

Sustainability and Economic Transformation- Emerging Issues and Policy Options in Nigeria

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Abstract: The study examined the effect of infrastructure innovation on industrialization in Nigeria. The specific objectives are to: (i) Assess the effect of infrastructure innovation (internet penetration) on industrialization in Nigeria; (ii) Examine the effect of domestic credit to the private sector on industrialization in Nigeria. The country was selected as a case study because it is the biggest economy in Africa. The study used the annual time series data for the period from 2000 to 2025. The base year 2000 marked when the country liberalized its telecommunication sector. The proposed study adopts the ex-post facto design, which is deemed appropriate for investigating relationships among macroeconomic variables through the use of historical data. Most existing studies have focused on traditional infrastructure such as electricity, transportation, and telecommunications without isolating the contribution of digital infrastructure to manufacturing sector performance. The study therefore focused on the role of infrastructure innovation, particularly internet penetration, in driving industrialization. The study is based on secondary quantitative data sourced from reliable databases at both the national and international levels. Data were sourced from the World Bank, World Development Indicators, Statistical Bulletin of the Central Bank of Nigeria and the National Bureau of Statistics. This study is anchored on the Endogenous Growth Theory postulated by Paul Romer (1990) and Robert Lucas (1988). From the results of the ARDL approach, industrialization is significantly influenced by its past performance, as shown by the highly significant lagged term of the manufacturing value added. The impact of internet penetration and trade openness on manufacturing value added is positive, but not statistically significant. Credit to the private sector has very little impact on industrialization and is non-significant and negative. This suggests that positive changes in digital and trade policy frameworks may not be sufficient for industrialization growth. Thus, policy makers should concentrate on industrial capabilities, financing of manufacturing and technology adoption in industries.

Key words : Infrastructure innovation, Industrialization, Internet penetration, Credit to private sector, Endogenous growth model.

Introduction

1.1 Background to the Study

Africa's development has been widely discussed recently, and much attention has been devoted to how the continent can diversify away from dependency on its rich resource endowment and build a more advanced industrial sector. The continent's natural wealth and growing population offer huge potential, but Africa continues to suffer from structural problems, including low industrial output, unemployment and low integration in international value chains. One of the reasons for this problem is the slow industrialisation process, which has made it difficult for many countries on the continent to enjoy sustainable growth. Dani Rodrik (2016) says that developing countries are now suffering from premature deindustrialisation, and it is impossible to grow through manufacturing.

The main reason for this situation is the poor infrastructure. Infrastructure (transport, energy and communication facilities) plays an important role in economic activities as it facilitates production, reduces costs and connects markets. But in most cases in Africa, most of the countries have infrastructural facilities which are inadequate and inefficient. This makes it expensive for businesses to do business and hinders the development of industries. Calderón César and Luis Servén (2010) found that infrastructure improvements increase productivity and economic performance. In addition to the infrastructure itself, there is now also more awareness about innovation in infrastructure in the form of digitisation. The internet is growing hand in hand with mobile communication and digital platforms, creating many possibilities for African economies to move fast in their development process and skip some traditional phases of their industrial development. According to Carlota Perez (2002), technology can act as a catalyst for the transformation of the whole economic system and create new development opportunities. In this regard, digital infrastructure can be regarded as a tool to foster the current industrialisation processes through efficient management and enhanced productivity. Industrialisation is a necessary component of any economic transformation in Africa. Industrialisation causes the economy to shift to more productive processes of manufacturing. This generates jobs and higher income levels. But the fact is that the condition of the industry in many African countries, including Nigeria, is not good. Industrialisation has a very small impact on GDP and does not show a stable pattern of growth.

This means that one faces a major challenge because although investments in infrastructure are growing, the performance of the industry does not improve as expected. This means that infrastructure is not important by itself. What matters is the nature of innovation and the efficiency of the infrastructure in relation to the needs of modern industries. Innovation is necessary to achieve the intended effect of

industrialisation through infrastructure. The paper focuses on innovation in infrastructure as a driver of industrialisation with emphasis on Nigeria in particular, based on the above discussion. The main objective of this paper is to determine the influence of digital infrastructure on manufacturing industries' performance, in addition to the effects of investment and financial development. The study seeks to answer the following questions: What is the effect of infrastructure innovation on industrialisation? How does investment influence industrial performance? And what role does financial development play in supporting industrialisation?

The importance of this research work is that it provides ideas on how West Africa can better utilise its infrastructures and technologies for the purpose of creating sustainable economic development. The study gives information on how Nigerians can benefit from the link between innovation and industrialisation.

1.2 Statement of the Problem

In ideal conditions, technological innovations and infrastructure improvements should promote industrialisation and productivity growth and therefore economic development. Hence, the Nigerian government has introduced several policy initiatives on infrastructure investments such as transportation, energy and digital infrastructure development to boost industrialisation. All this notwithstanding, the outcomes of industrialisation have not been favourable. The contribution of the manufacturing sector to GDP has not improved due to a lack of any significant technological innovations and productivity growth. Previous research has been largely concentrated on the relationship between infrastructure and economic growth, but has neglected the effect of innovation in infrastructure, such as digital infrastructure, on industrial performance. The above research gaps are the lack of understanding of why there has been a poor relationship between infrastructure investments and industrialisation, and why there has been poor industrialisation despite having initiated policies, and how innovation in infrastructure can be used to improve industrial performance.

Knowledge Gap : few studies have specifically examined the role of infrastructure innovation, particularly internet penetration, in driving industrialization. Most existing studies have focused on traditional infrastructure such as electricity, transportation, and telecommunications without isolating the contribution of digital infrastructure to manufacturing sector performance.

1.3 Objectives of the Study

The main objective of this study is to examine the effect of infrastructure innovation on industrialisation in Nigeria.

The specific objectives are to:

1. Assess the effect of infrastructure innovation (internet penetration) on industrialisation in Nigeria;
2. Examine the effect of domestic credit to the private sector on industrialisation in Nigeria.

1.4 Research Hypotheses

In line with the objectives of the study, the following null hypotheses are formulated for empirical testing:

H₀₁: Infrastructure innovation has no significant effect on industrialisation in Nigeria.

H₀₂: Domestic credit to the private sector has no significant effect on industrialisation in Nigeria.

1.5 Scope of the Study

The study examines the impact of infrastructure innovations on industrialisation in Nigeria. It examines the impact of digital infrastructure innovation on the performance of manufacturing firms and economic development in general. The country was selected as a case study because it is the biggest economy in Africa; however, it still struggles with industrialisation despite its efforts in infrastructure development. The study used the annual time series data for the period from 2000 to 2025. 2000 was selected as the base year since this was when the country liberalised its telecommunication sector and embarked on massive development of digital infrastructure. 2025 will be selected because this is the most recent data we have. The variables considered are infrastructure innovations, industrialisation, investment and financial development. Trade openness is used as the control variable.

2. Review of Related Literature

2.1 Conceptual Review

2.1.1 Concept of Innovation in Infrastructure

Innovation in infrastructure is the process of applying new technologies, systems and processes in the delivery of infrastructure services. Innovation is much more than physical expansion. Using digital technology in infrastructure systems can improve efficiency and productivity. Carlota Perez (2002) points out that technological innovation in infrastructure enables structural change by implementing new production systems. The digital infrastructure consists of internet connections, broadband services, and mobile networks that enable communication and business activities. Digital infrastructure makes information more accessible, reduces transaction costs and enables innovations in production processes. The physical infrastructure comprises traditional infrastructure systems such as energy supply, transport systems, and logistics infrastructure that enable smooth industrial production and distribution processes.

2.1.2 Concept of Industrialisation

Industrialisation is an economic transition from agriculture to manufacturing. Industrialisation means the growth of industries, the increase in production capacity and the manufacturing sector's share in the total output of an economy. According to Walt Rostow (1960), industrialisation is one of the major steps in economic development through which economies move into high productivity activities. The development of the manufacturing sector is very important in the process of industrialisation as it creates jobs, increases the capacity for export and technology. Value addition and productivity are indicators of the extent to which natural resources are converted into more valuable products.

2.1.3 Linkages between infrastructure innovation and industrialisation

The link between infrastructure innovation and industrialisation can be found in the idea that infrastructure is the foundation of change. Better infrastructure makes production processes more efficient, cost structures lower, and markets more integrated. In this sense, innovation in infrastructure, especially in digital infrastructure, becomes the engine for the development of industries as firms become able to use advanced technologies.

The linkage can be summarised as:

Infrastructure Innovation → Industrialisation → Economic Transformation

Thus, successful infrastructure development translates into better industrial performance, which in turn drives broader economic transformation through diversification, job creation and sustained growth.

2.2 Theoretical Review

The research relies on theories of how innovations, capital formation and structural change can contribute to industrialisation and sustainable economic transformation. The theory focuses on those theories that can best describe the contribution of infrastructure innovations in influencing the industrialisation performance in developing countries like Nigeria.

2.2.1 Endogenous Growth Theory

The theory is based on the works of Paul Romer (1986, 1990) and Robert Lucas (1988). The endogenous growth theory accounts for the long-term economic growth as a consequence of the factors which are embedded in the economy itself, such as innovation, human capital, knowledge and technology. The theory posits that investment in these factors generates increasing returns and economic growth. This theory is important for the present research because it focuses on innovation and technology as the fundamental sources of productivity growth. Innovation in infrastructure, in particular digital infrastructure such as Internet connectivity and broadband access, raises the efficiency of the economy, lowers transaction costs, and helps to coordinate production.

2.2.2 Structural Change Theory

Also, this study uses structural change theory, which was developed by W. Arthur Lewis in 1954. According to the theory of structural change, economic development is achieved by the reallocation of labour and resources from traditional sectors with lower productivity to industrial sectors with higher productivity. This movement of labour and resources is important for economic development. The present study shows the way infrastructure development enables industrialisation through sectoral shift, productivity improvement and expansion of manufacturing capacity by the theory of structural change. However, such transformation is often very slow in many developing countries, including Nigeria, due to a lack of necessary infrastructure and technology. Both theories are very useful for the analysis of the issue under discussion in this study. The endogenous growth theory indicates that innovation and technological infrastructure stimulate productivity and industrialisation, and the structural change theory shows the necessary sectoral transformation. So the theories offer a possibility to explain the effect of infrastructure innovation on industrialisation.

2.3 Empirical Review

The empirical literature on infrastructure and industrialisation exposes contradicting as well as congruent findings on the role of infrastructure development and innovations in the determination of industrial performance. One of the first global research works by Calderón César and Luis Servén (2010) explored the quantity and quality of infrastructure (electricity, roads and telecommunication) and their impact on the output in the manufacturing sector and GDP growth rate by using cross-country panel data from 1960 to 2005 for developing countries. The research work using the Generalised Method of Moments (GMM) approach found that infrastructure stock has a positive contribution to industrial performance and long-run economic growth. The study showed that infrastructure development is an important engine of structural transformation. However, it paid less attention to digital innovations than to physical infrastructure development, undermining its relevance in today's industrial dynamics. It supports the present study with respect to infrastructure development, but not the innovation variable.

Similarly, Caleb O. Odhiambo (2013) examined the effect of infrastructure development on industrial growth using Kenya's time series data from 1980 to 2010 and employing the Vector Error Correction Model (VECM) approach. The research variables were electricity consumption, transport infrastructure and manufacturing production.

Findings revealed a positive long-run relationship between infrastructure and industrialisation. The results show the importance of infrastructure for industrial growth, but they do not include the digital side of infrastructure, and therefore, the study is less relevant for innovation-based economies. The present study is similar to this research by

providing evidence of the infrastructure-industrialisation connection, but it differs in methodology and scope of the study.

O. Akinwale Y. (2018) examined the nexus between infrastructure development and industrial efficiency in Nigeria with annual data covering the period 1981 to 2016 in Africa. The inputs for the ARDL method include electricity, transportation infrastructure, and manufacturing productivity. This indicated that the efficiency of the industry is positively related to infrastructure development. The author concluded that poor infrastructure development is the major barrier to industrialisation in Nigeria. However, the main focus of the research was traditional infrastructure without taking into account any innovative aspects. Evidence for this is found in E. K. Ogunleye's research (2020).

The paper analyses the impact of telecommunications infrastructure on industrial performance in Nigeria using data from 2001 to 2018. The study used OLS regression. The results reveal that the internet penetration has positive effects on manufacturing productivity and industrial output.

It is observed that digital infrastructure has become more and more relevant for modern-day industrialisation. This finding supports the present study and confirms the importance of infrastructure innovation, although the present study does not consider macroeconomic control variables such as investment and finance. A common theme among the different literatures we have looked at is the importance of infrastructure for the process of industrialisation. The main distinction among various literatures is that while global and African literatures are centred on traditional infrastructure, recent Nigerian literatures are centred on digital infrastructure. The main limitation discovered is the omission of infrastructure innovation, investment and finance into a single model. Further, there is a lack of recent research works in the subject matter up to the year 2025.

3. Methodology

3.1 Research Design

The proposed study adopts the ex-post facto design, which is deemed appropriate for investigating relationships among macroeconomic variables through the use of historical data and without manipulation of the variables. As mentioned by Kerlinger, Fred N. (2000), the ex post facto research design is the most suitable in situations where it would not be feasible to control the variables being studied but observe their occurrence naturally. Similarly, Creswell John W. (2014) states that the research design is typical of quantitative economic research based on secondary data. The research design is suitable for the present study as infrastructure innovation and industrialisation are long-term economic processes and can only be examined on the basis of existing data.

3.2 Nature and Source of Data

The study is based on secondary quantitative data sourced from reliable databases at both the national and international levels. These are time series data from the year 2000 to the year 2025. Data are sourced from the World Bank, World Development Indicators, Statistical Bulletin of the Central Bank of Nigeria and the National Bureau of Statistics. Gujarati, Damodar N. (2009) says that secondary time series data are ideal for macroeconomic econometric analyses.

3.3 Theoretical Framework

This study is based on the Endogenous Growth Theory postulated by Paul Romer (1990) and Robert Lucas (1988). This theory assumes that economic growth comes from internal processes such as innovation, knowledge and capital formation, where technology is important in increasing productivity. The theory further assumes increasing returns to scale in the long run as a result of the spill-over effect of human capital and technological progress. It suggests that policy measures and investments in infrastructure may permanently change the growth path.

4.0 Data Presentation and Analysis

The unit root test was conducted using the Augmented Dickey-Fuller (ADF) test to determine the stationary properties of the variables employed in the study. Stationary testing is essential because regression involving non-stationary variables may produce spurious results, thereby invalidating statistical inferences.

4.1 Unit Root Test

Table 4.1 Unit Root Test Table

Variable	ADF-STAT	5% Critical	Order of Dif	Condition
MAN	-3.873797	-1.956406	1(1)	stationary
INT-P	-3.195018	-3.0048	1(1)	stationary
DCPS	-3.5524	-3.02069	1(1)	stationary
TOP	-5.1584	-1.9572	1(1)	stationary

Source : Researchers E-view output.

The results reveal that the absolute values of the ADF statistics for all variables exceed their respective 5 percent critical values after first differencing. Specifically, Manufacturing Value Added (MAN) recorded an ADF statistic of -3.8738, which is more negative than the critical value of -1.9564. Similarly, Internet Penetration (INT-P), Domestic Credit to Private Sector (DCPS), and Trade Openness (TOP) recorded ADF

statistics of -3.1950, -3.5524, and -5.1584 respectively, all exceeding their corresponding critical values in absolute terms.

Consequently, the null hypothesis of a unit root is rejected for all variables at first difference. This indicates that the variables are non-stationary at levels but become stationary after first differencing. Therefore, all variables are integrated of order one, denoted as $I(1)$.

The implication of this result is that the variables exhibit long-run stochastic trends and may potentially move together over time. Since none of the variables is integrated of order two, $I(2)$, the dataset satisfies the fundamental requirement for applying co-integration techniques that accommodate a mixture of $I(0)$ and $I(1)$ variables.

4.2 Test of Hypotheses

The model examines the effects of Internet Penetration (INT_PETN), Credit to Private Sector (CPS), and Trade Openness (TOP) on Manufacturing Value Added (MVADD), which serves as a proxy for industrialization.

Table 4.2 ARDL Table

Dependent Variable: MVADD				
Method: ARDL				
Variable	Coefficient t	Std. Error	t-Statistic	Prob.*
MVADD(-1)	0.920513	0.156730	5.873249	0.0000
INT_PETN	0.041650	0.031945	1.303784	0.2097
CPS	-0.001253	0.061828	-0.020270	0.9841
TOP	1.95E-11	1.82E-11	1.074881	0.2974
C	-0.179671	2.385577	-0.075315	0.9408
R-squared	0.834391	Mean dependent var		9.256052
Adjusted R-squared	0.795424	S.D. dependent var		1.692357
S.E. of regression	0.765454	Akaike info criterion		2.500021
Sum squared resid	9.960637	Schwarz criterion		2.747985
Log likelihood	-22.50023	Hannan-Quinn criter.		2.558434
F-statistic	21.41287	Durbin-Watson stat		2.233910
Prob(F-statistic)	0.000002			

Source : Researchers E-view output.

The ARDL(1,0,0,0) model selected by the Akaike Information Criterion (AIC) indicates that only the dependent variable required a lag structure, while the explanatory variables exert contemporaneous effects.

The coefficient of determination ($R^2 = 0.8344$) indicates that about 83.44 percent of variation in the value added in the manufacturing industry can be jointly attributed to internet penetration, private credit, trade openness and the value of manufacturing value added in the previous period. The adjusted R-squared is 79.54 per cent.

The overall model is statistically significant with an F-statistic of 21.4129 and a probability value of 0.000002. Thus, the explanatory variables as a group exert a significant impact on manufacturing value added. The model is well specified, with a Durbin-Watson statistic of 2.2339, so there are no major autocorrelation issues in the model. The MVADD(-1) = 0.9205 coefficient is statistically positive and significant at the 1% level ($p = 0.0000$). It means that past manufacturing performance has a large effect on current manufacturing performance. In other words, a 1% increase in the manufacturing value added of the past years leads to about a 0.92% increase in the manufacturing value added of the current year, holding other variables constant. The high coefficient shows that there is quite a lot of persistence and inertia in the manufacturing sector. Industrial growth depends on the productive capacity, infrastructure, technology and accumulation of investments. In this respect, the result is consistent with the theory of endogenous growth that explains growth in terms of capital accumulation and technological change. INT_PETN has a coefficient of 0.0417, which is statistically positive but insignificant ($p = 0.2097$).

The positive sign indicates that as the Internet penetration increases, the manufacturing value added is likely to increase. In this case, each 1 unit increase in Internet penetration will increase by about 0.042 in manufacturing value added. However, the effect is not statistically significant as the probability value is greater than the conventional 5% significance level.

This suggests that, although digital technologies can support industrial growth through effective communication, automation, access to markets and information, their effect on the period under review was small enough to produce a statistically significant effect on the manufacturing performance. That could be because most developing countries have Internet penetration limited to urban centres and may not have been integrated into the industrial production process.

Coefficient of CPS is negative and statistically insignificant ($p=0.9841$) with a value of -0.0013. The negative coefficient implies that an increase in private sector credit is associated with a small decrease in manufacturing value added. However, this coefficient is practically equal to zero and statistically highly insignificant. That is, the funds

allocated in the economy may not go to productive manufacturing activities, but may be concentrated somewhere else.

The findings also suggest that credit availability alone may not be sufficient to spur industrial growth unless there is effective financial intermediation, a conducive lending environment and the availability of industrial financing in the long term. The coefficient on TOP = 1.95E-11 is positive but statistically insignificant ($p = 0.2974$). The positive coefficient indicates that openness to trade positively influences the value added in manufacturing. However, the positive effect of the openness to trade is very small and statistically insignificant. This suggests that the gains from openness to trade have not been translated into industrial growth.

This may be because more openness has meant more competition from foreign firms and thus less scope for gains from trade. The results suggest that openness to trade per se is not sufficient for engendering industrial growth. For the growth of the industries, other policies like industrial protection, export promotion, technological advancement, infrastructural development, etc., are needed.

4.3 Discussion of the Findings

Based on the research findings, it can be seen that the industrialization or manufacturing value added is mostly determined by the past performance of industrialisation itself, based on the positive coefficient of the lagged manufacturing value added variable, which is statistically significant. The result shows that there is strong persistence of manufacturing value added, and it also shows that the past level of industrial performance has a great impact on the current industrial performance. The findings are consistent with Endogenous Growth Theory introduced by Romer (1986), which states that economic and industrial growth is determined by the accumulation of knowledge, technological change, development of human capital and past investments in an economy. The theory posits that a past production activity generates learning and technology externalities that increase industrial productivity. It also aligns with the Growth Laws proposed by Kaldor (1967), which highlight the significance of the manufacturing sector in stimulating economic growth and achieving increasing returns to scale. Lagged manufacturing value added is significant, and therefore, it implies that industrial development is a process that is cumulative in nature.

This conclusion is consistent with the findings of Rodrik (2013), who argued that industrialisation has a path dependence, implying that countries that already have manufacturing industries have a high probability of further industrialisation. Szirmai (2012) has also argued that manufacturing remains one of the most important drivers of economic transformation because of its potential for productivity gains, technological innovation and job creation.

The empirical analysis conducted shows that internet use has a positive but insignificant effect on the manufacturing value added. The positive coefficient of this variable means that improved communication and information provision as a result of advanced IT infrastructures can contribute to industrial development by increasing production and marketing efficiency. This finding supports the Technology Diffusion Theory, according to which the ICTs offer an opportunity for knowledge diffusion.

This result is also consistent with the Endogenous Growth Theory, which considers technological progress as an important variable in the determination of economic and industrial growth in the long term. However, low penetration of the internet indicates that internet technology may not be adequate in driving growth in the industry as a result of inadequate use of digital technology in the production process, low production of electricity, low digital literacy and digital capacity among others. This is consistent with the findings of Stanley, Doucouliagos & Steel (2018) who found that ICT investments are only effective in raising productivity when there are investments in skills, infrastructure and institutions. Adeleye & Eboagu (2019) also showed that the relationship between economic performance and internet penetration in Africa is positive but constrained by structural and institutional constraints. Furthermore, private sector domestic credit has a negative, but statistically insignificant, impact on value added in the manufacturing sector. The above result, however, goes against the theory of financial intermediation of McKinnon (1973) and Shaw (1973). The theory is that an efficient financial system encourages savings and channels credit into productive investment, leading to industrialisation and growth.

The lack of significance of the relationship between credit supplied by the financial system and value added in manufacturing could be due to the diversion of financial resources from manufacturing to less productive ventures. However, this result supports the conclusion reached by Beck, Demirgüç-Kunt and Levine (2005), who stated that the relationship between financial development and growth is only possible if there is an efficient distribution of credit and affordable credit to productive firms. Most of the manufacturing firms in the developing countries are facing problems in access to bank credit due to high costs, collateral, and a lack of long-term loans. So, a high level of total private credit does not necessarily mean manufacturing growth.

Another observation from the above research is supported by Akinlo and Egbetunde (2010), who observed low connections between financial development and growth in the manufacturing industries in some African countries due to the inefficiency in the financial sector. Moreover, openness to international business was positively (but not statistically significantly) associated with the value added in manufacturing. The positive

coefficient is in line with the Comparative Advantage Theory of Ricardo (1817) and the Export-Led Growth Hypothesis that suggests that international openness leads to specialisation, technology transfer, productivity improvements and industrialisation. This is achieved through international business in which local businesses are able to enter bigger markets, better technologies and foreign investments.

This study is consistent with the assertions of Chang (2002), who argued that developing nations need supporting industrial policies and infant industry protection for their full benefit from international business transactions. Similarly, Rodrik (2008) found that trade openness is associated with positive industrial effects only when there are good institutions, adequate infrastructure, technology and healthy competition among domestic firms. This result is also consistent with the findings of Iyoha & Okim (2017) that openness to trade does not have substantial impacts on the industrialisation of many economies in Africa due to an uncompetitive manufacturing sector and high dependence on imports. The findings of the analysis indicate that, while digital infrastructure, financial development and trade openness are important factors in the industrialisation process, their roles can be limited without supportive industrial policies, technological capability, effective financial intermediation and a conducive business environment. Dominance of the lagged manufacturing sector reveals that the industrialisation process in developing economies is largely determined by productive capacities and past achievements of industries.

Therefore, the government needs to focus on improving the industrial base by improving financing for manufacturing industries, increasing technology usage and improving the competitiveness of local industries to enable the digital revolution, financial sector reform and trade openness to foster industrial growth.

4.4 Conclusion

From the results of the ARDL approach, industrialisation is significantly influenced by its past performance, as shown by the highly significant lagged term of the manufacturing value added. The impact of internet penetration and trade openness on manufacturing value added is positive, but not statistically significant. Credit to the private sector has very little impact on industrialisation and is non-significant and negative. This suggests that positive changes in digital and trade policy frameworks may not be sufficient for industrialisation growth. Thus, policy makers should concentrate on industrial capabilities, financing of manufacturing and technology adoption in industries.

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