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Venturing the Golden Indonesia 2045: Are Electricity and Broadband Development for Five Indonesian Priority Industries Impactful?

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A B S T R A C T

This study aims to examine the impact of electricity and broadband development on the progress of five priority industries in Indonesia. Initial findings indicate a mismatch between policy expectations and their impacts. This research collected secondary data from 2010 to 2019, using a time series approach and bootstrapping 1000 times to strengthen and cover the weaknesses of the method and the short time span. The results reveal that the electronics sector has the greatest beneficial impact both partially and simultaneously from all external variables. Additionally, four industries, except the automotive sector, show the same impact. This report emphasizes the necessity of synergy between digitalization and electrification, asserting the inseparable integration of policies. The automotive sector has experienced significant growth over the past decade, but it has not been directly impacted by these policies. Conversely, the food industry is affected and has emerged as the largest output producer, while other sectors are considered to have growth potential, indicating the need for alternative infrastructure initiatives. This study is expected to provide insights to all stakeholders regarding the impact of government policies and how to maximize business benefits amid global challenges.

A B S T R A K

Kajian ini bertujuan untuk mengkaji dampak pembangunan ketenagalistrikan dan broadband terhadap kemajuan lima industri prioritas di Indonesia. Pada temuan awal mengemukakan adanya ketidaksesuaian antara ekspestasi kebijakan dengan dampaknya. Penelitian ini mengumpulkan data sekunder pada tahun 2010 hingga 2019, menggunakan pendekatan time series dan bootstrapping sebanyak 1000 kali untuk memperkuat dan menutupi kelemahan metode serta rentang waktu yang pendek. Hasil penelitian mengungkapkan bahwa sektor elektronik mempunyai dampak manfaat paling besar baik secara parsial maupun simultan dari seluruh variabel eksternal. Selain itu, empat industri, kecuali sektor otomotif, menunjukkan dampak yang sama. Laporan ini menekankan keharusan sinergi antara digitalisasi dan elektrifikasi, menegaskan integrasi kebijakan yang tidak dapat dipisahkan. Sektor otomotif mengalami pertumbuhan yang signifikan selama satu dekade namun tidak terkena dampak langsung dari kebijakan tersebut. Sebaliknya, industri makanan terpengaruh dan muncul sebagai penghasil output terbesar, sementara sektor lain dinilai mempunyai potensi pertumbuhan, yang menandakan perlunya inisiatif infrastruktur alternatif. Penelitian ini diharapkan dapat memberikan wawasan kepada setiap pemangku kepentingan mengenai dampak kebijakan pemerintah dan bagaimana menyerap keuntungan bisnis maksimal di tengah tantangan global.

1. INTRODUCTION

In venturing a national vision for the Golden Indonesia 2045, Indonesia should imperatively put a significant emphasis on undergoing a digital transformation revolution 4.0 (CNBC & Syahputra, 2022).

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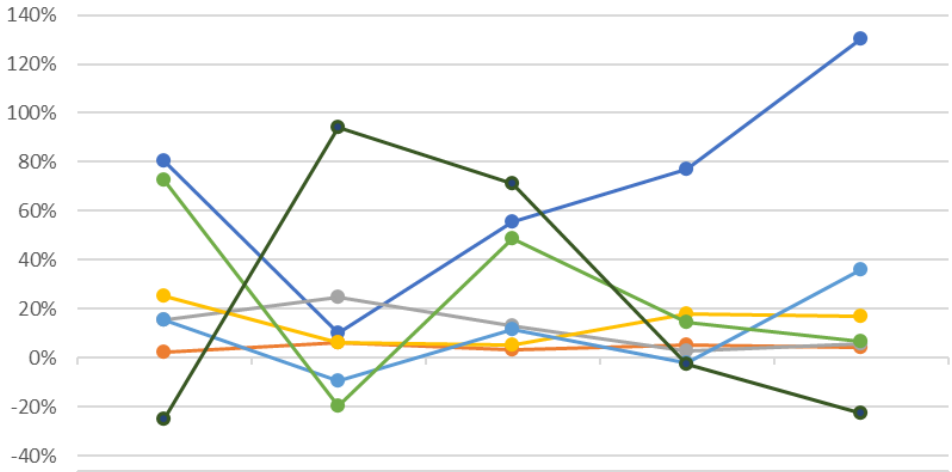
Recognizing this imperative, the Indonesian government must adopt a proactive approach by fully promoting industrial growth through the digital economy. One of the measures taken by the government is to prioritize certain industries, aiming to facilitate optimal industrial optimization. These prioritized industries include the food, automotive, chemical, electronic, and textile sectors. The decision to prioritize these sectors is based on their substantial contribution to job creation and gross domestic product (GDP). These sectors collectively account for over 60% of the GDP, with more than 65% of their output being exported and employing over 60% of the workforce (Indonesia Central Bureau of Statistics, 2024a). Given these factors, focusing on the development of these five sectors is a rational choice for the Indonesian government to achieve its vision.

Numerous studies have highlighted the correlation between digitalization and electrification policies, demonstrating their role in expediting industrialization (Falentina & Resosudarmo, 2019; Myovella et al., 2020; Zhang & Li, 2020; Wang et al., 2021; Xu et al., 2021; Ong et al., 2023). Those scholars argue that digitalization factors are pivotal in hastening the industrialization process, particularly in developed countries with established infrastructure. Conversely, developing nations that lag in digitalization implementation may face challenges in their industrialization endeavors compared to their digitally advanced counterparts. As highlighted by Rodrik (2016) and Myovella et al., (2020), the efficiency gains in production attributed to the Internet can pose challenges for developing countries that have not yet embraced digitalization. These nations may find themselves relegated solely to serving as markets for products. When compounded by a shortage of skilled labor, this scenario may prompt industrial companies to relocate their production to technologically advanced countries. It is crucial to underscore that digitalization enhances accessibility to information and facilitates trade, both domestically and internationally. In cases where the domestic market lacks readiness for more sophisticated domestic products, it may become inundated with higher-quality foreign products.

Amidst the challenges of industrialization, the government's decision to prioritize infrastructure development is a logical step toward fostering growth in the digital industry, infrastructure has long knowingly as a booster to the trade and economy (Agénor, 2010; Arif et al., 2021; Mao et al., 2024). It is said that the essential factors to this transformation are broadband internet and electricity (ITU, 2014). Recognizing their importance, the government has integrated these infrastructural needs into its planning initiatives. Since 2009, efforts have been underway through the Indonesia Broadband Plan, a national broadband project aimed at extending internet access to remote areas of the country to reduce information inequality and drive economic growth (Ministry of National Development Planning, 2014). Moreover, the availability of electricity is paramount to supporting digitalization efforts. Under President Joko Widodo's administration, an energy self-reliance policy was established to ensure adequate electricity supply for Indonesia's future economic growth, as evidenced by the implementation of the 35,000-megawatt (MW) infrastructure policy (Ministry of Energy and Mineral Resources, 2022).

Given the imperative nature of digitalization, numerous survey reports highlight the pivotal role of broadband infrastructure in aiding businesses, particularly in accessing previously untapped markets, including opportunities abroad. The dissemination of product information and benefits facilitated by broadband internet penetration also contributes to enhancing consumer familiarity with products and their advantages (APJII, 2022). Additionally, industries have reported notable efficiencies resulting from the utilization of Internet of Things (IoT) technologies in their operations (Javaid et al., 2021; Ashima et al., 2022; Li et al., 2022; Pourrahmani et al., 2022). This sense of urgency underscores the government's objective of significantly increasing internet penetration, given the anticipated benefits arising from Indonesia's geographical conditions. The presence of internet networks will undoubtedly play a crucial role in facilitating these future advancements.

It is crucial to underscore the significance of electricity as a fundamental component in the production process. According to Falentina & Resosudarmo (2019), companies would incur substantial financial losses in the event of frequent power outages. Furthermore, it is estimated that power outages in Indonesia result in annual losses of $4.19 million, even though they are not a regular occurrence. Productivity is paramount in the industrial sector, and electricity plays a pivotal role in enhancing it. Consistent and reliable electricity supply is particularly crucial for industrial productivity in developing countries (Allcott et al., 2016; Grainger & Zhang, 2019) and even more so in advanced economies like China (Zhang & Li, 2020; Xu et al., 2021). These two critical infrastructures have the potential to bolster



	2015	2016	2017	2018	2019
Data Bandwidht (Mbits)	81%	10%	56%	77%	130%
Electricity (Twh)	2%	6%	3%	5%	4%
Food & Drinks	16%	25%	13%	3%	6%
Textile & Apparel	25%	6%	5%	18%	17%
Chemical	15%	-9%	12%	-2%	36%
Automotive	73%	-20%	49%	14%	7%
Electronic Equipment	-25%	94%	71%	-3%	-22%

Figure 1. Output of five Indonesian industries 2015-2019 (Compiled by the authors from Indonesia Central Bureau of Statistics (2024b) and ITU (2024))

the country's economy, especially when directed towards the five priority industries that are pivotal in the current era of digital transformation. This finding also presents a compelling case for policymakers and governments to prioritize the development of robust power infrastructure to ensure uninterrupted power supply and faster internet connectivity, both of which are essential for fostering the growth and development of a country's economy.

However, Djunaedi (2021) revealed that digital penetration in Indonesia has not yielded the anticipated contribution to the country's economy. While a survey conducted by APJII in 2022 suggests that Indonesian society utilizes the Internet for economic activities, it is imperative to scrutinize whether industries in Indonesia are indeed reaping the benefits of these policies. An examination of data obtained and processed from the Indonesia Central Bureau of Statistics (2024b) and the International Telecommunication Union (ITU, 2024) as presented in Figure 1, indicates a consistent increase in electricity consumption and international bandwidth usage in Indonesia. This rise reflects heightened information activities within the market, which can influence trading decisions and the industrial landscape. Despite the growth in energy and data consumption, the data also reveals a decline in the output value of two sectors, namely the chemical and automotive industries, particularly in 2016 and 2018 by 9% and 20%, respectively. This discrepancy prompts questions about which of the five industries benefited the most from the government's initiatives related to energy and digitalization projects. It is noteworthy that the presented data was not influenced by the pandemic as it was collected before the outbreak.

The Indonesian government's policies aimed at boosting output in five priority industries have not yielded results that align with their efforts. This study introduces novel insights by focusing on initial findings that reveal discrepancies between the impact of broadband and energy and the expected output in these five priority industries. Although these discrepancies may not persist indefinitely, this research aims to serve as a preventive measure and a foundation for implementing necessary corrective actions promptly. Moreover, while this research may initially serve an academic purpose, it holds the potential to open avenues for further, more detailed studies within each industry. This could help identify a balanced approach to achieving the expected outputs. By focusing on these early findings,

this study not only contributes to existing knowledge but also encourages ongoing research to ensure that the Indonesian government's efforts translate into the desired economic growth and industry performance.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

2.1. Solow Exogenous Growth Model

We base this study on the logical framework of the Solow exogenous growth model (Solow, 1956), which underscores the understanding of total factor productivity growth influenced by external factors beyond the existing factors of production. These external factors yield long-term effects extending beyond the mere accumulation of labor and capital. In this regard, we posit that the trends in electricity availability and broadband technology will augment the existing production system. Supported by the concept of constant returns to scale, which suggests that increasing inputs positively impact output, the implementation of internet technology alongside sufficient energy availability to support it will enhance production efficiency and productivity, resulting in increased output. Given that industries are closely associated with productivity and efficiency, adopting the total factor productivity enhancement approach is a logical choice in this research (Frischmannt, 2005). This study delineates two distinct concepts regarding the policy for this industry to develop a more detailed framework delineating the independent variables.

2.2. Internet and Industry

The Internet is widely recognized as a pivotal component in advancing Sustainable Development Goals (SDGs), to the extent that it is asserted that these goals cannot be attained without it (ITU, 2014). Numerous countries also attribute their economic development primarily to the Internet (ITU, 2019). Digitalization plays a critical role in expediting the industrialization process, particularly in advanced countries with established digital infrastructure (Li et al., 2022). Conversely, developing nations that lag in digitalization implementation may face setbacks in industrialization (Myovella et al., 2020). This is because the efficiencies generated by the internet may adversely impact developing countries, relegating them to mere markets for technological products. Moreover, this phenomenon could lead to the migration of skilled workers and the redirection of industrial investments to technologically prepared countries (Rodrik, 2016; Myovella et al., 2020). Some argue that the latest information technology, such as 5G, represents a triumph for industries in countries that adopt it first (Huseien & Shah, 2022).

2.3. Electricity and Industry

The correlation between the industrial sector and electricity is indisputable. Electricity serves as a crucial catalyst for economic growth and plays a pivotal role in driving the expansion and advancement of the industrial sphere (Mawejje & Mawejje, 2016; Zhang & Li, 2020; Xu et al., 2021). According to Liyu & Wan (2020), electricity consumption serves as a clear indicator of a country's growth and industrial activity, offering a tangible reflection of its progress by illustrating how its industries continue to expand and thrive. Falentina & Resosudarmo (2019) revealed that frequent power outages can result in significant economic losses for a country. This is primarily due to the direct impact of power outages on industrial productivity, which subsequently affects industrial output. Thus, any disruption in the power supply can have severe consequences for a country's economy. Furthermore, signs of post-pandemic economic recovery in the industrial sector can be discerned through electricity consumption, as evidenced by the economic recovery of China, reflected in its increased electricity consumption (Wang et al., 2021). This underscores the critical importance of ensuring electricity availability from the outset to meet the sudden surge in industrial demand.

3. RESEARCH METHOD

This study analyzes data from the Indonesia Central Bureau of Statistics (2024a) concerning the five major industries prioritized by the Indonesian government, focusing on their respective output across industry sectors. Recognizing that micro, small, and medium enterprises (MSMEs) employ over 60% of the workforce, while large industries contribute more than 60% to the GDP, the study emphasizes the equal importance of all industrial scales. The research assesses the impact of two infrastructure policies

on the overall output of these five industries, irrespective of their scale, aiming to identify areas for improvement and growth.

The industrial electrification data stem from the overall electricity consumption, encompassing household, business, and industrial customers in Indonesia. This information is sourced from the Indonesia Central Bureau of Statistics (2024b). While this data does not differentiate between industrial electricity needs and general household electricity consumption, it is expected to offer valuable insights into household-industrial consumption across micro to medium scales. This is attributed to the characteristic of Indonesian society, where industrial electricity operational needs are often intertwined with daily household electricity requirements. Moreover, the study's data includes the percentage of the population with access to electricity, obtained from the World Bank (2024a). The study assesses that electricity penetration among the population is a key factor influencing industrial output growth, as it reflects the impact of energy infrastructure policies. Additionally, access to electricity influences market behavior and undoubtedly affects industries.

Utilizing various datasets, the study aims to offer a comprehensive understanding of the extent to which digital infrastructure has permeated throughout Indonesia. Internet usage data is sourced from the International Telecommunication Union (ITU, 2024), specifically encompassing data on international connection usage measured in Mbit/s. Additionally, the study employs data on mobile cellular subscriptions, providing insights into mobile cellular ownership, and broadband subscriber data from the World Bank (2024a). Furthermore, individual internet usage data, reflecting internet usage over the past three months, is obtained from the Indonesia Central Bureau of Statistics (2024c).

Several studies have also linked economic development with electricity consumption as a variable that needs to be investigated. For instance, economic growth in Pakistan is attributed to 99% of its increase in electricity consumption (Ali et al., 2020). Additionally, access to mobile usage, bandwidth, broadband, and the internet has also been widely used as a basis for describing economic development in China (Hu et al., 2023).

It is worth noting that this data does not differentiate between industrial and individual interests, as overall internet usage serves as a reflection of broadband penetration in Indonesia. However, surveys indicate that the majority of broadband usage is for economic purposes (APJII, 2022). It is anticipated that this diverse array of data will elucidate the impact of digital infrastructure penetration on industries.

The study covers 10 years, from 2010 to 2019, coinciding with the government's purported implementation of digitalization-related policies, that start at 2010 and expected to conclude by the end of 2019. This timeframe was also intentionally chosen to mitigate any data bias stemming from the pandemic in 2020. The study utilizes five-time series model methods, incorporating ten observation data points with five dependent variables for comparison. It aims to determine the industries poised to benefit from these policies. To achieve this, the study employs an approach rooted in Solow's Theory (Solow, 1956) growth formula, expressed as follows:

$$Y = f(K, L, A) \quad \text{.....(1)}$$

In this context, Y represents the output obtained from the function of K for physical capital, L for labor, and A denotes technological progress. Building on this, the formula is elaborated as follows:

$$\log n\, Y_t = \beta_0 + \beta_1 \log n\, ElcCon_t + \beta_2 \log n\, AcElc_t + \beta_3 \log n\, MSub_t + \beta_4 \log n\, IntBw_t + \beta_5 \log n\, IntUsr_t\, \beta_6 \log n\, BbSub_t + e_t \quad \text{.....(2)}$$

Y represents the output of production for the five sectors as the dependent variable, β_0 is constant, $\beta_{1..3}$ is a coefficient, t refers to time, e represents error, and using six exogenous variables are denoted as follows; $ElcCon$ as electricity consumption and $AcElc$ access to electrification both variables sourced from research by Ali et al. (2020), while $MSub$ mobile users, $IntBw$ international bandwidth, $IntUsr$ internet users in the last 3 months and $BbSub$ broadband users variables taken from research by Hu et al. (2023).

All variables undergo transformation into natural logarithms to conform to the log-linear model or constant elasticity model, simplifying calculations by converting them into pure numbers. This process eliminates their units, allowing for a focus on percentage change ratios (Gujarati, 2015). The

research model employs a bootstrapping approach with 1000 repetitions for coefficient estimation and residuals, aiming to yield more robust results. Bootstrapping is anticipated to enhance the accuracy of time series calculations, thereby bolstering calculation precision (Liu, 2015). This methodology is intended to mitigate the limitations of the 10-year time series data, enhance calculation reliability, and achieve high confidence intervals.

4. DATA ANALYSIS AND DISCUSSION

Table 1 presents insights into the variables and progress of five priority industries in Indonesia over a decade. Among these industries, the chemical sector exhibits a positive growth trend, with a standard deviation value of 125 trillion. However, it registers the lowest growth rate in terms of percentage, with its value rising from 249 trillion in 2010 to 654 trillion in 2019, representing an annual growth rate of only 16%. This conclusion arises from comparing its growth rate with that of other priority industries. Moreover, the World Bank (2024b) reports a significant downward trend in the percentage growth of value-added in the chemical industry until 2021, despite government efforts to promote its growth (Republika, 2023). This underscores the need for targeted efforts to stimulate growth in this sector.

According to Table 1, the food industry boasted the highest output contribution value in 2019, reaching 2.015 trillion. Its growth trajectory is equally noteworthy, nearly tripling (286%) over the span of one decade, equating to an annual growth rate of approximately 29%. Furthermore, with a mean value of 1.272 trillion, this industry demonstrates stable and substantial growth compared to Indonesia's GDP. Moreover, the positive standard deviation value of 553 trillion underscores the significant growth consistency in this sector. These figures not only reflect Indonesia's market interests but also suggest ample potential for substantial job creation within the industry. Given the paramount importance of food security in sustaining economic growth, the food industry warrants increased attention and support.

It is worth noting the remarkable growth rate of approximately 258% in the textile industry in Indonesia over the last decade, mirroring the growth ratio observed in the food industry. This suggests that the textile sector has kept pace with other flourishing industries in the country. With a sizable population of around 270 million people, Indonesia boasts a predominantly young and dynamic demographic, highly inclined towards adopting a consumerist lifestyle, particularly concerning clothing. Consequently, the textile industry holds significant economic potential, given Indonesia's demographic composition. However, according to CNBC Indonesia (2023) despite an upsurge in consumer consumption and purchasing power towards clothing, many textile industries are grappling with challenges. This presents a paradoxical situation as they are experiencing losses rather than profits.

Table 1. Variable description

Dependent Variable	Mean	STDEV	Min	Max
Food & beverages industry	1,272,343.3	553,170.31	522,621.00	2,015,319.00
Textile industry	442,632.5	198,467.13	217,814.00	779,368.00
Chemical industry	413,442.5	125,931.47	249,357.00	654,964.00
Automotive industry	291,970.6	156,454.68	58,108.00	527,945.00
Electronic equipment industry	212,335.9	153,559.77	55,500.42	453,222.53
Independent Variable	**Mean**	**STDEV**	**Min**	**Max**
Electricity consumption (GWh)	189,293.9	30,557.8	141,228.7	232,647.4
Access to electricity (% of population)	96.9	1.6	94.2	98.8
Mobile subscriber (unit)	337,552,908.8	49,728,162.3	253,129,420.0	435,193,605.0
International bandwidth usage (Mbit/s)	3,032,856.0	5,243,560.4	65,000.0	17,158,800.0
Internet user/three months (% of population)	23.7	12.5	10.9	47.7
Broadband subscriber (unit)	4,923,629.1	2,741,544.0	2,280,316.0	10,284,364.0

Notes: Industrial output in billion rupiah

Table 2. Correlation matrix of variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Food industry	1										
2. Textile industry	0.972	1									
3. Chemical industry	0.915	0.962	1								
4. Automotive industry	0.908	0.946	0.904	1							
5. Electronic equipment industry	0.927	0.861	0.761	0.868	1						
6. Electricity consumption	0.972	0.948	0.907	0.841	0.864	1					
7. Access to electricity	0.948	0.918	0.901	0.805	0.819	0.988	1				
8. Mobile subscriber	0.653	0.496	0.528	0.385	0.615	0.647	0.696	1			
9. International bandwidth	0.689	0.791	0.807	0.734	0.546	0.709	0.641	0.128	1		
10. Internet user	0.943	0.964	0.906	0.926	0.869	0.931	0.878	0.426	0.865	1	
11. Broadband subscriber	0.908	0.936	0.862	0.896	0.843	0.903	0.839	0.345	0.880	0.992	1

As such, this sector requires government attention and priority, despite the discrepancy in the current scenario.

The growth of the automotive and electronic equipment industries, as depicted in table 1, is particularly noteworthy. These sectors have witnessed remarkable expansion, boasting annual growth rates of 82% and 71%, respectively. Commencing with figures of 58 trillion and 55 trillion, the output of these industries has surged by over 700% over the course of a decade. These findings underscore the substantial impact of recent government policies in fueling this growth. The government's concerted efforts toward development appear to have generated abundant opportunities for growth and advancement within these industries.

The statistical analysis of exogenous variables indicates a significant impact of government policies on digitization. As outlined in Table 1, the electronic equipment industry has notably expanded. This growth is partly attributed to the rapid increase in mobile cellular users, which surged by 72%. Furthermore, there has been a marked rise in the openness of Indonesian society, evidenced by a substantial annual growth of 2630% in international bandwidth consumption. Such considerable progress may facilitate more effective market information transactions within priority industries. It is well-established that the Internet plays a pivotal role in promoting global trade by fostering connections between nations (ITU, 2019). However, the modest 4% growth in internet access in Indonesia over the past decade, as depicted in Table 1, suggests potential obstacles to infrastructure development in the country, particularly considering the geographical challenges posed by the archipelago.

Based on the data presented in Table 2, it is evident that the food industry holds significant potential for interconnection with other sectors. This is underscored by the correlation matrix values, all of which exceed 0.90. While these findings don't imply causation or direct influence, they do suggest a potential linear relationship among the output variables. This positive correlation implies interdependence, wherein the growth of one industry can complement and bolster that of others. Understanding these correlations can empower businesses to make informed decisions and craft strategies that align with broader industry trends. Consequently, fortifying the food industry can yield positive ripple effects across various sectors, and vice versa. It is crucial to highlight the pivotal role of government intervention in fostering the development of the food industry, thereby catalyzing growth across multiple sectors.

Table 3. Result of time series data for five models

Independent variable (log)		Dependent variable (log)				
		Food Industry	Textile Industry	Chemical Industry	Automotive Industry	Electronic Industry
Electricity consumption	*coef.*	4.648	6.137	-1.975	7.380	32.531
	p-value	0.162	0.209	0.641	0.521	0.006***
Access to electricity	*coef.*	-20.078	-38.089	-21.789	-57.290	-224.774
	p-value	0.364	0.280	0.504	0.509	0.008***
Mobile subscriber	*coef.*	0.159	-0.781	-0.158	-1.754	-1.284
	p-value	0.601	0.156	0.725	0.208	0.092*
International Bandwith Usage	*coef.*	-0.138	-0.123	0.023	-0.586	-0.953
	p-value	0.121	0.279	0.823	0.110	0.004***
Internet user	*coef.*	1.442	2.978	1.414	7.940	7.142
	p-value	0.052*	0.021**	0.138	0.024**	0.003***
Broadband subscriber	*coef.*	-0.952	-2.325	-0.940	-5.192	-5.722
	p-value	0.142	0.043**	0.289	0.075*	0.007***
Durbin-watson stat	*coef.*	2.394	2.538	2.827	2.684	2.794
jarque-bera	*p-value*	0.626	0.699	0.746	0.783	0.686
Adjusted R-sq	*coef.*	0.961	0.909	0.792	0.677	0.951
Prob (F-statistic)	*p-value*	0.006***	0.022**	0.07*	0.136	0.009***

Notes: ***significance level of 1%; **significance level of 5%; *significance level of 10%

The findings presented in Table 2 also reveal that the electronic industry variable exhibits lower correlation matrix values compared to other variables, except in the case of the food industry. While these correlation values remain relatively high, with an average exceeding 0.7, this scenario suggests a potential dominance of electronic trade driven by increased imports relative to domestic production and consumption as other industries progress. Consequently, this possibility may account for the lower correlation observed in the output of the electronic industry. This hypothesis finds further support in data from the World Bank (2024b), which indeed indicates a trend towards increased imports of machinery, electronics, and manufacturing goods in Indonesia from 2011 to its peak in 2019.

An intriguing observation from Table 2 is the relatively low correlation matrix values between the growth of mobile subscribers and the textile and automotive industries, standing at only 0.496 and 0.385, respectively. These lower values may stem from the multitude of determinant factors that exert a more pronounced influence on the textile and automotive sectors compared to mobile subscriber growth. Factors such as demographic trends, government policies, consumer purchasing power, and fashion dynamics likely contribute to this divergence. Moreover, the intricate dynamics of these industries, including complex consumer and supplier distribution chains within both domestic and global markets for raw materials, can further explain these outcomes. In contrast, electricity consumption exhibits a notably high correlation with all industries under examination.

Particularly noteworthy is its strongest association with the food industry, as depicted in Table 2, registering a value of 0.972. Electricity plays multifaceted roles in food production processes, encompassing tasks such as processing, storage, packaging, and other essential procedures. This robust correlation underscores the significant likelihood of the food industry's reliance on electricity for its production and processing activities. Discrepancies in correlation outcomes, notably when comparing the food industry with the automotive or electronics sectors, may also reflect technological disparities. As noted by Pourrahmani et al., (2022), advanced industries like electronics and automotive may employ cutting-edge production technologies such as the Internet of Things or have adopted energy-intensive production methods, leading to more efficient energy management practices. Consequently, these sectors may exhibit smaller correlation values relative to other priority industries.

The correlation value between mobile subscribers and international bandwidth usage, as presented in Table 2, appears unusually low at 0.128. Given the rapid expansion of mobile subscribers in Indonesia, one would expect these two variables to exhibit a stronger correlation. However, several additional factors not considered in this analysis may contribute to the observed low correlation. Factors such as users' education levels, income levels, and infrastructure conditions could influence the correlation value. Furthermore, it's possible that the linearity between these variables is minimal due to the predominant provision of domestic data access by telecommunication providers rather than reliance on international data access. Domestic data access is often more economically viable, and offers faster speeds, and greater stability, as noted by APJII (2024), particularly with the establishment of the Indonesia Internet Exchange (IIX). Moreover, telecommunication providers typically offer data packages covering domestic regions, which are more cost-effective for users, prompting mobile users to favor these services. Another potential factor is the widespread use of Wi-Fi for internet access by mobile users, as suggested by the APJII (2022) survey, which could contribute to the observed lack of correlation with international bandwidth usage.

The data analysis presented in Table 3 focuses exclusively on the correlation of variables with statistically significant p-values. The time series models utilized in Table 3 indicate no autocorrelation, as evidenced by Durbin-Watson statistics approaching 2. Furthermore, the Jarque-Bera results suggest that all models meet the criterion above 0.05, indicating no instances of normal data distribution. Among the five calculation models employed, only the automotive industry model fails to yield simultaneous effects from all exogenous variables, with an f-statistic probability value of 0.136. Conversely, the other four models demonstrate simultaneous effects, with significant values, from all exogenous variables.

In Table 3, the food industry exhibits a partial influence from internet users (p-value 0.052*). This finding suggests that internet penetration might aid in expanding the market for this industry across all regions of Indonesia. Moreover, Indonesia's demographic makeup, which is currently dominated by consumers of productive age, presents significant opportunities for the food industry. It's plausible that the availability of platforms and applications facilitating easier access to food products also contributes to the growth of this industry.

Table 3 reveals that the textile industry was only partially influenced by internet users and broadband subscribers. Merely focusing on developing electrification infrastructure is insufficient to generate a significant impact on this industry. Complementary infrastructure policies are necessary to achieve the desired outcomes. The government should prioritize this labor-intensive industry and shield it from the potential threat posed by imported products. According to the World Bank (2024b), the Indonesian textile market was flooded with imported products until 2016, but this trend has gradually decreased since then. The study did not explore the textile industry's growth in relation to the expansion of textile import values, leaving room for further investigation.

Upon reviewing the data presented in Table 3, it is notable that the chemical industry in Indonesia appears unaffected by the external factors mentioned. While there is a simultaneous effect of 0.07, these findings indicate a need for the government to reassess its priorities regarding policies related to the chemical sector. It is crucial to acknowledge the pivotal role the chemical industry plays in Indonesia's future economic growth. Despite efforts to bolster local production, Indonesian chemical products have yet to fully penetrate the domestic market or match the quality of imported products. This discrepancy serves as a warning sign for policymakers to reconsider their strategies and potentially adopt more innovative industry support policies. It is imperative to infuse creativity into the sector to ensure its vitality and position it as a key player in Indonesia's economic landscape. A thriving chemical industry not only benefits the economy but also serves as the cornerstone of innovation, growth, and a promising future for Indonesia. This underscores the urgency for policymakers to reevaluate strategies and inject innovation and support into the industry to secure its long-term success.

Upon analyzing Table 1, it becomes apparent that the automotive industry in Indonesia is experiencing rapid growth. However, upon examining the policies related to electrification and digitalization, as illustrated in Table 3, it's evident that this industry isn't significantly impacted simultaneously (p-value 0.136), resulting in only a partial effect observed in broadband subscribers (p-value 0.075*). While electrification and digitalization policies are crucial, other factors, such as physical infrastructure policies like highways and toll roads, which were not considered in this study, may also wield significant influence. These findings underscore the necessity for further research to delve into the interplay among various factors, offering valuable insights into maximizing the growth potential of the automotive industry.

Referring to the findings in Table 3 regarding the electronics industry, it's apparent that this sector experiences a significant partial influence from the government's electricity energy policy, as evidenced by the data concerning electricity consumption (p-value 0.006) and access to electricity (p-value 0.008). This correlation is unsurprising, given the close relationship between electronics and electricity. However, upon comparative analysis of the five priority industries, it can be inferred that the electronics industry receives the most substantial influence from government policies related to digitalization and electrification. Furthermore, the results presented in Table 3 suggest that the exogenous variable of internet usage significantly impacts all priority industries except for the chemical sector. This corroborates the argument posited by ITU (2014), which underscored the government's prioritization of internet usage growth to bolster development across all industrial sectors. Various research studies, including those by Javaid et al., (2021) and Li et al., (2022), along with surveys conducted by APJII, (2022), provide additional evidence reinforcing the relationship between this exogenous variable and its influence on industrial growth.

However, it is crucial to highlight that certain industries display significant results with negative coefficient values. Specifically, the textile, automotive, and electronics sectors are affected by broadband subscriber variables with negative coefficients of -2.325, -5.192, and -5.722, respectively. A similar trend is evident in the partial influence calculations of access to electricity, mobile subscribers, and international bandwidth usage in the electronics industry. These negative coefficients might stem from the absence of other explanatory variables, suggesting the potential for further research to delve into these industries with the inclusion of additional exogenous variables. Alternatively, this trend may reflect market dynamics, wherein imported goods, propelled by internet usage, could replace domestic products in these sectors. There are many factors which may be considered as a trigger effect to make industrial policy go well, such as education and political stabilization, a holistic approach to all societal aspects to bring industrialization to fully absorb (Haraguchi et al., 2019; Young et al., 2019). These

findings also underscore the complexity of factors influencing industrial dynamics and emphasize the necessity for comprehensive analyses to grasp the intricacies of industrial growth in Indonesia fully.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Indonesia's demographic factors should be leveraged to bolster the growth of these five industries by enhancing both the quality and quantity of domestic industrial production. It is imperative to ensure that a significant portion of product components originates domestically, establishing technological resilience within Indonesia. Given that digitalization has been shown to adversely affect countries lacking in physical infrastructure and human capital, the government must prioritize ensuring Indonesia's preparedness in these areas. Additionally, the government should align the needs of these five industries with the availability of raw materials and a skilled workforce, fostering an ecosystem conducive to sectoral industrial sustainability. Prioritizing and promoting the utilization of the Internet of Things (IoT) across all industrial scales can further drive optimal production output. These measures will stimulate job creation and reduce Indonesia's reliance on foreign products. Subsequent studies can delve deeper into each industry to better understand their potential and challenges.

Despite our notable findings, we should acknowledge any limitations in this study, opening valuable avenues for future studies. Ultimately, since this study merely focuses on the impact of electricity and broadband development on the progress of five priority industries in Indonesia, future research can explore the potential implications by investigating the specific impact of IoT adoption on productivity and efficiency across various scales of industries. This could include case studies on how IoT integration has optimized production processes, reduced waste, and increased overall output. The second potential is to evaluate the economic and environmental impacts of increased industrial production driven by digitalization. This could include assessing the balance between economic growth and environmental sustainability and identifying best practices for minimizing environmental negative impact while maximizing economic benefits.

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