

INTELLECTUAL CAPITAL MODERATES FINANCIAL EFFICIENCY AND DIGITAL TRANSFORMATION WITH SUSTAINABLE GROWTH RATE

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Abstract

This study aimed to examine the effect of financial efficiency and digital transformation on the sustainable growth rate, with intellectual capital as a moderating variable, in non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period. The study employed a quantitative approach with a causal-associative design. The population consisted of 131 non-cyclical consumer companies, and a sample of 50 companies was selected through purposive sampling, resulting in 200 firm-year observations over four years. Secondary data were collected from annual reports published on the Indonesia Stock Exchange website. The data were analyzed using panel data regression and Moderated Regression Analysis with the assistance of EViews 13. The results showed that financial efficiency had no significant effect on the sustainable growth rate, with a regression coefficient of -0.358 and a significance value of 0.379 . Digital transformation had a significant positive effect on the sustainable growth rate, with a regression coefficient of 0.022 and a significance value of 0.040 . Intellectual capital did not moderate the relationship between financial efficiency and the sustainable growth rate, with a significance value of 0.486 , nor the relationship between digital transformation and the sustainable growth rate, with a significance value of 0.190 . The F-test confirmed that financial efficiency and digital transformation simultaneously affected the sustainable growth rate with a significance value of 0.048 . These findings implied that digital transformation served as a key driver of sustainable growth, while financial efficiency and intellectual capital did not strengthen the sustainable growth rate in the non-cyclical consumer sector during the study period.

Keywords: Financial Efficiency, Digital Transformation, Intellectual Capital, Sustainable Growth Rate

1. Introduction

In an era of increasingly competitive and dynamic business competition, the sustainability of the company's growth is one of the main indicators of long-term success. According to Higgins (1977), sustainable growth is the most important platform or standard required for a company to increase its revenue by using less money, with its factors including the rate of retention of earnings and return on equity. Sustainable growth rate reflects a company's ability to grow sustainably without having to increase financial leverage excessively, which is now a strategic concern for many business entities. Sustainable growth is the ability to ensure survival in a competitive world and continued expansion and competitiveness in the market (Vuković et al., 2022). The concept of sustainable growth should be an important segment of any company's strategic plan, from small family companies to large multinationals. In other words, it is the company's long-term and continuous growth rate with an optimal ratio set between loan funds and own



funds. Further, the sustained growth rate is an estimate of expected development expressed in percentages, with the maintenance of liquidity, profitability, leverage, company size, and efficiency of existing assets.

In the business world, the sustainable growth rate can signify a company's capacity to manage its resources and investments to ensure long-term survival. This relates to the concept of the triple bottom line in business, which emphasizes not only economic outcomes (profit) but also social (people) and environmental (planet) impacts. Sustainable growth rates are essential to refine growth rates without increasing the company's debt burden or issuing additional shares that are believed to have a significant impact on the company's overall well-being. Companies utilize the sustainable growth rate to assess their profitability, as it reflects a company's ability to grow sustainably without having to increase financial leverage excessively (Agha, 2023). To achieve optimal sustainable growth, companies are required to not only focus on efficiency in financial resource management, but also be able to adapt to technological developments through digital transformation. This phenomenon is increasingly relevant amid the global demand for sustainable and environmentally friendly business practices. The goal of any corporate business is to maximize shareholder wealth, which is manifested in profit maximization, sustainable growth, and development. Unlike profit, which is an expression of a company's short-term performance, the rate of sustained growth is the basis for predicting a company's long-term performance.

Financial efficiency is the company's ability to manage and utilize financial resources optimally to generate output (income) at minimal cost, so as to improve the company's performance and sustainability (Al-Janabi, 2024). Financial efficiency is generally measured through the Operating Expense Ratio, which shows the amount of costs incurred by the company in generating revenue. In practice, the company conducts an analysis of operational costs to achieve optimal performance, with the aim of maximizing revenue and reducing costs to a minimum. The lower the Operating Expense Ratio, the more efficient the company will be in managing its operational activities. Financially efficient companies tend to be able to maintain healthy profitability ratios and profit retention, which directly affects the sustainable growth rate. Through higher profits, the company will grow better in the future and create prerequisites to boost financially sustainable growth and ensure sustainable development. Leverage can be one way to ensure the company's sustainable growth, given the high risk and uncertainty of the listed company, the ability to meet obligations as a reflection of the company's financial condition and operational capacity is a crucial factor for the company's survival and development (Vuković et al., 2022).

Digital transformation is the process of integrating digital technology into all aspects of the business, thereby changing the way companies operate and providing value to customers (El Awady et al., 2025). Digital transformation includes the use of data, automation, the Internet of Things, artificial intelligence, and digital platforms in business strategy, supply chain management, marketing, and customer service. Digital transformation enables companies to improve business processes, accelerate innovation, and reach markets more effectively. Digitalization can also lower operational costs and improve the customer experience, which can ultimately strengthen a company's financial position and support sustainable growth. By leveraging digital transformation, organizations can develop comprehensive strategies, address challenges, mitigate risk, and implement best practices for successful integration. Digital transformation facilitates the release and exchange of knowledge, information, and improves their ability to learn,



understand new market opportunities according to market demand, as well as develop new products or services, which encourage innovation (Sun et al., 2024).

Intellectual capital is a collection of knowledge and information owned by a company that is able to provide added value and generate profits (Stewart, 1997). Intellectual capital plays an important role in achieving sustainable growth for companies, by investing in innovation capital, companies can create new products and technologies that increase efficiency and reduce waste (Balaji & Mamilla, 2024). Intellectual capital, which includes human capital, structural capital, and relational capital, serves as a signal that the company has strong capacity for knowledge, innovation, and managerial ability. In the context of signal theory, intellectual capital shows the internal qualities of a company that are not easily observed by investors. The higher the intellectual capital, the stronger the positive signal that investors receive that the company is able to maximize the benefits of efficiency and digitalization to support sustainable growth.

Previous research on the effect of financial efficiency on the sustainable growth rate has produced mixed findings. According to research by Parapat et al. (2024), efficiency has no effect on sustainable growth. This research is in line with the results of Vuković et al.'s (2022) research that efficiency is not a statistically significant determinant of sustainable company growth. Meanwhile, the results of Ahmeti et al.'s (2025) research show that the sustainable growth rate has a statistically significant positive relationship with efficiency and sales growth, implying that organizations with higher levels of asset efficiency and sales growth have better sustained growth rates.

Previous research on the effect of digital transformation on the sustainable growth rate has also produced mixed findings. According to Awonuga et al. (2024), digital transformation has an effect on sustainable growth. This research is in line with Sun et al. (2024), who stated that digital transformation has a positive impact on the company's sustainable growth, as digital technology helps companies optimize factor allocation, improve the efficiency of systematic collaboration, and expand coordination and integration capabilities.

Previous research on the moderating role of intellectual capital has also produced mixed findings. The results of Balaji and Mamilla's (2024) research show that intellectual capital consisting of Human Capital Efficiency, Innovation Capital Efficiency, Structural Capital Efficiency, and Relational Capital Efficiency has a substantial positive impact on the rate of sustainable growth. Research by Septiana (2022) found that intellectual capital has an effect on the sustainable growth rate. However, research by Rana and Hossain (2023) states that intellectual capital consisting of Structural Capital Efficiency and Relational Capital Efficiency has a negative impact on business performance and the achievement of sustainable growth, and Florensia et al. (2022) stated that intellectual capital consisting of Human Capital and Structural Capital does not have a significant effect on the sustainable growth rate.

The urgency of this research is driven by several critical factors. First, in an era of increasingly competitive and dynamic business competition, the sustainability of the company's growth is one of the main indicators of long-term success, yet many companies experience a decrease in sustainable growth rate from year to year. Second, the consumer non-cyclicals sector is a strategic sector that supports national economic stability, yet empirical evidence on the determinants of sustainable growth rate in this sector remains limited. Third, empirical evidence regarding financial efficiency, digital transformation, and intellectual capital on the sustainable growth rate remains inconclusive, with some studies reporting significant effects and others reporting insignificant or no relationship.



Fourth, the moderating role of intellectual capital in these relationships remains underexplored, with contradictory findings in prior research. Fifth, the non-cyclical consumer companies during the 2021–2024 period represent a unique context characterized by post-pandemic recovery, digital acceleration, and evolving sustainability practices, yet empirical evidence on the determinants of sustainable growth rate in this sector remains limited.

Previous research has shown significant but fragmented findings regarding the determinants of sustainable growth rate. Studies have demonstrated that financial efficiency significantly influences the sustainable growth rate (Ahmeti et al., 2025; Al-Janabi, 2024), that digital transformation affects the sustainable growth rate (Awonuga et al., 2024; Sun et al., 2024; Hussain et al., 2022), and that intellectual capital influences the sustainable growth rate (Balaji & Mamilla, 2024; Septiana, 2022; Xu & Wang, 2018). However, other studies have reported contradictory findings, indicating that financial efficiency does not significantly affect the sustainable growth rate (Parapat et al., 2024; Vuković et al., 2022), and that intellectual capital does not significantly affect the sustainable growth rate (Rana & Hossain, 2023; Florensia et al., 2022). These inconsistencies suggest that the relationships among financial efficiency, digital transformation, intellectual capital, and the sustainable growth rate remain underexplored, particularly in the context of non-cyclical consumer companies in Indonesia.

The research gap in this study lies in the limited understanding of how financial efficiency and digital transformation jointly influence the sustainable growth rate, particularly in the non-cyclical consumer sector in Indonesia. While individual studies have examined the direct effects of these factors on the sustainable growth rate, the integrated framework connecting these factors with intellectual capital as a moderating variable remains underexplored. Additionally, most previous studies have focused on various sectors or other periods, leaving a significant gap in knowledge regarding the dynamics of sustainable growth rate in non-cyclical consumer companies during the 2021–2024 period. Furthermore, empirical evidence on the determinants of sustainable growth rate in Indonesia remains limited, particularly in the context of digital acceleration and evolving sustainability practices.

The novelty of this research lies in several aspects. First, this study focuses on non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period, representing a unique context characterized by post-pandemic recovery, digital acceleration, and evolving sustainability practices. Second, this study develops an integrative model that simultaneously examines the influence of financial efficiency and digital transformation on the sustainable growth rate, with intellectual capital as a moderating variable, providing a more comprehensive understanding of the determinants of sustainable growth rate in the non-cyclical consumer sector. Third, this study contributes to the limited empirical evidence on the sustainable growth rate in non-cyclical consumer companies, providing insights into how financial efficiency, digital transformation, and intellectual capital collectively influence the sustainable growth rate. Fourth, this study extends the application of Signaling Theory and Resource-Based View Theory to the context of sustainable growth rate in Indonesia, validating theoretical predictions in an under-researched institutional context. Fifth, this study provides actionable insights for investors, corporate management, and regulators in designing effective strategies to enhance sustainable growth and digital transformation.



The purpose of this study is to examine the effect of financial efficiency and digital transformation on the sustainable growth rate in non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period, with intellectual capital as a moderating variable. Specifically, this research aims to analyze the effect of financial efficiency on the sustainable growth rate, analyze the effect of digital transformation on the sustainable growth rate, analyze the moderating role of intellectual capital in the relationship between financial efficiency and the sustainable growth rate, and analyze the moderating role of intellectual capital in the relationship between digital transformation and the sustainable growth rate. The choice of this goal was driven by the limited understanding of how these factors collectively influence the sustainable growth rate and the need for empirical evidence that can inform investors, corporate management, and regulators in designing effective strategies to enhance sustainable growth and digital transformation.

The contribution of this research is multifaceted. From a theoretical perspective, this research contributes to the enrichment of literature on financial management and sustainability by proposing and testing an integrative model that links financial efficiency and digital transformation with the sustainable growth rate, incorporating intellectual capital as a moderating variable, extending the application of Signaling Theory and Resource-Based View Theory to the context of sustainable growth rate in Indonesia. The findings contribute to the understanding of how financial efficiency, digital transformation, and intellectual capital influence the sustainable growth rate, providing a more nuanced theoretical framework for analyzing corporate growth sustainability in the non-cyclical consumer sector. From a practical perspective, this study provides actionable insights for investors, corporate management, and regulators in assessing and managing sustainable growth risk. For investors, the findings provide guidance on which factors should be considered in evaluating a company's sustainable growth prospects. For corporate management, the results offer insights into the importance of digital transformation and intellectual capital management in maintaining sustainable growth. For regulators, the results offer insights into the importance of digital infrastructure and sustainability reporting standards in promoting sustainable growth. For academics, this study contributes to the growing body of literature on financial management and sustainability, providing a foundation for future research on sustainable growth rate.

2. Theoretical Background

2.1 Signaling Theory

Signaling Theory introduced by Spence (1973) explains how the information party can send a signal in the form of useful information to the receiving party. According to this theory, management utilizes signals to reduce information imbalances between the parties involved. Signaling theory is an action taken by company management that provides investors with instructions on how management views the company's prospects. This theory provides an explanation of why the company has the incentive to submit or provide information related to the company's financial statements to external parties. The encouragement to convey or provide information related to financial statements for external parties is based on the existence of information asymmetry between the company's management and external parties (Bergh et al., 2014). In this study, financial efficiency and digital transformation function as signals that convey information about the company's financial health and digital readiness to investors, while intellectual capital reflects the internal qualities of the company that strengthen the credibility of these



signals. Accordingly, Signaling Theory provides the theoretical foundation for this study by explaining how financial efficiency and digital transformation influence the sustainable growth rate, with intellectual capital as a moderating variable.

2.2 Resource-Based View Theory

Resource-Based View Theory is an understanding of the relationship between resources, capabilities, competitive advantage, and profitability, particularly being able to understand the mechanisms by maintaining competitive advantage over time. This theory was first put forward by Wernerfelt (1984) and then Barney (1991), who explained that company resources help companies improve the efficiency and effectiveness of company operations. Resource-Based View is a theory that emphasizes the importance of internal resources and organizational capabilities in creating sustainable competitive advantage (Barney & Arikan, 2005). The Resource-Based View is rooted in the view that a company is a collection of resources that are unique and difficult to replicate. These resources can be physical assets, human capabilities, technology, information, or even a company's reputation. According to the Resource-Based View theory, valuable, rare, hard-to-replicate, and hard-to-substitute resources are the key to building a sustainable competitive advantage (Barney & Ray, 2015). In this study, financial efficiency, digital transformation, and intellectual capital function as strategic resources that influence the sustainable growth rate. Accordingly, Resource-Based View Theory provides the theoretical foundation for this study by explaining how these resources collectively influence the sustainable growth rate.

2.3 Sustainable Growth Rate

According to Higgins (1977), sustainable growth is the most important platform or standard required for a company to increase its revenue by using less money, with the main factors including the rate of profit retention and return on equity. Sustainable growth is the ability to ensure survival in a competitive world as well as continued expansion and competitiveness in the market, and should be an important segment of any company's strategic plan (Vuković et al., 2022). Sustainable Growth Rate is an estimate of a company's long-term development by maintaining liquidity, profitability, leverage, company size, and asset efficiency. From the perspective of Signaling Theory and Resource-Based View Theory, the sustainable growth rate reflects the outcomes of effective signaling and strategic resource utilization (Spence, 1973; Barney & Ray, 2015). In this study, the sustainable growth rate is measured through the combination of four main components, namely profit margin, retention rate, asset turnover ratio, and financial leverage.

2.4 Financial Efficiency

According to Hasibuan (1984), efficiency is the best comparison between inputs and outputs, as well as achieving optimal results by using limited resources. Financial efficiency is the company's ability to manage and utilize financial resources optimally to generate output (income) at minimal cost, so as to improve the company's performance and sustainability (Al-Janabi, 2024). Financially efficient companies tend to be able to maintain healthy profitability and profit retention ratios, which directly affects the sustainable growth rate. Financial efficiency refers to a company's ability to manage working capital efficiently, optimize capital structure, increase Return on Equity and Return on Assets, as well as reduce capital costs and accelerate asset turnover. From the



perspective of Signaling Theory and Resource-Based View Theory, financial efficiency reflects the company's strategic resource utilization and serves as a signal of management quality to external parties (Spence, 1973; Barney & Ray, 2015). In this study, financial efficiency is measured using the Operating Expense Ratio, calculated as operating costs divided by total revenues. A lower Operating Expense Ratio indicates better financial efficiency.

2.5 Digital Transformation

According to Libert et al. (2016), digital transformation is a change that builds on the foundation of digital technology, ushering in unique changes in business operations, business processes, and value creation. In the era of digital economy, digital transformation is an important path for the development of high-quality companies both in operational and strategic aspects. Corporate digital transformation involves the application of advanced digital technologies that enable companies to achieve significant innovation in terms of manufacturing, business processes, and information systems. The goal is to reduce operational costs and take greater social responsibility, thereby meeting the expectations of all stakeholders and ultimately maximizing the company's value (Siebel, 2019). From the perspective of Signaling Theory and Resource-Based View Theory, digital transformation reflects the company's strategic capability to adapt to technological changes and serves as a signal of future orientation (Spence, 1973; Barney & Ray, 2015). In this study, digital transformation is measured using a dummy variable, with a value of 1 if the company explains in its financial statements that it has implemented or carried out digital transformation initiatives in its operations, and a value of 0 if the company does not explain in the financial statements that it has carried out digital transformation.

2.6 Intellectual Capital

Intellectual capital is a collection of knowledge and information owned by a company that is able to provide added value and generate profits (Stewart, 1997). Intellectual capital plays an important role in achieving sustainable growth for companies, by investing in innovation capital, companies can create new products and technologies that increase efficiency and reduce waste (Balaji & Mamilla, 2024). From the perspective of Signaling Theory and Resource-Based View Theory, intellectual capital reflects the internal qualities of a company that are not easily observed by investors and serves as a strategic resource that can strengthen the credibility of sustainability signals (Spence, 1973; Barney & Ray, 2015). In this study, intellectual capital is measured using the Value Added Intellectual Coefficient, calculated as the sum of Value Added Capital Employed, Value Added Human Capital, and Structural Capital Value Added.

2.7 The Effect of Financial Efficiency on Sustainable Growth Rate

Financial efficiency is the company's ability to manage and utilize financial resources optimally to generate output (income) at minimal cost, so as to improve the company's performance and sustainability (Al-Janabi, 2024). From the perspective of Signaling Theory, financial efficiency is a form of positive information that the company conveys to external parties, especially investors. When a company is able to demonstrate efficient financial performance, it signals that the company has strong fundamentals and is able to grow sustainably (Spence, 1973). In the context of Resource-Based View Theory, financial efficiency is a strategic resource that allows companies to manage capital



optimally, minimize costs, avoid wasting resources, and increase profitability (Barney & Ray, 2015). Empirical evidence supports this relationship, with studies by Ahmeti et al. (2025) and Al-Janabi (2024) finding that financial efficiency significantly influences the sustainable growth rate. However, other studies report contradictory findings, indicating that financial efficiency has no significant effect on the sustainable growth rate (Parapat et al., 2024; Vuković et al., 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H1: Financial efficiency has a significant effect on the sustainable growth rate.

2.8 The Effect of Digital Transformation on Sustainable Growth Rate

Digital transformation is the process of integrating digital technology into all aspects of the business, thereby changing the way companies operate and providing value to customers (El Awady et al., 2025). From the perspective of Signaling Theory, digital transformation can be seen as an important signal because it shows that companies are ready to adapt to technological and market changes, sending a message to investors that the company is trying to improve operational effectiveness, service quality, and speed in decision-making (Spence, 1973). In the context of Resource-Based View Theory, digital transformation reflects the company's strategic capability to integrate technology into business activities, creating unique capabilities that are difficult to replicate (Barney & Ray, 2015). Empirical evidence supports this relationship, with studies by Awonuga et al. (2024), Sun et al. (2024), and Hussain et al. (2022) finding that digital transformation significantly influences the sustainable growth rate. However, other studies report contradictory findings, indicating that digital transformation has no significant effect on the sustainable growth rate (Bruce et al., 2023). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H2: Digital transformation has a significant effect on the sustainable growth rate.

2.9 Intellectual Capital Moderates the Relationship Between Financial Efficiency and Sustainable Growth Rate

Intellectual capital is a collection of knowledge and information owned by a company that is able to provide added value and generate profits (Stewart, 1997). In the context of Signaling Theory, intellectual capital shows the internal qualities of a company that are not easily observed by investors, emphasizing that strengthening organizational knowledge can magnify the impact of financial efficiency on the sustainable growth rate (Spence, 1973). According to Resource-Based View Theory, valuable, rare, hard-to-replicate, and hard-to-substitute resources are the key to building a sustainable competitive advantage, enabling companies to maximize the benefits of financial efficiency through knowledge-based decision-making, process innovation, and increased productivity (Barney & Ray, 2015). Empirical evidence supports this relationship, with studies by Balaji and Mamilla (2024) and Septiana (2022) finding that intellectual capital significantly influences the sustainable growth rate. However, other studies report contradictory findings, indicating that intellectual capital does not moderate this relationship (Rana & Hossain, 2023; Florensia et al., 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H3: Intellectual capital moderates the effect of financial efficiency on the sustainable growth rate.



2.10 Intellectual Capital Moderates the Relationship Between Digital Transformation and Sustainable Growth Rate

Intellectual capital is a collection of knowledge and information owned by a company that is able to provide added value and generate profits (Stewart, 1997). From the perspective of Signaling Theory, the high level of intellectual capital gives a positive signal to investors that the company has the competence, knowledge capabilities, and management qualities that enable the implementation of digital transformation to run successfully, creating long-term growth prospects (Spence, 1973). According to Resource-Based View Theory, valuable, rare, inimitable, and non-substitutable resources are key to building a sustainable competitive advantage, strengthening the impact of digital transformation because companies have unique capabilities in integrating technology, developing innovation, and improving operational efficiency (Barney & Ray, 2015). Empirical evidence supports this relationship, with studies by Balaji and Mamilla (2024) and Septiana (2022) finding that intellectual capital significantly influences the sustainable growth rate. However, other studies report contradictory findings, indicating that intellectual capital does not moderate this relationship (Rana & Hossain, 2023; Florensia et al., 2022). Based on the theoretical explanation and empirical findings, the hypothesis proposed in this study is as follows:

H4: Intellectual capital moderates the effect of digital transformation on the sustainable growth rate.

3. Methods

3.1 Research Design

This study employs a quantitative approach with a causal-associative design to examine the effect of financial efficiency and digital transformation on the sustainable growth rate, with intellectual capital as a moderating variable, in non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period. The quantitative approach is considered appropriate because the study aims to empirically test the proposed hypotheses using statistical analysis of numerical data derived from annual reports. The causal-associative research design enables the examination of causal relationships between independent variables (financial efficiency and digital transformation) and the dependent variable (sustainable growth rate), with intellectual capital as a moderating variable. The type of data used is secondary data, including financial statement data and digital transformation information obtained from annual reports published on the Indonesia Stock Exchange website.

3.2 Population and Sample

The population in this study consists of non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period, totaling 131 companies. The sample was selected using purposive sampling with the following criteria: (1) non-cyclical consumer companies listed consecutively on the Indonesia Stock Exchange during the 2021–2024 period; (2) companies that published complete financial statements during the 2021–2024 period; (3) companies that did not suffer losses during the 2021–2024 period; (4) financial statements expressed in rupiah; and (5) companies with complete information needed related to the calculation indicators used as variables in the research. Based on these criteria, 50 companies were selected as samples, resulting in 200 firm-year observations (50 companies × 4 years), as presented in Table 1.



Table 1. Sample Determination

No	Criteria	Quantity
1	Non-cyclical consumer companies listed on IDX, 2021–2024	131
2	Companies that did not meet the criteria	(81)
3	Number of sample companies	50
4	Observation period (4 years × 50 companies)	200

Source: Processed data (2025)

Table 1 presents the sample determination process. From 131 non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period, 81 companies did not meet the predetermined criteria, leaving 50 companies as the research sample. The observation period covered four years, resulting in 200 firm-year observations.

3.3 Data Collection Techniques

Data collection was conducted using the documentation method. The required data were obtained from publicly available secondary sources, particularly annual reports published on the Indonesia Stock Exchange website (www.idx.co.id). The collected data were subsequently organized and coded according to the operational definitions and measurement instruments of each research variable. The data collection process involved several sequential steps: (1) identification of non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period; (2) selection of companies meeting the predetermined purposive sampling criteria; (3) collection of annual reports for each observation year; (4) collection of sustainable growth rate data from financial statements; (5) collection of financial efficiency data from financial statements; (6) collection of digital transformation data from annual reports; (7) collection of intellectual capital data from financial statements; and (8) documentation of all extracted data systematically organized into a panel dataset suitable for statistical analysis.

3.4 Operational Definition of Variables

Table 2. Operational Definition and Measurement of Variables

Variable	Definition	Measurement	Scale	Source
Sustainable Growth Rate (Y)	The most important platform or standard required for a company to increase its revenue by using less money (Higgins, 1977)	$\text{SGR} = \frac{\text{Profit Margin} \times \text{Retention Rate} \times \text{Asset Turnover Ratio}}{\text{Financial Leverage}}$	Ratio	Higgins (1977)
Financial Efficiency (X ₁)	The company's ability to manage and utilize financial resources optimally to	$\text{Operating Expense Ratio} = \frac{\text{Operating Expense}}{\text{Total Revenues}}$	Ratio	Al-Janabi (2024)



Variable	Definition	Measurement	Scale	Source
	generate output at minimal cost (Al-Janabi, 2024)			
Digital Transformation (X ₂)	The process of integrating digital technology into all aspects of the business, thereby changing the way companies operate and providing value to customers (El Awady et al., 2025)	Dummy variable: 1 if the company explains in its financial statements that it has carried out digital transformation, and 0 if it has not	Nominal	Sun et al. (2024)
Intellectual Capital (Z)	A collection of knowledge and information owned by a company that is able to provide added value and generate profits (Stewart, 1997)	VAIC = VACA + VAHU + STVA	Ratio	Pulic (2000)

Source: Developed for this research (2025)

Table 2 presents the operational definitions and measurements of all research variables. The sustainable growth rate is measured through the combination of profit margin, retention rate, asset turnover ratio, and financial leverage. Financial efficiency is measured using the Operating Expense Ratio, calculated as operating costs divided by total revenues. Digital transformation is measured using a dummy variable, with a value of 1 if the company explains in its financial statements that it has carried out digital transformation, and 0 if it has not. Intellectual capital is measured using the Value Added Intellectual Coefficient, calculated as the sum of Value Added Capital Employed, Value Added Human Capital, and Structural Capital Value Added.

3.5 Data Analysis Techniques

Data analysis in this study was conducted using panel data regression with the assistance of EViews 13 software. The analysis stages included descriptive statistics, panel data model selection (Chow test, Hausman test, and Lagrange Multiplier test), classical assumption tests, panel data regression analysis, coefficient of determination analysis, simultaneous F-test, partial t-test, and Moderated Regression Analysis. Descriptive statistics were employed to describe the characteristics of the research data, including mean, median, standard deviation, maximum, and minimum values. The panel data regression model used in this study was formulated as follows:



$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 Z + \beta_4 (X_1 \times Z) + \beta_5 (X_2 \times Z) + \varepsilon$$

Where:

Y = Sustainable Growth Rate

α = Constant

β_1 – β_5 = Regression coefficients

X_1 = Financial Efficiency

X_2 = Digital Transformation

Z = Intellectual Capital

$X_1 \times Z$ = Interaction between Financial Efficiency and Intellectual Capital

$X_2 \times Z$ = Interaction between Digital Transformation and Intellectual Capital

ε = Error term

Hypothesis testing was conducted using several methods. The partial t-test was used to determine the individual effect of each independent variable and interaction term on the sustainable growth rate. The simultaneous F-test was used to examine the collective effect of independent variables on the sustainable growth rate. The coefficient of determination (R^2) was used to determine the model's ability to explain variations in the sustainable growth rate. All hypothesis tests were conducted at a significance level of 5 percent ($p < 0.05$).

4. Results and Discussion

4.1 Descriptive Statistics

Table 3. Descriptive Statistics of Research Variables

Variable	N	Mean	Std. Dev.	Minimum	Maximum
Sustainable Growth Rate	200	0.127233	0.062632	0.030277	0.223028
Financial Efficiency	200	0.077850	0.011137	0.020376	0.082254
Digital Transformation	200	0.855000	0.352984	0.000000	1.000000
Intellectual Capital	200	5.577952	1.593633	4.064976	13.30252

Source: Processed data from EViews 13 (2025)

Table 3 presents the descriptive statistics for all research variables based on 200 observations from 50 companies across four years (2021–2024). The sustainable growth rate variable had a mean value of 0.127233, with a minimum value of 0.030277 owned by PT BISI International Tbk in 2021 and a maximum value of 0.223028 owned by PT Charoen Pokphand Indonesia Tbk in 2023. This value shows that in general companies in the non-cyclical consumer sector have a relatively stable sustainable growth ability in the long term, with a variation between companies that is not too large as reflected in the standard deviation of 0.062632. The financial efficiency variable had a mean value of 0.077850, with a minimum value of 0.020376 owned by PT Wilmar Cahaya Indonesia Tbk in 2024 and a maximum value of 0.082254 owned by PT Akasha Wira International Tbk in 2021. The standard deviation of financial efficiency of 0.011137 indicates that the variation in financial efficiency between companies tends to be small. The digital transformation variable had a mean value of 0.855000, with a value range between 0 and 1, indicating that most non-cyclical consumer companies have adopted digital transformation initiatives during the period 2021 to 2024. The standard deviation of 0.352984 indicates that there is a variation in the level of digitalization between



companies. The intellectual capital variable showed a mean value of 5.577952, with a minimum value of 4.064976 owned by PT Bakrie Sumatra Plantations Tbk in 2023 and a maximum value of 13.30252 owned by PT Sampoerna Agro Tbk in 2021. The standard deviation of 1.593633 indicates a relatively high level of intellectual capital variation between companies.

4.2 Panel Data Regression Analysis

Table 4. Panel Data Regression Results

Variable	Coefficient	Prob.
C	0.119031	–
Financial Efficiency	–0.358060	0.3790
Digital Transformation	0.021548	0.0403
FE × IC	–0.050564	0.4862
DT × IC	0.007527	0.1904

Source: Processed data from EViews 13 (2025)

Table 4 presents the results of the panel data regression and Moderated Regression Analysis. The estimated regression equation can be expressed as follows:

$$SGR = 0.119031 - 0.358060FE + 0.021548DT + 0.003165IC - 0.050564FE_IC + 0.007527DT_IC$$

The constant term of 0.119031 indicates the baseline level of the sustainable growth rate when all independent variables and interaction terms are held at zero. The financial efficiency variable has a coefficient value of –0.358060 with a probability value of 0.3790, which is greater than $\alpha = 0.05$. This shows that financial efficiency has no significant effect on the sustainable growth rate. The digital transformation variable has a coefficient value of 0.021548 with a probability value of 0.0403, which is smaller than $\alpha = 0.05$. This shows that digital transformation has a significant positive effect on the sustainable growth rate. The FE × IC interaction variable has a coefficient value of –0.050564 with a probability value of 0.4862, which is greater than $\alpha = 0.05$. This shows that intellectual capital is not able to moderate the influence of financial efficiency on the sustainable growth rate. The DT × IC interaction variable has a coefficient value of 0.007527 with a probability value of 0.1904, which is greater than $\alpha = 0.05$. This shows that intellectual capital is not able to moderate the influence of digital transformation on the sustainable growth rate. Overall, the regression results indicate that only digital transformation has a significant direct effect on the sustainable growth rate, while financial efficiency and the moderating role of intellectual capital do not show statistically significant effects in the model.

4.3 Simultaneous Test (F-Test)

Table 5. F-Test Results

Statistic	Value
F-statistic	3.089197
Prob(F-statistic)	0.047752

Source: Processed data from EViews 13 (2025)

Table 6 shows the simultaneous test results. Based on the table, the F-calculated value is 3.089197 with a probability of 0.047752. The F-table value at a significant level of 0.05 is 3.04. Therefore, it can be determined that F-calculated > F-table (3.089197 > 3.04) with a probability (0.047752 < 0.05), so that it can be concluded that together the variables of



financial efficiency and digital transformation have a significant effect on the sustainable growth rate.

4.4 Partial Test (t-Test)

Table 6. t-Test Results

Variable	t-Statistic	Prob.	Decision
Financial Efficiency	-1.346508	0.1797	Not Significant
Digital Transformation	2.014753	0.0453	Significant

Source: Processed data from EViews 13 (2025)

Table 6 presents the partial test results. The financial efficiency variable has a t-calculated value of -1.346508 with a probability value of 0.1797 , so the $t\text{-calculated} < t\text{-table}$ ($-1.346508 < 1.653$) and the probability of $0.1797 > 0.05$, then the first hypothesis is rejected, so it can be concluded that financial efficiency has no effect on the sustainable growth rate. The digital transformation variable has a t-calculated value of 2.014753 with a probability value of 0.0453 , then the $t\text{-calculated} > t\text{-table}$ ($2.014753 > 1.653$) and a probability of $0.0453 < 0.05$, then the second hypothesis is accepted, so it can be concluded that digital transformation has an effect on the sustainable growth rate.

4.5 Hypothesis Testing Summary

Table 7. Hypothesis Testing Summary

Hypothesis	Statement	Result
H1	Financial efficiency has a significant effect on the sustainable growth rate	Rejected
H2	Digital transformation has a significant effect on the sustainable growth rate	Accepted
H3	Intellectual capital moderates the effect of financial efficiency on the sustainable growth rate	Rejected
H4	Intellectual capital moderates the effect of digital transformation on the sustainable growth rate	Rejected

Source: Processed data (2025)

Table 7 presents the hypothesis testing summary. Based on the partial test results, H1 is rejected because financial efficiency has no significant effect on the sustainable growth rate, with a significance value of 0.3790 . H2 is accepted because digital transformation has a significant positive effect on the sustainable growth rate, with a significance value of 0.0403 . H3 is rejected because intellectual capital does not moderate the relationship between financial efficiency and the sustainable growth rate, with a significance value of 0.4862 . H4 is rejected because intellectual capital does not moderate the relationship between digital transformation and the sustainable growth rate, with a significance value of 0.1904 .

4.6 Discussion

4.6.1 The Effect of Financial Efficiency on Sustainable Growth Rate

The results indicate that financial efficiency has no effect on the sustainable growth rate ($B = -0.358060$; $p = 0.3790$). This finding is consistent with Parapat et al. (2024) and Vuković et al. (2022), who also concluded that efficiency has no effect on sustainable growth. From the perspective of Signaling Theory, improved financial efficiency does not necessarily send strong enough positive signals to affect sustainable growth expectations, especially when investors pay more attention to other indicators such as



profit resilience, innovation, and adaptability to changing business environments (Spence, 1973). In the context of Resource-Based View Theory, financial efficiency may not be sufficient as a strategic resource to drive sustainable growth without support from other resources such as innovation and technology (Barney & Ray, 2015). The finding implies that in the non-cyclical consumer sector, financial efficiency alone does not guarantee sustainable growth, as companies may need to demonstrate how financial efficiency translates into tangible improvements in profitability, innovation, and market competitiveness. This result differs from Ahmeti et al. (2025), who found that sustainable growth rate has a statistically significant positive relationship with efficiency and sales growth.

4.6.2 The Effect of Digital Transformation on Sustainable Growth Rate

The results show that digital transformation has an effect on the sustainable growth rate ($B = 0.021548$; $p = 0.0403$). This finding is consistent with Awonuga et al. (2024), Sun et al. (2024), and Hussain et al. (2022), who also concluded that digital transformation has a positive impact on the company's sustainable growth. From the perspective of Signaling Theory, digital transformation can be seen as an important signal because it shows that companies are ready to adapt to technological and market changes, sending a message to investors that the company is trying to improve operational effectiveness, service quality, and speed in decision-making (Spence, 1973). In the context of Resource-Based View Theory, digital transformation reflects the company's strategic capability to integrate technology into business activities, creating unique capabilities that are difficult to replicate (Barney & Ray, 2015). The finding implies that in the non-cyclical consumer sector, digital transformation serves as a key driver of sustainable growth, as the use of digital technology in business processes can improve operational efficiency, decision-making quality, and the company's ability to respond to market dynamics. Companies that carry out digital transformation are generally considered to be more responsive to industry dynamics and have greater growth opportunities.

4.6.3 The Moderating Role of Intellectual Capital in the Relationship Between Financial Efficiency and Sustainable Growth Rate

The results show that intellectual capital does not moderate the relationship between financial efficiency and the sustainable growth rate ($B = -0.050564$; $p = 0.4862$). This finding is consistent with Rana and Hossain (2023) and Florensia et al. (2022), who also concluded that intellectual capital does not significantly affect the sustainable growth rate. From the perspective of Signaling Theory, the company's performance and strategy are reflected through information conveyed to the market, including the company's ability to manage intellectual capital (Spence, 1973). However, the results of the insignificant moderation test show that intellectual capital is not yet a strong enough signal for investors to assess the company's ability to achieve the sustainable growth rate. This can be due to the limited disclosure of intellectual capital in financial statements, making it easier for the market to catch financial and visible signals, such as financial efficiency, than intangible signals. In the framework of Resource-Based View Theory, intellectual capital is seen as intangible assets that have the potential to create a sustainable competitive advantage if they meet the characteristics of valuable, rare, inimitable, and non-substitutable (Barney & Ray, 2015). However, the results of this study show that intellectual capital has not functioned as a strategic capability that is able to optimize the



use of financial efficiency in encouraging sustainable growth rate. The finding implies that in the non-cyclical consumer sector, intellectual capital tends to be a supporting resource whose economic benefits are not directly reflected in the increase in the sustainable growth rate in the short term, and that the relationship between financial efficiency and the sustainable growth rate is more direct, regardless of the company's intellectual capital level.

4.6.4 The Moderating Role of Intellectual Capital in the Relationship Between Digital Transformation and Sustainable Growth Rate

The results show that intellectual capital does not moderate the relationship between digital transformation and the sustainable growth rate ($B = 0.007527$; $p = 0.1904$). This finding is consistent with Rana and Hossain (2023) and Florensia et al. (2022), who also concluded that intellectual capital does not significantly affect the sustainable growth rate. From the perspective of Signaling Theory, digital transformation can be perceived as a positive signal by the market because it reflects a company's ability to adapt to technological developments and the business environment (Spence, 1973). However, the results of the moderation test show that intellectual capital does not strengthen the signals generated by digital transformation against the sustainable growth rate. This can be explained by the limitations of the disclosure of intellectual capital in financial statements, so that the market does not fully grasp the quality of intellectual capital as relevant information in assessing the sustainability of the company's growth. In the framework of Resource-Based View Theory, intellectual capital is seen as an intangible resource that has the potential to create a sustainable competitive advantage (Barney & Ray, 2015). However, the results of this study show that intellectual capital has not yet functioned as a strategic capability that is able to strengthen the use of digital transformation in encouraging sustainable growth rate. The finding implies that in the non-cyclical consumer sector, digital transformation influences the sustainable growth rate directly, and does not depend on the high or low intellectual capital owned by the company. In addition, the benefits of intellectual capital tend to be long-term, while the sustainable growth rate reflects a company's ability to sustain growth based on the financial performance of the current period, causing intellectual capital to not be able to strengthen the impact of digital transformation on the sustainable growth rate statistically.

5. Conclusion

This study aimed to examine the effect of financial efficiency and digital transformation on the sustainable growth rate, with intellectual capital as a moderating variable, in non-cyclical consumer companies listed on the Indonesia Stock Exchange during the 2021–2024 period. Using a quantitative approach with panel data regression and Moderated Regression Analysis on 200 observations from 50 companies selected through purposive sampling, the study successfully tested the proposed hypotheses.

The results indicate that financial efficiency has no significant effect on the sustainable growth rate, with a regression coefficient of -0.358060 and a significance value of 0.3790 , indicating that H1 is rejected. Improved financial efficiency does not necessarily send strong enough positive signals to affect sustainable growth expectations, especially when investors pay more attention to other indicators such as profit resilience, innovation, and adaptability to changing business environments. Digital transformation has a significant positive effect on the sustainable growth rate, with a regression coefficient of 0.021548 and a significance value of 0.0403 , indicating that H2 is accepted. Digital



transformation can provide positive signals regarding the prospect of increasing the sustainable growth rate, as operational efficiency and technological innovation strengthen long-term competitiveness. Companies that adopt technology well are considered able to keep up with industry trends and anticipate market changes, making digitalization not only an internal strategic move but also a strong signal that companies are future-oriented and have readiness in managing business risks.

Intellectual capital does not moderate the relationship between financial efficiency and the sustainable growth rate, with a regression coefficient of -0.050564 and a significance value of 0.4862 , indicating that H3 is rejected. Intellectual capital tends to be a supporting resource whose economic benefits are not directly reflected in the increase in the sustainable growth rate in the short term, and the relationship between financial efficiency and the sustainable growth rate is more direct, regardless of the company's intellectual capital level. Intellectual capital does not moderate the relationship between digital transformation and the sustainable growth rate, with a regression coefficient of 0.007527 and a significance value of 0.1904 , indicating that H4 is rejected. The influence of digital transformation on the company's ability to achieve sustainable growth is direct and does not depend on the high or low intellectual capital owned by the company. The simultaneous test using the F-test showed a significance value of 0.047752 , indicating that financial efficiency and digital transformation collectively have a significant effect on the sustainable growth rate.

The theoretical implications of this study extend the application of Signaling Theory and Resource-Based View Theory to the context of sustainable growth rate in Indonesia. The finding that financial efficiency does not significantly influence the sustainable growth rate suggests that improved financial efficiency does not necessarily send strong enough positive signals to affect sustainable growth expectations. The finding that digital transformation significantly influences the sustainable growth rate supports Signaling Theory's emphasis on the credibility and relevance of non-financial signals. The finding that intellectual capital does not moderate the relationships between financial efficiency, digital transformation, and the sustainable growth rate suggests that intellectual capital has not yet functioned as a strategic capability that is able to optimize the use of financial efficiency and digital transformation in encouraging the sustainable growth rate. This study also contributes to the limited empirical evidence on the determinants of sustainable growth rate in the non-cyclical consumer sector, providing insights into how financial efficiency, digital transformation, and intellectual capital collectively influence the sustainable growth rate.

Based on these findings, several recommendations can be proposed. For investors, the findings suggest that digital transformation and intellectual capital should be considered as important indicators when evaluating a company's sustainable growth prospects. For corporate management, the results suggest that improving digital transformation and intellectual capital management can enhance the sustainable growth rate, while financial efficiency alone may not be sufficient to drive sustainable growth. For regulators, the results suggest that continued improvement in digital infrastructure and sustainability reporting standards is important to ensure that companies can achieve sustainable growth and contribute to national economic development. For academics, this study contributes to the growing body of literature on financial management and sustainability, providing a foundation for future research on the sustainable growth rate.

This study has several limitations that should be acknowledged. First, the study focuses only on non-cyclical consumer companies listed on the Indonesia Stock



Exchange, which may limit the generalizability of the findings to other sectors or industries. Second, the study uses a four-year observation period (2021–2024), which may not capture long-term changes in sustainable growth practices. Third, the sample size is relatively limited (50 companies, 200 observations) due to strict sampling criteria, which may limit the statistical power of the analysis. Fourth, the study examines only a limited set of financial variables, without considering other potential determinants of the sustainable growth rate such as profitability, leverage, firm size, or corporate governance. Fifth, the model's explanatory power is moderate, indicating that other factors not included in the model may still influence the sustainable growth rate.

For future research, it is recommended to expand the scope of study by involving other sectors or industries to improve the generalizability of the findings. Future studies may also extend the observation period to capture long-term changes in sustainable growth practices and increase the sample size to enhance statistical power. Additionally, future research may incorporate additional variables, such as profitability, leverage, firm size, and corporate governance, to provide a more comprehensive understanding of the determinants of the sustainable growth rate. Researchers should also consider employing qualitative or mixed-method approaches to gain deeper insights into the challenges and effectiveness of digital transformation and intellectual capital management in the non-cyclical consumer sector.

This study contributes to the growing body of literature on financial management and sustainability by providing empirical evidence on the determinants of the sustainable growth rate in non-cyclical consumer companies in Indonesia. The findings suggest that digital transformation significantly influences the sustainable growth rate, while financial efficiency does not. Intellectual capital does not moderate the relationships between financial efficiency, digital transformation, and the sustainable growth rate. As Indonesia continues to strengthen its digital economy and sustainability practices, understanding these factors becomes increasingly important for developing effective strategies to enhance sustainable growth and business sustainability.

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