

**DETERMINANTS OF OPERATIONAL PERFORMANCE IN
MANUFACTURING-RELATED FIRMS LISTED UNDER IDX-IC**

A THESIS

Presented as a Partial Fulfillment of the Requirements to obtain a Bachelor's Degree

in the Accounting Department



By:

FADHILLAH ANDHINI PUTRI

Student Number: 22312274

INTERNATIONAL UNDERGRADUATE PROGRAM IN ACCOUNTING

FACULTY OF BUSINESS AND ECONOMICS

UNIVERSITAS ISLAM INDONESIA

YOGYAKARTA

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DECLARATION OF AUTHENTICITY

Here in I declare the originality of the thesis; I have not presented anyone else's work to obtain my university degree, nor have I presented anyone else's word, ideas, or expression without acknowledgement. All quotations are cited and listed in the bibliography of the thesis.

If in the future this statement is proven to be false, I am willing to accept any sanction complying with the determined regulation or its consequences.

Yogyakarta, 31 May 2026



Fadhillah Andhini Putri

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DETERMINANTS OF OPERATIONAL PERFORMANCE IN
MANUFACTURING-RELATED FIRMS LISTED UNDER IDX-IC

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**DETERMINANTS OF OPERATIONAL PERFORMANCE IN MANUFACTURING-RELATED FIRMS
LISTED UNDER IDX-IC**

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Universitas Islam Indonesia



Dr. Mahmudi, S.E., M.Si.

MOTTO AND DEDICATION

“Allah tidak membebani seseorang, kecuali menurut kesanggupannya. Baginya ada sesuatu (pahala) dari (kebajikan) yang diusahakannya dan terhadapnya ada (pula) sesuatu (siksa) atas (kejahatan) yang diperbuatnya”

(Q.S. Al-Baqarah:286)

“Sebaik-baik manusia adalah orang yang paling bermanfaat bagi manusia”

(HR. Thabrani dan Daruquthni)

“Tujuan pendidikan itu untuk mempertajam kecerdasan, memperkuat kemauan, serta memperhalus perasaan”

(Tan Malaka)

“Aku membahayakan nyawa ibuku untuk lahir ke dunia, jadi tidak mungkin aku tidak ada artinya. Aku membuat ayahku bekerja tiap hari tanpa lelah, jadi aku pastikan lelahnya tidak sia-sia”

(Rid.)

I dedicate this thesis to my parents, Mrs. Hikmah Yuliani and Mr. Sumario; my siblings, Tika Puspitasari and Riris Sutrisno; as well as to the Islamic faith, the Indonesian people, and my beloved university, Universitas Islam Indonesia

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throughout the author's entire lifetime, which the author will certainly never be able to repay. Thank you for believing in and supporting the author even when others doubted her.

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actions or words were offensive to Ms. Ayu Chairina Laksmi, S.E., M.App.Com., M.Res., Ph.D., Ak., CA.

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10. As for **the author herself**, she was born with the name Fadhillah Andhini Putri. People say that a name is a parent's prayer. The author's name means "a beneficial and obedient daughter." May the author, throughout her life, be able to fulfill her parents' prayers and hopes. Over the past 21 years, the author has faced many obstacles and trials in the form of both joy and pain. While not everything was overcome smoothly, at least the author has tried to make peace with all the events that have occurred. Therefore, the author expresses gratitude to herself for never deciding to give up the fight and for believing in herself. All challenges were overcome, even if it meant shedding sweat and even tears.

In closing, the author acknowledges that this thesis has its limitations. Therefore, the author hopes that this work will be of benefit and serve as a small but meaningful contribution to the advancement of knowledge. The author welcomes all constructive criticism and suggestions as a basis for future improvements.

Wassalamu'alaikum Warahmatullahi Wabarakatuh.

Yogyakarta, 14th May 2026

Author,

Fadhillah Andhini Putri

ABSTRACT

This study aims to examine the effect of Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity (CATA), and Liquidity (LIQ) on the operational performance of manufacturing-related firms listed under the Indonesia Stock Exchange Industrial Classification (IDX-IC). Operational performance is measured using Operating Profit Margin (OPM). This research employs a quantitative approach using secondary data obtained from annual reports and sustainability reports of industrial sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period. The sample consists of 32 companies with 96 firm-year observations selected through purposive sampling. The data were analyzed using multiple linear regression. The results show that Circular Economy Disclosure and Current Asset Intensity have a positive and significant effect on operational performance. Meanwhile, Financial Leverage and Liquidity have a negative and significant effect on operational performance. These findings indicate that sustainability-related disclosure and firm financial characteristics play important roles in determining operational performance. Firms that disclose circular economy practices and maintain adequate current assets tend to achieve better operational performance, whereas excessive leverage and liquidity may reduce operational profitability. This study contributes to the literature by providing empirical evidence on the determinants of operational performance in manufacturing-related firms in Indonesia and highlights the importance of sustainability disclosure and efficient financial resource management.

Keywords: *Circular Economy Disclosure, Financial Leverage, Current Asset Intensity, Liquidity, Operational Performance.*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity (CATA), dan Liquidity (LIQ) terhadap kinerja operasional perusahaan manufaktur terkait yang terdaftar dalam Indonesia Stock Exchange Industrial Classification (IDX-IC). Kinerja operasional diukur menggunakan Operating Profit Margin (OPM). Penelitian ini menggunakan pendekatan kuantitatif dengan data sekunder yang diperoleh dari laporan tahunan dan laporan keberlanjutan perusahaan sektor industri yang terdaftar di Bursa Efek Indonesia selama periode 2022–2024. Sampel penelitian terdiri dari 32 perusahaan dengan total 96 observasi yang dipilih menggunakan teknik purposive sampling. Data dianalisis menggunakan regresi linier berganda. Hasil penelitian menunjukkan bahwa Circular Economy Disclosure dan Current Asset Intensity berpengaruh positif dan signifikan terhadap kinerja operasional. Sebaliknya, Financial Leverage dan Liquidity berpengaruh negatif dan signifikan terhadap kinerja operasional. Temuan ini menunjukkan bahwa pengungkapan circular economy serta karakteristik keuangan perusahaan berperan penting dalam menentukan kinerja operasional. Perusahaan yang mengungkapkan praktik circular economy dan memiliki aset lancar yang memadai cenderung mencapai kinerja operasional yang lebih baik, sedangkan tingkat leverage dan likuiditas yang terlalu tinggi dapat menurunkan profitabilitas operasional. Penelitian ini memberikan bukti empiris mengenai faktor-faktor yang memengaruhi kinerja operasional perusahaan manufaktur terkait di Indonesia serta menegaskan pentingnya pengungkapan keberlanjutan dan pengelolaan sumber daya keuangan yang efisien.

Kata kunci: *Circular Economy Disclosure, Financial Leverage, Current Asset Intensity, Liquidity, Kinerja Operasional.*

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CHAPTER I

INTRODUCTION

1.1 Background of The Research

The manufacturing sector plays a vital role in supporting economic growth, industrial development, and employment creation. As one of the major contributors to national economic activity, manufacturing-related firms are expected to maintain operational efficiency while simultaneously responding to increasing environmental and sustainability challenges. In Indonesia, manufacturing industries remain among the sectors with significant economic contributions while also being closely associated with environmental issues such as industrial waste generation, resource consumption, and carbon emissions (Ramadhan & Ermaya, 2025).

Rapid industrialization, urbanization, and growing consumption patterns have significantly increased the pressure on firms to adopt more sustainable business practices. Traditional production systems that follow a linear economic model based on resource extraction, production, consumption, and disposal have contributed to environmental degradation and resource inefficiency. Consequently, the concept of the circular economy (CE) has gained increasing global attention as an alternative approach to sustainable development. Circular economy principles emphasize reducing waste generation, reusing materials, recycling resources, and improving production

efficiency to support long-term sustainability and resource optimization (Dagilienè et al., 2020).

The growing implementation of circular economy practices has also increased expectations regarding corporate transparency and sustainability reporting. Companies are increasingly encouraged to disclose sustainability-related information, including circular economy initiatives, through annual reports and sustainability reports. Circular Economy Disclosure (CED) serves as a mechanism through which firms communicate their environmental commitment, resource management strategies, and sustainability initiatives to stakeholders. According to Vitolla et al. (2023), research on Circular Economy Disclosure remains relatively limited and continues to focus primarily on disclosure practices and reporting quality rather than organizational performance outcomes.

In Indonesia, sustainability disclosure has become increasingly important due to regulatory developments and stakeholder demands. The Indonesia Financial Services Authority (OJK) continues to encourage public companies to implement sustainable finance practices and improve sustainability reporting quality. OJK's sustainable finance regulations emphasize the importance of environmental and social accountability as part of corporate transparency and long-term business sustainability (Maftuchah, 2018). Furthermore, public companies are increasingly encouraged to integrate

Environmental, Social, and Governance (ESG) considerations into their business strategies and reporting systems (Prayitno et al., 2024).

The increasing emphasis on sustainability disclosure has also attracted growing academic interest regarding its relationship with firm performance. Previous studies suggest that sustainability disclosure may contribute to improved corporate transparency, stakeholder trust, and long-term competitiveness. For example, sustainability-related disclosures have been associated with stronger financial performance and operational efficiency because they reflect better resource management and corporate accountability (Wahyuni et al., 2025). However, empirical findings remain inconsistent. Some studies report positive effects of sustainability disclosure on firm performance, while others find limited or insignificant relationships due to implementation costs and varying stakeholder responses (Ramadhan & Ermaya, 2025).

Besides sustainability-related factors, operational performance may also be influenced by a firm's financial characteristics. Operational performance reflects a company's ability to generate profit from its core business activities through efficient management of resources, assets, and operational costs. One commonly used indicator of operational performance is Operating Profit Margin (OPM), which measures the proportion of operating income generated from sales revenue. A higher Operating Profit Margin indicates greater operational efficiency and stronger operational profitability.

One important financial characteristic influencing operational performance is financial leverage. Financial leverage reflects how a company finances its assets through equity and external funding sources. Although leverage can provide additional resources for expansion and business growth, excessive leverage may increase financial obligations and reduce operational flexibility. Previous studies have found that leverage may negatively affect firm performance because higher debt levels increase financial risk and operational burdens (Aminah et al., 2023).

Another factor closely related to operational performance is current asset intensity. Current asset intensity reflects the proportion of current assets relative to total assets owned by a company. Current assets such as cash, inventories, and accounts receivable play an important role in supporting daily operational activities and working capital management. Adequate current assets allow firms to maintain operational continuity, manage inventory efficiently, and respond to short-term business needs. Therefore, efficient management of current assets may contribute positively to operational performance.

Liquidity also represents an important determinant of operational performance. Liquidity reflects a firm's ability to fulfill short-term obligations using its current assets. Companies with adequate liquidity are generally better able to support operational activities and reduce financial distress risk. However, excessive liquidity may indicate inefficient allocation of resources because large amounts of current assets may remain idle and generate lower

returns. Consequently, firms must balance liquidity and profitability to achieve optimal operational performance.

Although previous studies have examined sustainability disclosure, leverage, liquidity, and firm performance, most research investigates these variables separately. Existing studies on sustainability disclosure generally focus on financial performance, firm value, or ESG outcomes rather than operational performance indicators. Likewise, studies examining leverage and liquidity often exclude sustainability-related disclosure variables from their analytical models (Aminah et al., 2023; Prayitno et al., 2024).

Furthermore, prior studies predominantly use profitability indicators such as Return on Assets (ROA), Return on Equity (ROE), or firm value as dependent variables. Research focusing specifically on operational performance measured through Operating Profit Margin (OPM) remains relatively limited, particularly in manufacturing-related firms operating in emerging economies such as Indonesia. As a result, empirical evidence regarding the combined influence of Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity (CATA), and Liquidity (LIQ) on operational performance remains insufficient.

Therefore, this study aims to examine the effect of Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity (CATA), and Liquidity (LIQ) on the operational performance of manufacturing-related firms listed under the IDX Industrial Classification

(IDX-IC). This study is expected to contribute to the literature by integrating sustainability-related disclosure and firm financial characteristics within a single research framework to explain operational performance in the Indonesian manufacturing context.

1.2 Problem Formulation

Based on the limitations of previous studies in analyzing CED on operational performance and the results of discussions on the variables proposed in previous studies, the problem formulation in this research is:

1. What is the level of Circular Economy Disclosure (CED) among relevant manufacturing companies listed on the IDX-IC?
2. Does Circular Economy Disclosure (CED) affect a company's operational performance?
3. Does financial leverage affect a company's operational performance?
4. Does current assets intensity affect a company's operational performance?
5. Does liquidity affect a company's operational performance?

1.3 Research Objectives

Based on the problems formulated in the previous section, the objectives of this study are:

1. To measure the level of Circular Economy Disclosure (CED) in relevant manufacturing companies listed in the IDX Industrial Classification (IDX-IC).
2. To analyze the effect of Circular Economy Disclosure (CED) on company operational performance.
3. To find out the effect of financial leverage on company operational performance.
4. To analyze the effect of current assets intensity on company operational performance.
5. To assess the effect of liquidity on the operational performance of companies.

1.4 Research Contributions

This research was conducted with the expectation that it would provide additional scientific benefits as well as new input and references for future research. The results of this study are expected to benefit the following parties:

1. For the university: Enriching CE literature in Indonesia and providing empirical evidence of its impact on operational efficiency.
2. For academics: Developing replicable CED instruments.
3. For policymakers: Providing insights for companies, regulators, and policymakers regarding the effectiveness of CE reporting.

1.5 Systematics of Writing

This research was written following the structure below:

CHAPTER I: INTRODUCTION

Chapter I is an introduction to this thesis, which is a report on this research, consisting of the research background, problem identification, problem formulation, research limitations, research objectives, research contributions, and writing structure.

CHAPTER II: LITERATURE REVIEW

Chapter II contains the concept of CE, an explanation of the theory as the basis for related variables, a review of previous studies, the preparation of a conceptual framework, and the development of hypotheses proposed in this study.

CHAPTER III: RESEARCH METHODOLOGY

Chapter III covers the type of research, population and sample used in this study, types and sources of data, operational definitions of each variable and measurement indicators, data collection techniques, and data analysis techniques.

CHAPTER IV: DATA ANALYSIS AND DISCUSSIONS

Chapter IV contains an overview of the research object, the results of data processing and analysis, whether it meets the hypothesis or proves the null hypothesis, along with further discussion of the statistical analysis results.

CHAPTER V: CONCLUSIONS AND RECOMMENDATIONS

Chapter V contains conclusions, implications, limitations, and recommendations for future related research.

CHAPTER II

LITERATURE REVIEW

This chapter presents the literature review supporting this research. A brief explanation of the supporting theories and prior research are provided to help formulate the research framework. At the end of this section, hypotheses are formulated based on the literature review.

2.1 Theoretical Basis

Several theories are used to support this research, the following is an explanation:

2.1.1 Legitimacy Theory

The Legitimacy Theory asserts that social legitimacy comes from an enterprise's behavior and policies. For example, in the sustainability aspect, for enterprises with a heavy environmental impact including the manufacturing industry, companies encounter extra public pressure to show the public that they are environmentally friendly through non-financial disclosure (Deegan, 2011). One strategic avenue for company engagement is to create circular economy disclosure (CED) to show how its companies run in alignment with the prevailing sustainability norms. According to recent empirical research, companies do tend to enhance the quality and intensity of their sustainability disclosures when their sense of legitimacy is threatened by environmental issues or regulatory compulsion. Martins et al. (2020) suggest that corporate

social and environmental disclosures are frequently used as impression management tactics to maintain or restore organizational appearance and compliance in the face of external social pressures, Vitolla et al. (2023) highlight that CED is a symbolic and substantive tool for legitimacy as well, particularly in resource-sensitive industries. Therefore, Legitimacy Theory is useful in understanding why companies are compelled to indicate circular economy practices in their sustainability reports.

2.1.2 Stakeholder Theory

According to Stakeholder Theory, companies do not just owe what they expect to the shareholders, but they owe something even better which is to their stakeholders like regulators, consumers, employees, investors, and the community. Different priorities, demands and stakeholders have different needs for stakeholders that can affect management choices and strategies, particularly with respect to sustainability and reporting (Harrison et al., 2020). Stakeholder awareness on such factors has been growing in recent years so companies have been encouraged to disclose more about their practices on a circular economy. According to a study by Kaur and Lodhia (2018), stakeholder pressure has a significant effect on corporate sustainability disclosure quality. Furthermore, Opferkuch et al. (2022) found that companies disclose circular economy information in sustainability reports to enhance transparency and communicate their sustainability commitments to stakeholders. Hence, Stakeholder Theory also provides a sound theoretical basis for explaining the nexus between CED

and operational performance, as the strategies implemented in response to stakeholder-driven demands will be followed up by changes in internal processes and operational efficiency.

2.1.3 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory sees firms as a collection of resources and capabilities that, if valuable, rare, inimitable, and non-substitutable, can provide a competitive advantage. From this view, circular economy practices are strategic capabilities that help firms maximize resource utilization, minimize waste, and improve operational efficiency (Barney, 1991). One recent finding is that the application of the principles of circular economy might improve production process efficiency and reduce operational costs. A study by Fayyaz et al. (2025) in the Journal of Cleaner Production found that circular economy practices contribute positively to operational efficiency and resource-based advantage. Kristoffersen et al. (2021) highlight the circular economy as an environmental approach, as a value-adding one that facilitates increased productivity and efficiency. Therefore, RBV elucidates why CED captures internally oriented capabilities that give rise to opportunities to better operational performance.

2.1.4 Trade-Off Theory

The trade-off theory explains that in economic and social decision-making, it is not possible to perfectly satisfy all objectives or interests at the same time due to resource constraints, conflicting interests among parties, and

conflicts between economic objectives (Campbell & Kelly, 1994). The study concluded that companies or decision-makers must determine the optimal balance based on the primary objectives they wish to achieve, as it is unrealistic to maximize all aspects simultaneously. In the context of business management and operations, trade-off theory can be observed in the improvement of one operational aspect, which typically comes at the expense of another, such as cost versus quality, flexibility versus efficiency, or speed versus reliability (Silveria & Slack, 2001). This study examines the relationship between liquidity, financial leverage, and a company's operational performance based on the trade-off theory. Companies that hold onto cash or focus too heavily on short-term investments will indeed have better financial performance in terms of financial security, but this will reduce the efficiency of asset utilization and lower operational profitability. Thus, companies face a trade-off between financial security and operational efficiency. In addition, companies with excessive debt may see their productivity decline because funds that should be used to finance business operations are instead used to service debt, which can lead to a decline in the company's performance.

2.1.5 Working Capital Management Theory

The Working Capital Management Theory explains the importance of managing a company's short-term assets and liabilities to maintain operational efficiency and financial stability (Afrifa, 2015). The primary focus of working

capital management is how a company manages current assets such as cash, accounts receivable, and inventory as well as current liabilities, which include short-term obligations and trade payables. Effective working capital management enables a company to support daily operational activities, maintain liquidity, and ensure business continuity.

Within this theoretical framework, the management of current assets plays a crucial role in determining a company's operational performance (García-Teruel & Martínez-Solano, 2007). Adequate current assets allow a company to fund short-term operational needs, maintain inventory availability, and avoid operational disruptions that could negatively impact productivity and profitability. Therefore, companies with efficient working capital management are generally expected to achieve better operational performance.

However, the Working Capital Management Theory also emphasizes that companies must maintain an optimal balance in managing current assets. Excessive levels of current assets can lead to idle cash, excess inventory, and inefficient asset allocation, which ultimately undermine profitability (Wasiuzzaman, 2015). Conversely, insufficient current assets can increase liquidity risk and disrupt operational activities (Eljelly, 2004). As a result, companies are required to allocate current assets efficiently to support operational effectiveness without sacrificing profit margins (Pais & Gama, 2015).

In the context of this study, Working Capital Management Theory is used to explain the relationship between current asset intensity and operational performance. Companies with effective management of current assets and liquidity are expected to maintain smoother operational activities and generate better operational profitability (Eljelly, 2004; Afrifa, 2015).

2.2 Theoretical Basis

This research consists of several variables, such as Circular Economy Disclosure (CED), Operational Performance, Financial Leverage, Current Asset Intensity, and Liquidity. Each of these variables is supported by a theoretical basis.

2.2.1 Circular Economy Concept

The linear economy is based on a take-make-dispose consumption model. According to Agustin and Rianingrum (2019), the application of the linear economy causes various socio-economic problems in various fields. As a result, new concepts have emerged to offer solutions to the problems that arise. The circular economy (CE) offers a new concept model that is oriented towards a sustainable economic system. Among the various definitions of circular economy, this study defines the CE as an economic system designed to maximize the use of resources through cyclical material flows, renewable energy sources, and cascading energy flows that are sustainable within nature's limits, while leveraging ecosystem cycles and respecting their natural

reproduction rates in the context of sustainable development (Korhonen et al., 2018).

The CE cannot stand alone. The four principles of 4R (recycle, reduce, reuse, and recover) are related to and associated with the concept of CE, while the primary use of the term 3R (reduce, reuse, and recycle) has also been confirmed (Schoggl et al., 2020). However, in the transition from a linear economy to a circular economy, Cramer (2017), based on the work of Potting et al. (2017), proposes a 9R framework. The authors argue that by systematically distinguishing between different stages and priorities in the circular economy, more opportunities can be found to promote the development of the circular economy and avoid waste or create potential value. According to Agustin and Rianingrum (2019), a product has four stages in its life cycle: 1) raw material extraction and processing, 2) manufacturing, 3) use, and 4) end of use. In the linear economy concept, at the end of its use, a product will be treated as waste and will be placed in a landfill, which will then be incinerated. This will certainly have an impact on environmental and air pollution in the surrounding area and does not provide opportunities for creative economic actors to process and manage waste that is no longer used to become useful. In contrast, the circular economy concept seeks to reduce the risk of waste supply by keeping the materials used in each product in circulation, even though it requires energy and other resources to carry out the process of decomposing and recycling the waste. Therefore, it can be said that the circular economy

concept aims to achieve a sustainable economic system that benefits both business actors and consumers of the business's products.

2.2.2 Circular Economy Disclosure

Another interesting feature that is closely related to sustainability reporting in the context of circular economy disclosure (CED) is that both CED and sustainability reporting seek to enhance accountability and transparency of environmental, social, and economic quality across the company. Sustainability reporting in accordance with the Global Reporting Initiative (GRI) standards is one of the main vehicles for corporations to use to include CED information, due to the transition from a linear economic model to a sustainable circular model, as it relates to regulations. Moreover, this is supported by stakeholder theory as CED enables companies to ensure that they gain legitimacy and create discussion about circular performance (e.g., waste reduction and resource optimization) by disclosing circular performance to stakeholders to build legitimacy (Vitolla et al., 2023). At the international level, this integration remains sparse with only a handful of firms weaving CED strongly into their reports, despite nearly all of them mentioning it outright (Opferkuch et al., 2022). Such a connection is further pertinent in Indonesia, where the Indonesia Stock Exchange (IDX), GRI, and the Financial Services Authority (OJK) rules and regulations promote ESG reporting because CE is included in a sustainable business transformation strategy.

Circular Economy Disclosure (CED) refers to the practice whereby companies communicate or report on their implementation of circular economy principles. This includes, within the framework of their economic models, strategies for resource regeneration that aim at preserving the value of materials and products at optimal levels. Ultimately, this approach seeks to minimize waste by adhering to circular economy practices such as reducing, reusing, recycling, and recovering resources. In contrast to the linear “take-make-dispose” economy, CED involves the disclosure of closed-loop supply chains, end-of-life product management, and resource efficiency measures that seek to create value from waste while progressing with the advancement of Sustainable Development Goals (SDGs) as stated in Vitolla et al (2023). Put more simply, CED is a means of transparency, enabling companies to prove the business model sustainability by a quantifiable disclosure index that covers, qualitative and quantitative indicators.

Companies typically present CE information via sustainability reports according to structured formats, such as through a disclosure index with four main categories: (1) awards and performance (e.g., energy savings or emissions); (2) investment and expenditure (e.g., circular strategy funding); (3) policy and implementation (e.g., national regulatory support); and (4) resource reuse (e.g., recycling rate) (Vitolla et al., 2023). This data is expressed in qualitative narrative (storytelling or strategy descriptions), quantitative (metric data, for example, tons of waste recycled), or both, but it is also often mixed

and combined to tell a story and, in overarching report elements such as CEO statements, non-financial materiality assessments, mention of the SDGs, targets, and performance indicators. In Europe, for instance, nearly all firms refer to CE, although only 7% integrate it comprehensively across all parts of the report (Opferkuch et al., 2022). In Indonesia, disclosure is made using the GRI framework and focuses on environmental indicators, strategic roadmaps, and cross-sector cooperation to achieve ESG transparency. The lack of global standards, which results in variation and subjectivity of the disclosure, is the primary limitation.

2.2.3 Operational Performance

Operational performance measures how well a company manages its internal processes and resources to produce output. For companies concentrating on the production of goods, operational performance assesses the efficient control of production cost, inventory, and capacity. In contrast to financial performance, which is concerned with financial outcomes including profits, operational performance is concerned with improving operating processes and using the raw material of production, as the basis for the maintenance of a sustainable performance (Abdul-Rashid et al., 2017).

Previous research in accounting and operations maintenance generally measured operational performance using ratio-based indicators such as COGS ratio, inventory turnover, operating profit margin, etc. Operating profit margin (OPM) is calculated by dividing a company's net income by its total sales. A

high OPM indicates that the company has successfully improved its administrative efficiency, while a low OPM suggests that the organization has been less successful in maximizing its management efficiency (Khresat & Jassar, 2025). This study uses OPM as a variable representing operating performance.

$$\text{Operational Profit Margin (OPM)} = \frac{\text{Operating Profit}}{\text{Revenue}}$$

Newly published empirical research demonstrates that sustainability oriented towards resource efficiency increases the direct linkages between resource efficiency focused sustainability practices and improved operational performance. Yu, Ramanathan, and Nath (2021) concluded from their study that organizations that adopt sustainability initiatives based on material and energy efficiency report higher inventory turnover and lower operating costs. Abdul-Rashid et al. (2017) also concluded comparable findings with respect to this theme by stating that operational efficiency is the primary mechanism by which companies derive value through sustainability practices.

2.2.4 Financial Leverage

According to Maulita (2018), the leverage ratio is an important factor that indicates the extent to which a company's assets are financed through debt or equity. There are several types of leverage models, but the one used in this study is the equity multiplier. Here is the formula:

$$\text{Financial Leverage (FINLEV)} = \frac{\text{Total Assets}}{\text{Total Equity}}$$

The equity multiplier represents the ratio of total assets to a company's equity (Zaitoun & Alqudah, 2020). Based on this statement, the larger a company's assets are, the smaller its total equity, and the higher its total leverage ratio will be. This can be interpreted as the extent to which total resources originate from the company's internal equity funds compared to external funds. A higher leverage ratio indicates a larger proportion of funds derived from external sources, such as debt or non-equity financing.

Financial leverage creates a trade-off between the potential for higher returns and increased financial risk. If managed effectively, leverage can serve as a powerful mechanism to enhance shareholder value by increasing returns on equity and providing tax benefits through interest expense deductions (Senan et al., 2021). However, excessive reliance on debt also amplifies financial risk by creating fixed interest obligations that must be met regardless of the company's operational performance, which could lead to financial difficulties during economic recessions or periods of reduced cash flow (Abubakar & Anyonje, 2025). Mutumanikam and Adelin (2024) found that companies with high leverage ratios are strongly correlated with poor financial performance. Bui et al. (2021) confirm that companies with high debt ratios significantly affect their financial performance. This suggests that excessive use of leverage reduces a company's profitability, which in turn affects its financial

performance. A higher ratio indicates greater financial leverage and a higher dependence on external financing.

2.2.5 Current Assets Intensity

Current Assets Intensity (CAI) indicates the proportion of a company's assets allocated to current assets. Current assets are assets that are necessary for or related to the operating cycle, excluding land and facilities, as well as assets that can be considered temporary investments of working capital and will automatically, or can immediately, be converted into free cash without disrupting the continuity and security of operations (Herrick, 1994). Current Assets Intensity (CAI), also commonly referred to as Current Assets to Total Assets (CATA), is calculated using the following formula:

$$\text{Current Assets to Total Assets (CATA)} = \frac{\text{Total Current Assets}}{\text{Total Assets}}$$

This ratio is used to measure the proportion of total assets classified as current assets for several purposes: (1) to assess the company's asset structure; (2) to illustrate operational flexibility; (3) to illustrate working capital availability; and (4) to illustrate asset efficiency or inefficiency.

When assessing a company's structure, it is useful to examine whether the company holds more current or fixed assets. Furthermore, current assets can also be used to illustrate operational flexibility, as they are used for daily operations, short-term payments, raw material purchases, inventory, etc.; thus, the higher the current assets, the more flexible operations typically are (M'ng

et al., 2017). Furthermore, the concept of working capital availability implies that companies with higher current assets are generally more liquid and better able to maintain operational continuity (Nazir & Afza, 2009). If operational continuity can be sustained, current assets help ensure smooth operations. Conversely, if too many current assets are tied up, operations can become inefficient and hindered (Raheman & Nasr, 2007).

2.2.6 Liquidity

In the context of financial markets, liquidity refers to the cost of executing a transaction involving a financial instrument or, in other words, the cost of opening a position in an asset and closing it out immediately (Grossman and Miller, 1988). Liquidity is defined as the speed and ease with which an asset can be converted into cash without significant loss of value. Liquidity is typically described by the following formula:

$$\text{Liquidity (LIQ)} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The importance of liquidity can be better understood if the consequences of a company's inability to meet its short-term obligations are taken into account. A lack of liquidity prevents a company from taking advantage of favorable discounts or promising opportunities. Current assets (cash, accounts receivable, and inventory) are resources expected to be realized within one year, while current liabilities are obligations that require the use of current assets. This ratio serves as an indicator of the margin of safety for short-

term creditors. The importance of liquidity can be better understood by considering the consequences of a company's inability to meet its short-term obligations. A lack of liquidity prevents a company from taking advantage of favorable discounts or promising opportunities (Subramanyam, 2014). Liquidity management faces a trade-off between security and profitability. Although high liquidity ensures smooth operations, excessive levels of current assets can lead to idle cash and inefficient resource allocation, which ultimately undermine the company's profitability (Lazaridis & Tryfonidis, 2006). This is consistent with findings that reducing investment in current assets to an optimal level can improve operating profit margins by minimizing funds trapped in the working capital cycle (Raheman & Nasr, 2007).

2.3 Previous Research

Research related to Circular Economy Disclosure (CED), firm financial characteristics, and operational performance has attracted increasing attention in recent years. However, existing studies tend to focus on these variables separately, resulting in limited understanding of their combined influence on operational performance.

Opferkuch et al. (2022) examined the incorporation of circular economy principles into sustainability reporting and found that only a small proportion of companies fully integrate circular economy concepts into their business strategies and reporting systems. The study highlighted substantial variation in

disclosure quality across companies due to the absence of universally accepted reporting standards.

Further development in this field was provided by Vitolla et al. (2023), who reviewed the state of Circular Economy Disclosure (CED) research and concluded that the field remains in an early stage of development. Their findings indicate that existing studies primarily focus on the determinants of disclosure, such as governance mechanisms and firm characteristics, while empirical evidence regarding the consequences of CED on firm performance remains limited.

In the broader sustainability literature, Sheldon and Jenkins (2020) found that sustainability disclosure may positively influence corporate performance because it serves as a signal of managerial quality and corporate commitment. However, the magnitude and direction of the relationship vary depending on the performance indicators used. Most studies focus on financial performance indicators such as profitability and firm value rather than operational performance.

Apart from sustainability-related factors, firm financial characteristics have also been widely examined as determinants of company performance. Afandy (2024) found that high financial leverage negatively affects operational efficiency because firms face greater financial obligations and reduced operational flexibility. Likewise, Ahamed et al. (2022) reported that financing

constraints resulting from excessive leverage may limit a firm's ability to improve performance and pursue efficiency-enhancing investments.

Research on working capital management provides additional insights into the role of current assets in supporting firm performance. García-Teruel and Martínez-Solano (2007) found that efficient working capital management improves firm profitability by reducing operational disruptions and improving resource utilization. Consistent with this finding, Nazir and Afza (2009) reported that an appropriate level of current assets contributes positively to firm performance because it supports operational continuity and working capital availability.

Liquidity has also been identified as an important determinant of firm performance. Lazaridis and Tryfonidis (2006) argued that firms must balance liquidity and profitability because excessive liquidity may lead to inefficient allocation of resources. More recently, Quoc et al. (2024) found that high liquidity negatively affects the performance of manufacturing firms, suggesting that excessive investment in current assets may reduce operational profitability.

Although previous studies have investigated Circular Economy Disclosure (CED), financial leverage, current assets, and liquidity, most studies examine these factors independently. Furthermore, prior research predominantly uses profitability, firm value, or market-based measures as indicators of performance. Studies focusing on operational performance, particularly those measured using Operating Profit Margin (OPM), remain

limited. In addition, empirical evidence integrating Circular Economy Disclosure and firm financial characteristics in a single model remains scarce, particularly in manufacturing-related firms operating in emerging economies such as Indonesia.

Therefore, this study seeks to fill this gap by examining the effect of Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Assets Intensity (CATA), and Liquidity (LIQ) on operational performance measured by Operating Profit Margin (OPM) in manufacturing-related firms listed under the IDX Industrial Classification (IDX-IC).

Table 1. Summary of Previous Research

Researcher & Year	Research Focus	Method	Key Findings	Research Gaps
Opferkuch et al. (2022)	Circular Economy Disclosure in Corporate Sustainability Reports: The Case of European Companies in Sustainability Rankings	Qualitative and Quantitative Content Analysis	CE enhance transparency and stakeholder communication; however, disclosures remain largely superficial and inconsistent	Did not examine the relationship between CE disclosure and operational or financial performance
Vitolla et al. (2023)	Circular Economy Disclosure determinants	Literature Review	Research on CED remains limited and focuses primarily on disclosure determinants	Limited evidence regarding performance consequences
Sheldon & Jenkins (2020)	Sustainability disclosure and company performance	Empirical Analysis	Sustainability disclosure may positively influence	Focused on financial performance rather than

			company performance	operational performance
Afandy (2024)	Financial leverage, cost management, and operational efficiency	SEM-PLS	Financial leverage significantly affects operational efficiency and earnings stability	Sustainability disclosure not considered
Ahamed et al. (2022)	Financial constraints and firm performance	Empirical Analysis	Financial constraints reduce company performance	Did not examine operational performance specifically
García-Teruel & Martínez-Solano (2007)	Working capital management and profitability	Panel Regression	Efficient working capital management improves profitability	No consideration of sustainability disclosure
Nazir & Afza (2009)	Working capital investment policy and firm performance	Regression Analysis	Current assets positively contribute to firm performance	Circular economy perspective absent
Lazaridis & Tryfonidis (2006)	Liquidity management and profitability	Regression Analysis	Excess liquidity may reduce profitability	Operational performance not examined
Quoc et al. (2024)	Liquidity and manufacturing firm performance	Regression Analysis	Liquidity negatively affects performance	Circular economy disclosure not included

2.3.2 Research Position

This study addresses this research gap by:

1. developing a Circular Economy Disclosure measurement based on company reports.
2. testing its impact on operational performance.

3. providing empirical evidence from the context of Indonesia as a developing country.

2.4 Hypotheses Formulation

This study formulates four hypotheses based on the discussions outlined in the previous paragraphs.

2.4.1 The Effect of Circular Economy Disclosure on Operational Performance

Circular Economy Disclosure (CED) reflects the extent to which firms communicate their implementation of resource efficiency, waste reduction, and material reuse practices. From the perspective of the Resource-Based View (RBV), the adoption of circular economy practices represents a strategic capability that enables firms to optimize resource utilization and improve operational efficiency (Barney, 1991). Firms that effectively implement such practices are expected to reduce production costs and enhance operational performance.

In addition, Legitimacy Theory and Stakeholder Theory explain that firms are encouraged to disclose sustainability-related information, including circular economy practices, in order to meet societal expectations and stakeholder demands (Martins et al., 2020; Kaur & Lodhia, 2018). Such disclosure may indicate that the firm has integrated sustainability practices into its operations.

Empirical studies support this argument. Kristoffersen et al. (2021) and Fayyaz et al. (2025) showed that circular economy practices improve

operational efficiency, while Yu et al. (2021) found that resource-efficient sustainability practices are associated with better operational performance. Although research on CED is still limited (Vitolla et al., 2023), it is expected that higher levels of disclosure reflect stronger internal capabilities. Based on these theoretical arguments and empirical findings, it is expected that firms with higher levels of CED will demonstrate better operational performance. Therefore, the following hypothesis is proposed:

H1: Circular Economy Disclosure positively affects a company's operational performance.

2.4.2 The Effect of Financial Leverage on Operational Performance

Leverage reflects the extent to which a firm relies on firm financing. From a financial perspective, high leverage may constrain a firm's operational flexibility due to fixed obligations such as interest payments. This can limit the firm's ability to invest in efficiency improvements, including sustainability practices.

According to the Resource-Based View (RBV), firms require sufficient financial resources to develop capabilities that enhance operational efficiency. High leverage may reduce the availability of such resources, thereby negatively affecting performance.

Empirical studies support this view. Afandy (2024) found that high leverage reduces operational efficiency, while Ahamed et al. (2022) highlighted that financial constraints can limit firms' ability to improve firm performance.

Based on these theoretical arguments and empirical findings, it is expected that firms with higher leverage will reduce operational performance. Therefore, the following hypothesis is proposed:

H2: Financial leverage negatively affects a company's operational performance.

2.4.3 The Effect of Current Assets Intensity on Operational Performance

The current asset ratio reflects the proportion of current assets to total assets held by a company. Current assets, which generally consist of cash, accounts receivable, inventory, and other short-term assets, play a crucial role in supporting a company's day-to-day operations (Nazir & Afza, 2009).

According to Working Capital Management Theory, adequate management of current assets is essential for maintaining the smooth operation of business activities and improving company performance (Afrifa, 2015). Companies with adequate current assets are considered better able to finance short-term operational needs, manage inventory availability, and effectively support sales activities. Proper working capital management can reduce operational disruptions and enhance a company's ability to generate operating income from its core business activities (García-Teruel & Martínez-Solano, 2007).

In manufacturing companies, adequate current assets can enhance operational flexibility and support operational efficiency (Knauer & Wöhrmann, 2013). Previous research has also shown that the structure of

current assets contributes positively to firm performance because current assets support operational continuity and the availability of working capital (Nazir & Afza, 2009; García-Teruel & Martínez-Solano, 2007). As such, companies with a higher current asset intensity are expected to post better operating performance. Therefore, the following hypothesis is proposed:

H3: Current assets intensity positively affects a company's operational performance.

2.4.4 The Effect of Liquidity on Operational Performance

Liquidity is a ratio that reflects a company's ability to quickly convert assets into cash to settle current liabilities (Masood et al., 2016). Maintaining a high level of liquidity ties up a large amount of capital in current assets, which cannot be used to generate revenue. Consequently, the company's revenue declines due to the loss of opportunities to utilize that capital (Quoc et al., 2024).

This is consistent with the trade-off theory, according to which high liquidity leads to lower profits because companies tend to hold cash or make short-term investments rather than undertake more costly long-term investments. Consequently, liquidity is inversely related to a company's profitability (Quoc et al, 2024).

Empirical studies support the above view. Quoc et al. (2024) demonstrated that liquidity had a negative effect on the performance of

manufacturing firms listed on the HSX. Therefore, the following hypothesis is proposed:

H4: Liquidity negatively affects a company's operational performance.

2.5 Research Framework

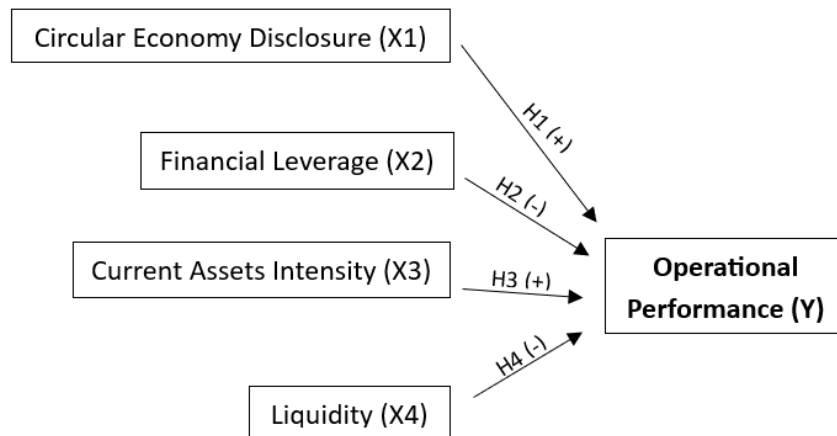
The research contributes to previous work indicating that the circular economy is adopted more as a sustainability initiatives; however, the disclosure of the circular economy in reports of enterprises (Circular Economy Disclosure/CED) remains unstandardized, and its influence on company performance is not well examined (Opferkuch et al., 2022; Vitolla et al., 2023). Previous research has been mostly limited to studies on disclosure drivers and the impact of this on financial performance and company value, whereas researchers now have few studies about the link between the CED and operational performance, especially in developing countries.

According to Legitimacy Theory and Stakeholder Theory, in view of regulatory pressures, public demands, and the demands of stakeholders for sustainability transparency (Martins et al., 2020; Kaur & Lodhia, 2018), businesses are required to disclose their circular economy practices. Yet this disclosure is not only an act of legitimacy but may also indicate the degree to which circular economy practices are integrated in the company's work practice. To this end, circular economy practices can be considered internal capabilities or capabilities to assist companies in improving resource utilization, in reducing production costs, and in optimizing processes of

operations from a Resource-Based View perspective (Kristoffersen et al., 2021; Fayyaz et al., 2025). Thus, greater levels of Circular Economy Disclosure also indicate an increased likelihood of an efficient operational system, which can be reflected in operational performance (operational profit margin). Furthermore, according to Signaling Theory, Circular Economy Disclosure may give external parties signals that the company has effective management and operational processes and commits to sustained sustainability (Sheldon et al., 2020; Buallay et al., 2020).

Nevertheless, the relationship between CED and operational performance may also be different depending on firms' financial and operational characteristics. Thus, the present study includes financial leverage, capital intensity, and liquidity as control variables common in sustainability research about sustainability or corporate performance (Khoza, 2025; Saif-Alyousfi et al, 2025; Quoc et al, 2024). From this description, this study's conceptual framework considers Circular Economy Disclosure as an independent variable that impacts operational performance of firms, with financial leverage, capital intensity, and liquidity acting as control variables.

Figure 1. Research Framework



CHAPTER III

RESEARCH METHODOLOGY

3.1 Types of Research

This study uses a quantitative approach with an explanatory research design. A quantitative approach was chosen because this study aims to examine the causal relationship between Circular Economy Disclosure (CED) and company operational performance, as well as to analyze the influence of control variables on this relationship based on statistical testing. This research is explanatory in nature because it focuses on explaining the influence of independent variables on dependent variables through testing previously formulated hypotheses. The quantitative approach with an explanatory design is commonly used in accounting and sustainability research based on secondary data to test the relationship between variables objectively and measurably using regression models (Creswell & Creswell, 2022; Mardia et al., 2024). The data used in this study are secondary data obtained from official company reports and public sources, so that the research results can be retested and replicated.

3.2 Population and Sample

This research uses a sampling technique from the population which will be described in detail below.

3.2.1 Research Population

The population for this study consists of all manufacturing-related companies listed on the Indonesia Stock Exchange (IDX) based on their IDX

Industrial Classification (IDX-IC). The chosen manufacturing-related sector is based on the characteristics of this sector, which has a relatively high intensity of resource use and waste production, making it relevant to the implementation and disclosure of the circular economy.

3.2.2 Sampling Techniques and Criteria

The sampling method is purposive sampling, the technique of selecting samples specifically to meet certain criteria related to the research purposes. This technique is typically employed in quantitative research involving reports from firms where some populations do not possess pertinent and comprehensive data (Friday et al., 2024). The sample selection criteria for the present study were as follows. The company would be categorized as a manufacturing class by the IDX-IC classification. The company is listed on the Indonesian Stock Exchange during the study period. The company provides a full annual report and/or sustainability report throughout the period of observation, which is from 2022 to 2024. The company has completed financial data available to measure all the research variables. The company did not have a delisting or a lengthy suspension of trading at any point during the period used for conducting the research. Such purposive sampling with these parameters will ensure that the sample of the research is not only relevant but is also rich and sufficient enough to test the research proposition empirically

3.3 Types and Sources of Data

This study relies on secondary data, which are obtained indirectly from officially published sources. The data used includes:

1. Annual reports of the company provide financial data and operational information.
2. Sustainability reports to identify and measure the level of Circular Economy Disclosure.
3. The official site of the Indonesia Stock Exchange (www.idx.co.id) to obtain information about the listed company and financial reports.
4. Company official websites to supplement information not available on the IDX website.
5. London Stock Exchange Group (LSEG) database

For accounting disclosure and sustainability research, secondary information from the company report is used, which is suitable as it provides objective data for the evaluation of company reporting techniques (Gutiérrez-Ponce, 2023).

3.4 Operational Definition and Variable Measurement

To guarantee a consistent and transparent measurement, each variable in the present study is operationally defined as described below:

Table 2. Definitions of Variables

Variable	Type	Operational Definition	Measurement
CED	Independent	Level of disclosure of circular economy	CED index with a 0–2 scoring system

		practices in company reports	
Operational Performance	Dependent	A company's ability to generate operating profits from its core business activities and manage operational efficiency	Operating Income / Revenue
Financial Leverage	Independent	To what extent the firm's assets are financed by equity	Total Assets / Total Equity
Current Assets Intensity	Independent	The company's level of reliance on physical and fixed assets play a crucial role in generating its output	Total Assets / Total Revenue
Liquidity	Independent	How quickly an asset can be converted into cash that the company can use	Current Assets / Current Liabilities

3.5 Data Collection Method

Data collection in this study was conducted using the documentation method. The sample was determined using purposive sampling criteria. Annual reports and sustainability reports were obtained from the Indonesia Stock Exchange (IDX) website and the official websites of the companies. The collected reports were then screened to ensure data completeness and consistency. Furthermore, content analysis was conducted using AI, specifically ChatGPT, on sustainability reports to identify and score Circular

Economy Disclosure indicators, while financial data were obtained from LSEG database and audited financial statements to calculate operational performance and control variables.

3.6 Data Analysis Method

Data analysis in this study was conducted using statistical software (SPSS) and consisted of several stages.

First, descriptive statistics were used to describe the characteristics of the data, including the minimum, maximum, mean, and standard deviation of each variable. Descriptive analysis helps provide an overview of the data distribution and detect potential anomalies (Mardia et al., 2024).

Second, classical assumption tests were conducted to ensure that the regression model met the required assumptions. These tests include normality, multicollinearity, and heteroscedasticity tests. The normality test was performed using the Kolmogorov–Smirnov test and normal probability plots to assess whether the data were normally distributed. The multicollinearity test was conducted using the Variance Inflation Factor (VIF) and tolerance values to examine the correlation among independent variables. The heteroscedasticity test was performed using scatterplot analysis to determine whether the variance of residuals was constant. These tests are essential to ensure the validity and reliability of the regression model (Gujarati & Porter, 2009; Mardia et al., 2024).

Third, Circular Economy Disclosure (CED) was measured using a content analysis approach with a scoring system ranging from 0 to 2. A score of 0 indicates no disclosure, a score of 1 indicates general or narrative disclosure, and a score of 2 indicates detailed disclosure accompanied by quantitative information or evidence that has been verified by a third party (i.e., environmental certification). Content analysis is widely used in sustainability disclosure research to systematically evaluate the quality and extent of corporate reporting (Krippendorff, 2019).

No	Dimension	Code	Indicator	Description	Score
A	Resource Efficiency				
1	Resource Efficiency	RE1	Energy efficiency	Disclosure of efforts to improve energy efficiency	0–2
2	Resource Efficiency	RE2	Water efficiency	Disclosure of efforts to reduce water usage	0–2
3	Resource Efficiency	RE3	Sustainable raw materials	Use of environmentally friendly or recycled materials	0–2
4	Resource Efficiency	RE4	Material reduction	Efforts to reduce material consumption in production	0–2
5	Resource Efficiency	RE5	Renewable energy	Use of renewable energy sources	0–2
B	Waste and Emission Management				
6	Waste & Emission	WE1	Waste disclosure	Disclosure of total waste generated	0–2
7	Waste & Emission	WE2	Waste management system	Description of waste treatment systems	0–2
8	Waste & Emission	WE3	Recycling rate	Disclosure of recycling activities or rates	0–2
9	Waste & Emission	WE4	Emission reduction	Efforts to reduce carbon emissions	0–2
10	Waste & Emission	WE5	Hazardous waste (B3)	Management of hazardous waste	0–2
C	Circular Practices				
11	Circular Practices	CP1	Reduce	Efforts to reduce waste/material use	0–2
12	Circular Practices	CP2	Reuse	Reuse of materials/products	0–2
13	Circular Practices	CP3	Recycle	Recycling practices	0–2
14	Circular Practices	CP4	Recovery	Recovery of energy/materials	0–2
15	Circular Practices	CP5	Eco-design	Sustainable product design practices	0–2
16	Circular Practices	CP6	Closed-loop system	Closed-loop supply chain implementation	0–2
D	Circular Strategy and Investment				
17	Strategy & Investment	CS1	CE policy	Existence of circular economy policies	0–2
18	Strategy & Investment	CS2	CE targets/KPI	Disclosure of CE-related targets or KPIs	0–2
19	Strategy & Investment	CS3	Green investment	Investment in sustainable technologies	0–2
20	Strategy & Investment	CS4	Collaboration	Partnerships related to circular economy initiatives	0–2

Table 3. CED Measurement Indicators

The indicators used to measure CED are presented in Table 3.2, which are categorized into four dimensions: resource efficiency, waste and emission

management, circular practices, and circular strategy and investment. These indicators were developed based on circular economy principles and prior studies such as Vitolla et al. (2023) and Opferkuch et al. (2022). The total CED score was obtained by summing the scores of all indicators. The CED index is calculated as follows:

$$CED = \frac{\text{Total Score Obtained}}{40}$$

Where the maximum possible score is 40 (20 indicators $\times$ 2). To be more specific, the waste management system indicator is indeed described as a “description.” A score close to one indicates that the company has implemented effective and standardized CE disclosure practices in accordance with the above indicators, and vice versa. However, in practice, the descriptions in a company’s sustainability report can vary widely, ranging from qualitative and quantitative narratives to the presentation of environmental certifications as evidence that the company has received third-party affirmation of its efforts to protect the environment to the best of its ability.

Fourth, multiple linear regression analysis was used to test the effect of Circular Economy Disclosure on operational performance, with firm size, leverage, and sales growth included as control variables. Multiple linear regression is commonly used to examine the relationship between one dependent variable and multiple independent variables simultaneously (Gujarati & Porter, 2009).

The regression model is formulated as follows:

$$OP = \beta_0 + \beta_1 CED + \beta_2 FINLEV + \beta_3 CAI + \beta_4 LIQ + \epsilon$$

Where:

- OP = Operational Performance
- CED = Circular Economy Disclosure
- $FINLEV$ = Financial Leverage
- CAI = Current Assets Intensity
- LIQ = Liquidity
- ϵ = Error term

Finally, hypothesis testing was conducted at a significance level of 5%. The decision to accept or reject the hypotheses was based on the significance values (p-values) obtained from the regression results. A hypothesis is accepted if the significance value is less than 0.05 (Mardia et al., 2024).

CHAPTER IV

DATA ANALYSIS AND DISCUSSIONS

4.1 General Overview of the Research Object

This study aims to examine the effect of CED on operational performance by considering financial leverage, current assets intensity, and liquidity as the company's financial and operational characteristics. The study focuses on companies listed on the Indonesia Stock Exchange (IDX) in the Industrials sector during the 2022–2024 period. This sector was selected because its operational characteristics are closely related to the use and processing of materials and raw material waste, making it applicable to studies examining the relevance of circular economy implementation and disclosure.

The sample was selected using purposive sampling, so that only companies meeting specific criteria were chosen for this study. These criteria required that the companies consistently publish annual reports and sustainability reports (whether integrated or separate) for three consecutive years. After screening based on the above criteria, 32 companies in the Industrials sector were deemed suitable for this study. These companies are considered capable of representing manufacturing firms in the Industrials category within the context of analyzing the impact of Circular Economy Disclosure (CED) on operational performance in Indonesia, specifically within the context of a developing country. The following details the number of companies meeting the research sample selection criteria:

Table 4. Sample Performance

No.	Criteria	Amount
1.	Industrial sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period.	65
2.	Industrial sector companies that have published annual and sustainability reports (both integrated and standalone) for the 2022–2024 period.	(33)
Number of companies in the study sample		32
Total data for 3 years (32×3)		96

4.2 Data Analysis Result

After conducting data testing in the Statistical Package for the Social Sciences (SPSS) application, various results were found which will be discussed as follows.

4.2.1 Descriptive Statistics Result

Descriptive statistics involve the analysis and summarization of data to gain insights into its characteristics and distribution. Descriptive statistics help researchers develop research ideas and guide further analysis by allowing them to explore patterns and trends in the data. Descriptive statistics are more commonly used in academic research because they help researchers better understand their datasets and serve

as a foundation for more advanced statistical techniques. Similarly, descriptive statistics are used to summarize and analyze data across various academic fields, including psychology, sociology, economics, education, epidemiology, and other fields. Descriptive statistics can be beneficial to researchers in hypothesis generation and exploratory analysis by identifying trends, patterns, and correlations among variables within very large datasets. Descriptive statistics are crucial in data-driven decision-making processes because they enable stakeholders to make informed decisions based on reliable data (Alabi & Bukola, 2023).

In the context of this study, descriptive statistics were used to describe the variables Circular Economy Disclosure (CED), financial leverage, current assets intensity, and liquidity as independent variables, and Operational Profit Margin (OPM) as the dependent variable. Through this analysis, researchers can identify data distribution patterns, trends in mean values, differences across periods, and the potential presence of outliers that may affect the results of statistical tests. Additionally, descriptive statistics help ensure that the sample used meets the study's criteria and reflects the conditions of companies in the industrials sector in Indonesia during the 2022–2024 period. The results of the descriptive statistics then serve as the basis for interpreting the characteristics of the sample, including the CED disclosure level,

financial leverage level, current assets intensity level, and OPM level.

A comprehensive understanding of these data characteristics is essential so that subsequent analyses, particularly the multiple linear regression test on OPM, can be conducted more accurately and in accordance with applicable methodological assumptions.

Table 5. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CED (X)	96	0	1	0.46	0.501
OPM (Y)	96	-0.51	0.39	0.0608	0.14875
FINLEV	96	1.06	8.64	1.9339	1.15858
CATA	96	0.28	0.94	0.5596	0.16194
LIQ_W	96	0.89	8.52	1.9361	1.15693
Valid N (listwise)	96				

Source: SPSS data analysis

Table 6. CED Details

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	52	54.2	54.2	54.2
	1	44	45.8	45.8	100
	Total	96	100	100	

Source: SPSS data analysis

Based on the results of the statistical tests presented in Table 4.2.1.1, this study used 96 observations for each variable analyzed. The characteristics and indicators of each variable are described as follows:

1. Circular Economy Disclosure (CED) was measured as an independent variable using a disclosure dummy variable with 96

observations. CED values in the sample range from 0.15, rounded to 0 as the minimum value for PT. Ateliers Mecaniques D'Indonesie Tbk in 2022, to 1 as the maximum value for PT United Tractors Tbk in 2024 and 2023. The average CED of 0.46 indicates that approximately 46% of the companies in the sample have made CED disclosures. The standard deviation of 0.501 indicates variation in CED levels among the companies in the study sample.

2. Operating Margin (OPM), as the dependent variable, was measured using the ratio of operating income (EBIT) to revenue, with 96 observations. The OPM values in the sample ranged from 0.51 the minimum value recorded by PT Green Power Group Tbk. in 2023 to 0.39 the maximum value recorded by PT Dynamics Indonesia Tbk. in 2022. The average OPM of 0.0608 indicates that, in general, companies in the sample have relatively low ability to generate operating profit from their core business activities. The standard deviation of 0.14875 indicates variation in operational margins across companies, suggesting that the level of operational efficiency among companies in the sample is quite diverse.

3. Financial leverage (FINLEV), used as an independent variable, was measured as total liabilities divided by total assets

across 96 observations. The FINLEV values in the sample ranged from 1.06 the minimum value recorded by PT Supreme Cable Manufacturing & Commerce Tbk. in 2024 to 8.64 the maximum value recorded by PT Kobexindo Tractors Tbk. in 2024. The average FINLEV of 1.9339 indicates that most companies have a fairly high level of leverage in their financing structure. The standard deviation of 1.15858 indicates variations in leverage levels among companies in the research sample.

4. Current Assets to Total Assets (CATA) or Current Assets Intensity (CAI), as an independent variable, was measured using the ratio of fixed assets to total assets across 96 observations. CAI values in the sample ranged from 0.28 the minimum value recorded by PT Cahayaputra Asa Keramik Tbk. in 2022 to 0.94 the maximum value recorded by PT Hexindo Adiperkasa Tbk. in 2023. The average CAI of 0.5596 indicates that most companies have a fairly large proportion of fixed assets in their asset structure. The standard deviation of 0.16194 indicates variation in current assets intensity levels among companies in the research sample.

5. Liquidity (LIQ_W), as an independent variable, was measured using a liquidity ratio that had been winsorized based on 96 observations. LIQ_W values in the sample range from

0.89 the minimum value at PT Kobexindo Tractors Tbk. in 2024 to 8.52 the maximum value at PT Perdana Bangun Pusaka Tbk. from 2022 to 2024. The average LIQ_W of 2.7327 indicates that, in general, the companies in the sample have a sufficiently good level of liquidity to meet their short-term obligations. The standard deviation of 2.06351 indicates variation in liquidity levels among companies, suggesting that companies' ability to manage current assets and short-term liabilities varies considerably.

Table 4.2.1.2 presents the frequency distribution of Circular Economy Disclosure (CED) among the sample companies. This variable is measured using a dummy variable system, where a value of 1 indicates that the company discloses information related to the circular economy, while a value of 0 indicates no disclosure.

Based on the table, out of 96 observations, 52 observations or 54.2% of the sample companies did not disclose information related to the circular economy in accordance with the established criteria. Meanwhile, 44 observations or 45.8% of the companies disclosed circular economy practices in their reports in accordance with the existing criteria. The cumulative

percentage indicates that all observations are valid with no missing data.

These findings indicate that more than half of the companies in the sample have not yet disclosed circular economy practices in a standardized manner, suggesting that the implementation and reporting of circular economy initiatives among the sampled companies remain relatively limited.

4.2.2 Classical Assumption Test Result

Classical assumption tests are conducted to verify whether the requirements for regression analysis are met. The tests performed include tests for normality, multicollinearity, and heteroscedasticity.

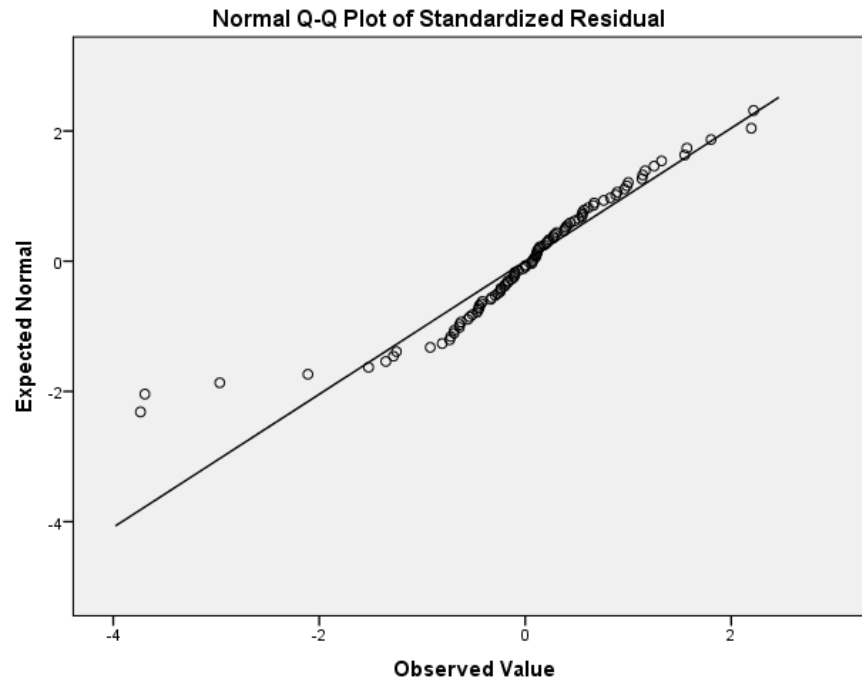
4.2.2.1 Normality Test Result

Table 7. Normality Test K-S

Standardized Residual	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
	0.123	96	0.001	0.907	96	0

Source: SPSS data analysis

Figure 2. Normal Q-Q Plot



Source: SPSS data analysis

Based on the results of the normality tests in Table 4.2.2.1 and the Normal Q-Q Plot above, the significance values for the Kolmogorov-Smirnov test are 0.001, and for the Shapiro-Wilk test are 0.000, both of which are below the significance level of 0.05. Statistically, these results indicate that the residuals in the regression model are not perfectly normally distributed.

However, based on the Normal Q-Q Plot graph, most of the residual points appear to follow and lie around the diagonal line.

Although there are some deviations in the left tail of the distribution, the residual pattern generally still shows a distribution that is close to normal. According to Gosselin (2024), the Q-Q Plot is an important visual method for evaluating the normality of residuals because it can reveal distribution patterns, skewness, and the presence of outliers more informatively than simply looking at the results of normality tests. Furthermore, research by Midway and White (2025) explained that linear regression generally remains quite robust against moderate deviations from normality, particularly with larger sample sizes.

4.2.2.2 Multicollinearity Test Result

The purpose of the multicollinearity test is to determine whether there is a high correlation among the independent variables in the regression model. A multicollinearity test can only be performed if the regression model has more than one independent variable. A good regression model does not suffer from multicollinearity. The common method for detecting multicollinearity is to examine the tolerance value and the variance inflation factor (VIF).

Table 8. Multicollinearity Test

Coefficients			
Model		Collinearity Statistics	
		Tolerance	VIF
1	CED	0.886	1.129
	FINLEV	0.726	1.377
	CATA	0.898	1.114
	LIQ W	0.792	1.262

a. Dependent Variable: OPM

Source: SPSS data analysis

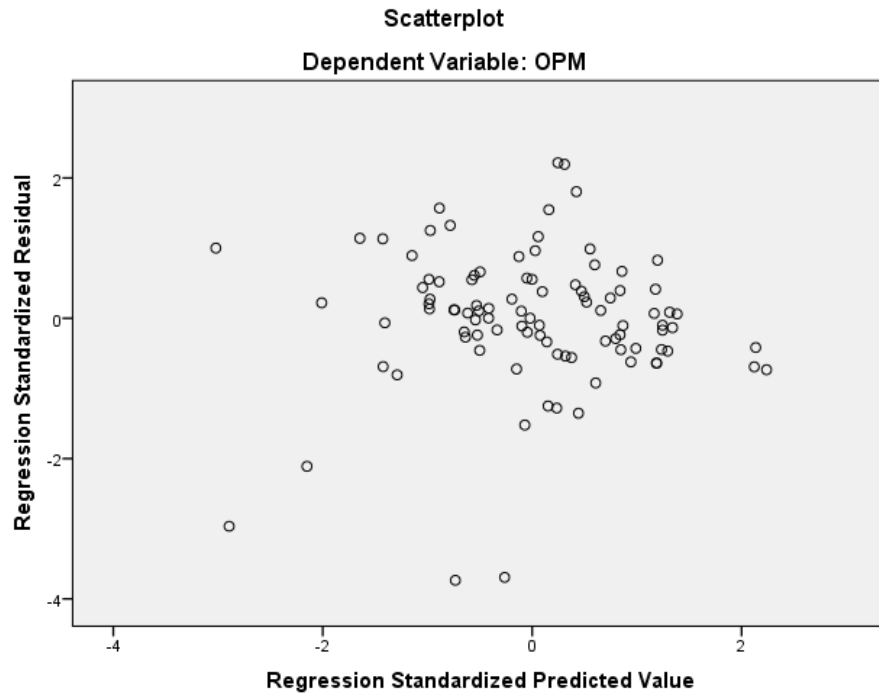
Based on the test criteria shown in Table 4.2.2.2., a regression model is considered free of multicollinearity if the tolerance value is greater than 0.10 and the VIF value is less than 10. The results of the multicollinearity test in this study indicate that all independent variables have tolerance values above 0.10 and VIF values below 10. Specifically, the VIF values for each independent variable range from 1.114 to 1.377, while the tolerance values range from 0.726 to 0.898.

The results indicate that there is no strong correlation among the independent variables in the regression model. Thus, it can be concluded that the regression model used in this study does not suffer from multicollinearity.

4.2.2.3 Heteroscedasticity Test Result

A heteroscedasticity test is used to determine whether there is unequal variance in the residuals of a regression model. A good regression model exhibits no heteroscedasticity, a condition commonly referred to as homoscedasticity. There are several methods for testing heteroscedasticity, such as scatterplots and the Glesjer test. The heteroscedasticity test is conducted using a scatter plot, which involves observing the distribution pattern of standardized residuals relative to standardized predicted values. A regression model is considered free of heteroscedasticity if the residual points are randomly scattered and do not form any specific pattern. This study uses the scatter plot to test for heteroscedasticity.

Figure 3. Scatterplot Graph



Source: SPSS data analysis

Based on the scatter plot in Figure 4.2.2.3, the residual points are randomly distributed above and below zero without forming any clear or systematic pattern. Although some observations appear relatively far from the center, the overall distribution of the residuals does not exhibit a funnel or wave pattern. Therefore, it can be concluded that the regression model does not exhibit serious heteroscedasticity issues.

4.2.3 Multiple Regression Result

Multiple regression is a statistical tool used to study the relationship between one dependent variable and one or more independent variables. Multiple regression has two main purposes: prediction and causal analysis. The purpose of prediction is to develop a formula to predict the dependent variable based on the observed values of the independent variables. Meanwhile, causal analysis aims to determine whether the independent variables influence the dependent variable (Allison, 1999). Based on this theory, this study uses the multiple regression method for the purpose of causal analysis.

Table 9. Multiple Regression

Variable	Coefficient	P-value
(Constant)	0.031	0.627
CED	0.063	0.045
FINLEV	-0.036	0.019
CATA	0.202	0.048
LIQ_W	-0.016	0.047
Model Summary		
Adjusted R Square	0.078	
Regression Model	0.022	

Significant Level of 5%

Source: SPSS data analysis

Table 4.2.3 shows the results of the F test in the ANOVA table, obtaining a significance value of 0.022. This value is smaller than the 0.05 significance level, so the regression model is declared feasible and can be used to explain the effect of Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity

(CATA), and Liquidity (LIQ) on Operational Performance (OPM). Thus, the independent variables in this study simultaneously influence the company's operational performance.

Based on the results of the coefficient of determination test, the Adjusted R Square value was 0.078. This indicates that the Circular Economy Disclosure (CED), Financial Leverage (FINLEV), Current Asset Intensity (CATA), and Liquidity (LIQ) variables are able to explain 7.8% of the variation in Operational Performance (OPM). Meanwhile, 92.2% of the variation in Operational Performance is explained by other factors not included in the research model.

Besides that Table 4.2.3 shows that Circular Economy Disclosure (CED), as an independent variable, has a p-value of 0.045. Since the p-value is smaller than the significance level of 0.05, it can be concluded that CED has a significant relationship with operational performance, as represented by the Operating Profit Margin (OPM). Furthermore, the multiple regression results also show that the CED coefficient is 0.031, indicating that the relationship between CED and operational performance is positive, as predicted. Thus, the first hypothesis (H1) is accepted. CED has a positive relationship with a company's operational performance.

Financial Leverage (FINLEV), as an independent variable, has a significance value of 0.019. Since this significance value is less than

the significance level of 0.05, it can be concluded that FINLEV has a significant relationship with operational performance, which is proxied by the Operating Profit Margin (OPM). Furthermore, the regression results show that the coefficient for FINLEV is -0.036, indicating that the relationship between FINLEV and operational performance is negative. Thus, the second hypothesis (H2) is accepted. Financial leverage has a negative effect on a company's operational performance.

Current Asset Intensity (CATA), as an independent variable, has a significance value of 0.048. Since this significance value is less than the significance level of 0.05, it can be concluded that CATA has a significant relationship with operational performance, which is proxied by the Operating Profit Margin (OPM). Furthermore, the regression results show that the CATA coefficient is 0.202, indicating that the relationship between CATA and operational performance is positive. Thus, the third hypothesis (H3) is accepted. Current asset intensity has a positive effect on a company's operational performance.

Liquidity (LIQ_W), as an independent variable, has a significance value of 0.047. Since this significance value is less than the significance level of 0.05, it can be concluded that LIQ_W has a significant relationship with operational performance, which is proxied by the Operating Profit Margin (OPM). Furthermore, the regression results show that the coefficient of LIQ_W is -0.016, indicating that the

relationship between liquidity and operational performance is negative.

Thus, the fourth hypothesis (H4) is accepted. Liquidity has a negative effect on a company's operational performance.

4.3 Result Interpretation

In the previous chapter, four hypotheses were proposed in this study.

Table 4.3 presents a summary of each hypothesis developed and proposed in this study.

Table 10. Hypotheses Testing

Variable	Hypotheses	Description	Result
Circular Economy Disclosure	H1	Circular Economy Disclosure positively affects a company's operational performance	Accepted
Financial Leverage	H2	Financial leverage negatively affects a company's operational performance	Accepted
Current Assets to Total Assets/ Current Assets Intensity	H3	Current assets intensity positively affects a company's operational performance	Accepted
Liquidity	H4	Liquidity negatively affects a company's operational performance	Accepted

Source: SPSS data analysis

As shown in Table 4.3, the first, second, third, and fourth hypotheses are accepted. This means that Circular Economy Disclosure (CED), financial leverage, current asset intensity, and liquidity were found to significantly influence the operational performance of companies in the industrial sector listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Specifically, Circular Economy Disclosure and current asset intensity have a

positive impact on operational performance, while financial leverage and liquidity have a negative impact on operational performance. Detailed explanations and implications of each variable are discussed in the following sections.

4.3.1 Circular Economy Disclosure (H1)

This study found that Circular Economy Disclosure (CED) has a positive impact on a company's operational performance. This finding supports the Resource-Based View (RBV) theory, which explains that circular economy practices can serve as strategic capabilities that enhance operational efficiency through resource optimization, waste reduction, and process efficiency. Companies that disclose circular economy practices are considered more likely to implement sustainable operational systems that support better operational outcomes.

These results are also consistent with previous studies conducted by Kristoffersen et al. (2021), Fayyaz et al. (2025), and Yu et al. (2021), which found that sustainability and circular economy practices improve operational efficiency and reduce operational costs. In the context of Indonesian industrial firms, companies that disclose circular economy activities tend to demonstrate better operational performance because such practices can reduce inefficiencies in raw material usage, improve waste management, and optimize operational processes.

Furthermore, these findings support Legitimation Theory and Stakeholder Theory, which explain that companies are increasingly disclosing sustainability-related activities to respond to stakeholder expectations and maintain legitimacy in society. Companies that actively disclose circular economy initiatives can also gain stronger reputational benefits and stakeholder trust, which can indirectly support operational effectiveness.

However, descriptive statistics show that only 45.8% of the sample disclosed circular economy practices, while 54.2% did not disclose such information. This indicates that the adoption and disclosure of circular economy practices among Indonesian industrial companies remain relatively limited.

4.3.2 Financial Leverage (H2)

This study found that financial leverage negatively affects a company's operational performance. This finding indicates that companies with higher dependence on external financing tend to experience lower operational efficiency and profitability.

These results support the trade-off theory, which states that to maximize one aspect, companies must sacrifice another aspect of their available resources. High leverage increases fixed financial obligations, particularly interest expenses, which can limit management's flexibility in allocating resources toward operational improvements and sustainability-related investments. Excessive leverage adversely affects a company's performance.

These findings are consistent with previous studies by Afandy (2024) and Ahamed et al. (2022), which concluded that excessive leverage reduces operational performance because companies face greater financial pressure and risk exposure. In the context of Indonesian industrial firms, companies with high leverage may prioritize debt repayment and short-term financial stability over investments that could improve operational efficiency.

Furthermore, descriptive statistics indicate that the average financial leverage among the sample firms is relatively high, suggesting that many firms rely heavily on external financing in their capital structure.

4.3.3 Current Asset Intensity (H3)

This study found that current asset intensity has a positive impact on a company's operational performance. This finding suggests that companies with a higher proportion of current assets tend to conduct smoother operational activities and achieve better operational profitability.

These results support Working Capital Management Theory, which emphasizes the importance of effectively managing current assets to support operational continuity and efficiency. Adequate current assets enable companies to finance short-term operational activities, maintain inventory availability, and avoid operational disruptions.

These findings are consistent with previous studies conducted by Nazir and Afza (2009) and García-Teruel and Martínez-Solano (2007), which show that efficient working capital management makes a positive contribution to firm

performance. In manufacturing and industrial firms, operational activities require a significant amount of working capital to support inventory management, procurement, and day-to-day production processes. Therefore, companies with a stronger current asset structure tend to operate more efficiently and maintain better operational performance.

Descriptive statistics also show that the average current asset intensity among the sample companies is relatively high, indicating that industrial companies in Indonesia generally allocate a large portion of their assets to support operational activities.

4.3.4 Liquidity (H4)

This study found that liquidity has a negative impact on a company's operational performance. These findings indicate that companies with excessively high liquidity levels tend to experience lower operational profitability.

These results support the Trade-Off Theory, which explains that maintaining excessive current assets and cash balances may enhance short-term financial security but can reduce operational efficiency and profitability because resources become idle and are not utilized optimally.

These findings are consistent with research conducted by Quoc et al. (2024), which shows that high liquidity has a negative impact on the performance of manufacturing firms. In the context of this study, firms with very high liquidity may hold excessive cash, accounts receivable, or inventory,

which are not optimally utilized to generate operating profits. Consequently, operating margins may decline due to inefficient resource allocation.

Furthermore, descriptive statistics reveal significant variation in liquidity levels among the companies in the sample, indicating differences in working capital management strategies and operational efficiency.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

This study aims to examine the impact of Circular Economy Disclosure (CED) on the operational performance of industrial sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. This study also analyzes the impact of financial leverage, current asset intensity, and liquidity on operational performance. The theoretical perspectives used in this study include Legitimation Theory, Stakeholder Theory, Resource-Based View (RBV) Theory, Trade-Off Theory, and Working Capital Management Theory.

The research objects consist of annual reports and sustainability reports published by industrial sector companies listed on the Indonesia Stock Exchange (IDX). Circular Economy Disclosure (CED) analysis was conducted using a content analysis approach based on circular economy indicators adapted from previous research, specifically Vitolla et al. (2023) and Opferkuch et al. (2022). Operational performance variables were measured using the Operating Profit Margin (OPM), while multiple linear regression analysis was used to test the hypotheses developed in this study.

Table 11. The Summary of Research Results

No	Research Question	Research Result
1	What is the level of Circular Economy Disclosure (CED) among industrial sector companies listed on the IDX during the 2022–2024 period?	From 96 observations, 44 observations (45.8%) disclosed circular economy practices, while 52 observations (54.2%) did not disclose circular economy information in accordance with the established criteria. This indicates that the level of circular economy disclosure among Indonesian industrial companies remains relatively limited.
2	Does Circular Economy Disclosure (CED) affect a company's operational performance?	Yes, it does. The research result showed that Circular Economy Disclosure positively affects operational performance.
3	Does financial leverage affect a company's operational performance?	Yes, it does. The research result showed that financial leverage negatively affects operational performance.
4	Does current assets intensity affect a company's operational performance?	Yes, it does. The research result showed that current assets intensity positively affects operational performance.
5	Does liquidity affect a company's operational performance?	Yes, it does. The research result showed that liquidity negatively affects operational performance.

Based on the results above, it can be seen that this study involved 32 companies in the industrial sector during the 2022–2024 period, yielding 96 observations. Based on the results of the descriptive statistical analysis, the average Circular Economy Disclosure (CED) level among the sample companies remains relatively low. Of the 96 observations, there are only 44 observations, or 45.8%, that disclosed circular economy practices, while 52 observations, or 54.2%, did not disclose circular economy information in accordance with the established criteria. These findings indicate that the implementation and disclosure of circular economy practices among industrial companies in Indonesia remain relatively limited.

The results of the hypothesis testing indicate that all hypotheses proposed in this study are accepted. Circular Economy Disclosure (CED) and Current Asset Intensity have a positive effect on operational performance, while Financial Leverage and Liquidity have a negative effect on operational performance.

The positive relationship between Circular Economy Disclosure and operational performance indicates that companies that disclose circular economy activities tend to have more efficient operational systems. This finding supports the Resource-Based View (RBV) theory, which explains that circular economy practices can serve as strategic organizational capabilities that enable companies to optimize resource utilization, reduce operational inefficiencies, and improve production processes. Furthermore, these findings also support Legitimation Theory and Stakeholder Theory, under which companies disclose sustainability-related activities to meet stakeholder expectations and strengthen organizational legitimacy.

The negative relationship between financial leverage and operational performance indicates that companies with higher reliance on external financing tend to experience lower operational profitability. These results imply that excessive debt creates financial pressure through fixed obligations such as interest expenses, thereby limiting a company's flexibility to allocate resources toward operational improvements and sustainability initiatives.

The positive relationship between current asset intensity and operational performance indicates that companies with a higher proportion of current assets tend to maintain smoother operational activities and better operational profitability. This

finding supports the Working Capital Management Theory, which emphasizes the importance of managing current assets in maintaining operational sustainability and efficiency.

Meanwhile, liquidity was found to have a negative impact on operational performance. These results imply that excessive liquidity can lead to inefficient resource allocation because companies hold excessive cash, accounts receivable, or inventory that is not optimally utilized to generate operating profit. This finding supports the Trade-Off Theory, which explains that companies face a trade-off between maintaining financial security and maximizing operational profitability.

Overall, this study concludes that Circular Economy Disclosure (CED) makes a positive contribution to the operational performance of companies in the industrial sector in Indonesia. These findings indicate that sustainability-oriented operational strategies, particularly circular economy practices, can enhance operational efficiency and profitability if effectively implemented and disclosed.

5.2 Research Implications

The findings of this research suggest that Circular Economy Disclosure (CED) is an important factor influencing operational performance among industrial sector companies in Indonesia. The positive influence of CED implies that sustainability-oriented operational practices are not only beneficial for environmental responsibility, but may also contribute to operational efficiency and profitability.

From a theoretical perspective, this research contributes to the development of circular economy and sustainability disclosure literature, particularly within the context

of developing countries such as Indonesia. This study extends the application of the Resource-Based View (RBV) Theory by demonstrating that circular economy practices may function as strategic organizational capabilities that enhance operational performance. In addition, this study supports Legitimacy Theory and Stakeholder Theory, which explain that sustainability disclosure is used by companies to respond to stakeholder expectations and strengthen organizational legitimacy.

The findings also contribute to Working Capital Management Theory and Trade-Off Theory by demonstrating that current assets intensity and liquidity significantly influence operational performance. Companies with effective current asset management tend to achieve better operational efficiency, while excessive liquidity may reduce operational profitability due to inefficient resource utilization.

From a practical perspective, this research implies that companies should not perceive Circular Economy Disclosure merely as a symbolic sustainability reporting activity. Instead, companies should integrate circular economy practices into operational strategies and business processes to improve efficiency, reduce waste, optimize resource utilization, and strengthen long-term operational performance.

The findings also imply that companies should maintain balanced financial management. Excessive leverage may reduce operational flexibility and profitability, while excessive liquidity may result in idle resources and inefficient operational performance. Therefore, companies should carefully manage debt levels, liquidity, and current assets to maintain operational efficiency.

For regulators and policymakers, this research indicates that circular economy disclosure practices among Indonesian industrial companies remain relatively limited. Therefore, regulatory institutions such as the Indonesia Stock Exchange (IDX) and the Financial Services Authority (OJK) may encourage more standardized sustainability and circular economy reporting practices to improve transparency and sustainability implementation among listed companies.

Furthermore, this study provides implications for investors and stakeholders by indicating that companies with stronger circular economy disclosure practices may have better operational efficiency and long-term sustainability potential. Therefore, sustainability-related disclosures may serve as additional information for evaluating a company's operational quality and prospects.

5.3 Research Limitations

This research still has several limitations that should be considered for future studies.

1. This study only focused on industrial sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Therefore, the findings may not fully represent companies from other sectors or countries with different operational and regulatory environments.
2. The measurement of Circular Economy Disclosure (CED) relied on content analysis of annual reports and sustainability reports. Consequently, the analysis depended on the availability and quality of

company disclosures, which may not fully reflect actual circular economy implementation within the company.

3. The study used Operating Profit Margin (OPM) as the sole proxy for operational performance. Other operational performance indicators such as inventory turnover, cost efficiency, or productivity ratios were not included in this research.
4. This research used quantitative analysis and secondary data only. Therefore, the study could not directly examine managerial motivations, internal operational practices, or the actual implementation process of circular economy initiatives within companies.
5. The number of observations in this study was relatively limited, consisting of 96 observations from 32 companies over a three-year period. A larger sample and longer observation period may provide more comprehensive results.

5.4 Recommendations

Based on the limitations and findings of this study, several recommendations are proposed for future research and practical implementation.

1. Future studies are expected to expand the research sample by including companies from different sectors or other developing countries in order to provide broader empirical evidence regarding Circular Economy Disclosure and operational performance.

2. Future research is recommended to use a longer observation period to better capture the long-term impact of Circular Economy Disclosure on operational performance.
3. Future studies are encouraged to use additional operational performance indicators, such as inventory turnover, operational efficiency, or productivity ratios, to provide more comprehensive measurements of operational performance.
4. Companies are recommended to strengthen the actual implementation of circular economy practices rather than limiting such practices to disclosure purposes only, as effective implementation may improve operational efficiency and long-term sustainability.
5. Regulators and policymakers are encouraged to develop clearer and more standardized Circular Economy Disclosure guidelines to improve reporting consistency and sustainability practices among Indonesian companies.

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APPENDICES

INDUSTRIAL COMPANY DATA

Appendix 1. Financial Report Data

Company	Year	CED	Current Assets Intensity	Liquidity_W	Financial Leverage	Operating Profit Margin
AMFG	2024	1	0.29	1.42	1.62	-0.11
AMFG	2023	1	0.37	1.44	1.77	-0.11
AMFG	2022	1	0.32	1.20	2.01	-0.11
AMIN	2024	1	0.82	1.37	1.79	0.07
AMIN	2023	0	0.63	1.40	2.27	0.07
AMIN	2022	0	0.64	1.39	2.21	0.06
APII	2024	0	0.49	1.60	1.51	0.09
APII	2023	0	0.51	1.75	1.46	0.18
APII	2022	0	0.55	1.79	1.49	0.14
ARNA	2024	0	0.57	2.10	1.42	0.20
ARNA	2023	0	0.60	2.41	1.41	0.23
ARNA	2022	0	0.62	2.34	1.41	0.29
ASGR	2024	1	0.84	2.57	1.53	0.07
ASGR	2023	0	0.82	2.64	1.50	0.06
ASGR	2022	0	0.83	2.43	1.58	0.04
ASII	2024	1	0.37	1.33	1.74	0.13
ASII	2023	1	0.37	1.33	1.78	0.14
ASII	2022	1	0.44	1.51	1.70	0.14
CTTH	2024	1	0.56	2.66	3.85	-0.01
CTTH	2023	1	0.57	2.72	3.56	0.06
CTTH	2022	0	0.61	1.19	4.12	-0.02
HEXA	2024	1	0.72	1.59	2.66	0.13
HEXA	2023	1	0.94	1.42	2.60	0.11
HEXA	2022	1	0.54	0.89	3.03	0.15
IKBI	2024	0	0.47	2.46	1.79	0.04
IKBI	2023	0	0.56	1.49	1.48	0.02
IKBI	2022	0	0.43	1.38	1.74	0.00
IMPC	2024	1	0.49	0.95	2.08	0.20
IMPC	2023	1	0.52	1.46	1.56	0.18
IMPC	2022	1	0.51	2.45	1.54	0.16

JECC	2024	0	0.77	1.19	3.08	0.03
JECC	2023	0	0.74	1.22	2.73	0.05
JECC	2022	0	0.73	1.16	2.94	0.04
JTPE	2024	1	0.60	1.64	1.64	0.14
JTPE	2023	1	0.58	1.59	1.65	0.14
JTPE	2022	0	0.54	1.73	1.53	0.14
KOBX	2024	1	0.66	0.89	8.64	0.05
KOBX	2023	1	0.68	0.90	7.30	-0.01
KOBX	2022	1	0.65	0.95	5.00	0.03
KONI	2024	0	0.81	8.52	1.20	0.09
KONI	2023	0	0.78	8.52	1.17	0.09
KONI	2022	0	0.77	8.52	1.20	0.07
LION	2024	1	0.65	3.36	1.43	0.03
LION	2023	1	0.65	3.03	1.51	0.06
LION	2022	1	0.69	3.50	1.44	0.06
MLIA	2024	1	0.34	2.69	1.32	0.00
MLIA	2023	1	0.35	2.17	1.42	0.00
MLIA	2022	1	0.34	2.01	1.52	0.00
SCCO	2024	1	0.39	7.76	1.06	0.05
SCCO	2023	1	0.39	5.94	1.08	0.04
SCCO	2022	1	0.37	5.43	1.08	0.02
TIRA	2024	0	0.49	1.23	2.13	0.05
TIRA	2023	0	0.45	1.22	2.06	0.04
TIRA	2022	0	0.48	1.24	2.10	0.06
TOTO	2024	0	0.48	3.63	1.38	0.21
TOTO	2023	0	0.44	3.64	1.42	0.19
TOTO	2022	0	0.46	3.57	1.44	0.24
UNTR	2024	1	0.41	1.54	1.73	0.20
UNTR	2023	1	0.41	1.46	1.83	0.23
UNTR	2022	1	0.56	1.88	1.57	0.24
VOKS	2024	1	0.72	1.14	2.83	0.03
VOKS	2023	1	0.74	1.33	3.56	0.05
VOKS	2022	1	0.72	1.04	3.71	-0.04
MARK	2024	1	0.45	4.53	1.11	0.39
MARK	2023	1	0.44	3.80	1.13	0.34
MARK	2022	1	0.43	3.90	1.19	0.39
SPTO	2024	0	0.41	1.71	1.44	0.13
SPTO	2023	0	0.39	1.61	1.45	0.12
SPTO	2022	0	0.38	1.49	1.48	0.11

CAKK	2024	1	0.35	0.89	2.64	-0.16
CAKK	2023	0	0.30	0.89	2.32	-0.12
CAKK	2022	0	0.28	0.89	1.77	0.04
CCSI	2024	1	0.52	1.99	1.59	0.05
CCSI	2023	0	0.56	1.61	1.84	-0.05
CCSI	2022	0	0.62	1.63	1.82	0.12
BLUE	2024	0	0.58	6.60	1.13	0.13
BLUE	2023	0	0.56	7.19	1.15	0.15
BLUE	2022	0	0.60	8.52	1.09	0.14
LABA	2024	0	0.54	2.34	1.56	-0.48
LABA	2023	0	0.28	8.49	1.07	-0.51
LABA	2022	0	0.48	8.52	1.13	-0.35
GPSO	2024	0	0.55	4.71	1.22	-0.51
GPSO	2023	0	0.63	4.98	1.22	-0.03
GPSO	2022	0	0.57	5.18	1.22	0.00
KUAS	2024	1	0.63	2.00	1.71	0.11
KUAS	2023	1	0.60	1.97	1.69	0.11
KUAS	2022	1	0.61	1.83	1.81	0.10
BINO	2024	0	0.34	4.36	1.17	-0.11
BINO	2023	0	0.40	3.58	1.23	0.03
BINO	2022	0	0.40	2.82	1.24	0.04
KING	2024	0	0.85	2.84	1.52	0.07
KING	2023	0	0.87	2.63	1.58	0.02
KING	2022	0	0.75	1.37	2.71	0.03
PTMP	2024	0	0.83	3.35	1.44	0.11
PTMP	2023	0	0.89	3.30	1.50	0.09
PTMP	2022	0	0.79	2.50	1.79	0.12

Appendix 2. Operating Income and Revenue

Company	Year	Operating Income	Revenue
AMFG	2024	-592,725	5,441,260,000,000
AMFG	2023	-643,171	5,913,565,000,000
AMFG	2022	-626,328	5,571,767,000,000
AMIN	2024	23,526,227,443	336,797,741,017
AMIN	2023	16,214,707,291	217,836,301,363
AMIN	2022	11,563,625,169	182,184,441,799
APII	2024	24,728,100,433	280,126,867,734
APII	2023	52,354,623,228	299,110,900,336
APII	2022	41,320,634,715	295,022,431,265
ARNA	2024	537,356,273,338	2,632,310,100,626
ARNA	2023	563,298,824,982	2,447,442,037,597
ARNA	2022	742,310,569,537	2,586,665,297,217
ASGR	2024	204,118	2,814,262,000,000
ASGR	2023	180,379	2,968,952,000,000
ASGR	2022	120,386	2,909,972,000,000
ASII	2024	42,202	330,920,000,000,000
ASII	2023	44,268	316,565,000,000,000
ASII	2022	42,201	301,379,000,000,000
CTTH	2024	-1,985,100,785	145,529,362,070
CTTH	2023	6,076,908,314	99,239,654,190
CTTH	2022	-1,824,815,576	115,113,867,868
HEXA	2024	77,214,295	9,707,207,899,741
HEXA	2023	70,125,867	9,496,518,012,268
HEXA	2022	70,820,772	6,647,357,774,923
IKBI	2024	10,429,670	3,933,104,523,810
IKBI	2023	5,208,115	3,427,894,348,485
IKBI	2022	-683,120	3,300,896,528,571
IMPC	2024	794,749,831,494	3,877,933,381,099
IMPC	2023	658,838,601,604	3,630,700,574,969
IMPC	2022	447,460,961,754	2,808,698,656,787
JECC	2024	114,526,186	3,508,544,707,000
JECC	2023	150,044,864	3,087,562,665,000
JECC	2022	99,823,614	2,816,473,345,000
JTPE	2024	303,590,607,540	2,116,285,894,967
JTPE	2023	312,401,410,266	2,296,271,601,062
JTPE	2022	196,596,764,070	1,423,142,732,743

KOBX	2024	101,700,463,171	2,101,582,212,772
KOBX	2023	-16,433,562,340	1,962,284,352,932
KOBX	2022	84,304,290,707	2,506,023,138,911
KONI	2024	23,939,888,321	279,234,631,602
KONI	2023	23,516,777,041	250,993,441,832
KONI	2022	13,112,751,202	178,583,574,879
LION	2024	12,901,234,610	425,423,985,814
LION	2023	27,420,203,238	452,134,429,435
LION	2022	24,317,393,283	408,811,497,547
MLIA	2024	437,756,864	4,417,035,469,000
MLIA	2023	798,770,390	4,806,411,306,000
MLIA	2022	1,163,766,298	5,073,812,958,000
SCCO	2024	344,846,678,845	6,939,147,619,476
SCCO	2023	246,527,627,313	5,823,016,502,106
SCCO	2022	105,063,441,188	5,469,205,561,730
TIRA	2024	14,559,590,229	287,085,798,251
TIRA	2023	10,099,466,216	259,866,255,082
TIRA	2022	15,892,819,479	285,154,421,885
TOTO	2024	359,042,736,356	1,707,458,283,469
TOTO	2023	298,345,495,936	1,544,297,098,890
TOTO	2022	377,233,170,446	1,559,786,310,303
UNTR	2024	27,181,530	134,426,998,000,000
UNTR	2023	29,723,143	128,583,264,000,000
UNTR	2022	29,132,716	123,607,460,000,000
VOKS	2024	61,307,931,821	1,879,353,267,138
VOKS	2023	161,722,238,723	3,055,441,987,857
VOKS	2022	-95,694,085,159	2,628,553,150,836
MARK	2024	353,455,525,169	909,986,179,510
MARK	2023	191,395,922,292	559,468,977,416
MARK	2022	324,769,040,990	823,656,040,401
SPTO	2024	372,434,334,391	2,915,244,767,837
SPTO	2023	310,513,635,801	2,605,488,939,158
SPTO	2022	288,146,116,580	2,505,644,878,372
CAKK	2024	-38,792,532,596	239,479,149,464
CAKK	2023	-24,729,878,143	208,635,900,710
CAKK	2022	10,226,647,648	250,320,655,340
CCSI	2024	14,381,300	291,364,724,000
CCSI	2023	-16,669,096	349,501,044,000
CCSI	2022	72,350,061	615,332,096,000

BLUE	2024	21,133,001,345	160,218,189,058
BLUE	2023	21,377,510,084	143,083,261,635
BLUE	2022	18,579,559,106	131,320,519,406
LABA	2024	-10,472,671,178	21,620,176,330
LABA	2023	-5,707,115,630	11,110,830,399
LABA	2022	-5,433,053,231	15,642,947,889
GPSO	2024	-5,169,659,580	10,185,970,833
GPSO	2023	-424,928,039	16,156,261,887
GPSO	2022	50,982,848	15,209,318,316
KUAS	2024	20,140,916,575	184,692,659,345
KUAS	2023	18,523,601,048	161,660,709,008
KUAS	2022	15,507,267,448	153,828,140,683
BINO	2024	-38,978,062,256	361,514,370,265
BINO	2023	9,935,598,942	364,775,355,900
BINO	2022	11,153,433,297	312,850,177,400
KING	2024	15,346,930,898	215,116,835,834
KING	2023	4,586,024,740	213,107,450,464
KING	2022	4,529,984,475	161,856,738,362
PTMP	2024	21,097,293,743	192,300,097,186
PTMP	2023	13,332,888,347	152,990,933,708
PTMP	2022	16,692,247,230	136,036,226,335

Appendix 3. Total Assets and Total Equity

Company	Year	Total Assets	Total Equity
AMFG	2024	7,271,566,000,000	4,493,485,000,000
AMFG	2023	7,500,664,000,000	4,240,737,000,000
AMFG	2022	7,466,520,000,000	3,720,172,000,000
AMIN	2024	302,507,741,513	169,085,891,010
AMIN	2023	349,831,869,426	154,172,119,018
AMIN	2022	323,052,524,991	146,467,951,463
APII	2024	628,645,607,287	417,433,943,563
APII	2023	600,737,338,506	410,447,289,084
APII	2022	564,389,039,479	377,677,206,114
ARNA	2024	2,661,363,620,207	1,877,542,047,769
ARNA	2023	2,620,491,657,384	1,855,036,456,226
ARNA	2022	2,578,868,615,545	1,833,173,357,237
ASGR	2024	2,948,437,000,000	1,925,660,000,000
ASGR	2023	2,682,813,000,000	1,791,902,000,000
ASGR	2022	2,677,651,000,000	1,693,222,000,000
ASII	2024	472,925,000,000,000	271,496,000,000,000
ASII	2023	445,679,000,000,000	250,424,000,000,000
ASII	2022	413,297,000,000,000	243,720,000,000,000
CTTH	2024	733,392,898,825	190,682,417,078
CTTH	2023	751,633,765,958	211,285,219,780
CTTH	2022	712,262,467,657	172,805,106,979
HEXA	2024	7,564,974,621,050	2,840,612,629,705
HEXA	2023	6,489,489,607,850	2,496,688,950,894
HEXA	2022	6,945,351,626,700	2,291,585,845,298
IKBI	2024	2,048,690,024,150	1,144,240,818,181
IKBI	2023	1,697,023,314,450	1,148,924,921,875
IKBI	2022	1,779,182,272,210	1,025,379,772,727
IMPC	2024	4,467,461,028,990	2,144,910,327,447
IMPC	2023	4,105,362,087,706	2,625,694,521,530
IMPC	2022	3,435,475,875,401	2,224,729,775,954
JECC	2024	2,559,780,236,000	830,675,864,000
JECC	2023	2,162,295,387,000	792,848,103,000
JECC	2022	2,199,797,641,000	748,228,960,000
JTPE	2024	2,056,046,902,628	1,255,446,996,634
JTPE	2023	1,789,774,127,224	1,085,119,509,183
JTPE	2022	1,563,637,707,080	1,022,066,401,511

KOBX	2024	3,399,225,834,197	393,325,936,456
KOBX	2023	3,504,469,145,665	480,031,792,796
KOBX	2022	2,904,929,971,947	581,243,271,749
KONI	2024	187,840,203,162	157,119,082,793
KONI	2023	160,654,900,392	136,773,378,850
KONI	2022	142,147,376,515	117,981,472,596
LION	2024	714,173,448,726	501,054,495,790
LION	2023	742,886,859,560	491,383,655,588
LION	2022	684,497,878,481	474,814,738,259
MLIA	2024	7,047,137,434,000	5,358,315,724,000
MLIA	2023	7,017,221,425,000	4,958,184,254,000
MLIA	2022	6,806,945,264,000	4,483,138,057,000
SCCO	2024	5,702,138,963,030	5,370,485,945,013
SCCO	2023	5,329,800,918,271	4,937,294,743,449
SCCO	2022	5,128,133,329,237	4,730,661,689,317
TIRA	2024	362,727,195,241	170,654,107,364
TIRA	2023	345,923,104,863	167,845,687,780
TIRA	2022	351,091,425,626	167,404,511,556
TOTO	2024	3,403,386,527,222	2,461,847,728,548
TOTO	2023	3,333,890,799,976	2,351,397,318,568
TOTO	2022	3,304,972,191,991	2,302,761,450,906
UNTR	2024	169,480,618,000,000	98,175,173,000,000
UNTR	2023	153,753,903,000,000	84,041,642,000,000
UNTR	2022	140,478,220,000,000	89,513,825,000,000
VOKS	2024	1,833,424,147,167	648,533,867,853
VOKS	2023	2,623,144,891,155	735,878,407,736
VOKS	2022	2,665,946,796,991	719,096,063,625
MARK	2024	955,841,009,395	860,896,265,733
MARK	2023	951,550,724,256	840,101,540,924
MARK	2022	1,005,368,365,991	843,781,090,844
SPTO	2024	3,415,593,681,665	2,363,846,780,175
SPTO	2023	3,237,655,784,669	2,229,593,055,850
SPTO	2022	3,116,150,805,162	2,107,640,326,367
CAKK	2024	488,293,543,875	184,674,591,486
CAKK	2023	466,022,798,636	200,674,954,592
CAKK	2022	447,970,072,779	252,521,962,253
CCSI	2024	665,973,603,000	419,260,891,000
CCSI	2023	751,953,677,000	409,233,004,000
CCSI	2022	795,180,378,000	436,991,009,000

BLUE	2024	109,305,353,340	96,441,994,701
BLUE	2023	103,992,480,787	90,699,993,393
BLUE	2022	95,882,590,139	87,863,834,988
LABA	2024	93,023,607,568	59,779,833,951
LABA	2023	58,615,074,591	54,709,757,491
LABA	2022	66,268,642,560	58,648,514,927
GPSO	2024	55,699,398,593	45,559,224,932
GPSO	2023	62,573,997,855	51,153,519,453
GPSO	2022	61,117,189,903	50,193,920,824
KUAS	2024	278,143,466,044	162,876,416,982
KUAS	2023	264,359,355,793	156,454,877,731
KUAS	2022	269,542,435,102	149,151,859,114
BINO	2024	482,277,518,939	413,017,887,012
BINO	2023	543,318,258,444	442,226,873,600
BINO	2022	544,212,563,185	437,865,368,437
KING	2024	160,124,524,230	105,175,502,052
KING	2023	147,218,734,114	93,467,965,011
KING	2022	75,394,920,104	27,850,582,834
PTMP	2024	334,864,065,588	232,277,067,812
PTMP	2023	257,054,319,282	170,862,538,171
PTMP	2022	124,825,165,426	69,901,563,849

Appendix 4. Total Assets and Revenue

Company	Year	Total Assets	Revenue
AMFG	2024	7,271,566,000,000	5,441,260,000,000
AMFG	2023	7,500,664,000,000	5,913,565,000,000
AMFG	2022	7,466,520,000,000	5,571,767,000,000
AMIN	2024	302,507,741,513	336,797,741,017
AMIN	2023	349,831,869,426	217,836,301,363
AMIN	2022	323,052,524,991	182,184,441,799
APII	2024	628,645,607,287	280,126,867,734
APII	2023	600,737,338,506	299,110,900,336
APII	2022	564,389,039,479	295,022,431,265
ARNA	2024	2,661,363,620,207	2,632,310,100,626
ARNA	2023	2,620,491,657,384	2,447,442,037,597
ARNA	2022	2,578,868,615,545	2,586,665,297,217
ASGR	2024	2,948,437,000,000	2,814,262,000,000
ASGR	2023	2,682,813,000,000	2,968,952,000,000
ASGR	2022	2,677,651,000,000	2,909,972,000,000
ASII	2024	472,925,000,000,000	330,920,000,000,000
ASII	2023	445,679,000,000,000	316,565,000,000,000
ASII	2022	413,297,000,000,000	301,379,000,000,000
CTTH	2024	733,392,898,825	145,529,362,070
CTTH	2023	751,633,765,958	99,239,654,190
CTTH	2022	712,262,467,657	115,113,867,868
HEXA	2024	7,564,974,621,050	9,707,207,899,741
HEXA	2023	6,489,489,607,850	9,496,518,012,268
HEXA	2022	6,945,351,626,700	6,647,357,774,923
IKBI	2024	2,048,690,024,150	3,933,104,523,810
IKBI	2023	1,697,023,314,450	3,427,894,348,485
IKBI	2022	1,779,182,272,210	3,300,896,528,571
IMPC	2024	4,467,461,028,990	3,877,933,381,099
IMPC	2023	4,105,362,087,706	3,630,700,574,969
IMPC	2022	3,435,475,875,401	2,808,698,656,787
JECC	2024	2,559,780,236,000	3,508,544,707,000
JECC	2023	2,162,295,387,000	3,087,562,665,000
JECC	2022	2,199,797,641,000	2,816,473,345,000
JTPE	2024	2,056,046,902,628	2,116,285,894,967
JTPE	2023	1,789,774,127,224	2,296,271,601,062
JTPE	2022	1,563,637,707,080	1,423,142,732,743

KOBX	2024	3,399,225,834,197	2,101,582,212,772
KOBX	2023	3,504,469,145,665	1,962,284,352,932
KOBX	2022	2,904,929,971,947	2,506,023,138,911
KONI	2024	187,840,203,162	279,234,631,602
KONI	2023	160,654,900,392	250,993,441,832
KONI	2022	142,147,376,515	178,583,574,879
LION	2024	714,173,448,726	425,423,985,814
LION	2023	742,886,859,560	452,134,429,435
LION	2022	684,497,878,481	408,811,497,547
MLIA	2024	7,047,137,434,000	4,417,035,469,000
MLIA	2023	7,017,221,425,000	4,806,411,306,000
MLIA	2022	6,806,945,264,000	5,073,812,958,000
SCCO	2024	5,702,138,963,030	6,939,147,619,476
SCCO	2023	5,329,800,918,271	5,823,016,502,106
SCCO	2022	5,128,133,329,237	5,469,205,561,730
TIRA	2024	362,727,195,241	287,085,798,251
TIRA	2023	345,923,104,863	259,866,255,082
TIRA	2022	351,091,425,626	285,154,421,885
TOTO	2024	3,403,386,527,222	1,707,458,283,469
TOTO	2023	3,333,890,799,976	1,544,297,098,890
TOTO	2022	3,304,972,191,991	1,559,786,310,303
UNTR	2024	169,480,618,000,000	134,426,998,000,000
UNTR	2023	153,753,903,000,000	128,583,264,000,000
UNTR	2022	140,478,220,000,000	123,607,460,000,000
VOKS	2024	1,833,424,147,167	1,879,353,267,138
VOKS	2023	2,623,144,891,155	3,055,441,987,857
VOKS	2022	2,665,946,796,991	2,628,553,150,836
MARK	2024	955,841,009,395	909,986,179,510
MARK	2023	951,550,724,256	559,468,977,416
MARK	2022	1,005,368,365,991	823,656,040,401
SPTO	2024	3,415,593,681,665	2,915,244,767,837
SPTO	2023	3,237,655,784,669	2,605,488,939,158
SPTO	2022	3,116,150,805,162	2,505,644,878,372
CAKK	2024	488,293,543,875	239,479,149,464
CAKK	2023	466,022,798,636	208,635,900,710
CAKK	2022	447,970,072,779	250,320,655,340
CCSI	2024	665,973,603,000	291,364,724,000
CCSI	2023	751,953,677,000	349,501,044,000
CCSI	2022	795,180,378,000	615,332,096,000

BLUE	2024	109,305,353,340	160,218,189,058
BLUE	2023	103,992,480,787	143,083,261,635
BLUE	2022	95,882,590,139	131,320,519,406
LABA	2024	93,023,607,568	21,620,176,330
LABA	2023	58,615,074,591	11,110,830,399
LABA	2022	66,268,642,560	15,642,947,889
GPSO	2024	55,699,398,593	10,185,970,833
GPSO	2023	62,573,997,855	16,156,261,887
GPSO	2022	61,117,189,903	15,209,318,316
KUAS	2024	278,143,466,044	184,692,659,345
KUAS	2023	264,359,355,793	161,660,709,008
KUAS	2022	269,542,435,102	153,828,140,683
BINO	2024	482,277,518,939	361,514,370,265
BINO	2023	543,318,258,444	364,775,355,900
BINO	2022	544,212,563,185	312,850,177,400
KING	2024	160,124,524,230	215,116,835,834
KING	2023	147,218,734,114	213,107,450,464
KING	2022	75,394,920,104	161,856,738,362
PTMP	2024	334,864,065,588	192,300,097,186
PTMP	2023	257,054,319,282	152,990,933,708
PTMP	2022	124,825,165,426	136,036,226,335

Appendix 5. Current Asset and Current Liabilities

Company	Year	Current Assets	Current Liabilities
AMFG	2024	2,128,507,000,000	1,502,915,000,000
AMFG	2023	2,776,505,000,000	1,922,939,000,000
AMFG	2022	2,392,927,000,000	1,986,252,000,000
AMIN	2024	247,361,669,367	180,745,978,416
AMIN	2023	219,546,498,054	156,573,698,247
AMIN	2022	205,809,889,601	147,961,497,672
APII	2024	310,199,311,834	194,071,687,181
APII	2023	308,413,652,363	175,767,795,344
APII	2022	312,339,991,473	174,914,078,408
ARNA	2024	1,506,249,726,473	717,936,133,361
ARNA	2023	1,573,862,491,967	652,036,510,074
ARNA	2022	1,601,724,616,560	685,894,904,063
ASGR	2024	2,480,929,000,000	966,778,000,000
ASGR	2023	2,187,131,000,000	829,325,000,000
ASGR	2022	2,226,330,000,000	917,998,000,000
ASII	2024	176,931,000,000,000	133,303,000,000,000
ASII	2023	166,186,000,000,000	125,022,000,000,000
ASII	2022	179,818,000,000,000	119,198,000,000,000
CTTH	2024	409,698,036,537	154,008,551,863
CTTH	2023	430,751,516,292	158,611,498,728
CTTH	2022	435,146,467,918	364,143,101,148
HEXA	2024	5,437,691,428,948	3,412,452,484,593
HEXA	2023	6,081,186,930,704	4,280,635,179,558
HEXA	2022	3,744,756,913,003	1,908,581,771,170,300
IKBI	2024	954,468,984,127	388,616,968,254
IKBI	2023	952,384,954,546	638,265,393,939
IKBI	2022	756,156,257,143	549,743,542,857
IMPC	2024	2,206,134,862,422	2,322,550,701,543
IMPC	2023	2,154,030,401,124	1,479,667,566,176
IMPC	2022	1,754,894,947,354	716,738,190,188
JECC	2024	1,966,667,496,000	1,652,255,723,000
JECC	2023	1,593,571,789,000	1,303,802,353,000
JECC	2022	1,612,699,929,000	1,391,322,089,000
JTPE	2024	1,232,553,669,534	752,730,827,069
JTPE	2023	1,042,772,962,708	654,105,514,930
JTPE	2022	843,786,540,254	488,176,318,701

KOBX	2024	2,249,226,499,411	2,651,986,788,778
KOBX	2023	2,394,043,104,831	2,655,104,384,047
KOBX	2022	1,901,805,550,288	1,991,440,209,084
KONI	2024	152,193,585,120	17,629,514,907
KONI	2023	125,688,153,695	11,021,131,542
KONI	2022	109,253,464,513	10,909,228,310
LION	2024	466,483,293,896	138,833,103,672
LION	2023	481,765,550,379	159,255,073,682
LION	2022	473,379,372,904	135,297,369,996
MLIA	2024	2,403,424,680,000	894,832,004,000
MLIA	2023	2,441,619,884,000	1,123,458,245,000
MLIA	2022	2,328,864,897,000	1,158,518,478,000
SCCO	2024	2,218,175,953,025	285,976,020,771
SCCO	2023	2,080,263,323,999	350,038,626,503
SCCO	2022	1,896,185,326,170	348,948,204,860
TIRA	2024	175,940,282,987	142,733,385,039
TIRA	2023	156,446,605,473	127,816,989,913
TIRA	2022	169,214,403,546	136,732,316,074
TOTO	2024	1,629,576,276,567	448,729,781,768
TOTO	2023	1,460,881,909,344	400,851,025,764
TOTO	2022	1,528,687,046,125	427,991,220,891
UNTR	2024	69,979,284,000,000	45,302,555,000,000
UNTR	2023	62,667,105,000,000	43,038,299,000,000
UNTR	2022	78,930,048,000,000	42,037,402,000,000
VOKS	2024	1,329,199,612,119	1,166,391,567,481
VOKS	2023	1,953,852,287,572	1,467,308,532,113
VOKS	2022	1,909,986,082,577	1,837,461,124,059
MARK	2024	430,265,056,672	94,944,743,662
MARK	2023	423,036,125,486	111,449,183,332
MARK	2022	436,258,395,750	111,916,306,055
SPTO	2024	1,411,495,643,021	825,475,645,889
SPTO	2023	1,268,404,496,700	789,166,654,793
SPTO	2022	1,175,602,452,283	791,069,117,798
CAKK	2024	170,922,786,622	296,770,707,195
CAKK	2023	139,016,812,151	194,311,162,777
CAKK	2022	127,135,857,284	168,476,334,141
CCSI	2024	348,600,117,000	175,438,308,000
CCSI	2023	424,821,582,000	264,179,869,000
CCSI	2022	495,013,365,000	304,024,658,000

BLUE	2024	63,088,654,961	9,560,510,229
BLUE	2023	58,521,645,176	8,136,278,357
BLUE	2022	57,397,264,994	6,657,078,611
LABA	2024	49,958,335,487	21,328,828,116
LABA	2023	16,633,351,278	1,959,702,820
LABA	2022	31,888,224,108	3,623,128,061
GPSO	2024	30,635,970,303	6,498,967,931
GPSO	2023	39,438,015,550	7,924,288,163
GPSO	2022	34,905,284,881	6,742,699,368
KUAS	2024	173,948,142,246	87,108,698,148
KUAS	2023	158,762,284,752	80,406,876,103
KUAS	2022	163,700,209,723	89,530,566,430
BINO	2024	165,814,512,409	37,994,155,128
BINO	2023	218,437,584,177	61,057,775,992
BINO	2022	217,006,719,399	76,839,284,372
KING	2024	135,571,278,605	47,712,834,499
KING	2023	127,422,182,028	48,535,560,189
KING	2022	56,621,375,724	41,286,483,075
PTMP	2024	278,801,349,772	83,190,759,430
PTMP	2023	228,260,569,126	69,090,008,727
PTMP	2022	98,065,731,384	39,251,201,433

SPSS OUTPUT

Appendix 6. Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
CED	96	0	1	.46	.501
CATA	96	.28	.94	.5596	.16194
LIQ_W	96	.89	8.52	2.7327	2.06351
FINLEV	96	1.06	8.64	1.9361	1.15693
Valid N (listwise)	96				

Appendix 7. CED Details

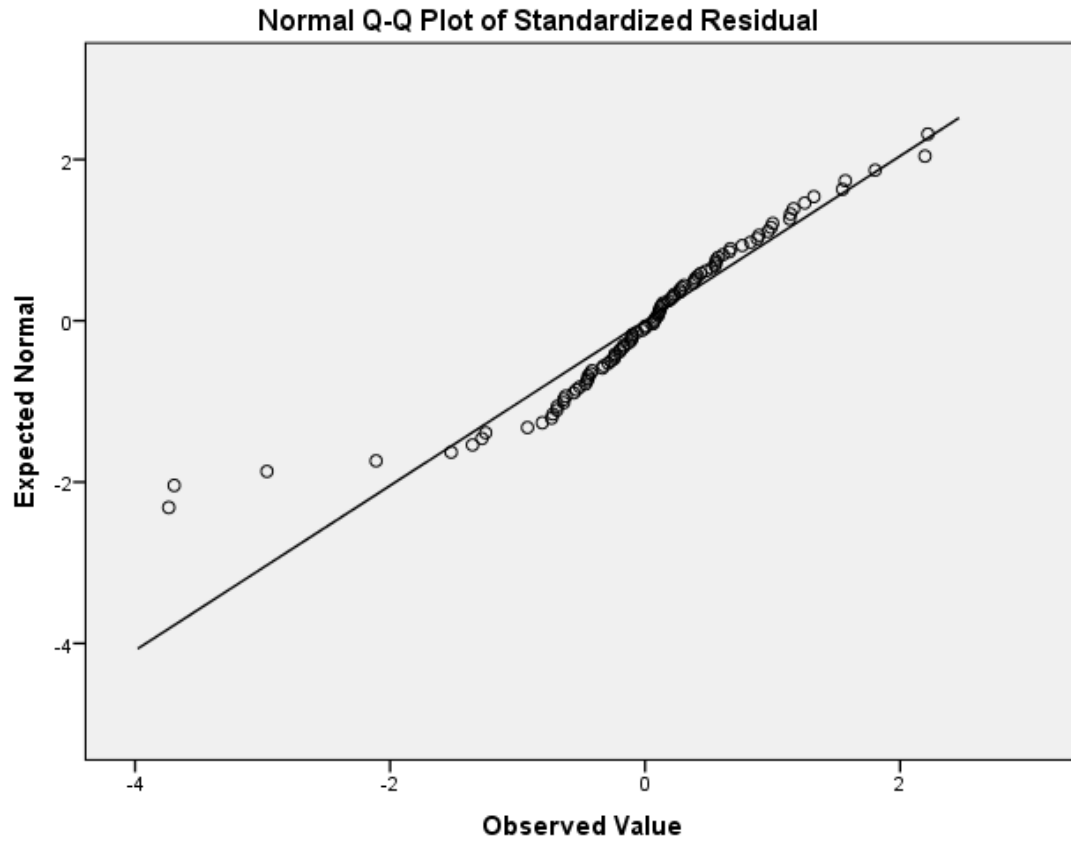
CED				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 0	52	54.2	54.2	54.2
1	44	45.8	45.8	100.0
Total	96	100.0	100.0	

Appendix 8. Normality Test

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.123	96	.001	.907	96	.000

a. Lilliefors Significance Correction

Appendix 9. Normal Q-Q Plot



Appendix 10. Multicollinearity Test

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	.031	.064		.487	.627		
CED	.063	.031	.213	2.034	.045	.886	1.129
CATA	.202	.095	.220	2.120	.037	.898	1.114
LIQ_W	-.016	.008	-.222	-2.009	.048	.792	1.262
FINLEV	-.036	.015	-.276	-2.392	.019	.726	1.377

a. Dependent Variable: OPM

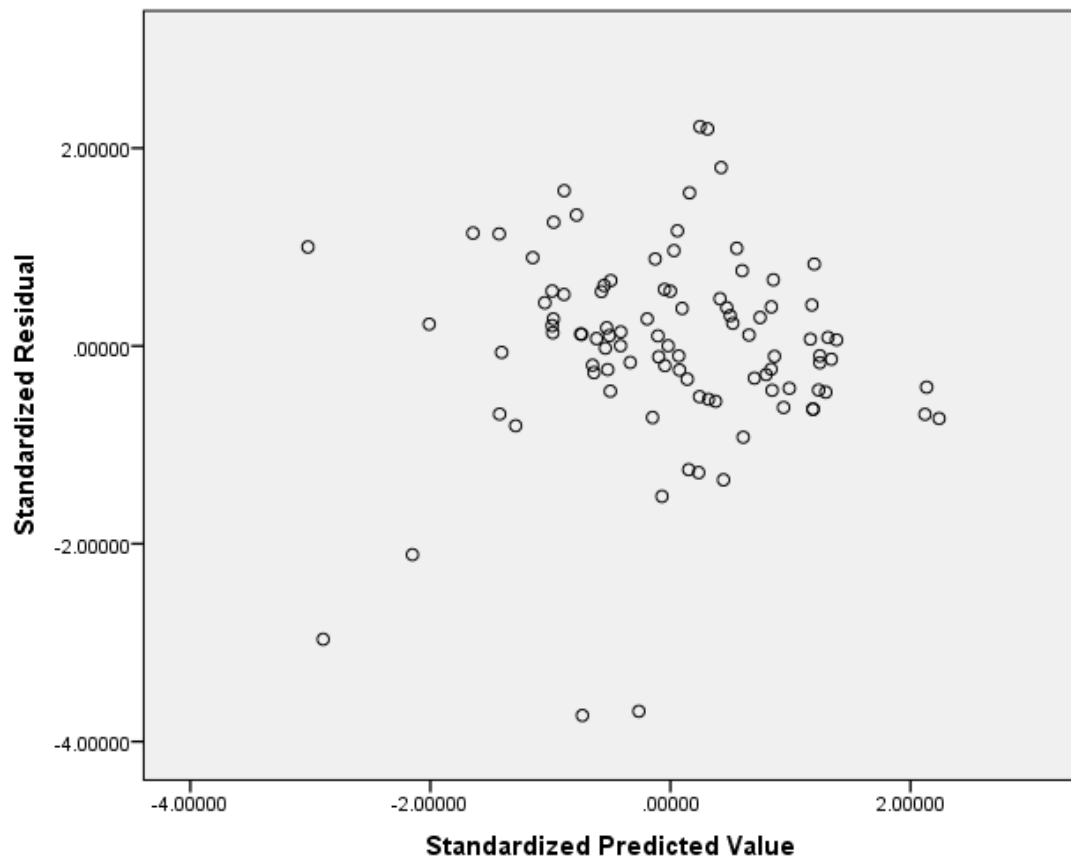
Appendix 11. Heteroscedasticity Test

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.152	.043		3.542	.001
	CED	-.006	.021	-.031	-.300	.765
	CATA	-.171	.064	-.271	-2.668	.009
	LIQ_W	.015	.005	.296	2.737	.007
	FINLEV	.001	.010	.008	.070	.944

a. Dependent Variable: ABS_RES

Appendix 12. Scatterplot Graph



Appendix 13. Multiple Regression

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342 ^a	.117	.078	.14281

a. Predictors: (Constant), FINLEV, CATA, CED, LIQ_W

b. Dependent Variable: OPM

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.246	4	.062	3.018	.022 ^b
	Residual	1.856	91	.020		
	Total	2.102	95			

a. Dependent Variable: OPM

b. Predictors: (Constant), FINLEV, CATA, CED, LIQ_W

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.031	.064		.485	.629		
	CED	.063	.031	.213	2.036	.045	.886	1.129
	CATA	.202	.095	.220	2.119	.037	.898	1.114
	LIQ_W	-.016	.008	-.223	-2.010	.047	.791	1.264
	FINLEV	-.035	.015	-.276	-2.388	.019	.724	1.381

a. Dependent Variable: OPM