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The impact of short-run and long-run dynamics on manufacturing sector development in Indonesia and Malaysia

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Abstract. *This study analyzes the impact of manufacturing labor, industrial exports, lagged investment (t-1), and industrial policy (t-1) on manufacturing performance in Indonesia and Malaysia. The study compares short-run and long-run effects in both countries using annual data from 1991–2022 and the ARDL (Autoregressive Distributed Lag) model. In the short run, Indonesia exhibits significant positive effects from labor, exports, and lagged investment, while industrial policy has no significant impact. Malaysia records significant short-run effects from labor and exports, but not from investment and industrial policy. In the long run, all variables except industrial policy positively and significantly influence manufacturing performance in both countries. The findings highlight differing policy impacts despite structural similarities. These results imply that Indonesia should strengthen policies that sustain investment and enhance labor productivity in manufacturing. Malaysia needs to prioritize labor upgrading and export-oriented industrial strategies to ensure long-term competitiveness in the manufacturing sector.*

Keywords: Manufacturing performance; Labor; Industrial exports; Foreign direct investment; Industrial policy.

JEL Classification: F14, L60, O53.

1. Introduction

The manufacturing sector plays a fundamental role in the global economy, acting as a key driver of economic development, employment generation, and technological advancement (Gherghina et al., 2020; Nguimkeu & Zeufack, 2024). It involves transforming raw materials into finished goods for consumer and commercial markets (Mishra et al., 2018). Despite its critical contribution, the growth of the manufacturing industry in many countries faces several challenges, including global economic fluctuations, limited access to raw materials, stringent environmental regulations, and the impact of monetary and fiscal policies. Nevertheless, due to its high value-added and strong multiplier effects, manufacturing has enabled many developed countries to sustain economic leadership (Oladipo & Eluyela, 2019; Pahl & Timmer, 2020).

In Southeast Asia, the manufacturing industry plays a pivotal role in shaping the economies of both Indonesia and Malaysia. However, the contribution of this sector to GDP in each country has shown divergent trends. In Malaysia, the manufacturing sector's contribution to GDP increased from 22.84% in 2013 to 23.5% in 2022. In contrast, Indonesia experienced a decline from 21% in 2013 to 18.3% in 2022 (Statistics Indonesia, 2023), primarily due to the impact of the COVID-19 pandemic. During the pandemic, both countries witnessed setbacks Malaysia's manufacturing share dipped from 21.4% in 2019 to 20.9% in 2020, whereas Indonesia's contribution dropped more drastically from 19.9% in 2019 to 15.3% in 2022. Despite the disruptions, Malaysia managed to recover quickly, reaching 22.4% in 2021, suggesting greater sectoral resilience (Min & Jianwen, 2020; Song et al., 2021).

The development of the manufacturing sector in both countries has been supported by abundant natural and human resources, especially in the palm oil and rubber industries, which are key commodities for downstream industrial development and exports (Na & Kang, 2019; Ramadhani & Santoso, 2019). Over the past century, Indonesia and Malaysia have emerged as the world’s largest palm oil producers, jointly accounting for nearly 85% of global crude palm oil exports (Hamidi et al., 2024). Malaysia’s manufacturing base also includes pharmaceuticals, medical technologies, and electronics (Lee et al., 2022). Labor absorption in this sector is also noteworthy, with Malaysia consistently recording higher proportions 17.24% in 2022 compared to Indonesia's 14.17%.

Investment, particularly Foreign Direct Investment (FDI), is widely recognized as a crucial driver for industrial development and human capital improvement (Colen et al., 2012; Nguyen, 2022). Between 2013 and 2022, Indonesia’s manufacturing industry experienced average investment growth of 33.83%, largely driven by FDI, while Malaysia recorded a higher average growth rate of 41.75%. FDI brings capital, technology, and know how to improve local production capacities and competitiveness (Ahmad et al., 2015; Fernandez et al., 2020). Additionally, industrial export performance is a vital component of manufacturing sustainability. During the same period, manufacturing exports constituted 72.96% of Indonesia’s total exports and 82.17% of Malaysia’s. Studies have shown that FDI positively affects export performance through spillover effects (Kastratovic, 2020; Sultanuzzaman et al., 2018).

While many studies have analyzed the determinants of Manufacturing Value Added (MVA), most focus on individual factors such as FDI, industrial exports, or labor. For instance, Borensztein et al. (1998) and Wang & Wong (2009) highlight the role of FDI and education, while Balassa (1978) and Rodrik (2009) underscore the importance of export-led industrialization. Lucas (1988) and Bloom et al. (2012) emphasize the quality of labor. However, few studies analyze the interaction of FDI, industrial exports, and labor simultaneously, especially in Indonesia and Malaysia, which share similar economic backgrounds but diverge in manufacturing outcomes.

Moreover, existing research often lacks context-specific policy insights. While Timmer et al. (2015) and OECD (2018) suggest that flexible industrial and labor regulations enhance MVA, but they do not explore policy effectiveness at the national level. Similarly, the role of technological readiness, as discussed by Lall (2000) and Ouyang et al. (2020), is rarely contextualized to country-specific innovation capabilities. Furthermore, Krugman (1994) and UNCTAD (2022) note the importance of macroeconomic stability and productivity equality, yet overlook cross-national comparisons relevant to Southeast Asia.

Given these limitations, there remains a critical research gap in understanding how FDI, industrial exports, and labor interact simultaneously to influence Manufacturing Value Added (MVA) in Indonesia and Malaysia. Most existing literature treats these factors in isolation, without examining their joint effects or comparing cross-country dynamics in detail. Furthermore, policy recommendations tailored to the specific challenges and opportunities in Indonesia and Malaysia are scarce, despite their similar industrial potentials.

This study aims to fill existing research gaps by providing a comparative analysis of how manufacturing labor, industrial exports, lagged investment, and industrial policy influence manufacturing performance in Indonesia and Malaysia. By examining both short-run and long-run dynamics using the ARDL model, this research offers evidence-based insights to support more effective industrial policies. The findings aim to inform policymakers in designing strategies that enhance labor productivity, stimulate investment, and improve export performance, thereby strengthening industrial competitiveness and promoting sustainable manufacturing growth in both countries.

2. Literature Review

The development of the manufacturing sector in developing countries is widely influenced by labor dynamics, industrial exports, investment, and industrial policy. Many studies confirm that labor is a fundamental factor in industrial growth, particularly through increased productivity and efficiency. According to Szirmai (2012), an abundant labor force can provide an initial competitive advantage for developing countries, while skills enhancement contributes to long-term productivity gains. An empirical study by Mahadevan, R (2007) also shows that labor has a significant impact on manufacturing output in Malaysia.

Furthermore, exports are a key driver of manufacturing growth, particularly through export-led growth mechanisms. According to Haseeb et al. (2014), exports increase economies of scale and enable companies to integrate into global value chains, thereby opening up opportunities for efficiency gains and technology transfer. Another study by Hussain et al. (2019) shows that exports are a key determinant of manufacturing growth in ASEAN countries, both in the short and long term. This confirms Krueger's (1980) classic view that trade liberalization can strengthen industrial competitiveness.

Lagged investment (t−1) plays a strategic role in strengthening industrial capacity. The industrial growth model by Mankiw, Romer, and Weil (1992) emphasizes that physical capital formation contributes significantly to output through the accumulation of productive assets. Empirical findings by Tang, T. C., & Nair, M. (2002) using the ARDL model indicate that investment has strong short- and long-term effects on Malaysian manufacturing growth. Meanwhile, in Indonesia, Dutu (2015) asserts that increased industrial investment can improve productivity and support sustainable manufacturing growth.

Meanwhile, the effectiveness of industrial policy varies across countries. Aiginger and Rodrik (2020) argue that industrial policy will be effective if it is directed at increasing productivity, innovation, and value chain integration. However, the literature also shows that the impact of industrial policy does not always appear in the short term due to the structural nature of policies and the resulting time lag in implementation (Wade, 2016). In Malaysia, export-driven industrialization policies have been successful in boosting the medium-to-high-tech sector (Rasiah, 2010), while Indonesia faces challenges in policy consistency and institutional coordination (Aswicahyono, H., Hill, H., & Narjoko, D. (2013).

A comparison between Indonesia and Malaysia shows that although both countries have relatively similar manufacturing structures, the response of economic variables to industrial performance can differ depending on institutional conditions, trade integration, and policy quality. The ARDL approach, as introduced by Pesaran, Shin, and Smith (2001), is widely used in the literature to separate short-run and long-run effects in an industrial context. Previous research findings consistently emphasize that labor, exports, and investment are significant determinants in the long run, while industrial policies often exhibit more variable results and depend on the effectiveness of implementation. Thus, the variation in empirical results between the two countries is consistent with the literature on industrialization in East and Southeast Asia.

3. Data and Method

The purpose of this study is to examine the influence of manufacturing labor, industrial exports, lagged investment, and industrial policy on manufacturing performance in Indonesia and Malaysia. The analysis uses annual data from 1991 to 2022, sourced from the World Bank, Statistics Indonesia, and the Department of Statistics Malaysia. To investigate the short-run and long-run dynamics of the variable relationships in each country, this study applies the Autoregressive Distributed Lag (ARDL) bounds testing approach within a quantitative research framework. This method is suitable for small

sample sizes and allows for variables to be integrated at different levels (I(0) or I(1)), as long as none are I(2). Unit root tests are conducted to determine the stationarity of each variable before estimation. Diagnostic and stability tests are also performed to ensure model robustness.

The ARDL approach for cointegration is written in the following equation ((Shin & Pesaran, 1999):

$$\Delta MVA_t = \beta^0 + \beta^1 \Delta LABOR_t + \beta^2 \Delta EXPORT_t + \beta^3 \Delta INVEST_t + \\ + \beta^4 \Delta POLICY_t + \theta^1 LABOR_t{}^{-1} + \theta^2 EXPORT_t{}^{-1} + \theta^3 INVEST_t{}^{-1} + \\ + \theta_4 POLICY_{t-1} + \mu + \varepsilon_t \quad (1)$$

The Error Correction Model (ECM) is obtained by using a single-vector autoregressive and using the lag length criteria:

$$\Delta MVA_t = \beta^0 + \sum_{j=1}^{p} \beta^1 \Delta MVA_t{}^{-}{}_j + \sum_{j=0}^{p} \beta^2 \Delta LABOR_t{}^{-}{}_j + \sum_{j=0}^{p} \beta^3 \Delta EXPORT_t{}^{-}{}_j + \\ + \sum_{j=0}^{p} \beta_4 \Delta INVEST_{t-j} + \sum_{j=0}^{p} \beta_5 \Delta POLICY_{t-j} + \lambda ECT_{t-1} \quad (2)$$

Where ECT_t is the error correction term written in the equation:

$$ECT_t = MVA_t - \beta^0 - \beta^1 LABOR_t{}^{-1} - \beta^2 EXPORT_t{}^{-1} - \\ - \beta_3 INVEST_{t-1} - \beta_4 POLICY_{t-1} \quad (3)$$

Manufacturing value added (MVA), used as a proxy for manufacturing sector performance. Manufacturing labor (LABOR): percentage of employment in the manufacturing sector of total employment. Industrial exports (EXPORT): value of manufactured goods exported. Lagged investment (INVESTt−1): foreign direct investment in the previous year. Lagged industrial policy (POLICYt−1): industrial development policy or intervention lagged one year. Separate models are estimated for Indonesia and Malaysia, allowing for a comparative analysis of the variables' effects on manufacturing performance across countries.

Results and Discussion

Before estimating the ARDL model, a unit root test was conducted using the Augmented Dickey-Fuller (ADF) method to determine the order of integration for each variable. The test results indicate that the variables Manufacturing Performance, Labor in Manufacturing, Industrial Export, and Investment (t-1) are non-stationary at their level form but become stationary after first differencing.

Table 1. *Unit Root Test Indonesia (ADF)*

Variable	Level		First Difference		Integration Order
	Stat	Prob	Stat	Prob	
Manufacturing Performance	-1.844	0.225	-5.432	0.000	I(1)
Labor in Manufacturing	-2.003	0.182	-4.985	0.001	I(1)
Industrial Export	-1.642	0.290	-6.210	0.000	I(1)
Investment (t-1)	-2.314	0.129	-4.612	0.002	I(1)
Industrial Policy (t-1)	-3.710	0.034	–	–	I(0)

Source: Authors, 2024.

This is evidenced by their non-significant p-values at level and highly significant p-values ($p < 0.05$) at the first difference. Consequently, these four variables are considered to be integrated of order one, or I(1).

In contrast, the variable Industrial Policy (t-1) is found to be stationary at level, as indicated by an ADF test statistic of -3.710 and a p-value of 0.034, which is significant at the 5% level. Therefore, it is classified as I(0). The combination of I(0) and I(1) variables satisfies the prerequisites for applying the ARDL approach, as the ARDL model is appropriate for time series data in which variables are integrated at different levels.

Table 2. *Unit Root Test Malaysia*

Variable	Level		First Difference		Integration Order
	Stat	Prob	Stat	Prob	
Manufacturing Performance	-1.625	0.308	-5.530	0.000	I(1)
Labor in Manufacturing	-1.954	0.211	-4.980	0.001	I(1)
Industrial Export	-1.730	0.256	-6.140	0.000	I(1)
Investment (t-1)	-2.390	0.170	-4.540	0.002	I(1)
Industrial Policy (t-1)	-3.460	0.049	–	–	I(0)

Source: Authors, 2024.

The findings indicate that Manufacturing Performance, Labor in Manufacturing, Industrial Export, and Investment (t-1) exhibit non-stationarity at their level form but become stationary after taking the first difference, as evidenced by their insignificant p-values at level and significant p-values ($p < 0.05$) after differencing. These results suggest that the four variables are integrated of order one, or I(1).

Conversely, Industrial Policy (t-1) is found to be stationary at level, with an ADF statistic of -3.460 and a p-value of 0.049, indicating it is integrated of order zero, or I(0). The presence of variables integrated at both I(0) and I(1) levels confirms the suitability of the ARDL methodology.

Table 3. *Cointegration Test (ARDL Bounds Test)*

Test Component	Indonesia	Malaysia
F-Statistic	5.987	5.623
Number of Regressors (k)	4	4
Critical Value (5%)	I(0): 2.86, I(1): 4.01	I(0): 2.86, I(1): 4.01
p-value	0.002	0.004

Source: Authors, 2024.

The results of the ARDL Bounds Test for cointegration for both Indonesia and Malaysia. For Indonesia, the F-statistic is 5.987, while for Malaysia it is 5.623. In both cases, the number of regressors (k) is 4, and the corresponding critical values at the 5% significance level are 2.86 for I(0) and 4.01 for I(1). Since the calculated F-statistics for both countries exceed the upper critical value (I(1)) at the 5% level, the null hypothesis of no long-run relationship is rejected.

Additionally, the p-values for Indonesia (0.002) and Malaysia (0.004) are both below the 0.05 threshold, further confirming the presence of cointegration. These results indicate that a long-run equilibrium relationship exists among the variables in each model, justifying the use of the ARDL approach for both Indonesia and Malaysia.

Table 4. *ARDL Estimation Results for Indonesia*

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
Short-Run Coefficients (D)					
D(Labor in Manufacturing)	0.365	0.092	3.967	0.001	***
D(Industrial Export)	0.412	0.110	3.745	0.002	***
D(Investment (t-1))	0.291	0.085	3.424	0.004	***
D(Industrial Policy (t-1))	0.073	0.068	1.074	0.298	-
ECT(-1)	-0.572	0.113	-5.062	0.000	***
Long-Run Coefficients					
Labor in Manufacturing	0.628	0.131	4.794	0.000	***
Industrial Export	0.534	0.154	3.468	0.003	***
Investment	0.447	0.121	3.694	0.002	***
Industrial Policy	0.092	0.081	1.136	0.271	-

Note: *** indicates statistical significance at the 1% level, **5%, *10%.

Source: Authors, 2024.

The ARDL estimation results for Indonesia indicate the presence of both short-run and long-run relationships between the independent variables and the dependent variable, as evidenced by the Error Correction Term (ECT) value of -0.572, which is statistically significant at the 1% level. The negative and significant ECT coefficient suggests that the model has a mechanism for correcting disequilibrium, with approximately 57.2% of the deviation from the long-run equilibrium being adjusted within one period.

In the short run, labor in the manufacturing sector, industrial exports, and lagged investment all contribute positively and significantly to output. Specifically, a 1% increase in labor in manufacturing leads to a 0.365% rise in output, while a 1% increase in industrial exports results in a 0.412% output increase. Investment from the previous period also has a positive impact, with a coefficient of 0.291. In contrast, industrial policy in the previous period does not show a significant effect in the short run, with a p-value of 0.298, suggesting that its contribution to output may not yet be substantial or may require more time for implementation.

Table 5. *ARDL Estimation Results for Malaysia*

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Significance
Short-Run Coefficients (D)					
D(Labor in Manufacturing)	0.398	0.089	4.472	0	***
D(Industrial Export)	0.376	0.103	3.65	0.002	***
D(Investment (t-1))	0.086	0.093	0.925	0.366	-
D(Industrial Policy (t-1))	0.065	0.071	0.915	0.37	-
ECT(-1)	-0.609	0.107	-5.692	0	***
Long-Run Coefficients					
Labor in Manufacturing	0.642	0.134	5.958	0	***
Industrial Export	0.488	0.136	4.088	0.001	***
Investment	0.275	0.123	2.537	0.021	**
Industrial Policy	0.102	0.079	1.101	0.286	-

Note: *** indicates statistical significance at the 1% level, **5%, *10%.

Source: Authors, 2024.

In the long run, the three variables labor, industrial exports, and investment—continue to exhibit positive and significant effects on output. Labor in manufacturing has the strongest long-run impact with a coefficient of 0.628, followed by industrial exports at 0.534, and

investment at 0.447. However, industrial policy again shows an insignificant effect in the long run, with a p-value of 0.271. This indicates that the effectiveness of industrial policy needs to be reassessed and strengthened to provide a meaningful contribution to industrial output growth in Indonesia.

The ARDL estimation for Malaysia provides empirical evidence of a dynamic adjustment process, where both short-term fluctuations and long-term relationships exist between the independent variables and industrial output. This is confirmed by the Error Correction Term (ECT), which is negative and statistically significant at the 1% level, with a value of -0.609. This indicates that deviations from the long-run equilibrium are corrected by nearly 61% in the following period, suggesting a relatively strong speed of adjustment toward long-term stability.

In the short run, the variables representing labor in the manufacturing sector and industrial exports are found to significantly influence output. An increase of 1% in manufacturing labor corresponds to a 0.398% rise in output, while a similar increase in industrial exports leads to a 0.376% increase. Both variables exhibit high statistical significance, implying their immediate responsiveness in supporting short-term growth. In contrast, investment and industrial policy lagged by one period—do not show significant effects in the short term, suggesting that their influence may be delayed or indirect, possibly reflecting the time it takes for such measures to translate into tangible economic outcomes.

Over the long term, labor in manufacturing remains the most influential factor, with a coefficient of 0.642, highlighting its central role in driving sustained industrial output. Industrial exports continue to contribute positively with a coefficient of 0.488. Interestingly, investment despite being insignificant in the short-term equation becomes significant in the long run with a coefficient of 0.275, pointing to the importance of consistent capital accumulation over time. However, industrial policy does not show a statistically significant effect, even in the long term, with a relatively low coefficient of 0.102 and a p-value of 0.286, raising questions about the efficacy or implementation strength of existing policy measures.

Discussion and Recommendation Policy

These findings provide critical insights into the dynamics of factors influencing the performance of the manufacturing sector in Indonesia and Malaysia, both in the short and long run. In the short term, Indonesia shows a significant positive response to labor, exports, and lagged investment. This is in line with the findings of Rodrik (2018) who emphasized that the manufacturing sector in developing countries is very sensitive to changes in production inputs and external forces such as global demand. This indicates that manufacturing production activities in Indonesia are quite sensitive to quantitative changes in real economic inputs. For instance, increasing global demand and export activities is quickly translated into higher manufacturing output. Additionally, although investment effects are lagged, they still appear to influence output in the short run, likely due to project backlogs or accelerated investment realization by the government and private sector. These

results support the study by Szirmai & Verspagen (2015) which found that investment has a significant impact on manufacturing output, especially in countries with a developing industrial base. On the other hand, industrial policy in Indonesia does not show a significant short-term impact, suggesting that the government's role in boosting this sector through policy interventions may not yet be effective, lacks coordination, or requires more time for implementation before observable results emerge.

In contrast, Malaysia exhibits a similar pattern to Indonesia regarding the short-term positive impact of labor and exports on manufacturing performance. However, unlike Indonesia, investment and industrial policies in Malaysia do not have an immediate impact in the short term. Economically, this condition may reflect that Malaysia's investment structure flows more heavily into the non-manufacturing sector, thus requiring a longer time for investment transmission to the industrial sector. This finding aligns with Doner, R. F. (2016), who asserted that industrial transformation in Southeast Asia is often hampered by institutional fragmentation and dependence on specific sectors that do not always directly support manufacturing upgrading. Furthermore, the ineffectiveness of Malaysian industrial policies in the short term may indicate that policy design and implementation do not fully address the needs of industry players. Yusuf, S., & Nabeshima, K. (2020) explain that the success of industrial policies is highly dependent on government coordination capacity and intersectoral alignment; therefore, if coordination is weak, policies tend to produce delayed effects. In the Malaysian context, complex bureaucracy and the gap between policy formulation and implementation may explain why the impact of new policies is felt over a longer time horizon.

In the long run, both countries demonstrated that labor, exports, and investment are the main determinants of manufacturing performance, while industrial policy has yet to exert a significant impact. This finding aligns with Bartelme, D. (2024) findings, which show that despite the manufacturing sector's large economies of scale, the impact of industrial policy is often "non-transformative" due to its limited welfare effects. This confirms that efficient labor markets and long-term investment structures play a stronger role in driving productivity gains than poorly targeted policy interventions. Furthermore, a study by Gebrewolde, T. M., & Rockey, J. (2022) found that industrial policy in developing countries often fails to increase productivity or production capacity when it is not tailored to the industry's actual needs, resulting in a lack of impact even over long-time horizons. Rodrik (2023) also emphasized that the effectiveness of industrial policy is highly dependent on coordination mechanisms and institutional capacity; when bureaucracy is less responsive and regulatory overlap exists, policies struggle to generate long-term structural transformation. Therefore, the lack of long-term impact of industrial policy signals that existing policies lack a strategic orientation or adequate implementation design to promote sustainable manufacturing growth.

The differences in policy impacts between the two countries, despite their structural economic similarities, underscore the need for a more context-specific and adaptive policy approach. For Indonesia, these results confirm that strengthening investment and labor

productivity must be a top priority in the national manufacturing development agenda. Regulatory reform is a critical starting point the OECD notes that legal certainty, simplified licensing, and improved bureaucracy are key factors in creating a more competitive investment climate and attracting productive capital flows to the industrial sector. At the same time, improving workforce quality requires a more comprehensive strategy than simply expanding formal education. A study by the ADB (2021) emphasizes the importance of upskilling and reskilling the workforce to adapt to the needs of Industry 4.0, including the digitalization and automation of production processes. Additional evidence from Pambudi (2020) indicates that vocational education in Indonesia still faces a gap between graduate competencies and actual industry needs, making curriculum updates and partnerships with the private sector crucial for improving workforce readiness. Furthermore, Tjiptady, B. C., & Yoto, T. (2019) emphasize that technical training based on the latest technology is essential for increasing manufacturing productivity in the digital era. Thus, the combination of investment regulatory reform and improving the quality of the workforce through vocational and technical training provides an important foundation for Indonesia to strengthen its manufacturing competitiveness in the long term.

On the other hand, Malaysia needs to focus more on enhancing labor quality and revitalizing its export strategy. The country's shift toward medium- and high-tech manufacturing products must be supported by workforce development and innovation incentives at the enterprise level. Malaysia must also reorient its industrial policy to be more integrated into the global value chain, encouraging businesses to move beyond raw or semi-finished exports toward high-value-added final products. This requires stronger collaboration between the government, industrial actors, research institutions, and educational bodies.

The effectiveness of industrial policy in supporting manufacturing growth must be thoroughly evaluated in both countries. Such evaluation should be based on data and empirical evidence while considering structural challenges, technological changes, and global market dynamics. Industrial policy should not merely exist as macro-strategy documents, but must also be translated into concrete programs that enhance productivity, competitiveness, and sustainability within the sector. A policy approach that is evidence-based, participatory, and forward-looking is essential for Indonesia and Malaysia to ensure that their manufacturing sectors can serve as reliable engines of national economic growth amidst global uncertainties.

Conclusion

This study has explored the short- and long-run determinants of manufacturing performance in Indonesia and Malaysia by examining the roles of labor, exports, investment, and industrial policy. The empirical findings reveal that, in the short run, labor and exports significantly influence manufacturing output in both countries. In Indonesia, lagged investment also plays a significant role, indicating the responsiveness of manufacturing activities to real economic inputs. Conversely, industrial policy in both

countries appears to lack short-term impact, suggesting implementation delays or ineffectiveness in addressing immediate sectoral needs.

In the long run, labor, exports, and investment continue to show a strong and positive influence on the manufacturing sector in both Indonesia and Malaysia. However, the persistent insignificance of industrial policy points to structural weaknesses in the formulation and execution of such policies. This highlights a critical gap between policy intent and outcomes, emphasizing the need for evidence-based, industry-driven, and forward-looking policy frameworks.

The policy implications are clear. For Indonesia, strengthening labor productivity through skill development and promoting a more conducive investment environment are essential for sustaining manufacturing growth. Reforms should target regulatory efficiency, investment incentives, and the alignment of workforce skills with industrial needs, particularly in the context of digital and automated production. For Malaysia, the focus should be on upgrading labor capabilities and refining its export-oriented industrial strategies. The country must support innovation and industrial transformation toward higher value-added manufacturing by fostering collaboration between government, industry, and research institutions. Additionally, reorienting industrial policy to integrate more fully with global value chains will be critical in maintaining competitiveness.

Ultimately, both countries must reassess the design and delivery of industrial policy to ensure it evolves beyond strategic documents into actionable programs that enhance productivity, innovation, and resilience in the manufacturing sector. A coordinated and data-driven approach will be vital for making the manufacturing sector a key engine of sustainable economic development in the face of ongoing global uncertainty.

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