

**THE EFFECT OF GOVERNMENT ELECTRIC VEHICLE
POLICY AND MACROECONOMIC FACTORS ON
FINANCIAL PERFORMANCE AND STOCK RETURNS OF
PT. INDOMOBIL SUKSES INTERNASIONAL, TBK.**



THESIS

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**MASTER OF BUSINESS ADMINISTRATION
IPMI INSTITUTE
JAKARTA
2026**

A THESIS

**Submitted in a partial fulfillment of the requirements for the degree of
Master Business Administration**

CERTIFICATE OF APPROVAL

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Topic : The Effect of Government Electric Vehicle Policy and
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Jakarta, 3 September 2026

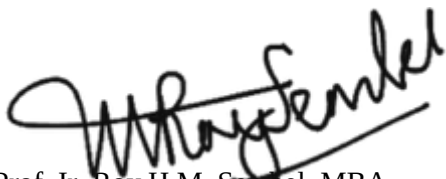
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NON-PLAGIARISM DECLARATION FORM

This Thesis is a presentation of my original research work. Wherever the contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgment of collaborative research and discussions.

Also, this work is being submitted in partial fulfilment of the requirements for the Master of Business Administration degree and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Jakarta, 3 September 2026



Alwin Hadikusuma

TABLE OF CONTENTS

Certificate of Approval.....	iii
Non-Plagiarism Declaration Form.....	iv
Table of Contents	v
List of Figures	viii
List of Tables	ix
Abstract.....	x
CHAPTER I INTRODUCTION	1
1.1. Background	1
1.1.1. Technology	3
1.1.2. Indonesian Automotive Industry	6
1.2. Company Background	11
1.3. Impact of Macroeconomy on the Company's Performance	13
1.4. Research Problem	16
1.5. Research Question	17
1.6. Research Objectives	18
1.7. Research Scope	20
1.8. Research Gap.....	20
1.9. Research Significance and Novelty	22
1.10. Structure of Report	22
CHAPTER II LITERATURE REVIEW	24
2.1. General Theory.....	24
2.1.1. Efficient Market Hypothesis Theory.....	24
2.1.2. Arbitrage Pricing Theory	25
2.1.3. Macroeconomic.....	26
2.1.4. Product Life Cycles and Diffusion Theory.....	27
2.1.5. DuPont Analysis	28
2.1.6. Market Return and Stock Return	28
2.1.7. Financial Ratio Analysis.....	29
2.2. Research Hypothesis.....	30
2.2.1. Fundamental Determinants of IMAS Profitability	30
2.2.2. Fundamental Determinants of IMAS Stock Return	31
2.2.3. EV Policy on IMAS Profitability and Stock Return	35
2.3. Research Framework	36
CHAPTER III RESEARCH METHODOLOGY	38
3.1. Research Design	38

3.2. Data Collection	39
3.3. Research Population and Sample	39
3.4. Economic Model, Variables and Indicators	40
3.5. Data Analysis Techniques and Statistical Methods.....	43
3.5.1. Classical Assumption Test	43
3.5.2. Partial t-Test and Simultaneous F-Test.....	46
3.5.3. F-test Two Sample for Variances	47
3.5.4. Welch t-Test	47
3.6. Research Procedure.....	48
CHAPTER IV FINDINGS, ANALYSIS & DISCUSSION	50
4.1. Fundamental Analysis	50
4.1.1. Financial Statement Analysis	50
4.1.2. Financial Ratio Analysis.....	53
4.1.3. DuPont Analysis.....	59
4.1.4. Data for Hypothesis Testing.....	62
4.2. The Effect of Financial Performance on IMAS Profitability.....	63
4.2.1. Lagged Dependent Variable.....	63
4.2.2. Classical Assumption Test.....	64
4.2.3. Independent Variable Significance with Partial t-Test.....	66
4.2.4. Model Significance with Simultaneous F-Test.....	67
4.2.5. Result Analysis and Discussion.....	67
4.3. The Effect of Financial Performance and Macroeconomic Variables on IMAS Stock Return	69
4.3.1. Augmented Dickey–Fuller (ADF) Test	70
4.3.2. Classical Assumption Test.....	71
4.3.3. Independent Variable Significance with Partial t-Test.....	74
4.3.4. Model Significance with Simultaneous F-Test.....	75
4.3.5. Result Analysis and Discussion.....	76
4.4. The Effect of EV policy on IMAS Profitability and Stock Return.....	79
4.4.1. F-Test Two Samples for Variances.....	79
4.4.2. Welch Two Samples t-Test.....	80
4.4.3. Result Analysis and Discussion.....	81
CHAPTER V CONCLUSION & RECOMMENDATIONS	84
5.1. Conclusion	84
5.2. Limitation of the Study.....	87
5.3. Theoretical Implications	88
5.4. Practical Implications	89

5.5. Recommendation.....	90
REFERENCES	91
APPENDICES.....	101

LIST OF FIGURES

Figure 1.1. New Electric Vehicle Sold in 2025	2
Figure 1.2. Global EV Production and Trade Outlook 2025.....	2
Figure 1.3. Government Subsidy per Vehicle by City in China.....	3
Figure 1.4. Breakdown Cost of ICE vs EV.....	4
Figure 1.5. Battery Price Forecast	4
Figure 1.6. Market Share EV Battery by Type.....	5
Figure 1.7. Vehicle Manufacturing Cost for Compact Car.....	6
Figure 1.8. Indonesia Vehicle Sales by Type.....	7
Figure 1.9. Indonesia Vehicle Market Share by Type	8
Figure 1.10. Gasoline Prices in Indonesia.....	8
Figure 1.11. No of Charging Station	9
Figure 1.12. SPKLU Distribution Roadmap.....	10
Figure 1.13. TCO EV vs ICE comparison due to Subsidy Scheme.....	11
Figure 1.14. IMAS Net Revenue Shares 2025.....	13
Figure 1.15. Economic Growth, Inflation, BI Rate & GDP per Capita.....	14
Figure 1.16. USD Exchange Rates & Oil Prices Trends.....	15
Figure 2.1. Research Framework I	37
Figure 2.2. Research Framework II.....	37
Figure 3.1. Research Design Flow	39
Figure 3.2. Research Procedure.....	48
Figure 4.1. IMAS Financial Performance.....	52
Figure 4.2. IMAS Profitability Ratio.....	54
Figure 4.3. IMAS Liquidity Ratio	55
Figure 4.4. IMAS Activity Ratio.....	56
Figure 4.5. IMAS Solvency Ratio.....	57
Figure 4.6. IMAS P/B and P/E Ratio.....	58
Figure 4.7. IMAS Dividend Policy Ratio.....	59
Figure 4.8. DuPont Model.....	59
Figure 4.9. Macroeconomic Variables.....	63
Figure 4.10. IMAS vs IHSG period 2015-2025.....	82

LIST OF TABLES

Table 1.1. Regulation Governing Vehicle Registration and Provisions	10
Table 1.2. Government Regulation Supporting EV.....	15
Table 2.1. Indicator of Financial Performance and Stock Return.....	36
Table 4.1. IMAS Balance Sheet (in Trillion IDR).....	50
Table 4.2. IMAS Income Statement (in Trillion IDR).....	51
Table 4.3. IMAS Cashflow Statement (in Trillion IDR).....	53
Table 4.4. IMAS Revenue & Income Trend.....	61
Table 4.5. IMAS & ASII Ratio.....	62
Table 4.6. Baseline vs Lagged ROE	68
Table 4.7. ADF Stationary Test Result.....	71
Table 4.8. Baseline vs IIS Regression (Robustness check).....	77
Table 4.9. Impulse Observation Events.....	78
Table 4.10. ROE F-Test Two Sample for Variances.....	80
Table 4.11. ISR F-Test Two Sample for Variances.....	80
Table 4.12. ROE Welch Two Sample t-Test.....	81
Table 4.13. ISR Welch Two Sample t-Test.....	81

ABSTRACT

The automotive industry is experiencing major disruption with the presence of electric vehicles (EV) entering the domestic markets. This study main objective is to evaluate the factors that may affect the financial performance and stock return of PT. Indomobil Sukses Internasional, Tbk. as one of the leading automotive company in Indonesia from the period 2015 to 2025 amidst intense competition, the impact of government policy and macroeconomic conditions. Research methodology begins with the formulation of hypothesis regarding the influencing factors, first is to understand the internal factors affecting company profitability, second is to understand internal and external factors affecting stock return of the company, and the third is to find out a difference in company profitability before and after the implementation of government EV policy. Financial ratio analysis combined with multiple regression, classical assumption test, significance test, and Welch t-test was performed to validate the hypothesis results. The first model revealed that Debt to Equity Ratio has a significant negative relationship with Return on Equity (ROE) whereas the lagged dependent variable of ROE shows a significant positive relationship with ROE. For the second model, growth transformation was applied to address stationarity data. Initially, the baseline model failed the normality test. However, the IIS (Impulse Indicator Saturation) regression results captured unusual quarter-specific movements that contribute substantially to the significance of the overall model towards stock return. A significant difference also found in ROE between the pre-selected and post-selected periods using the Welch test, while stock return shows no significant difference. Year 2021 was chosen as the cut off between the two period, since the government EV policy was announced in late 2019 and pandemic occurred the following year. Nevertheless, these findings do not establish a causal effect of EV policy, as the policy period overlapped with post-pandemic recovery, also with other economic and market conditions.

Keywords: *Financial Health, Financial Ratio, Automotive Industry, Electric Vehicle, Macroeconomic, Government Policy.*

CHAPTER I

INTRODUCTION

1.1. Background

The global automotive industry is experiencing a major transformation driven by the transition from Internal Combustion Engine (ICE) vehicles to Electric Vehicles (EVs). This shift is primarily influenced by environmental concerns, technological advancements, and government policies aimed at reducing greenhouse gas emissions. As countries strive to achieve carbon neutrality targets and reduce dependency on fossil fuels, the EV adoption has accelerated significantly in recent years, making the EV market as one of the fastest-growing segments in the global transportation sector.

China has dominated the electric vehicles industry worldwide with more than 10 million units sold in 2024. As the world's largest producer of electric vehicles, China has a big influence on the global market. China's electric vehicle production is not only aimed for domestic market but also exported to various countries. Things that are driving the electric vehicle boom in China including domestic and global demand in EV as well as government policy push, which supported by an end-to-end industrial supply chain ecosystem from upstream to downstream has triggered the fast growing and invites more players to the market, leads to increasing competition in the automotive sector.

Government incentives, massive EV charging infrastructure, and the presence of major domestic EV manufacturers such as BYD and Geely have contributed significantly to China's leadership in EV adoption. Meanwhile, the European market represents the second-largest EV market globally, with electric vehicles volume for around 20% of new car sales, driven by strict emission regulations and supportive government policies. In the United States, EV sales have also continued to grow steadily, reaching approximately 10% of total vehicle sales in recent years.



Figure 1.1. New Electric Vehicle Sold in 2025
Source: <https://ourworldindata.org> accessed on 2026

As shown in figure 1.1 and figure 1.2. China EV maker with its scalability, currently able to dominate the global EV market due to large production capacity, strong industry ecosystem and the government support. Chinese car brands such as BYD, Cherry, Wuling, NIO, AION and many others have entered the EV market in several European, North America and Asia Pacific countries including Indonesia.

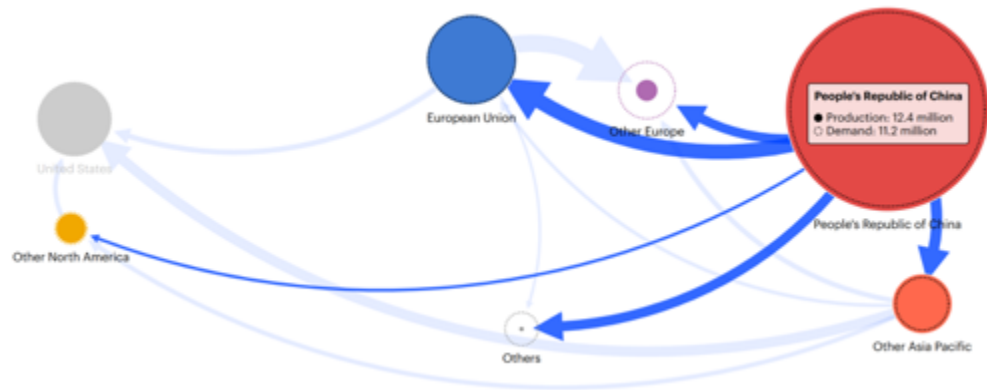


Figure 1.2. Global EV Production and Trade Outlook 2025
Source: <https://www.iea.org> accessed on 2026

China's rapid Electric Vehicle (EV) sales growth relies heavily on government subsidies which represent by dark blue color in figure 1.3. while currently not all manufacturers are profitable yet. Less than 10 percent of EV brands in China will turn a profit in the next five years, as the industry grapples

with a price war and chronic overcapacity, according to AlixPartners. According to Bloomberg, in 2019 there were 500 Chinese EV manufacturers in China. After fierce competition, only 100 manufacturers remained by 2023 and will likely continue to drop if they cannot survive.

Due to high government subsidies, excess capacity and profitability raise questions regarding the sustainability of this industry. Players must be able to find a market large enough to absorb China's EV production and achieve an optimal point between production costs and vehicle selling prices that are acceptable to the market, so that subsidies can be reduced or even eliminated.

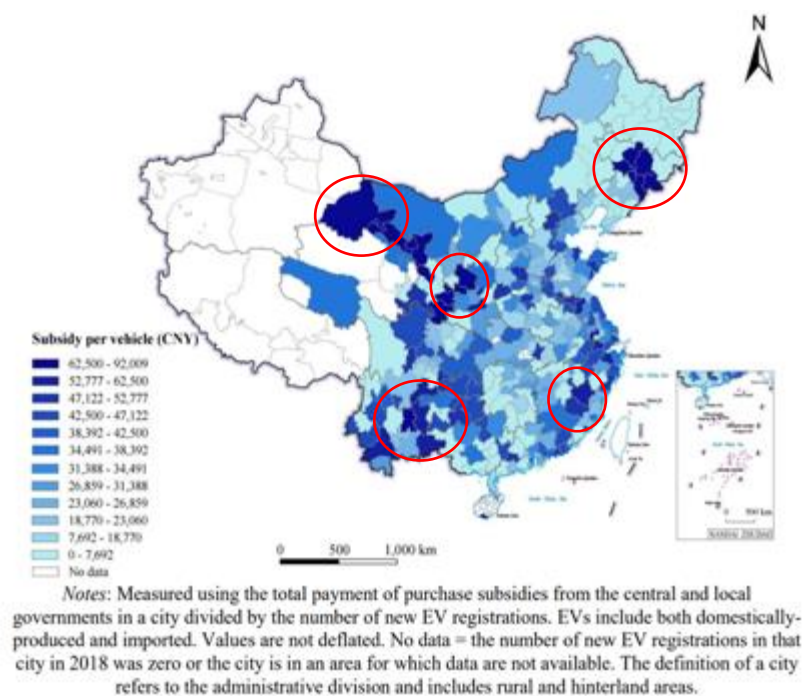


Figure 1.3. Government Subsidy per Vehicle by City in China

Source: Effectiveness of Electric Vehicle subsidy in China

<https://www.sciencedirect.com/> accessed on 2026

1.1.1. Technology

Battery is the core component in EV, the battery cost reach 20-30% of the total vehicle cost. However, battery cost is predicted to continue to fall in the future, driven by two things: technological innovation and the continued downturn in battery metal prices. The battery market was previously dominated

by nickel batteries, but then there is LFP (lithium ferro phosphate) an iron-based as cheaper alternative.

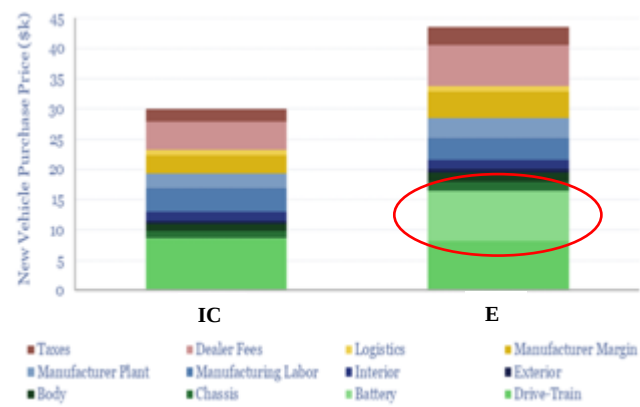


Figure 1.4. Breakdown Cost of ICE vs EV
Source: <https://thundersaidenergy.com/> accessed on 2026

Very high entry barrier in the battery manufacturing industry, typically takes 10 years from R&D to production. Many companies in China have been operating for 10-15 years but haven't yet reached breakeven EBITDA. Currently, five companies in China control nearly 80% of the battery market share, all of which have been in operation for over two decades.

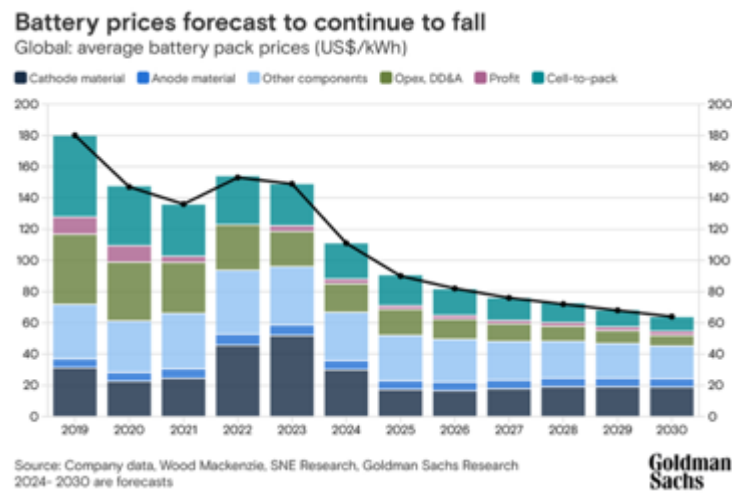


Figure 1.5. Battery Price Forecast
Source: <https://www.goldmansachs.com> accessed on 2026

Battery costs are significantly impacted by the availability of raw materials, such as minerals and rare earths. Therefore, geopolitical tensions and

supply chain factors also play a significant role in the rise or fall of production costs.

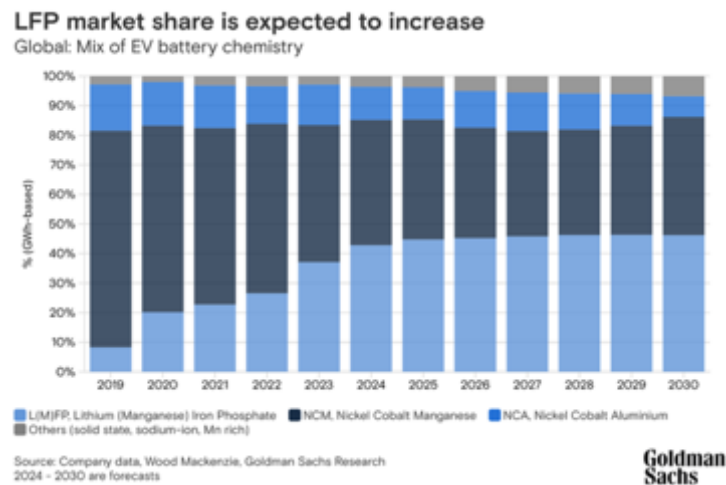


Figure 1.6. Market Share EV Battery by Type
Source: <https://www.goldmansachs.com> accessed on 2026

Along with the development of new technology, the EV production costs also will be cheaper over time, especially from the battery manufacturing costs. Manufacturer will also continue to find ways to optimize the production processes, finding better and cheaper raw materials and components, increase productivity and efficiency in the supply chain, production and distributions. This creates opportunities as well as challenges in determining selling prices of new and used cars.

While Internal Combustion Engine (ICE) vehicles rely on sophisticated combustion technology that only established players have developed through decades of research, EVs start with a completely different technological foundation. This gives new players the opportunity to develop new vehicle faster without the prior knowledge and experience of established players, as long as they have strong battery technology development capabilities. Knowledge in other vehicle components, such as chassis, transmission, braking systems, suspension, exterior, and interior, is generally common, allowing many manufacturers to produce in-house or rely on 3rd party component manufacturers. Other components like radiators and exhaust pipe are not required for EVs, thus simplifying the production process.

But the resale values of EVs are falling faster because consumers are thinking they can buy a cheaper EV in the future with better technology advancement, so achieving the optimal price parity between Internal Combustion Engine (ICE) and EV is crucial for this particular market to thrive.

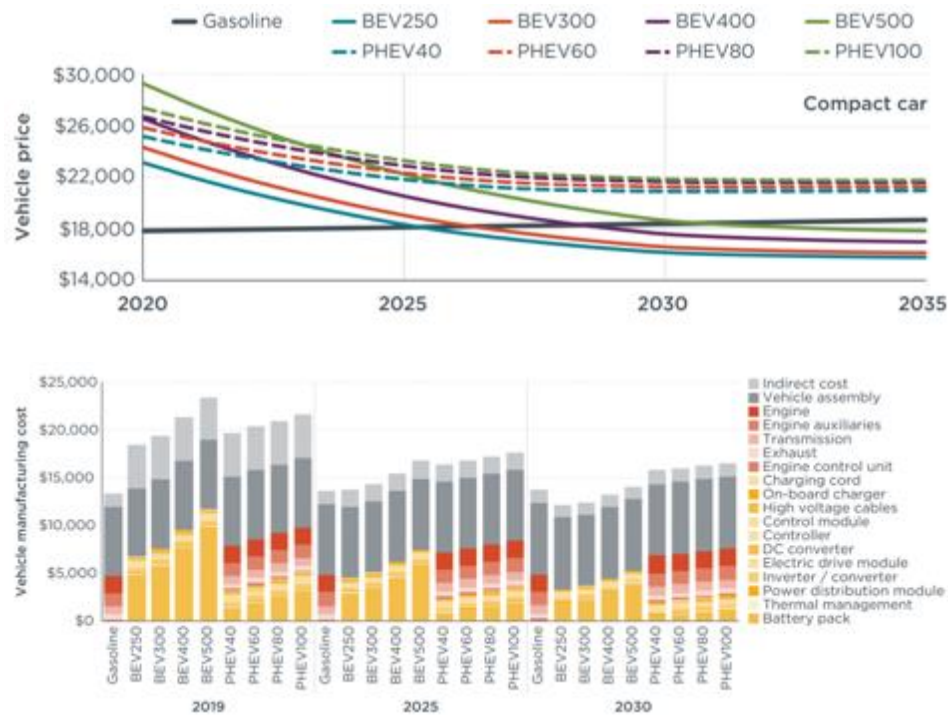


Figure 1.7. Vehicle Manufacturing Cost for Compact Car

Source: International Council on Clean Transportation & Rujie Yu
China Automotive Technology and Research Center accessed on 2026

1.1.2. Indonesian Automotive Industry

In Indonesia, automotive industry always seen as a barometer of economic strength and growth, because high automotive sales reflect the strength of purchasing power and economic potential. However, in 2019 automotive market showed a decline in vehicle sales because it was a year of politics and trade war between the US and China. Then in 2020, the market was hit by the COVID-19 pandemic where sales dropped 50%, but the automotive industry managed to rebound in 2021 and 2022. Entering 2023, once again the market began to show a decline, the downfall continuing in 2024 and early 2025 due to several factors, one of which was the weakening economy and declining of purchasing power, especially low to middle income segment.

In addition, generally vehicle sales are influenced by several things such as loan interest rates since on average 70% of vehicle sales are credit, exchange rates where 40-80% of vehicle components are still imported, make it vulnerable to exchange rate fluctuations. Fuel prices as one of the main costs when operating a vehicle according to daily use, government incentives and taxes that affect the vehicle purchase price and annual operating costs. Inflation also may affects people's decision to purchase, since vehicles are generally considered a luxury item and people tend to prioritize other primary needs over buying a new vehicle.

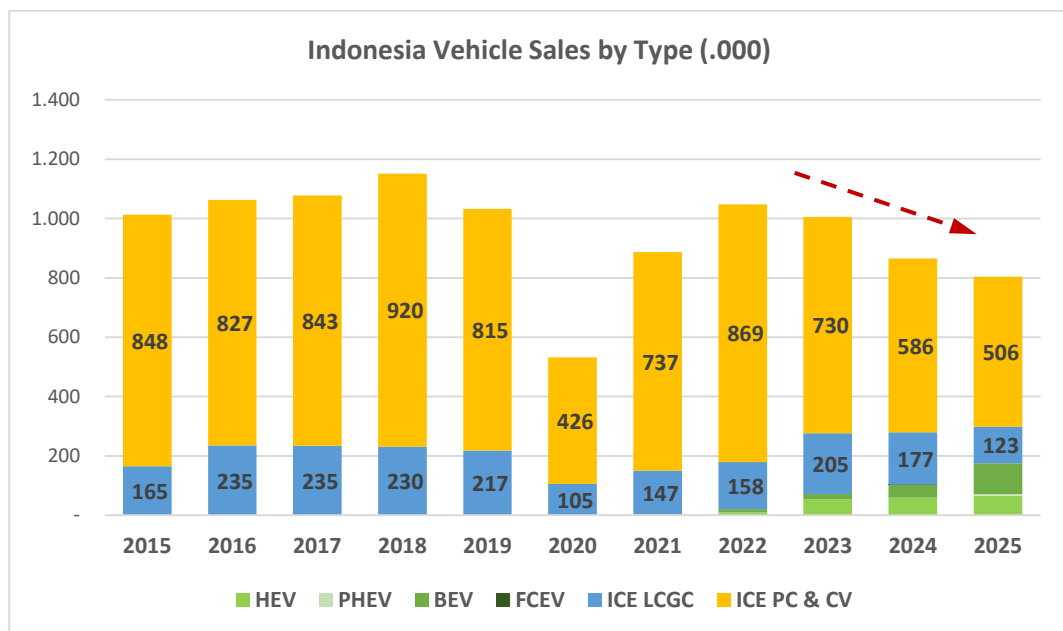


Figure 1.8. Indonesia Vehicle Sales by Type
Source: Gaikindo (<https://www.gaikindo.or.id>) accessed on 2026

Along with the economic slowdown, the Indonesian automotive market is being enlivened by the entry of electric vehicles, including hybrid (HEV), battery (BEV) and plug-in Hybrid (PHEV) which are currently dominated by brands from China and Korea. The market share chart in figure 1.9. shows an increase in the portion of electric vehicles, both HEV and BEV, with rapid growth in BEV amidst decline in the portion of ICE vehicles and weakening customer purchasing power as well as other factors contribute to the decline.

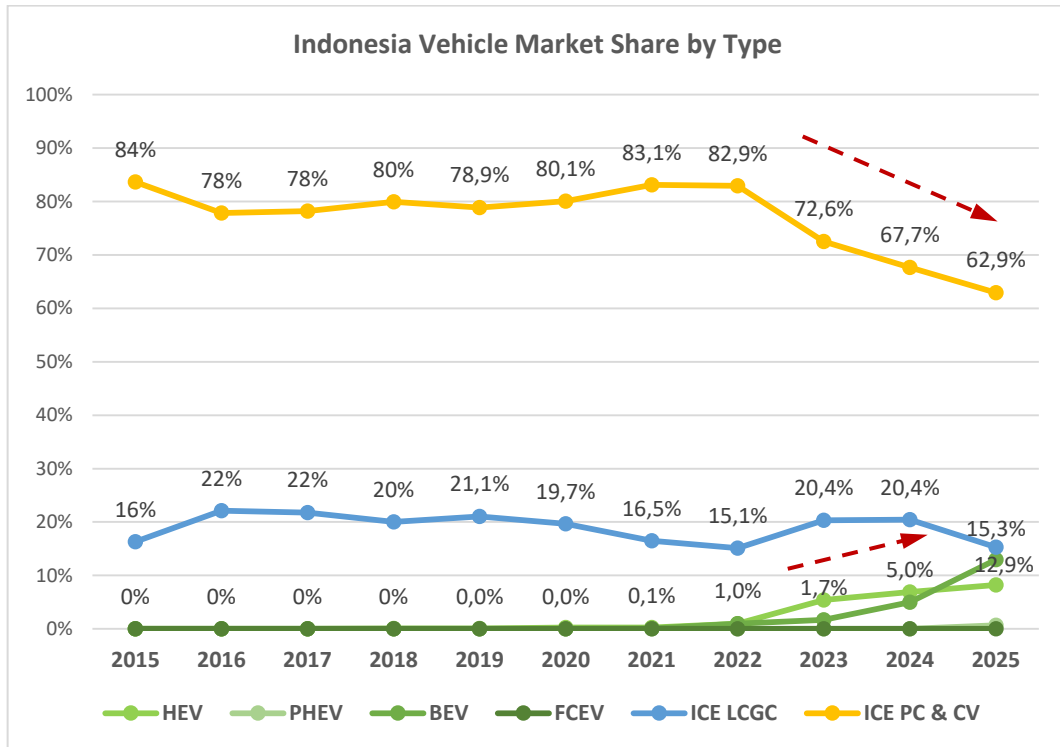


Figure 1.9. Indonesia Vehicle Market Share by Type
Source: Gaikindo (<https://www.gaikindo.or.id>) accessed on 2026

The rise in fuel prices in Indonesia over the past 5 years has been driven by the surge in global crude oil prices, geopolitical tensions like the Russia-Ukraine and Middle East conflicts that disrupted supply, the weakening of the Rupiah exchange rate against the US dollar, and the excessive burden of state budget subsidy. In 2022, the Indonesian government raised the price of subsidized fuel 31%, which put pressure on vehicle sales in 2023.

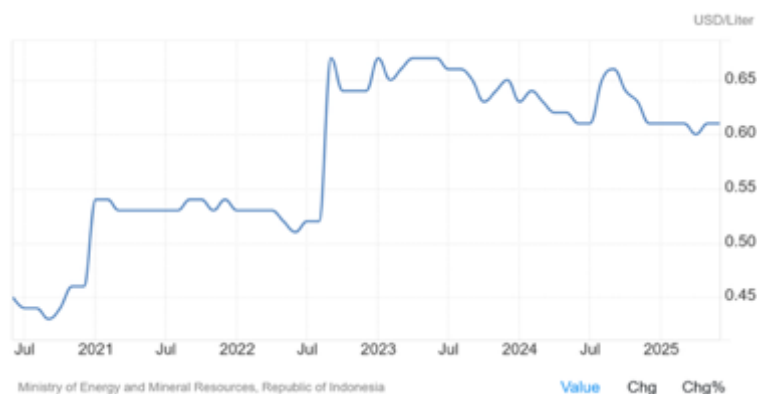


Figure 1.10. Gasoline Prices in Indonesia
Source: <https://id.tradingeconomics.com> on 2026

Parallel with the increase of fuel prices, there are still obstacles in number of charging stations infrastructure for EV. PLN continues to accelerate the expansion of electric vehicle charging infrastructure. There are 3 types of charging stations, e.g. Electric Vehicle Charging Stations for Public (SPKLU), Public Electric Charging Stations for Electric Motor (SPLU) and Home Charging Systems (HCS). It is also available in Ultra Fast Charger, Fast Charger, Medium Charger and Standard Charger.

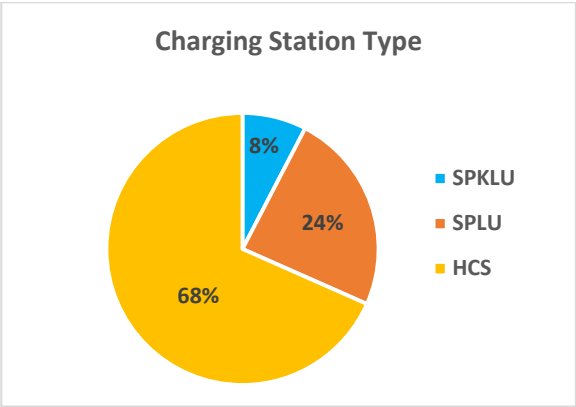


Figure 1.11. No of Charging Station
Source: PLN accessed on 2026

The number of installed charging stations has also increased significantly, in 2024 HCS covers the most at 68% followed by SPLU 24% and SPKLU 8%, but the distribution is still concentrated on the island of Java. Overall ratio number of SPKLU versus number of electric vehicle in Indonesia is 1:21 and the government aims to achieve target ratio of 1:17 in 2025. The top 3 region with the lowest ratio are Jakarta is 1:47, Banten is 1:27 and West Java is 1:18, indicates that Java island still needs a lot of charging station infrastructure where most EV sold are in Java Island.

This correlates with Indonesia’s economic center, which is currently concentrated on the island of Java, and regional government policies that provide higher incentives for EV taxes and the freedom to use BEVs on the capital’s protocol roads, which normally will follow the odd-even license plate rule during rush hour.

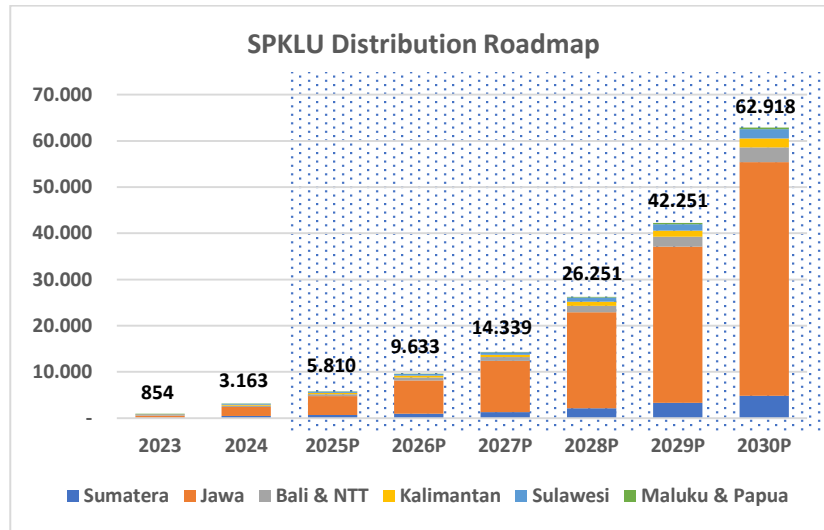


Figure 1.12. SPKLU Distribution Roadmap
Source: <https://gatrik.esdm.go.id> accessed on 2026

As listed in the Table 1.1. the Indonesian government’s policy in providing subsidies and tax incentives for EVs has made EV prices affordable while in parallel accelerate EV adoption. Government subsidy affect financial strength of the companies in the EV related business (Assagaf, et al., 2017). It is hoped that the government will continue to provide this subsidy so the price of electric vehicles remains competitive in the market especially during the economic downturn.

Table 1.1. Regulation Governing Vehicle Registration and Provisions

Table 1. Regulations governing vehicle registration, and selected provisions

Tax scheme	National/ local	One time/ recurring	Tax rate for ICE	Tax rate for EVs
Luxury tax (PPNBM) Government Regulation No. 74/2021 on Luxury Tax for Motor Vehicle	National	One time	Passenger vehicle below 10 seats and with engine displacement below 3000 cc • CO ₂ g/km <150 (15%) • CO ₂ g/km 150 - 200 (20%) • CO ₂ g/km 200 - 250 (25%) • CO ₂ g/km > 250 (40%)	0%
Value added tax (VAT) Act No. 43/2009, which is the third update of the original Act No.8/1983 on Value Added Tax	National	One time	10%	10%
Transfer tax and Circulation Tax Act No. 1/2022 on Finance Relationship between Central and Local Governments	Local*	Transfer tax: one time Circulation tax: recurring	Transfer Tax: 12% Circulation tax: 2%	Transfer Tax: 0% Circulation tax: 0%
Road accident fund Act No. 33/1964 on Mandatory Transportation Accident Fund. Using insurance scheme run by PT. Jasa Raharja (State-owned insurance company), payable upon claim for fatal accident with casualties.	National	Recurring	IDR 143.000 (US\$ 10)	IDR 143.000 (US\$ 10)

*The rates for transfer taxes and circulation taxes are determined by provincial governments and can vary across provinces. The maximum rates are 12% for the transfer tax and 2% for the circulation tax.

Source: The consumer cost of ownership of electric passenger cars in Indonesia 2023.
Authors: Aditya Mahalana, Zifei Yang, Francisco Posada

Chart in Figure 1.13. below illustrates the cost difference between ICE versus EV before and after government subsidy. EV with a higher base price will require incentives and subsidy to meet the price level similar to ICE vehicle.

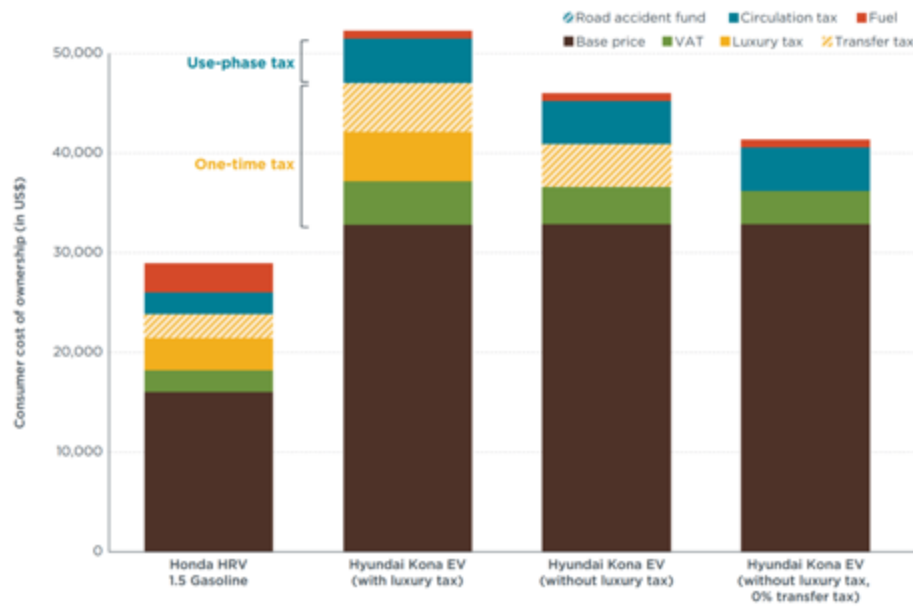


Figure 1.13. TCO EV vs ICE comparison due to Subsidy Scheme

Source: The consumer cost of ownership of electric passenger cars in Indonesia 2023.

Authors: Aditya Mahalana, Zifei Yang, Francisco Posada

1.2. Company Background

PT. Indomobil Sukses Internasional, Tbk. (IMAS), widely known as the Indomobil Group, is one of Indonesia's leading integrated automotive company. The company operates as a diversified automotive holding group with business activities spanning from vehicle manufacturing, distribution, financing, logistics, and other supporting automotive services. Headquartered in Jakarta, Indomobil has established itself as a major player within Indonesian automotive industry through its extensive local network of subsidiaries and partnerships with global automotive brands.

The company was originally established in 1976 under the name PT. Indomobil Investment Corporation. The company underwent a significant corporate restructuring through a merger with PT. Indomulti Inti Industri, Tbk. in 1997. Since then, the company selected its current name PT. Indomobil Sukses Internasional, Tbk. The merger enable the company to expand the business and scale their operational while strengthening position in the

Indonesian automotive industry. Over time, the company grew into a large automotive conglomerate with a large and various business segments and subsidiaries.

Indomobil operates an integrated business across different automotive business value chain. Its core automotive business includes a brand holder and distributor of automobiles, vehicle manufacturing and assembly, spare parts distribution, after-sales services, and vehicle financing. Additionally, the company is involved in other related business, like car rental services, logistics, heavy equipment distribution, and other support services. Through these diversified business and operations, the company is able to serve both passenger and commercial vehicle markets in Indonesia.

The company manages and distributes products across various segments from numerous internationally recognized automotive brands. Those segments include passenger, commercial vehicles, motorcycles, and heavy equipment. Global brands that are associated with Indomobil Group including Suzuki, Nissan, Audi, Volkswagen, Hino, Volvo Trucks, Renault Trucks, Jaguar Land Rover, and other international manufacturers. This broad portfolio enables the company to serve diverse market segments from individual consumers to industrial business.

Over the years, Indomobil has developed a strong nationwide distribution network that is supported by sales, service, and spare parts (3S) facilities across Indonesia. This strong network plays an important role in maintaining customer satisfaction while strengthening the company's market presence. Furthermore, the company continuously expands its portfolio and business capabilities to adapt to the changing trends in the automotive industry like digital transformation and the growing EV adoption.

With decades of experience and a diversified automotive ecosystem, PT. Indomobil Sukses Internasional, Tbk. remains an important contributor to Indonesia's automotive industry and economy. Its strong partnerships with global automotive manufacturers, combined with its integrated business structure, position the company to respond to emerging industry trends such as

electrification, sustainability, and technological innovation in the transportation sector.

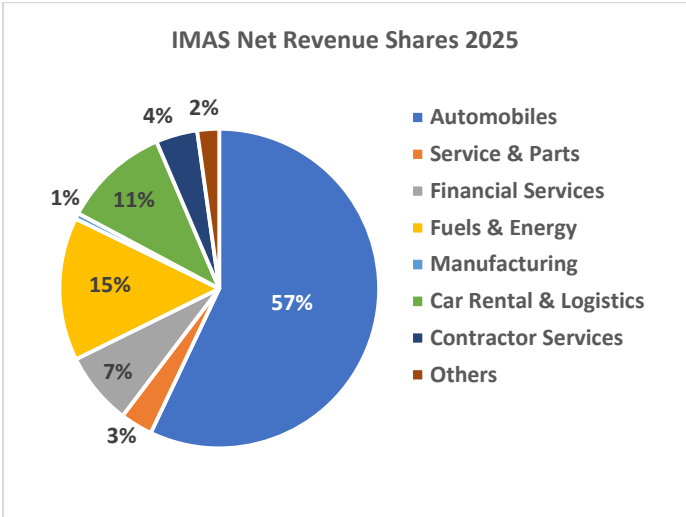


Figure 1.14. IMAS Net Revenue Shares 2025
Source: IMAS Annual Reports 2025

Albeit PT. Indomobil Sukses Internasional, Tbk. has many business segments, vehicle sales, spare parts and service, account for 64% of its total revenue. The share increases to 72% including financial services and manufacturing as the main supporting business of automotive.

1.3. Impact of Macroeconomy on the Company’s Performance

Indonesia’s economy was also impacted by COVID-19, with economic growth of minus 2.1% in 2020, a slight rebound in 2021, and return to normal growth at around 5% throughout 2023 and 2025. Inflation remained relatively controlled at 2-3%, but in 2022 inflation spike to 5.5% due to adjustments to subsidized fuel prices, rising global prices for the imported goods, and increased demand post-pandemic. The BI rate left its highest level in 2015 indicating economic stability and reached the lowest level during the pandemic. It relatively well-adjusted to economic conditions and inflation, as evidenced by the BI rate adjustments in 2023 and 2024, aimed at curbing inflation.

Overall, Indonesia’s economy remains stable with year-over-year GDP per capita in upward trend. Along with the increasing middle class consumer segment, GDP per capita rise from USD 3.288 in 2015 to USD 5.083 in 2025.

However, vehicle is the second-largest purchase after housing and is not a primary need for most Indonesians. Under economic pressures such as declining growth, inflation increase, and especially the rise of BI rate, automotive sales in Indonesia can be impacted significantly. Primarily due to the fact that 70% of automotive sales in Indonesia are financed through credit, the interest rate of which is highly dependent on the BI rate and the government need to keep the interest rate stable (Kosnandar et al., 2025).

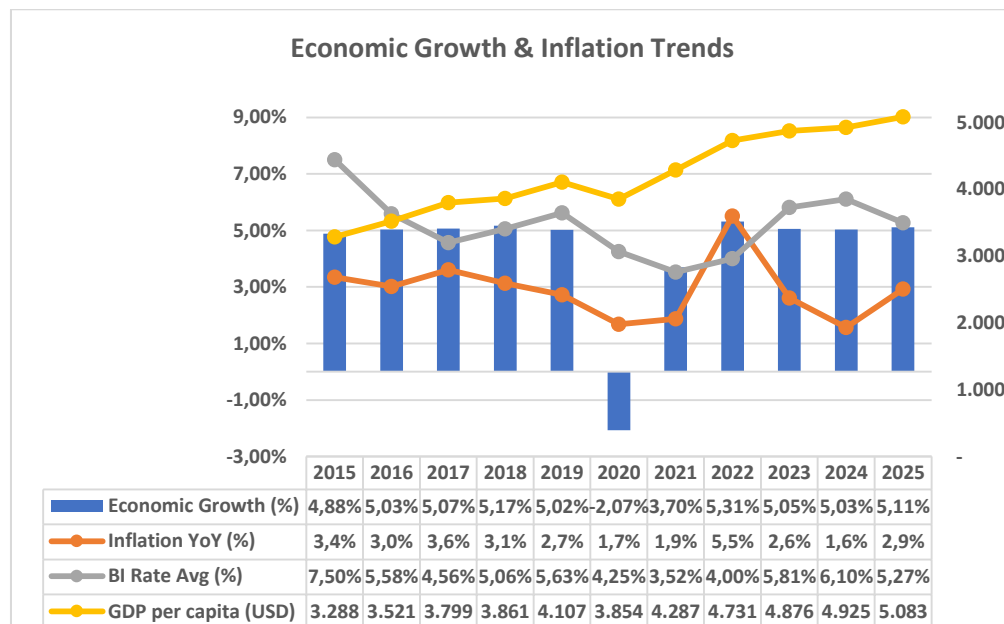


Figure 1.15. Economic Growth, Inflation, BI Rate & GDP per Capita

Source: <https://www.bps.go.id> accessed on 2026

The rupiah exchange rate against the USD also continues to experience pressure from year to year and reached its lowest level in 2025. Oil prices also fluctuate due to global geopolitic conditions such as the war between Russia and Ukraine, which caused oil prices to spike in 2022. The Indonesian automotive industry, which still relies on 30-70% imported components, could be significantly impacted by the rupiah's exchange rate against the USD.

Meanwhile oil prices, which is correlated with domestic fuel prices, also impact sales of oil-fueled vehicles in Indonesia (Lis B. et al., 2012). Therefore, the Indonesian government is accelerating the energy transition through the implementation of electric vehicles to reduce dependence on global oil prices.

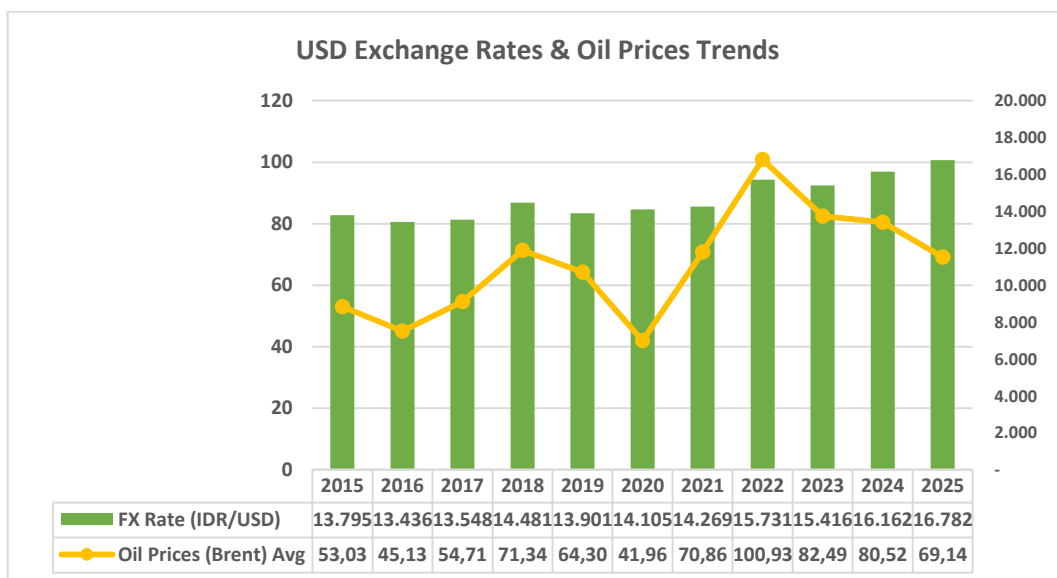


Figure 1.16. USD Exchange Rates & Oil Prices Trends

Source: <https://www.bps.go.id>; <https://www.macrotrends.net/> accessed on 2026

Apart from macroeconomic conditions, Indonesian government issued several regulations to accelerate development of industries that support electric vehicles. It was started in 2019, the Presidential Regulation No. 55 of 2019 (Perpres 55/2019) is the foundational policy in Indonesia designed to accelerate development of the Battery Electric Vehicle (BEV) industry. It aims to shift transportation toward cleaner energy, reduce fuel imports, and build a domestic EV manufacturing ecosystem. Table 1.2. shows the list of Indonesian Government Regulations released by multiple government agency and ministry to support EV during 2019-2025.

Table 1.2. Government Regulation Supporting EV

Year	Regulation Type & No	Subject	Remarks
2019	Presidential Regulation No. 55/2019	Acceleration of Battery Electric Vehicles (BEV/KBLBB) Program	Main umbrella policy for national EV development
2019	Government Regulation No. 73/2019	Luxury Goods Sales Tax (PPnBM) on Motor Vehicles	Introduces emission-based taxation, benefiting EVs
2020	Minister of Energy Regulation No. 13/2020	EV Charging Infrastructure (SPKLU/SPBKLU)	Supports charging ecosystem development
2020	Minister of Home Affairs Regulation No. 8/2020	Regional Motor Vehicle Tax for EVs	Provides local tax incentives
2020	Minister of Transportation Regulation No. 45/2020	Certain Vehicles Using Electric Motors	Legal framework for light electric vehicles
2020	Minister of Transportation Regulation No. 65/2020	Conversion of Fuel Motorcycles to Electric	Enables motorcycle retrofitting to EV

2021	Minister of Finance Regulation No. 141/2021	Tax Incentives for Low-Emission Vehicles	Early fiscal incentives for EVs and hybrids
2022	Minister of Industry Regulation No. 6/2022	Domestic Content Requirement (TKDN) for EVs	Encourages local EV manufacturing
2022	Minister of Transportation Regulation No. 15/2022	Conversion of Fuel Cars to Electric	Expands conversion program to cars
2023	Presidential Regulation No. 79/2023	Amendment to Perpres 55/2019	Strengthens EV policy and local content requirements
2023	Minister of Finance Regulation No. 38/2023 (amended by 116/2023)	VAT Incentives for EVs	Government-borne VAT subsidy
2024	Minister of Finance Regulation No. 8/2024	Continued VAT Incentives for EVs	Extension of EV purchase subsidies
2025	Minister of Finance & Industry Decrees No. 12/2025 & No. 968/2025	VAT Incentives & TKDN Policy	Supports EV sales and domestic production

Source: Author (2026)

1.4. Research Problem

The rapid transition toward Electric Vehicles (EV), mainly driven by government policy to accelerate EV adoption and changing market conditions. This new phenomena creates uncertainty regarding its impact to profitability and stock return of PT. Indomobil Sukses Internasional, Tbk. The management shall reprioritize their strategy, allocate resources and capital to maintain its position in the domestic market and take the opportunity from EV growth. While investors also should be well-informed about the risks level associated with PT. Indomobil Sukses Internasional, Tbk. (IMAS) stock return.

Albeit slowdown in automotive sales for the past 3 years, rapid growth of electric vehicle sales creates opportunities as well as challenges. A moment that should be anticipated by the company to capture opportunity optimally. The main driver of EV growth is government policy and support, but the impact still unclear, particularly on the financial performance and stock return of the company. Challenges such as increasing competition from many EV brands from China, lower profitability, high new investment, increasing production costs, uncertain continuity of government incentives in supporting EV. Meanwhile, opportunity comes from the government policy and support as well as changing customer behaviour.

Despite its strong brand portfolio, PT. Indomobil Sukses Internasional, Tbk., as one of the largest incumbent automotive companies in Indonesia faced several strategic and financial challenges between 2015 and 2025 that affected

its overall performance and shareholder value. The EV era in Indonesia began in 2019 when the government issued Presidential Regulation no. 55 of 2019 (Perpres 55/2019) to push the acceleration of Battery Electric Vehicles (BEV) adoption. But then, COVID-19 pandemic happened in 2020 to 2021 which caused an economic slowdown, and was followed by several major events such as global geopolitical tension leads to foreign exchange fluctuation, rise in fuel prices and inflation due to supply chain disruption, etc. The company operates in a dynamic business environment, therefore it is important to understand financial and macroeconomic factors that may influence profitability and stock return (Halim, B., 2022).

Year 2021 is adopted as breakpoint in this study between before (period 1 during 2015 - 2020) and after (period 2 during 2021-2025) as an analytical rather than policy start date. Perpres No. 55 in late 2019 established the starting point of the EV program, including the release of several subsequent concrete regulations in 2020. The year 2020 is also considered an unusual year due to the impact of the COVID-19 pandemic.

1.5. Research Questions

This research motivation is to understand how PT. Indomobil Sukses Internasional, Tbk. (IMAS) navigate business challenges and the effect of government policy for EV to their profitability and stock return.

1. What fundamental financial factors affect IMAS profitability?
 - a. How does Leverage affect IMAS profitability?
 - b. How does Liquidity affect IMAS profitability?
 - c. How does Asset Turnover affect IMAS profitability?
2. What fundamental financial factors and macroeconomic variables affect IMAS Stock Return?
 - a. How does Leverage affect IMAS stock return?
 - b. How does Liquidity affect IMAS stock return?
 - c. How does Asset Turnover affect IMAS stock return?
 - d. How does fluctuations in Economic Growth affect IMAS stock return?
 - e. How does fluctuations in Inflation affect IMAS stock return?

- f. How does fluctuations in BI rate affect IMAS stock return?
 - g. How does fluctuations in FX rate (USD/IDR) affect IMAS stock return?
 - h. How does fluctuations in Oil Price affect IMAS stock return?
 - i. How does Market Return affect IMAS stock return?
3. How does IMAS profitability and stock return perform in response to the EV trends, before and after the government policy?
 - a. Does IMAS profitability differ before and after government policy supporting EV?
 - b. Does IMAS stock return differ before and after government policy supporting EV?

Questions above are important to stakeholders, like investors, managers of the company, and scholars. It produce insights to understand company profitability and stock return under major events and macroeconomic conditions.

1.6. Research Objectives

This study aims to explore and evaluate profitability and stock return of PT. Indomobil Sukses Internasional, Tbk. from 2015 to 2025, how the company navigate business challenges from both internal and external factors such as macroeconomics. Also to study for any differences in profitability and stock return of the company, before (2015-2020) and after (2021-2025) the emergence of government policy supporting EV.

1. Analyse fundamental financial factors listed below that affect profitability of IMAS using statistical tools.
 - a. Leverage affects IMAS profitability.
 - b. Liquidity affects IMAS profitability.
 - c. Asset Turnover affects IMAS profitability.
2. Analyse fundamental financial factors and macroeconomic variables listed below that affect IMAS stock return using statistical tools.
 - a. Leverage affects IMAS stock return.
 - b. Liquidity affects IMAS stock return.
 - c. Asset Turnover affects IMAS stock return.
 - d. Fluctuations in Economic Growth affect IMAS stock return.

- e. Fluctuations in Inflation affect IMAS stock return.
 - f. Fluctuations in BI rate affect IMAS stock return.
 - g. Fluctuations in FX rate (USD/IDR) affect IMAS stock return.
 - h. Fluctuations in Oil Price affect IMAS stock return.
 - i. Market Return affects IMAS stock return.
3. Analyse the difference of IMAS profitability and stock return in response to the government policy supporting EV.
- a. IMAS profitability before and after government policy may differ.
 - b. IMAS stock return before and after government policy may differ.

Next chapters will provide the literature review to provide context to the study, outline the methodological framework, discuss about the results, generate conclusions and recommendations, while highlighting research limitations. The results of this study were expected to benefit both academic and investor. By analyzing the impact of EV trends, financial ratios, and macroeconomics variables, it is expected that this research would give benefits:

- For Management of the company: This research provides insights to enhance the decision making and strategy formulation in managing and navigating the company, especially during the dynamic market condition, potential business opportunity and challenging competition.
- For Investors: This research provides investors with a deeper understanding of the key factors influencing stock return, particularly in relation to PT Indomobil Sukses Internasional, Tbk. By identifying the most significant determinants, investors will be better informed to make a strategic investment decisions.
- For Academics: This research contributes to the existing body of literature by examining the impact of the EV trends and macroeconomic variables to the company profitability and stock return. It offers empirical insights in the context of an Indonesian automotive company, topic that has not been extensively explored. Additionally, this research provides a baseline for further studies to build upon and refine its findings.

1.7. Research Scope

This research focus to analyze the profitability and stock return of PT. Indomobil Sukses International, Tbk. as well as the effect of government policy supporting EV. This research analysis comes from secondary data provided in the form of company's annual financial reports published from 2015 to 2025.

1.8. Research Gap

Previous studies have been carried out to understand the impact of financial performance from a company's financial ratios specifically for Return on Equity (ROE) and Stock Return, but the results are quite varied due to many factors like the financial ratios used, the independent and dependent variables used, as well as differences in the industrial sectors from the sample company taken. Therefore, the influence of each financial ratio on stock return cannot be generalized to different industries. Research by (Yeti et al., 2025) shows that high solvency ratio shows the company's dependence on debt funding, which has consequences in long term financial risks. The study from (Faizah et al., 2025) mention that the company can face serious problems if profitability is very low. For example when the high debt burden has put pressure on the company's net profit, operational efficiency and investment strategies need to be improved in managing the crisis.

Another example from (Phiartiany, 2025) found that significant improvement in Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin indicates enhanced operational efficiency and resource utilization. (Raditya et al., 2023) studies the effect of Presidential Decree to accelerate electric vehicle adoption found no significant differences in financial performance for distributor companies between before (2016-2018) and after (2019-2021) the validation of Presidential Decree no.55 2019. Nevertheless, research from (Zaki et al., 2025) for the US automotive company shows that exposure to the risk of ESG-related sanctions could impact its stock and financial performance in the future.

Several research and study have been done to find the effect of multiple independent variables from financial ratios to profitability of the company such

as Return on Equity (ROE) or Return on Assets (ROA) as well as Stock Return. But the result are vary, for example study from (Hendrawati et al., 2024) and (Widya et al., 2023) indicates that Current Ratio, Assets Turnover Ratio, Debt to Equity Ratio (DER) have impact on Return on Investment (ROI) as well as Return on Equity (ROE) respectively.

Study from (Purba et al., 2024) and (Setya et al., 2020) shows simultaneous test for Current Ratio (CR) and DER do not have a significant influence on ROE. (Heryati et al., 2023) study prove that CR has no effect on ROA, Debt to Equity Ratio has a negative and significant effect on ROA while combination of CR and DER simultaneously affect ROA. (Akbar et al., 2025) research shows CR and Debt to Asset Ratio (DAR) have a positive and significant impact on ROA, while Total Asset Turnover (TATO) does not significantly influence ROA.

Impact analysis on Stock Return mainly affected by independent variables from Financial Ratios, like the study from (Ihsan et al., 2023) indicates Market Return and ROE had a positive and significant effect on the Stock Returns. While (Tahir et al., 2018) has stated that macroeconomic variables have a great influence on the Stock Returns, but study from (Trisnowati et al., 2022) shows that good model is one with ESG score and financial performance variables that affect stock return, while macroeconomic variables need to be excluded from the model. Study from (Ariani et al., 2025) prove that ROE and Market Return have a positive and significant impact on the Stock Return, while TATO, CR, exchange rate, interest rate do not significantly impact the Stock Return.

With so many differences and variances from those studies, it is necessary to carry out more specific studies, especially to support research problems and answer existing research questions and objectives to provide accountable information for the company to navigate business dynamics and help the investors in the capital market. The main goal of this research is to examine the potential relations between company's fundamental financial factors and stock returns of an automotive company navigating the impact of Electric Vehicle (EV) and macroeconomic challenges. There was still limited

research that observed the impact of these fundamental factors on company's profitability and stock returns, especially within the 11 years period, while many events happening during the time period such as EV Presidential Decree, COVID-19 pandemic, geopolitical turmoil, and other things reflected in the macroeconomic indicators. Overall, there have been no studies linking Indonesia's EV policy, especially in regards to the automotive companies such as Indomobil with macroeconomic factors during the 2015–2025 period.

1.9. Research Significance and Novelty

This research novelty is the analysis period conducted for 11 years during the period 2015-2025 while combining multiple factors from EV trend to the effects of macroeconomic in Indonesia which never been done in the previous studies. The first five years (2016-2020) was a relatively stable period and the automotive industry growing rapidly even though it was disrupted by rising fuel prices in 2016, global economic turmoil in 2018 and COVID-19 pandemic in 2020, then the last five years was the period where the EV trend began to develop in Indonesia, indicated by more than 10 regulations issued by the Indonesian government to support the acceleration of EV adoption.

Along with the development of EVs, the second half period was also marked by the COVID-19 pandemic, world geopolitical turmoil such as the Russia-Ukraine war and trade war between US-China, supply chain disruption especially the semiconductor, oil price increase, changes in FX rates, economic growth, inflation, and BI rate fluctuations. Data also shows in the last 3 years (2023-2025), demand for EVs has begun to appear with the increasing sales. This study can produce new insights towards the business, the company, the industry as well as the investors.

1.10. Structure of Report

This paper study about the financial performance and macroeconomic factors as well as the effect of government EV policy specifically on Profitability (ROE) and Stock Returns of PT. Indomobil Sukses Internasional, Tbk, This study consists of five chapters:

- Chapter I - Introduction:

This chapter outlines the prerequisites for conducting the research. It covers several sections, such as the background, research problem, research objectives, research questions, gaps in prior research, the study's significance and novelty, and the thesis structure.

- Chapter II - Literature Review:

This chapter explain the theoretical review that serves as the foundation for the research. It presents relevant theories, variable definitions, and the research framework. The literature review comprises a collection of journals, articles, reports, books, and other information sources that support the study.

- Chapter III - Research Methodology:

This chapter explains the methods used to conduct the research. It covers the methodology, research framework, data sources, population and sample, data analysis, reliability and validity.

- Chapter IV - Findings, Analysis, and Discussion:

This chapter details the data results, analysis, and discussion. It presents the research findings and hypothesis testing results, including an explanation of how each financial ratio was evaluated. The analysis and discussion of the results is the core this chapter, particularly regarding whether the findings support the proposed hypotheses.

- Chapter V - Conclusions and Recommendations:

The entire research analysis, from start to finish, is summarized in this chapter. Finally, it presents key points and recommendations based on the research conclusions that are valuable for the business community, investors utilizing market financial information, and academics conducting future research.

CHAPTER II

LITERATURE REVIEW

2.1. General Theory

Refer to the Institute of Indonesia Chartered Accountants (2015), the definition of financial statements in Financial Accounting Standards, is a structured presentation of a company financial position and performance. A balance sheet and income statement are general components of financial statements. The balance sheet exhibit a company financial position at a specific point in time, while the profit and loss statement indicates its financial performance during a period of time (Fraser, 2016). Cashflow is the movement of money into and out of a business within a specific period, showing how the company generates and manage cash for operations, investing, and financing activities (Drake et al., 2012). This study use the financial statements from the annual report of PT. Indomobil Sukses Internasional, Tbk. in the automotive industry period 2015 to 2025.

2.1.1. Efficient Market Hypothesis Theory

The Efficient Market Hypothesis (EMH) was selected as the grand theory for this study, since EMH explains how stock prices react to new information. The theory was first proposed by Eugene F. Fama in 1970. Fama defines an efficient market as one where stock prices reflect all available information, along with the past, present and confidential information, including information known only to the company or internal parties. In an efficient market, no investor can consistently achieve above average returns by leveraging available information, since stock prices always reflect that information.

Fama stated that in an efficient market, stock prices move according to a random pattern, meaning that price changes cannot be predicted with certainty. According to Fama, the primary role of the capital market is the allocation of capital ownership in the economy (Fama, 1970). This theory implies that investors cannot outperform the market in the long run, except through luck or taking higher risks. A market is considered efficient if it meets three conditions.

First, the market must have a sufficient number of rational participants who seek to maximize profits. Second, all market participants must have free access to information. Finally, prices must adjust immediately when new information is released. Fama suggest three levels of market efficiency: weak-form, semi-strong-form, and strong-form. This classification is based on the extent to which new information is reflected in stock prices.

In weak efficiency level, stock prices typically reflect all information provided from historical price data. On a semi-strong efficiency level, stock price reflect the time series of past price fluctuations and other publicly available information. The strongest efficiency level indicates stock prices reflect all available information in public as well as internal generated information including the company fundamental factors (e.g. financial ratios or economic indicators). Financial market participants use fundamental information to assess the value generated by listed companies. In other words, in a perfectly efficient capital market, an optimistic firm's financial performance should be reflected in the market through a rise in its share price or positive stock returns. Conversely, poor financial performance should trigger a decline in the company's share price.

In this study, EMH provides a theoretical foundation for analyzing stock returns of PT. Indomobil Sukses Internasional, Tbk. The theory indicates any changes in macroeconomic variables, Electric Vehicle (EV) trends, and company financial performance should be reflected in stock price movements. Hence, fluctuations in stock returns during the period 2015-2025 can be explained as the market's response to evolving economic conditions, industry transformation, and firm-specific performance. This theory is particularly relevant in examining how external factors such as the EV adoption and macroeconomic may influence investor expectations and valuation of the company.

2.1.2. Arbitrage Pricing Theory

This study use Arbitrage Pricing Theory (APT) as the middle theory to check the correlation between macroeconomic variables and stock returns of

PT Indomobil Sukses Internasional, Tbk. Stephen Ross develop a theory that offers multifactor approach to asset pricing, stating that stock returns are influenced by several systematic risk factors. APT acknowledges that macroeconomic variables such as inflation, interest rates, exchange rates, and economic growth, simultaneously influence asset returns (Ross et al., 2018).

Variables such as inflation rate, BI rate, economic growth, exchange rate (USD/IDR), and oil prices are the examples of systematic risk factors that may influence stock return (Teguh F., 2023). EV can also be interpreted as an industry-specific factor affecting investor perception and future earnings expectations. Therefore, APT provides a theoretical foundation for constructing a multiple regression model to analyze stock returns determinants.

2.1.3. Macroeconomic

Macroeconomics used as middle theory, to examine the performance of national economies and government policies that could influence the economic performance. Macroeconomics also can be seen as the external factors that influence company performance. Companies who invest in a certain country should consider macroeconomic factors, such as gross domestic product, exchange rates, inflation, interest rates, employment, trade, industrial output, and retail sales (Abel et al., 2011).

Economic growth is part of the macroeconomic factors that mostly used to measure the overall economic activity, also considered as the most well-known and widely used indicator to measure country's economic health. According to (Abel et al., 2011). Better economic growth indicates an increase in consumer purchasing power to buy goods and services as well as to invest in the stock market. High demand for goods and services will influence sales increase and the company profits, eventually improves financial performance and fundamentals of the company (Ratnaningrum et al., 2022). Additionally, a demand increase on the stock market will trigger the increase in company stock price, and eventually will influence the increase of stock returns.

Modern theory from Milton Friedman quoted: Inflation is always exists, a monetary phenomenon that arises from a rapid expansion in the quantity of

money compared to total output (Friedman, 1963). Inflation is a macroeconomic and institutional phenomenon (Totonchi, 2021). When the prices majority of goods and services are rising from time to time, means the economy is experiencing inflation (Abel et al., 2011).

The exchange rates definition is the rate at which domestic currency can be exchanged with other foreign currency (Abel et al., 2011). A weak exchange rate is a signal of an economy that is weak and vulnerable, while a strong exchange rate usually indicates economic stability and viability (Gunarto et al., 2019). As part of the macroeconomic factor, the exchange rate affects stock return (Kalam, 2020) and exchange rate also could have a negative and significant effect to the stock return of consumer goods companies listed in Jakarta Stock Exchange period 2009 to 2018 (Thamrin et al, 2020).

2.1.4. Product Life Cycles and Diffusion Theory

Product Life Cycles and Diffusion Theory used as the following middle theory, explains that technological innovations tend to follow a predictable adoption pattern over time. This perspective is important to understand the growth of Electric Vehicles (EVs), where the diffusion of innovation can influence market demand, industry dynamics, and ultimately firm performance (Jiping Li et al., 2020). The adoption process typically follows stages, first the innovators, early adopters, early majority, late majority, and laggards. Collectively, these theories highlight that EV adoption can still play a significant role in shaping long-term corporate performance and investor expectations. The ability to adapt to this new technological is crucial to maintain competitiveness and long-term sustainability (García-Avilés, 2020).

In this study, the automotive industry is undergoing a transition phase where traditional Internal Combustion Engine (ICE) vehicles are reaching maturity, while Electric Vehicles (EVs) are in the growth stage. This transition creates both opportunities and challenges for incumbent firms. Companies that fail to adapt to this shift may experience declining performance, while those that successfully embrace innovation may achieve sustainable growth.

2.1.5. DuPont Analysis

DuPont analysis framework is used to analyze company's fundamental performance, created by the DuPont Corporation in the 1920s. It is a useful technique for decomposing return on equity (ROE) to further investigate the key components drives company's profitability. The DuPont model helps visualize financial information, it is a useful financial analysis tool to gain a better understanding on how operational, financing and investment impact the financial performance of the company (Anthony et al., 2011).

The DuPont framework highlights three key financial aspects that drive return on equity (ROE) including operational efficiency, asset utilization and financial leverage. Operational efficiency is measured by net profit margin or net income divided by total sales or revenue. Efficiency in asset utilization is measured by the asset turnover ratio. Leverage measured by the equity multiplier (EM), which is equal to average assets divided by average equity or estimated by the proportion of debt to equity (Bhagyalakshmi et al., 2019).

2.1.6. Market Return and Stock Return

According to (Hayes, 2021) a market return is known as a financial return or a market index return, is the amount of money gained or lost on an investment over a certain period. Jakarta Composite Index (JKSE) is the most important index on the Indonesian stock exchange (IDX), previous study shows that market return represented by JKSE return has a positive and significant effect on the stock return of consumer goods companies listed on the IDX (Thamrin et al., 2020). Stock return is a measure of the net profit or loss generated from an investments made by investors in the stock market. Fundamental analysis studies the primary factors affecting stock return, allow investors to check the critical financial aspects in evaluating market investment opportunities (Muhammad et al., 2018). Albeit, fundamental analysis also allows investors to analyze financial condition of the company, potential financial future and to predict stock return movements.

Greater financial performance is usually associated with higher stock price in the stock market (Brealey et al., 1995). The money gained or lost

through an investment over some period is known as a return for the investor, other mentioned that return refers to the profit or loss realized on an investment over a specified time frame (Gitman et al., 2008). Therefore, stock return refers to the gains or losses realized by investors during a specific time period, and the main reason of investor to put money into the stock market is basically to earn returns that will meet their expectations. (Sharpe et al., 1970) study results a negative relation between expected long-term earnings growth and expected inflation, while (Jones et al., 2006) indicates that inflation adjustments have a weak predictive power to estimate stock returns.

2.1.7. Financial Ratio Analysis

A financial ratio analysis is a numerical measurement from dividing one data point by another, it is used to explain the relativity of various financial variables. Company use financial ratios to assess its performance, for example to measure capability in paying its debts, evaluating its businesses, and forecasting their future financial variable (Barnes, 1987). Financial ratios are categorized into:

- Profitability ratio (Return on Equity, Return on Investment, Return on Asset).
- Short-term Solvency or Liquidity ratio (Current Ratio, Quick Ratio, Cash Ratio).
- Long-term Solvency or Financial Leverage ratio (Debt to Equity Ratio, Debt to Asset Ratio).
- Activity or Efficiency ratio (Asset Turnover, Inventory Turnover, Average Collection Period).

Return on Equity (ROE) and Return on Assets (ROA) are the most frequently used profitability ratios to predict company value. ROE is the preferred metric for evaluating management's ability to utilize a company's equity and generate profits (Traub et al., 2001). Higher ROE means the more efficient company utilizes shareholder equity to generate returns. ROA is a ratio that shows a company's ability to make a profit from ownership of assets (Puspitawati, 2017). The results of research by (Budiasih, 2009), (Naimah, 2006), and

(Indriyani, 2015) indicates ROA significantly influence company profitability. Liquidity ratio normally used to measure a company's ability to settle short-term liabilities and to finance its operational activities (Anthony et al., 2011). High quick ratio indicates a company's ability to finance its short-term liabilities with better capability in distributing dividends to investors, this will increase investor confidence with the invested capital (Yap et al., 2019).

Debt to Asset Ratio (DAR) and the Debt to Equity Ratio (DER) used to measure company's leverage and solvency. Higher debt proportion relative to assets (DAR), the greater financial risk for the company. Higher risk will lead investors to demand higher returns, which will increase the company's overall cost of capital. DER indicates the relative proportions of debt and equity used to finance a company's assets. A high DER reflects a high risk solvency in a company, where investors tend to avoid companies with high debt or high DER (Atidhira et al., 2017). Other common measure of efficiency is asset turnover, to measure company's efficiency in utilizing its asset to generate revenue.

2.2. Research Hypothesis

2.2.1. Fundamental Determinants of IMAS Profitability

The Effect of Leverage on Profitability

One way to increase corporate profits is through financial leverage, using debt as an instrument to increase corporate returns. A reasonable level of debt improved a company's Return on Equity (ROE) and profitability, this indicates that an increase in the Debt to Equity Ratio (DER) reflects effective management, which can increase company profits (Leman et al., 2020). However, other studies show that leverage Debt to Equity Ratio (DER), has a significant and negative impact on Return on Assets (ROA) for companies in the automotive and components sub-sector listed on the Indonesia Stock Exchange (IDX) during the 2016-2020 (Heryati, 2023). ROE was selected for the model since it better reflects the shareholder perspective regarding invested equity compared to ROA, which is limited to assets. Furthermore, DER is used as an independent variable which acts as a financial lever that can boost ROE.

H1a: Leverage negatively affects profitability.

The Effect of Liquidity on Profitability

Liquidity normally measured using the current ratio, represents a company's ability to settle short-term liabilities with current assets. High liquidity or higher current ratio indicates the company's ability to meet short term obligations and reduce the risks of bankruptcy (Gautama et al., 2024). Higher current ratio also reflects lower solvency risk, that a company will be unable to settle short-term liabilities. Therefore, liquidity should be neither too low nor too high. Low liquidity not only negatively impacts a company's credibility in meeting its obligations but can also disrupt operations, whereas excessive liquidity indicates the presence of idle funds that are not being optimally managed to generate profit. Findings in automotive and components sub-sector companies listed on the Indonesia Stock Exchange (IDX) during 2016-2020 indicate that liquidity (Current Ratio) has no effect on Return on Assets (Heryati, 2023). Current ratio also has no effect on ROE (Jati, W. et al., 2019).

H1b: Liquidity positively affects profitability.

The Effect of Activity on Profitability

The Total Asset Turnover Ratio (TATO) is a metric that measure company's ability in utilizing their assets to generate revenue. Companies with a higher turnover rate of total assets will allow to grab external sources of funding (Karim, 2023). TATO indicates a company's efficiency in managing total assets to generate maximum revenue. Higher asset turnover means the more efficiently the company utilizes its assets to generate revenue. However, high asset turnover may also has a significant negative effect on profitability, indicates low efficiency which result in profit decrease (Panjaitana et al., 2020).

H1c: Activity negatively affects profitability.

2.2.2. Fundamental Determinants of IMAS Stock Return

The Effect of Leverage on Stock Return

Leverage refers to the financing options performed by a company and associated with financial risk level faced by the company. Leverage normally measured by Debt to Equity Ratio (DER). The decision on capital structure is

perhaps one of the most important decisions for managers, since a change in the leverage ratio may affect the company financing capacity, cost of capital, strategic decisions, potential risks, and ultimately shareholder wealth (Adami, 2010). High DER reflected higher risk of the company, consequently reducing the investors interest to invest in companies that had a high DER where stock return may negatively affected.

H2a: Leverage negatively affects Stock Return.

The Effect of Liquidity on Stock Return

Liquidity normally measured by the current ratios, suggest a company's ability to meet its short term financial obligations. High liquidity indicates a company's ability to meet its short-term obligations, while low liquidity means the opposite and may lead to bankruptcy. Significant and positive current ratio to stock return, indicates company's ability to handle short-term liabilities is a positive signal for shareholders to invest (Ramadhani et al., 2023).

H2b: Liquidity positively affects Stock Return.

The Effect of Activity on Stock Return

Total Asset Turnover Ratio (TATO) measures how efficiently a company manages its assets to generate larger sales. High TATO reflects better conditions and provides creditors and investors with insight into the company's internal management. Conversely, a low TATO ratio indicates overproduction, poor inventory management, and ineffective collection efforts. High TATO may accompanied by a decrease in the stock returns, when company's ability to optimize its assets does not affect investor's interest in buying the company's shares, this can happen because some companies that are able to get high TATO in the same period are not followed by profits which make investors not interested in buying shares in the company. Causing the company's stock price to decline which results in a decrease in stock returns (Sitohang, et al., 2019).

H2c: Activity negatively affects Stock Return.

The Impact of Economic Growth on Stock Return

Many studies present different results regarding the relevance of relationship between the stock market and economic growth, many argues that stock market is linked to economic growth. These findings suggest a positive relationship between economic growth and the stock market in both the short and long term. There is evidence of an indirect transmission mechanism through the effect of stock market development on investment (Masoud, 2013).

H2d: Economic Growth positively affects Stock Return.

The Impact of Inflation on Stock Return

Inflation can be described as a continuous year-over-year change in the general price level of goods and services. It occurs when purchasing power exceeds the supply of goods and services. Based on severity, economists classify inflation into several types: (i) Creeping Inflation (mild inflation), (ii) Galloping Inflation (inflation faster than creeping inflation), (iii) Hyperinflation (extremely high inflation), (iv) Stagflation (inflation and recession occur simultaneously), and (v) Deflation, which is the opposite of inflation (a decline in the general price level). A study was conducted to examine the relationship between inflation and stock returns, and the results indicate that inflation influences stock market returns. Therefore, this can guide market participants such as traders, investment managers, and investors in making better portfolio decisions based on information regarding both expected and unexpected inflation (Sathyanarayana, 2018).

H2e: Inflation negatively affects Stock Return.

The Impact of BI Rate on Stock Return

BI rate can influence stock market movements in Indonesia and the stock market's reaction to a specific phenomenon can be measured through abnormal returns, where stock price returns fall below investor expectations. A study by (Wijayaningsih, 2016) indicates that the BI rate and the Fed rate serve as benchmarks for investors when investing in the Indonesia Stock Exchange.

When BI rate rises, investors shift their funds to lower-risk assets such as time deposits, securities, and other instruments, resulting in a decline in stock prices.

H2f: BI Rate negatively affects Stock Return.

The Impact of FX Rate (USD/IDR) on Stock Return

The exchange rate is the rate at which the domestic currency can be exchanged for foreign currency, a weak exchange rate indicates a weak and vulnerable economic, whereas a strong exchange rate can reflect economic stability. Various studies have examined the relationship between exchange rates and the Indonesia Stock Exchange (IDX), shows mixed results that depend on capital market dynamics and international financial markets, particularly during global stock market turbulence, such as the US economic crisis. Given the heavy reliance of Indonesian automotive companies on imported goods, it is important to understand the impact of the USD/IDR exchange rate on the stock market. Analysis results indicate that the USD/IDR exchange rate has a significant and negative impact on the IDX (Robiyanto et al., 2019).

H2g: FX Rate (USD/IDR) negatively affects Stock Return.

The Impact of Oil Price on Stock Return

Oil price fluctuations may influence the sales of oil-powered vehicles. Various studies have examined the correlation between oil prices and the stock returns of vehicle manufacturing companies. Research by (Lis et al., 2012) found that, in general, automotive stocks do not react negatively to rising crude oil prices, unlike the broader market. For instance, Japanese companies showed no sensitivity at all, German companies tended to be sensitive, while US and German companies exhibited higher sensitivity in more recent periods. A study by (Debdatta, 2019) noted that this co-movement pattern is more pronounced in the long term, with stock returns proving sensitive to oil price increases driven by demand shocks. These findings contradict the common view that crude oil prices always move counter-cyclically relative to automotive stocks. For investors, this diminishes the potential benefits of including oil assets in an

automotive stock portfolio, as crude oil fails to provide a cushion against automotive stock market declines during times of crisis.

H2h: Oil Price negatively affects Stock Return.

The Impact of Market Return on Stock Return

Corporate stock returns and market returns are interconnected. An upward trend in corporate stock returns has a positive impact on overall market returns (Thamrin, 2020). However, this positive relationship depends on the returns achieved by other companies in the similar industry. Conversely, a positive market outlook (a bullish stock market) also positively affects the stock returns of companies within that market sector. Market returns share a significant positive relationship with corporate stock returns.

H2i: Market Return positively affects Stock Return.

2.2.3. EV Policy on IMAS Profitability and Stock Return

The Effect of EV Policy on IMAS Profitability

Previous studies shows that government policy and regulations may have impact to financial performance of the company. Study by (Gibran et al., 2025) confirm that government policies play a crucial moderating role in enhancing financial performance and innovation outcomes.

H3a: There is a difference in IMAS Profitability before and after Government Policy.

The Effect of EV Policy on IMAS Stock Return.

Government policies can influence a company's stock return, a study by (Chen et al., 2005) found that business entry requirements boosted the performance of securities firms, as regulatory controls on new market entrants can limit competition in the industry. Findings by (Sun et al., 2024) also confirm the effectiveness of government green subsidies from the perspective of investors and capital markets.

H3b: There is a difference in IMAS Stock Return before and after Government Policy.

2.3. Research Framework

This study use financial indicators and stock return selected from the financial statement, ratios, macroeconomic data, market index as well as stock return. All indicators and ratios will be analyzed, but not all factors will be calculated using the regression model. Some of the key internal and external factors will be selected as independent variables in the model to test the impact towards dependent variables such as profitability and stock return.

Table 2.1. Indicator of Financial Performance and Stock Return

Indicators of Financial Performance	
Profit Margin	Gross Profit Margin Operating Profit Margin Net Profit Margin
Financial Ratios	Profitability Ratios (ROE, ROI, ROA) Liquidity Ratios (Current Ratio, Quick Ratio, Cash Ratio) Efficiency Ratios (Asset Turnover, Inventory Turnover, Average Collection Period) Solvency Ratios (Financial Leverage Ratio, Debt to Equity Ratio, Debt to Asset Ratio)
Dividend Policy	Dividend Yield Dividend Payout Ratio
Shares Ratio	Price-to-Earnings (P/E) Price-to-Book (P/B) Earnings Per Share (EPS)
Indicator of Stock Return	
Stock Return	Measured by capital gains, dividend yield, and total return over time
Market Return	Measured by percentage of rate of return of market index

Conceptual Framework Diagram in Figure 2.1. below visualized the first research framework to study the financial fundamental determinants of IMAS profitability. The independent variables to predict IMAS stock return are Debt to Equity ratio (Leverage), Current Ratio (Liquidity), Total Asset Turnover (Activity) towards Return on Equity (Profitability) as dependent variable. Figure 2.2. illustrate the second research framework that analyze the significance effect of internal factors such as leverage, liquidity, and activity as well as external factors of macroeconomic variables on IMAS Stock Return. The selected macroeconomic variables were changes in Economic Growth, Inflation, BI Rate, FX Rate (USD/IDR), Oil Price, and Market Return.

Subsequently, an analysis will be conducted to determine whether there are differences in IMAS's Profitability and Stock Return before and after the Government EV policy.

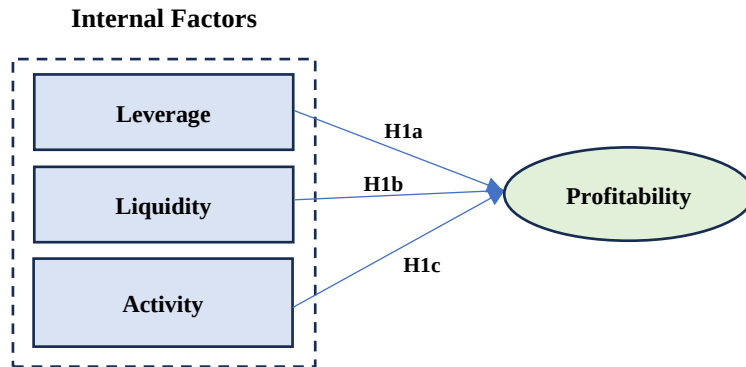


Figure 2.1. Research Framework I

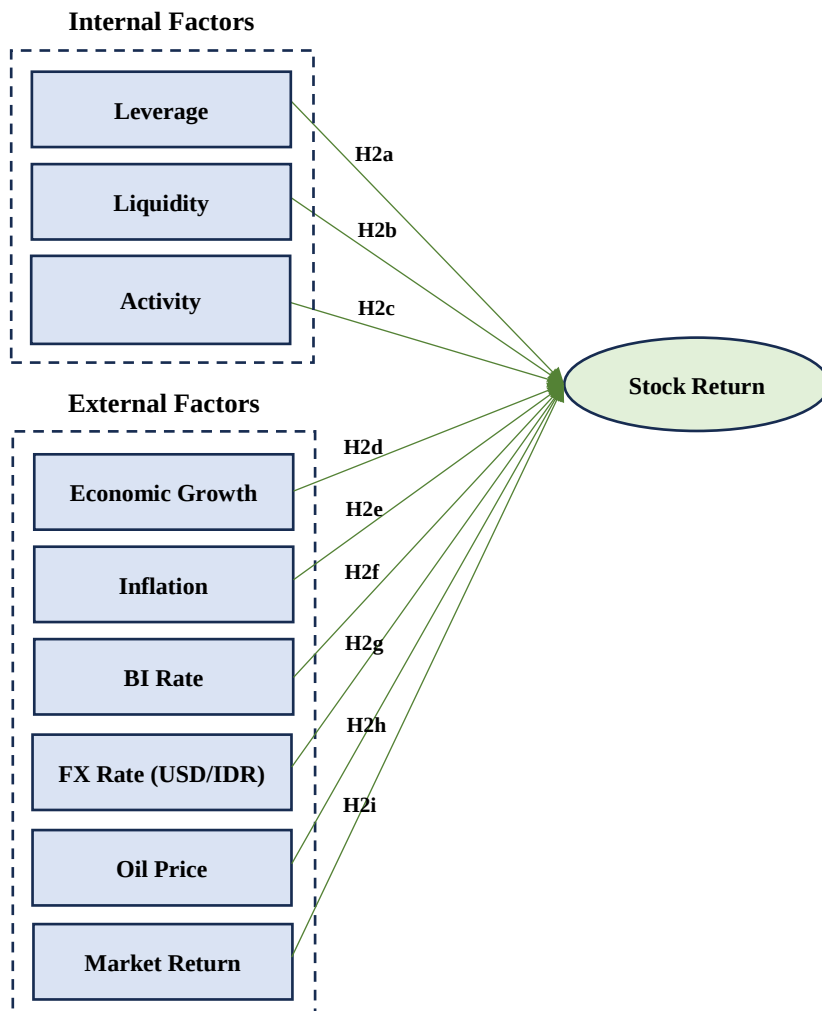


Figure 2.2. Research Framework II

CHAPTER III

RESEARCH METHODOLOGY

3.1. Research Design

This study employs a quantitative and qualitative descriptive research design using secondary data to assess the financial performance of PT. Indomobil Sukses Internasional, Tbk. over the 11 years period from 2015 to 2025. The research design focuses on finding and investigate the correlational impact of the connection between company performance in terms of profitability and stock return versus several variables both from internal and external factors. This study include analyzing financial statements, key financial ratios, dividend policy, valuation indicators, and their relationship to stock returns. The relationship between those variables can be positive, negative, or zero.

Developing the research design is also important to provide a framework for the research process, to address research questions by collecting data, classifying, analyzing and finally developing research conclusions in response to the research problem. Nevertheless, this study does not aim to establish causality between variables. Figure 3.1. shows the breakdown of each research stage, start with identifying the research topic, reviewing the literature and defining the problem, developing research questions, developing research design, collecting data and pre-testing, analyzing data, drawing conclusions, and developing recommendations.

The research design use quantitative method and a sampling technique for collecting the required sample data. The process will be continued with a scientific investigation of quantitative properties, phenomena, and its relationships while also testing the stated objectives. Quantitative research enhances the validity of research that uses statistical and mathematical methods to measure results conclusively. Quantitative analysis aims to find correlations between variables by testing hypotheses from the study through various statistical research methods (Winter, 2020).

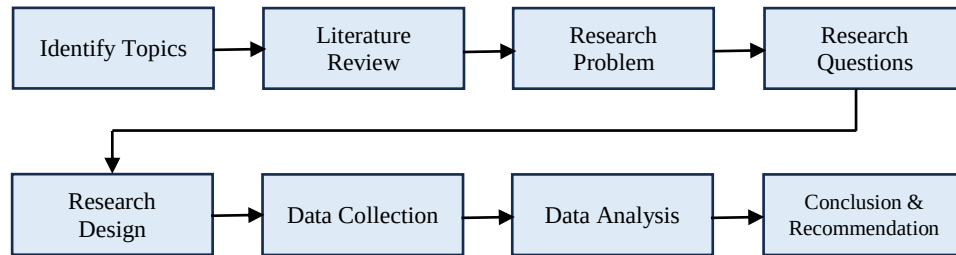


Figure 3.1. Research Design Flow

3.2. Data Collection

In order to conduct the research using quantitative research method, data was collected with the technique to select appropriate dataset for addressing the research questions. To support this, data collection relies on secondary data obtained from:

1. Annual reports of PT Indomobil Sukses Internasional, Tbk. (2015-2025) to collect data about financial performance of the company and distribution of revenue by segment.
2. Gabungan Industri Kendaraan Bermotor Indonesia (Gaikindo) to collect data about vehicle sales in Indonesia by brand and type (ICE, EV, and Hybrids).
3. Indonesian Central Statistic Agency (BPS) to collect Economic Growth.
4. Bank Indonesia website to collect macroeconomics data such as Inflation, BI Rate, FX Rate (USD/IDR).
5. Other websites (e.g. Yahoo Finance, Investing.ID, Macrotrends, IDX/TICMI) to complement data collection with other information like Oil Prices, Stock Return and Market Return.

3.3. Research Population and Sample

The research sample consisted of 44 quarterly financial reports from IMAS website period 2015 to 2025. Using the data, multiple regression analysis was performed to analyze relationship between IMAS financial Profitability and Stock Return versus independent variables within the internal and external factors.

3.4. Economic Model, Variables and Indicators

Financial Performance Indicators:

- Profitability Ratios: ROE, ROI, ROA, GPM, OPM, NPM.
- Liquidity Ratios: Current Ratio, Quick Ratio, Cash Ratio.
- Solvency Ratios: Financial Leverage Ratio, DER, DAR.
- Efficiency Ratios: Inventory Turnover, TATO, Avg. Collection Period.
- Dividend Ratios: Dividend Yield and Dividend Payout Ratio.
- Valuation Metrics: P/B Ratio, P/E Ratio, EPS.
- Stock Return: Annual share price appreciation and dividend yield.

Profitability Ratios: Measures business ability to generate revenue and profit at certain period of time.	
Return on Equity (ROE): Measures profitability of shareholder investment or equity. (Weygandt et al., 2012)	$\text{ROE (\%)} = \left(\frac{\text{Net Income}}{\text{Shareholders' Equity}} \right) \times 100$ Eq. 3.1
Return on Investment (ROI): Measures firm earnings from the invested capital. (Anthony, 2011)	$\text{ROI (\%)} = \left(\frac{\text{Net Operating Profit After Taxes (NOPAT)}}{\text{Capital Employed}} \right) \times 100$ Eq. 3.2
Return on Asset (ROA): Measures overall profitability of assets. (Weygandt et al., 2012)	$\text{ROA (\%)} = \left(\frac{\text{Net Income}}{\text{Total Assets}} \right) \times 100$ Eq. 3.3
Profit Margin Ratios: Measures how efficiently a company produces and sells its products.	
Gross Profit Margin: Measure of remaining revenue after deducting the COGS. (Gillingham, 2015)	$\text{Gross Profit Margin (\%)} = \left(\frac{\text{Revenue} - \text{COGS}}{\text{Revenue}} \right) \times 100$ Eq. 3.4
Operating Margin: Measure the effectiveness of operating income versus revenue. (Khresat et al., 2025)	$\text{Operating Margin (\%)} = \left(\frac{\text{Operating Income}}{\text{Revenue}} \right) \times 100$ Eq. 3.5
Net Profit Margin: Measures net income generated by each currency unit of sales. (Weygandt et al., 2012)	$\text{Net Profit Margin (\%)} = \left(\frac{\text{Net Profit (Net Income)}}{\text{Revenue}} \right) \times 100$ Eq. 3.6

Liquidity Ratio: Measures company's ability to raise cash in the short term to meet its obligations.	
Cash Ratio: Measures cash and cash equivalent balances relative to current liabilities (Gillingham, 2015)	$\text{Cash Ratio (\%)} = \left(\frac{\text{Cash} + \text{Cash Equivalents}}{\text{Current Liabilities}} \right) \times 100$ Eq. 3.7
Current Ratio (CR): Measures short-term debt-paying ability. (Weygandt et al., 2012)	$\text{Current Ratio (\%)} = \left(\frac{\text{Current Assets}}{\text{Current Liabilities}} \right) \times 100$ Eq. 3.8
Acid-test (Quick) Ratio: Measures immediate short-term liquidity. (Weygandt et al., 2012)	$\text{Quick Ratio (\%)} = \left(\frac{\text{Cash} + \text{Cash Equivalents} + \text{Marketable Securities} + \text{Accounts Receivable}}{\text{Current Liabilities}} \right) \times 100$ Eq. 3.9
Activity Ratios: Measures the level of efficiency in using company resources and the ability to carry out daily activities.	
Collection Period: Measures the effectiveness of a company's collection policies. (Weygandt et al., 2012)	$\text{Collection Period} = \left(\frac{\text{Accounts Receivable}}{\text{Revenue}} \right) \times 365$ Eq. 3.10
Inventory Turnover: Measures liquidity of inventory. (Weygandt et al., 2012)	$\text{Inventory Turnover (in days)} = \left(\frac{\text{Average Inventory}}{\text{Cost of Goods Sold (COGS)}} \right) \times 365$ Eq. 3.11
Asset Turnover (TATO): Measures how efficiently assets are used to generate sales. (Weygandt et al., 2012)	$\text{Asset Turnover (\%)} = \left(\frac{\text{Revenue}}{\text{Capital Employed}} \right) \times 100$ Eq. 3.12
Solvency Ratios: Measures a company's long-term ability to meet its financial obligations.	
Equity to Asset Ratio: Measures the proportion of a company's assets that are financed by shareholders' equity. (Kantrovich, 2011)	$\text{Equity to Asset Ratio (\%)} = \left(\frac{\text{Total Equity}}{\text{Total Assets}} \right) \times 100$ Eq. 3.13
Debt to Equity Ratio (DER): Measures a company's proportion of financing its debt related. (Gillingham, 2015)	$\text{Debt to Equity Ratio (\%)} = \left(\frac{\text{Total Liabilities}}{\text{Total Equity}} \right) \times 100$ Eq. 3.14
Debt to Asset Ratio: Measures percentage of total assets provided by creditors. (Weygandt et al., 2012)	$\text{Debt to Asset Ratio (\%)} = \left(\frac{\text{Total Liabilities}}{\text{Total Assets}} \right) \times 100$ Eq. 3.15

Equation 1. Regression equation model to test the effects of Leverage, Liquidity and Activity to IMAS profitability (ROE).

$$IMAS_ROE_t = \beta_0 + \beta_1 Leverage_t + \beta_2 Liquidity_t + \beta_3 Activity_t + e_t$$

Eq. 3.16

β_0 = Constant (intercept)

$\beta_1 Leverage_t$ = Regression Coefficient x Leverage

$\beta_2 Liquidity_t$ = Regression Coefficient x Liquidity

$\beta_3 Activity_t$ = Regression Coefficient x Activity

e_t = Error term (residual) at time period

Equation 2. Regression equation model to test the effects of Leverage, Liquidity, Activity, Economic Growth, Inflation, BI Rate, FX Rate, Oil Price, and Market Return to IMAS Stock Return.

$$IMAS_Stock_Return_t = \beta_0 + \beta_1 Leverage_t + \beta_2 Liquidity_t + \beta_3 Activity_t + \beta_4 EcoGrowth_t + \beta_5 Inflation_t + \beta_6 BIRate_t + \beta_7 FXRate_t + \beta_8 OilPrice_t + \beta_9 MarketReturn_t + e_t$$

Eq. 3.17

β_0 = Constant (intercept)

$\beta_1 Leverage_t$ = Regression Coefficient x Leverage

$\beta_2 Liquidity_t$ = Regression Coefficient x Liquidity

$\beta_3 Activity_t$ = Regression Coefficient x Activity

$\beta_4 EcoGrowth_t$ = Regression Coefficient x EcoGrowth

$\beta_5 Inflation_t$ = Regression Coefficient x Inflation

$\beta_6 BIRate_t$ = Regression Coefficient x BIRate

$\beta_7 FXRate_t$ = Regression Coefficient x FXRate

$\beta_8 OilPrice_t$ = Regression Coefficient x OilPrice

$\beta_9 MarketReturn_t$ = Regression Coefficient x MarketReturn

e_t = Error term (residual) at time period

This study applies several quantitative data analysis techniques, trend analysis is used to observe development of key financial indicators such as revenue, net income, and total assets over time, allowing the researcher to identify growth

patterns, declines, or stagnation during 2015-2025 period. Ratio analysis is performed to assess the company's profitability, liquidity, solvency, and operational efficiency by calculating and interpreting financial ratios including Return on Assets (ROA), Return on Equity (ROE), Current Ratio, Debt-to-Equity Ratio, and Inventory Turnover. These ratios provide insights to financial health and operational sustainability of the company. In addition, valuation analysis using metrics such as Price-to-Earnings (P/E), Price-to-Book (P/B) evaluates how the market values the company relative to its financial performance. Dividend analysis is conducted to assess payout stability, investor returns, and management dividend policy, using indicators such as Dividend Payout Ratio and Dividend Yield.

Finally, a correlation analysis is applied to validate the relationship between financial performance and stock returns, to test whether improvements in financial ratios are connected with increased shareholder value. These combined techniques enable a well-rounded, data-driven understanding of IMAS financial trajectory and market behavior over the examined period.

- Trend Analysis: To observe changes in financial performance indicators across the years.
- Ratio Analysis: To evaluate financial profitability, liquidity, efficiency, and solvency.
- Comparative Analysis: To benchmark IMAS performance against industry averages or selected automotive peers.
- Correlation Analysis: To assess the relationship between financial indicators and stock returns.
- Valuation Assessment: Using historical multiples (P/E, P/B) to evaluate market perception and intrinsic value.

3.5. Data Analysis Techniques and Statistical Methods

3.5.1. Classical Assumption Test

The classical assumption test is a test of statistical assumptions that must be met in linear regression analysis based on Ordinary Least Squares (OLS).

To obtain an unbiased and efficient examiner value (Best Linear Unbias Estimator) from a multiple regression equation using the Least Squares method, several tests are required to determine the regression model result meets the requirements of classical assumptions, which include:

1. Normality Test.

The purpose of the normality test is to find out whether the distribution of data follows or is close to a normal distribution, namely a data distribution with a bell shape. Good data is data that has a pattern like a normal distribution, that is, the data distribution does not deviate to the left or deviate to the right. The normality test was carried out on the model residual values. This test is necessary because carrying out the t-test and F-test assumes that the residual values follow a normal distribution. According to (Sukesti et al., 2021), there are two ways to detect whether the residuals are normally distributed or not, namely by graphical and statistical analysis. Normality can be detected by looking at the histogram of the residual values. If the data spreads around the diagonal line and follows the direction of the diagonal line, or if the histogram graph shows a normal distribution pattern, then the regression model satisfies the assumption of normality. The statistical test will be used to test residual normality is the Jarque-Bera normality test. Data is considered "normal" if the Jarque-Bera value is not significant, if the p-value is greater than 0.05 (Aruan M. et al., 2022).

2. Multicollinearity Test.

The multicollinearity test is to determine whether or not there is a significant correlation between independent variables in a multiple linear regression model. This test is needed to determine whether there are independent variables that are similar to other independent variables in one model. The similarity between independent variables in one model will cause a very strong correlation between one independent variable and other independent variables (Rusiadi et al., 2013). According to (Sukesti et al., 2021) the multicollinearity assumption test aims to test whether the regression model finds a correlation among the independent variables and a good regression model does not have correlation among independent variables. If a

correlation occurs, it means having a multicollinearity problem where the correlation value between independent variables is high. Meanwhile, to find out this symptom, it can be detected from the size of the VIF (Variance Inflation Factor). The provisions for detecting the presence or absence of multicollinearity can be seen from the following rules where $VIF < 10$ means there is no multicollinearity (Sujarweni, 2019).

3. Heteroscedasticity Test

The heteroscedasticity test aims to check whether in the regression model there is an inequality of variance from the residuals of one observation to another. If the variance from the residual is constant from one observation to another, it is called homoscedasticity and if it is different it is called heteroscedasticity. A good regression model is homoscedastic or does not have heteroscedasticity. Detecting symptoms of heteroscedasticity can be done using the Park Glejser method (Sujarweni, 2019), if the probability value is greater than 0.05, then it can be ensured that the model does not contain elements of heteroscedasticity.

4. Auto-correlation Test

The auto-correlation test aims to test whether in a linear regression model there is a correlation between the residuals in period t and the residuals in period $t-1$ (previous). A good regression model is a regression that should be free from auto-correlation and one of the method that can be used to test the auto-correlation is Breusch-Godfrey Serial Correlation LM test (Abdulhafedh, A. , 2017). The LM test is particularly useful because it is not only suitable for testing for temporal autocorrelation of any order, but also suitable for models with or without lagged dependent variables.

$$LM = (n - i) R^2$$

LM = Lagrange multiplier test statistic

n = number of observations in the dataset

i = order of the autocorrelation

R^2 = unadjusted R^2 statistic (coefficient of determination) model

(1)

- If the Prob(Chi-square) < 0.05 , failed auto-correlation test.
- If the Prob(Chi-square) > 0.05 , pass auto-correlation test.

The Impulse Indicator Saturation (IIS) method in EViews is used to detect and control for outliers. To handle the structural breaks in the data, IIS employs dummy variables for the relevant periods. Detecting and isolating outliers enables the model to pass normality tests, given that such outliers are typically triggered by specific events affecting those periods. The Augmented Dickey–Fuller (ADF) test is used to assess the stationarity of a time series by testing for the presence of a unit root, particularly in studies involving multiple variables with diverse characteristics. Using non-stationary data carries the risk of leading to spurious regression.

3.5.2. Partial t-Test and Simultaneous F-Test

The partial t-Test will be used to examine whether each individual independent variable has a significant effect on the dependent variable. The t-Test assesses the significance of the regression coefficient of the individual independent variables, with the hypothesis statement and the formula below:

$$H_0: \beta_j = 0$$

$$H_a: \beta_j \neq 0$$

$$t = \frac{\hat{\beta}_i}{SE(\hat{\beta}_i)}$$

t = t-statistic

$\hat{\beta}_i$ = estimated regression coefficient

$SE(\hat{\beta}_i)$ = standard error of the coefficient (2)

- If the p-value < 0.05, the independent variable is significant.
- If the p-value > 0.05, the independent variable is insignificant.

The purpose of simultaneous F-test examines whether all independent variables together significantly affect the dependent variable. Hypothesis statement and the formula below:

$$\text{Model example: } Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

$$H_0: \beta_1 = \beta_2 = \beta_3 = 0 \text{ (no variables affects } Y)$$

$$H_1: \text{ (at least one coefficient is not equal to zero)}$$

$$F = \frac{SSR/k}{SSE/(n-k-1)}$$

R^2 = coefficient of determination

$$\begin{aligned} k &= \text{number of independent variables} \\ n &= \text{sample size} \end{aligned} \quad (3)$$

- If the Prob(F-statistic) < 0.05, the model is significant.
- If the Prob(F-statistic) > 0.05, the model is insignificant.

3.5.3. F-Test Two Sample for Variances

A Two-Sample F-Test for Variances is a statistical test used to validate whether two groups have the same variance. The F-test can be two-tailed or one-tailed depending on the purpose of the test. While one-tailed is one direction, to show variance from the first population was either greater or less than the second population variance. A two-tailed tests the alternative hypothesis that the variances are not equal.

$$F = \frac{s_1^2}{s_2^2}$$

$$\begin{aligned} s_1^2 &= \text{variance of Group 1} \\ s_2^2 &= \text{variance of Group 2} \end{aligned} \quad (4)$$

- If $p < 0.05$, variances are different (difference between the two groups).
- If $p > 0.05$, variances are equal (no difference between the two groups).

3.5.4. Welch t-Test

A Welch t-test also known as unequal variances t-test, is a statistical test used to compare the means of two groups when their variances are not equal. The Welch t-test is commonly used to compare two samples of two groups populations regardless whether the two samples had equal or unequal variances.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$\begin{aligned} \bar{X}_1 &= \text{mean of Group 1} \\ \bar{X}_2 &= \text{mean of Group 2} \\ s_1^2 &= \text{variance of Group 1} \\ s_2^2 &= \text{variance of Group 2} \\ n_1 &= \text{sample size of Group 1} \\ n_2 &= \text{sample size of Group 2} \end{aligned} \quad (5)$$

- If $|t_{\text{Stat}}| > t_{\text{critical}}$, then reject H_0 or if $p < 0.05$, mean variances are different (difference between the two groups).
- If $|t_{\text{Stat}}| < t_{\text{critical}}$, then fail to reject H_0 or if $p > 0.05$, mean variances are equal (no difference between the two groups).

3.6. Research Procedure

The research procedures conducted aim to analyze IMAS financial performance through data analysis and to assess the association between the dependent variable such as IMAS Profitability and Stock Return against multiple independent variables such as financial performance, financial ratios and macroeconomic variables. This study use statistical procedures that are primarily econometrics-based method using the Ordinary Least Squares (OLS) regression with Classical Assumption Test, partial t-Test and F-test as significance test, F-test Two Sample, Welch t-Test for variances of two groups.

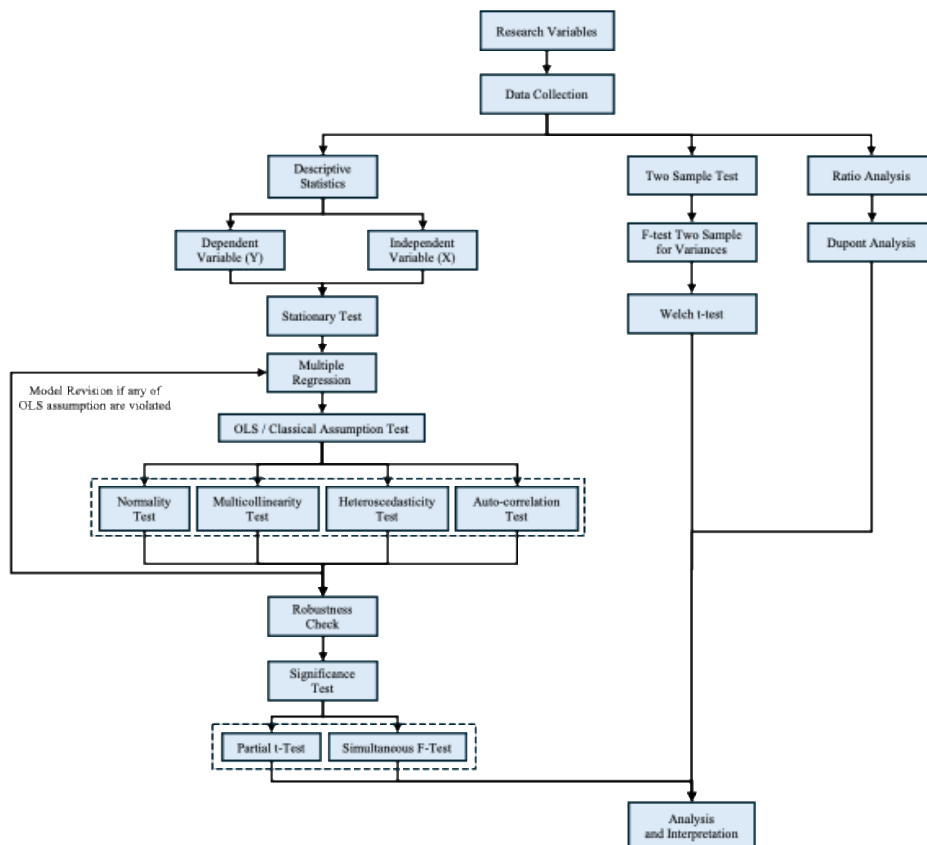


Figure 3.2. Research Procedure

The first section of this research is to conduct descriptive statistics analysis after all the required data variables were collected, then constructed a regression model to study the determinants of IMAS Profitability and Stock Return. To validate the regression models, OLS classical assumption tests were conducted, using normality test, heteroscedasticity test, multicollinearity test, and auto-correlation test. Variables in each regression model were tested to detect any violations of OLS assumptions, then significance tests were performed to assess the significance of the relationship between the independent and dependent variables formulated in the research questions. The results of the significance test are analyzed to test the hypothesis and to evaluate the significance of the independent variables and the models.

The second section of this study aims to examine the differences between the two sample data, specifically to analyze the differences in IMAS Profitability and Stock Returns before and after the implementation of government policy supporting EV. The data is divided into 2015-2020 period (pre-EV policy) and 2021-2025 period (post-EV policy), then Two-Sample F-Test and a Welch t-Test are performed to evaluate the variances of the two data samples and assess potential differences in sample means.

The third section of this study aims to analyze IMAS financial performance, financial data were collected from company financial reports and evaluated to calculate financial ratios. These ratios were analyzed using DuPont framework to understand the drivers of IMAS financial performance. As part of the scope of this study and consistent with the previous research framework diagram, only several independent variables from financial ratios are used in the correlation testing: Leverage represented by Debt to Equity Ratio (DER), Liquidity represented by Current Ratio (CR), and Activity represented by Total Asset Turnover (TATO). As for the macroeconomics data, independent variables used are Economic Growth, Inflation, BI Rate, FX Rate (USD/IDR), Oil Price, and Market Return. This research also utilizes several tools commonly used in financial and quantitative analysis to support the accuracy and effectiveness of data analysis, such as: Microsoft Excel and EViews v.14 for data computation and regression analysis.

CHAPTER IV

FINDINGS, ANALYSIS & DISCUSSION

4.1. Fundamental Analysis

4.1.1. Financial Statement Analysis

From the period 2015 to 2025, PT. Indomobil Sukses Internasional, Tbk. (IMAS) demonstrated substantial balance sheet growth during 2015-2025. Total assets increased from 24.9 trillion in 2015 to 78.5 trillion in 2025, indicating significant business expansion. This growth was primarily financed by liabilities, which rose from 18.2 trillion to 62.5 trillion over the same period. Current liabilities increased steadily, reflecting greater short-term financing needs, while non-current liabilities expanded considerably after 2022, suggesting increased long-term borrowing. Equity also strengthened from 6.7 trillion to 16.0 trillion, indicating retained earnings accumulation and improved shareholder value. Overall, IMAS exhibited strong asset growth, although the increasing reliance on debt highlights the importance of maintaining financial leverage and solvency at sustainable levels.

Table 4.1. IMAS Balance Sheet (in Trillion IDR)

Balance Sheet	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
ASSETS	24.9	25.6	32.0	41.0	44.7	48.4	51.0	57.4	62.9	67.6	78.5
LIABILITIES	18.2	18.9	22.7	30.8	35.3	35.7	38.2	43.3	47.4	51.6	62.5
CURRENT LIABILITIES	13.0	12.6	16.3	21.5	21.3	24.0	26.5	30.2	28.8	27.4	35.0
NONCURRENT LIABILITIES	5.1	6.3	6.4	9.3	14.0	11.7	11.6	13.0	18.6	24.2	27.4
EQUITY	6.7	6.7	9.3	10.2	9.4	12.7	12.8	14.2	15.5	16.0	16.0

Source: IMAS Annual Report

IMAS net sales generally increased from 19.5 trillion in 2015 to 30.5 trillion in 2025, reflecting business growth and recovery following the COVID-19 pandemic after experiencing stagnant conditions in 2017 to 2018. COGS also rose slowly but the company was still able to maintain stable gross profit margins during this period, even in conditions of high business competition. Operating profit improved significantly from 1.0 trillion in 2015 to 2.8 trillion

in 2024-2025, indicating enhanced operational efficiency. However, net income remained volatile, with losses recorded in several years especially during COVID-19 pandemic before turning positive in 2023-2025. Overall, IMAS demonstrated revenue growth and stronger operating performance, but profitability especially the bottom-line remained vulnerable to cost pressures.

Table 4.2. IMAS Income Statement (in Trillion IDR)

Income Statement	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NET SALES	19.5	18.1	15.0	15.4	17.9	15.2	19.2	25.6	28.9	29.3	30.5
COGS	16.8	15.4	12.4	12.3	14.5	11.9	15.5	20.4	23.0	23.3	24.3
GROSS PROFIT	2.6	2.7	2.7	3.1	3.4	3.4	3.7	5.2	5.9	6.0	6.2
OPERATING EXPENSES	-1.6	-1.7	-2.1	-1.7	-1.8	-2.6	-2.4	-3.2	-3.1	-3.2	-3.4
OPERATING PROFIT	1.0	1.0	0.6	1.4	1.6	0.8	1.3	2.0	2.8	2.8	2.8
NET INCOME	-0.1	-0.0	-0.3	-0.1	0.1	-0.7	-0.3	0.6	0.8	0.4	0.2

Source: IMAS Annual Report

Despite the decline in national vehicle sales during the COVID-19 pandemic and slower growth from 2023 to 2025, the company successfully recorded higher revenue growth. Total IMAS revenue were dominated by automobiles (60%) including service and parts, followed by fuels & energy business (15%), car rental & logistics (11%), financial service (7%) and smaller revenue from other businesses. IMAS has established strategic policies and business development in harmony to supports the company's long-term goal.

The company supports government policies in encouraging growth of electric vehicle industry by participating in marketing, developing and presenting electric-based vehicles at affordable price. The company's strategic policy is formulated by the precautionary principle, the company continues to develop electric vehicles parallel with other businesses, like logistics, transportation, energy, etc. Over the years, the company face unstable global economy due to COVID-19 pandemic, economy challenges and geopolitical tensions. Therefore, the company regularly evaluate their strategy, continue to execute the plan while monitoring the operational cost management and prepare funding required by various businesses and the expansion plans.

Gross Profit Margin of PT. Indomobil Sukses Internasional, Tbk. are stable, this indicates resilient result but not significantly improving for the past 5 years, suggest limited efficiency gains. Operating Profit Margin shows better upward trajectory, rising from 6% to 9%, reflecting improved operational efficiency. However, Net Profit Margin remained volatile, turning negative in several years and reaching its lowest point of -4% in 2020 due to the COVID-19 pandemic. The recovery of NPM to positive levels after 2021 suggests improving profitability, although bottom-line performance remains relatively low compared to gross and operating margins.

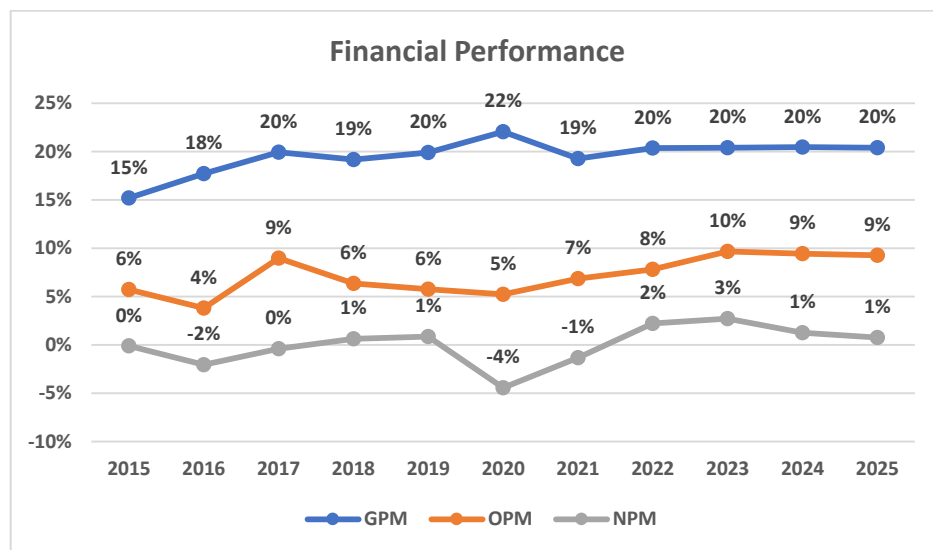


Figure 4.1. IMAS Financial Performance
Source: IMAS Annual Report

IMAS exhibited fluctuating cash flow performance during 2015-2025, the company generated strong operating cash flow in 2019 and 2020, a consistent decline since 2021 and reaching low levels in 2023-2024 suggests weakening internal cash generation, likely due to rising costs, working capital pressures, and possible additional EV related activities. Investing cash flow was predominantly negative, reflecting continuous capital expenditures and investments to support business expansion. Financing cash flow fluctuated significantly, suggesting changes in borrowing and funding strategies over time. Consequently, net changes in cash varied from year to year, with strong increases in 2025.

Negative investing cashflows may indicate capital expenditures to capture new opportunities, though these investments have not yet produced immediate returns. To support this expansion, the company has relied more on external financing since 2022, increasing its exposure to macroeconomic variables such as interest rates, exchange rate volatility, and inflation. As a result, net cash flow turned negative in 2023 and 2024, signaling emerging liquidity pressure. Overall, IMAS is strategically positioning itself within the EV transition, this shift has led to cashflow constraints and financial risk.

Table 4.3. IMAS Cashflow Statement (in Trillion IDR)

Cashflows	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Operating Activities	0.8	0.1	-0.6	-2.2	3.5	3.5	2.4	1.9	-0.4	0.5	2.0
Investing Activities	-1.0	-1.3	-1.1	-3.2	-1.2	-1.2	-1.4	-2.3	-3.0	-2.2	-3.3
Financing Activities	0.4	1.5	1.5	5.3	-0.8	-0.8	-1.0	2.0	2.4	1.4	4.0
Net Increase in Cash	0.2	0.3	-0.3	-0.2	1.4	1.4	0.0	1.6	-1.0	-0.3	2.8

Source: IMAS Annual Report

4.1.2. Financial Ratio Analysis

The profitability performance of PT Indomobil Sukses Internasional Tbk. over the 2015-2025 period demonstrates fluctuation follows the global economy dynamics, a gradual recovery post pandemic followed by stabilization amid industry transformation to Electric Vehicle.

Profitability Ratio (Ross, 2012):

Adding the drop of ROE in 2016, the company experienced negative profitability in 2020-2021, with ROE declining to -5% and -2%, reflecting the adverse impact of economic disruptions and weakened automotive demand caused by COVID-19 pandemic. Post pandemic, profitability improved significantly in 2022-2023, as ROE increased to 4% and peaked at 5%, while ROI and ROA also turned positive, indicating enhanced efficiency in utilizing equity and assets. Nevertheless, a decline in ROE to 2% in 2024 and 1% in 2025 as well as slight reductions in ROI and ROA indicate that profitability remains relatively modest and susceptible to external pressures. These fluctuations may be attributed to macroeconomic factors such as rising interest rates, exchange

rate volatility, and inflation, as well as the high capital requirements associated with EV related investments. Overall, while PT. Indomobil Sukses Internasional, Tbk. has shown signs of profitability recovery, but its financial performance remains constrained, highlighting the challenges of sustaining returns during rising competition and transition toward electrification.

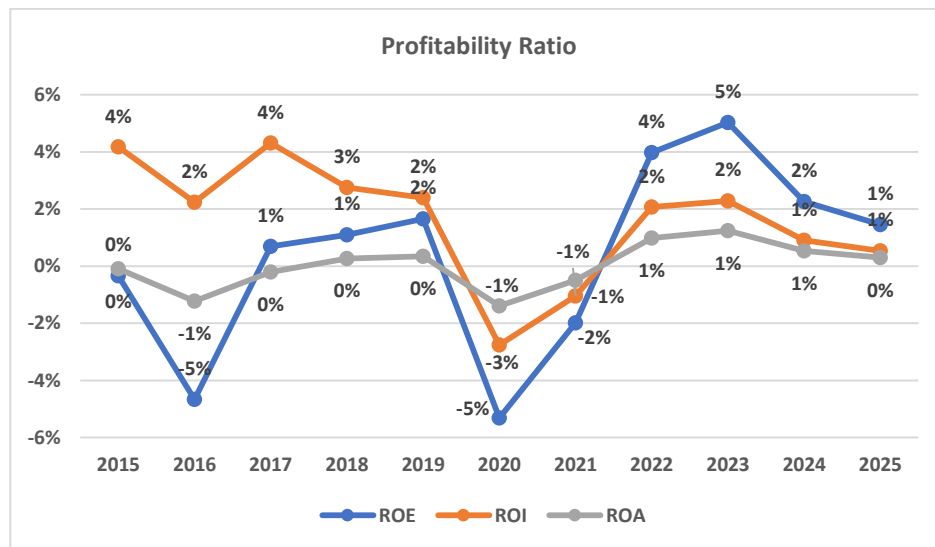


Figure 4.2. IMAS Profitability Ratio
Source: IMAS Annual Report

Liquidity Ratio (Subramanyam, 2009):

The liquidity position of PT. Indomobil Sukses Internasional, Tbk. over the 2015-2025 period shows gradual improvement, although it remains relatively constrained. Current Ratio fluctuated between 0.7 and 1.0, suggesting that current assets were generally insufficient to fully cover current liabilities. The ratio remained below the conventional benchmark of 2.0, reflecting a relatively tight working capital position. Current Ratio increased from 0.7 in 2021 post pandemic to 1.0 in 2024, indicating a slow recovery in the company's ability to meet short-term obligations, yet still reflecting a borderline liquidity position. Similarly, the Quick Ratio remained stable at 0.6 for most of the period before rising to 0.8 in 2024, suggesting limited availability of highly liquid assets excluding inventory.

Meanwhile, the Cash Ratio remained the weakest liquidity measure, consistently low at around 0.1-0.2. Highlighting minimal cash reserves relative

to current liabilities, this indicates a strong dependence on inventory turnover, receivable collection, and operating cash flows to meet short-term obligations. Despite some improvement, the company continues to face tight liquidity conditions, likely driven by high working capital requirements and significant capital expenditures associated with the transition toward EV initiatives. Liquidity position is sensitive to macroeconomic factors such as interest rate increases and exchange rate volatility, which may increase financing costs and pressure in the short-term cash availability. Overall, while PT. Indomobil Sukses Internasional, Tbk. shows signs of liquidity improvement, but its short-term financial flexibility remains limited, emphasizing the need for careful cash and working capital management during its strategic transformation.

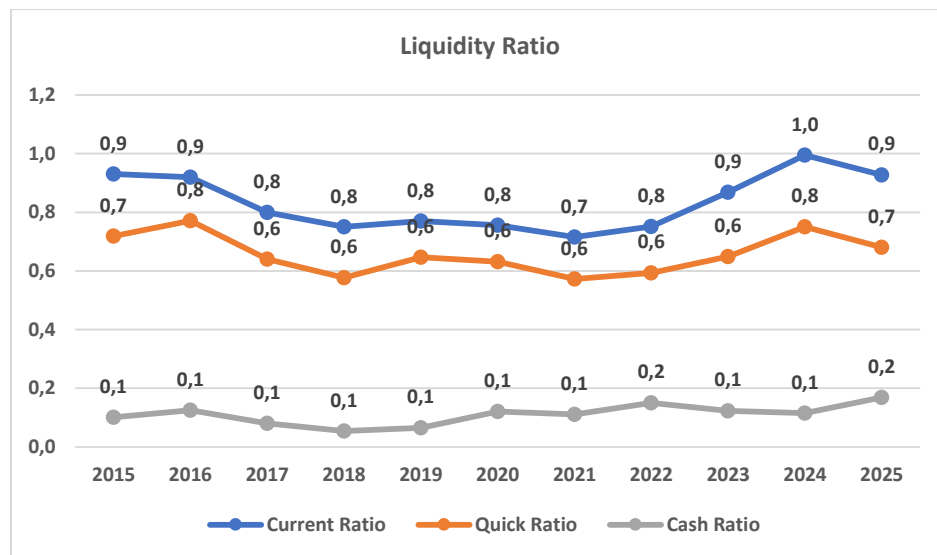


Figure 4.3. IMAS Liquidity Ratio
Source: IMAS Annual Report

Activity Ratio (Ambarukmi, 2017):

The activity or efficiency ratios of PT. Indomobil Sukses Internasional, Tbk. over the 2015-2025 indicate mixed efficiency performance amid its strategic transition. Total Asset Turnover (TATO) stable around 0.4 in the past few years, suggesting average asset utilization. In contrast, Inventory Turnover showed a declining trend after 2022, falling from 4.3 to 2.8 in 2025, may indicates slower inventory movement. Additionally, the Average Collection Period increased significantly, reached the peak of 61 days in 2024 before

declining to 54 days in 2025, reflecting slower receivables collection and potential pressure on working capital.

These trends suggest that while the company has made moderate progress in utilizing its asset base, operational efficiency has weakened particularly in inventory and receivables management. This condition may be influenced by the transition toward EV related business segments, which typically involve longer production cycles and higher inventory reserves, shifting product mix, demand uncertainty, as well as macroeconomic factors such as inflation and weakening consumer purchasing power. Overall, the efficiency performance highlights growing working capital challenges that could further constrain liquidity and cash flow (Putri et al., 2016).

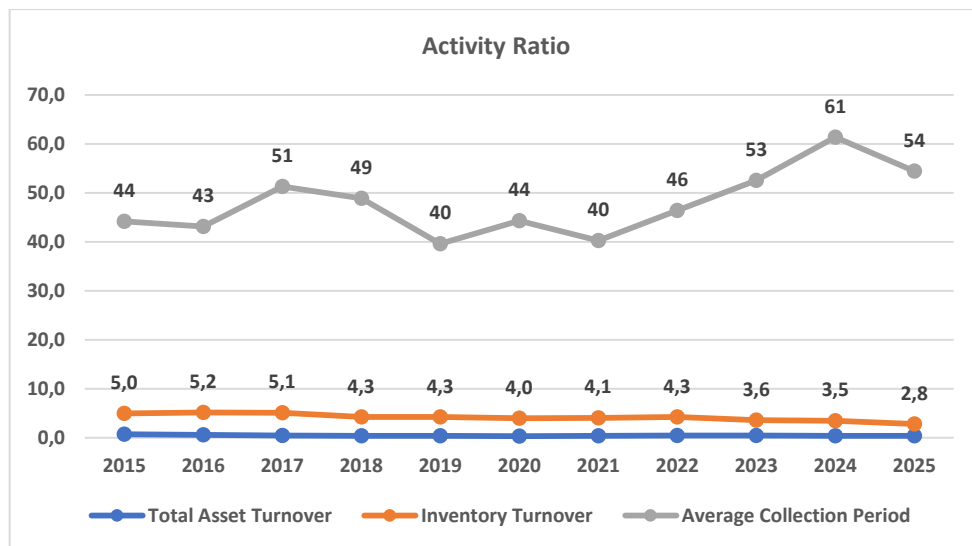


Figure 4.4. IMAS Activity Ratio
Source: IMAS Annual Report

Solvency Ratio (Ross, 2012):

The solvency position of PT. Indomobil Sukses Internasional, Tbk. over the 2015-2025 indicates a consistently high and increasing reliance on debt financing. The financial leverage ratio peaked at 4.9 in 2025 reflecting high value capital invested in assets compared to shareholder equity. The Debt-to-Equity Ratio (DER) follows the same pattern, after increased to 3.8 in 2019, it grow steadily and peaked again at 3.9 in 2025. This pattern reflecting a growing proportion of debt relative to shareholders equity. The Debt-to-Asset Ratio

(DAR) remained flat at around 0.7-0.8, indicating that the majority of the company's assets are financed through liabilities.

This trend suggests that the company is operating with a high leveraged capital structure, which may support its aggressive investment strategy, particularly in response to the capital-intensive transition toward EV technologies. However, such high leverage also exposes the firm to significant financial risk (Yetti et al., 2025), especially under unfavorable macroeconomic conditions such as rising interest rates and exchange rate volatility, which can increase debt servicing costs. Overall, while the company is leveraging external financing to support strategic growth, its elevated debt levels highlight the importance of prudent financial management to mitigate solvency risks during the EV transition and economic uncertainty.

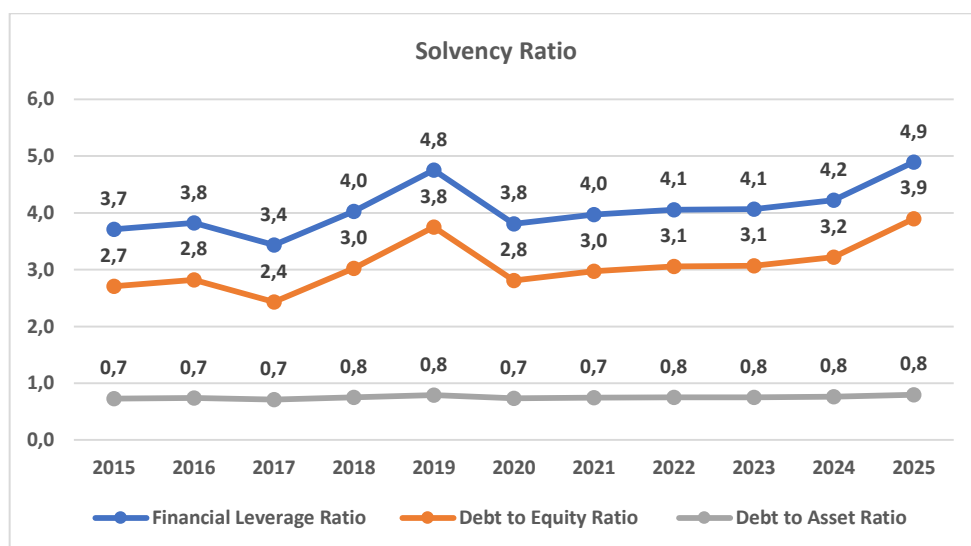


Figure 4.5. IMAS Solvency Ratio
Source: IMAS Annual Report

P/B Ratio and P/E Ratio:

The market-based performance of PT Indomobil Sukses Internasional, Tbk. over the period 2015-2025 demonstrates significant volatility. The Earnings per Share (EPS) fluctuates considerably, reflecting unstable profitability driven by cyclical industry conditions and external shocks such as the COVID-19 pandemic. Consequently, the Price-to-Earnings (P/E) ratio exhibits extreme variations and becomes less reliable during periods of negative

earnings. Meanwhile, the Price-to-Book (P/B) ratio shows a declining long-term trend, indicating weakening investor confidence and limited value creation.

Overall, the company's valuation reflects cautious market expectations, likely influenced by ongoing structural transitions, including investments in EV and exposure to macroeconomic uncertainties. Concerns remain regarding the company's long-term growth prospects and asset efficiency linked to the capital-intensive nature of the transition toward EV sustainable market, which requires substantial investment with delayed returns. Additionally, macroeconomic factors such as interest rate increases, inflation, and exchange rate volatility may further influence investor perception and valuation.

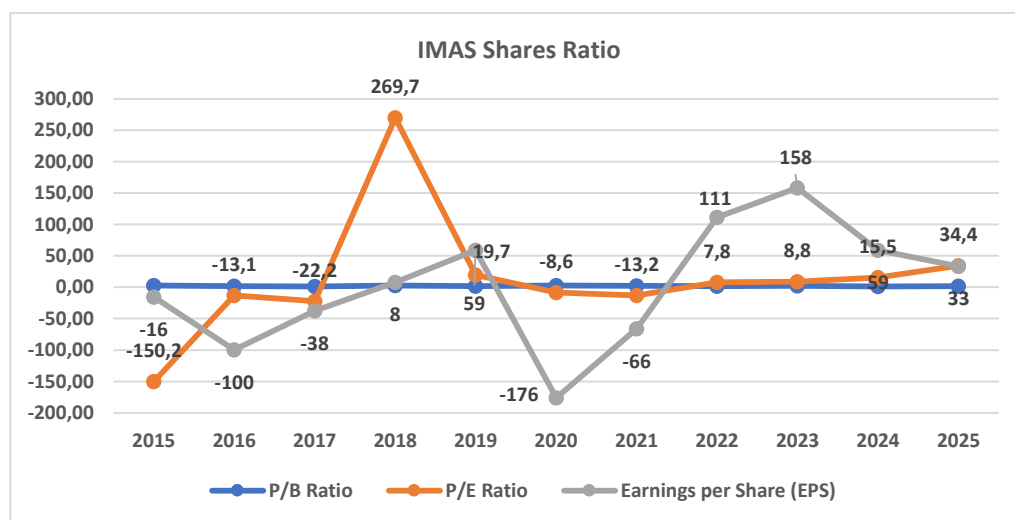


Figure 4.6. IMAS P/B and P/E Ratio
Source: IMAS Annual Report

Dividend Policy Ratio:

The dividend policy of PT. Indomobil Sukses Internasional, Tbk. over the 2015-2025 reflects a transition from constrained distributions to a more normalized payout structure. In 2020-2021, the company recorded negative dividend payout ratios -3% and -6%, in line with its net losses, indicating limited capacity to distribute earnings. However, as profitability recovered in 2022-2023, the dividend payout ratio turned positive before rising to 17% in 2024 and 12% in 2025. This upward trend suggests a stronger commitment to shareholders value return as earnings stabilized. The dividend yield remained low but stable, reflecting a cautious dividend policy. Earnings are likely retained

to fund capital-intensive investments and support long-term growth. Dividend decisions may also be influenced by the macroeconomic factors. Overall, the company balances shareholder returns with preserving funds for future expansion and industry transformation.

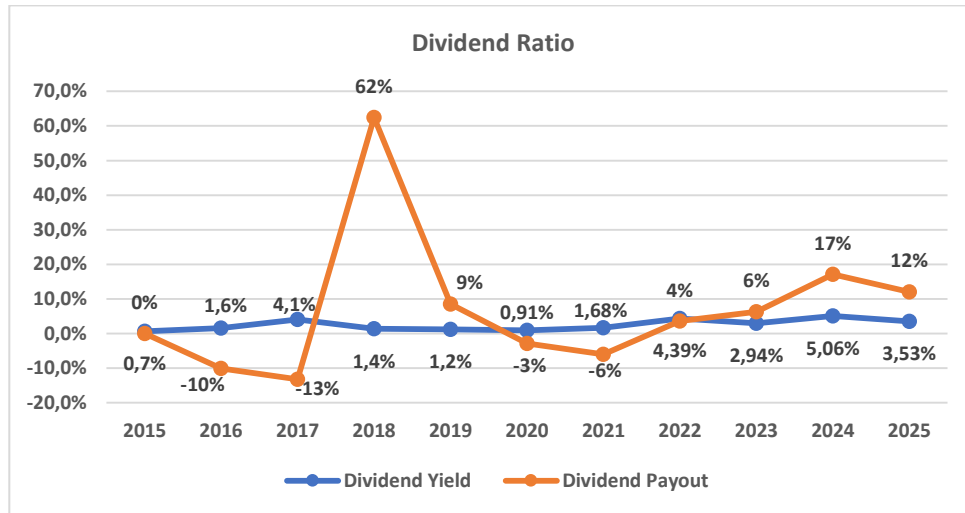


Figure 4.7. IMAS Dividend Policy Ratio
Source: IMAS Annual Report

4.1.3. DuPont Analysis

DuPont Analysis (Soliman, 2008) is a method used to break down Return on Equity (ROE) into its core components to better understand what drives a company's profitability.

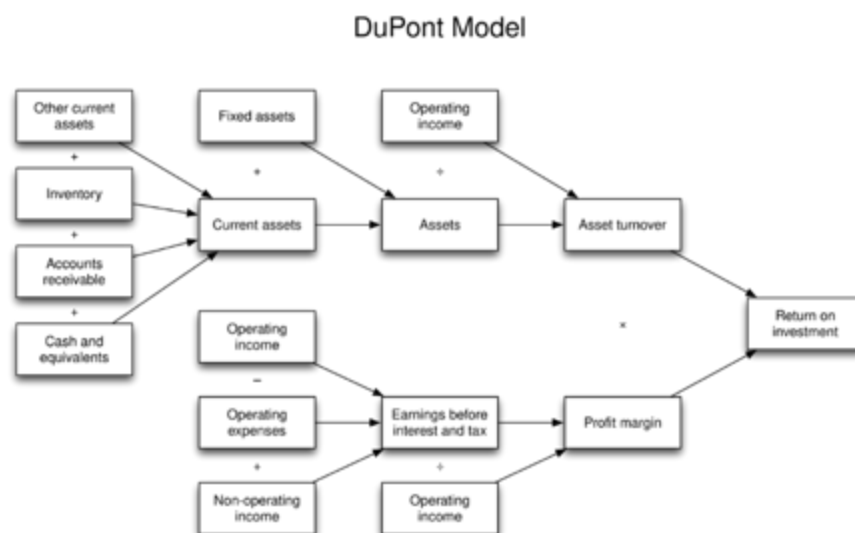


Figure 4.8. DuPont Model

The revenue and income trends of PT. Indomobil Sukses Internasional, Tbk. over the 2015-2025 period reflect a recovery phase after COVID-19 pandemic followed by a noticeable slowdown in automotive market. The company experienced a significant contraction in revenue in 2020 (-18%) before rebounding strongly in 2021 and 2022 with growth rates of 26% and 33%, respectively. However, revenue growth de-accelerated to 1% in 2024 and 4% in 2025, indicating a plateau in top-line expansion. This volatility is also reflected in net profit margins, which improved from negative levels in 2020-2021 to a peak of 3% in 2023, before declining to 1% in 2024 and 2025. These trends suggest while the company successfully recovered from earlier losses and benefited from post-pandemic rising demand and operational improvements, its profitability remains relatively thin and unstable.

In 2025 operating profit margin stood at 9%, which indicates improvement compared to the pre-pandemic period, however financial charges eroded 93% earnings before tax. Financial charges are the total costs that an individual or company must pay for borrowing money or using a credit facility. The slowdown Net Profit Margin (NPM) to 1% in 2025 may be attributed to rising costs, competitive pressures, and the capital-intensive investment. Additionally, macroeconomic factors may have further impacted both demand and cost structures. Overall, the financial performance of the company indicates a condition that is less sustainable, highlighting ongoing challenges in maintaining growth and profitability during industry transformation.

Despite the growth of asset, Asset Turnover also impact the profitability in the case the company is unable to utilize asset compared to the revenue, which reflected in 2025. TATO has remain flat at 0.4 over the past few years, indicating less effective asset utilization relative to the revenue generated. Meanwhile in 2025, fixed assets grew moderately at 14%, current assets grew more aggressively at 19%, as indicated by increases in inventories. Inventory increased by up to 29% compared to the previous year, days of inventory increase up to 130 days in 2025. During that time EV were largely imported, it was necessary to maintain adequate inventory levels to meet market demand.

Cash and equivalents also surged by 85%, likely due to an accumulation of cash derived from loans.

In 2025, the equity multiplier of IMAS from the total asset vs total equity reached 4.89, was the highest in the study period, this shows that the company finances most of its assets using debt. DuPont model ROE formula of Net Profit Margin 1% x Asset turnover 0.4 x Equity Multiplier 4.89, indicates a low shareholder return and also carried associated risks which require in-depth examination based on the structure of its formation. This is indicated by a low net profit margin, low asset utilization, and a high equity multiplier. ROE is not supported by operational efficiency or rapid asset turnover, but rather from significant debt leverage. The company faces high financial risk regarding solvency, where a slight decline in sales or profit margins could threaten its viability, given its slow asset turnover and substantial interest expenses and debt obligations. The results of this DuPont analysis are consistent with regression findings indicating that a high DER gives downward pressure on ROE.

Table 4.4. IMAS Revenue & Income Trend

Trend	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Revenue Growth	-7%	-17%	2%	16%	4%	-18%	26%	33%	13%	1%	4%
Net Profit Margin	0%	-2%	0%	1%	1%	-4%	-1%	2%	3%	1%	1%

Source: IMAS Annual Report

There are almost no public companies similar to PT. Indomobil Sukses International, Tbk. (IMAS) within Indonesian automotive industry. The most similar is PT. Astra International, Tbk. (ASII), although they are actually different from the business segments point of view. IMAS demonstrates significantly weaker profitability, as reflected in its lower and more volatile net profit margins, which only turned positive after 2021 and remained modest relative to ASII consistent strong margins.

From an efficiency standpoint, IMAS is underperforms, with lower Total Asset Turnover compared to ASII, indicating less effective utilization of assets in generating revenue. IMAS also exhibits substantially higher financial leverage, with its Debt-to-Equity Ratio (DER) exceeding 3.0, compared to ASII

relatively conservative level below 1.0. This suggests that IMAS relies heavily on debt financing to enhance its ROE and the overall ROE is not driven by strong operational performance, but rather supported by elevated leverage, which increases financial risk.

In contrast, ASII achieves higher and more stable ROE through a balanced combination of solid profitability, efficient asset utilization, and moderate leverage. These findings indicate that while IMAS is undergoing a strategic transition, potentially linked to investments in the EV, its current financial performance remains structurally weaker and more vulnerable to macroeconomic pressures such as rising interest rates and exchange rate volatility. DuPont Analysis highlights that IMAS ability to generate shareholder returns is constrained by operational inefficiencies and thin margins, with leverage acting as the primary, yet riskier, driver of its ROE compared to ASII. Similar result to the study from (Hendrawati et al., 2024).

Table 4.5. IMAS & ASII Ratio

Stocks	Ratios	2020	2021	2022	2023	2024	2025
IMAS	Profitability: Return on Equity (ROE)*	-5%	-2%	4%	5%	2%	1%
IMAS	Return on Asset (ROA)	-1%	-1%	1%	1%	1%	0%
IMAS	Liquidity: Current Ratio*	0.8	0.7	0.8	0.9	1.0	0.9
IMAS	Leverage: Debt to Equity Ratio (DER)*	2.8	3.0	3.1	3.1	3.2	3.9
IMAS	Debt to Asset Ratio (DAR)	0.7	0.7	0.8	0.8	0.8	0.8
IMAS	Activity: Total Asset Turnover (TATO)*	0.3	0.4	0.4	0.5	0.4	0.4
ASII	Profitability: Return on Equity (ROE)*	10%	12%	17%	18%	16%	14%
ASII	Return on Asset (ROA)	5%	7%	10%	10%	9%	8%
ASII	Liquidity: Current Ratio*	1.5	1.5	1.5	1.3	1.3	1.2
ASII	Leverage: Debt to Equity Ratio (DER)*	0.7	0.7	0.7	0.8	0.7	0.7
ASII	Debt to Asset Ratio (DAR)	0.4	0.4	0.4	0.4	0.4	0.4
ASII	Activity: Total Asset Turnover (TATO)*	0.5	0.6	0.7	0.7	0.7	0.6

Source: IMAS & ASII Annual Report

4.1.4. Data for Hypothesis Testing

Figure 4.9. below shows a chart of the macroeconomic 44 quarterly data combined both internal and external factors as independent variables, from 2015 to 2025 used for the hypothesis testing analysis.

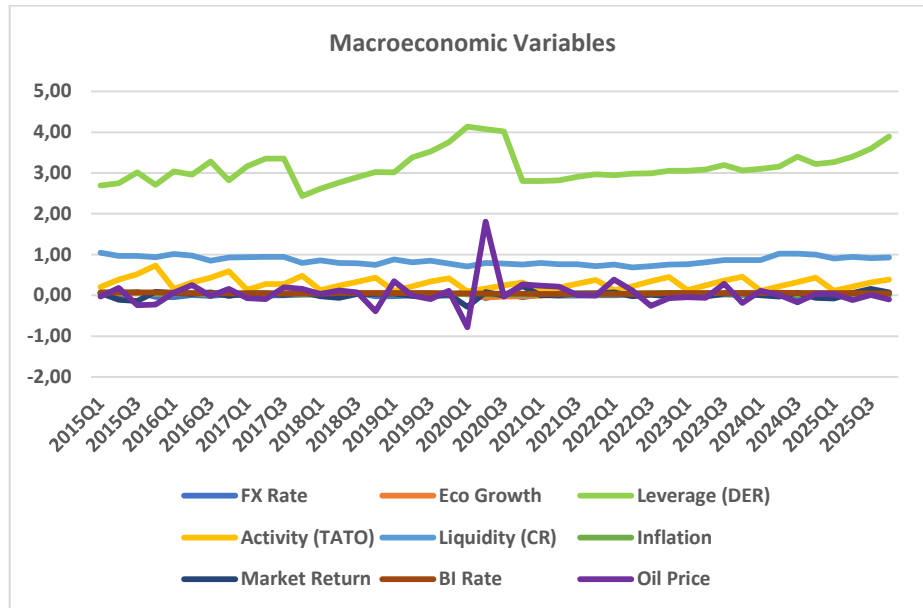


Figure 4.9. Macroeconomic Variables

4.2. The Effect of Financial Performance on IMAS Profitability

To investigate the real drivers of IMAS profitability, a multiple regression analysis with 44 quarterly data was conducted with IMAS profitability as dependent variable in the study and financial ratios as independent variables. The first regression equation model tested the significance and influence of the selected financial factors on the level of IMAS profitability, profitability metric used in the model is Return on Equity (ROE). The following group of hypotheses addressed by the first model are:

- H1a: Leverage (DER) negatively affects profitability.
- H1b: Liquidity (CR) positively affects profitability.
- H1c: Activity (TATO) negatively affects profitability.

4.2.1. Lagged Dependent Variable

Previous-quarter ROE was added as lagged dependent variable using the formula Y_{t-1} in the first regression model to capture profitability persistence over time, since current profitability may be related to the company's previous-quarter profitability. For each quarter, Y_{t-1} equals the ROE observed in the immediately preceding quarter. To obtain the lagged value for the first sample observation (Q1 2015), the ROE for Q4 2014 was used. Therefore, although

the main study period begins in 2015Q1, Q4 2014 data was required solely to construct the lagged dependent variable and maintain the total 44 usable observations. The purpose of first regression model is to examine the relationship between the actual financial performance rather than changes in those variables, using the level data preserves the economic interpretation of ratios such as DER, CR, and TATO. Stationarity was still considered to ensure that the regression did not produce a spurious relationship, but transforming the variables would change the interpretation from the relationship between levels to the relationship between changes.

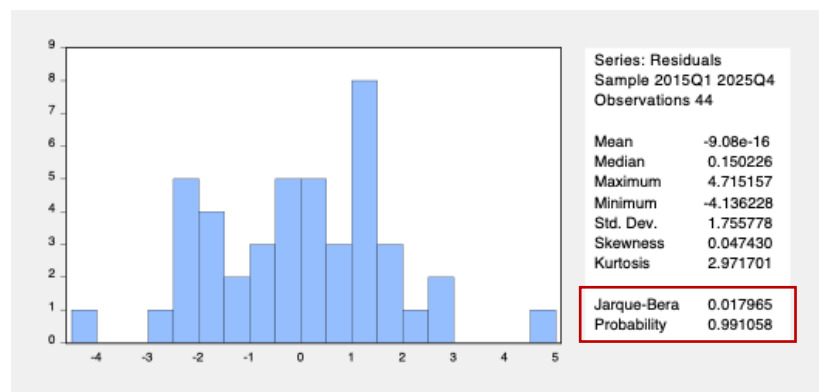
4.2.2. Classical Assumption Test

After previous-quarter ROE (Y_{t-1}) was added as lagged dependent variable, the first regression model results improved, passed the heteroscedasticity and auto-correlation test. The expected result is to track past outcome and modelling momentum of the regression model.

1. Normality Test (Jarque-Bera):

Normality Test using Jarque-Bera was performed, shows the result of probability $0.99 > 0.05$ which means the data is normally distributed.

Dependent Variable: ROE Method: Least Squares Date: 08/24/26 Time: 23:14 Sample: 2015Q1 2025Q4 Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.045320	3.485672	2.308111	0.0264
DER	-2.421197	0.749832	-3.228986	0.0025
CR	0.059135	2.866676	0.020628	0.9836
TATO	-1.350991	1.968514	-0.686300	0.4966
LAGROE	0.803542	0.098645	8.145823	0.0000
R-squared	0.640721	Mean dependent var	0.172500	
Adjusted R-squared	0.603871	S.D. dependent var	2.929230	
S.E. of regression	1.843621	Akaike info criterion	4.167985	
Sum squared resid	132.5586	Schwarz criterion	4.370734	
Log likelihood	-86.69566	Hannan-Quinn criter.	4.243174	
F-statistic	17.38766	Durbin-Watson stat	1.997678	
Prob(F-statistic)	0.000000			



2. Multicollinearity Test (VIF):

Variance Inflation Factors
Date: 08/24/26 Time: 23:15
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	12.14991	157.2833	NA
DER	0.562248	73.20403	1.077623
CR	8.217833	79.12233	1.023572
TATO	3.875048	5.358814	1.046994
LAGROE	0.009731	1.056704	1.054965

Multicollinearity test was performed using the Variance Inflation Factor (VIF) to measure the amount of multicollinearity in the multiple regression variables. The result shows that all predictors in the first regression model are < 10.00 which is the acceptable benchmark for level of multicollinearity, this test indicate that multicollinearity was not present among the variables and the regression model satisfied the normality of OLS assumption.

3. Heteroscedasticity Test (Glejser):

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	0.182552	Prob. F(4,39)	0.9461
Obs*R-squared	0.808682	Prob. Chi-Square(4)	0.9373
Scaled explained SS	0.663612	Prob. Chi-Square(4)	0.9557

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 08/24/26 Time: 23:15
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.769597	2.003094	0.883432	0.3824
DER	-0.298464	0.430902	-0.692649	0.4926
CR	0.793980	1.647379	0.481966	0.6325
TATO	-0.333419	1.131236	-0.294738	0.7698
LAGROE	0.011272	0.056688	0.198843	0.8434

R-squared	0.018379	Mean dependent var	1.413915
Adjusted R-squared	-0.082300	S.D. dependent var	1.018386
S.E. of regression	1.059464	Akaike info criterion	3.060049
Sum squared resid	43.77612	Schwarz criterion	3.262798
Log likelihood	-62.32107	Hannan-Quinn criter.	3.135238
F-statistic	0.182552	Durbin-Watson stat	2.334159
Prob(F-statistic)	0.946083		

Heteroscedasticity was performed using Glejser method, shows the result of Probability Obs*R-squared: $0.9373 > 0.05$, meaning there is no heteroscedasticity and the model was accepted.

4. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM test):

Auto-correlation test was performed using Breusch-Godfrey Serial Correlation LM test. The result shows regression model passed the auto-correlation test (Probability Obs*R-squared: $0.9540 > 0.05$).

Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 1 lag				
F-statistic	0.002877	Prob. F(1,38)	0.9575	
Obs*R-squared	0.003331	Prob. Chi-Square(1)	0.9540	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/24/26 Time: 23:16				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.028004	3.569497	0.007845	0.9938
DER	-0.002518	0.761055	-0.003309	0.9974
CR	-0.018257	2.923921	-0.006244	0.9951
TATO	-0.017956	2.022076	-0.008880	0.9930
LAGROE	0.003932	0.123932	0.031724	0.9749
RESID(-1)	-0.011184	0.208512	-0.053636	0.9575
R-squared	0.000076	Mean dependent var	-9.08E-16	
Adjusted R-squared	-0.131493	S.D. dependent var	1.755778	
S.E. of regression	1.867651	Akaike info criterion	4.213364	
Sum squared resid	132.5485	Schwarz criterion	4.456662	
Log likelihood	-86.69400	Hannan-Quinn criter.	4.303590	
F-statistic	0.000575	Durbin-Watson stat	1.987481	
Prob(F-statistic)	1.000000			

4.2.3. Independent Variable Significance with Partial t-Test

Significance Partial t-Test was performed for each individual independent variables, the p-value of each independent variables as follows:

- DER prob: $0.0025 < 0.05$; means DER negatively affect ROE.
- CR prob: $0.9836 > 0.05$; means CR does not affect ROE.
- TATO prob: $0.4966 > 0.05$; means TATO does not affect ROE.
- LAGROE prob: $0.000 < 0.05$; means LAGROE positively affect ROE.

Dependent Variable: ROE				
Method: Least Squares				
Date: 08/24/26 Time: 23:14				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.045320	3.485672	2.308111	0.0264
DER	-2.421197	0.749832	-3.228986	0.0025
CR	0.059135	2.866676	0.020628	0.9836
TATO	-1.350991	1.968514	-0.686300	0.4966
LAGROE	0.803542	0.098645	8.145823	0.0000
R-squared	0.640721	Mean dependent var	0.172500	
Adjusted R-squared	0.603871	S.D. dependent var	2.929230	
S.E. of regression	1.843621	Akaike info criterion	4.167985	
Sum squared resid	132.5586	Schwarz criterion	4.370734	
Log likelihood	-86.69566	Hannan-Quinn criter.	4.243174	
F-statistic	17.38766	Durbin-Watson stat	1.997678	
Prob(F-statistic)	0.000000			

The regression results indicate that high leverage (DER) has a negative and significant effect on profitability (ROE), suggests that an increase in leverage is associated with lower profitability. The DER coefficient indicates 1.0 increase in DER is associated with about a 2.42 decrease in ROE. Low liquidity (CR) has a positive but insignificant effect on profitability, this may occur due to improvements in short-term liabilities, but has not yet significantly impacted profitability. Low activity ratio (TATO) also has a negative but insignificant

effect on profitability, the influence of these variables on company profitability can be influenced by many other factors, with different research results (Rompas et al., 2023). Investor may view an increase in debt as a risk of default, while an increase in liquidity represent the ability to manage assets and debt optimally. The lagged dependent variable (LAGROE) is positive and highly significant, this confirms that past profitability strongly carries over into current periods.

4.2.4. Model Significance with Simultaneous F-Test

Model significance was tested using Simultaneous F-Test. The result shows that the overall model is significant with probability value (F-statistic) $0.000 < 0.05$, however only DER and LAGROE are individually significant. F-statistic from Wald Joint Restriction test shows that DER, CR, TATO, LAGROE collectively significant. Furthermore, the R-squared value of 0.640 indicates that 64% of the variation in profitability can be explained by the independent variables included in the model.

Dependent Variable: ROE Method: Least Squares Date: 08/24/26 Time: 23:14 Sample: 2015Q1 2025Q4 Included observations: 44					Wald Test: Equation: Untitled			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Test Statistic	Value	df	Probability
					F-statistic	17.38766	(4, 39)	0.0000
					Chi-square	69.55063	4	0.0000
C	8.045320	3.485672	2.308111	0.0264	Null Hypothesis: C(2)=0, C(3)=0, C(4)=0, C(5)=0			
DER	-2.421197	0.749832	-3.228986	0.0025	Null Hypothesis Summary:			
CR	0.059135	2.866676	0.020628	0.9836	Normalized Restriction (= 0)			
TATO	-1.350991	1.968514	-0.686300	0.4966		Value		Std. Err.
LAGROE	0.803542	0.098645	8.145823	0.0000				
R-squared	0.640721	Mean dependent var		0.172500	C(2)	-2.421197	0.749832	
Adjusted R-squared	0.603871	S.D. dependent var		2.929230	C(3)	0.059135	2.866676	
S.E. of regression	1.843621	Akaike info criterion		4.167985	C(4)	-1.350991	1.968514	
Sum squared resid	132.5586	Schwarz criterion		4.370734	C(5)	0.803542	0.098645	
Log likelihood	-86.69566	Hannan-Quinn criter.		4.243174	Restrictions are linear in coefficients.			
F-statistic	17.38766	Durbin-Watson stat		1.997678				
Prob(F-statistic)	0.000000							

4.2.5. Result Analysis & Discussion

Initially, the diagnostic results of the baseline model indicate evidence of serial correlation and failed the heteroscedasticity as well as the auto-correlation test, suggesting that the current specification did not fully capture the time-dependent behavior of quarterly ROE. Based on this diagnostic, ROE (Y_{t-1}) was introduced as a lagged dependent variable. This specification is also economically justified because corporate profitability may exhibit persistence across consecutive quarters, as financial and operating conditions generally do not reflected instantaneously.

Table 4.6. Baseline vs Lagged ROE

Test Results	Baseline	Lagged ROE (Yt-1)
No of Observations	44	44
Normality Test (Jarque-Bera)	Passed	Passed
Multicollinearity Test (VIF)	Passed	Passed
Heteroscedasticity Test (Glejser)	Failed	Passed
Auto-correlation Test (Breusch-Godfrey Serial Correlation LM test)	Failed	Passed
Partial t-Test (Individual Variable)	None	None
DER	0.3360 (-Not Sig)	0.0025 (-Sig)
CR	0.6981 (-Not Sig)	0.9836 (+Not Sig)
TATO	0.6424 (-Not Sig)	0.4966 (-Not Sig)
LAGROE	n/a	0.0000 (+Sig)
Simultaneous F-Test (All Variables)	0.7505 (Not Sig)	0.0000 (Sig)
R-squared	0.0294	0.6407
Adjusted R-squared	-0.0433	0.6038

Source: Author

The regression result highlights that leverage (DER) had significant negative relation with profitability, thus hypothesis H1a is accepted. High financial leverage correspond to the increase exposure to risk that higher short-term expenses and higher cost of capital would result in profit reduction. According to previous studies, improvement in liquidity (CR) contributes to the increase of company's profitability (Waleed, 2016). The result of the regression shows that liquidity (CR) negatively but insignificantly affect profitability of the company, leading to the rejection of the hypothesis H1b.

This phenomena can be explained that excessive liquid asset may also impacting the profitability, it implies the company is unable to maximize the use of current assets to optimize the profit. High current liabilities compared to current asset may also increase the risks of debt default, therefore it is important for company to maintain a certain degree of liquidity to sustain positive profitability growth. Total asset turnover (TATO) measures how well the company in utilizing its asset base. According to (Munawar et al., 2019), high amount of productive assets may improve sales and positively affect profitability. The regression result shows TATO negatively but insignificantly

affect profitability. This implies that changes in asset utilization efficiency do not significantly affect the company's profitability due to low profit margin, inefficiency in asset utilization, and high interest expenses. Therefore hypothesis H1c is rejected.

The lagged dependent variable (LAGROE) is positive and highly significant, this confirms that past profitability strongly affect ROE in the current period. The significance of the lagged dependent variable also affects the significance of the overall model, as indicated by the F-test results. Both DER and ROE incorporate shareholder's equity, while TATO serves as a fundamental efficiency component within the traditional DuPont method.

Consequently, a portion of the observed empirical relationship between these variables may stem from mathematical interdependence rather than purely behavioral or operational dynamics. From the perspective of broader economic interpretation, these variables also provide tangible managerial signals such as asset utilization efficiency through TATO and capital structure policy through DER may influence the level of return that management can optimize for shareholder's ROE.

4.3. The Effect of Financial Performance and Macroeconomic Variables on IMAS Stock Return

To understand the effect of financial performance and macroeconomic variables on IMAS Stock Return, a multiple regression analysis with 44 quarterly data was performed using a combination of Microsoft Excel and EViews statistical tools. As discussed in the previous section, the regression model must not violate any of the OLS Assumptions, therefore multiple tests were performed to validate the regression model and analyze the impact of independent variables to IMAS Stock Return. Classical Assumption Test such as normality, multicollinearity, heteroscedasticity and auto-correlation were tested, to assess whether any of the key OLS assumptions are violated. The hypothesis addressed by the second regression model are as follows:

- H2a: Leverage (DER) negatively affects Stock Return.
- H2b: Liquidity (CR) positively affects Stock Return.

- H2c: Activity (TATO) negatively affects Stock Return.
- H2d: Economic Growth positively affects Stock Return.
- H2e: Inflation negatively affects Stock Return.
- H2f: BI Rate negatively affects Stock Return.
- H2g: FX Rate (USD/IDR) negatively affects Stock Return.
- H2h: Oil Price negatively affects Stock Return.
- H2i: Market Return positively affects Stock Return.

4.3.1. Augmented Dickey–Fuller (ADF) Test

Initially the regression model was conducted using the original data, the classical assumption test results indicate the model passed all the test except the normality test. Since the normality test was failed, outlier auto-detection using EViews Impulse Indicator Saturation (IIS) was performed as robustness check to detect and control outlier data (Hendry, D. et al., 2015). To absorb the structural breaks, Impulse Indicators Saturation (IIS) use a dummy variable equal to zero everywhere other than a single value of one at period t . This indicator can be used to model single observation outlier, and is equivalent to the @isperiod function used at the date corresponding to t (EViews blogs). The detection and isolation of outlier data, enable the model to passed the normality test. However, since this study employs a combination of variables with different characteristics, there is a risk of non-stationary data.

The Augmented Dickey–Fuller (ADF) test is used to examine whether a time series is stationary by testing the presence of a unit root and it is very important in research where the underlying variables based on time (Mushtaq, R., 2011). Non-stationary data will make regression become spurious regression, when a relationship appears significant when it actually is not. The R-squared value can be very high even though the relationship between variables is invalid. If the p-value is below the chosen significance level (5%), the null hypothesis is rejected, indicating that the data is stationary and suitable for further analysis. A growth data transformation using percentage growth rate was performed for all macroeconomic variables and Q4 2014 was used for the first sample observation.

Table 4.7. ADF Stationary Test Result

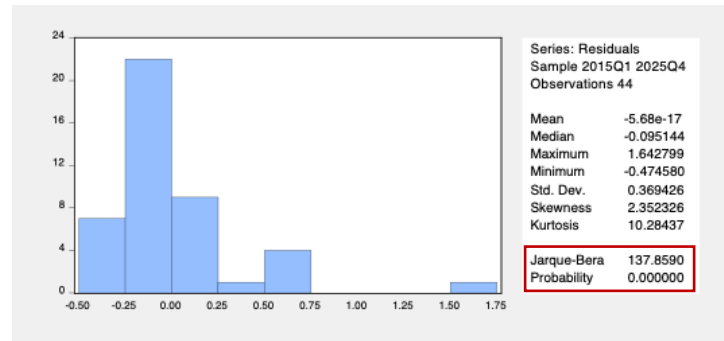
Variables	p-value (Before)	Result (Before)	p-value (After)	Result (After)
DER	0.1274	Non-Stationary	0.0000	Stationary
CR	0.1224	Non-Stationary	0.0000	Stationary
TATO	0.0678	Non-Stationary	0.0001	Stationary
ECO	0.0819	Non-Stationary	0.0000	Stationary
INF	0.0071	Stationary	0.0071	Stationary
BIR	0.0495	Stationary	0.0495	Stationary
FXR	0.0000	Stationary	0.0000	Stationary
OIL	0.0000	Stationary	0.0000	Stationary
MRT	0.0000	Stationary	0.0000	Stationary
ISR	0.0000	Stationary	0.0000	Stationary

Source: Author

4.3.2. Classical Assumption Test

After all data become stationary, the classical assumption tests was performed to ensure that a regression model satisfies the assumptions required for valid statistical inference using the Ordinary Least Squares (OLS) method. These tests evaluate whether the model is free from problems such as normality residuals, multicollinearity, heteroskedasticity, and auto-correlation. In the first iteration of the normality test using Jarque-Bera method, the regression model failed with probability < 0.05 .

Dependent Variable: ISR Method: Least Squares Date: 08/05/26 Time: 21:45 Sample: 2015Q1 2025Q4 Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.149513	0.332863	0.449174	0.6562
DER	-0.490594	0.834069	-0.588194	0.5603
CR	0.288132	0.992340	0.290356	0.7733
TATO	0.090290	0.108541	0.831855	0.4113
ECO	0.032387	0.039016	0.830087	0.4123
INF	2.556703	5.077076	0.503578	0.6178
BIR	-3.781509	6.620191	-0.571208	0.5716
FXR	-2.681809	2.551815	-1.050942	0.3007
OIL	0.223028	0.225924	0.987184	0.3305
MRT	0.105365	1.121586	0.093943	0.9257
R-squared	0.184600	Mean dependent var	0.032500	
Adjusted R-squared	-0.031241	S.D. dependent var	0.409112	
S.E. of regression	0.415453	Akaike info criterion	1.277824	
Sum squared resid	5.868452	Schwarz criterion	1.683321	
Log likelihood	-18.11212	Hannan-Quinn criter.	1.428202	
F-statistic	0.855261	Durbin-Watson stat	1.691290	
Prob(F-statistic)	0.572514			



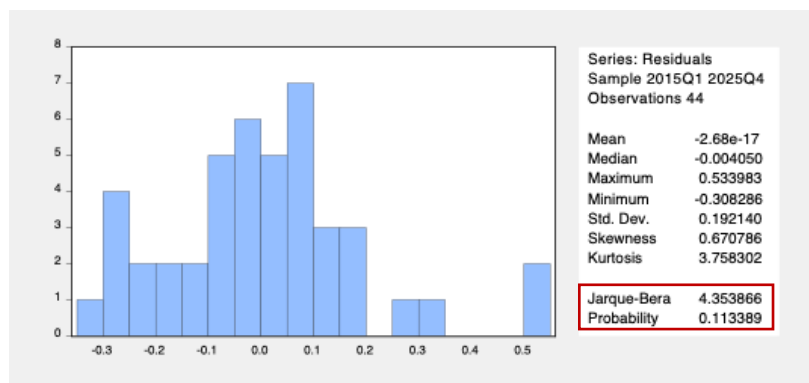
Since the normality test was failed, outlier auto-detection using EViews Impulse Indicator Saturation (IIS) was again performed as robustness check to detect and control outlier data for the rest of the research procedure.

1. Normality Test (Jarque-Bera):

The normality test using Jarque-Bera was performed, this time the data is normally distributed with probability > 0.05 . Thus, the regression model passed the normality test after the detection of 3 impulse observation data.

Dependent Variable: ISR
Method: Least Squares
Date: 08/05/26 Time: 21:49
Sample: 2015Q1 2025Q4
Included observations: 44
Indicator Saturation: IIS, 44 indicators searched over 2 blocks
3 IIS variables detected

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022839	0.183066	-0.124757	0.9015
DER	0.138007	0.531490	0.259660	0.7968
CR	0.516846	0.561188	0.920987	0.3642
TATO	-0.027316	0.062720	-0.435528	0.6662
ECO	0.004768	0.021520	0.221549	0.8261
INF	3.804490	2.775372	1.370803	0.1803
BIR	-3.156499	3.614881	-0.873196	0.3893
FXR	-0.669847	1.441980	-0.464533	0.6455
OIL	0.210771	0.127017	1.659388	0.1071
MRT	0.956945	0.648220	1.476266	0.1500
@ISPERIOD("2018Q2	1.840142	0.243241	7.565099	0.0000
@ISPERIOD("2020Q4	0.924268	0.297743	3.104243	0.0041
@ISPERIOD("2023Q2	0.929390	0.248738	3.736421	0.0008
R-squared	0.779427	Mean dependent var	0.032500	
Adjusted R-squared	0.694044	S.D. dependent var	0.409112	
S.E. of regression	0.226293	Akaike info criterion	0.106736	
Sum squared resid	1.587467	Schwarz criterion	0.633883	
Log likelihood	10.65180	Hannan-Quinn criter.	0.302228	
F-statistic	9.128603	Durbin-Watson stat	1.712160	
Prob(F-statistic)	0.000000			



2. Multicollinearity Test (VIF):

The multicollinearity test was performed using the Variance Inflation Factor (VIF) to measure the amount of multicollinearity in the multiple regression variables. The result shows that all variables in the second regression model are < 10.00 which is the acceptable benchmark for level of multicollinearity, this test indicate that multicollinearity was not present and the regression model satisfied the normality of OLS assumption.

Variance Inflation Factors
Date: 08/05/26 Time: 21:52
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.033513	28.79566	NA
DER	0.282482	1.792243	1.742483
CR	0.314932	1.319169	1.319155
TATO	0.003934	1.474476	1.284912
ECO	0.000463	1.355342	1.298425
INF	7.702692	8.252226	1.417114
BIR	13.06737	32.09489	1.468741
FXR	2.079307	2.018050	1.950776
OIL	0.016133	1.600752	1.565781
MRT	0.420189	2.282753	2.206368
@ISPERIOD("2018Q2	0.059166	1.155394	1.129135
@ISPERIOD("2020Q4	0.088651	1.731176	1.691831
@ISPERIOD("2023Q2	0.061871	1.208207	1.180748

3. Heteroscedasticity Test (Glejser):

The heteroscedasticity test was performed with Glejser method, it is used to examine whether there is inequality of variance in the residuals (disturbance or error terms) across different observations in a linear regression model. The result shows the result of Probability Obs*R-squared: $0.3466 > 0.05$, meaning there is no heteroscedasticity and the model was accepted.

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	1.120973	Prob. F(12, 31)	0.3791
Obs*R-squared	13.31499	Prob. Chi-Square(12)	0.3466
Scaled explained SS	11.47787	Prob. Chi-Square(12)	0.4885

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 08/05/26 Time: 21:52
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.265721	0.101937	2.606716	0.0139
DER	0.348007	0.295950	1.175899	0.2486
CR	0.087734	0.312486	0.280762	0.7808
TATO	-0.060952	0.034925	-1.745248	0.0908
ECO	0.010071	0.011983	0.840446	0.4071
INF	-0.426369	1.545412	-0.275893	0.7845
BIR	-1.848476	2.012876	-0.918326	0.3655
FXR	0.117668	0.802939	0.146546	0.8844
OIL	0.024138	0.070727	0.341279	0.7352
MRT	0.323510	0.360949	0.896276	0.3770
@ISPERIOD("2018Q2	-0.100376	0.135444	-0.741092	0.4642
@ISPERIOD("2020Q4	-0.134668	0.165793	-0.812271	0.4228
@ISPERIOD("2023Q2	-0.085344	0.138505	-0.616178	0.5423
R-squared	0.302613	Mean dependent var		0.141556
Adjusted R-squared	0.032657	S.D. dependent var		0.128116
S.E. of regression	0.126007	Akaike info criterion		-1.064252
Sum squared resid	0.492210	Schwarz criterion		-0.537106
Log likelihood	36.41355	Hannan-Quinn criter.		-0.868761
F-statistic	1.120973	Durbin-Watson stat		1.905690
Prob(F-statistic)	0.379137			

4. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM test):

The auto-correlation test was performed using Breusch-Godfrey Serial Correlation LM test, to check for a correlation or relationship between the error terms (residuals) of a given time period and previous period. The result shows regression model passed the auto-correlation test (Probability Obs*R-squared: $0.1813 > 0.05$).

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 1 lag

F-statistic	1.269734	Prob. F(1,30)	0.2687
Obs*R-squared	1.786657	Prob. Chi-Square(1)	0.1813

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 08/05/26 Time: 21:53
Sample: 2015Q1 2025Q4
Included observations: 44
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015603	0.182800	0.085356	0.9325
DER	-0.116681	0.539228	-0.216385	0.8302
CR	-0.269431	0.607772	-0.443309	0.6607
TATO	-0.005512	0.062640	-0.087997	0.9305
ECO	-0.005396	0.021956	-0.245771	0.8075
INF	0.459140	2.793255	0.164374	0.8705
BIR	-0.365251	3.613823	-0.101071	0.9202
FXR	-0.244133	1.452002	-0.168136	0.8676
OIL	0.016304	0.127293	0.128083	0.8989
MRT	-0.117537	0.653793	-0.179777	0.8585
@ISPERIOD(*2018Q2	-0.166532	0.283720	-0.586958	0.5616
@ISPERIOD(*2020Q4	-0.123224	0.315982	-0.389970	0.6993
@ISPERIOD(*2023Q2	-0.087551	0.259565	-0.337301	0.7382
RESID(-1)	0.286919	0.254626	1.126825	0.2687
R-squared	0.040606	Mean dependent var	-2.68E-17	
Adjusted R-squared	-0.375132	S.D. dependent var	0.192140	
S.E. of regression	0.225315	Akaike info criterion	0.110738	
Sum squared resid	1.523007	Schwarz criterion	0.678434	
Log likelihood	11.56377	Hannan-Quinn criter.	0.321267	
F-statistic	0.097672	Durbin-Watson stat	1.942724	
Prob(F-statistic)	0.999963			

4.3.3. Independent Variable Significance with Partial t-Test

Significance Partial t-Test was performed for each individual independent variables in the model. The probability result of each independent variables towards dependent variable IMAS Stock Return (ISR) as follows:

- DER t-Stat Prob: $0.7968 > 0.05$; means DER does not affect ISR.
- CR t-Stat Prob: $0.3642 > 0.05$; means CR does not affect ISR.
- TATO t-Stat Prob: $0.6662 > 0.05$; means TATO does not affect ISR.
- ECO t-Stat Prob: $0.8261 > 0.05$; means ECO does not affect ISR.
- INF t-Stat Prob: $0.1803 > 0.05$; means INF does not affect ISR.
- BIR t-Stat Prob: $0.3893 > 0.05$; means BIR does not affect ISR.
- FXR t-Stat Prob: $0.6455 > 0.05$; means FXR does not affect ISR.
- OIL t-Stat Prob: $0.1071 > 0.05$; means OIL does not affect ISR.

- MRT t-Stat Prob: 0.1500 > 0.05; means MRT does not affect ISR.

Dependent Variable: ISR
Method: Least Squares
Date: 08/05/26 Time: 21:49
Sample: 2015Q1 2025Q4
Included observations: 44
Indicator Saturation: IIS, 44 indicators searched over 2 blocks
3 IIS variables detected

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022839	0.183066	-0.124757	0.9015
DER	0.138007	0.531490	0.259660	0.7968
CR	0.516846	0.561188	0.920987	0.3642
TATO	-0.027316	0.062720	-0.435528	0.6662
ECO	0.004768	0.021520	0.221549	0.8261
INF	3.804490	2.775372	1.370803	0.1803
BIR	-3.156499	3.614881	-0.873196	0.3893
FXR	-0.669847	1.441980	-0.464533	0.6455
OIL	0.210771	0.127017	1.659388	0.1071
MRT	0.956945	0.648220	1.476266	0.1500
@ISPERIOD("2018Q2	1.840142	0.243241	7.565099	0.0000
@ISPERIOD("2020Q4	0.924268	0.297743	3.104243	0.0041
@ISPERIOD("2023Q2	0.929390	0.248738	3.736421	0.0008
R-squared	0.779427	Mean dependent var		0.032500
Adjusted R-squared	0.694044	S.D. dependent var		0.409112
S.E. of regression	0.226293	Akaike info criterion		0.106736
Sum squared resid	1.587467	Schwarz criterion		0.633883
Log likelihood	10.65180	Hannan-Quinn criter.		0.302228
F-statistic	9.128603	Durbin-Watson stat		1.712160
Prob(F-statistic)	0.000000			

The partial t-Test results indicate that none of the independent variables have a significant effect on IMAS Stock Return at the 5% significance level. Although several variables have coefficient signs consistent with theoretical expectations, the results suggest these financial ratios and macroeconomic variables individually do not significantly explain variations in IMAS Stock Returns during the study period. IIS automatically creates dummy variable and absorbs outlier values into three @IS variables and all are significant.

4.3.4. Model Significance with Simultaneous F-Test

Model significance tested using Simultaneous F-Test, the result shows a probability value of $0.0000 < 0.05$, indicating the overall IIS model is significant due to three impulse indicators. The R-squared value of 0.779 indicates that 77,9% of the variation in IMAS Stock Return (ISR) can be explained by the variables included in the model, while the remaining 22,06% are explained by other factors outside the model. Adjusted R-squared value of 0.694 indicates relatively strong explanatory power, however it requires cautious interpretation because the IIS model incorporates three impulse observation. Consequently, the increase in adjusted R-squared reflects both the

explanatory contribution of the model variables and the ability of IIS to capture exceptional observations.

Additionally, the overall initial baseline model was not significant, and none of the nine independent variables being individually significant. Wald Joint Restriction test F-statistic result indicates that all nine original variables (DER, CR, TATO, ECO, INF, BIR, FXR, OIL, MRT) also were not collectively significant.

Dependent Variable: ISR Method: Least Squares Date: 08/05/26 Time: 21:49 Sample: 2015Q1 2025Q4 Included observations: 44 Indicator Saturation: IIS, 44 indicators searched over 2 blocks 3 IIS variables detected					Wald Test: Equation: Untitled			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Test Statistic	Value	df	Probability
C	-0.022839	0.183066	-0.124757	0.9015	F-statistic	1.823957	(9, 31)	0.1035
DER	0.138007	0.531490	0.259660	0.7968	Chi-square	16.41561	9	0.0587
CR	0.516846	0.561188	0.920987	0.3642	Null Hypothesis: C(2)=0, C(3)=0, C(4)=0, C(5)=0, C(6)=0, C(7)=0, C(8)=0, C(9)=0, C(10)=0			
TATO	-0.027316	0.062720	-0.435528	0.6662	Null Hypothesis Summary:			
ECO	0.004768	0.021520	0.221549	0.8261	Normalized Restriction (= 0)			
INF	3.804490	2.775372	1.370803	0.1803		Value	Std. Err.	
BIR	-3.156499	3.614881	-0.873196	0.3893	C(2)	0.138007	0.531490	
FXR	-0.669847	1.441980	-0.464533	0.6455	C(3)	0.516846	0.561188	
OIL	0.210771	0.127017	1.659388	0.1071	C(4)	-0.027316	0.062720	
MRT	0.956945	0.648220	1.476266	0.1500	C(5)	0.004768	0.021520	
@ISPERIOD("2018Q2	1.840142	0.243241	7.565099	0.0000	C(6)	3.804490	2.775372	
@ISPERIOD("2020Q4	0.924268	0.297743	3.104243	0.0041	C(7)	-3.156499	3.614881	
@ISPERIOD("2023Q2	0.929390	0.248738	3.736421	0.0008	C(8)	-0.669847	1.441980	
R-squared	0.779427	Mean dependent var		0.032500	C(9)	0.210771	0.127017	
Adjusted R-squared	0.694044	S.D. dependent var		0.409112	C(10)	0.956945	0.648220	
S.E. of regression	0.226293	Akaike info criterion		0.106736	Restrictions are linear in coefficients.			
Sum squared resid	1.567467	Schwarz criterion		0.633883				
Log likelihood	10.65180	Hannan-Quinn criter.		0.302228				
F-statistic	9.128603	Durbin-Watson stat		1.712160				
Prob(F-statistic)	0.000000							

4.3.5. Result Analysis & Discussion

The Augmented Dickey–Fuller (ADF) test results indicate that the variables have mixed stationarity characteristics, and the presence of non-stationary variables suggests that some variables may contain underlying trends, which can potentially inflate the explanatory power of the regression model and contribute to a high R-squared value without necessarily reflecting a true economic relationship.

Following the result of the ADF test, data source for the baseline regression must be ensured to be stationary. Then classical assumption tests was performed to ensure that a regression model satisfies the assumptions required for valid statistical inference using the Ordinary Least Squares (OLS) method. The following is a comparison between the baseline and the IIS regression. The baseline regression was affected by the presence of extreme observations, causing the residuals to fail the normality test and weakening the model ability to explain the relationship between variables.

Table 4.8. Baseline vs IIS Regression (Robustness check)

Test Results	Baseline	IIS
No of Observations	44	44
Augmented Dickey–Fuller Test (Stationary Data)	Passed	Passed
Outlier Treatment	No	IIS (3 Impulse Obs)
Normality Test (Jarque-Bera)	Failed	Passed
Multicollinearity Test (VIF)	Passed	Passed
Heteroscedasticity Test (Glejser)	Passed	Passed
Auto-correlation Test (Breusch-Godfrey Serial Correlation LM test)	Passed	Passed
Partial t-Test (Individual Variable)	None	None
DER	0.5603 (-Not Sig)	0.7968 (+Not Sig)
CR	0.7733 (+Not Sig)	0.3642 (+Not Sig)
TATO	0.4113 (+Not Sig)	0.6662 (-Not Sig)
ECO	0.4123 (+Not Sig)	0.8261 (+Not Sig)
INF	0.6178 (+Not Sig)	0.1803 (+Not Sig)
BIR	0.5716 (-Not Sig)	0.3893 (-Not Sig)
FXR	0.3007 (-Not Sig)	0.6455 (-Not Sig)
OIL	0.3305 (+Not Sig)	0.1071 (+Not Sig)
MRT	0.9257 (+Not Sig)	0.1500 (+Not Sig)
@ISPERIOD 2018Q2	n/a	0.0000 (+Sig)
@ISPERIOD 2020Q4	n/a	0.0041 (+Sig)
@ISPERIOD 2023Q2	n/a	0.0008 (+Sig)
Simultaneous F-Test (All Variables)	0.5725 (Not Sig)	0.0000 (Sig)
R-squared	0.1846	0.7794
Adjusted R-squared	-0.0312	0.6940

Source: Author

Robustness check comparing the baseline and IIS regression model indicates that despite the coefficient changes, the individual effects of all variables are consistent, as none of the nine variables is significant in both model. The basemodel failed the normality test with the p-value < 0.05 , while IIS regression model passed all the classical assumption test (normality, multicollinearity, heteroscedasticity, and auto-correlation tests). The overall significance of the regression model is sensitive to influential observations and the substantial increase in R^2 (0.7794) and Adjusted R^2 (0.6940) indicates that the three identified impulse observations account for a considerable portion of the variation in IMAS stock return and the value inflated by the IIS dummy

variable, whereas all the independent variables in the model remains partially insignificant in both models.

After applying the IIS regression, three impulse observation were identified and controlled, which improved the residual distribution and substantially increased the model's explanatory power. The outlier treatment did not alter the individual significance of the results based on the partial t-Test whereas the overall model became significant based on the simultaneous F-Test. This indicates that the impulse observations had distorted the initial regression and reliability of the estimated relationships.

Therefore, the IIS regression provides better representation of the factors affecting the dependent variable by detecting unusual events or abnormal observations in the dataset. Both regression models produced consistent result as none of the independent variables are significant, this result indicate that all research hypotheses (H2a, H2b, H2c, H2d, H2e, H2f, H2g, H2h, H2i) were rejected. IIS result also indicate that impulse events have a greater impact on IMAS Stock Return than the financial and macroeconomic variables included in the model.

Table 4.9. Impulse Observation Events

Impulse Observation Events	Source
IIS1 = Q2 2018: IMAS shares peaked in June 2018 as investors responded positively to the company's financial performance both top-line and bottom-line results, before ultimately drop due to profit-taking.	https://www.cnbcindonesia.com/market/20180704144334-17-21916/saham-imas-anjlok-48-dalam-9-hari-ada-apa
IIS2 = Q4 2020: The rise in IMAS shares through the end of 2020 was driven by a major corporate action, specifically rights issue of its subsidiary as well as sentiment regarding the automotive market's recovery amidst the COVID-19 pandemic's "new normal" trend.	https://www.cnbcindonesia.com/market/20200824120709-17-181484/siap-rights-issue-rp-663-m-saham-grup-indomobil-meroket
IIS3 = Q2 2023: IMAS shares experienced a sharp surge driven by a 125.8% year-on-year (YoY) jump in first-quarter net profit. This positive sentiment was fueled by net revenue growth and market enthusiasm regarding the company's expansion into the electric vehicle.	https://www.cnbcindonesia.com/market/20230430143142-17-433332/saham-imas-sebulan-cuan-bagger-duit-rp10-juta-jadi-rp22-juta

Source: Author

The three impulse observations identified statistically unusual observations, above table is the subsequent event analysis is a separate contextual exercise intended to explore plausible explanations for those observations, rather than to establish causal effects.

4.4. The Effect of EV Policy on IMAS Profitability and Stock Return

Government policy supporting EV may have had a significant impact on the EV industry in Indonesia, it creates great opportunities for the automotive industry who invests and sells electric vehicles, such as PT. Indomobil Sukses International, Tbk. The statistical F-test and Welch t-test were used to investigate whether IMAS profitability and stock return differ from the period before and after government policy.

The F-Test for variances is used to determine if two independent populations have equal variances. In contrast, the Welch Two Sample t-Test is used to compare the means of two independent populations when their population variances are assumed to be unequal. The following group of hypotheses were addressed under this section with the F-test and Welch t-Test before and after government EV policy:

- H3a: There is a difference in IMAS Profitability before and after Government policy.
- H3b: There is a difference in IMAS Stock Return before and after Government policy.

4.4.1. F-Test Two Samples for Variances

The result of F-Test Two Sample for variances shows that there is a significant difference in variance between the periods before and after the implementation of the government EV policy, for both the ROE and Stock Return. IMAS Profitability (ROE) p-value for both one-tail and two-tail is lower than 0.05, this indicates that the variance of profitability (ROE) before and after the two periods differs significantly and the null hypothesis of equal variances is rejected.

Table 4.10. ROE F-Test Two Sample for Variances

ROE: F-Test Two-Sample for Variances		
	<i>Before</i>	<i>After</i>
Mean	-0.92995159	1.495809
Variance	10.79257831	2.97634485
Observations	24	20
df	23	19
F	3.626118229	
P(F<=f) one-tail	0.003000993	
F Critical one-tail	2.123262602	
P two-tail	0.006001987	

The result of IMAS Stock Return (ISR) in F-Test Two Sample for variances also shows that p-value for both one-tail and two-tail is lower than 0.05, this indicates that the variance of stock return before and after the two periods differs significantly.

Table 4.11. ISR F-Test Two Sample for Variances

ISR: F-Test Two-Sample for Variances		
	<i>Before</i>	<i>After</i>
Mean	0.046364111	0.016310532
Variance	0.245476113	0.080005639
Observations	24	20
Df	23	19
F	3.068235152	
P(F<=f) one-tail	0.007932939	
F Critical one-tail	2.123262602	
P two-tail	0.015865879	

4.4.2. Welch Two Samples t-Test

The Welch Two Sample t-Test assuming unequal variances for IMAS Profitability (ROE) shows p-value for both one-tail and two tail are lower than 0.05, this indicates a significant difference in the mean profitability (ROE) before and after the two periods. Specifically, the result shows that the mean ROE improved from the period 2021 to 2025. Therefore, the null hypothesis is rejected and confirms that hypothesis H3a is accepted.

Table 4.12. ROE Welch Two Sample t-Test

ROE: t-Test: Two-Sample Assuming Unequal Variances		
	<i>Before</i>	<i>After</i>
Mean	-0.92995159	1.495809
Variance	10.79257831	2.97634485
Observations	24	20
Hypothesized Mean Difference	0	
df	36	
t Stat	-3.1355444	
P(T<=t) one-tail	0.001704093	
t Critical one-tail	1.688297714	
P(T<=t) two-tail	0.003408186	
t Critical two-tail	2.028094001	

Albeit, the Welch Two Sample t-Test for IMAS Stock Return shows that both p-value for one-tail and two-tail are greater than 0.05, means there is no significant difference of mean in stock return between the two groups. Therefore, the null hypothesis cannot be rejected and hypothesis H3b is rejected.

Table 4.13. ISR Welch Two Sample t-Test

ISR: t-Test: Two-Sample Assuming Unequal Variances		
	<i>Before</i>	<i>After</i>
Mean	0.046364111	0.016310532
Variance	0.245476113	0.080005639
Observations	24	20
Hypothesized Mean Difference	0	
df	38	
t Stat	0.251951732	
P(T<=t) one-tail	0.401218052	
t Critical one-tail	1.68595446	
P(T<=t) two-tail	0.802436104	
t Critical two-tail	2.024394164	

4.4.3. Result Analysis & Discussion

F-test result shows there is a significant difference in variance between the group period before vs after for both IMAS Profitability (ROE) and IMAS Stock Return. It can be concluded that the two groups in ROE and Stock Return

have different variances in their respective groups, suggesting that ROE and stock returns became significantly less volatile after the period.

The Welch's two-sample test result for IMAS Profitability (ROE) indicate a significant difference in mean ROE before and after the two periods. Therefore, the null hypothesis is rejected and hypothesis H3a is accepted, suggesting that the average profitability differs significantly between the two periods. Specifically, the mean ROE increased in the second period, suggesting an improvement in the company's profitability during 2021 to 2025. However, Welch's two-sample test result for IMAS Stock Return indicate that there is no significant difference in stock return before and after two periods. Therefore, the null hypothesis cannot be rejected and hypothesis H3b is rejected. The Welch two-sample t-test was employed to compare the mean ROE and stock return between the periods because the two groups unequal variances. However, the quarterly observations originate from a single time series and may therefore exhibit temporal dependence. Although the regression residuals did not indicate significant serial correlation based on the Breusch–Godfrey test, the independence assumption of the two-sample comparison cannot be fully guaranteed.

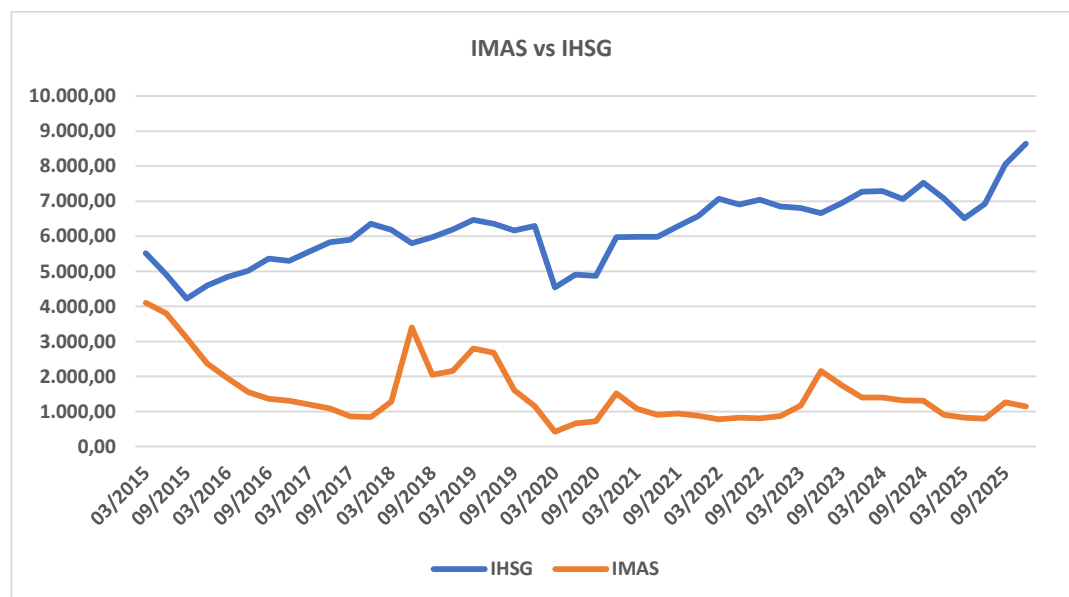


Figure 4.10. IMAS vs IHSG period 2015-2025

The beta value of IMAS stock between 2015 to 2025 is 1.42, calculated based on the quarterly data of stock IMAS stock return and market return, indicates the stock is volatile compared to the overall market. A beta greater than one suggests that IMAS is an aggressive stock whose returns tend to fluctuate more than market returns. This finding implies that IMAS carries relatively high systematic risk, making it more sensitive to macroeconomic conditions and overall market movements compared to average market stocks. This result is interpreted solely as a measure of market sensitivity and does not imply causality, profitability, or overall firm performance.

CHAPTER V

CONCLUSION & RECOMMENDATIONS

5.1. Conclusion

The financial performance of PT. Indomobil Sukses Internasional Tbk. (IMAS) over the 2015-2025 period reflects a company that has navigated both growth opportunities and industry challenges while maintaining its position in the automotive sector. IMAS demonstrated resilience in managing its assets, liabilities, and profitability despite fluctuations in economic conditions. The company balance sheet indicates a generally expanding asset base, supported by steady growth in assets. At the same time, liabilities also increased in line with business expansion. Company's management of leverage and maintenance of adequate equity capital levels reflect its approach to funding growth. Income statement indicates varying levels of revenue and profitability over the years. Prior to 2019, IMAS exhibited a relatively low profitability and this trend continued in 2020 and 2021 due to the impact of the COVID-19 pandemic. Year 2022 onwards shows improvement on the operating profit and net income, along with vehicle sales are starting to show better performance.

However, despite the improvement in the company's operating margin, net profit remains relatively low and continues to face pressure. Profitability ratios also exhibit considerable fluctuations over the observed period, indicating inconsistent earnings performance. While liquidity ratios show an upward trend, this may also suggest that the company has not been utilizing its assets efficiently. Declining inventory turnover ratio, reflects slower inventory movement and less effective inventory management. Furthermore, the increase in solvency ratios, particularly the financial leverage ratio and Debt-to-Equity Ratio (DER), indicates a greater reliance on debt financing. This exposes the company to higher financial risk and may further constrain its profitability due to increased financing obligations. In addition, operational efficiency has weakened, as evidenced by the longer average collection period, suggesting that the company's ability to collect receivables has deteriorated. These findings indicate that although the company has shown improvements in certain

operational aspects, it continues to face significant challenges in maintaining profitability, managing assets efficiently, controlling financial risk, and optimizing working capital management. The following is the conclusion regarding that research question:

1. The first multiple regression model was conducted to examine the effect of fundamental financial factors on IMAS Profitability (ROE) during the observation period: The F-test results indicate that the overall model has a significant effect on ROE. However, individual partial t-test reveal that DER has a significant negative effect on ROE whereas LAGROE has a significant positive effect on ROE. These appears reasonable, as DER reflects the IMAS reliance on debt financing and the growing burden of liabilities. In contrast, TATO and the Current Ratio remained relatively stable throughout the observation period. Lagged dependent variable LAGROE is positive and highly significant, indicate that past profitability strongly affect ROE in the current period. The significance of the lagged dependent variable also affects the significance of the overall model, as indicated by the F-test results.
2. The second multiple regression model was conducted to examine the effect of both internal (Financial) and external (Macroeconomic) factors towards IMAS Stock Return: Nine predictors were individually insignificant, the baseline model was insignificant overall, and the full IIS model became significant after three impulse indicators were included. The insignificant result of the individual test suggests that IMAS Stock Returns during the period of study were not driven consistently by its leverage, liquidity, asset efficiency, economic growth, inflation, interest rate, exchange rate, oil price, or market return individually, but were strongly affected by exceptional quarter-specific shocks. This is supported by the three significant IIS indicators (2018-Q2, 2020-Q4, and 2023-Q2), which capture unusual movements not explained by the nine variables. Such a result is economically plausible for an individual automotive stock because firm-specific news, earnings surprises, restructuring, investor sentiment, and major market shocks can generate large abnormal returns. For example,

IMAS reported a substantial turnaround in Q2 2018, in Q4 2020 mostly driven by corporate action and automotive market recovery post pandemic, while Q2 2023 saw strong year-on-year growth in revenue and net profit as well as market enthusiasm regarding IMAS expansion into the EV. The result is also consistent with Efficient Market Hypothesis (EMH), where stock prices rapidly incorporate new information, and Arbitrage Pricing Theory (APT), which recognizes that returns can respond to multiple systematic and unexpected risk factors rather than a fixed set of observable variables. The insignificant t-Test do not mean the factors are irrelevant, rather their effects may be conditional, driven by investors sentiment or dominated by unexpected firm-specific and market shocks. Previous studies also suggest that local factors contribute more to stock return variation than global factors. Moreover, several macroeconomic indicators have been found to be insignificant when used in levels instead of shocks or surprises (Bilson et al., 2001).

3. The third equation model was performed to examine the differences of IMAS Profitability (ROE) and Stock Return between the selected two periods: The F-test results indicate both ROE and IMAS Stock Return exhibited different variances in their respective groups between the two periods. Welch t-test indicates ROE were significantly different between the two periods, where IMAS ROE improved in the second period. Meanwhile, the Welch t-test for IMAS Stock Return indicates there are no differences between the two periods. This likely occurs, although revenue and ROE have improved, these gains have not yet translated into a significant impact on stock returns.

Generally within automotive industry, Government EV policy may have created a more favorable business environment for automotive companies by encouraging investment, increasing consumer confidence, and accelerating EV ecosystem development. IMAS may have benefited from strategic investments, new EV partnerships, or improved operational performance during the post-policy period. Nevertheless, the automotive business could also reflect the post-pandemic economic recovery, stronger automotive demand, and company-

specific management initiatives, in addition to the EV development. Nevertheless, Government EV policy may not have been immediately reflected in IMAS's stock return since investors may also considered other factors such as overall market conditions, company performance, and global automotive industry developments. Stock returns are influenced by many firm-specific and market sentiment, so the effect of government policy alone may not have been strong enough to create a statistically significant difference during the observation period. While simultaneous test results for the second regression model indicate a significant influence on stock returns, it is not necessarily have an impact to IMAS Stock Return after government EV policy.

5.2. Limitation of the Study

The main focus of this study is to analyze PT. Indomobil Sukses Internasional, Tbk., one of the largest automotive companies in Indonesia. Data is limited to a few selected financial and macroeconomic factors within the observation period 2015-2025. Therefore, the explanatory power of the multiple linear regression results is limited. It is possible that there are other unobserved variables that potentially have a significant impact on the company's profitability and stock returns.

Other limitations include: (1) Single company analysis, (2) IIS overfitting risk, (3) The EV-policy cutoff may not fully isolate the policy effect because other economic events occurred simultaneously, (4) Lagged dependent variable was included to capture the persistence of ROE but its inclusion may affect model result, (5) Stationarity considerations require cautious interpretation of level relationships, (6) Baseline model for the second framework failed the normality test while the IIS model passed all the classical assumption test, (7) IIS robustness check may be sensitive to the detected outliers as the sample is limited to 44 quarterly observations, (8) Ratios such as ROE, DER, and TATO are economically interrelated, and (9) The timing of company's financial result and stock returns may differ, creating potential time-order or information-timing effects.

More extensive research will be required in the future to analyze the broader impact of financial and market conditions on the stock return of automotive companies. The benefits of EV policy may take longer to materialize, whereas stock markets often react to a combination of expectations, broader economic conditions, and company-specific news rather than a single policy initiative.

5.3.Theoretical Implications

The results of this study can be used to complement insights from previous studies. For example, factors such as leverage influence company profitability, consistent with the findings of previous studies, while stock return mostly driven by conditional events and investor sentiment. The IIS result suggests that IMAS stock returns are influenced by the multiple major events, rather than one dominant factor, which is consistent with the multi-factor perspective of APT. Although these findings differ from some previous studies reporting significant individual relationships, such differences may reflect different companies, observation periods, economic conditions, and investor expectations. This difference is a common finding in various previous studies. For examples: Companies with higher debt obligations prioritize financial commitments over stock return and firms with higher liquidity tend to have lower stock return due to non-optimized use of assets (Ojo, 2021). Sometimes investors may not perceive higher asset utilization as a positive signal during the observation period, or other firm-specific and market factors may have played a more dominant role in determining stock return. Hence, companies with operational efficiency and optimal asset utilization may not always affect the stock return (Handayani et al., 2023).

Differences may also occur in macroeconomic variables, sometimes economic growth may occur without increasing the profits of public companies (Madsen, J.B. et al., 2013). Inflation rates below certain percentage remain acceptable to the market if public still can afford the price increases, and such levels do not significantly impact profit or stock price fluctuations (Cipta V. et al, 2021). Normally, an increase in the BI rate normally will have a negative

effect on automotive sales. But sometimes, predominantly negative predictive power may switch temporarily to positive around economic shocks and suggest a change in the risk perception of higher values (McMillan, 2022). Normally in automotive industry, exchange rate increase will trigger rising of material and production costs, thus lower the investor confidence level (Wijayaningsih, 2016). But sometimes, increase in stock returns may occur if investors look at other factors such as operational effectiveness and hedging (Williamson, 2021). The rise of oil prices normally reduce the stock return of the automotive company, although the result may not always be negative (Pal, D. et. al., 2019). Generally the overall market return has a favourable and substantial impact on the stock return (Chin, S. C. et al., 2024), but sometimes stock returns are also influenced by various macro factors and risk premiums which change from time to time, so the relationship with market returns is not always stable (Cieslak, A. et. al., 2023). When the overall market rises, investors can shift funds from certain stocks to other stocks that are considered more attractive or liquid and macroeconomic variables become insignificant when used in levels instead of shocks or surprises (Bilson et al., 2001).

5.4. Practical Implications

The findings from this study are useful for automotive company management to continuously monitor and control leverage, liquidity, and activity, that could impact profitability. Although not all variables have a significant impact, managers should still consider the company's financial aspects and macroeconomic factors when managing automotive companies. This is crucial in the current geopolitical climate, risks related to raw material and component supply, rising costs due to exchange rates, declining sales due to economic pressure, rising interest rates, and oil prices can all impact overall sales conditions.

Furthermore, these findings are also useful for investors looking to invest in automotive company stocks, investors are advised to exercise caution and prudence when making investment decisions or to adopt an aggressive approach when evaluating a company's growth potential. Timing different between

volatility in macroeconomy versus company's financial condition and market sentiment, is also important to be considered.

5.5.Recommendation

Based on the findings, it is recommended that management maintain the focus on the EV trend, considering both the opportunities and risks involved. This includes monitoring the financial ratios, particularly those that impact profitability and cashflow. Currently the company are in debt dependence, with thin net profit margins, low inventory turnover, high receivable collection period. The company should manage the debt and their cashflow, while improving the efficiency ratios such as inventory turnover and lower the receivable collection to increase their operating cashflow. Furthermore, the company should continue to monitor geopolitical and macroeconomic conditions to ensure resiliency in navigating the turbulence. Investors also need to stay prudent in the investment decision for automotive stocks, while considering the EV trend, financial aspect and profitability of the company as well as macroeconomic conditions. The selected financial and macroeconomic variables did not individually account for IMAS stock return in this study, however should consider quarter-specific events which carried much more explanatory weight towards the stock return.

Based on the findings and methodological qualifications of this study, IMAS financial performance expanded materially, such as revenue, assets and ROE during the observation period while maintaining a high level of debt dependence. DER shows a strong relationship with ROE in first regression model. In contrast, the baseline model for stock return equation performed poorly where the model cannot explain the effect of financial and macroeconomic variables towards stock return. However, the specific events identified by the IIS model in a given quarter correspond to the influence on IMAS Stock Returns during the period. The analysis also found a difference in ROE between the selected period, although this result does not provide sufficient evidence to conclude that the difference was caused by government EV policy, as other economic and business factors may have contributed.

REFERENCES

- Abdulhafedh, A. (2017). How to Detect and Remove Temporal Autocorrelation in Vehicular Crash Data. *Journal of Transportation Technologies*, 7(2), 133-147. <https://doi.org/10.4236/jtts.2017.72010>.
- Abel, A. B., Bernanke, B. S., & Croushore, D. (2011). *Macroeconomics*, Seventh Edition. Addison-Wesley.
- Adami, R., Gough, O., Muradoglu, G., & Sivaprasad, S. (2010). The Leverage Effect on Stock Returns. *SSRN*. <https://doi.org/10.2139/ssrn.1690183>.
- Akbar, M., & Nugraha, R. (2025). Analysis the Impact of Liquidity Ratios, Activity Ratios, and Leverage Ratios on Profitability with Firm Size as a Moderating Variable (an Empirical Study of Transportation Sector Companies Listed on the Jakarta Stock Exchange from 2018 to 2022). *Journal of Social Research*, 4(3), 413-428. <https://doi.org/10.55324/josr.v4i3.2454>.
- Ambarukmi, K. T., & Diana, N. (2017). Pengaruh Size, Leverage, Profitability, Capital Intensity Ratio dan Activity Ratio terhadap Effective Tax Rate (ETR). Studi empiris pada perusahaan LQ-45 yang terdaftar di BEI selama periode 2011-2015. *E_Jurnal Ilmiah Riset Akuntansi*, 6(17), 13-26. <http://riset.unisma.ac.id/index.php/jra/article/view/154>.
- Anthony, R. N., Hawkins, D. F., & Merchant, K. A. (2011). *Accounting: Texts and Cases* (13th edition). McGraw-Hill/Irwin.
- Assagaf, A., Yusoff, Y. M., & Hassan, R. (2017). Government Subsidy, Strategic Profitability and its Impact on Financial Performance: Empirical Evidence from Indonesia. *Investment Management and Financial Innovations*, 14(3), 135-147. [https://doi.org/10.21511/imfi.14\(3\).2017.13](https://doi.org/10.21511/imfi.14(3).2017.13).
- Atidhira, A. T., & Yustina, A. I. (2017). The Influence of Return on Asset, Debt to Equity Ratio, Earnings per Share, and Company Size on Share Return in Property and Real Estate Companies. *JAAF (Journal of Applied Accounting and Finance)*, 1(2), 128-146. <https://doi.org/10.33021/jaaf.v1i2.363>.
- Barnes, P. (1987). The Analysis and Use of Financial Ratios: A Review Article. *Journal of Business Finance & Accounting*, 14(4), 449-461. <https://doi.org/10.1111/j.1468-5957.1987.tb00106.x>.

- Bhagyalakshmi, K., & Saraswathi, S. (2019). A Study on Financial Performance Evaluation using DuPont Analysis in select Automobile Companies. *International Journal of Management, Technology and Engineering*, 9(1), 354-362.
- Bilson, C. M., Brailsford, T. J., & Hooper, V. J. (2001). Selecting Macroeconomic Variables as Explanatory Factors of Emerging Stock Market Returns. *Pacific-Basin Finance Journal*, 9(4), 401-426. [https://doi.org/10.1016/S0927-538X\(01\)00020-8](https://doi.org/10.1016/S0927-538X(01)00020-8).
- Budiasih, I. G. A. N. (2009). Faktor-faktor yang mempengaruhi praktik perataan laba. *Jurnal Ilmiah Akuntansi dan Bisnis*, 4(1), 1–14. <https://ojs.unud.ac.id/index.php/jiab/article/view/2589>.
- Brealey, R. A., Myers, S. C., Marcus, A. J. (1995). *Fundamentals of Corporate Finance*. McGraw-Hill.
- Chen, S. K., Chen, X., Lin, B.-X., Zhong, R. (2005). The Impact of Government Regulation and Ownership on the Performance of Securities Companies: Evidences from China. *Global Finance Journal*, 16(2), 113-124. <https://doi.org/10.1016/j.gfj.2005.06.001>.
- Chin, S. C. (2024). The Effect of Financial Performance and Market Return on Stock Return with GDP Growth as a Moderating Variable. *International Journal of Business, Economics and Law*. <http://repository.ipmi.ac.id/id/eprint/2513>.
- Cieslak, A., & Pflueger, C. (2023). Inflation and Asset Returns. *Annual Review of Financial Economics*, 15(1), 433-448. <https://doi.org/10.1146/annurev-financial-110921-104726>.
- Cipta, V. A. P., & Djawoto. (2021). Pengaruh inflasi, suku bunga, return on equity (ROE), dan ukuran perusahaan terhadap harga saham pada perusahaan food and beverages yang terdaftar di BEI. *Jurnal Ilmu dan Riset Manajemen*, 10(2), 1–21. <https://jurnalmahasiswa.stiesia.ac.id/index.php/jirm/article/view/3904>.
- Drake, P. P., & Fabozzi, F. J. (2012). *Analysis of financial statements (3rd edition)*. John Wiley & Sons.

- El Gibran, P. A., & Nainggolan, Y. A. (2025). Impact of Financial Performance on The Innovation and Development of Research and Development in Electric Vehicle Industry. *Economic Reviews Journal*, 4(2), 534-552. <https://doi.org/10.56709/mrj.v4i2.688>.
- Eugene F. Fama (1976). *Foundations of Finance: Portfolio Decisions and Securities Prices*. Blackwell.
- Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417. <https://doi.org/10.2307/2325486>.
- Fama, E. F. (1981). Stock returns, Real Activity, Inflation, and Money. *The American economic review*, 71(4), 545-565.
- Faizah, A. R., Pudyaningsih, A. R., & Akramiah, N. (2025). Analisis Perbandingan Kinerja Keuangan Sub Sektor Otomotif (Studi Di Bursa Efek Indonesia 2020-2024). *Jurnal Akuntansi dan Manajemen*, 4(2), 1407-1416. <https://doi.org/10.59086/jam.v4i2.1060>.
- Fraser, L. M., Ormiston, A. (2016). *Understanding Financial Statements*. Pearson.
- García-Avilés, J. A. (2020). Diffusion of Innovation. *The International Encyclopedia of Media Psychology*, 1(8), 1-8. <https://doi.org/10.1002/9781119011071.iemp0137>.
- Gautama, B. P., Asrifah, C., Nurhayati, N. S., Miftahuddin, A., & Perdana, Y. (2024). The Effect of Profitability and Liquidity on Firm Value with Capital Structure as a Moderating Variable. *Jurnal Ilmiah Akuntansi*, 7(1), 763-776. <https://doi.org/10.57178/atestasi.v7i1.940>.
- Gitman, L. J., & Zutter, C. J. (2008). *Principles of Managerial Finance: Student Value Edition*. Prentice Hall.
- Gunarto, A. G., & Sembel, R. (2019). The Effect of Macroeconomy on Stock Performance of LQ45 Companies at IDX. *International Journal of Business, Economics and Law*, 19(1), 22-29.
- Halim, B., Sembel, R., Malau, M. (2022) Financial Performance Analysis and the Effect of Profitability and Market Return on The Stock Return of PT. Adaro Energy Indonesia Tbk - A Coal Mining Company in Indonesia. *5th*

International CEO Communication, Economics, Organization & Social Sciences Congress.

- Handayani, R. S., & Aprilia, E. N. (2023). Pengaruh Current Ratio, Debt to Equity Ratio, Return on Equity dan Total Asset Turnover terhadap Return Saham Perusahaan Sektor Pertambangan yang terdaftar di Bursa Efek Indonesia Periode 2018-2022. *Jurnal Akuntansi & Keuangan*, 12(1), 49-57.
- Hendry, D. (2015). Detecting Location Shifts during Model Selection by Step-Indicator Saturation. *Econometrics*, 3(2), 240-264.
<https://doi.org/10.3390/econometrics3020240>.
- Heryati, D. S., & Kurniawan, D. (2023). The Effect of Liquidity and Leverage Ratios on Profitability in Automotive and Component Sub-Sector Companies on the IDX 2016-2020. *IJESM Indonesian Journal of Economics and Strategic Management*, 1(1), 36-50.
- Ihsan, F., Sembel, R., Malau, M. (2023). The Effect of Macroeconomic, Market Return, and Financial Performance with Moderating Variable of COVID-19 pandemic on Stock Return: A Case Study of Mobile Operator Companies Listed in IDX period 2012-2021. *South East Asia Journal of Contemporary Business, Economics and Law*, 28(3), 58-68.
- Indriyani, I. (2015). The Influence of Financial Ratios on Profit Growth in Mining Companies Listed on the Indonesia Stock Exchange. *Sriwijaya Business Management Journal*, 13(3), 343-358.
- Ikatan Akuntan Indonesia (2015). Exposure Draft PSAK Penyajian Laporan Keuangan. Retrieved from:
[https://www.iaiglobal.or.id/v03/files/file_publikasi/ED%20PSAK%201%20\(26%20Juni%202015\).pdf](https://www.iaiglobal.or.id/v03/files/file_publikasi/ED%20PSAK%201%20(26%20Juni%202015).pdf) on 6 April 2026 22:07pm.
- Blog EViews (2020). Using Indicator Saturation to Detect Outliers and Structural Shifts. Retrieved from: <https://blog.eviews.com/2020/12/using-indicator-saturation-to-detect.html> on 8 Aug 2026 19:07pm.
- Jati, W. (2019). The Effect of Current Ratio (CR) and Debt to Equity Ratio (DER) on Return on Equity (RoE) at PT Aneka Tambang, Tbk, Years 2010 - 2017. *Pinisi Discretion Review*, 3(1).

- Karim, A., Widyarti, E. T., & Santoso, A. (2023). Effect of Current Ratio, Total Asset Turnover, and Size on Profitability: Evidence from Indonesia Manufacturing Companies. *Diponegoro International Journal of Business*, 6(1), 57-63. <https://doi.org/10.14710/dijb.6.1.2023.57-63>.
- Kosnandar, C. A. (2025). Financial Performance, Macro Economy, and Market Return Impact on Stock Return: Study of Consumer Cyclical Indonesia period 2014-2023. *IPMI Institute Jakarta*.
- Li, J., Zhang, J., & Zhao, Z. (2020). Analysis of rapid demand variation in electric vehicle industry based on innovation diffusion theory. *IOP Conference Series: Earth and Environmental Science*, 619(1), Article 012065. <https://doi.org/10.1088/1755-1315/619/1/012065>.
- Lis, B., Nessler, C., & Retzmann, J. (2012). Oil and Cars: The Impact of Crude Oil Prices on the Stock Returns of Automotive Companies. *International Journal of Economics and Financial Issues*, 2(2), 190-200.
- Friedman M. & Schwartz A.J. (1963). A Monetary History of the United States, 1867-1960. *The Princeton University Press*.
- Madsen, J. B., Dzhumashev, R., & Yao, H. (2013). Stock Returns and Economic Growth. *Applied Economics*, 45(10), 1257-1271. <https://doi.org/10.1080/00036846.2011.613802>.
- Masoud, N. M. (2013). The Impact of Stock Market Performance upon Economic Growth. *International Journal of Economics and Financial issues*, 3(4), 788-798.
- McMillan, D. G. (2022). The Time-Varying Relation between Stock Returns and Monetary Variables. *Journal of Risk and Financial Management*, 15(1), Article 9. <https://doi.org/10.3390/jrfm15010009>.
- Munawar, A. H. (2019). Firm Age Memoderasi ROE dan DER terhadap Kebijakan Dividen berdasarkan Indeks IDX High Dividend 20. *Jurnal Akuntansi*, 14(1), 22-31.
- Muhammad, S., & Ali, G. (2018). The Relationship between Fundamental Analysis and Stock Returns Based on the Panel Data Analysis; Evidence from Karachi Stock Exchange (KSE). *Research Journal of Finance and Accounting*, 9(3), 84-96.

- Mushtaq, R. (2011). Augmented Dickey-Fuller Test. *Université Paris I Panthéon-Sorbonne*. <https://doi.org/10.2139/ssrn.1911068>.
- Naimah, Z., Utama, S. (2006). The Influence of Company Size, Growth, and Profitability on The Profit Response Coefficient and The Book Value of Equity Response Coefficient: A Study of Manufacturing Companies on The Jakarta Stock Exchange. *National Accounting Symposium IX*.
- Nachrowi, N. D., Usman, H. (2002). *Use of Techniques Econometrics*. Revised edition. Indonesia, Jakarta: King Grafindo Persada.
- Newbold, P. & Granger, C.W.J. (1974), Experience with Forecasting Univariate Time Series and the Combination of Forecasts. *Journal of the Royal Statistical Society: Series A (General)*, 137(2), 131-165. <https://doi.org/10.2307/2344546>.
- Hendrawati, N. & Ningrum, R. S. (2024). Analisis Perbandingan Pengaruh Current Ratio, Fixed Assets Turnover Ratio, dan Debt to Equity Ratio terhadap Return On Investment (ROI) pada PT. Astra International, Tbk. dan PT. Indomobil Sukses Internasional, Tbk. tahun 2012-2017. *Jurnal Akuntansi*, 17(2), 72-117.
- Ojo, M. C., & Albertus, R. H. (2021). The Effect of Current Ratio, Return on Equity, and Debt to Equity Ratio on Stock Returns on the Indonesia Stock Exchange. *Strategic Management Business Journal*, 1(1), 1-13. <https://doi.org/10.55751/smbj.v1i01.2>.
- Pal, D., & Mitra, S. K. (2019). Oil Price and Automobile Stock Return Co-movement: A Wavelet Coherence Analysis. *Economic Modelling*, 76, 172-181. <https://doi.org/10.1016/j.econmod.2018.07.028>.
- Panjaitana, P. H. & Alfinas D. (2020). Effect of CR, DER, and TATO on Profit Growth in Pharmaceutical Companies Listed on IDX. *Journal of Applied Business and Technology*, 1(2).
- Phiartiany, R. (2025). Analysis and Evaluation of Financial and Stock Performance PT. Sumber Alfaria Trijaya, Tbk Before, During, and After The COVID-19 Pandemic Crisis in Indonesia for the Years 2017-2024. *Doctoral dissertation, Institut IPMI*.

- Purba, S. A., & Marendra, I. G. (2024). Pengaruh Current Ratio (CR) dan Debt to Equity Ratio (DER) terhadap Return On Equity (ROE) pada PT Indomobil Sukses Internasional Tbk. periode 2013-2022. *Journal of Research and Publication Innovation*, 2(4), 3598-3610.
- Putri, A. P. W., Dzukirom, M., & Saifi, M. (2016) Efektivitas Penggunaan Modal Kerja Sebagai Salah Satu Upaya Meningkatkan Likuiditas (Studi Pada Perusahaan Otomotif Indomobil Sukses International Tbk. tahun 2012-2014). *Brawijaya University*.
- Raditya, B., Daryanto, W. M., & Rahadi, R. A. (2023). Comparative Analysis of the Effects of President Decree No.55 the Year 2019 on the Company Performance of a Car Distributor Company in Indonesia a Case Study of PT. Astra International Tbk. and PT Indomobil Sukses Internasional Tbk. *South East Asia Journal of Contemporary Business, Economics and Law*, 29.
- Ramadhani, A. M. (2023). Analyzing the Effect of Current Ratio and Debt Equity Ratio on Stock Returns in the Automotive and Component Subsector Companies Listed on the Indonesia Stock Exchange. *EKALAYA Jurnal Ekonomi Akuntansi*, 1(2). <https://doi.org/10.59966/ekalaya.v1i2.148>.
- Ratnaningrum, R., Putri, B. K., Wulandari, R., & Purnama, K. D. (2022). The Influence of Inflation, and Exchange Rate on the IDX Composite Stock Index (IHSG). *International Journal of Science, Technology & Management*, 4(2), 428-433. <https://doi.org/10.46729/ijstm.v4i2.779>.
- Rusiadi (2013). Management Research Methods, Accounting and Development Economics, Concepts, Cases and Applications of SPSS, Eviews, Amos and Lisrel. *Medan, pers USU*.
- Robiyanto, R., Santoso, M. A., Atahau, A. D. R., & Harijono, H. (2019). The Indonesia Stock Exchange and its Dynamics: An Analysis of the Effect of Macroeconomic Variables. *Montenegrin Journal of Economics*, 15(4), 59-73. <https://doi.org/10.14254/1800-5845/2019.15-4.5>.
- Rompas, I. L. M., & Rumokoy, L. J. (2023). Pengaruh Current Ratio, Debt To Equity Ratio, Dan Total Asset Turnover Terhadap Return on Asset Perusahaan Sub Sektor Otomotif & Komponen Di Bursa Efek Indonesia

- Periode 2015-2021. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, 11(1), 833-843.
- Ross, S. A., Westerfield, R. W., Jordan, B. D., Lim, J., & Tan, R. (2012). *Fundamentals of Corporate Finance, Asia Global Edition*. McGraw- Hill.
- Ross, S. A., Westerfield, R. W., Jaffe, J. F., & Jordan, B. D. (2008). *Modern Financial Management (8th ed.)*. McGraw-Hill/Irwin.
- Ross, S. (2015). *Fundamentals of Corporate Finance*. McGraw-Hill.
- Sathyanarayana, S. & Gargesa, S. (2018). An Analytical Study of the Effect of Inflation on Stock Market Returns. *IRA-International Journal of Management & Social Sciences*, 13(2), 48-64.
<https://doi.org/10.21013/jmss.v13.n2.p3>.
- Sembel, R. (2025). *Kiat Meningkatkan dan Memaksimalkan Kinerja dengan Financial Wisdom*. Jakarta: IPMI Press.
- Setya, R. I., Darna, N., & Muhidin, A. (2020). Pengaruh Modal Kerja dan Solvabilitas terhadap Profitabilitas Perusahaan Otomotif (Studi Kasus pada PT Indomobil Sukses Internasional Tbk. yang Terdaftar di Bursa Efek Indonesia Periode 2010-2019). *Business Management and Entrepreneurship Journal*, 6(2), 17-29.
- Sharpe, W. F. (1970). *Portfolio Theory and Capital Markets*. McGraw-Hill.
- Sitohang, M. R. (2019). The Effect of Financial Performance on Stock Return in Coal Mining Companies Registered in Indonesia Stock Exchange. *Indonesian Journal of Business, Accounting and Management*, 2(1).
- Soliman, M. T. (2008). The use of DuPont Analysis by Market Participants. *The Accounting Review*, 83(3). <https://doi.org/10.2308/accr.2008.83.3.823>.
- Statistical Yearbook of Indonesia 2025 volume 53 2025. Retrived from:
<https://www.bps.go.id/id/publication/2025/02/28/8cfe1a589ad3693396d3db9f/statistik-indonesia-2025.html>. on 6 April 2026 22:06pm.
- Sukesti F., Ghozali I., Fuad F., Almasyhari K.A., & Nurcahyono N. (2021). Factors Affecting the Stock Price: The Role of Firm Performance. *Journal of Asian Finance, Economics and Business*, 8(2).
- Sun, G., Wang, J., & Ai, Y. (2024). The Impact of Government Green Subsidies on Stock Price Crash Risk. *Energy Economics Journal*, 134, 107573.

- Sujarweni, V. W. (2019). *The Master Book of SPSS*. Jakarta: Anak Hebat Indonesia.
- Kementerian Energi dan Sumber Daya Mineral Republik Indonesia (2025). *SPKLU distribution 2025–2030*. Retrieved from: https://gatrik.esdm.go.id/assets/uploads/download_index/files/82f2f-kepmen-roadmap-spkl-2025-sd-2030.pdf. on 9 April 2026 21:46pm.
- Teguh, F., Sembel, R. & Malau, M. (2023). The Impact of Macroeconomics, Market Return, Financial Performance, Market Perception, and Covid-19 on Stock Returns on Telecommunication Tower Companies in Indonesia. *South East Asia Journal of Contemporary Business, Economics and Law*, 29 (1).
- Thamrin, J., & Sembel, R. (2020). The Effect of Company's Fundamental, Market Return and Macroeconomic to Stock Return: A Case Study of Consumer Goods Companies Listed in BEI Period 2009-2018. *International Journal of Business Studies*, 4(3), 184-197.
- Traub, E. (2001). Using ROE to Analyze Stocks: What You Need To Know About. *American Association of Individual Investor Journal*, 4-7.
- Trisnowati, Y., Achsani, N. A., Sembel, R., & Andati, T. (2022). The Effect of ESG score, Financial Performance, and Macroeconomics on Stock Returns during the Pandemic Era in Indonesia. *International Journal of Energy Economics and Policy*, 12(4), 166-172.
- Totonchi, J. (2021). Macroeconomic Theories of Inflation. *International Conference on Economics and Finance Research*, 4.
- Waleed, A., Pasha, A., & Akhtar, A. (2016). Exploring the Impact of Liquidity on Profitability: Evidence from Banking Sector of Pakistan. *Journal of Internet Banking and Commerce*, 21(3).
- Weygandt, J. J., Kimmel, P. D., and Kieso, D. E. (2013). *Financial Accounting*, IFRS Edition. John Wiley & Sons, Inc.
- Widya, A. (2023). The Effect of Current Ratio (CR), Debt Equity Ratio (DER), Total Asset Turnover (TATO) on Return of Equity (ROE) in the Manufacturing Industry of Consumer Goods Sector in 2019-2021. *Indonesian Vocational Research Journal*, 3(1), 30-37.

- Wild, J. J., & Subramanyam, K. R. (2009). *Financial Statement Analysis*. McGraw-Hill.
- Williamson, R. (2001). Exchange Rate Exposure and Competition: Evidence from the Automotive Industry. *Journal of financial Economics*, 59(3).
- Winter, G. (2000). A Comparative Discussion of the Notion of ‘validity’ in Qualitative and Quantitative Research. *The Qualitative Report*, 4(3), 1-14. <https://doi.org/10.46743/2160-3715/2000.2078>.
- Wijayaningsih, R., Rahayu, S. M., & Saifi, M. (2016). Pengaruh BI rate, Fed rate, dan Kurs Rupiah terhadap Indeks Harga Saham Gabungan (IHSG). *Studi pada Bursa Efek Indonesia periode 2008-2015*. Brawijaya University.
- Yap, H. C., & Firnanti, F. (2019). Faktor-faktor yang Mempengaruhi Return Saham. *Jurnal Bisnis dan Akuntansi*, 21(1a), 27-38. <https://doi.org/10.34208/jba.v21i1a-1.706>.
- Yetti, A., & Subekti, R. (2025). The Evaluation of Financial Performance of PT. Indomobil Sukses Internasional Tbk 2020-2023 through Profitability and Solvency Ratio Analysis. *International Students Conference of Economics and Business Excellence*, (1), 50-56.
- Zaki, F. H., & Rahadi, R. A. (2025). Automobile Industry Market Competition In USA: Stock Valuation Analysis of Ford Motor Company (NYSE: F) Amidst Consistent Growth of Electric Automobile Sales in 2020-2024. *International Research Journal of Economics and Management Studies IRJEMS*, 4(7).

APPENDICES

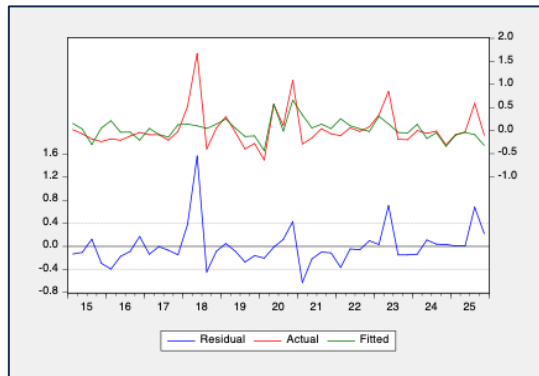
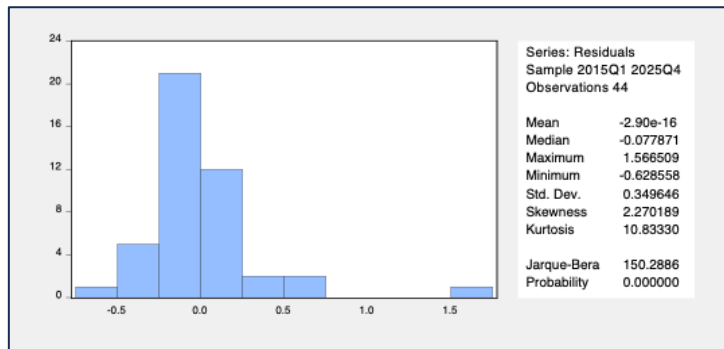
1. Model 2 - Regression Test #1:

a. Initial Data

Year	DER	CR	TATO	ECO	INF	BIR	FXR	OIL	MRT	ISR
2015Q1	2,69	1,04	0,20	0,049	0,064	0,075	0,05	-0,03	0,06	0,02
2015Q2	2,75	0,97	0,38	0,048	0,073	0,075	0,02	0,18	-0,11	-0,07
2015Q3	3,01	0,97	0,52	0,049	0,068	0,075	0,08	-0,24	-0,14	-0,18
2015Q4	2,71	0,93	0,73	0,050	0,034	0,075	-0,04	-0,23	0,09	-0,24
2016Q1	3,04	1,02	0,16	0,050	0,045	0,068	-0,05	0,06	0,05	-0,18
2016Q2	2,96	0,98	0,32	0,051	0,035	0,053	0,01	0,25	0,04	-0,21
2016Q3	3,28	0,85	0,44	0,051	0,031	0,050	-0,02	-0,01	0,07	-0,12
2016Q4	2,82	0,92	0,59	0,050	0,030	0,048	0,02	0,16	-0,01	-0,04
2017Q1	3,17	0,94	0,14	0,051	0,036	0,048	-0,01	-0,07	0,05	-0,09
2017Q2	3,35	0,94	0,28	0,050	0,044	0,048	0,00	-0,09	0,05	-0,09
2017Q3	3,35	0,94	0,28	0,051	0,037	0,043	0,00	0,20	0,01	-0,21
2017Q4	2,43	0,80	0,48	0,051	0,036	0,043	0,02	0,16	0,08	-0,02
2018Q1	2,62	0,86	0,12	0,051	0,034	0,043	0,01	0,03	-0,03	0,52
2018Q2	2,76	0,80	0,23	0,052	0,031	0,053	0,02	0,12	-0,06	1,67
2018Q3	2,90	0,79	0,33	0,052	0,029	0,058	0,06	0,07	0,03	-0,40
2018Q4	3,02	0,75	0,44	0,052	0,031	0,060	-0,03	-0,39	0,04	0,05
2019Q1	3,01	0,88	0,11	0,052	0,025	0,060	-0,02	0,34	0,04	0,30
2019Q2	3,39	0,81	0,22	0,051	0,033	0,060	0,00	-0,01	-0,02	-0,04
2019Q3	3,53	0,85	0,34	0,050	0,034	0,053	-0,01	-0,10	-0,03	-0,40
2019Q4	3,75	0,77	0,42	0,048	0,027	0,050	-0,01	0,11	0,02	-0,28
2020Q1	4,14	0,71	0,09	0,029	0,030	0,045	0,08	-0,78	-0,28	-0,64
2020Q2	4,08	0,79	0,16	-0,053	0,020	0,043	-0,07	1,80	0,08	0,56
2020Q3	4,02	0,78	0,24	-0,034	0,014	0,040	0,05	-0,03	-0,01	0,11
2020Q4	2,81	0,76	0,31	-0,023	0,017	0,038	-0,05	0,27	0,23	1,09
2021Q1	2,81	0,79	0,09	-0,007	0,014	0,035	0,02	0,24	0,00	-0,29
2021Q2	2,82	0,76	0,19	0,072	0,013	0,035	-0,01	0,21	0,00	-0,16
2021Q3	2,90	0,76	0,28	0,040	0,016	0,035	-0,01	0,01	0,05	0,04
2021Q4	2,97	0,72	0,38	0,045	0,019	0,035	0,01	-0,01	0,05	-0,07
2022Q1	2,94	0,75	0,12	0,047	0,026	0,035	0,00	0,39	0,07	-0,11
2022Q2	2,98	0,69	0,22	0,054	0,044	0,035	0,02	0,12	-0,02	0,06
2022Q3	2,99	0,72	0,35	0,063	0,060	0,043	0,02	-0,26	0,02	-0,02
2022Q4	3,05	0,75	0,45	0,049	0,055	0,055	0,04	-0,07	-0,03	0,08
2023Q1	3,06	0,76	0,12	0,049	0,050	0,058	-0,02	-0,04	-0,01	0,34
2023Q2	3,09	0,81	0,24	0,050	0,035	0,058	-0,02	-0,06	-0,02	0,85
2023Q3	3,20	0,86	0,36	0,052	0,023	0,058	0,03	0,29	0,04	-0,19
2023Q4	3,07	0,87	0,46	0,051	0,026	0,060	0,01	-0,19	0,05	-0,20
2024Q1	3,10	0,87	0,11	0,052	0,031	0,060	0,01	0,11	0,00	0,00
2024Q2	3,16	1,03	0,22	0,050	0,025	0,063	0,04	0,01	-0,03	-0,06
2024Q3	3,40	1,02	0,32	0,050	0,018	0,060	-0,06	-0,17	0,07	-0,01
2024Q4	3,22	1,00	0,43	0,050	0,016	0,060	0,04	0,03	-0,06	-0,31
2025Q1	3,27	0,91	0,11	0,049	0,010	0,058	0,03	0,04	-0,08	-0,09
2025Q2	3,40	0,94	0,21	0,051	0,019	0,055	-0,01	-0,12	0,06	-0,03
2025Q3	3,60	0,91	0,32	0,051	0,027	0,048	0,01	0,01	0,16	0,59
2025Q4	3,89	0,93	0,39	0,053	0,029	0,048	0,01	-0,10	0,07	-0,10

b. Normality Test (Jarque-Bera): Failed

Dependent Variable: ISR Method: Least Squares Date: 08/03/26 Time: 11:42 Sample: 2015Q1 2025Q4 Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.606352	0.804120	1.997653	0.0538
DER	-0.256968	0.180817	-1.421152	0.1644
CR	-0.918442	0.845497	-1.086275	0.2850
TATO	-0.597115	0.463809	-1.287417	0.2066
ECO	-3.772427	3.301768	-1.142548	0.2612
INF	1.755364	5.011102	0.350295	0.7283
BIR	5.694272	8.277171	0.687949	0.4962
FXR	-1.870302	2.440125	-0.766478	0.4487
OIL	0.086340	0.230299	0.374902	0.7101
MRT	0.908987	1.118792	0.812473	0.4222
R-squared	0.269580	Mean dependent var	0.032500	
Adjusted R-squared	0.076234	S.D. dependent var	0.409112	
S.E. of regression	0.393209	Akaike info criterion	1.167765	
Sum squared resid	5.256850	Schwarz criterion	1.573263	
Log likelihood	-15.69083	Hannan-Quinn criter.	1.318143	
F-statistic	1.394285	Durbin-Watson stat	1.901147	
Prob(F-statistic)	0.229296			



c. Multicolleniarity Test (VIF): Passed

Variance Inflation Factors
Date: 08/03/26 Time: 11:45
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.646609	184.0126	NA
DER	0.032695	93.57973	1.377570
CR	0.714866	151.3083	1.957411
TATO	0.215119	6.539822	1.277737
ECO	10.90167	7.575730	1.796851
INF	25.11114	8.910282	1.530119
BIR	68.51156	55.73244	2.550453
FXR	5.954211	1.913965	1.850160
OIL	0.053038	1.742929	1.704851
MRT	1.251694	2.252209	2.176846

d. Heteroscedasticity Test (Glejser): Passed

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	0.465449	Prob. F(9,34)	0.8874
Obs*R-squared	4.826462	Prob. Chi-Square(9)	0.8492
Scaled explained SS	6.214174	Prob. Chi-Square(9)	0.7183

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 08/03/26 Time: 11:44
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.315767	0.590385	2.228657	0.0326
DER	-0.213374	0.132756	-1.607262	0.1172
CR	-0.413743	0.620765	-0.666505	0.5096
TATO	-0.248920	0.340529	-0.730980	0.4698
ECO	-1.118414	2.424161	-0.461361	0.6475
INF	-2.963707	3.679155	-0.805540	0.4261
BIR	2.719720	6.077106	0.447535	0.6573
FXR	0.494928	1.791542	0.276258	0.7840
OIL	-0.044673	0.169086	-0.264204	0.7932
MRT	0.081783	0.821418	0.099564	0.9213

R-squared	0.109692	Mean dependent var	0.217109
Adjusted R-squared	-0.125977	S.D. dependent var	0.272065
S.E. of regression	0.288694	Akaike info criterion	0.549820
Sum squared resid	2.833709	Schwarz criterion	0.955317
Log likelihood	-2.096029	Hannan-Quinn criter.	0.700198
F-statistic	0.465449	Durbin-Watson stat	1.705776
Prob(F-statistic)	0.887412		

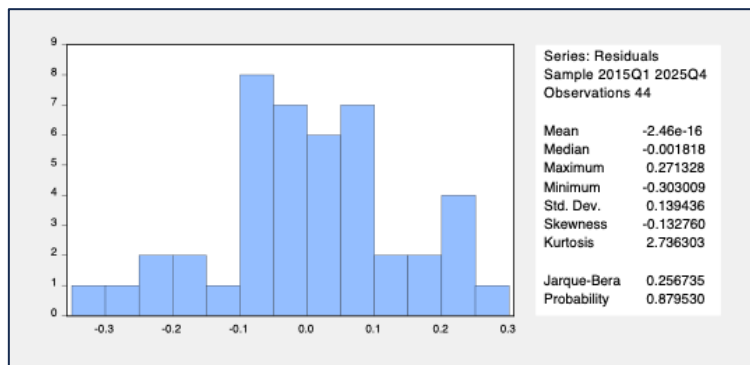
e. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM): Passed

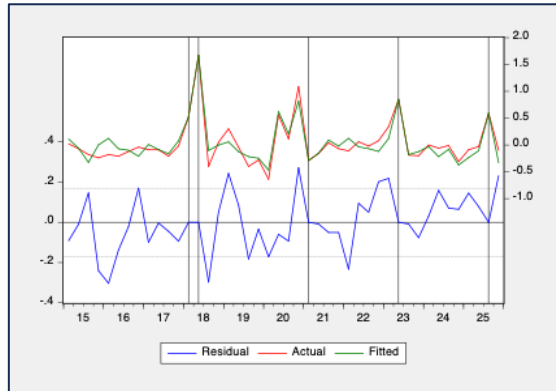
Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 1 lag				
F-statistic	0.086039	Prob. F(1,33)	0.7711	
Obs*R-squared	0.114421	Prob. Chi-Square(1)	0.7352	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/05/26 Time: 22:23				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001727	0.815172	0.002119	0.9983
DER	-0.002928	0.183569	-0.015950	0.9874
CR	0.049573	0.873599	0.056746	0.9551
TATO	0.012555	0.472115	0.026594	0.9789
ECO	0.003236	3.347079	0.000967	0.9992
INF	0.363855	5.229104	0.069583	0.9449
BIR	-0.872420	8.902260	-0.098000	0.9225
FXR	-0.391936	2.811420	-0.139409	0.8900
OIL	-0.004189	0.233895	-0.017909	0.9858
MRT	-0.138753	1.228834	-0.112914	0.9108
RESID(-1)	0.060280	0.205504	0.293325	0.7711
R-squared	0.002600	Mean dependent var	-2.90E-16	
Adjusted R-squared	-0.299642	S.D. dependent var	0.349646	
S.E. of regression	0.398603	Akaike info criterion	1.210616	
Sum squared resid	5.243180	Schwarz criterion	1.656663	
Log likelihood	-15.63354	Hannan-Quinn criter.	1.376032	
F-statistic	0.008604	Durbin-Watson stat	1.985593	
Prob(F-statistic)	1.000000			

2. Model 2 - Regression Test #2 (Regression Test#1 failed the normality test):

a. Normality Test (Jarque-Bera): Passed (5 impulse observation detected)

Dependent Variable: ISR Method: Least Squares Date: 08/03/26 Time: 11:46 Sample: 2015Q1 2025Q4 Included observations: 44 Indicator Saturation: IIS, 44 indicators searched over 2 blocks 5 IIS variables detected				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.376245	0.431698	3.187984	0.0034
DER	-0.265257	0.100765	-2.632433	0.0134
CR	-0.318418	0.380962	-0.835826	0.4101
TATO	-0.436809	0.206412	-2.116207	0.0430
ECO	-7.480335	1.618800	-4.620913	0.0001
INF	2.635624	2.208867	1.193202	0.2425
BIR	1.100198	3.761359	0.292500	0.7720
FXR	-1.579587	1.137848	-1.388224	0.1756
OIL	-0.022791	0.101740	-0.224016	0.8243
MRT	1.016178	0.581836	1.746503	0.0913
@ISPERIOD(*2018Q1	0.456527	0.193248	2.362395	0.0251
@ISPERIOD(*2018Q2	1.725325	0.183753	9.389356	0.0000
@ISPERIOD(*2021Q1	-0.720716	0.211835	-3.402247	0.0020
@ISPERIOD(*2023Q2	0.861474	0.179851	4.789931	0.0000
@ISPERIOD(*2025Q3	0.709180	0.204795	3.462887	0.0017
R-squared	0.883838	Mean dependent var	0.032500	
Adjusted R-squared	0.827760	S.D. dependent var	0.409112	
S.E. of regression	0.169789	Akaike info criterion	-0.443597	
Sum squared resid	0.836020	Schwarz criterion	0.164650	
Log likelihood	24.75913	Hannan-Quinn criter.	-0.218030	
F-statistic	15.76082	Durbin-Watson stat	1.537799	
Prob(F-statistic)	0.000000			





b. Multicollinearity Test (VIF): Passed

Variance Inflation Factors
Date: 08/03/26 Time: 11:47
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.186363	284.4415	NA
DER	0.010154	155.8655	2.294467
CR	0.145132	164.7519	2.131325
TATO	0.042606	6.946786	1.357249
ECO	2.620515	9.766656	2.316506
INF	4.879094	9.285216	1.594505
BIR	14.14782	61.72507	2.824691
FXR	1.294698	2.232061	2.157652
OIL	0.010351	1.824351	1.784495
MRT	0.338533	3.266927	3.157609
@ISPERIOD(*2018Q1	0.037345	1.295416	1.265975
@ISPERIOD(*2018Q2	0.033765	1.171255	1.144635
@ISPERIOD(*2021Q1	0.044874	1.556604	1.521227
@ISPERIOD(*2023Q2	0.032346	1.122038	1.096537
@ISPERIOD(*2025Q3	0.041941	1.454849	1.421784

c. Heteroscedasticity Test (Glejser): Passed

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	0.804298	Prob. F(14,29)	0.6581
Obs*R-squared	12.30615	Prob. Chi-Square(14)	0.5817
Scaled explained SS	9.366556	Prob. Chi-Square(14)	0.8069

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 08/03/26 Time: 11:48
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.285801	0.237344	1.204166	0.2383
DER	-0.038817	0.055400	-0.700668	0.4891
CR	-0.106052	0.209450	-0.506336	0.6164
TATO	-0.102702	0.113483	-0.904997	0.3729
ECO	-0.950078	0.890003	-1.067500	0.2946
INF	-0.334565	1.214417	-0.275495	0.7849
BIR	2.444915	2.067964	1.182282	0.2467
FXR	0.140664	0.625579	0.224854	0.8237
OIL	-0.053088	0.055936	-0.949078	0.3504
MRT	0.206924	0.319889	0.646863	0.5228
@ISPERIOD(*2018Q1	-0.119481	0.106246	-1.124568	0.2700
@ISPERIOD(*2018Q2	-0.124036	0.101026	-1.227764	0.2294
@ISPERIOD(*2021Q1	-0.161313	0.116465	-1.385071	0.1766
@ISPERIOD(*2023Q2	-0.134132	0.098881	-1.356501	0.1854
@ISPERIOD(*2025Q3	-0.110541	0.112594	-0.981765	0.3343

R-squared	0.279685	Mean dependent var	0.105010
Adjusted R-squared	-0.068053	S.D. dependent var	0.090326
S.E. of regression	0.093349	Akaike info criterion	-1.640029
Sum squared resid	0.252705	Schwarz criterion	-1.031782
Log likelihood	51.08063	Hannan-Quinn criter.	-1.414462
F-statistic	0.804298	Durbin-Watson stat	1.979451
Prob(F-statistic)	0.658113		

d. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM): Passed

Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 1 lag				
F-statistic	1.711634	Prob. F(1,28)	0.2014	
Obs*R-squared	2.534761	Prob. Chi-Square(1)	0.1114	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/05/26 Time: 22:24				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.040827	0.427636	0.095471	0.9246
DER	-0.004691	0.098615	-0.047092	0.9628
CR	0.007726	0.376419	0.020525	0.9838
TATO	0.033121	0.205490	0.161182	0.8731
ECO	-0.239497	1.609739	-0.148780	0.8828
INF	0.474430	2.212179	0.214463	0.8317
BIR	-0.808353	3.767057	-0.214585	0.8316
FXR	-0.037780	1.124510	-0.033597	0.9734
OIL	0.021149	0.101806	0.207736	0.8369
MRT	-0.029021	0.575254	-0.050450	0.9601
@ISPERIOD(*2018Q1	0.018461	0.191441	0.096536	0.9238
@ISPERIOD(*2018Q2	-0.004612	0.181574	-0.025402	0.9799
@ISPERIOD(*2021Q1	-0.101652	0.223241	-0.455346	0.6524
@ISPERIOD(*2023Q2	-0.063227	0.184139	-0.343363	0.7339
@ISPERIOD(*2025Q3	-0.021740	0.203008	-0.107089	0.9155
RESID(-1)	0.296970	0.226990	1.308294	0.2014
R-squared	0.057608	Mean dependent var	-2.46E-16	
Adjusted R-squared	-0.447245	S.D. dependent var	0.139436	
S.E. of regression	0.167743	Akaike info criterion	-0.457476	
Sum squared resid	0.787859	Schwarz criterion	0.191320	
Log likelihood	26.06448	Hannan-Quinn criter.	-0.216872	
F-statistic	0.114109	Durbin-Watson stat	1.838007	
Prob(F-statistic)	0.999967			

3. Augmented Dickey-Fuller Test (ADF):

4/9 (DER, CR, TATO, ECO) variables failed (Non-stationary Data)

Null Hypothesis: DER has a unit root Exogenous: Constant Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
	t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic	-2.479556	0.1274		
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(DER) Method: Least Squares Date: 08/03/26 Time: 12:39 Sample (adjusted): 2015Q2 2025Q4 Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DER(-1)	-0.287400	0.115908	-2.479556	0.0174
C	0.927668	0.365425	2.538602	0.0150
R-squared	0.130402	Mean dependent var	0.027907	
Adjusted R-squared	0.109192	S.D. dependent var	0.299584	
S.E. of regression	0.282755	Akaike info criterion	0.356922	
Sum squared resid	3.277962	Schwarz criterion	0.438838	
Log likelihood	-5.673822	Hannan-Quinn criter.	0.387130	
F-statistic	6.148197	Durbin-Watson stat	1.869181	
Prob(F-statistic)	0.017356			

Null Hypothesis: CR has a unit root Exogenous: Constant Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
	t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic	-2.500621	0.1224		
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(CR) Method: Least Squares Date: 08/03/26 Time: 12:39 Sample (adjusted): 2015Q2 2025Q4 Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR(-1)	-0.223840	0.089514	-2.500621	0.0165
C	0.188851	0.077052	2.450968	0.0186
R-squared	0.132332	Mean dependent var	-0.002558	
Adjusted R-squared	0.111170	S.D. dependent var	0.061377	
S.E. of regression	0.057865	Akaike info criterion	-2.816024	
Sum squared resid	0.137281	Schwarz criterion	-2.734107	
Log likelihood	62.54451	Hannan-Quinn criter.	-2.785816	
F-statistic	6.253107	Durbin-Watson stat	2.344110	
Prob(F-statistic)	0.016488			

Null Hypothesis: TATO has a unit root Exogenous: Constant Lag Length: 4 (Automatic - based on SIC, maxlag=9)				
	t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic	-2.797766	0.0678		
Test critical values:	1% level	-3.610453		
	5% level	-2.930917		
	10% level	-2.607932		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(TATO) Method: Least Squares Date: 08/03/26 Time: 12:40 Sample (adjusted): 2016Q2 2025Q4 Included observations: 39 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TATO(-1)	-0.333912	0.119350	-2.797766	0.0085
D(TATO(-1))	-0.253873	0.126137	-2.012677	0.0524
D(TATO(-2))	-0.325930	0.119584	-2.725538	0.0102
D(TATO(-3))	-0.378065	0.119426	-3.165842	0.0033
D(TATO(-4))	0.439079	0.122686	3.578879	0.0011
C	0.086871	0.033891	2.563228	0.0151
R-squared	0.964778	Mean dependent var	0.005897	
Adjusted R-squared	0.959442	S.D. dependent var	0.189788	
S.E. of regression	0.038222	Akaike info criterion	-3.550194	
Sum squared resid	0.048209	Schwarz criterion	-3.294262	
Log likelihood	75.22879	Hannan-Quinn criter.	3.458368	
F-statistic	180.7849	Durbin-Watson stat	2.015199	
Prob(F-statistic)	0.000000			

Null Hypothesis: ECO has a unit root Exogenous: Constant Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
	t-Statistic	Prob.*		
Augmented Dickey-Fuller test statistic	-2.702165	0.0819		
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation Dependent Variable: D(ECO) Method: Least Squares Date: 08/03/26 Time: 12:41 Sample (adjusted): 2015Q2 2025Q4 Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECO(-1)	-0.303596	0.112353	-2.702165	0.0100
C	0.013126	0.005542	2.368435	0.0227
R-squared	0.151168	Mean dependent var	9.30E-05	
Adjusted R-squared	0.130465	S.D. dependent var	0.019197	
S.E. of regression	0.017901	Akaike info criterion	-5.162554	
Sum squared resid	0.013138	Schwarz criterion	-5.080638	
Log likelihood	112.9949	Hannan-Quinn criter.	-5.132346	
F-statistic	7.301694	Durbin-Watson stat	1.860042	
Prob(F-statistic)	0.009975			

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

t-Statistic

Prob.*

Augmented Dickey-Fuller test statistic

Test critical values:

1% level

5% level

10% level

-3.725961

-3.596616

-2.933158

-2.604867

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 08/03/26 Time: 12:41
Sample (adjusted): 2015Q3 2025Q4
Included observations: 42 after adjustments

Variable

Coefficient

Std. Error

t-Statistic

Prob.

INF(-1)

-0.325126

0.087260

-3.725961

0.0006

D(INF(-1))

0.193730

0.138553

1.398237

0.1699

C

0.009349

0.003023

3.092423

0.0037

R-squared

0.267425

Mean dependent var

-0.001048

Adjusted R-squared

0.229857

S.D. dependent var

0.008878

S.E. of regression

0.007792

Akaike info criterion

-6.802808

Sum squared resid

0.002368

Schwarz criterion

-6.678689

Log likelihood

145.8590

Hannan-Quinn criter.

-6.757314

F-statistic

7.118431

Durbin-Watson stat

2.149720

Prob(F-statistic)

0.002315

Null Hypothesis: BIR has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

t-Statistic

Prob.*

Augmented Dickey-Fuller test statistic

Test critical values:

1% level

5% level

10% level

-2.937961

-3.596616

-2.933158

-2.604867

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(BIR)
Method: Least Squares
Date: 08/03/26 Time: 12:42
Sample (adjusted): 2015Q3 2025Q4
Included observations: 42 after adjustments

Variable

Coefficient

Std. Error

t-Statistic

Prob.

BIR(-1)

-0.148399

0.050511

-2.937961

0.0055

D(BIR(-1))

0.524042

0.126287

4.149617

0.0002

C

0.007379

0.002683

2.750637

0.0090

R-squared

0.381829

Mean dependent var

-0.000643

Adjusted R-squared

0.350127

S.D. dependent var

0.004509

S.E. of regression

0.003635

Akaike info criterion

-8.327630

Sum squared resid

0.000515

Schwarz criterion

-8.203511

Log likelihood

177.8802

Hannan-Quinn criter.

-8.282136

F-statistic

12.04465

Durbin-Watson stat

2.091431

Prob(F-statistic)

0.000084

Null Hypothesis: FXR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

t-Statistic

Prob.*

Augmented Dickey-Fuller test statistic

Test critical values:

1% level

5% level

10% level

-9.546221

-3.592462

-2.931404

-2.603944

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FXR)
Method: Least Squares
Date: 08/03/26 Time: 12:42
Sample (adjusted): 2015Q2 2025Q4
Included observations: 43 after adjustments

Variable

Coefficient

Std. Error

t-Statistic

Prob.

FXR(-1)

-1.358755

0.142334

-9.546221

0.0000

C

0.007285

0.004834

1.507102

0.1395

R-squared

0.689700

Mean dependent var

-0.000930

Adjusted R-squared

0.682132

S.D. dependent var

0.055326

S.E. of regression

0.031193

Akaike info criterion

-4.051854

Sum squared resid

0.039893

Schwarz criterion

-3.969938

Log likelihood

89.11487

Hannan-Quinn criter.

-4.021646

F-statistic

91.13033

Durbin-Watson stat

2.052989

Prob(F-statistic)

0.000000

Null Hypothesis: OIL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

t-Statistic

Prob.*

Augmented Dickey-Fuller test statistic

Test critical values:

1% level

5% level

10% level

-9.289693

-3.592462

-2.931404

-2.603944

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(OIL)
Method: Least Squares
Date: 08/03/26 Time: 12:43
Sample (adjusted): 2015Q2 2025Q4
Included observations: 43 after adjustments

Variable

Coefficient

Std. Error

t-Statistic

Prob.

OIL(-1)

-1.357511

0.146131

-9.289693

0.0000

C

0.071299

0.050182

1.420798

0.1629

R-squared

0.677922

Mean dependent var

-0.001628

Adjusted R-squared

0.670067

S.D. dependent var

0.565837

S.E. of regression

0.325016

Akaike info criterion

0.635508

Sum squared resid

4.331042

Schwarz criterion

0.717425

Log likelihood

-11.66343

Hannan-Quinn criter.

0.665716

F-statistic

86.29839

Durbin-Watson stat

2.008576

Prob(F-statistic)

0.000000

Null Hypothesis: MRT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

t-Statistic

Prob.*

Augmented Dickey-Fuller test statistic

Test critical values:

1% level

5% level

10% level

-6.668183

-3.592462

-2.931404

-2.603944

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MRT)
Method: Least Squares
Date: 08/03/26 Time: 12:43
Sample (adjusted): 2015Q2 2025Q4
Included observations: 43 after adjustments

Variable

Coefficient

Std. Error

t-Statistic

Prob.

MRT(-1)

-1.042478

0.156336

-6.668183

0.0000

C

0.014051

0.012464

1.127395

0.2661

R-squared

0.520270

Mean dependent var

0.000233

Adjusted R-squared

0.508569

S.D. dependent var

0.114964

S.E. of regression

0.080592

Akaike info criterion

-2.153442

Sum squared resid

0.266297

Schwarz criterion

-2.071526

Log likelihood

48.29900

Hannan-Quinn criter.

-2.123234

F-statistic

44.46467

Durbin-Watson stat

1.891004

Prob(F-statistic)

0.000000

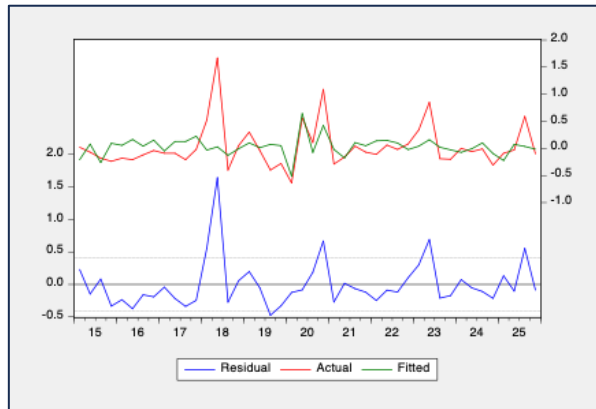
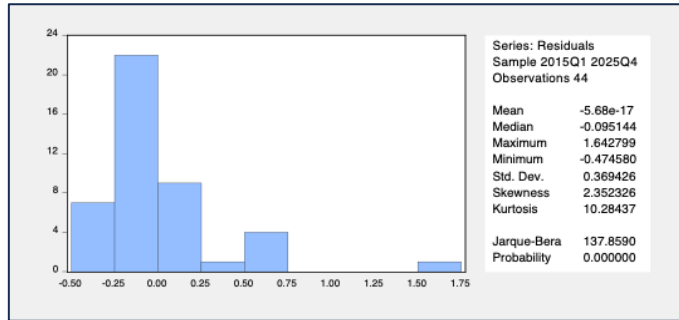
4. Model 2 - Regression Test #3 (Regression Test#2 failed the stationary test):

a. Initial Data

Year	DER	CR	TATO	ECO	INF	BIR	FXR	OIL	MRT	ISR
2015Q1	0,08	0,01	-0,76	0,008	0,064	0,075	0,05	-0,03	0,06	0,02
2015Q2	0,02	-0,07	0,90	-0,014	0,073	0,075	0,02	0,18	-0,11	-0,07
2015Q3	0,10	0,00	0,34	0,013	0,068	0,075	0,08	-0,24	-0,14	-0,18
2015Q4	-0,10	-0,04	0,41	0,031	0,034	0,075	-0,04	-0,23	0,09	-0,24
2016Q1	0,12	0,09	-0,78	-0,008	0,045	0,068	-0,05	0,06	0,05	-0,18
2016Q2	-0,03	-0,04	0,99	0,026	0,035	0,053	0,01	0,25	0,04	-0,21
2016Q3	0,11	-0,13	0,37	-0,002	0,031	0,050	-0,02	-0,01	0,07	-0,12
2016Q4	-0,14	0,09	0,35	-0,016	0,030	0,048	0,02	0,16	-0,01	-0,04
2017Q1	0,12	0,01	-0,77	0,016	0,036	0,048	-0,01	-0,07	0,05	-0,09
2017Q2	0,06	0,00	1,01	-0,014	0,044	0,048	0,00	-0,09	0,05	-0,09
2017Q3	0,00	0,00	0,00	0,010	0,037	0,043	0,00	0,20	0,01	-0,21
2017Q4	-0,27	-0,15	0,74	0,014	0,036	0,043	0,02	0,16	0,08	-0,02
2018Q1	0,08	0,08	-0,74	0,000	0,034	0,043	0,01	0,03	-0,03	0,52
2018Q2	0,06	-0,07	0,90	0,012	0,031	0,053	0,02	0,12	-0,06	1,67
2018Q3	0,05	-0,01	0,42	0,000	0,029	0,058	0,06	0,07	0,03	-0,40
2018Q4	0,04	-0,05	0,31	0,000	0,031	0,060	-0,03	-0,39	0,04	0,05
2019Q1	0,00	0,17	-0,74	-0,004	0,025	0,060	-0,02	0,34	0,04	0,30
2019Q2	0,12	-0,07	0,99	-0,008	0,033	0,060	0,00	-0,01	-0,02	-0,04
2019Q3	0,04	0,04	0,51	-0,023	0,034	0,053	-0,01	-0,10	-0,03	-0,40
2019Q4	0,06	-0,08	0,23	-0,046	0,027	0,050	-0,01	0,11	0,02	-0,28
2020Q1	0,10	-0,08	-0,77	-0,404	0,030	0,045	0,08	-0,78	-0,28	-0,64
2020Q2	-0,01	0,11	0,71	-2,874	0,020	0,043	-0,07	1,80	0,08	0,56
2020Q3	-0,01	-0,02	0,49	-0,363	0,014	0,040	0,05	-0,03	-0,01	0,11
2020Q4	-0,30	-0,03	0,30	-0,326	0,017	0,038	-0,05	0,27	0,23	1,09
2021Q1	0,00	0,05	-0,70	-0,712	0,014	0,035	0,02	0,24	0,00	-0,29
2021Q2	0,00	-0,04	1,05	-11,848	0,013	0,035	-0,01	0,21	0,00	-0,16
2021Q3	0,03	0,00	0,46	-0,436	0,016	0,035	-0,01	0,01	0,05	0,04
2021Q4	0,02	-0,06	0,34	0,121	0,019	0,035	0,01	-0,01	0,05	-0,07
2022Q1	-0,01	0,05	-0,67	0,033	0,026	0,035	0,00	0,39	0,07	-0,11
2022Q2	0,01	-0,09	0,81	0,147	0,044	0,035	0,02	0,12	-0,02	0,06
2022Q3	0,00	0,04	0,55	0,179	0,060	0,043	0,02	-0,26	0,02	-0,02
2022Q4	0,02	0,05	0,28	-0,234	0,055	0,055	0,04	-0,07	-0,03	0,08
2023Q1	0,00	0,01	-0,72	0,008	0,050	0,058	-0,02	-0,04	-0,01	0,34
2023Q2	0,01	0,07	0,95	0,031	0,035	0,058	-0,02	-0,06	-0,02	0,85
2023Q3	0,04	0,06	0,49	0,022	0,023	0,058	0,03	0,29	0,04	-0,19
2023Q4	-0,04	0,01	0,28	-0,008	0,026	0,060	0,01	-0,19	0,05	-0,20
2024Q1	0,01	0,00	-0,75	0,010	0,031	0,060	0,01	0,11	0,00	0,00
2024Q2	0,02	0,18	0,93	-0,033	0,025	0,063	0,04	0,01	-0,03	-0,06
2024Q3	0,08	0,00	0,45	0,002	0,018	0,060	-0,06	-0,17	0,07	-0,01
2024Q4	-0,05	-0,03	0,36	-0,004	0,016	0,060	0,04	0,03	-0,06	-0,31
2025Q1	0,01	-0,09	-0,75	-0,008	0,010	0,058	0,03	0,04	-0,08	-0,09
2025Q2	0,04	0,04	0,92	0,034	0,019	0,055	-0,01	-0,12	0,06	-0,03
2025Q3	0,06	-0,03	0,50	0,002	0,027	0,048	0,01	0,01	0,16	0,59
2025Q4	0,08	0,01	0,23	0,025	0,029	0,048	0,01	-0,10	0,07	-0,10

b. Normality Test (Jarque-Bera): Failed

Dependent Variable: ISR Method: Least Squares Date: 08/05/26 Time: 21:45 Sample: 2015Q1 2025Q4 Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.149513	0.332863	0.449174	0.6562
DER	-0.490594	0.834069	-0.588194	0.5603
CR	0.288132	0.992340	0.290356	0.7733
TATO	0.090290	0.108541	0.831855	0.4113
ECO	0.032387	0.039016	0.830087	0.4123
INF	2.556703	5.077076	0.503578	0.6178
BIR	-3.781509	6.620191	-0.571208	0.5716
FXR	-2.681809	2.551815	-1.050942	0.3007
OIL	0.223028	0.225924	0.987184	0.3305
MRT	0.105365	1.121586	0.093943	0.9257
R-squared	0.184600	Mean dependent var		0.032500
Adjusted R-squared	-0.031241	S.D. dependent var		0.409112
S.E. of regression	0.415453	Akaike info criterion		1.277824
Sum squared resid	5.868452	Schwarz criterion		1.683321
Log likelihood	-18.11212	Hannan-Quinn criter.		1.428202
F-statistic	0.855261	Durbin-Watson stat		1.691290
Prob(F-statistic)	0.572514			



c. Multicollinearity Test (VIF): Passed

Variance Inflation Factors
Date: 08/05/26 Time: 21:47
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.110798	28.24478	NA
DER	0.695671	1.309511	1.273154
CR	0.984738	1.223780	1.223767
TATO	0.011781	1.310109	1.141677
ECO	0.001522	1.321784	1.266276
INF	25.77670	8.193215	1.406981
BIR	43.82693	31.93650	1.461493
FXR	6.511760	1.875038	1.812531
OIL	0.051042	1.502519	1.469693
MRT	1.257956	2.027579	1.959733

d. Heteroscedasticity Test (Glejser): Passed

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	0.303615	Prob. F(9,34)	0.9685
Obs*R-squared	3.273159	Prob. Chi-Square(9)	0.9525
Scaled explained SS	3.721150	Prob. Chi-Square(9)	0.9288

Test Equation:
Dependent Variable: ARESID
Method: Least Squares
Date: 08/05/26 Time: 21:47
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.320998	0.234154	1.370882	0.1794
DER	-0.316128	0.586730	-0.538796	0.5935
CR	-0.294448	0.698067	-0.421805	0.6758
TATO	0.051869	0.076354	0.679322	0.5015
ECO	0.034541	0.027446	1.258482	0.2168
INF	-0.513554	3.571497	-0.143792	0.8865
BIR	-0.824332	4.657010	-0.177009	0.8606
FXR	-0.865930	1.795088	-0.482389	0.6326
OIL	0.053650	0.158927	0.337577	0.7378
MRT	-0.305602	0.788986	-0.387335	0.7009

R-squared	0.074390	Mean dependent var	0.249138
Adjusted R-squared	-0.170624	S.D. dependent var	0.270116
S.E. of regression	0.292253	Akaike info criterion	0.574322
Sum squared resid	2.904001	Schwarz criterion	0.979820
Log likelihood	-2.635089	Hannan-Quinn criter.	0.724700
F-statistic	0.303615	Durbin-Watson stat	1.587975
Prob(F-statistic)	0.968480		

e. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM): Passed

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 1 lag				
F-statistic	0.997506	Prob. F(1,33)	0.3252	
Obs*R-squared	1.290985	Prob. Chi-Square(1)	0.2559	
Test Equation: Dependent Variable: RESID Method: Least Squares Date: 08/05/26 Time: 21:48 Sample: 2015Q1 2025Q4 Included observations: 44 Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.048791	0.336441	0.145022	0.8856
DER	-0.114656	0.841963	-0.136177	0.8925
CR	-0.168280	1.006578	-0.167180	0.8682
TATO	-0.022697	0.110898	-0.204669	0.8391
ECO	-0.004202	0.039244	-0.107078	0.9154
INF	1.149117	5.205993	0.220730	0.8267
BIR	-1.316641	6.750409	-0.195046	0.8466
FXR	-1.030249	2.752509	-0.374294	0.7106
OIL	-0.029600	0.227868	-0.129899	0.8974
MRT	-0.284601	1.157259	-0.245927	0.8073
RESID(-1)	0.196604	0.196850	0.998752	0.3252
R-squared	0.029341	Mean dependent var	-5.68E-17	
Adjusted R-squared	-0.264799	S.D. dependent var	0.369426	
S.E. of regression	0.415469	Akaike info criterion	1.293499	
Sum squared resid	5.696268	Schwarz criterion	1.739546	
Log likelihood	-17.45697	Hannan-Quinn criter.	1.458915	
F-statistic	0.099751	Durbin-Watson stat	1.956136	
Prob(F-statistic)	0.999736			

5. Augmented Dickey-Fuller Test (ADF):

9/9 variables passed (Stationary Data)

Null Hypothesis: DER has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-7.534500	0.0000	
Test critical values:		1% level	-3.592462	
		5% level	-2.931404	
		10% level	-2.603944	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(DER)				
Method: Least Squares				
Date: 08/05/26 Time: 12:46				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DER(-1)	-1.161286	0.154129	-7.534500	0.0000
C	0.014854	0.013265	1.119768	0.2693
R-squared	0.580643	Mean dependent var	2.74E-18	
Adjusted R-squared	0.570415	S.D. dependent var	0.131240	
S.E. of regression	0.086018	Akaike info criterion	-2.023125	
Sum squared resid	0.303363	Schwarz criterion	-1.941209	
Log likelihood	45.49719	Hannan-Quinn criter.	-1.992917	
F-statistic	56.76870	Durbin-Watson stat	1.965383	
Prob(F-statistic)	0.000000			

Null Hypothesis: CR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-8.953972	0.0000	
Test critical values:		1% level	-3.592462	
		5% level	-2.931404	
		10% level	-2.603944	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(CR)				
Method: Least Squares				
Date: 08/05/26 Time: 12:47				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR(-1)	-1.323285	0.147787	-8.953972	0.0000
C	-0.000615	0.010436	-0.058979	0.9533
R-squared	0.661643	Mean dependent var	6.45E-19	
Adjusted R-squared	0.653390	S.D. dependent var	0.116230	
S.E. of regression	0.068429	Akaike info criterion	-2.480643	
Sum squared resid	0.191984	Schwarz criterion	-2.398727	
Log likelihood	55.33382	Hannan-Quinn criter.	-2.450435	
F-statistic	80.17362	Durbin-Watson stat	2.009628	
Prob(F-statistic)	0.000000			

Null Hypothesis: TATO has a unit root				
Exogenous: Constant				
Lag Length: 2 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-35.94541	0.0001	
Test critical values:	1% level	-3.600987		
	5% level	-2.935001		
	10% level	-2.605836		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(TATO)				
Method: Least Squares				
Date: 08/05/26 Time: 12:48				
Sample (adjusted): 2015Q4 2025Q4				
Included observations: 41 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TATO(-1)	-3.928038	0.109278	-35.94541	0.0000
D(TATO(-1))	1.950305	0.080131	24.33904	0.0000
D(TATO(-2))	0.966862	0.042622	22.68431	0.0000
C	0.939575	0.034006	27.62994	0.0000
R-squared	0.983687	Mean dependent var	-0.002683	
Adjusted R-squared	0.982364	S.D. dependent var	1.048132	
S.E. of regression	0.139191	Akaike info criterion	-1.013471	
Sum squared resid	0.716843	Schwarz criterion	-0.846293	
Log likelihood	24.77616	Hannan-Quinn criter.	-0.952594	
F-statistic	743.7123	Durbin-Watson stat	1.445009	
Prob(F-statistic)	0.000000			

Null Hypothesis: ECO has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-5.985062	0.0000	
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(ECO)				
Method: Least Squares				
Date: 08/05/26 Time: 12:48				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECO(-1)	-0.932631	0.155826	-5.985062	0.0000
C	-0.361075	0.290911	-1.241186	0.2216
R-squared	0.466292	Mean dependent var	0.000395	
Adjusted R-squared	0.453274	S.D. dependent var	2.523731	
S.E. of regression	1.866070	Akaike info criterion	4.130941	
Sum squared resid	142.7709	Schwarz criterion	4.212857	
Log likelihood	-86.81524	Hannan-Quinn criter.	4.161149	
F-statistic	35.82096	Durbin-Watson stat	1.997161	
Prob(F-statistic)	0.000000			

Null Hypothesis: INF has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-3.725961	0.0071	
Test critical values:	1% level	-3.596616		
	5% level	-2.933158		
	10% level	-2.604867		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(INF)				
Method: Least Squares				
Date: 08/05/26 Time: 12:49				
Sample (adjusted): 2015Q3 2025Q4				
Included observations: 42 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.325126	0.087260	-3.725961	0.0006
D(INF(-1))	0.193730	0.138553	1.398237	0.1699
C	0.009349	0.003023	3.092423	0.0037
R-squared	0.267425	Mean dependent var	-0.001048	
Adjusted R-squared	0.229857	S.D. dependent var	0.008878	
S.E. of regression	0.007792	Akaike info criterion	-6.802808	
Sum squared resid	0.002368	Schwarz criterion	-6.678689	
Log likelihood	145.8590	Hannan-Quinn criter.	-6.757314	
F-statistic	7.118431	Durbin-Watson stat	2.149720	
Prob(F-statistic)	0.002315			

Null Hypothesis: BIR has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-2.937961	0.0495	
Test critical values:	1% level	-3.596616		
	5% level	-2.933158		
	10% level	-2.604867		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(BIR)				
Method: Least Squares				
Date: 08/05/26 Time: 13:00				
Sample (adjusted): 2015Q3 2025Q4				
Included observations: 42 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BIR(-1)	-0.148399	0.050511	-2.937961	0.0055
D(BIR(-1))	0.524042	0.126287	4.149617	0.0002
C	0.007379	0.002683	2.750637	0.0090
R-squared	0.381829	Mean dependent var	-0.000643	
Adjusted R-squared	0.350127	S.D. dependent var	0.004509	
S.E. of regression	0.003635	Akaike info criterion	-8.327630	
Sum squared resid	0.000515	Schwarz criterion	-8.203511	
Log likelihood	177.8802	Hannan-Quinn criter.	-8.282136	
F-statistic	12.04465	Durbin-Watson stat	2.091431	
Prob(F-statistic)	0.000084			

Null Hypothesis: FXR has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-9.546221	0.0000	
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(FXR)				
Method: Least Squares				
Date: 08/05/26 Time: 13:01				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FXR(-1)	-1.358755	0.142334	-9.546221	0.0000
C	0.007285	0.004834	1.507102	0.1395
R-squared	0.689700	Mean dependent var	-0.000930	
Adjusted R-squared	0.682132	S.D. dependent var	0.055326	
S.E. of regression	0.031193	Akaike info criterion	-4.051854	
Sum squared resid	0.039893	Schwarz criterion	-3.969938	
Log likelihood	89.11487	Hannan-Quinn criter.	-4.021646	
F-statistic	91.13033	Durbin-Watson stat	2.052989	
Prob(F-statistic)	0.000000			

Null Hypothesis: OIL has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-9.289693	0.0000	
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(OIL)				
Method: Least Squares				
Date: 08/05/26 Time: 13:01				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
OIL(-1)	-1.357511	0.146131	-9.289693	0.0000
C	0.071299	0.050182	1.420798	0.1629
R-squared	0.677922	Mean dependent var	-0.001628	
Adjusted R-squared	0.670067	S.D. dependent var	0.565837	
S.E. of regression	0.325016	Akaike info criterion	0.635508	
Sum squared resid	4.331042	Schwarz criterion	0.717425	
Log likelihood	-11.66343	Hannan-Quinn criter.	0.665716	
F-statistic	86.29839	Durbin-Watson stat	2.008576	
Prob(F-statistic)	0.000000			

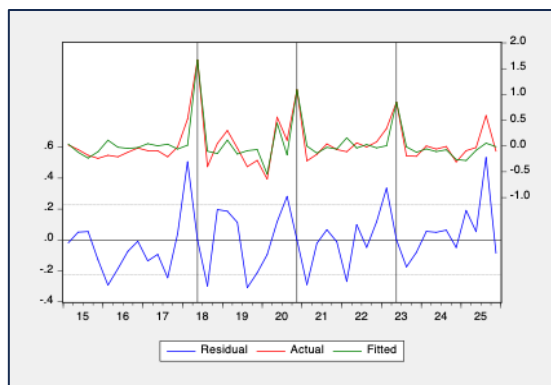
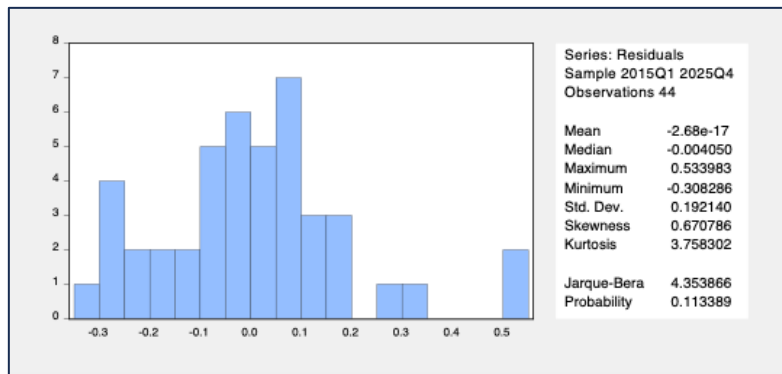
Null Hypothesis: MRT has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-6.668183	0.0000	
Test critical values:	1% level	-3.592462		
	5% level	-2.931404		
	10% level	-2.603944		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(MRT)				
Method: Least Squares				
Date: 08/05/26 Time: 13:02				
Sample (adjusted): 2015Q2 2025Q4				
Included observations: 43 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MRT(-1)	-1.042478	0.156336	-6.668183	0.0000
C	0.014051	0.012464	1.127395	0.2661
R-squared	0.520270	Mean dependent var	0.000233	
Adjusted R-squared	0.508569	S.D. dependent var	0.114964	
S.E. of regression	0.080592	Akaike info criterion	-2.153442	
Sum squared resid	0.266297	Schwarz criterion	-2.071526	
Log likelihood	48.29900	Hannan-Quinn criter.	-2.123234	
F-statistic	44.46467	Durbin-Watson stat	1.891004	
Prob(F-statistic)	0.000000			

6. Model 2 - Regression Test #4:

a. Normality Test (Jarque-Bera): Passed (3 impulse observation detected)

Dependent Variable: ISR
Method: Least Squares
Date: 08/05/26 Time: 21:49
Sample: 2015Q1 2025Q4
Included observations: 44
Indicator Saturation: IIS, 44 indicators searched over 2 blocks
3 IIS variables detected

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.022839	0.183066	-0.124757	0.9015
DER	0.138007	0.531490	0.259660	0.7968
CR	0.516846	0.561188	0.920987	0.3642
TATO	-0.027316	0.062720	-0.435528	0.6662
ECO	0.004768	0.021520	0.221549	0.8261
INF	3.804490	2.775372	1.370803	0.1803
BIR	-3.156499	3.614881	-0.873196	0.3893
FXR	-0.669847	1.441980	-0.464533	0.6455
OIL	0.210771	0.127017	1.659388	0.1071
MRT	0.956945	0.648220	1.476266	0.1500
@ISPERIOD(*2018Q2	1.840142	0.243241	7.565099	0.0000
@ISPERIOD(*2020Q4	0.924268	0.297743	3.104243	0.0041
@ISPERIOD(*2023Q2	0.929390	0.248738	3.736421	0.0008
R-squared	0.779427	Mean dependent var	0.032500	
Adjusted R-squared	0.694044	S.D. dependent var	0.409112	
S.E. of regression	0.226293	Akaike info criterion	0.106736	
Sum squared resid	1.587467	Schwarz criterion	0.633883	
Log likelihood	10.65180	Hannan-Quinn criter.	0.302228	
F-statistic	9.128603	Durbin-Watson stat	1.712160	
Prob(F-statistic)	0.000000			



b. Multicollenarity Test (VIF): Passed

Variance Inflation Factors
Date: 08/05/26 Time: 21:52
Sample: 2015Q1 2025Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.033513	28.79566	NA
DER	0.282482	1.792243	1.742483
CR	0.314932	1.319169	1.319155
TATO	0.003934	1.474476	1.284912
ECO	0.000463	1.355342	1.298425
INF	7.702692	8.252226	1.417114
BIR	13.06737	32.09489	1.468741
FXR	2.079307	2.018050	1.950776
OIL	0.016133	1.600752	1.565781
MRT	0.420189	2.282753	2.206368
@ISPERIOD(*2018Q2	0.059166	1.155394	1.129135
@ISPERIOD(*2020Q4	0.088651	1.731176	1.691831
@ISPERIOD(*2023Q2	0.061871	1.208207	1.180748

c. Heteroscedasticity Test (Glejser): Passed

Heteroskedasticity Test: Glejser				
Null hypothesis: Homoskedasticity				
F-statistic	1.120973	Prob. F(12,31)		0.3791
Obs*R-squared	13.31499	Prob. Chi-Square(12)		0.3466
Scaled explained SS	11.47787	Prob. Chi-Square(12)		0.4885
Test Equation:				
Dependent Variable: ARESID				
Method: Least Squares				
Date: 08/05/26 Time: 21:52				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.265721	0.101937	2.606716	0.0139
DER	0.348007	0.295950	1.175899	0.2486
CR	0.087734	0.312486	0.280762	0.7808
TATO	-0.060952	0.034925	-1.745248	0.0908
ECO	0.010071	0.011983	0.840446	0.4071
INF	-0.426369	1.545412	-0.275893	0.7845
BIR	-1.848476	2.012876	-0.918326	0.3655
FXR	0.117668	0.802939	0.146546	0.8844
OIL	0.024138	0.070727	0.341279	0.7352
MRT	0.323510	0.360949	0.896276	0.3770
@ISPERIOD("2018Q2	-0.100376	0.135444	-0.741092	0.4642
@ISPERIOD("2020Q4	-0.134668	0.165793	-0.812271	0.4228
@ISPERIOD("2023Q2	-0.085344	0.138505	-0.616178	0.5423
R-squared	0.302613	Mean dependent var		0.141556
Adjusted R-squared	0.032657	S.D. dependent var		0.128116
S.E. of regression	0.126007	Akaike info criterion		-1.064252
Sum squared resid	0.492210	Schwarz criterion		-0.537106
Log likelihood	36.41355	Hannan-Quinn criter.		-0.868761
F-statistic	1.120973	Durbin-Watson stat		1.905690
Prob(F-statistic)	0.379137			

d. Auto-correlation Test (Breusch-Godfrey Serial Correlation LM): Passed

Breusch-Godfrey Serial Correlation LM Test:				
Null hypothesis: No serial correlation at up to 1 lag				
F-statistic	1.269734	Prob. F(1,30)		0.2687
Obs*R-squared	1.786657	Prob. Chi-Square(1)		0.1813
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Date: 08/05/26 Time: 21:53				
Sample: 2015Q1 2025Q4				
Included observations: 44				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015603	0.182800	0.085356	0.9325
DER	-0.116681	0.539228	-0.216385	0.8302
CR	-0.269431	0.607772	-0.443309	0.6607
TATO	-0.005512	0.062640	-0.087997	0.9305
ECO	-0.005396	0.021956	-0.245771	0.8075
INF	0.459140	2.793255	0.164374	0.8705
BIR	-0.365251	3.613823	-0.101071	0.9202
FXR	-0.244133	1.452002	-0.168136	0.8676
OIL	0.016304	0.127293	0.128083	0.8989
MRT	-0.117537	0.653793	-0.179777	0.8585
@ISPERIOD("2018Q2	-0.166532	0.283720	-0.586958	0.5616
@ISPERIOD("2020Q4	-0.123224	0.315982	-0.389970	0.6993
@ISPERIOD("2023Q2	-0.087551	0.259565	-0.337301	0.7382
RESID(-1)	0.286919	0.254626	1.126825	0.2687
R-squared	0.040606	Mean dependent var		-2.68E-17
Adjusted R-squared	-0.375132	S.D. dependent var		0.192140
S.E. of regression	0.225315	Akaike info criterion		0.110738
Sum squared resid	1.523007	Schwarz criterion		0.678434
Log likelihood	11.56377	Hannan-Quinn criter.		0.321267
F-statistic	0.097672	Durbin-Watson stat		1.942724
Prob(F-statistic)	0.999963			