

Uncovering the Latent Drivers of Risk Management System Adoption in Indonesian Small and Medium Enterprises

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ABSTRACT

Research on family firm SMEs has predominantly emphasized risk-taking behavior as a driver of performance, while limited attention has been given to the determinants of risk management system adoption. Aiming to address the gap, this study tries to identify the latent drivers motivating Indonesian family firm SMEs to adopt risk management practices. Using survey data from 233 firms and applying principal component analysis (PCA), the study extracts underlying motivational factors from validated questionnaire items. The results reveal seven key determinants: knowledge, accounting, good governance, sustainability, value, obligatory, and personal motivations. The Kaiser-Meyer-Olkin (KMO) value of 0.766 and significant Bartlett's test confirm sampling adequacy, while all extracted factors show eigenvalues greater than one. These determinants collectively explain a substantial proportion of variance and indicate that both cognitive (knowledge-based) and behavioral (owner-driven) considerations influence adoption decisions. The study finds that family firm SMEs are not purely intuition-driven, but increasingly use structured, evidence-based practices. However, the results are limited to the Indonesian context and an exploratory use of PCA. Future research should use confirmatory methods and cross-country comparisons to enhance generalizability.

Keywords: Family Firm SMEs; Knowledge-Oriented Drivers; Managerial-Oriented Drivers; Principal Component Analysis (PCA); Risk Management Adoption

JEL Classification: M10; G32; L25

INTRODUCTION

Family firm small and medium enterprises (SMEs) play a significant role in economic development, particularly in emerging markets such as Indonesia (Manansala & Vargas, 2025; Mugiati, 2024; Sinolungan & Kimbal, 2024). These firms are typically characterized by concentrated ownership and strong managerial control exercised by owner-CEOs, which shapes strategic decision-making processes (Chen et al., 2016; Ha et al., 2022). Prior research has extensively examined the role of risk-taking orientation in enhancing firm performance within family businesses (Napathorn, 2023). However, the governance implications of such orientation remain underexplored, especially in relation to the adoption of formal risk management systems (Bascieri et al., 2017; Kallmuenzer et al., 2023). Given the increasing complexity of business environments, risk management has emerged as an essential managerial tool to anticipate uncertainty and ensure organizational resilience (Boh et al., 2020; Calabrò et al., 2021; Škare & Porada-Rochoń, 2021).

Within family firms, decision-making is often embedded in deeply rooted norms, values, and beliefs derived from the owning family. This institutional setting can simultaneously support and hinder the implementation of new managerial practices, such as risk management systems. On one side, concentrated family ownership may promote rapid decision-making and a long-term strategic perspective (Juwita, 2019). Conversely, it can also reduce receptiveness to external expertise and impede the development of more formal governance structures. As a result, the adoption of risk management in family firm SMEs cannot be fully understood through purely structural or contingency perspectives; rather, it requires consideration of the underlying motivations that shape managerial choices at both organizational and individual levels (Basco et al., 2023; Burgstaller & Wagner, 2015; Falkner & Hiebl, 2015; Lobo et al., 2023; Mitter, Walcher, et al., 2022; Peláez-León & Sánchez-Marín, 2023).

Existing studies suggest that the implementation of risk management in SMEs is influenced by multiple factors, including managerial knowledge, regulatory pressures, and stakeholder expectations (Glowka et al., 2021). Nevertheless, empirical evidence remains fragmented, and limited attention has been given to identifying the latent motivational drivers that collectively explain adoption behavior in family firm contexts. This limitation is particularly relevant given that family firms often exhibit hybrid decision-making patterns that combine rational evaluation with value-based and experience-driven judgments (Mitter, Postlmayr, et al., 2022).

Moreover, the heightened focus on corporate governance, sustainability, and accountability has intensified external demands on SMEs to implement more formalized management practices. Within this setting, risk management is not only a control instrument but also a strategy for moderating risk-taking behavior and ensuring alignment between organizational goals and stakeholder expectations. Nevertheless, despite its recognized significance, there is still a limited understanding of how these external and internal pressures translate into tangible drivers of adoption, particularly in the context of emerging markets.

Another key consideration concerns the influence of knowledge and learning on the formation of managerial decisions. The diffusion of risk management practices often depends on the extent to which owner-managers are exposed to academic insights, professional expertise, and evidence-based frameworks (Mitter, Postlmayr, et al., 2022). At the same time, personal beliefs, family norms, and individual risk preferences continue to influence how such knowledge is interpreted and applied (Mafrolla et al., 2016). This

interaction indicates that the adoption of risk management systems extends beyond a purely technical choice, encompassing a socio-cognitive process shaped by the dynamic interplay between knowledge and managerial judgment (Sundkvist & Stenheim, 2023).

In light of these issues, the fundamental focus of this study is to analyze the underlying motivations that drive the adoption of risk management systems in family firm SMEs. Specifically, this research addresses the following gap: prior literature has largely emphasized observable factors and outcomes of risk-taking behavior, while overlooking the latent motivational structure that explains why family firms choose to adopt risk management practices. To address this gap, the study adopts an exploratory design, applying principal component analysis (PCA) to survey data gathered from Indonesian family-owned SMEs in order to uncover the principal underlying drivers.

This study contributes to the literature in several ways. First, it offers empirical insights into the diverse motivations that shape the adoption of risk management practices within family-owned SMEs. Second, it introduces a structured classification of these motivations, highlighting the coexistence of knowledge-related and owner-driven considerations. Third, it extends the understanding of family firms as adaptive organizations capable of integrating formal management practices alongside traditional value systems. By doing so, the study offers a more comprehensive perspective on how risk management is adopted within the unique institutional context of family-controlled SMEs.

LITERATURE REVIEW

Family Firm SMEs and Decision-Making Context

Family-owned SMEs are distinguished by concentrated ownership and the dominant involvement of owner-managers in strategic decision-making. This governance structure creates a distinct organizational context in which authority is centralized and strategic choices are closely tied to the preferences of the owning family. As highlighted in prior studies, decision-making in such firms is not solely driven by economic rationality but is also shaped by socioemotional wealth considerations, including family control, identity, and long-term continuity (Chen et al., 2016; Kallmuenzer et al., 2021). Consequently, strategic orientations, such as whether to pursue conservative or innovative approaches, often reflect the personal philosophy and risk preferences of the owner-CEO rather than purely market-based logic.

In this context, family firm SMEs frequently exhibit hybrid decision-making patterns, combining rational analysis with value-based and experience-driven judgments. While formal tools and analytical frameworks may be considered, their adoption depends on whether they are perceived as compatible with existing norms and beliefs. Prior research suggests that owner-managers may selectively integrate external knowledge into their decision processes, filtering it through personal experience and family values (Mitter, Postlmayr, et al., 2022). This hybrid nature implies that managerial decisions are neither fully objective nor entirely intuitive but instead emerge from the interaction between cognitive evaluation and socio-cultural influences.

Another critical aspect of decision-making in family-owned SMEs concerns the role of organizational learning and the acquisition of knowledge. Although these firms are sometimes perceived as resistant to external ideas, evidence indicates that many owner-managers actively invest in human capital development to enhance competitiveness. Training initiatives and knowledge-sharing practices are often implemented to strengthen internal capabilities, particularly in response to competitive pressures (Feranita et al.,

2017; Gomez-Mejia et al., 2018). However, the extent to which such knowledge is translated into organizational practices varies, especially among smaller firms with limited resources. This suggests that knowledge adoption is contingent not only on availability but also on managerial willingness to internalize and apply new concepts.

Finally, decision-making in family firm SMEs is strongly influenced by long-term orientation and sustainability considerations. These firms often prioritize continuity across generations, leading to a greater emphasis on stability, reputation, and stakeholder relationships. Compliance with social norms, regulatory frameworks, and community expectations further reinforces this orientation (Boh et al., 2020; Koropp et al., 2013). At the same time, deeply embedded family values may either facilitate or hinder the adoption of new managerial systems, depending on their perceived alignment with the firm's identity. As a result, the decision to adopt practices such as risk management systems should be understood as a multidimensional process shaped by the interplay of strategic intent, knowledge considerations, and value-based judgments.

Risk Management Adoption in SMEs

Risk management has increasingly been recognized as a critical managerial tool for addressing uncertainty and enhancing organizational resilience in dynamic business environments. It enables firms to systematically identify, assess, and respond to potential risks that may affect operational and strategic outcomes. Although formal risk management systems are well established in large organizations, their adoption among SMEs remains inconsistent. This disparity is often attributed to structural limitations, including resource constraints, lack of expertise, and limited access to formal management frameworks (Brustbauer, 2016). As a result, many SMEs rely on informal or intuitive approaches to risk handling rather than structured systems.

Within the context of family firm SMEs, the adoption of risk management becomes even more complex due to the centralized nature of decision-making and the dominant role of the owner-manager. The effectiveness of risk management implementation largely depends on the degree of alignment between the system and the firm's internal attributes, especially the owner's strategic orientation and tolerance for risk. Prior studies indicate that owner-managers with a higher tolerance for risk may perceive formal risk management as restrictive, whereas more risk-averse individuals are more likely to support its adoption as a control mechanism (Glowka et al., 2021; Mitter, Postlmayr, et al., 2022). This suggests that adoption decisions are not purely technical but are shaped by individual attitudes toward uncertainty and control.

In addition to internal factors, external pressures play a significant role in influencing risk management adoption in SMEs (Hanggraeni et al., 2019). Regulatory frameworks, governance standards, and industry expectations increasingly require firms to implement structured approaches to risk oversight. In many jurisdictions, elements of risk management are embedded within broader corporate governance requirements, making compliance a key driver of adoption (Burgstaller & Wagner, 2015; Zhu et al., 2023). Furthermore, stakeholder expectations, including those of investors, customers, and the broader community, encourage SMEs to adopt risk management practices as part of responsible and sustainable business conduct. These pressures highlight the role of institutional forces in shaping organizational behavior.

Ultimately, the adoption of risk management in SMEs may also be interpreted as a component of a wider process of organizational adaptation to increasing environmental complexity. As firms face increasing uncertainty arising from market competition, technological change, and global disruptions, the need for structured decision-support

systems becomes more pronounced. However, the effectiveness of adoption depends on the perceived fit between the risk management system and the firm's existing structures, capabilities, and values. Misalignment may lead to superficial or ineffective implementation, as observed in prior studies where risk management systems failed to integrate with organizational routines (Hiebl et al., 2019). Therefore, understanding risk management adoption in SMEs requires a multidimensional perspective that considers both internal motivations and external pressures, as well as the interaction between them.

Knowledge-Based Motivations

The literature on managerial decision-making emphasizes the central role of knowledge and learning in shaping the adoption of organizational practices. In the context of SMEs, the diffusion of risk management systems is closely associated with the extent to which owner-managers are exposed to formal knowledge, including academic research, professional training, and expert consultation. Such exposure enhances the ability of decision-makers to recognize the relevance and potential benefits of structured risk management approaches. Prior studies suggest that firms with higher levels of managerial knowledge are more likely to adopt formalized systems, as they are better equipped to understand the implications of uncertainty and the value of proactive risk mitigation (Feranita et al., 2017; Gomez-Mejia et al., 2018; König et al., 2013; Richards et al., 2019).

In family-owned SMEs, however, the influence of knowledge is shaped by the cognitive frameworks of owner-managers. Unlike large corporations with specialized departments, these firms rely heavily on the interpretation and judgment of a limited number of decision-makers. As a result, the adoption of risk management practices depends not only on the availability of knowledge but also on how such knowledge is perceived and internalized (Falkner & Hiebl, 2015; Hiebl et al., 2019; Lin & Shen, 2015). Evidence-based practices must be translated into forms that are consistent with existing beliefs and experiences before they can be effectively implemented. This highlights that knowledge motivation is not purely objective but is embedded within a broader socio-cognitive process.

A key dimension of knowledge-based motivation relates to accounting and financial understanding, which provides a concrete basis for evaluating the benefits of risk management (Ali et al., 2019). Financial indicators such as profitability, cost efficiency, and loss prevention serve as tangible signals that influence managerial decisions. Risk management is often perceived as a mechanism to enhance financial stability by reducing unexpected losses and improving resource allocation. Empirical evidence indicates that SMEs possessing more advanced accounting capabilities are more likely to implement structured management systems, as these capabilities enable them to more effectively evaluate the financial implications of risks and the prospective benefits of mitigation strategies.

Furthermore, knowledge-based motivations extend beyond internal learning to include the influence of governance-related knowledge and external standards. Awareness of best practices in corporate governance, transparency, and accountability can encourage firms to align their management systems with widely accepted norms. In this sense, knowledge serves as a bridge between internal decision-making processes and external expectations. The combination of theoretical understanding, financial reasoning, and governance awareness forms a cognitive foundation that supports the adoption of risk management systems. In this study, these dimensions are reflected in the constructs of

knowledge motivation, accounting motivation, and good governance motivation, which collectively represent the knowledge-oriented drivers within the proposed framework.

Governance and External Pressure Motivations

Governance structures and external institutional pressures constitute an important set of drivers influencing the adoption of risk management systems in SMEs. In recent years, the increasing emphasis on transparency, accountability, and responsible business conduct has elevated the role of governance practices across organizations of all sizes. For SMEs, and particularly family firm SMEs, the adoption of risk management can be understood as part of a broader effort to strengthen governance mechanisms and align managerial practices with stakeholder expectations. Prior studies suggest that firms with stronger governance orientation are more likely to formalize their internal processes, including the implementation of risk management systems, in order to enhance credibility and legitimacy (Kallmuenzer et al., 2023).

Within family firms, governance-related motivations are shaped by the need to balance internal control with external accountability. While ownership concentration allows for efficient decision-making, it may also raise concerns regarding transparency and the protection of stakeholder interests. As a result, the adoption of formal risk management systems can serve as a mechanism to signal commitment to good governance practices. This is particularly relevant in contexts where firms interact with external stakeholders such as investors, creditors, and regulatory bodies, all of whom may demand higher standards of oversight and risk control. Thus, governance motivation reflects not only internal managerial intent but also the firm's responsiveness to external scrutiny.

In addition to governance considerations, regulatory and institutional pressures play a significant role in shaping adoption decisions. In many countries, elements of risk management are embedded within broader regulatory frameworks and corporate governance codes, making compliance an important factor for SMEs. Legal requirements, industry standards, and government policies may directly or indirectly encourage firms to adopt structured approaches to risk management. From this perspective, adoption may be driven not solely by strategic choice but also by perceived obligations to conform to external rules and norms. This dimension is captured in the concept of obligatory motivation, which reflects the influence of formal institutional forces on managerial behavior (Zhu et al., 2023).

Moreover, external pressures extend beyond regulatory compliance to include broader stakeholder expectations and societal demands. Increasing awareness of sustainability, environmental responsibility, and ethical business conduct has led stakeholders to expect greater accountability from firms, including SMEs. Risk management systems are often viewed as tools that enable organizations to anticipate and mitigate risks related to these broader concerns. Consequently, firms may adopt such systems to maintain legitimacy, strengthen stakeholder relationships, and enhance their reputation within the business ecosystem. In this study, governance motivation and obligatory motivation jointly represent the influence of governance structures and external pressures, highlighting the role of institutional and stakeholder-driven factors in shaping risk management adoption.

Sustainability and Value-Based Motivations

Sustainability considerations represent a central dimension of decision-making in family firm SMEs, particularly due to their long-term orientation and intergenerational focus. Unlike non-family firms that may prioritize short-term financial performance, family businesses often emphasize continuity, legacy preservation, and the transfer of

ownership across generations. This orientation aligns with the stewardship perspective, which views owner-managers as custodians of the firm's long-term welfare rather than purely profit-maximizing agents (Koropp et al., 2013). Within this context, the adoption of risk management systems can be interpreted as a proactive strategy to safeguard business continuity and mitigate uncertainties that may threaten long-term survival.

The role of sustainability motivation is further reinforced by the increasing complexity and volatility of the business environment. Family firm SMEs are exposed to various risks, including market fluctuations, operational disruptions, and regulatory changes, which may have long-term implications if not properly managed. Risk management systems provide a structured approach to anticipating and responding to such uncertainties, thereby supporting organizational resilience (Mafrolla et al., 2016). However, the decision to adopt these systems depends on whether owner-managers perceive them as aligned with their long-term strategic priorities. This suggests that sustainability motivation reflects not only an awareness of external risks but also a commitment to maintaining the firm's enduring viability.

In addition to sustainability considerations, organizational values and family norms play a critical role in shaping managerial behavior in family firm SMEs. These values are often deeply embedded and serve as guiding principles for decision-making processes. Prior research indicates that family firms tend to develop strong internal cultures that influence how new practices are evaluated and implemented. The adoption of risk management systems, therefore, is contingent upon their compatibility with these existing value systems. If such practices are perceived as consistent with the firm's identity and beliefs, they are more likely to be accepted and institutionalized. Conversely, misalignment may lead to resistance or superficial adoption.

Importantly, the interaction between sustainability orientation and value-based considerations represents a distinctive feature of family firm decision-making, contributing to the novelty of this study. While prior literature has examined these dimensions separately, this research integrates them as complementary motivational drivers underlying risk management adoption. Sustainability motivation captures the long-term strategic intent of the firm, whereas value motivation reflects the normative and cultural context in which decisions are embedded. Together, they highlight that adoption is not solely driven by rational or regulatory considerations but also by deeply rooted beliefs and aspirations. This integrated perspective provides a more comprehensive understanding of how family firm SMEs evaluate and internalize risk management practices within their unique organizational context.

Personal Motivations and Managerial Judgment

Individual-level considerations constitute a critical dimension in understanding the adoption of risk management systems within family-owned SMEs. In such organizational settings, strategic authority is highly concentrated in the hands of the owner-manager, whose personal beliefs and cognitive orientations strongly shape decision outcomes. As a result, managerial judgment is not merely a complementary factor but often becomes the central mechanism through which strategic initiatives are evaluated and either accepted or rejected. This centralization of authority implies that the adoption of formal risk management practices is closely tied to how individual decision-makers perceive uncertainty and control (Glowka et al., 2021).

A key aspect of this perspective relates to heterogeneity in risk preferences among owner-managers. Individuals who exhibit a higher degree of risk aversion tend to favour structured and systematic approaches, viewing formal risk management systems as

tools to minimize exposure to uncertainty and enhance predictability. In contrast, those with greater tolerance for risk may perceive such systems as restrictive or unnecessary, preferring instead to rely on experiential knowledge and intuitive judgment. This divergence highlights that the inclination to adopt risk management practices cannot be fully explained by organizational characteristics alone, but must also account for the psychological disposition of decision-makers.

Beyond risk preferences, cognitive biases, and personal experiences further influence managerial interpretation of risk-related information. Owner-managers often rely on heuristics shaped by past successes or failures, which can either reinforce or hinder the perceived value of formalized systems. In family firms, where decision-making processes are deeply embedded in personal and familial contexts, these subjective elements become even more pronounced. Consequently, the evaluation of risk management practices is not purely analytical but reflects a complex interplay between rational assessment and experiential judgment.

Exploratory Nature of the Study

Although prior studies provide insights into various determinants of risk management adoption, the literature lacks a unified framework that integrates these factors into a coherent structure. Most existing research adopts a confirmatory approach, testing predefined relationships between variables. In contrast, this study adopts an exploratory perspective, aiming to uncover latent motivational drivers without imposing rigid theoretical assumptions.

By employing PCA, this research seeks to identify underlying dimensions that emerge from empirical data. This approach is particularly appropriate given the complex and multidimensional nature of decision-making in family firm SMEs. The exploratory design allows for a more nuanced understanding of how different motivations interact and cluster together in shaping adoption behavior.

Building on the preceding discussion, the literature suggests that the adoption of risk management systems in family firm SMEs is shaped by a multidimensional set of interrelated motivations spanning cognitive, organizational, institutional, and individual domains. Specifically, knowledge motivation, accounting motivation, and good governance motivation reflect a knowledge-oriented dimension, grounded in formal learning, financial reasoning, and governance awareness.

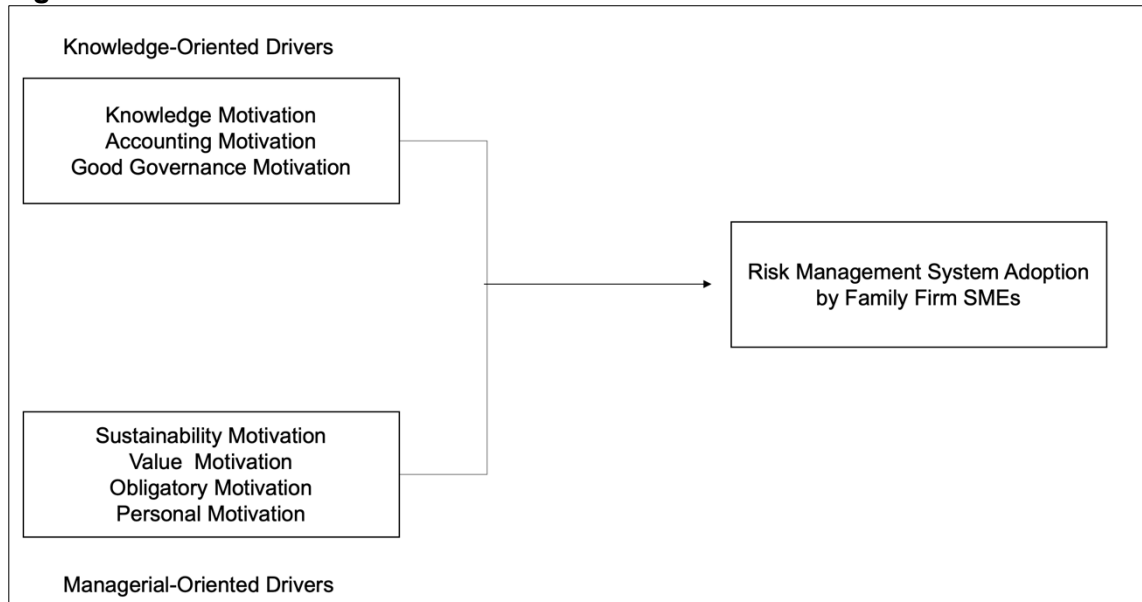
In parallel, sustainability motivation, value motivation, obligatory motivation, and personal motivation capture a managerial-oriented dimension, encompassing long-term orientation, cultural norms, regulatory pressures, and individual judgment. Rather than operating independently, these seven factors are conceptually linked through the central role of the owner-manager, who integrates diverse sources of influence when evaluating the relevance of risk management practices.

Accordingly, the framework presented in [Figure 1](#) synthesizes these insights by positioning risk management adoption as the outcome of interacting motivations operating at multiple levels of analysis. Consistent with the exploratory nature of this study, this framework does not impose predefined causal relationships but instead provides a theoretically informed structure for interpreting the latent factors identified through empirical analysis.

The first dimension includes knowledge motivation, accounting motivation, and good governance motivation, which reflect cognitive and rational considerations derived from

formal knowledge, financial logic, and governance principles. The second dimension includes sustainability motivation, value motivation, obligatory motivation, and personal motivation, which reflect normative, regulatory, and individual-level influences rooted in managerial judgment and organizational context.

Figure 1. Research Framework



The framework emphasizes that risk management adoption is not the result of a single determinant but rather emerges from the interaction between cognitive and behavioural motivations. Within the context of family firms, owner-managers play a central role in integrating these diverse influences, balancing analytical reasoning with socio-emotional considerations. Consequently, the adoption process is conceptualized as a multidimensional socio-cognitive phenomenon shaped by both internal and external forces.

RESEARCH METHOD

Research Design

This study adopts a quantitative and exploratory research design to identify the latent motivational drivers underlying the adoption of risk management systems in family firm SMEs. Given the limited theoretical consensus regarding the structure of these motivations, an exploratory approach is considered appropriate to uncover underlying patterns without imposing predefined relationships. The study employs PCA as the main analytical technique to reduce observed variables into a smaller set of interpretable latent constructs.

Population and Sampling Criteria

The population of this study consists of Indonesian SMEs registered under the Ministry of Small and Medium Enterprises, Republic of Indonesia. This study specifically focuses on family firm SMEs, which are defined as enterprises that meet at least two criteria: (1) ownership is predominantly held by a single family, and (2) key managerial positions are occupied by family members, particularly the owner-CEO or close relatives.

A purposive sampling technique is employed to ensure that only firms meeting the definition of family businesses are included. Additionally, the study restricts the sample

to firms with 10 to 200 employees, consistent with SME classification standards. A total of 527 questionnaires were distributed across 33 provinces in Indonesia, resulting in 233 usable responses, representing a response rate of approximately 43%.

Questionnaire Development

The measurement instrument was developed through a multi-stage process to ensure content validity. In the first stage, an initial pool of 42 items was generated based on an extensive review of the literature on risk management, family business, and organizational behavior. This was followed by a focus group discussion (FGD) involving two professors specializing in risk management and one expert in family business studies.

In the second stage, the instrument underwent expert validation involving three professors in finance and three in family business research. Based on their evaluation, redundant and ambiguous items were eliminated, resulting in a refined set of 22 measurement items. This iterative process ensured that the questionnaire adequately captured the multidimensional nature of motivations underlying risk management adoption.

All items were measured using a five-point Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). This scaling approach is widely used in behavioral and management research to capture respondents’ perceptions and attitudes. The items were designed to reflect various potential motivations, including knowledge acquisition, financial considerations, governance pressures, sustainability concerns, organizational values, regulatory compliance, and personal preferences.

Data Analysis Technique: PCA

To identify the latent structure of motivational drivers, this study employs PCA. PCA is a data reduction technique that transforms a set of correlated variables into a smaller number of uncorrelated components while preserving the maximum amount of variance (Markowitz, 2018).

For a given multivariate set of k variables, the model can be described as follows:

$$r - \mu = LF + \varepsilon$$

with $m < k$, and where r is the vector (r_1, r_2, \dots, r_k), μ is the corresponding mean vector ($\mu_1, \mu_2, \dots, \mu_k$), L is the matrix of factor loadings ($L = [l_{ij}]_{km}$), and ε as the specific error term ($\varepsilon = (\varepsilon_1, \varepsilon_2, \dots, \varepsilon_k)$).

Factor Extraction

The factor extraction process follows the Kaiser criterion, where only components with eigenvalues greater than 1.0 are retained. This criterion ensures that each extracted factor explains a meaningful proportion of the total variance. Additionally, the scree plot is examined to confirm the appropriate number of factors by identifying the point at which the slope of the eigenvalue levels off.

Rotation Method

To improve interpretability, the study applies an orthogonal rotation using the Varimax method. This rotation technique maximizes the variance of factor loadings across variables, resulting in a clearer separation of factors and facilitating a more meaningful interpretation of each component.

Thresholds and Item Retention

Several thresholds are applied to ensure the robustness of the factor structure: factor loadings ≥ 0.50 are considered significant for interpretation. Items with cross-loadings above 0.40 on multiple factors are carefully evaluated and removed if necessary. The anti-image correlation matrix is examined to ensure that individual measures of sampling adequacy exceed the minimum threshold of 0.50

Validity and Reliability Assessment

The suitability of the data for factor analysis is assessed using two key statistical tests. The first is the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, with a minimum acceptable value of 0.50. In this study, the KMO value exceeds this threshold, indicating adequate sampling adequacy. The second is the Bartlett's Test of Sphericity, which tests whether the correlation matrix is significantly different from an identity matrix. A significant result ($p < 0.05$) confirms that the variables are sufficiently correlated for factor analysis.

Furthermore, internal consistency is evaluated by examining the coherence of items within each extracted factor. Only factors with theoretically meaningful and statistically reliable groupings are retained for further interpretation.

RESULTS

Data Adequacy and Preliminary Analysis

Table 1. Correlations Matrix

Variable	MSA
Fitting personal opinion	0.711
Government regulations	0.765
Positive opinion from stakeholder	0.748
Implementing theory	0.812
Going concern	0.766
Science said so	0.791
Academic proven	0.777
Required by the stakeholder	0.704
Avoiding losses	0.786
Make profit higher	0.786
Meets shareholder's expectation	0.772
Owner's belief	0.763
Family's norms	0.656
Family's business codes	0.801
Abnormal return	0.823
Not preferred to risk	0.833
Become more responsible to society	0.790
Comply with the rules	0.669
Preach by the experts	0.769
Risk avoidance	0.624
Sustainability	0.602
Stewardship principles	0.593

Prior to factor extraction, the suitability of the dataset for PCA was assessed. The KMO measure of sampling adequacy yielded a value of 0.766, exceeding the recommended threshold of 0.50, indicating that the sample is adequate for factor analysis (Table 1). In addition, the Bartlett's Test of Sphericity was statistically significant ($p < 0.001$),

confirming that the correlation matrix is not an identity matrix and that meaningful relationships exist among variables.

Further examination of the anti-image correlation matrix shows that all diagonal elements are above 0.50, with the lowest value reported at 0.583. This indicates that each individual item meets the minimum requirement for inclusion in the factor analysis. These results collectively support the appropriateness of proceeding with PCA.

Factor Extraction and Determination

Table 2. Total Variance Explained

Comp	Initial Eigenvalues			Extraction Sum of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	3.849	17.495	17.495	3.849	17.495	17.495	2.810	12.774	12.774
2	2.645	12.021	29.516	2.645	12.021	29.516	2.769	12.585	25.359
3	2.295	10.430	39.947	2.295	10.430	39.947	1.855	8.433	33.793
4	1.436	6.528	46.475	1.436	6.528	46.475	1.661	7.550	41.343
5	1.232	5.599	52.074	1.232	5.599	52.074	1.614	7.337	48.679
6	1.113	5.058	57.131	1.113	5.058	57.131	1.594	7.243	55.923
7	1.063	4.832	61.963	1.063	4.832	61.963	1.329	6.041	61.963
8	0.910	4.138	66.102	—	—	—	—	—	—
9	0.860	3.907	70.009	—	—	—	—	—	—
10	0.801	3.643	73.652	—	—	—	—	—	—
11	0.695	3.161	76.812	—	—	—	—	—	—
12	0.636	2.890	79.702	—	—	—	—	—	—
13	0.627	2.851	82.553	—	—	—	—	—	—
14	0.586	2.664	85.217	—	—	—	—	—	—
15	0.508	2.310	87.527	—	—	—	—	—	—
16	0.451	2.052	89.579	—	—	—	—	—	—
17	0.438	1.991	91.570	—	—	—	—	—	—
18	0.424	1.926	93.497	—	—	—	—	—	—
19	0.398	1.809	95.305	—	—	—	—	—	—
20	0.366	1.664	96.970	—	—	—	—	—	—
21	0.344	1.563	98.533	—	—	—	—	—	—
22	0.323	1.467	100.000	—	—	—	—	—	—

The extraction of latent factors was conducted using the Kaiser criterion (eigenvalues > 1.0). The results indicate that seven components satisfy this criterion, suggesting the presence of seven underlying dimensions. This decision is further supported by the scree plot, which shows a clear inflection point after the seventh component.

The retained factors collectively explain a substantial proportion of the total variance (as presented in Table 2), indicating that the extracted components capture the majority of the information contained in the original variables. Given the exploratory nature of the study, the seven-factor solution is considered both statistically adequate and conceptually meaningful.

Factor Rotation and Interpretation

Table 3. Rotated Component Matrix

Variable		C1	C2	C3	C4	C5	C6	C7
1	Fitting personal opinion	0.032	0.144	0.076	-0.116	0.011	0.203	0.657
2	Government regulations	-0.176	0.199	0.063	-0.014	-0.139	0.635	0.026
3	Positive opinion from stakeholder	0.014	-0.179	0.505	0.096	0.197	0.561	0.057
4	Implementing theory	0.654	0.068	0.127	-0.079	0.074	0.046	-0.183
5	Going concern	0.486	0.200	0.246	0.128	0.076	-0.043	-0.323
6	Science said so	0.798	0.114	-0.112	-0.030	0.011	-0.038	0.159
7	Academic proven	0.508	0.049	0.483	-0.065	-0.009	-0.209	0.142
8	Required by the stakeholder	-0.094	-0.103	0.776	0.034	-0.011	0.167	0.123
9	Avoiding losses	0.085	0.823	0.089	0.004	-0.026	-0.064	0.161
10	Make profit higher	0.125	0.748	-0.257	0.076	-0.071	0.055	-0.132
11	Meets shareholder's expectation	-0.043	0.777	-0.147	0.082	0.138	0.008	-0.032
12	Owner's belief	-0.244	-0.251	0.238	0.149	0.541	0.324	-0.006
13	Family's norms	0.002	0.230	0.066	0.040	0.803	0.030	-0.059
14	Family's business codes	0.497	0.192	-0.010	-0.098	0.551	-0.108	0.206
15	Abnormal return	0.277	0.598	0.155	0.027	0.281	-0.147	0.151
16	Not preferred to risk	0.253	0.455	-0.359	-0.109	0.275	0.042	0.306
17	Become more responsible to society	0.299	-0.069	0.583	-0.154	0.301	0.010	-0.031
18	Comply with the rules	0.053	-0.173	-0.023	0.127	0.147	0.764	0.075
19	Preach by the experts	0.798	0.018	-0.050	0.001	-0.084	-0.058	0.023
20	Risk avoidance	-0.049	-0.025	0.116	0.356	0.007	-0.103	0.688
21	Sustainability	-0.079	0.012	-0.034	0.830	0.059	0.064	-0.019
22	Stewardship principles	0.013	0.115	-0.006	0.834	-0.016	0.086	0.084

Notes: Extraction Method: Principal Component Analysis (PCA). Rotation Method: Varimax with Kaiser Normalization. Convergence: Achieved in 7 Iterations.

To enhance interpretability, an orthogonal Varimax rotation was applied. The rotated component matrix (Table 3) reveals a clear loading structure, with most items loading strongly on a single factor and minimal cross-loadings, consistent with the predefined threshold of 0.50.

Based on the rotated solution, seven distinct factors emerge and are interpreted accordingly. The first factor, Knowledge Motivation, encompasses elements related to scientific knowledge, academic evidence, theoretical application, and the influence of

experts. The second, Accounting Motivation, reflects financial considerations such as loss avoidance, profitability, shareholder expectations, and the pursuit of abnormal returns.

The third factor, Good Governance Motivation, captures aspects of stakeholder expectations, social responsibility, and accountability. This is followed by Sustainability Motivation, which emphasizes long-term orientation, going concern considerations, and stewardship principles. The fifth factor, Value Motivation, represents family norms, organizational values, and underlying belief systems.

Furthermore, Obligatory Motivation highlights the role of regulatory compliance and adherence to government policies. Finally, Personal Motivation reflects individual dimensions, including risk preferences, personal beliefs, and managerial attitudes.

It is important to note that these labels are interpretive and based on the conceptual meaning of grouped items, consistent with exploratory factor analysis practices. The study does not impose causal relationships among factors but rather identifies patterns of co-occurring motivations.

Reliability Analysis and Robustness Check

To assess the internal consistency of the extracted factors, Cronbach's alpha coefficients were calculated for each construct. The results indicate that all factors achieve acceptable reliability levels, with alpha values exceeding the commonly accepted threshold of 0.70. This suggests that the items within each factor are sufficiently correlated and measure a coherent underlying construct.

In addition, item-total correlations were examined to ensure that each item contributes meaningfully to its respective factor. No items were removed at this stage, as all retained items met the minimum reliability criteria.

As an additional robustness check, convergent validity was assessed by examining the magnitude of factor loadings. All retained items exhibit loadings above 0.50 on their respective factors, indicating adequate convergence.

To further ensure factor stability, the consistency between the initial extraction and the rotated solution was evaluated. The factor structure remained stable across these stages, suggesting that the identified components are not sensitive to minor variations in the data.

The results identify seven latent motivational drivers underlying the adoption of risk management systems in family firm SMEs. These findings provide empirical support for the multidimensional nature of adoption behavior, highlighting that managerial decisions are influenced by a combination of knowledge-based, governance-related, normative, and individual-level considerations.

Importantly, the classification of these factors into broader dimensions (e.g., knowledge-oriented and managerial-oriented drivers) should be interpreted as an analytical grouping rather than statistically tested higher-order constructs, and therefore requires further validation in future research.

DISCUSSION

This study aims to uncover the latent motivational drivers underlying the adoption of risk management systems in family firm SMEs. The findings reveal seven distinct factors: knowledge motivation, accounting motivation, good governance motivation, sustainability motivation, value motivation, obligatory motivation, and personal motivation; derived through PCA. Given the exploratory nature of the method, the discussion focuses on interpreting these factors in light of prior literature, without inferring causal relationships.

Key Findings Analysis

The first factor, knowledge motivation, highlights the importance of academic knowledge, scientific evidence, and expert influence in shaping managerial decisions. This finding suggests that exposure to formal knowledge plays a critical role in increasing awareness of risk management practices. It is consistent with prior studies emphasizing that the diffusion of managerial innovations depends on knowledge transfer and learning processes (Sundkvist & Stenheim, 2023). In the context of family firms, where decision-making is often centralized, the presence of knowledge-based motivation indicates a growing openness toward evidence-based practices. However, this result should be interpreted as an indication of perceived relevance rather than a direct causal mechanism for adoption.

The second factor, accounting motivation, reflects financial considerations such as profitability, loss avoidance, and shareholder expectations. This suggests that risk management is perceived not only as a control mechanism but also as a tool for financial optimization. This finding aligns with earlier research linking risk management practices to improved financial performance and resource allocation (Ali et al., 2019). Within family firm SMEs, where financial sustainability is often a primary concern, such motivations may play a significant role in encouraging adoption. Nevertheless, the analysis does not establish whether these expectations translate into actual financial outcomes.

The third factor, good governance motivation, captures the influence of stakeholder expectations, accountability, and social responsibility. This finding indicates that external pressures from stakeholders may encourage firms to adopt more structured management practices. It supports the argument that governance mechanisms serve as an important driver of risk management implementation (Kallmuenzer et al., 2023). In family firms, where ownership and control are often concentrated, the presence of governance-related motivation suggests an increasing recognition of the need to balance internal authority with external accountability.

The fourth factor, sustainability motivation, reflects long-term orientation, stewardship, and concerns for business continuity. This finding is consistent with the stewardship perspective, which posits that family firms prioritize long-term survival over short-term gains (Koropp et al., 2013). Risk management, in this context, is perceived as a mechanism to ensure organizational resilience. However, given the exploratory design, this result should be interpreted as a perceived motivation rather than evidence of actual long-term strategic integration.

The fifth factor, value motivation, emphasizes the role of family norms, organizational culture, and belief systems in shaping managerial decisions. This finding reinforces the notion that family firms operate within a strong value-based framework, where decisions are influenced by deeply embedded cultural elements (Mafrolla et al., 2016). The inclusion of this factor suggests that the adoption of risk management practices is

contingent upon their compatibility with existing values. This highlights the importance of aligning managerial innovations with organizational identity in family-controlled contexts.

The sixth factor, obligatory motivation, represents the influence of regulatory requirements and policy compliance. This finding indicates that external institutional pressures, such as government regulations, contribute to the adoption of risk management systems. It is consistent with prior research emphasizing the role of regulatory frameworks in shaping organizational behavior (Zhu et al., 2023). However, the results do not differentiate between voluntary and mandatory adoption, and thus should be interpreted as reflecting perceived compliance pressures rather than actual enforcement effects.

The seventh factor, personal motivation, captures individual-level influences, including risk preferences and personal beliefs of owner-managers. This finding underscores the central role of the owner-CEO in family firm decision-making. It is consistent with studies suggesting that managerial characteristics significantly influence strategic choices in SMEs (Glowka et al., 2021). The presence of this factor confirms that risk management adoption is partly shaped by subjective judgment, although the extent of its influence relative to other factors cannot be determined within the current analytical framework.

Taken together, these findings suggest that the adoption of risk management systems in family firm SMEs is influenced by a multidimensional set of motivations spanning cognitive, organizational, institutional, and individual domains. While the study identifies patterns of co-occurring motivations, it does not establish hierarchical relationships or causal pathways among them. Therefore, any grouping of these factors into broader categories should be interpreted as a conceptual simplification rather than a statistically validated structure.

The seven motivational factors identified in this study are conceptually integrated within the framework presented in Figure 1, which distinguishes between knowledge-oriented and managerial-oriented drivers of risk management system adoption in family firm SMEs. The first group, comprising knowledge motivation, accounting motivation, and good governance motivation, represents the cognitive dimension of decision-making, where adoption is influenced by formal knowledge, financial considerations, and governance expectations.

These factors reflect the extent to which owner-managers rely on analytical reasoning and external standards when evaluating the relevance of risk management practices. In contrast, the second group, consisting of sustainability motivation, value motivation, obligatory motivation, and personal motivation, captures the behavioral and contextual dimension, emphasizing the role of long-term orientation, family values, regulatory pressures, and individual preferences.

As illustrated in the framework, these two sets of drivers do not operate in isolation; rather, they converge to shape the adoption decision through the central role of the owner-manager, who interprets and balances both rational and socio-emotional considerations. Therefore, consistent with the exploratory nature of the analysis, the framework should be understood as a representation of coexisting and interacting motivations, rather than a causal model specifying directional relationships among the identified factors.

Overall, the results contribute to the literature by providing an empirically grounded yet exploratory understanding of the diverse motivations that may shape risk management

adoption. The findings highlight that family firm SMEs are influenced by both formal knowledge and contextual considerations, reflecting the complex nature of decision-making in such organizations. Future research employing confirmatory methods is needed to validate the structure and examine the relationships among these factors in greater depth.

Research Implications

Managerial Implications

First, the findings suggest that managers of family-owned SMEs should move beyond viewing risk management as a purely technical or compliance-driven activity and instead recognize it as a multidimensional managerial tool shaped by both cognitive and behavioural drivers. The identification of knowledge, accounting, and governance motivations implies that effective adoption requires deliberate investment in managerial education, financial literacy, and governance awareness. Practically, this means that owner-managers should engage in structured training programs, consult external experts, and institutionalize basic financial analysis practices to better understand the value of risk management systems. Without strengthening these cognitive foundations, adoption is likely to remain superficial or symbolic rather than operationally embedded.

Second, the presence of sustainability, value, and personal motivations highlights that implementation strategies must be contextually aligned with the internal characteristics of family firms, particularly their long-term orientation and socioemotional priorities. Managers should therefore avoid imposing standardized or overly rigid risk management frameworks that may conflict with existing family norms and organizational culture. Instead, a more effective approach would involve customizing risk management practices to reflect the firm's values, legacy concerns, and continuity objectives. Embedding risk management into strategic planning, succession discussions, and stewardship practices can enhance its acceptance and ensure that it is perceived not as an external imposition but as an integral part of the firm's identity.

Third, the role of obligatory and governance-related motivations indicates that external pressures can be leveraged as strategic catalysts rather than mere compliance burdens. Policymakers, financial institutions, and industry associations increasingly require higher standards of accountability, and SMEs can use these expectations to legitimize internal changes. From a managerial perspective, aligning risk management adoption with regulatory requirements, stakeholder expectations, and sustainability reporting can improve credibility and access to external resources such as financing and partnerships. Consequently, managers should proactively interpret external demands as opportunities to strengthen organizational resilience and transparency, rather than reacting to them defensively.

An additional implication for practitioners lies in the need to adopt a phased and capability-sensitive approach to risk management implementation. Rather than pursuing immediate full-scale system adoption, owner-managers of family SMEs should prioritize incremental integration, beginning with simple risk identification and monitoring routines before progressing toward more formalized frameworks. This staged approach allows firms to gradually build internal acceptance, reduce resistance rooted in value misalignment, and develop organizational learning over time. Moreover, aligning risk management initiatives with existing decision-making practices, such as informal consultations within the family or reliance on experiential judgment, can enhance practical usability and ensure that the system evolves organically within the firm's operational context.

Theoretical Implications

From a theoretical standpoint, this study contributes to the risk management and family business literature by demonstrating that the adoption of risk management systems is best understood as a multidimensional socio-cognitive phenomenon, rather than a purely rational or structural decision. The identification of seven latent motivational drivers extends prior research that has predominantly focused on observable determinants (e.g., firm size, resources, or performance outcomes). By uncovering underlying motivational structures, the study provides a more nuanced explanation of why firms adopt risk management practices, emphasizing the interaction between knowledge-based reasoning and value-driven judgment.

Second, the study offers an important refinement to existing theoretical perspectives by highlighting the central role of the owner-manager as an integrative decision-maker. Unlike traditional models that treat organizational adoption as a function of external pressures or internal capabilities alone, the findings suggest that these influences are filtered through individual cognition, beliefs, and preferences. This insight bridges the gap between institutional theory and behavioural decision-making theory, particularly in the context of family firms where authority is highly concentrated. As such, the study supports the argument that adoption behavior cannot be fully explained without incorporating micro-level managerial interpretations.

Finally, the exploratory identification of knowledge-oriented and managerial-oriented dimensions provides a foundation for future theory development, although it stops short of confirming higher-order constructs. This distinction opens avenues for advancing research toward more integrative frameworks that combine cognitive, institutional, and socioemotional perspectives in explaining risk management adoption. Future studies can build on this by employing confirmatory techniques such as structural equation modelling to test causal relationships and hierarchical structures among these drivers. In doing so, the present study serves as an initial step toward developing a more comprehensive and context-sensitive theory of risk management adoption in SMEs, particularly within emerging market settings.

CONCLUSION

This study set out to explore the latent motivational drivers underlying the adoption of risk management systems in family firm SMEs. Using PCA on survey data from Indonesian firms, the findings identify seven distinct factors: knowledge motivation, accounting motivation, good governance motivation, sustainability motivation, value motivation, obligatory motivation, and personal motivation. These factors represent a multidimensional set of considerations that collectively shape how owner-managers perceive and approach the adoption of risk management practices.

The results suggest that risk management adoption in family firm SMEs is influenced by a combination of cognitive, organizational, institutional, and individual-level motivations. Knowledge-related considerations, such as exposure to academic insights and financial reasoning, appear alongside governance pressures, sustainability concerns, and deeply embedded family values. In addition, the presence of personal motivation highlights the role of owner-manager judgment in interpreting and integrating these influences. Taken together, these findings indicate that adoption is not driven by a single dominant factor but reflects the interaction of multiple motivations within the specific context of family-controlled enterprises.

Importantly, the study does not establish causal relationships among these factors, nor does it determine their relative importance. Instead, it provides an exploratory mapping of how different motivations cluster together in shaping adoption decisions. In doing so, the study contributes to the literature by offering a more nuanced understanding of risk management adoption in family firm SMEs, emphasizing its socio-cognitive and context-dependent nature. The findings also suggest that family firms should not be viewed solely as intuition-driven organizations, but rather as entities that may incorporate both structured knowledge and value-based considerations in managerial decision-making.

LIMITATION

This study is subject to several limitations that should be acknowledged. First, the empirical analysis is based on cross-sectional survey data collected from Indonesian family firm SMEs. As such, the findings may be context-specific and may not be directly generalizable to other institutional environments or cultural settings. Future research could extend this study by conducting cross-country comparisons to examine whether similar motivational structures emerge in different contexts.

Second, the study employs an exploratory methodological approach using PCA. While this approach is appropriate for identifying latent structures, it does not allow for the testing of causal relationships or the validation of higher-order constructs. Consequently, the interpretation of the identified factors remains descriptive rather than confirmatory. Future studies are encouraged to apply confirmatory factor analysis (CFA) or structural equation modelling (SEM) to validate the factor structure and examine the relationships among constructs more rigorously.

Third, the measurement relies on self-reported perceptions of owner-managers, which may be subject to response bias. The study captures perceived motivations rather than actual adoption behavior or implementation outcomes. Future research could incorporate longitudinal data or objective performance indicators to better understand how these motivations translate into real organizational practices.

Finally, while the study identifies seven distinct motivational factors, it does not assess their relative influence or potential interactions in a predictive framework. Further research could explore the relative importance of these drivers, as well as potential moderating variables such as firm size, generational stage, or industry characteristics. Despite these limitations, this study provides a useful foundation for understanding the complex and multidimensional nature of risk management adoption in family firm SMEs and opens avenues for more rigorous and theory-driven investigations in future research.

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