

The Influence of Accounting Information System Implementation, Internal Audit, and Human Resource Competence on the Effectiveness of Internal Control (A Case Study at PT. Agrodana Futures)

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ABSTRACT: This study examines the influence of Accounting Information System (AIS) implementation, Internal Audit, and Human Resource (HR) Competence on the Effectiveness of Internal Control at PT Agrodana Futures. The research is prompted by the critical role of internal control in the high-risk futures brokerage industry and the scarcity of studies analyzing the combined effect of these three variables in this context. The central research question is to what extent these factors affect internal control effectiveness. This paper provides a new contribution by simultaneously analyzing the roles of AIS, internal audit, and HR competence within a single integrated model, grounded in Agency Theory and Signaling Theory. Previous studies have generally examined these factors separately or outside the futures brokerage sector. A quantitative survey approach was employed. Data were collected from 40 employees via an online questionnaire and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The findings reveal that AIS ($\beta = 0.408$; $p = 0.022$), Internal Audit ($\beta = 0.378$; $p = 0.010$), and HR Competence ($\beta = 0.308$; $p = 0.000$) each have a positive and significant effect. Collectively, they explain 87% of the variance in internal control effectiveness ($R^2 = 0.870$). The study concludes that a reliable AIS, an independent internal audit function, and competent human resources are key to strengthening internal control systems. These findings underscore the necessity of a holistic approach to internal governance in high-risk industries like futures trading.

Keywords: Accounting Information System, Internal Audit, Human Resource Competence, Internal Control Effectiveness.



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INTRODUCTION

In the dynamic landscape of business operations, the effectiveness of internal control systems has become an indispensable element for organizational success. Internal control goes beyond administrative procedures. It is a process that spans all organizational levels to ensure efficiency,

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reliable reporting, asset protection, and compliance (Azzahra et al., 2021). Three key pillars underpin a robust internal control system: an effective Accounting Information System (AIS) (Limba & Sapulette, 2023; Simon et al., 2023), a strong internal audit function (Munte et al., 2024), and competent human resources (Ridwan, 2020). The proper integration of these elements not only strengthens internal governance but also signals the credibility and integrity of a firm to external stakeholders (Mulyadi, 2023).

The brokerage industry is especially vulnerable due to high transaction volumes and risks from volatile derivative markets. In Indonesia, cases of investor losses and misconduct have raised concerns about weak internal controls (Ayu et al., 2021). Although the Commodity Futures Trading Regulatory Agency (BAPPEBTI) supervises the sector, inconsistent enforcement highlights the need for company level improvements (Astuti & Samudra, 2022). For firms, strong internal controls are therefore not only a safeguard but also a demonstration of transparency and good governance to maintain public trust (Aditya & Nurbaiti, 2020).

Signal Theory and Agency Theory are the theoretical lenses that guide this study. Agency Theory emphasizes how internal control helps align the interests of owners and managers, reducing agency costs (Jensen & Meckling, 1976). Furthermore, Signal Theory, as proposed by Spence, (1978), suggests that firms can reduce information asymmetry by demonstrating credibility through mechanisms such as advanced AIS (Zamzami et al., 2021), independent internal audit practices (Setiani & Aulia, 2021), and qualified human capital to send credible signals to external parties, thereby mitigating information asymmetry (Pranata & Rahayu, 2024).

Although prior studies have explored the individual effects of AIS (Mustopa et al., 2019), internal audits (Jamaludin, 2021), and HR competence (Hadiwijaya et al., 2020), the empirical findings across these three variables remain inconsistent, with some studies reporting significant effects while others found insignificant results. Moreover, there is little research on these factors within Indonesia's futures brokerage industry. Third, existing studies often treat these elements separately rather than as complementary mechanisms of organizational credibility and compliance.

This research seeks to fill these gaps by examining the influence of AIS implementation, internal audit, and HR competence on internal control effectiveness within PT Agrodana Futures a mature brokerage firm operating under BAPPEBTI's supervision. The study poses three main research questions: (1) Does AIS implementation significantly influence internal control effectiveness? (2) Does internal audit significantly influence internal control effectiveness? (3) Does HR competence significantly influence internal control effectiveness?

This study proposes three hypotheses to steer the empirical research. The first (H1) posits that accounting information systems strengthen internal controls. The second (H2) suggests that internal audit functions significantly enhance control effectiveness, while the third (H3) contends that the competence of human resources is a key positive factor. These hypotheses reflect the theoretical proposition that each element technological systems, independent oversight, and skilled personnel serves as a distinct yet complementary driver of robust internal control within the futures brokerage context.

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Methodologically, the study adopts a quantitative survey design, with data collected from all employees of PT Agrodana Futures and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hoai & Nguyen, 2022). Theoretically, it contributes to the literature on internal control in high-risk industries by integrating Agency and Signal theories. Practically, it offers actionable insights for strengthening governance structures in futures brokerage firms and for signaling operational integrity to investors and regulators (Choi, 2023).

METHOD

Research Type

This study used a quantitative approach with a cross-sectional survey design. All 40 employees of PT Agrodana Futures Indonesia were included using a census method. Data were collected through a structured online questionnaire in June-July 2025 to assess the influence of Accounting Information Systems (AIS), internal audit, and human resource competence on internal control effectiveness. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 to evaluate both the measurement and structural models.

Population and Sample/Informants

The population consisted of all 40 employees at PT Agrodana Futures, including operational, financial, and managerial staff involved in internal processes. Since the population was relatively small, a census sampling technique was used to include the entire population as the research sample, allowing for more comprehensive and bias-free data representation (Sugiyono, 2019).

Research Location

The research was conducted at PT Agrodana Futures, a futures brokerage firm located in Jakarta, Indonesia, operating under the supervision of the Commodity Futures Trading Regulatory Agency (BAPPEBTI). This location was a relevant context for analyzing internal control mechanisms in a highly regulated financial industry.

Instrumentation or Tools

The study employed a structured and validated questionnaire developed from prior academic literature to measure four constructs: accounting information systems, internal audit, human resource competence, and internal control effectiveness. All items were assessed on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) (Sugiyono, 2019). The questionnaire included indicators such as system accuracy, audit independence, employee skills, and components of internal control based on COSO, (2013).

The dependent variable was internal control effectiveness, defined as a process providing reasonable assurance of achieving objectives in financial reporting, compliance, and operational efficiency. It was measured through five dimensions: control environment, risk assessment, control activities, information and communication, and monitoring. The independent variables included:

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(1) accounting information systems, defined as a system that transforms data into information for decision-making, with indicators covering human resources, procedures, database, software, hardware, and security; (2) internal audit, defined as an independent activity to strengthen control effectiveness, measured through independence, competence, scope, and audit execution; and (3) human resource competence, defined as knowledge, skills, and attitudes of individuals. Measurement items were adapted from established literature, as presented in Table 1.

Table 1. Operational Definition of Variables

No	Variable	Definition	Indicators	Scale
1	Internal Control Effectiveness (Y)	A structured procedure implemented to offer reliable assurance that organizational goals related to reporting, regulatory compliance, and operational efficiency will be met. (Puspitasari & Andayani, 2023)	1. Control environment 2. Risk assessment 3. Control activities 4. Information & communication 5. Monitoring Source: Yusuf & Kanji, (2020)	Likert 1–5
2	Accounting Information System (X1)	To aid in decision-making, this framework captures, organizes, retains, and manipulates data to transform it into actionable insights. (Machmury et al., 2021)	1. Brainware 2. Procedures 3. Database 4. Software 5. Hardware 6. Control & security Source: Romney et al., (2018) (in Yusuf & Kanji, (2020))	Likert 1–5
3	Internal Audit (X2)	An independent and objective activity that provides assurance and consulting to improve operations by evaluating control, risk management, and governance processes. (Vitriany & Ardini, 2024)	1. Independence 2. Professional competence 3. Scope of work 4. Audit implementation Source: Yusuf & Kanji, (2020)	Likert 1–5
4	Human Resource Competence (X3)	An individual's ability consisting of knowledge, skills, and attitudes required to perform tasks effectively. (Tarigan & Sari, 2021)	1. Knowledge 2. Skills 3. Attitude Source: Nurpajriah & Kustinah, (2021)	Likert 1–5

Source: Primary Data, 2025

Data Collection Procedures

Quantitative data were collected using Google Forms, distributed electronically to all employees during a one-month period in June-July 2025. Prior to distribution, a pilot test was conducted to

validate clarity and structure. Participants received an informed consent form and instructions, and all responses were automatically recorded, coded, and cleaned for further analysis (Sugiyono, 2019).

Data Analysis

This research utilized Partial Least Squares Structural Equation Modeling (PLS-SEM), implemented with the SmartPLS 4.0 software, following a three-stage analytical procedure adapted from (Rialdy et al., 2021). The initial stage involved evaluating the measurement model by confirming convergent validity (via Average Variance Extracted) and reliability (using Composite Reliability and Cronbach's Alpha), in addition to establishing discriminant validity with the Heterotrait-Monotrait (HTMT) ratio. Subsequently, the structural model was assessed through an analysis of path coefficients, R^2 values, and their significance. The final stage employed a bootstrapping technique with 5,000 subsamples to test the hypotheses, a method supported by (Hair Jr et al., 2021) in order to determine the statistical significance of the model's pathways.

Ethical Approval

All participants were informed about the purpose and confidentiality of the study through a digital consent form. Participation was voluntary, and responses were treated with anonymity and confidentiality. No physical, psychological, or legal risks were involved. As the research did not involve vulnerable groups or sensitive personal data, formal institutional ethical clearance was not required, though academic ethical guidelines were followed throughout.

RESULT AND DISCUSSION

Overview of the Research Object

Founded in 2000, PT Agrodana Futures is a licensed and regulated brokerage firm headquartered in Jakarta with branches in Bandung, Surabaya, and Lampung. It is a member of BAPPEBTI, JFX, and ICDX, supported by their respective clearing institutions (KBI and ICH), ensuring compliance and client fund security in the high-risk futures trading industry. Guided by its vision to become a leading brand in Indonesian futures trading and a mission to offer the best full-service brokerage experience, the company emphasizes integrity, professionalism, and excellence. Its leadership includes internationally certified professionals, fostering a strong internal control culture.

Agrodana operates through physical branches and academic partnerships (CDIG) while offering a diverse range of derivative products via the MT4 platform. Its support ecosystem includes market analysis, AI tools, free education, and community programs enhancing client empowerment and aligning with COSO principles of control, communication, and information. Thus, PT Agrodana Futures presents a strong case for analyzing internal control effectiveness through its regulatory compliance, customer centric strategy, and technology driven operations.

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Respondent Characteristics and Variable Descriptions

Of the 40 respondents, 60% are female and 40% male, indicating a relatively balanced workforce. Age-wise, the workforce is predominantly young, with 60% aged 30 or below 35% under 25 and 25% between 25-30 suggesting a dynamic and adaptable team, complemented by a smaller proportion of older, more experienced staff.

Educationally, 57.5% of respondents have completed high school (SMA/SMK), while others hold higher degrees: 12.5% diploma (D3), 17.5% bachelor's (S1), and 12.5% master's (S2). This reflects a workforce where competence is shaped not only by formal education but also by hands-on experience and internal training key to assessing "Human Resource Competence." In terms of work experience, 37.5% have been with the company for less than one year, while 20% have over ten years of experience, indicating a mix of fresh talent and seasoned professionals.

Functionally, 47.5% work in Sales & Account Management, emphasizing the company's client-focused operations. This is followed by 20% in Administration and Support, 10% in Audit (relevant for evaluating the "Internal Audit" variable), and 10% each in Supervisory and Marketing roles. One respondent (2.5%) holds a managerial position, offering a leadership viewpoint. This diverse role distribution strengthens the analysis of internal control effectiveness, as shown in Table 2.

Table 2. Respondent Characteristics

Category	Sub-category	Frequency	Percentage (%)
Gender	Male	16	40 %
	Female	24	60 %
Age	< 25 years	14	35 %
	25-30 years	10	25 %
	31-35 years	5	12.5 %
	36-40 years	6	15 %
	41-45 years	4	10 %
	> 45 years	1	2.5 %
Education	High School/Vocational (SMA/SMK)	23	57.5 %
	Diploma (D3)	5	12.5 %
	Bachelor (S1)	7	17.5 %
	Master (S2)	5	12.5 %
Work Experience	< 1 year	15	37.5 %
	1-3 years	5	12.5 %
	4-6 years	6	15 %
	7-10 years	6	15 %
	> 10 years	8	20 %
Department	Sales & Account Management	19	47.5 %
	Administration & Support Staff	8	20 %
	Audit	4	10 %
	Supervisory	4	10 %
	Marketing	4	10 %
	Managerial	1	2.5 %
Total Respondents		40	100 %

Source: Primary Data, 2025

Measurement Model Analysis (Outer Model)

Convergent Validity and Discriminant Validity

The measurement model was evaluated for convergent and discriminant validity. Convergent validity was confirmed as all outer loadings exceeded 0.70 and AVE values surpassed 0.50 (Table 3). Discriminant validity, assessed using the HTMT ratio, was also satisfied, with all values below the 0.90 cutoff. The highest HTMT value was 0.891 (between internal audit and internal control), which remains within the acceptable range. These results indicate that the constructs are valid and distinct.

Table 3. Construct Validity Testing

Construct	Outer Loadings (Range)	AVE	HTMT Correlation (Max)	Validity Status
Accounting Information Systems (SIA)	0.784 - 0.907	0.715	0.847 (vs PI)	Convergent & Discriminant Valid
Internal Audit (AI)	0.788 - 0.860	0.682	0.891 (vs PI)	Convergent & Discriminant Valid
Human Resource Competence (KSDM)	0.750 - 0.921	0.724	0.776 (vs PI)	Convergent & Discriminant Valid
Internal Control (PI)	0.827 - 0.916	0.776	-	Convergent & Discriminant Valid

Source: Primary Data Processed with SmartPLS, 2025

Reliability Testing

Cronbach's Alpha and Composite Reliability (rho_c)

Construct reliability was assessed using Cronbach's Alpha and Composite Reliability (rho_c), with values above 0.70 indicating acceptable internal consistency. As shown in Table 4, all constructs exceeded this threshold, confirming that the measurement instrument is highly reliable across all constructs.

Table 4. Reliability Testing Results

Construct	Cronbach's Alpha	Composite Reliability (ρ_c)	Reliability Status
Accounting Information Systems (SIA)	0.921	0.938	Reliable
Internal Audit (AI)	0.844	0.896	Reliable
Human Resource Competence (KSDM)	0.936	0.948	Reliable
Internal Control (PI)	0.968	0.972	Reliable

Source: Primary Data Processed with SmartPLS, 2025

Structural Model Analysis (Inner Model)

Multicollinearity Test (VIF), Coefficient of Determination (R^2), Goodness of Fit (GoF) and Effect Size (f^2)

A structural model analysis was conducted to assess the hypothesized relationships and predictive power. Multicollinearity was not a concern, with all VIF values below 5. The model showed strong explanatory power, with $R^2 = 0.870$ for internal control, meaning AIS, internal audit, and HR competence explained 87% of its variance. Model fit was acceptable (SRMR = 0.097, Table 5). Effect size analysis (f^2) further indicated that all predictors had substantial impacts, with AIS (0.708) being the strongest, followed by internal audit (0.598) and HR competence (0.439). These results confirm the model's robustness for hypothesis testing and interpretation.

Table 5. Structural Model Evaluation

Test Type	Indicator	Result	Interpretation
Multicollinearity (VIF)	SIA $\rightarrow$ PI	1.820	No multicollinearity
	AI $\rightarrow$ PI	1.842	No multicollinearity
	KSDM $\rightarrow$ PI	1.665	No multicollinearity
R-Square	Internal Control (PI)	0.870	Very strong explanatory power
Adjusted R-Square	Internal Control (PI)	0.860	Robust prediction model
Model Fit (SRMR)	Saturated & Estimated Model	0.097	Model fit acceptable (< 0.10)
Effect Size (f^2)	SIA $\rightarrow$ PI	0.708	Large effect
	AI $\rightarrow$ PI	0.598	Large effect
	KSDM $\rightarrow$ PI	0.439	Large effect

Source: Primary Data Processed with SmartPLS, 2025

Hypothesis Testing

To empirically validate the postulated direct effects on internal control, hypothesis testing was undertaken using a bootstrapping procedure to ascertain path coefficients and their significance. The results provide support for all three hypotheses, confirming that each construct exerts a significant positive influence. As shown in Table 6, the path coefficients for the accounting information system ($\beta = 0.408$, $p = 0.022$), internal audit ($\beta = 0.378$, $p = 0.010$), and human resource competence ($\beta = 0.308$, $p = 0.000$) were all statistically significant at the 5% level, thereby affirming their positive roles in enhancing internal control effectiveness.

Table 6. Hypothesis Testing Results

Hypothesis	Path	Path Coefficient (β)	T-Statistic	P-Value	Conclusion
H1	SIA $\rightarrow$ PI	0.408	2.299	0.022	Significant
H2	AI $\rightarrow$ PI	0.378	2.573	0.010	Significant
H3	KSDM $\rightarrow$ PI	0.308	3.583	0.000	Significant

Source: Primary Data Processed with SmartPLS, 2025

The Influence of Accounting Information System on Internal Control Effectiveness

The first hypothesis (H1) testing revealed a significant positive relationship between the Accounting Information System (AIS) and Internal Control effectiveness at PT Agrodana Futures. This finding is consistent with prior studies Suhandi & Siregar, (2023); Yusuf & Kanji, (2020), which emphasize the role of AIS in strengthening internal control systems.

From the Agency Theory perspective, an effective AIS functions as a critical control mechanism that reduces information asymmetry between management and owners, thereby lowering agency costs. In the context of PT Agrodana Futures, the use of a reliable AIS enhances accuracy, completeness, and timeliness in recording transactions, particularly in high-risk derivative trading, which supports monitoring and anomaly detection (Paranita & Aditya, 2020). Furthermore, Signaling Theory highlights that investment in a secure and sophisticated AIS provides a credible signal of transparency, compliance, and fund security to regulators and stakeholders such as Bappebti. These findings suggest important managerial and policy implications: companies operating in high-risk industries should prioritize continuous AIS development, not only to comply with regulatory requirements but also to build stakeholder trust and maintain competitive advantage.

The Influence of Internal Audit on Internal Control Effectiveness

This study confirms the significant role of Internal Audit in enhancing Internal Control effectiveness, supporting Hypothesis 2 (H2). The finding is consistent with prior studies Agustina, (2020) and Jamaludin, (2021), which emphasize the importance of internal audit in strengthening a company's control systems.

From an Agency Theory perspective, internal audit operates as an extension of the principal's oversight, providing independent and objective monitoring of the agent's compliance with established controls. At PT Agrodana Futures, where strict adherence to Bappebti regulations is essential, internal audit ensures that managerial decisions align with both principal and regulatory expectations (Alfina & Utama, 2025). In line with Signaling Theory, the presence of a competent and independent internal audit function also communicates the company's commitment to good governance, signaling robust risk management and fraud prevention to clients and investors. Beyond theoretical support, these findings underscore the need for management to further strengthen internal audit independence and authority as a policy priority, particularly in the high-risk futures brokerage industry where operational integrity is critical.

The Influence of Human Resource Competence on Internal Control Effectiveness

The third hypothesis (H3) is supported, confirming that Human Resource Competence plays a significant role in enhancing Internal Control effectiveness. This result is consistent with previous research Nurhaeda & Solatiah, (2024), which also found a strong positive link between HR competence and internal control.

From an Agency Theory perspective, competent employees those with strong knowledge, skills, and integrity are more likely to align with principal interests, effectively carrying out control procedures and reducing opportunistic behavior (Sinosi et al., 2025). In terms of Signaling Theory,

a company's commitment to recruiting, training, and retaining high-quality personnel conveys a strong signal of managerial capability and long-term sustainability. In the case of PT Agrodana Futures, operating in a high-risk, knowledge-intensive financial services industry, these findings highlight that the effectiveness of internal controls relies not only on formal systems but also critically on the competence of the individuals implementing them. Accordingly, management should prioritize continuous HR development and integrity-based recruitment policies as a strategic measure to strengthen governance and ensure compliance in a volatile regulatory environment.

Interpretation of Key Findings

This study found that accounting information systems, internal audit, and human resource competence each have a significant positive effect on the effectiveness of internal control. Specifically, accounting information systems ($\beta = 0.408$, $p = 0.022$), internal audit ($\beta = 0.378$, $p = 0.010$), and human resource competence ($\beta = 0.308$, $p = 0.000$) all demonstrated significant relationships with internal control effectiveness. These findings support the theoretical assumptions derived from Agency Theory, which posits that accurate information systems, independent oversight, and competent personnel reduce agency risks and improve alignment between management and owners. From a Signaling Theory perspective, the presence of these elements serves as a credible indicator of strong governance and operational reliability to external stakeholders particularly important in a trust-driven industry such as futures brokerage.

Comparison with Previous Studies

These results are consistent with prior research. (Yusuf & Kanji, 2020) and (Suhandi & Siregar, 2023) emphasized the role of AIS in ensuring data accuracy and transparency, while (Agustina, 2020) and (Jamaludin, 2021) highlighted the importance of internal audits in compliance and fraud detection. Additionally, (Nurhaeda & Solatiah, 2024) confirmed the critical role of HR competence in effective control implementation. This study complements existing findings by examining these relationships in the specific context of PT Agrodana Futures, a financial services company operating under strict regulatory oversight by the Commodity Futures Trading Regulatory Agency, thereby extending the contextual relevance of Agency and Signaling theories to high-risk, regulation-intensive industries.

Limitations and Cautions

Although the findings provide valuable insights, several limitations should be acknowledged. First, the cross-sectional research design limits the ability to draw causal inferences. Second, the reliance on self-reported questionnaire data may introduce social desirability bias or response bias. Third, as the study was conducted within a single financial firm in Indonesia, the generalizability of the results to other companies or industries may be limited. Finally, this study did not incorporate external factors such as organizational culture, leadership style, or external audit practices, which may also influence the effectiveness of internal control.

Recommendations for Future Research

Future research could adopt a longitudinal design to better capture causal relationships and track changes in internal control effectiveness over time. Expanding the research to multiple companies across different industries, organizational sizes, or even cross-country contexts would enhance the generalizability of the findings. Additionally, incorporating qualitative methods such as interviews with internal auditors, compliance officers, or managers could provide richer insights into practical challenges and organizational dynamics in implementing internal control systems. Exploring additional variables such as organizational culture, leadership, or technological readiness may also deepen understanding of the factors that shape effective internal controls.

CONCLUSION

The study demonstrates that accounting information systems, internal audit, and human resource competence each exert a positive and significant influence on the effectiveness of internal control at PT Agrodana Futures. The structural equation modeling results confirm that accounting information systems ($\beta = 0.408$, $p = 0.022$), internal audit ($\beta = 0.378$, $p = 0.010$), and human resource competence ($\beta = 0.308$, $p = 0.000$) are critical determinants of internal control effectiveness.

By applying Agency Theory and Signaling Theory, this study provides evidence from the context of a financial brokerage firm operating under the oversight of Bappebti. The findings underscore the necessity of integrating reliable information systems, maintaining independent internal audits, and ensuring competent human resources to promote compliance, transparency, and stakeholder trust.

The generalizability of the findings is constrained by the cross-sectional research design, the reliance on self-reported measures, and the single-firm setting. These factors may limit the extent to which the conclusions apply across different organizational and industry contexts.

In practice, firms are encouraged to prioritize investments in technological infrastructure, strengthen oversight and audit mechanisms, and implement systematic programs for employee development. Future research should consider longitudinal approaches, mixed-methods designs, and comparative analyses across industries to provide deeper insights into the mechanisms that strengthen internal control systems.

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