International Journal of Applied Economics, Finance and Accounting
ISSN 2577-767X
Vol. 16, No. 2, pp. 234-247
2023
DOI: 10.33094/ijaefa.v16i2.966

Business intelligence, management control systems and startup performance: Empirical study from Indonesia

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Keywords:
Business intelligence
Company performance
Management control system.

JEL Classification:
M410; M130; M150.

Received: *19 December 2022*
Revised: *27 March 2023*
Accepted: *2 May 2023*
Published: *11 May 2023*
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Abstract

This study aimed to examine the relationship between business intelligence and management control systems and how they impact company performance. It used 209 startup companies recorded in the database of the Ministry of Tourism and Creative Economy Republic of Indonesia. The sample consists of startups less than ten years old and experiencing a period of growth. The partial least squares SEM (PLS-SEM) is used to estimate cause-effect relationship models. The finding shows that the management control system positively contributes to the company's performance. The moderation analysis concludes that business intelligence is not able to moderate the relationship between management control systems and company performance. This finding supports the contingency theory, which claims the need to evaluate conditional factors in creating effective management control. Also, the theory emphasizes the alignment between management control and company performance to support performance improvement. This research provides practical implications for startups about the importance of creating a more contextual management control system to improve company performance.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.

1. Introduction

The rapid development of information technology has triggered business globalization. Indeed, rapid changes in managing companies have become an important issue, especially regarding performance measurement. Performance measurement has moved towards examining companies, where everything happening within companies impacts their performance (Kherrazi, 2021; Minna & Ukko, 2013; Nartey, Aboagye-Otchere, & Yaw Simpson, 2020; Rehman, Mohamed, & Ayoup, 2018). In terms of startup, for example, the poor performance of startup companies has recently come to the attention of academics because it may lead to business failure. It is true that startup companies have experienced a significant increase in the last decade. However, this increase is directly proportional to startup failures in various countries (Akter & Iqbal, 2020; Cantamessa, Gatteschi, Perboli, & Rosano, 2018; Khelil, 2016; Öndas, 2021; Pisoni, Aversa, & Onetti, 2021). Several studies report that most startups have failed to generate revenue (Bajwa, Wang, Nguyen Duc, & Abrahamsson, 2017; Battistella, De Toni, & Pessot, 2017), leading to the termination of their operations (Bednár & Tarišková, 2017; Kalyanasundaram, 2018). Business failures, such as those in startups, are caused by a lack of experience and managerial perspective, disrupting business development processes that impact performance (Cantamessa et al., 2018; Carraro, Meneses, & Brito, 2020). Poor business development processes prevent startups from seeing a projected return on investment. Öndas (2021) identify several main factors contributing to the failure of business performance. These factors include management, product, and market problems, as well as financial challenges. Similarly, a report from CB Insight, a company engaged in research on the startup industry, found that market, investment, and management failure as the main problems in

startup business performance (Bestari, 2022). This shows the weakness of the management control system (MCS) applied in startup companies (Okvist & Pavlovic, 2018). The formal use of MCS causes various limitations in modern business activities (Davila, Foster, & Jia, 2015), resulting in MCS being considered as an innovation obstacle and often being unnoticed (Ploss, 2018).

Previous studies have discussed the importance of implementing MCS in improving performance in startup companies but have shown inconsistent results. Arend, Zhao, Song, and Im (2017) argue that implementing MCS as strategic planning negatively affects innovative activities. This supports Honig and Hopp (2016) that the use of initial business planning not followed by further business planning has no positive impact on performance. On the contrary, Davila, Foster, and Oyon (2009) claim that adopting MCS at the right time improves the company's performance. The use of MCS in high-growth firms was also found to support growth (Okvist & Pavlovic, 2018). Gomez-Conde, Lunkes, and Rosa (2019) also insist that using MCS and an innovation strategy affects startup performance improvement.

Some previous studies indicate that information technology could make performance measurement and management practices more effective and efficient (Aydiner, Tatoglu, Bayraktar, Zaim, & Delen, 2019; Azeroual & Theel, 2018; Bititci, Garengo, Dörfler, & Nudurupati, 2012). Startup companies in the industrial revolution 4.0 era should implement information technology to gain a competitive advantage and avoid business failures. Therefore, this study included a moderating variable of the business intelligence system in the relationship between MCS and firm performance. It used a contingency approach to align managerial decisions and various contingent factors, such as a business intelligence system, in realizing superior performance. Companies rely heavily on sophisticated information systems in the form of business intelligence to meet the demands of today's innovation (Salisu, Bin, & Bin, 2021). This is because managers are faced with doubling data growth yearly, which requires difficult analysis (Schubmehl & Vesset, 2014; Turner, Gantz, Reinsel, & Minton, 2014). This study aimed to investigate the role of business intelligence concerning MCS in improving company performance. The objectives are to (1) examine the effect of MCS on firm performance, and (2) examine the moderating effect of business intelligence on the relationship between MCS and firm performance. This study contributes to extending the previous findings of startup performance. Furthermore, the findings may motivate startups to consider the importance of creating a more contextual management control system to boost their performance.

2. Theoretical Literature Review

2.1. Contingency Theory

The relationship between MCS and performance could be studied through contingency theory. Within contingency theory, Otley (1992) believes that no universally appropriate accounting system is suitable for all organizations in all situations. Based on this argument, hence, when designing management control systems, organizations should identify and adopt the most relevant environmental factors as part of management control systems. In fact, the contingency approach explains how the design and effectiveness of a management control system depend on organizational structure, environment, strategy, culture, and information technology (Crespo, Rodrigues, Samagaio, & Silva, 2019; Frare, Cruz, Lavarda, & Akroyd, 2022; Gomez-Conde, Lopez-Valeiras, Malagueño, & Gonzalez-Castro, 2021; Lill, Wald, & Munck, 2021; Pereira, 2018; Samagaio, Crespo, & Rodrigues, 2018). Contingency theory also assumes that control variables are related and seek the optimal control system design in certain circumstances (Gerdin, 2005). The fit between these factors and MCS leads organizations to better decision-making, contributing to increased company performance (Chenhall, 2003; Luft & Shields, 2003). Indeed, a better fit between the management control system and contingent variables results in increased firm performance (Fisher, 1998). Therefore, this study used a contingency theory approach to comprehensively explain the specific characteristics influencing the adoption of MCS in startup companies.

The general business environment has shown a change and increased competition locally and globally, creating uncertainty. The development of information technology drives changes at a higher level, including in business practices. The business complexity requires the help of strategic management tools to adapt to the changing environment. Therefore, business intelligence systems are introduced as technologies that could transform data into meaningful knowledge to support business decisions (Brands & Holtzblatt, 2015; Nielsen, 2015; Wieder & Ossimitz, 2015). Alignment between business intelligence and MCS would determine the effectiveness of the company's MCS design and encourage better performance.

2.2. Company Performance

Company performance describes achieving goals, objectives, vision, and mission contained in the strategic plan. It refers to the company's effectiveness, which indicates success in achieving its goals (Otley, 2016). Achieving company performance requires performance management. Performance management is closely related to utilizing information generated through performance measurement (Saunila, 2016). Performance measurement provides the basis for assessing how the company is achieving its goals, as well as helping to identify areas of weakness and decide on future initiatives. Bititci et al. (2012) argue that organizations need

performance measures to improve performance. Therefore, performance measurement is required to maintain more effective management (Amaratunga & Baldry, 2002).

Performance measurement has traditionally been concentrated on financial measures that describe performance indicators based on results. It is considered the narrowest concept of business performance (Caseiro & Coelho, 2019). Financial ratios include commonly used measures such as return on investment (Chen et al., 2014), return on equity (Kim, Shin, Kim, & Lee, 2011), return on assets (Torres, Sidorova, & Jones, 2018), income (Davila et al., 2015; Rai, 2006), and sales (Davila & Foster, 2005). These indicators usually show the company's ability to generate profits. However, performance measurement currently examines the organization, where various conditions impact its performance (Saunila & Ukko, 2013). Performance management identifies key factors that influence performance measurement success and failure, such as organizational structure, management style, size and culture, system maturity, and information and communication systems (Chenhall, 2003; Franco & Bourne, 2003; Garengo & Bititci, 2007; Hoque & James, 2000; Otley, 1999; Reid & Smith, 2000; Simons, 1994). It is based on business structures, units, processes, and workflows that measure the efficiency and effectiveness of actions using variables such as cost, quality, and time (Bititci et al., 2012; Dyczkowski & Dyczkowska, 2018). According to Caseiro and Coelho (2019), organisational effectiveness is the broadest conceptualization of performance.

In examining startup performance, Rompho (2018) identified several key indicators that are relevant to startups, such as customer activity, financial, and process perspectives. Customer activities help startup companies measure and understand how customers perceive the benefits provided, including customer satisfaction and repeat customers. The financial perspective focuses on economic viability and profitability, including liquidity, margin analysis, and ROI. Moreover, the process perspective aims to improve efficiency, including customer lifetime value, learning curve, and costs of acquisition.

2.3. Management Control System (MCS)

A management control system (MCS) is an important instrument that provides managers with the necessary information to assist decision-making, planning, and control. The implementation of MCS in large companies has led to better performance (Bellora-Bienengräber, 2019; Einhorn, Heinicke, & Guenther, 2021; Kherrazi, 2021; Pereira, 2018).

However, there is still debate about whether MCS can facilitate growth (Flamholtz & Randle, 2012). In this case, startup companies need the flexibility to be creative and innovative in determining competitive advantages to support company growth. At the same time, they also need management control to survive (Carraro et al., 2020; Crespo et al., 2019).

MCS comprises various control systems that work together (Otley, 1992). Therefore, the management control literature highly recommends studying MCS from a holistic perspective. Studying the management control framework as a package is becoming increasingly important. This study conceptualized MCS by referring to the framework definition of Malmi and Brown (2008). The use of the MCS package system is based on the assumption that a single control system cannot operate separately from other organizational control systems. The linkages between single systems within the organization must be considered when predicting the benefits and impacts of using a control system.

2.4. Business Intelligence

Business intelligence describes a concept and method of increasing knowledge by analyzing the data collected from various sources. Business intelligence includes technologies and methodologies that enable companies to collect data from internal and external sources (Rikhardsson & Yigitbasioglu, 2017). The general purpose of business intelligence is to create knowledge from data analysis in the form of meaningful information (Wieder & Ossimitz, 2015).

It is widely used in strategic management and information systems (Chugh & Grandhi, 2013) to help managers obtain relevant information. Business intelligence also enables the efficient use of company resources by combining information technology and business management. Furthermore, it facilitates the work of managers by shortening the time to search for data. Business intelligence helps generate timely, relevant, and easy-to-use information in business reporting and analysis, enabling managers to make better decisions (Mohamed Z Elbashir, Sutton, Mahama, & Arnold, 2021).

Utilizing business intelligence in startup companies provides a huge competitive advantage as it facilitates systematic and real-time data integration and extraction processes with accurate results (Azeroual & Theel, 2019). Moreover, using business intelligence saves working time for startup companies that still have few workers with various responsibilities.

It can help startup companies respond quickly to their business analysis, which is crucial for strategic planning, especially for companies that have shorter planning horizons than large companies. According to Elbashir, Collier, and Sutton (2011), business intelligence plays a vital role in supporting decision-making. It also provides business analysis, and managing company performance by converting data into information for sophisticated management control systems.

3. Empirical Literature Review and Hypothesis Development

3.1. Management Control System and Company Performance

Previous studies have shown the importance of MCS in initiating company growth. The study by Davila et al. (2015) indicates a significant positive relationship between MCS adoption and firm value. MCS contributes to the growth of startup companies by using management control methods related to revenue and performance (de Oliveira Silva, Marques, da Silva Faia, & Lavarda, 2022; Dyczkowski & Dyczkowska, 2018; Frare et al., 2022; Gomez-Conde et al., 2019). Furthermore, Lin, Chen, and Lin (2017) found that operational control has a positive correlation with the performance of startup companies. Okvist and Pavlovic (2018) also concluded that the Simons control lever MCS supports company growth. Ploss (2018) also confirms the positive performance impact of using MCS in startups.

The studies indicate an emerging paradigm that advocates a value-enhancing role for formal control systems in startup companies. According to Davila et al. (2015), the formal adoption of MCS leads to better decisions. MCS improves managerial decisions, resource coordination, and information flow (Davila, 2012; Ploss, 2018). Planning increases the effectiveness of resource use and decision speed in startups (Ploss, 2018). Business planning positively and significantly impacts startup performance (Garonne, 2016). This indicates the company's managerial qualities and prospects for future growth. Investing in infrastructure to address management challenges facilitates high growth. In line with this, Ploss (2018) concludes that MCS facilitates organizational learning and promotes performance improvement.

MCS facilitates organizational learning and thus improves performance (Elbashir, Collier, Sutton, Davern, & Leech, 2013). A meta-analysis of the impact of business planning on startup performance reveals a beneficial and important relationship (Brinckmann, Grichnik, & Kapsa, 2010). Several studies show that elements of management control can have a positive impact on startup performance (Kherrazi, 2021; Metin, 2021; Seynaeve, 2021). MCS contributes to the growth of startup companies by using management control methods related to performance evaluation, as measured by using their income and employment (Davila et al., 2009; Dyczkowski & Dyczkowska, 2018). In line with other researchers, Lin et al. (2017) found that operational control is positively related to performance at startup companies. Research by Okvist and Pavlovic (2018) proves the effect of Simons' control lever MCS in supporting growth. Ploss (2018) confirms the positive performance impact of using MCS in startups.

Contingency-based MCS studies highlight the choice of appropriate MCS practices appropriate for a company's situation. The studies also examined the performance effects of combining MCS practices (Carraro et al., 2020; Frare et al., 2022). Garonne (2016) analyzed the importance of MCS as an analytical tool in capturing opportunities and avoiding mistakes to continue the growth path. Moreover, Ploss (2018) claims that a company can withstand market pressures only through control. Startups that adopt MCS early are expected to grow faster and perform better. Ploss (2018) showed that implementing MCS in the first three years of a startup leads to significantly improved employee growth and overall performance. Therefore, MCS is expected to be useful for startups and their performance, leading to the following hypothesis:

H1. Management control system positively affects company performance.

3.2. Management Control System, Business Intelligence, and Company Performance

Previous studies showed the success of business intelligence systems as a strategic analysis tool in improving performance. Jacobson (2016) concluded that business intelligence tools are mainly used in reporting and performance management. According to Vukšić, Bach, and Popovič (2013), business intelligence improves core processes that drive performance. Popovič, Hackney, Coelho, and Jaklič (2012) found that the maturity effect of business intelligence has an impact on information used in business processes. Applying a business intelligence system at the operational level increases company performance (Elbashir et al., 2021). Furthermore, Lee and Widener (2016) claimed that business intelligence uses diagnostic and interactive controls to increase the knowledge base of managers. A study by Bronzo et al. (2013) also indicates a direct effect between business orientation, analytical indicators, and performance, which is considered statistically significant. Furthermore, Yeoh and Koronios (2010) insist that using business intelligence associated with business orientation could help achieve better results.

Several studies have also reported the use of business intelligence in management control systems by providing positive support for MCS in companies (Forsgren & Sabherwal, 2015; Jacobson, 2016; Peters, Wieder, Sutton, & Wakefield, 2016). Jacobson (2016) examines the use of business intelligence in MCS using a control framework comprising trust, boundary, interactive, and diagnostic control levers. The study concludes a significant influence on all aspects of MCS. Marx, Lahrmann, Mayer, and Winter (2011) claim that business intelligence's contingent design supports organizational management control. Peters et al. (2016) also confirmed the role of business intelligence quality in supporting the diagnostic and interactive dimensions of MCS. The contribution of business intelligence in MCS directly supports the competitive benefits of using interactive controls and internal corporate benefits with diagnostic controls (Forsgren & Sabherwal, 2015). Additionally, competitive benefits have a positive effect on internal benefits.

The advantages of using business intelligence in implementing MCS also help improve company performance (Elbashir et al., 2021; Jacobson, 2016). Previous studies have shown that effective business

intelligence assimilation leads to improved organizational learning and company performance (Elbashir et al., 2013). Aligning the business intelligence and MCS systems could form an interaction that increases the effectiveness of the company's operations (Elbashir et al., 2021; Eldridge, van Iwaarden, van der Wiele, & Williams, 2014). According to contingency theory, company performance comes from aligning company characteristics with contingency factors (Donaldson, 2001). The results of research by Elbashir, Collier, and Davern (2008) support this theory, which states that the application of the business intelligence system at the operational control level provides benefits to the performance of business processes. This shows that the business intelligence system could enhance the effectiveness of MCS in improving the company's overall performance. Therefore, business intelligence positively relates to firm performance by enhancing organizational learning (Elbashir et al., 2013; Lee & Widener, 2016).

The studies reinforce the idea of business intelligence as a system that influences the design of management controls and improves company performance (Richards, Yeoh, Chong, & Popovič, 2019). Business intelligence helps explain the contradictory relationship between MCS and company performance (Arend et al., 2017; Honig & Hopp, 2016; Pernot & Roodhooft, 2014). As a moderator in the relationship between MCS and company performance, business intelligence could unravel the tension between conflicting interests of control and flexibility. Previous studies have shown that the interaction between business intelligence systems and MCS would impact performance. Therefore, the following hypothesis was formulated:

H2. Business intelligence moderates the relationship between management control systems and company performance.

Figure 1 shows the theoretical framework.

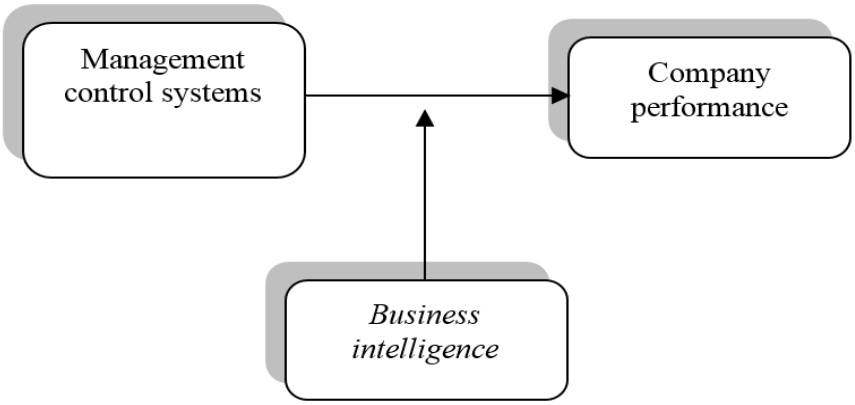

Figure 1. Research model.

4. Research Methodology

The study population comprises 1,190 startup companies registered in the Ministry of Tourism and Creative Economy database in Indonesia in 2022. A purposive sampling method was used to select 209 startup companies less than ten years old from various business fields, as shown in Table 1. The data were analyzed using Structural Equation Modeling (SEM) with Partial Least Square (PLS) using smart PLS 3.0 software.

Table 1. Summary of questionnaire delivery and return.

No.	Description	Amount	Percentage
1.	Questionnaire sent	1.190	100%
2.	Questionnaire that does not return	977	82.1%
2.	Returning questionnaire	213	17.9 %
3.	Questionnaire could not be processed	(4)	0.3%
4.	The questionnaire is complete and can be processed	209	17.6%

Table 1 indicates that 209 startups throughout Indonesia, which represents 17.6% of the entire population, were used as the total sample for this study. Response rates below 75% can lead to non-sampling related errors (Van der Stede, Young, & Chen, 2005), thus requiring checking of sample representativeness with biased non-response testing. Table 2 presents the results of the non-response bias test, which show that the indicators on the MCS variables, business intelligence, and company performance produce a probability value greater than the level of significance (alpha = 5%). This value indicates that there is no significant difference between the early and late response category of respondents in filling out the questionnaire, and that the selected data is unbiased.

This study adopts MCS as an exogenous variable and business intelligence as a moderating variable. These two variables are used to predict the endogenous variable of company performance. MCS are measured using the framework of Malmi and Brown (2008). The MCS framework includes planning control, cybernetic

control, reward and compensation control, administrative control, and cultural control. Malmi and Brown (2008) combine the five control elements to cover a broad spectrum of control systems.

Table 2. Non response bias test results.

Variable	Dimension	F-statistics	T-statistics	P-value
Management control system	Planning control	0.215	-1.832	0.068
	Cybernetic control	0.474	0.310	0.757
	Reward and compensation control	0.313	-1.761	0.080
	Administrative control	2.397	-1.088	0.278
	Cultural control	2.059	0.357	0.722
Business intelligence	Organizational dimensions	0.060	0.127	0.899
	Process dimensions	3.907	-0.014	0.989
	Technological dimension	1.927	0.281	0.779
Company performance		0.237	-0.511	0.610

The business intelligence system has three dimensions in its implementation, including organization, process, and technology (Forsgren & Sabherwal, 2015; Isik, Jones, & Sidorova, 2011; Olszak & Ziemba, 2012; Peters et al., 2016; Yeoh & Koronios, 2010). The system was measured using indicators developed by Olszak and Ziemba (2012) and Isik et al. (2011), which clearly describe the implementation of business intelligence in startup companies. Company performance is measured using indicators developed by Chen et al. (2014); Akter and Iqbal (2020) and Torres et al. (2018), which compare the company's current financial and non-financial performance with that of its competitors. Table 3 displays the indicators for each variable.

Table 3. Indicators of research variables.

Variable	Dimension	Indicator	Source
Management control system	1. Planning control	1. Action planning (Static) 2. Long-term (Strategic) planning	Malmi and Brown (2008); Ploss (2018)
	2. Cybernetic control	1. Budget 2. Financial and non-financial measurement systems	
	3. Reward and compensation control	1. Performance evaluation 2. Rewards for performance	
	4. Administrative control	1. Corporate governance structure 2. Organizational structure 3. Procedures and policies	
	5. Cultural control	1. Clan control 2. Value control 3. Symbol control	
Business intelligence	1. Organization	1. Adequate budget 2. Support from senior management 3. Competent BI team	Olszak and Ziemba (2012); Isik et al. (2011)
	2. Process	1. Define business problems and processes well 2. BI analysis accuracy level 3. The suitability of the BI solution with the user's business expectations	
	2. Technology	1. Data quality and up-to-date 2. Appropriate technology and tools 3. BI system is easy to use (User friendly) 4. Flexibility and responsiveness of BI to user needs	
Company performance		1. Return on investment 2. Sales growth 3. Profitability 4. Return of assets 5. Competitive advantage	Chen et al. (2014); Akter and Iqbal (2020); Torres et al. (2018)

5. Empirical Results and Discussion

5.1. Descriptive Statistics

The descriptive statistics in Table 4 show that the MCS variable for the planning control dimension has an average score of 4.0752, indicating a very high level of planning application among the startup respondents in Indonesia. The tendency of respondents' answers suggests a strong preference for their companies. The descriptive statistical testing of the MCS variable on the cybernetic control dimension shows an average value of 3.8287, indicating a moderate level of cybernetic control implementation among the startup respondents. Similarly, the descriptive statistical tests for other dimensions in the MCS variable also show a moderate level, with an average of 3.7608 for compensation and reward control, 3.8038 for administrative control, and 3.9677 for cultural control.

The business intelligence variable is indicated by three dimensions: organizational, process, and technology. Descriptive statistics show that the organizational dimensions have an average score of 3.2616, indicating a moderate application of business intelligence in startup companies according to respondents' answers. Furthermore, the process and technology dimensions have average values of 3.4386 and 3.8289, respectively, suggesting a medium level of implementation in these areas. Concerning the dependent variable of company performance, the actual average value is 3.6794, which means that respondents perceive the performance of startup companies as being in the medium category.

Table 4. Descriptive statistics.

Variable	Dimension	N	Min	Max	Mean	Standard deviation
Management control system	Planning control	209	1.43	5	4.075	0.699
	Cybernetic control	209	1.20	5	3.829	0.778
	Reward and compensation control	209	1.00	5	3.761	0.848
	Administrative control	209	1.00	5	3.804	0.789
	Cultural control	209	1.25	5	3.968	0.796
Business intelligence	Organizational dimension	209	1.00	5	3.262	1.074
	Process dimension	209	1.00	5	3.439	1.011
	Technology dimension	209	1.00	5	3.829	0.949
Company performance		209	1.00	5	3.679	0.805

5.2. PLS Test Results

Before examining the hypotheses, this study first evaluated the measurement model (outer model) and the structural model (inner model). The validity and reliability of the outer model are valid as all indicators have a loading factor value above 0.70 (the Average Variance Extracted – AVE exceeded 0.50). All dimensions and variables also have Cronbach's alpha of more than 0.7 and composite reliability values of more than 0.70, which means that they are reliable. Table 5 summarizes the results of the validity and reliability tests.

Table 5. Summary of validity and reliability analysis results.

Variable	Dimension	AVE	Cronbach's Alpha	Composite reliability
Management control system	Planning control	0.630	0.882	0.911
	Cybernetic control	0.726	0.905	0.930
	Reward and compensation control	0.751	0.835	0.901
	Administrative control	0.723	0.904	0.929
	Cultural control	0.719	0.870	0.911
Business intelligence	Organizational dimension	0.850	0.911	0.944
	Process dimension	0.906	0.948	0.966
	Technology dimension	0.744	0.885	0.921
Company performance		0.674	0.912	0.880

The structural model was tested by calculating the value of R-squares, Q2 (predictive relevance), and Goodness of fit. The R-square test results in Table 4 show that the relationship between variables ranges from 0.375 to 0.486, indicating a moderate relationship. The Q2 test results showed a value of 0.364, which means the model explains 36.4% of the variability of the company's performance. The goodness of fit test used three parameters, including the Standardized Root Mean Square Residual (SRMR), Normed Fit Index (NFI), and Root Mean Square (RMS) Theta. The three values fall within the acceptable range based on the rule of thumb shown in Table 6. Finally, the hypotheses were tested, and their results are summarised in Table 7.

Table 6. Summary of PLS analysis.

Variable	R square	R square adjusted
Management control system	0.375	0.372
Company performance	0.417	0.411
$Q2 = 1 - [(1 - R12)(1 - R22)]$ $Q2 = 1 - [(1 - 0.375)(1 - 0.417)]$ $Q2 = 0.364$		

Table 7. Goodness of fit.

Criteria	Estimated model	Rule of thumb
SMSR	0.080	< 0.08
NFI	0.998	>0.9
RMS theta	0.113	< 0.12

Hypotheses were tested to prove the causal and moderating relationship between exogenous and endogenous variables. The PLS analysis showed significant and insignificant paths, as presented in Table 8.

Table 8. Hypothesis test results.

Hypothesis		Coefficient	Standard deviation	T statistics	P values
1.	Management control system → Company performance	0.39	0.098	3.966	0.000
2.	Business intelligence → Management control system and company performance	-0.076	0.053	1.423	0.155

The results in Table 8 show that testing hypothesis 1 yielded a t-statistic of 3.966, which is greater than 1.96, a p-value of 0.05, which is greater than 0.000, and a path coefficient of 0.39. This shows that MCS positively and significantly affects the company's performance, thus supporting hypothesis 1. On the other hand, the results of the second hypothesis test yielded a t-statistic value of 1.423, which is less than 1.96, and a p-value of 0.155, which is greater than 0.05. Additionally, the analysis also showed a path coefficient value of -0.076, indicating that business intelligence negatively and insignificantly affects the relationship between MCS and company performance, thus refuting hypothesis 2.

6. Discussion

6.1. The Influence of MCS on Company Performance

The test results on the first hypothesis (H1) presented in Table 8 show that MCS positively and significantly affects company performance. This indicates that the implementation of MCS, which includes planning, cybernetic, compensation and reward, administrative, and cultural control, enhances the performance of startup companies in Indonesia. According to Davila and Foster (2007), startups tend to have limited informal management styles during their establishment. By implementing a consistent and balanced MCS, communication among employees, managers, and directors is encouraged. This leads to increased collaboration and the development of creative skills necessary for exploiting and exploring knowledge (Einhorn et al., 2021; Frare et al., 2022). Furthermore, MCS plays a crucial role in directing and monitoring activities and standardizing company processes (Zarzycka, Dobroszek, Lepistö, & Moilanen, 2019). The use of various controls helps managers to focus on multiple objectives to support performance improvement (Barros & Ferreira, 2019; Kherrazi, 2021). The evolution of MCS into more complex forms of control has transformed it into a calculative practice that helps improve performance (Chenhall & Moers, 2015).

These findings highlight the importance of startup companies adopting MCS packages beneficial in dealing with business uncertainty and surviving in the market (Akroyd, Biswas, & Chuang, 2016). The results support dynamically coupled control packages to change according to interests and the innovative context facing startup companies (Lövstål & Jontoft, 2017). Implementing MCS configurations allows for more flexibility in dealing with changing environments, unforeseen contingencies, and technological uncertainties. Furthermore, the configuration of MCS strengthens informal practices to stimulate novelty and idea creation when dealing with innovation for growth (Chenhall & Moers, 2015). The proportion of formal controls could be increased when dealing with market competition to reduce the danger of appropriation and spillovers (Kherrazi, 2021). In highly innovative startup companies, using MCS configurations helps balance the need between innovation and efficiency (Barros & Ferreira, 2019). This results in dynamic tensions driving performance improvements (van der Kolk, van Veen-Dirks, & ter Bogt, 2020).

The empirical findings show how to control packages developed internally and tailored to company contingencies could help reduce uncertainty and tension during the early-stage startup development process and promote goal alignment (Pereira, 2018; van der Kolk et al., 2020). This supports the contingency theory proposed by Otley (1992) by showing the adaptability of MCS, which is flexible to suit the needs and development of startups. The results corroborate (Carraro et al., 2020; Crespo et al., 2019; Frare et al., 2022;

Ploss, 2018) that configuring MCS in startup companies is a complementary system that refers to balance and is useful in aligning various stakeholders. Therefore, implementing MCS configuration in startup companies encourage startup growth.

6.2. Moderating Effect of Business Intelligence on the Relationship between MCS and Company Performance

The second hypothesis (H2) states that business intelligence moderates the relationship between MCS and firm performance. The PLS analysis showed that the business intelligence system does not moderate the relationship between MCS configuration and company performance, refuting hypothesis 2. This means that a business intelligence system does not affect the relationship between MCS and company performance. The system is an analytical tool that assists management in directing the company's strategic activities. It facilitates the integration of various company data analyzed to provide meaningful insights for decision-makers (Esswein & Chamoni, 2018; Nielsen, 2018). The success of implementing business intelligence highly depends on the cooperation between the business intelligence system and corporate governance (Chugh & Grandhi, 2013), represented by MCS. Aligning the two benefits the next process and increases company performance (Richards et al., 2019).

Boyton, Ayscough, Kaveri, and Chiong (2015) and Hanafi (2022) argue that the organizational, process, and technological dimensions support the successful implementation of business intelligence. The organizational dimension emphasizes management support for the running of business intelligence projects. The process dimension relates to the ability of business intelligence systems to analyze company business problems. Moreover, the technology dimension contains data architecture support. The success of a business intelligence system requires high intensity and involvement from all three dimensions. An emphasis on one dimension could disrupt the sustainability of implementation (Chugh & Grandhi, 2013).

The analysis showed that management support for implementing a business intelligence system only has standard strength. Business intelligence projects run at startup companies do not receive full management support. They do not get the required budget readiness, implementation support, and a competent business intelligence team. Business intelligence systems require policies, standards, and frameworks related to data management to translate realistic ideas into objectives (Wieder & Ossimitz, 2015). These various supports also require the understanding and skills of the business intelligence team regarding the use of data through analytical tools (Elbashir et al., 2021). Startups have limitations in management support and competent business intelligence team resource management. Subsequently, the organizational dimensions cannot strengthen the relationship between MCS and company performance. This is in line with Owusu (2019) that top management support is not statistically significant for implementing business intelligence.

The dimensions of the business intelligence process at startups had a medium average value, meaning that the ability to analyze business problems at startups was moderate. This indicates that the business intelligence system of startup companies cannot define problems and processes well, leading to less accountable analysis results. Implementing business intelligence helps solve various business problems by providing valuable insights and creating knowledge (Božič & Dimovski, 2019). The startups' limited analytical capabilities weaken business intelligence in strengthening the relationship between MCS and company performance. The mean value of the technology dimension was higher than the other two dimensions. This means startups put more emphasis on data management support in managing business intelligence systems. Due to the ease and flexibility of their use, Hanafi (2022), suggests that most startups want a business intelligence system model that is simple and easy to use, but they do not consider how business intelligence answers the problems faced by the company.

Weak management support and low business intelligence analytical skills are caused by startups using more commercial systems. Ready-to-use business intelligence systems provide general analytical facilities that are useful for various needs. However, the system cannot translate specific business needs for each startup (Boyton et al., 2015). This study found that over 90% of startups use ready-to-use business intelligence systems from various vendors. Building an integrated business intelligence system requires a large investment (Rikhardsson & Yigitbasioglu, 2017). However, most startups are still in the early stages of establishment with limited capital (Davila et al., 2015). The business intelligence tool is a high-risk project that requires a significant amount of resources and maximum effort in its implementation (Chugh & Grandhi, 2013). Startups use business intelligence systems on an ad hoc basis and are not implemented properly. This results in the accumulation of data within the company that cannot be turned into meaningful information. Therefore, business intelligence governance is not aligned with MCS configuration, and it does not affect the relationship between the MCS configuration and company performance. This supports the contingency theory that company performance comes from aligning company characteristics and contingent factors (Donaldson, 2001).

7. Summary and Conclusion

The findings show that effective implementation of configuration management control systems contributes positively to improving firm performance. The configuration, comprising several control elements, balances the need for innovation and efficiency, which is useful in increasing startup performance. Formal control in the form of business planning is mostly applied to startups with high innovation needs, but it is

balanced with the application of informal cultural controls. This encourages creating a dynamic balance needed by startup companies with high growth demands to anticipate business failures. These findings are consistent with the contingency theory, which evaluate the conditional factors required to create an effective MCS.

The results also revealed the applications of business intelligence for startup companies in Indonesia. However, business intelligence was unable to moderate the relationship between MCS and performance due to the limitations of startup companies in management support and competent business intelligence team resource management. These limited resources lead to weak analytical skills, making the business intelligence unable to strengthen the relationship between MCS and company performance. This finding supports the contingency theory that management control must be consistent with specific aspects that support performance improvement. The application of business intelligence requires good governance and alignment with the MCS configuration. However, the governance of business intelligence was incompatible with MCS and could not moderate the relationship between MCS configuration and company performance.

Startup founders must improve business intelligence governance, which includes organizational, process, and technology dimensions. Good governance would create high alignment with MCS and new insights and knowledge for future performance improvements. However, this study did not test business intelligence services specifically regarding business analytics related to startups. Measurement using business intelligence analytic tools would provide better knowledge insights. Therefore, future studies could use more specific business intelligence indicators referring to their intelligence facilities. The findings would enlighten startup companies regarding the proper and accurate use of business intelligence tools.

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