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STRATEGIC PRECISION: EXPLORING THE INFLUENCE OF STRATEGIC MANAGEMENT ACCOUNTING TECHNIQUES ON INVESTMENT EFFICIENCY DECISIONS WITH A FOCUS ON MODERATING ROLE OF OPERATIONS QUALITY CONTROL IN INDONESIAN MANUFACTURING COMPANIES

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Research Paper

Abstract: *The implementation of quality control measures in production operations has the potential to greatly enhance the effectiveness of strategic management accounting techniques in large-scale companies. By implementing measures to maintain a high level of product quality and effectively reducing the occurrence of defects, organisations have the opportunity to decrease their production expenses and bolster their standing within the industry. This facilitates the conduct of precise cost analyses and enables more informed investment decisions, thereby enhancing investment efficiency. Hence, the primary objective of this study is to examine the moderating impact of quality control processes on the association between management accounting techniques and investment efficiency within the context of manufacturing firms in Indonesia. A structured, self-administered questionnaire was distributed to a sample of 300 owners and senior managers using a convenient sampling technique. The study employed a cross-sectional research design, which involved collecting data at a single point in time, and utilised a quantitative research approach, focusing on numerical data analysis. The findings from the Partial Least Square (PLS)-Structural Equation Modelling (SEM) analysis reveal that the utilisation of strategic management accounting techniques, such as just in time, target costing, and balanced scorecard, exhibits statistically significant and positive effects on investment efficiency. However, it is important to note that the relationship between target costs and investment efficiency is greatly influenced by quality control. This underscores the crucial role that quality control plays in cost management and the enhancement of efficiency. The level of quality control exhibited by*

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the just-in-time, balanced scorecard, and investment efficiency approaches was found to be relatively insignificant. This study presents noteworthy findings and offers recommendations for Indonesian manufacturing firms to improve their investment efficiency and competitiveness within their distinct market environment. The results of this study enhance our comprehension of the factors that impact investment efficiency and underscore the interplay between quality control and specific management accounting strategies within the manufacturing sector in Indonesia.

Keywords: *strategic management accounting techniques, investment efficiency, quality control.*

1. Introduction

In the current competitive landscape, entrepreneurs are diligently monitoring the enduring capacity of their assets and striving to maximise their profits. In this particular context, the decision-making process regarding investments plays a crucial role, as it establishes the structure and potential for future expansion (Wu, 2022). These investment options are frequently associated with a readiness to engage in deliberate risks, as they involve the allocation of resources towards ventures that have the potential for long-term profitability (Jbarah, 2018). The accuracy of sales forecasts plays a crucial role in determining success in this field, which is further complicated by the presence of inherent uncertainty within the business environment (Jbarah, 2018). In addition, it is imperative for entrepreneurs to possess an intricate network comprising both financial and non-financial limitations. The constraints in question encompass a wide range of factors, such as the investor's time availability and adherence to statutory obligations (Hodgson et al., 2000; Jbarah, 2018). Strategic management accounting techniques have the potential to enhance these limitations by offering prompt and precise financial information, thereby enabling investors to make well-informed decisions within their constrained time frame (Thien & Hung, 2023).

Moreover, through the provision of valuable perspectives on cost management and budgeting, these techniques contribute to the efficient fulfilment of responsibilities. Furthermore, the facilitation of compliance with legal obligations is enhanced by the implementation of accurate financial reporting and adherence to regulatory frameworks, which is further reinforced by the utilisation of strategic management accounting techniques Al Refai and Poornima . In the given context, the utilisation of strategic management accounting techniques is recognised as an essential instrument for businesses. This is due to its ability to address complex managerial issues and contribute to the formulation of a company's mission and strategic objectives (Jbarah, 2018). The effective fulfilment of duties across various business units is enhanced by the continuous management of critical business information and the facilitation of information flow. This, in turn, contributes to the overall sustainability and success of the enterprise (Fuertes et al., 2020). Furthermore, it is crucial to highlight the significance of soliciting input from various stakeholders in order to shape strategic and managerial decisions effectively, thereby guaranteeing the optimisation of operations that yield advantages for all involved parties.

Strategic management accounting techniques have emerged as a crucial component in enhancing investment decision-making processes. Our study delves further into this subject by examining the influence of three strategic management accounting techniques on investment choices. The aforementioned methodologies

encompass target costing, just-in-time production, and the balanced scorecard, which have been identified as means to enhance investment efficiency (Ibarah, 2018). Target costing is a distinct management accounting technique that differentiates itself from conventional methods through the determination of product costs. This determination is based on a predetermined selling price, which is derived from comprehensive market research (Ibarah, 2018). The aforementioned novel methodology possesses the capacity to facilitate cost reduction and augment profitability for businesses, particularly within fiercely competitive market landscapes (Anghelache et al., 2019).

The implementation of just-in-time production strategies in supply chains offers several benefits, including inventory reduction, loss minimization, and a focus on product quality, design, zero stock, employee involvement, and ongoing improvement. These factors have the potential to positively impact investment choices (Lai, 2016). In contrast, the balanced scorecard framework serves to harmonise an organisation's mission and strategy by establishing clear financial objectives. This facilitates the process of allocating resources and improves the overall efficiency and adaptability of the organisation in response to changing circumstances (Ojha, Patel, & Sridharan, 2020; Zaitsev, Kichigin, & Korotkova, 2019). These techniques collectively provide businesses with valuable tools to make informed and efficient investment decisions. The potential for enhanced efficiency lies in the implementation of quality control measures within the process. By incorporating quality control practices, the reliability of data utilised in strategic management accounting techniques can be improved, thereby resulting in more precise financial insights. Consequently, this enhances the accuracy of investment efficiency determinations, mitigating risks and optimising the allocation of resources (Altin, Akgün, & Kasimoğlu, 2020).

There is a recognised significance attributed to the utilisation of strategic management accounting techniques in improving investment efficiency. However, it is worth noting that there is a significant gap in research pertaining to the implementation of these techniques, specifically in the context of large-scale manufacturing firms. Manufacturing enterprises make investment determinations by conducting a thorough evaluation of various factors, including the local industrial environment, their own organisational performance, accessible resources, and related expenses. The available body of scholarly work indicates that the size of a firm is a significant factor in determining the effectiveness of strategic management accounting applications (Joshi, 2001). In general, it is observed that larger firms exhibit a greater degree of proficiency and effectiveness in the implementation of strategic management accounting techniques as compared to small and medium-sized enterprises (SMEs). The existing body of literature has primarily concentrated on the examination of the utilisation of strategic management accounting by small and medium-sized enterprises (SMEs) in the context of their investment decision-making (Fahrizal, Lindrianasari, & Dewi, 2021; Hadid & Al-Sayed, 2021). Fahrizal et al. (2021) conducted a study to examine the utilisation of strategic management accounting tools among small and medium-sized enterprises (SMEs).

Numerous empirical studies have been conducted to investigate the utilisation of strategic management accounting by small and medium-sized manufacturers in order to enhance their business performance and cost management (Abdullah et al., 2022; Maziriri, Mapuranga, & Madinga, 2018; Musah, Gakpetor, & Pomaa, 2018). The current body of scholarly work has extensively examined the utilisation of strategic

management accounting techniques by small and medium-sized enterprises (SMEs) in their investment decision-making processes. However, there is a noticeable research gap when it comes to investigating the use of these techniques in large-scale manufacturing firms. The implementation of management accounting techniques to improve investment efficiency may pose distinct challenges for larger organisations, given their intricate nature and extensive scope. Consequently, it is imperative to conduct additional research in this particular context (Rashid, Ali, & Hossain, 2020). Exploring the distinctive challenges and opportunities that large organisations face when implementing these techniques for investment decision-making in the manufacturing sector is imperative, owing to the disparities in scale and complexity.

Furthermore, the relationship between management accounting techniques and investment efficiency remains inconclusive based on previous research findings. Several studies have indicated a positive correlation between the application of specific accounting methods and enhanced investment efficiency, as they provide more accurate financial information and decision-making tools (Assad, Jaafar, & Zervopoulos, 2023; Thien & Hung, 2023). However, contrasting findings have also been reported, with some studies suggesting limited or no significant impact (Altin et al., 2020). These inconsistencies may be attributed to variations in the industry context, firm size, or the specific techniques utilised. Moreover, the impact of strategic management accounting techniques on investment efficiency can be contingent upon various factors, including quality control (Altin et al., 2020; Chen et al., 2011).

Previous research has primarily concentrated on examining the direct impact of strategic management accounting techniques on investment, with limited consideration given to the moderating effect of inventory control processes. This study focuses on examining the impact of operations quality control as a moderating factor on the relationship between accounting techniques and investment efficiency in the context of a previous relationship. Furthermore, prior research has predominantly concentrated on countries and sectors other than Indonesia's manufacturing companies, resulting in a dearth of studies in this specific context (Altin et al., 2020). The manufacturing sector in Indonesia holds significant importance from both social and economic perspectives (Khusufi et al., 2023). In order to examine the moderating effect of inventory control on the relationship between strategic management accounting practices and the investment efficiency of manufacturing companies in Indonesia, this research sought to address this noteworthy contribution.

The study's findings are of great significance due to their valuable contributions to the fields of management accounting and investment efficiency, specifically within the context of large-scale manufacturing companies in Indonesia. The research provides practical insights for Indonesian manufacturing firms aiming to enhance their financial performance by empirically showcasing the beneficial effects of strategic management accounting practices such as Just in Time, Target Costing, and the Balanced Scorecard on investment efficiency. Additionally, the research emphasises the significant importance of quality control as a moderating variable, demonstrating its ability to strengthen the association between target costs and investment efficiency. The aforementioned findings offer guidance for businesses operating in Indonesia, enabling them to effectively prioritise lean manufacturing principles, cost-effective strategies, and quality control processes. This, in turn, allows them to optimise investment decisions and effectively compete in the global market. Moreover,

the study underscores the significance of taking into account the distinct market dynamics and industry-specific factors that impact investment effectiveness, underscoring the necessity for strategies tailored to the specific context and further investigation of these dynamics in subsequent research endeavours. The research was structured into five distinct chapters in order to achieve the research objective.

2. Literature Review

2.1 Strategic Management Accounting

During the 1980s and 1990s, there was a notable transformation in the perception of conventional management accounting. The difficulties it encountered in adjusting to the shifting business environment and its inability to effectively support managerial decision-making were the driving forces behind this transformation (Altin et al., 2020). The diminished significance of conventional management accounting can be ascribed to various factors, such as the rapid progression of technology, intensified market competition, the emergence of novel cost rationalisation techniques, and heightened consumer awareness regarding pricing, quality, and product offerings (Johnson & Kaplan, 1987) (Toms, 2014). As a result, there emerged an urgent requirement to reconfigure management accounting as a discipline that is more strategically focused within the accounting systems of the organisation (Dlamini, 2023). The emergence of strategic management accounting practices has been recognised as a managerial solution to address this challenge. These practices primarily emphasise the provision of externally oriented information, market-driven tools, and customer-centric techniques to organisations. The main focal points of strategic management accounting practices include the product life cycle, product quality, market share, competitors' growth rates, investment amounts, profitability metrics, business performance, personnel management, and cost structures (Dlamini, 2023). The techniques discussed can be classified into five primary domains: costing and planning, control and performance measurement, strategic decision-making, competitor analysis, and customer analysis (Altin et al., 2020; Pratami et al., 2022). It is worth noting that recent compilations of strategic management accounting techniques have excluded investment appraisal (Cadez & Guilding, 2008).

The majority of international scholarly investigations pertaining to strategic management accounting techniques have primarily focused on the cost and financial performance of manufacturing companies. The aforementioned techniques demonstrate variability in accordance with different types of business strategies and geographic regions (Anand, Sahay, & Saha, 2005; Saragih et al., 2020; Sharkar, Sobhan, & Sultana, 2006). Nevertheless, a prevalent constraint in these investigations is the lack of comprehensive elucidation regarding the application, utilisation, and intended objectives of strategic management accounting techniques by various entities (Nixon & Burns, 2012). This study makes a valuable contribution to the academic field by establishing a connection between strategic management techniques and investment decisions, with a specific focus on the domain of large-scale industrial manufacturing. The central focus of this study revolves around three strategic management accounting techniques, namely target costing, balanced scorecard, and just in time (JIT) production (Altin et al., 2020). It is imperative to acknowledge that these techniques demonstrate a non-linear cause-and-effect association, intricately intertwining their effects in distinct manners. In the context of production design, the utilisation of target costing is enhanced by the pivotal role played by the

balanced scorecard. This strategic tool provides product designers with valuable information and measurement tools to evaluate the impact of their design decisions on production processes (Lueg & Carvalho e Silva, 2013).

Moreover, the balanced scorecard, initially proposed by Norton and Kaplan during the early 1990s, functions as a performance evaluation framework that integrates non-financial indicators such as customer satisfaction, internal business processes, organisational innovation, and development in conjunction with financial reporting mechanisms. The framework consists of four distinct dimensions, namely financial performance, customer satisfaction, internal business processes, and organisational learning and growth. The dimensions mentioned above exhibit an interconnected relationship characterised by circular reasoning. This is evident in the alignment of financial performance with shareholders' perspectives, the reflection of customer satisfaction through customer perceptions, the assurance of efficiency through internal business processes, and the driving force of continuous improvement through organisational learning and growth Kaplan and Norton (1996). The implementation of the balanced scorecard has the potential to decrease information asymmetry, address issues arising from the misalignment between top management and employees, and alleviate the complexities and stress associated with various roles within organisations.

However, it is imperative to acknowledge that the applicability of the balanced scorecard framework may differ based on the unique business environment and strategic approach of a company (Hansen & Mouritsen, 2005; Marbun et al., 2020). The utilisation of the balanced scorecard can also facilitate the establishment of qualitative objectives, such as product quality, customer satisfaction, employee motivation, and reward systems. Additionally, target costing is employed to estimate forthcoming costs. Nevertheless, the cause-and-effect relationship can occasionally become intricate as a result of subjective managerial perspectives and delays in the implementation of plans. In contrast, the balanced scorecard demonstrates a harmonious relationship with organisations that implement just-in-time (JIT) production (Altin et al., 2020). Organisations have the ability to choose performance metrics that are in line with their overall corporate strategy and action plans. They can use the balanced scorecard approach to effectively monitor and improve their comparative performance. The intricate interplay of strategic management accounting techniques presents a sophisticated method to tackle the intricate array of challenges and opportunities encountered by organisations in the contemporary and intricate business environment (Altin et al., 2020).

Furthermore, target costing is a strategic methodology that centres on the management of quantity and price through the delineation of costs across the entire lifespan of a product (Hilton & Platt, 2020; Horngren, Sundem, & Stratton, 2005). The process of cost estimation involves determining the cost of a product by deducting a predetermined profit margin from an estimated or market-based price during the stages of production and process design. The objective is to attain the desired production, engineering, or market cost in the future. Target costing encompasses two main stages: cost planning and cost reduction initiatives during the product's development process. Manufacturers endeavour to achieve their predetermined costs within these cycles (Jiang & Hansen, 2016; Nu'man et al., 2020). Several scholarly investigations have examined the utilisation of target costing in diverse settings, including non-Japanese manufacturers situated in the Netherlands (Hamood, Omar, &

Sulaiman, 2011), manufacturing firms in the United Kingdom, Australia, and New Zealand (Yazdifar & Askarany, 2012), as well as manufacturing firms operating in Bangladesh (Dlamini, 2023; Fowzia, 2011). Furthermore, the third dimension refers to the concept of just-in-time (JIT), which is a managerial philosophy that centres on organisational innovation. This philosophy encompasses various aspects such as continuous improvement, material flow control, and production scheduling. Just-in-Time (JIT) has a direct influence on various aspects of organisational performance, including productivity enhancement, cost reduction, and quality improvement (Altin et al., 2020). The phenomenon has acquired significance as a result of the escalating costs associated with inputs such as labour and raw materials. Just-in-Time (JIT) methodology not only facilitates effective cost control but also fosters the advancement of quality, autonomy, adaptability, and ingenuity within the realm of production (Balkhi, Alshahrani, & Khan, 2022).

The evaluation of JIT techniques is predicated upon an assessment of their potential benefits and the anticipated costs associated with their implementation. The adoption of Just-in-Time (JIT) is contingent upon a combination of external and internal factors, encompassing management orientation as well as previous experiences of success or failure under comparable circumstances (Balkhi et al., 2022). Just-in-Time (JIT) seeks to effectively synchronise interventions across multiple dimensions of production, encompassing elements such as product structure, processes, organisation, personnel, planning, control, and supplier relationships. The adoption of Just-in-Time (JIT) by firms has been found to yield several advantages. These advantages encompass waste reduction, enhanced competitiveness, improved working relationships with employees and suppliers, increased profitability, and heightened levels of customer satisfaction (Lai, 2016). The successful implementation of Just-in-Time (JIT) entails careful consideration of various factors, including the number of suppliers, the establishment of strong supplier relationships, demand-based production, quality control, effective teamwork, and product quality. These factors contribute to the numerous advantages offered by JIT. The implementation of Just-in-Time (JIT) can pose challenges despite its conceptual simplicity. Any disruptions within the system, such as interruptions in the supply chain or failures in machinery, have the potential to completely halt production (Štefanić, Križan, & Čala, 2008).

2.2 Strategic Management accounting Techniques and investment Efficiency

A lot of research studies have looked closely at the links between strategic management accounting techniques like just-in-time (JIT), balanced scorecard, and target costing, as well as how they affect the efficiency of investments in a wide range of industries. Numerous empirical studies have provided evidence supporting the beneficial impact of just-in-time (JIT) on investment efficiency. According to a study conducted by Altin et al. (2020), empirical evidence suggests that the implementation of Just-in-Time (JIT) principles, which involve the reduction of inventory levels and the enhancement of production processes, can lead to improved capital efficiency. This is achieved through a decrease in working capital requirements and a reduction in holding costs. Organisations that adopt Just-in-Time (JIT) practices often observe enhanced allocation of resources, decreased lead times, and heightened production flexibility, thereby leading to improved investment efficiency. For instance, a study conducted by Huson and Nanda (1995) as well as Nugroho et al. (2022) revealed that firms in the manufacturing industry who implemented Just-in-Time (JIT) practices demonstrated enhanced profitability, suggesting a potential improvement in investment efficiency.

The collective findings of this study indicate that the implementation of just-in-time (JIT) can result in improved allocation of financial resources, thereby positively impacting a firm's investment choices. Subsequent research has demonstrated that the balance scorecard framework exerts a notable influence on investment efficiency. By adopting a more comprehensive viewpoint, organisations are able to evaluate the enduring consequences of their investments and allocate resources in a more efficient manner, thereby ultimately improving investment efficacy. The studies conducted by Adler, Everett, and Waldron (2000) and Sharkar et al. (2006) have revealed that companies that implement balanced scorecards have been able to attain improved financial performance. These findings indicate a positive correlation between the adoption of balanced scorecards and the efficiency of investments. Furthermore Anand et al. (2005), emphasised the efficacy of the balanced scorecard in enhancing firms' strategic orientation by effectively aligning investments with organisational objectives. The aforementioned findings emphasise the importance of incorporating non-financial indicators in the assessment of investment effectiveness, as well as the role played by the balanced scorecard in facilitating this evaluative procedure (Hidayat & Hersugondo, 2022).

Empirical investigations have been conducted to examine the influence of target costing on investment efficiency (Altin et al., 2020). Target costing is a strategic approach that entails establishing predetermined cost objectives for products and aligning these objectives with the desired levels of profitability. Firms strive to effectively manage costs during the initial phases of product development and influence their investment choices through the adoption of target costing (Hilton & Platt, 2020). It has been contended that companies that employ target costing techniques are more likely to make investment decisions that are cost-effective, as they possess enhanced capabilities to forecast future costs and allocate resources in a more efficient manner (Altin et al., 2020). An example can be found in a study conducted by Ibarah (2018), which emphasised the significance of target costing in enhancing investment efficiency. This approach involves designing products in a manner that aligns with predetermined cost targets, thereby minimising the probability of cost overruns during the production process. In addition Zengin and Ada (2010), put forth a target costing module as a model for cost competition in small and medium-sized enterprises (SMEs), highlighting the significance of cost leadership in the market while maintaining product quality and functionality. The empirical findings presented in this study highlight the potential advantages of employing target costing as a means to direct investment decisions towards outcomes that are both cost-effective and efficient. Thus, based on previous discussion, it is hypothesized that:

H1: *Just in Time has significant impact on investment efficiency of manufacturing companies in Indonesia.*
H2: *Cost effecting has significant impact on investment efficiency of manufacturing companies in Indonesia.*
H3: *Balance scored has significant impact on investment efficiency of manufacturing companies in Indonesia.*

2.3 Moderating role of quality control

The existing literature on the relationship between strategic management accounting techniques and investment efficiency has yielded inconclusive findings, suggesting the presence of additional variables that may help elucidate this

relationship. The literature demonstrates that quality control plays a significant role as a moderator in a range of studies (Ramadhani & Sudarma, 2017; Salsabila & Sukirman, 2017). Hence, quality control has the potential to serve as a moderator. In the context of manufacturing firms, the implementation of just-in-time (JIT) practices is more likely to result in enhanced investment efficiency. This outcome is particularly evident when JIT is accompanied by effective quality control mechanisms that guarantee product quality and minimise defects. Consequently, these combined measures lead to cost savings and improved allocation of resources (Ye, Suleiman, & Huo, 2022).

The effectiveness of the balanced scorecard in enhancing investment efficiency is further enhanced when quality control measures are aligned with the goals of customer satisfaction and product quality. This underscores the significance of incorporating quality-related metrics into performance evaluation (Awad et al., 2023). Additionally, the efficacy of target costing in directing investment choices towards cost-effective results is enhanced through the implementation of quality control measures that guarantee the attainment of cost targets while upholding product quality, thereby facilitating optimal allocation of resources (Almashhadani & Almashhadani, 2023). The empirical findings presented collectively suggest a complementary relationship between quality control and management accounting techniques in the optimisation of investment efficiency. These findings highlight the significance of adopting a unified approach that takes into account both cost management and quality assurance in order to achieve superior investment outcomes. Thus, based on previous discussion, study has following research hypothesis.

H4: *quality control significantly moderates between just in time and investment efficiency of manufacturing companies in Indonesia.*
H5: *quality control significantly moderates between target costing and investment efficiency of manufacturing companies in Indonesia.*
H6: *quality control significantly moderates between balanced scored card and investment efficiency of manufacturing companies in Indonesia.*

3. Research Methodology

The research design employed a quantitative approach, which is widely regarded as a superior technique in comparison to qualitative methods (Creswell, 1999; Hussein, 2009). Furthermore, the study utilised a cross-sectional research design, which involved the collection of data at a single point in time, in contrast to a longitudinal research design, which involves the collection of data at multiple time points (Asenahabi, 2019). The cross-sectional research design is deemed suitable when survey data is collected (Van der Stede, 2014). The study's target population comprises individuals who hold ownership or senior managerial positions within manufacturing companies in Indonesia. Data collection was conducted using a self-administered survey questionnaire that was adapted from previous studies. This paper discusses three strategic management accounting techniques: just-in-time (JIT), target costing (TAC), and balanced scorecard (BAS). Within this set of constructs, the construct of just-in-time (JIT) was assessed using a scale consisting of four items. The construct of Total Acquisition Cost (TAC) was evaluated through the use of a scale comprising five items. Lastly, the construct of Business Agility Strategy (BAS) was measured by means of a scale consisting of four items. The aforementioned items were

derived from the research conducted by Jbarah (2018). The measurement of investment decisions was conducted using a set of seven items, which were derived from the research conducted by Jbarah (2018).

Finally Imran, Hamid, and Aziz (2018),'s research served as the basis for a set of seven items used to assess the quality control process. The questionnaire was divided into two primary categories. The initial category examined the demographic attributes of manufacturing companies, investigating factors such as the firm's age, initial investment expenditure, average yearly revenue, employee count, and primary operational domains. During the second survey category, participants were asked questions pertaining to strategic management accounting techniques, investment decisions, and quality control processes. These questions were answered using a closed-ended 5-point Likert scale. The questionnaire that had been developed was disseminated to a sample of 300 individuals, comprising owners and senior managers. A total of 250 valid surveys were obtained from a sample size of 300. The research design of the study was formed by combining the collected data with descriptive analysis and multiple linear regression analysis. Furthermore, in order to enhance the trustworthiness and accuracy of the survey instrument, the researchers utilised Cronbach's alpha and conducted multiple validity assessments, thereby enhancing the overall robustness of the research methodology.

4. Statistical Analysis

4.1 Demographic Profile

Table 1 presents the results that provide insights into the demographic profile and characteristics of the respondents who participated in the study. Regarding gender, the majority of respondents were male, constituting 60% of the total sample, while females comprised the remaining 40%. Upon analysing the age distribution of the respondents, it becomes evident that the sample exhibited diversity in terms of age. The diversity of ages within the sample becomes evident. The most prominent demographic cohort consisted of individuals aged 25 to 34 years, comprising 30% of the survey participants. This finding suggests that a significant proportion of the participants were in the initial phases of their professional trajectories. Furthermore, it is worth noting that individuals between the ages of 35 and 44, as well as those between the ages of 45 and 54, accounted for 24% and 20% of the total sample, respectively. This data suggests a noteworthy representation of individuals in the mid-career stage of their professional lives.

Moreover, it is worth noting that 10% of the participants belonged to the age group of 55 years and older, indicating the need to incorporate individuals with greater levels of experience in the research. The survey encompassed a variety of educational qualifications. The largest proportion, comprising 40% of the sample, possessed a bachelor's degree, whereas 30% possessed vocational or technical qualifications. An additional 20% of participants possessed a high school education or lower, while 10% possessed master's degrees. The presence of diverse educational backgrounds among the participants suggests that the study included individuals with different degrees of academic readiness. The demographic composition of the survey sample exhibits a consistent portrayal of gender, a wide range of ages, and a heterogeneous distribution of educational backgrounds. This composition renders the sample highly suitable for conducting a thorough investigation into manufacturing companies, specifically

focusing on their strategic management accounting techniques, inventory control practices, and investment decision-making processes. The anticipated outcomes are presented in Table 1.

Table.1: Demographic Profile

Demographic Category	Number of Respondents	Percentage
Gender		
Male	150	60%
Female	100	40%
Age Group		
18-24 years	40	16%
25-34 years	75	30%
35-44 years	60	24%
45-54 years	50	20%
55 and above	25	10%
Education Level		
High school or below	50	20%
Vocational/Technical	75	30%
Bachelor's degree	100	40%
Master's degree	25	10%
Company Size		
Years in Operation		
Less than 5 years	50	20%
5-10 years	75	30%
11-20 years	60	24%
21-30 years	40	16%
More than 30 years	25	10%

5. Measurement Model Results

The investigators utilised the Partial Least Squares (PLS)-Structural Equation Modelling (SEM) methodology. The technique utilised in this study involved the application of Smart PLS, which is widely regarded as suitable for analysing non-normal data (Hair Jr et al., 2017). The utilisation of PLS-SEM analysis was implemented in two distinct models, specifically the measurement model and the structural model. The measurement model utilised in the study conducted by Imran et al. (2018) incorporated two validity criteria, namely convergent and discriminant, as outlined by Hair Jr et al. (2017). Table 2 presents the anticipated outcomes, which demonstrate the convergent validity of various constructs such as Quality Control (Process), Investment Decisions, Just-in-Time, Target Costing, and Balanced Scorecard. Convergent validity holds significant importance within the context of construct validity in research, as it evaluates the degree to which items designed to measure a particular construct effectively converge or closely converge (Brahma, 2009; Hair, Ringle, & Sarstedt, 2013).

First and foremost, it is crucial to acknowledge that the evaluation of convergent validity commonly involves the utilisation of four primary criteria: factor loadings, Cronbach's Alpha, composite reliability, and Average Variance Extracted (AVE). Factor loadings are used to assess the strength of the relationship between each item and its underlying construct. According to Table 2, the predicted values demonstrate that the factor loadings generally satisfy the recommended threshold of 0.50 or greater (Hair et al., 2013; Hair et al., 2019). This finding implies that the majority of items exhibit a robust correlation with their corresponding constructs, thereby demonstrating sound

convergent validity. Additionally, the Cronbach's Alpha coefficient is used to evaluate the internal consistency of the items comprising each construct (Peterson & Kim, 2013). The values presented in the table exhibit a range of 0.823 to 0.901, all of which exceed the widely acknowledged threshold of 0.70 (Peterson & Kim, 2013). This finding suggests that the items comprising each construct demonstrate consistent measurement of the underlying concept. According to Peterson and Kim (2013).

In addition, it is worth noting that the recommended threshold for composite reliability is 0.7. Upon examining the values presented in Table 2, it becomes evident that the construct's composite reliability exceeds this threshold. This finding suggests that the construct possesses convergent validity, as indicated by Peterson and Kim (2013). Finally, an essential component in evaluating convergent validity is the Average Variance Extracted (AVE). The AVE (Average Variance Extracted) metric quantifies the extent to which the construct captures variance compared to the variance resulting from measurement error. In order to establish robust convergent validity, it is generally recommended that the average variance extracted (AVE) values surpass a threshold of 0.50 (Peterson & Kim, 2013). The predicted values in Table 2 demonstrate that all values exceed 0.50, thereby satisfying the AVE criteria (Purwanto, 2021). The aforementioned findings regarding the measurement model demonstrate strong convergent validity, as illustrated in Table 2 below.

Table.2: Convergent Validity Results

Variables	Item	Mean	VIF	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average
Quality control (Process)	PRO1	3.62	2.12	0.84	0.893	0.901	0.732
	PRO2	3.23	1.34	0.74			
	PRO3	3.13	2.67	0.83			
	PRO4	3.41	1.45	0.94			
	PRO5	3.25	2.78	0.75			
	PRO6	3.40	1.56	0.82			
	PRO7	3.45	1.78	0.83			
Investment Efficiency Decisions	IND1.	3.51	1.34	0.82	0.843	0.862	0.732
	IND2	3.91	2.67	0.78			
	IND3	3.22	2.98	0.82			
	IND4	3.73	2.45	0.91			
	IND5	3.16	1.46	0.79			
	IND6	3.80	1.87	0.75			
	IND7	3.47	1.67	0.88			
Just-in-Time	JIT1	3.34	1.56	0.89	0.870	0.893	0.734
	JIT2	3.56	2.76	0.76			
	JIT3	3.78	2.45	0.85			
	JIT4	3.89	1.67	0.92			
Target Costing	TAC1	3.95	2.34	0.78			
	TAC2	3.56	3.56	0.83			
	TAC3	3.53	3.78	0.87			
	TAC4	3.45	3.67	0.80			
	TAC5	3.67	2.56	0.74			
Balanced Scorecard	BAS1	3.48	2.30	0.88	0.823	0.842	0.782
	BAS2	3.78	2.23	0.90			
	BAS3	3.52	1.45	0.87			
	BAS4	3.53	2.43	0.89			

Discriminant validity is a subsequent criterion that delineates a subset within the broader construct validity framework. Henseler, Ringle, and Sarstedt (2015) demonstrate the efficacy of a test in accurately measuring a given concept. Discriminant validity is a concept that primarily concerns the identification of the absence of relationships between constructs that are theoretically incompatible or unrelated (Henseler, Ringle, & Sarstedt, 2015). The assessment of discriminant validity was conducted using the heterotrait-monotrait correlation (HTMT) method, with the criterion that correlation values should be below 0.85 or 0.90 (Henseler et al., 2015; Hussain et al., 2018). All the numerical values presented in Table 3's projected values exhibit a magnitude below 0.85. This observation implies that the concept under investigation possesses discriminant validity. The predicted result displayed in Table 3 illustrates the HTMT value.

Table.3: HTMT

	PRO	IND	JIT	TAC	BAS
PRO					
IND	0.407				
JIT	0.746	0.558			
TAC	0.586	0.163	0.605		
BAS	0.531	0.316	0.678	0.316	

Note: PRO-process, IND-investment decisions, JIT-just in time, TAC-target costing, BAS-balance scorecard.

5.1 Structural Model

The findings from the analysis of the measurement model and the PLS-SEM structural model, which were conducted using 5000 bootstrap resampling, offer significant insights into the associations between different factors and investment efficiency within the specific context of large-scale manufacturing firms in Indonesia. The initial R Square value prior to moderation analysis was 0.45, suggesting that the exogenous variables collectively account for a significant 45% variation in the endogenous variable. Following the introduction of the moderating effect, the R square values exhibited an increase from 0.45 to 0.56, indicating a substantial moderating effect of inventory control on the relationship between strategic management accounting practices and investment efficiency. The results of the direct regression analysis using Partial Least Squares Structural Equation Modelling (PLS-SEM) indicate that the variable "just in time" has a positive and statistically significant impact on investment efficiency. This finding provides support for the proposed hypothesis (HI).

Furthermore, it is worth noting that target costing exhibits a favourable and substantial impact on investment efficiency, thereby providing support for the proposed hypothesis H2. Additional findings suggest that the balanced scorecard has a positive and significant impact on investment efficiency, thereby providing support for hypothesis H3. The results of this study suggest that Indonesian manufacturing companies that employ just-in-time practises, prioritise target costing, and implement a balanced scorecard approach are more likely to attain superior levels of investment efficiency. The results of this study are consistent with the notion that the implementation of effective strategic management accounting practises has the potential to enhance investment efficiency within the manufacturing sector.

The hypotheses H4 and H6 are not supported as their p-values exceed the commonly accepted significance level of 0.05. This suggests that there is no statistically significant moderating effect of quality control on the relationship between just-in-time and investment efficiency, as well as between balanced scorecard and investment efficiency, within the context of Indonesian manufacturing companies. The findings of this study indicate that the influence of quality control on the impact of these factors on investment efficiency may not be substantial. However, it is crucial for businesses to take into account other potential factors or interactions that could potentially affect these relationships. Finally, it's clear that H5 is true, which means that quality control is a big part of how target costing and investment efficiency are linked in Indonesian large manufacturing companies. This implies that the impact of quality control processes on the association between target costing strategies and investment efficiency should be taken into consideration. This suggests that companies that effectively incorporate quality control measures into their target costing practices may experience greater enhancements in investment efficiency. The aforementioned findings are anticipated and presented in Table 4 below.

Table.4: Hypothesis Results

Hypothesis	Path Coefficient	T Statistics	Sign. Level	Decision
JIT->IND	0.546	4.632	<0.001	Accepted
TAC->IND	0.319	2.814	0.005	Accepted
BAS->IND	0.429	3.717	<0.001	Accepted
JIT*PROS->IND	0.183	1.802	0.072	Rejected
TAC*PRO>IND	0.268	2.313	0.021	Accepted
BAS*PROS->IND	0.142	1.309	0.190	Rejected

Note: P<0.005, PRO-process, IND-investment decisions, JIT-just in time, TAC-target costing, BAS-balance scorecard.

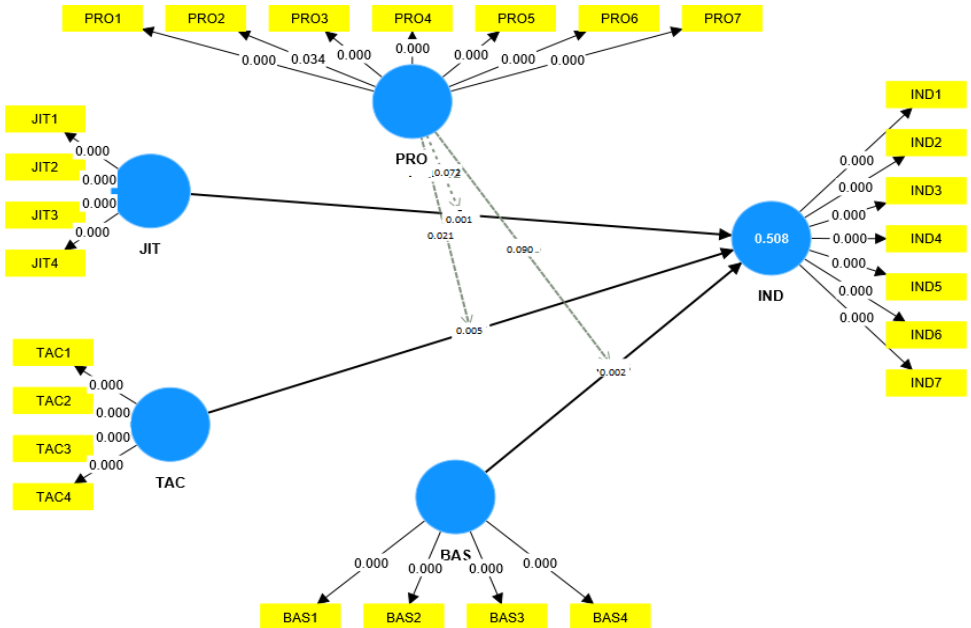

Figure.1: Structural Model

6. Discussion and Contributions

The implementation of quality control measures in production operations has the potential to greatly enhance the effectiveness of strategic management accounting techniques in large-scale companies. By implementing measures to maintain a consistent level of product quality and minimise the occurrence of defects, companies have the opportunity to decrease their production costs and improve their overall reputation. Consequently, this facilitates more precise cost analysis and enhances the level of information available for investment decisions, thereby ultimately enhancing investment efficiency. This demonstrates the significant role that quality control processes play in enhancing management accounting techniques, ultimately leading to improved investment efficiency. The research objective of this study was to examine the moderating effect of quality control processes on the relationship between strategic management accounting techniques and investment efficiency in manufacturing companies in Indonesia. In order to achieve the intended objective, the research employed the methodology of Partial Least Square (PLS)-Structural Equation Modelling (SEM). The findings derived from the PLS-SEM analysis performed on a sample of large-scale manufacturing firms in Indonesia offer significant insights into the determinants that impact investment efficiency within this particular setting. The findings suggest that the implementation of just-in-time (JIT) practices has a significant and positive impact on investment efficiency. This demonstrates the significant contribution of Indonesian large-scale manufacturing to implementing just-in-time practices to enhance investment efficiency.The aforementioned findings are consistent with prior research (Altin et al., 2020; Jbarah, 2018).

These studies posit that the adoption of just-in-time (JIT) practices can result in decreased inventory expenses and enhanced operational effectiveness. Moreover, cost effectiveness has a positive and significant impact on investment efficiency. These findings are consistent with prior research conducted by Altin et al. (2020) and Jbarah (2018). Our research reaffirms these findings within the Indonesian context and emphasises the significance of cost efficiency in attaining greater investment efficiency. Moreover, the balanced scorecard has been found to have a positive and significant impact on investment efficiency. The positive and significant impact of the Balanced Scorecard on investment efficiency in Indonesian manufacturing companies can be attributed to its ability to align strategic objectives, improve performance measurement, and promote adaptability in a dynamic market. This strategic tool facilitates the optimisation of resource allocation, enables effective responsiveness to market changes, and promotes transparent communication of performance to stakeholders, thereby resulting in enhanced investment efficiency. These findings are consistent with previous studies (Altin et al., 2020; Jbarah, 2018).

However, additional findings indicate that quality control does not possess a statistically significant moderating influence on the association between just-in-time, balanced scorecard, and investment efficiency in manufacturing companies in Indonesia. Although these findings may appear to contradict common knowledge, it is crucial to acknowledge that the impact of quality control on investment effectiveness can differ based on the industry and specific contextual factors. This discovery implies that within the framework of Indonesia's extensive manufacturing sector, additional factors might exert a more prominent influence on investment efficiency. Another potential explanation for the lack of significance in this relationship could be the

presence of overlapping variables within the model. Another potential explanation is that the presence of multiple factors in investment decisions, such as market dynamics and strategic alignment, may have a greater impact on Indonesian manufacturing companies, in addition to quality control. Finally, additional findings suggest that the presence of quality control in the operations process plays a significant role in moderating the relationship between target costs and investment efficiency. This suggests that the implementation of robust quality control procedures has the potential to amplify the influence of target costing strategies on investment efficiency within the manufacturing sector of Indonesia. This discovery emphasises the crucial significance of quality control in the management of costs and the enhancement of efficiency. The findings of this study align with prior research that suggests quality control may serve as a potential moderator (Ramadhani & Sudarma, 2017; Salsabila & Sukirman, 2017). Hence, this research makes a valuable contribution to the existing literature by specifically emphasising the interplay between quality control and target costing within the Indonesian context.

In accordance with empirical research, this study has made a valuable contribution to the existing body of literature by examining both theoretical and practical aspects within the domain of large-scale manufacturing firms in Indonesia, with potential applicability to other nations. The aforementioned statement highlights the significant importance of quality control in improving investment efficiency through error reduction, facilitating accurate allocation of resources, mitigating regulatory risks, and promoting a more strategic investment approach. This study offers significant insights to Indonesian manufacturers regarding the significance of quality control (QC) and the integration of strategic management accounting methods, such as Just in Time, target costing, and the Balanced Scorecard, in order to improve financial performance. The findings of the study hold practical significance in terms of enhancing investment decision-making processes. The research contributes to our theoretical understanding by examining how quality control moderates the relationship between strategic management accounting techniques and investment efficiency. This study provides a nuanced perspective on the intricate interplay of factors involved in the investment decision-making process. Furthermore, this study serves to strengthen the existing body of knowledge regarding the beneficial effects of just-in-time (JIT), target costing, and the balanced scorecard. Consequently, it contributes to the theoretical soundness and validity of these concepts. This study also makes a valuable contribution to the existing body of knowledge regarding the potential benefits of employing quality control and management accounting techniques in order to improve investment efficiency. It is worth noting that the findings of this research may have implications that extend beyond the manufacturing sector in Indonesia.

7. Conclusion

The present study highlights the significance of quality control processes in improving investment efficiency by moderating the association between strategic management accounting techniques and investment efficiency in large-scale manufacturing firms operating in Indonesia. The findings of the study indicate that the implementation of just-in-time, target costing, and balanced scorecard approaches have been shown to have statistically significant and positive effects on investment efficiency. The findings of the study indicate that quality control plays a significant role in

moderating the effects of target costs. This observation implies that the synergy between robust quality control procedures and targeted costing approaches plays a pivotal role in enhancing investment efficiency within the specific context of Indonesia. The aforementioned findings offer significant insights for businesses operating in Indonesia, providing valuable guidance on effectively utilising management accounting techniques and quality control practices to improve their investment efficiency. Nevertheless, it is crucial to recognise that these findings are contingent upon the specific context and may exhibit variations across diverse industries and regions. Consequently, additional research is warranted to delve into the intricacies of the Indonesian market and its ramifications for investment decision-making.

8. Limitations and Future Recommendations

Research, despite yielding significant findings, is not without its limitations, which may serve as potential avenues for future research. For example, a study was conducted on manufacturing companies in Indonesia, which possess distinct work cultures in comparison to other developed nations. Consequently, future research endeavours could be undertaken to investigate manufacturing companies in other developed nations in order to enhance the generalizability of the research findings. The scope of the research was constrained to examining the moderating effect, overlooking other potential mediating variables such as the accounting information system, which could potentially mediate the relationship between management accounting techniques and investment efficiency. Hence, it is recommended that future research endeavours consider incorporating additional mediating variables in order to broaden the scope of the study. The study exclusively utilised a quantitative research approach, neglecting the potential benefits of a qualitative research approach. Consequently, it is recommended that future research endeavours consider employing a mixed-methods approach in order to enhance the generalizability of the findings.

Furthermore, drawing from the research findings within the specific context of large-scale manufacturing companies in Indonesia, a number of practical recommendations can be derived to assist these firms in enhancing their investment efficiency. First and foremost, considering the notable beneficial effects of Just in Time practices, it is imperative for manufacturing companies in Indonesia to prioritise the implementation of lean manufacturing principles. This entails the reduction of surplus inventory, the streamlining of production processes, and the optimisation of supply chain management. By implementing this approach, organisations can successfully reduce operational expenses, enhance operational effectiveness, and allocate financial resources towards more strategic investment opportunities. Furthermore, it is imperative for companies to prioritise ongoing improvement endeavours in order to maintain the long-term advantages of just-in-time practices.

Additionally, it is imperative for Indonesian manufacturing enterprises to prioritise the integration of quality control procedures, specifically in conjunction with target costing methodologies. The implementation of an efficient quality control system can greatly contribute to cost management and efficiency improvement initiatives related to target costing. It is recommended that companies allocate resources towards the implementation of comprehensive quality control systems and conduct periodic

quality audits in order to mitigate the occurrence of defects and the subsequent financial implications. This approach not only guarantees the quality of the product but also facilitates the attainment of cost-efficient production objectives. Moreover, it is imperative for these firms to consistently monitor and adjust their quality control procedures in order to align with the ever-changing industry norms and the shifting demands of consumers. By integrating quality control with cost management strategies such as target costing, manufacturers in Indonesia can achieve a harmonious equilibrium between operational efficiency and product quality. This, in turn, can result in enhanced investment efficiency and heightened competitiveness within the global market.

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