Jurnal Ekonomi dan Bisnis Digital (MINISTAL)
Vol. 4, No. 4, 2025: 459-474

The Influence of Digital Transformation and Free Cash Flow on Cost Stickiness Moderated by Firm Complexity

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A R T I C L E I N F O
Keywords: Cost Stickiness, Digital Transformation, Free Cash Flow, Firm Complexity

Received : 08, November
Revised : 29, November
Accepted: 28, December

A B S T R A C T
In the era of globalization and rapid technological advancement, digital transformation has become a crucial strategy for companies to enhance operational efficiency and competitiveness. Implementing technologies like automation, big data, and artificial intelligence (AI) enables companies to cut expenses and enhance productivity. However, not all companies are able to optimally adjust their cost structures, especially amid market demand fluctuations, such as those experienced during the Covid-19 pandemic. This study aims to analyze the effect of digital transformation and free cash flow on the level of cost stickiness in manufacturing companies, with firm complexity as a moderating variable. The study also considers control variables such as profitability and firm size to provide a more comprehensive analysis. A quantitative approach is employed in this research, utilizing secondary data sourced from the financial reports of manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the period 2020 to 2022. A total of 43 manufacturing companies were analyzed. Data processing was carried out using EViews version 10. The results show that digital transformation has a negative effect on cost stickiness. Conversely, free cash flow has a positive effect on cost stickiness, indicating that excess liquidity may lead to higher fixed costs during periods of declining activity. Firm complexity is not proven to significantly strengthen the relationship between the independent variables and cost stickiness, despite being theoretically relevant.

DOI: https://doi.org/10.55927/ministal.v4i4.15676
ISSN-E: 2827-8259
https://journal.formosapublisher.org/index.php/ministal

INTRODUCTION

In the era of globalization and rapid technological advancement, digital transformation has become a crucial strategy for companies to enhance their competitiveness and operational efficiency. Business processes are being transformed through the use of advanced technologies such as automation, big data, and Artificial Intelligence (AI). Companies that effectively implement digital strategies are expected to reduce operational costs, improve productivity, and provide added value to their customers. However, not all companies are able to easily adapt to changes in market demand. This phenomenon is referred to as cost stickiness, which is the asymmetric behavior of costs—where costs increase more significantly than they decrease when a company's activity level changes (Ningrum & Noegroho, 2021).

With the onset of digital transformation, the level of cost stickiness has significantly declined, as digital tools help reduce marginal costs. When sales volume declines, managers tend to find ways to manage costs more efficiently. For example, digital promotions can be used to reallocate underutilized resources in the short term. Therefore, digital transformation is indicated to help suppress the level of cost stickiness (Chen, 2022).

According to a Kompas report published in June 2021, the Indonesian Retail Entrepreneurs Association (Aprindo) stated that many retail companies went bankrupt during the Covid-19 pandemic. More than 400 outlets had closed down. In 2020, an average of 5–6 outlets closed each day, and in 2021, the average was 1–2 outlets per day. PT Matahari Department Store closed 25 outlets in 2020, and Giant (part of PT Hero Supermarket Tbk) shut down all its stores by July 2021. Centro Department Store was declared bankrupt by the Central Jakarta District Court in May 2021. These closures were primarily due to financial performance deterioration resulting from Large-Scale Social Restrictions (PSBB) imposed during the pandemic. Naturally, this situation had a severe impact on the sales volume of manufacturing sector products.

Shifts in consumer demand will influence a company's sales level. To respond to fluctuating demand, it is essential to implement effective management strategies to address the challenges brought about by the Covid-19 outbreak. The term committed resources refers to existing and available resources that incur fixed costs, whereas flexible resources are only acquired when needed, and they give rise to variable costs. Managers consider future adjustment costs when facing current demand declines (Chen et al., 2019 in Lian, Nuridah, & Kusumaningtyas, 2024).

On the other hand, companies with high levels of Free Cash Flow (FCF) can invest in new technologies and adjust their operations according to market conditions. Firms with sufficient FCF are better able to manage and adjust operational costs, thus potentially reducing cost stickiness. Free Cash Flow (FCF) is defined as the remaining cash flow after accounting for working capital requirements, and it is usually used for investment or dividend payments (Widyasti & Putri, 2021). Companies with high FCF tend to invest more in operational expenses but may delay cost reductions in response to declining

needs (Habib & Costa, 2020). This suggests that higher FCF may reduce a company's ability to maintain profitability.

Profitability analysis is often used to measure company performance. Profitability reflects a company's ability to generate operating profit. Managers aim to meet their goals by achieving target profits, which include setting earnings targets. In response to declining sales, managers may cut underutilized resources—this is a managerial strategy to generate profit. Consequently, the presence of earnings targets is considered to have a negative impact on cost stickiness (Yunaz & Sasongko, 2017).

Firm characteristics refer to specific traits that distinguish one company from another. One way to understand firm characteristics is through firm size, which can be determined by factors such as total assets, sales volume, workforce size, and market capitalization. Firm size can affect the level of disclosure in financial reports—larger firms tend to disclose more information (Amalia, 2013). However, larger companies also tend to have stickier operational cost structures. When sales decline, larger firms are more likely to survive. Nevertheless, large firms face greater challenges in decision-making compared to smaller firms. Thus, firm size is considered to increase cost stickiness (Herfanti & Prasitiono, 2023).

The level of cost stickiness can also be influenced by firm complexity, which includes company size, product diversification, and geographic reach. More complex firms may face greater obstacles in adjusting operational costs compared to smaller firms. As operations become more complex, managerial decision-making becomes more difficult due to the increasing number of factors to consider. Therefore, firm complexity is believed to strengthen the relationship between several factors and the level of cost stickiness.

Various studies on the determinants of cost stickiness have yielded differing conclusions. For example, Chen (2022) found that digital transformation reduces adjustment costs, thereby negatively affecting cost stickiness. In contrast, studies on Free Cash Flow by Herfanti & Prasitiono (2023) and Zulfianti, Gusliana, & Nuridah (2019) found that FCF has no significant effect on cost stickiness. Meanwhile, Habib & Costa (2020) argue that FCF positively influences cost stickiness.

Various studies on the determinants of cost stickiness have produced different conclusions. For example, research conducted by Chen (2022) shows that digital transformation reduces adjustment costs, which in turn has a negative effect on cost stickiness. Furthermore, research on the free cash flow factor conducted by Herfanti and Prasitiono (2023) and Zulfianti, Gusliana, and Nuridah (2019) indicates that free cash flow has no effect on cost stickiness. Meanwhile, according to Habib and Costa (2020), free cash flow has a positive effect on cost stickiness. Based on this explanation, the researcher intends to examine the effect of implementing digital transformation and analyze corporate cost management, as well as analyze the level of free cash flow of a company that may influence cost stickiness. This study also employs firm characteristics, namely firm complexity, which is considered to have an effect in strengthening the relationship between digital transformation and free cash flow as a

moderating variable, representing the novelty of this research. In addition, this study uses control variables, namely profitability and firm size. The data employed in this research are secondary data in the form of financial reports from manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the years 2020 to 2022. The year 2020 is considered the peak of the COVID-19 pandemic, while 2021 to 2022 are considered the period of economic recovery following the pandemic.

LITERATURE REVIEW

Agency Theory

Agency theory was developed by Jensen and Meckling in 1976 to study the incentives given to managers. This theory is also used to explain the actions and relationships between managers, referred to as agents, and shareholders, referred to as principals. In a contract, the principal grants authority and responsibility to the agent, and the agent acts in accordance with the assigned role. According to Abdeltawab (2021), performing work on behalf of the principal means delegating part of the decision-making power to the agent. The agreed incentive plan or contract aims to ensure that the agent acts in line with the principal's interests.

The phenomenon of cost stickiness occurs because managers often retain excess resources for their personal interests, which differ from the shareholders' objective of cost savings. Digital transformation can mitigate agency problems through improved transparency, accuracy, and monitoring, thereby reducing opportunistic managerial behavior. Conversely, free cash flow exacerbates agency problems as it allows room for unproductive investments and wasteful fixed costs. Corporate complexity reinforces agency problems by making monitoring more difficult, which increases the importance of digital transformation, while free cash flow becomes increasingly risky in triggering inefficiencies. Agency theory serves as the foundation for explaining this relationship (Handayani, Indrabudiman, and Christiane, 2022).

Deliberate Decision Theory

According to Anderson et al. (2007), the Deliberate Decision Theory—also referred to as the theory of intentional or deliberate managerial decision-making—suggests that sticky cost behavior is determined by and closely linked to managerial decisions. Therefore, if resources are permanently eliminated, it may result in higher future costs when attempting to reacquire those resources (Yasukata & Kajiwara, 2011). According to Yasukata and Kajiwara, this can lead to a long-term decline in company profits, as opposed to temporarily retaining unused resources.

The deliberate decision theory involves managerial choices to increase resources during periods of rising sales and to reduce resources when sales decline. This is because managers face the risk of being unable to meet demand if sales recover and resources have been permanently removed (Wijaya, 2022). Thus, deliberate decision-making is closely related to cost stickiness, as it is considered a primary driver behind managerial decisions concerning cost control (Evelyn, 2018).

Cost Stickiness

In the field of accounting, cost plays a crucial role in determining a company's profitability. Therefore, understanding cost behavior and management accounting is a fundamental requirement for every accountant. Anderson et al. (2003), as cited in Nurani and Lastanti (2023), define cost stickiness as a cost behavior in which managers tend to adjust costs in response to changes in business activity levels. In this process, managers must first assess whether such changes are temporary or long-term before making cost adjustment decisions.

When a company experiences a decline in sales volume, the role of managers becomes critical in ensuring proper cost adjustments to maintain business stability in challenging conditions. Cost stickiness occurs when managers choose to retain underutilized resources despite a reduction in activity. This decision affects Selling, General, and Administrative (SG&A) expenses, which remain high even as sales decline, because a significant portion of the budget continues to be allocated to these costs (Priantana & Sayuthi, 2020).

Digital Transformation

Digital transformation is a process of change that must be undertaken by all companies, not only those operating in high-tech industries. This transformation compels companies to continuously evolve and enhance their corporate value by reshaping value creation methods and the underlying business logic (Nurani & Lastanti, 2023).

The level of digital transformation refers to the extent to which a company adopts digital technologies in its operations to improve performance and efficiency. This includes the implementation of technologies such as artificial intelligence, blockchain, cloud computing, and big data to accelerate business processes, more accurately identify consumer needs and preferences, and enhance the company’s competitiveness (Zhao et al., 2024).

Free Cash Flow

Free Cash Flow (FCF) is a critical indicator for evaluating a company’s growth, financial performance, and overall stability. This concept refers to the amount of cash remaining after a company fulfills its operating obligations and capital expenditures, which can then be used for various purposes such as dividend distribution, business expansion, or debt repayment. Since it is less susceptible to manipulation compared to net income after tax, this metric is often considered a more accurate and reliable measure of profitability when assessing a company’s overall financial condition.

Setyawan (2019) defines free cash flow as the surplus cash available after meeting all investment needs, including working capital and fixed assets. This cash flow can be allocated to shareholders and creditors. Similarly, Lidya and Efendi (2019) state that free cash flow is the cash available to be distributed to investors after operational and long-term investment obligations are fulfilled. Both perspectives highlight that free cash flow reflects the company’s actual liquidity capacity, which can be utilized to generate added value for all stakeholders.

Profitability

Profitability is a financial ratio analysis used to measure a company's ability to generate profit over a specific period (Yopeace, Pratiwi, & Ramli, 2024). According to Puteri and Laily (2018), as cited in Santoso and Pratiwi (2023), profitability reflects a company's capability to generate income by utilizing its resources—such as sales activities, cash flow, capital, workforce, and number of branches. The purpose of this measurement is to determine the extent to which a company can produce profit within a certain period, making it an indicator of managerial efficiency in managing the company's operations.

Profitability is one of the key indicators in evaluating a company's performance. The term refers to the company's ability to earn profit over a given time frame. It also reflects the company's success in efficiently managing and utilizing its assets, which is typically measured by comparing the profit earned during a certain period to the total assets or equity owned by the company (Prawesti & Ariani, 2024).

Firm Size

According to Olivia, Riswandari, Nelson, and Jeninfer (2025), firm size is one of the determinants that influence a company's capacity to generate profit. Generally, large-scale companies tend to gain greater investor trust, which in turn can contribute to enhancing firm value. In addition, larger firms possess better financial flexibility and funding capabilities, making it easier for them to access capital markets. Large firms typically find it easier to secure financing, whether from internal or external sources.

A larger firm size reflects financial stability and sufficient income to support operations and meet business needs. Therefore, large companies often rely on internal funding, such as equity capital, to minimize dependence on debt. However, in practice, large firms also require substantial capital. If internal funds are insufficient, the company will seek external financing, such as loans, and as a last resort, may issue new shares (Wongso & Saputra, 2022).

Firm Complexity

Operational complexity within a company arises from the establishment of various departments and the division of responsibilities across different operational units. The level of firm complexity can be measured through several indicators, such as the number of subsidiaries owned, the degree of product and market diversification, as well as the geographic location and operational scope of each subsidiary (Nurani & Lastanti, 2023).

According to Handayani, Indrabudiman, and Christiane (2022), companies with a high level of operational complexity tend to face challenges in the timely preparation of financial statements. The more complex a company's operations are, the greater the effort and time required to collect, process, and present financial information accurately.

The following is an example of a theoretical framework formulation based on the relationships between variables and findings from previous studies:

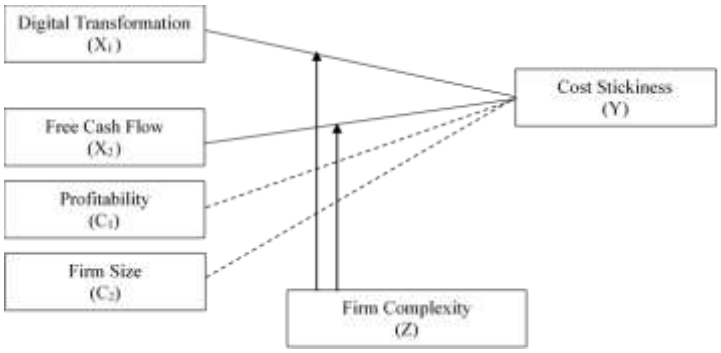

Figure 1. Conceptual Framework

Hypothesis

The Relationship Between Digital Transformation and Cost Stickiness

Digital transformation is a process that must be undertaken by all companies, not limited only to high-technology-based firms. Digital transformation is considered capable of reducing a company's marginal costs through increased cost flexibility and operational efficiency. However, in the short term, the transformation process itself can create a rigid cost structure due to substantial initial investments. Digital transformation is believed to lower a company's marginal costs by reducing various types of expenses, such as search costs, adjustment costs, and additional costs from producers through the use of digital platforms. The use of technologies such as data mining, analytics, and supporting applications enables management to make cost control decisions based on quantitative data analysis rather than mere subjective judgment, thereby reducing agency problems. Previous research by Chen (2022) indicated that digital transformation has a negative relationship with cost stickiness.

Digital transformation reduces cost stickiness by promoting efficiency, transparency, and adaptability within companies. Digital technologies allow for faster cost adjustments through automation and real-time data, preventing managers from maintaining unproductive resources. From the perspective of agency theory, transparency suppresses information asymmetry and reduces the likelihood of opportunistic managerial behavior. Meanwhile, deliberate decision theory emphasizes that data-based decisions make cost adjustments more rational and targeted. Thus, digital transformation reduces cost stickiness through more effective oversight and more rational managerial decision-making. Based on the above discussion, the first research hypothesis in this study is formulated as follows:

H_1: Digital Transformation has a negative effect on Cost Stickiness

The Relationship Between Free Cash Flow and Cost Stickiness

Free Cash Flow is the cash flow remaining after deducting working capital requirements and not allocated to shareholders or creditors (Sidabutar & Akmal, 2018). When a company has high free cash flow, it can encourage more efficient cost management because these funds can be used to address excess capacity or underutilized resources (Herfanti & Prasetiono, 2023). Thus, the greater the free cash flow a company possesses, the lower the level of cost stickiness, as the company is able to control costs even when sales decline. This finding is

consistent with the results of studies conducted by Sidabutar and Akmal (2018), as well as Zulfianti, Gusliana, and Nuridah (2019), which show that free cash flow has a negative effect on cost stickiness.

From the perspective of agency theory, low FCF can limit managers' ability to engage in opportunistic behavior, such as maintaining excess resources for personal benefit. Therefore, cash flow constraints encourage managers to be more disciplined in cost efficiency, thereby reducing the likelihood of cost stickiness (Sidabutar & Akmal, 2018). Meanwhile, deliberate decision theory explains that limited FCF forces managers to make more rational and strategic decisions in resource management. This condition fosters stricter cost control and quicker adjustments to sales declines, thereby reducing cost stickiness. Thus, from both the perspective of agency theory and deliberate decision theory, low FCF implies reduced cost stickiness (Zulfianti, Gusliana, and Nuridah, 2019). Based on the above discussion, the second hypothesis in this study is formulated as follows:

H_2: Free Cash Flow has a negative effect on Cost Stickiness

The Relationship Between Digital Transformation and Cost Stickiness Moderated by Firm Complexity

In the digital era, companies are required to adapt to rapid technological developments. Digital transformation drives companies to continuously grow and adjust to market needs. Through the utilization of technologies such as the Internet of Things, blockchain, and cloud computing, companies can manage large volumes of data to better understand consumer preferences (Chen, 2022). Companies with high complexity tend to be more prepared to adopt digital transformation because they possess broader data capacity and scope. The use of various analytical tools supports management in making data-driven decisions and helps reduce agency problems.

Company complexity strengthens the influence of digital transformation on cost stickiness. In complex conditions, information asymmetry increases, which triggers opportunistic behavior by managers according to agency theory. Digital transformation can mitigate this issue through transparency and monitoring. Meanwhile, based on deliberate decision theory, complexity requires more strategic cost decisions, which are supported by accurate data and analytics provided by digital transformation. Thus, the more complex the company, the greater the role of digital transformation in reducing cost stickiness. Based on this explanation, the third research hypothesis is formulated as follows:

H_3: Firm complexity strengthens the relationship between Digital Transformation and Cost Stickiness

The Relationship Between Free Cash Flow and Cost Stickiness Moderated by Firm Complexity

Companies with a high level of complexity generally have the ability to manage costs more efficiently. The cash flow generated tends to result in free cash flow as discretionary funds that are not required to be distributed to shareholders or creditors. These funds can be utilized to reduce agency cost

problems within the company. Therefore, it is assumed that firm size may strengthen the effect of free cash flow on cost stickiness.

Company complexity strengthens the relationship between Free Cash Flow (FCF) and cost stickiness. From the perspective of agency theory, complexity increases information asymmetry, providing managers with room to opportunistically utilize FCF by maintaining inefficient resources. Meanwhile, deliberate decision theory views cost management as a strategic decision, which in complex firms involves many considerations. However, without adequate monitoring, complexity instead amplifies the tendency of cost stickiness due to delays in cost reductions when sales decline. Based on the above explanation, the first hypothesis in this study is formulated as follows:

H_4: Firm complexity strengthens the relationship between Free Cash Flow and Cost Stickines

METHODOLOGY

This study employs a quantitative approach by utilizing secondary data sourced from the annual reports of manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2022 period. The selected companies are those that have complete data required for measuring all variables. A total of 43 companies were analyzed, selected using a purposive sampling technique. The study examines several variables, with cost stickiness serving as the dependent variable, while digital transformation and free cash flow act as independent variables. In addition, firm complexity is employed as a moderating variable to observe how the influence of the independent variables on the dependent variable may change in the presence of this moderating factor. Furthermore, profitability and firm size are included as control variables to reduce the potential bias from external influences on the relationships among the main variables. The measurement of each variable used in this study is described in Table 1.

Table 1. Variable Measurement

<table>
<tr><th>Variable</th><th colspan="2">Measurement Indicator</th><th>Scale</th></tr>
<tr><td>Cost Stickiness (Y)
Cost stickiness refers to a condition in which an increase in costs due to rising activity volume is not matched by a proportional decrease in costs when the activity volume declines at the same rate (Restuti et al., 2022). This phenomenon, also known as asymmetric cost behavior, reflects the influence of managerial decisions in the company's cost adjustment process in response to changes in its operational activities.</td><td colspan="2">$Sticky = \ell og\frac{\Delta COST}{\Delta SALES} i,\tau - \ell \text{og}\frac{\Delta COST}{\Delta SALES} i,\tau$ dengan $\tau\tau \in \{t,\ldots,t-3\}$.</td><td>Ratio</td></tr>
<tr><td>Digital Transformation (X_1)
Digital transformation is a process of change that must be undertaken by all companies, not</td><td>Skor</td><td>Quantitative Content Analysis</td><td>Content Analysis</td></tr>
<tr><td></td><td>(0)</td><td>No information found regarding the indicator used</td><td></td></tr>
</table>

only those operating in high-tech industries. This process can serve as a driving force for companies to continuously grow and enhance their corporate value through adjustments in value proportion and changes in the underlying business logic (Setiawan, Augustine, & Purwanti, 2021).	(1) Sentence (2) Paragraph (3) 2–3 Paragraphs (4) 4–5 Paragraphs (5) More than 5 Paragraphs		
Free Cash Flow (X_2) According to Herfanti and Prasetiono (2023), free cash flow is the remaining cash flow available after deducting working capital requirements, where the funds are not allocated for distribution to owners or creditors.		$FCF = \frac{CF\ Operating\ Activity\ -\ CF\ Financing\ Actiivit}{Total\ Asset}$	Ratio
Firm Complexity (Z) According to Cristansy & Ardianti (2018), firm complexity refers to the level of intricacy in a company's transactions, which can be observed from the number of subsidiaries and branch offices it owns.		Firm Complexity = ∑ Subsidiaries	Ratio
Profitability (C1) According to Muchtar (2021), profitability is the most effective indicator for assessing a company's ability to generate profit over a specific period, as well as reflecting the extent of management's effectiveness in carrying out its operational activities.		$ROE = \frac{Net\ Income\ After\ Tax\ and\ Interest}{Total\ Equity})$	Ratio
Firm Size (C2) According to Hidayat and Khotimah (2022), firm size reflects the scale of a business entity, whether large or small. The total amount of assets owned is a key indicator in assessing a company's size. Therefore, effective asset management is essential to maintain the firm's scale at an optimal level.		*UK= LN (Total Asset)*	Ratio

Source: Previous Research Journals

RESEARCH RESULT

Descriptive Statistics

Descriptive statistical analysis aims to provide a general overview of the research data by examining the maximum value, minimum value, mean, and

standard deviation. In this study, the variables analyzed descriptively include Cost Stickiness (Y), Digital Transformation (X_1), Free Cash Flow (X_2), Profitability (C_1), Firm Size (C_2), and Firm Complexity (Z). The following table presents the results of the descriptive statistical analysis of these variables.

Table 2. Descriptive Statistics

Variable	N	Minimum	Maksimum	Mean	Median	Std. Deviation
Cost Stickiness (Y)	43	-1,3992	0,8530	-0,0019	0,0006	0,2182
Digital Transformation (X_1)	43	0	5	2,713	3	2,115
Free Cash Flow (X_2)	43	0,0010	0,8417	0,226	0,1689	0,174
Profitability (C_1)	43	0,0004	1,5350	0,185	0,1309	0,226
Firm Size (C_2)	43	8,1127	14,6163	12,5636	12,5282	0,940
Firm Complexity (Z)	43	0	41	8,4961	3	12.377

Source: Processed data using EViews 10

Based on Table 2, it can be concluded that the Cost Stickiness variable has a maximum value of 0.8530, a minimum value of -1.3992, an average (mean) of -0.0019, a median of 0.006, and a standard deviation of 0.2182. For the Digital Transformation variable, the minimum value is 0, the maximum is 5, the mean is 2.713, the median is 3, and the standard deviation is 2.115. Meanwhile, the Free Cash Flow variable has a minimum value of 0.0010, a maximum of 0.8417, a mean of 0.226, a median of 0.1689, and a standard deviation of 0.174. For Profitability, the minimum value is 0.0004, the maximum is 1.5350, the average return on equity is 0.185, the median is 0.1309, and the standard deviation is 0.226. Regarding the Firm Size variable, the lowest value recorded is 8.1127, the highest is 14.6163, with an average of 12.564, a median of 12.5182, and a standard deviation of 0.940. Lastly, the Firm Complexity variable has a minimum value of 0, a maximum of 41, a mean of 8.496, a median of 3, and a standard deviation of 12.377.

Multiple Linear Regression Analysis

Multiple linear regression analysis was conducted using EViews 10. Based on Table 3, the following are the results of the data processing that has been carried out:

Table 3. Multiple Linear Regression Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Digital Transformation (X1)	-0.096068	0.069167	-1.388921	0.1674
Free Cash Flow (X2)	1.539002	0.814341	1.889874	0.0612
Profitability (C_1)	0.444678	0.590578	0.752953	0.4529
Firm Size (C_2)	-0.091534	0.174645	-0.524112	0.6012
Firm Complexity (Z)	-2.295769	2.184117	-1.051120	0.2953
R-squared	**0.092004**	Mean dependent var		-1.552267
Adjusted R-squared	0.039476	S.D. dependent var		0.938742
S.E. of regression	0.920027	Sum squared resid		102.4204
F-statistic	1.751509	Durbin-Watson stat		1.816889
Prob(F-statistic)	0.103345			

Source: Processed data using EViews 10

Based on the table above, the multiple linear regression equation is obtained as follows:

$$Y = -2.295769 - 0.096068X_1 + 1.539002X_2 + 0.444678C_1 - 0.091534C_2 + e$$

Table 4. Multiple Moderated Linear Regression Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Digital Transformation (X1)	-0.034297	0.084043	-0.408087	0.6840
Free Cash Flow (X2)	1.644017	0.928958	1.769743	0.0794
Profitability (C_1)	0.407399	0.594362	0.685440	0.4944
Firm Size (C_2)	-0.103773	0.209489	-0.495365	0.6213
Firm Complexity (Z)	0.042193	0.034994	1.205740	0.2304
Digital Tranformation*Firm Complexity	-0.006094	0.008094	-0.752949	0.4530
Free Cash Flow*Firm Complexity	-0.000484	0.090861	-0.005322	0.9958
Koefisien	-2.444442	2.506577	-0.975211	0.3315

Source: Processed data using EViews 10

Based on Table 4, the moderated regression equation is as follows:

$$Y = -2.444442 - 0.034297X_1 + 1.644017X_2 + 0.407399C_1 - 0.103773C_2 + 0.042193Z - 0.006094X_1Z - 0.000484X_4Z$$

F-Test

The F-test is used to determine whether the independent variables simultaneously have an effect on the dependent variable. Based on the results in Table 3, the Prob. (F-statistics) value is 0.103345 > 0.05. Therefore, it can be concluded that collectively, the variables Digital Transformation, Free Cash Flow, Profitability, and Firm Size do not have a significant effect on Cost Stickiness (Y).

Coefficient of Determination Test

The coefficient of determination test aims to determine how much influence the independent variables have in explaining the variation of the dependent variable. If the value of the coefficient of determination is low or close to zero, then the independent variables have a weak ability to explain the dependent variable. Based on the table above, the R-squared value is 0.092, which means the coefficient of determination is 9.20%. This value indicates that the contribution of the independent variables to the dependent variable is relatively low and not significant.

The calculation of the coefficient of determination is as follows:

$Kd = r^2 \times 100\%$

$Kd = 0{,}092 \times 100\%$

$Kd = 9{,}20\%$

This value indicates that, simultaneously, the variables Digital Transformation, Free Cash Flow, Profitability, and Firm Size contribute 9.2% to Cost Stickiness. Meanwhile, the remaining 90.8% of the variation in Cost Stickiness is influenced by other factors not included in this research model. Thus, although the independent variables in this study do have an effect on the level of cost stickiness in manufacturing companies, the influence is not statistically significant.

DISCUSSION

The results of the t-test statistic show that the regression coefficient for the Digital Transformation variable is -0.096068 with a probability value (p-value) of 0.1674 > 0.05. This indicates that although there is an influence between the independent variable and the dependent variable, the influence is not statistically significant. Therefore, the hypothesis in this study can be accepted, and it can be concluded that Digital Transformation has a negative partial effect on Cost Stickiness. This finding aligns with the deliberate decision theory, which is closely related to the phenomenon of cost stickiness, as managerial decisions are considered a key factor in cost control. The implementation of digital transformation by management is one of the significant strategic steps to reduce the potential occurrence of cost stickiness within a company. Thus, it can be concluded that companies that have optimally implemented digital transformation have a better ability to control the level of cost stickiness in their operations. Based on the findings, this study shows that the Digital Transformation variable has a negative partial effect on the level of Cost Stickiness, which is in line with the results of a previous study by Chen (2022).

Based on the results of the moderated regression analysis and t-test, the obtained regression coefficient is -0.034297 with a probability value of 0.4530 > 0.05. This implies that although the moderating variable has an effect in strengthening the relationship between the independent and dependent variables, the effect is not statistically significant. Therefore, the hypothesis is accepted, and it can be concluded that firm complexity plays a role in strengthening the influence of digital transformation on cost stickiness.This conclusion is consistent with the assumption that the higher the level of a firm's complexity, the more complex the managerial decision-making process becomes, as more aspects and business units must be considered. Therefore, under high complexity conditions, the role of digital transformation becomes increasingly important to support efficient and accurate decision-making, which in turn affects the control of cost stickiness.

The t-test results show that the Free Cash Flow variable has a positive regression coefficient of 1.539002 with a p-value of 0.0612 > 0.05. Therefore, although there is an effect between the independent variable and the dependent variable, the effect is not statistically significant. Thus, the proposed hypothesis is rejected, and it can be concluded that Free Cash Flow has a positive partial effect on Cost Stickiness. This study previously assumed that companies with high levels of free cash flow could use the excess cash to reduce burdens, particularly in managing underutilized resources. Based on this assumption, Free Cash Flow was expected to have a negative effect on Cost Stickiness, meaning that higher free cash flow would lead to a decrease in cost stickiness. This view is supported by previous studies from Sidabutar & Akmal (2018) and Zulfianti, Gusliana, & Nuridah (2019), which stated that free cash flow has a negative effect on cost stickiness. However, the findings of this study contradict that expectation, as the positive regression coefficient indicates that Free Cash Flow actually contributes to an increase in Cost Stickiness, and thus, the second hypothesis is rejected.

Based on the results of the moderated regression analysis and t-test, the regression coefficient is positive at 1.644017 with a p-value of 0.9958 > 0.05. Therefore, it can be concluded that the moderating variable, which is firm complexity, is capable of strengthening the relationship between the independent variable (Free Cash Flow) and the dependent variable (Cost Stickiness), but the effect is not statistically significant. As such, the hypothesis in this study is still accepted. Although the results obtained are contrary to the initial research assumption, which posited a negative influence, the findings remain consistent with the deliberate decision theory as the main theoretical foundation of the study. In the context of free cash flow, managerial decision-making is a key factor—whether the available funds will be allocated for investment or used to reduce the company's burden in order to avoid cost stickiness. Moreover, the higher the firm complexity, especially with the number of subsidiaries owned, the greater the challenge in managerial decision-making related to cost control and its influence on the level of cost stickiness.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings regarding the effect of digital transformation and free cash flow on cost stickiness, with firm complexity as a moderating variable, in manufacturing companies listed on the Indonesia Stock Exchange during the 2020–2022 period, it can be concluded that digital transformation—measured by the extent of digital transformation disclosures in the company's annual reports using content analysis techniques—was found to have a partial negative effect on cost stickiness. This supports the first hypothesis, indicating that the stronger the implementation of digital transformation in a company's operations, the more efficient the cost management becomes, thereby reducing the tendency for cost stickiness to occur. Meanwhile, free cash flow was found to have a positive effect on cost stickiness. This finding contradicts the second hypothesis, leading to its rejection. Initially, it was assumed that greater levels of free cash flow would be used to control cost surges during periods of declining sales. However, the analysis results showed otherwise—free cash flow actually contributed to an increase in cost stickiness during sales downturns, possibly due to suboptimal or inefficient allocation of cash in response to operational activity fluctuations.

ADVANCED RESEARCH

Future research can extend this study by incorporating longer time-series data and cross-industry comparisons to capture more robust patterns of cost stickiness under varying levels of digital maturity. Scholars may also explore whether managerial ability or governance mechanisms mediate the unexpected positive effect of free cash flow on cost stickiness. Additionally, using more granular indicators—such as digital investment intensity or real-time operational data—could provide deeper insight into how digital transformation and firm complexity jointly shape asymmetric cost behavior.

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