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Review

Labor-intensive focused industrial policy in Ethiopia: Potentials, latecomer's advantage and binding constraints

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This study deals with industrial policy, an issue that has been hotly debated in economic development. It argues that strategic and proactive industrial policy is a key to unlock the potential and wade through industrialization for low-income countries such as Ethiopia where market failures are pervasive. More specifically, it argues that industrial policy should be tailored to factors endowment structure. In the case of Ethiopia, as its economic structure is yet to transform substantially from agriculture to manufacturing, the current policy focus should be on labor-intensive sectors. Using the analytical framework of new structural economics supported with the primary survey data covering 80 manufacturing firms and secondary data sources, a comprehensive analysis has been conducted to explore the potentials, latecomer's advantages, and the binding constraints of labor-intensive manufacturing industries in Ethiopia. Accordingly, it proposes five policy domains to unlock the labor-intensive manufacturing potentials of Ethiopia: Facilitating the linkage between agriculture and manufacturing industry along the value chain; fostering industrial park and cluster-based industrial development; strengthening the cooperation between government and the private sector; improving doing business environment; enhancing the industrial upgrading and diversification along with the changing endowment structure.

Key words: Industrial policy, industrialization, labor-intensive manufacturing, structural transformation.

INTRODUCTION

A journey from poverty to prosperity requires successful structural transformation along the process. A structural transformation from low to high productive sectors is vital in achieving sustained economic development (Chenery, 1979; Syrquin, 1988). To this end, manufacturing has played an engine role for economic growth, structural change, and catch-up (Sugihara, 2007). Indeed, industrialization is the central process of growth and transformation in developing countries (Syrquin, 1988). However, successful industrialization requires proactive industrial policy to facilitate the structural transformation and to remove the bottlenecks for industries to become competitive in domestic and international markets (Lin, 2014). Nevertheless, industrial policy is one of the hotly

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debated and controversial issues in economic development (Di Maio, 2014). The industrial policy debates and practices have experienced ups and downs over time, from overall consensus on its merits during the mercantilism phase in the 16th to 18th centuries and the period of structuralism of import-substitution strategy in the 1950s and 1970s, to outright rejection in the 1980s and 1990s of neo-liberal prescriptions (Altenburg, 2011). More recently, the failure of the neoliberal alternative in developing countries coupled with the East Asian countries' late industrialization successes, has brought the industrial policy back into the development agenda (Lin, 2012; Noman and Stiglitz, 2012; Lin and Monga, 2013). The 2008 global financial crises in the developed countries, mainly caused by the laissez-faire policies also contributed to the revitalization of the industrial policy (Wade, 2015).

The New Structural Economics (NSE) proposed and advocated by Professor Justin Lin, has emerged as the new development thinking. According to the NSE, both a facilitator state and an efficient market is vital for successful economic development. It proposes an industrial policy that targets industries having a latent comparative advantage at present, and facilitating the industrial upgrading along with the factor endowment changes of a country (Lin, 2012; Lin, 2014; Lin and Monga, 2017). Moreover, it proposes the Growth Identification and Facilitation (GIF) Framework that helps policymakers in developing countries to identify the industries with latent comparative advantages and suggest ways to remove the binding constraints for those industries' development (Lin, 2012).

From a practical perspective, the post-World War II industrialization process is characterized by the sharp contrast of the miracle economic development successes of the East Asian countries and the failures in Sub Sharan Countries (SSA) (Carbonnier et al., 2010). The most significant factor that explains East Asia's development success was its manufacturing-driven dynamic structural transformation (Felipe, 2018). On the contrary, SSA countries experienced premature deindustrialization, which is mainly characterized by the stagnation or the decline of the manufacturing growth at the earlier stage of countries' development before reaching its expected level (Rodrik, 2016). Consequently, many people in SSA are still living under the poverty line. World Bank (2018b), in its report on poverty and shared prosperity, reveals that while the average poverty rate for other regions stood below 13% in 2015, it remained at about 41% in SSA. However, African countries do hold a lot of human and material potential that would enable them to compete favorably with the rest of the world if they follow proper policies (Nzau, 2010). Proactive policy formulation and implementation, such as facilitating the growth of unskilled labor-intensive industries, is necessary to transform SSA countries' economies (Stiglitz et al., 2013).

Ethiopia has registered rapid economic growth (10.6% annual average from 2004 to 2017) after centuries of stagnation and steady decline (World Bank, 2018a). Despite such promising achievements, the economy has been challenged by macroeconomic imbalance such as inflation, debt burden, shortage of foreign currency and unemployment (Ethiopian National Planning Commission (ENPC), 2018). The economy also has not yet experienced a structural change from low to high productive economic sectors. The contribution of the manufacturing sector to the GDP is very low (only 6.3% in 2017), which is lower than 10% of the SSA average in 2017 (World Bank, 2018a).

The government has formulated and implemented a labor-intensive focused and export-oriented industrial strategy since 2004. Textile, leather, and agro-processing are the major targeted manufacturing sectors selected in the strategy. Based on these policy directions, the government envisioned "to become a light manufacturing hub in Africa in 2025" (ENPC, 2016b, p. 82). It has invested in industrial park development and other infrastructure to foster the industrialization process. Despite all these efforts, the performance so far is below the aspirations and targets of the government.

The issue is one of the least researched areas despite the attempts of some researchers. Oqubay (2015) had a comprehensive study on the industrial policy in Ethiopia, and he concludes that the industrial policy outcomes have been distantly uneven. According to him, the policy has produced better outcomes in the flower industry and weak outcomes in the leather due to industry-specific factors, the varying scope for linkage effects in different sectors, and the disparity in political commitment. Gebreeyesus (2016) also states that there is a better industrial policy outcome on the flower industry than on the leather and textile industries, which were selected by the government as strategic sectors, and he associated the performance difference with the strategic selection of the sectors. Altenburg (2010), on the other hand, associated the performance difference between the flower and leather sectors are due to the nature of the sectors and recommended different types of policy interventions. The existing researches, therefore, have a gap in analyzing the feasibility of the labor-intensive focused industrial development strategy of Ethiopia in comprehensive way. The feasibility of the labor-intensive focused industrial policy direction to transform the Ethiopian is not well researched issue.

Thus, this study is aimed to answer three research questions: does Ethiopia have the potentials and latecomer's advantage to be competitive in labor-intensive light manufacturing industries? what are the binding constraints that affect the performance of the manufacturing firms? how does the government perform in formulating and implementing the industrial policy to unlock the potentials and overcome the binding constraints?

LITERATURE REVIEW

The study reviews the main theoretical and empirical literature related to the research issue. Literature on definition and scope of industrial policy, debates and theoretical justifications of industrial policy and labor-intensive industrialization pathway were briefly reviewed.

Definition and scope of industrial policy

There is no common and agreed definition of industrial policy among scholars. Some of them define it narrowly as the tool of the industry sector development. According to Robinson (2009), industrial policy is "the government's deliberate attempt to promote industry" (p. 62). For Pitelis (2006), industrial policy is "a set of measures taken by a government and aiming at influencing a country's industrial performance towards the desired objective" (p. 435).

Some others define it as the tool of structural transformation of the economy. For example, Noland and Pack (2003) defines industrial policy as "an effort by the government to alter the sectoral structure of production towards sectors it believes offer greater prospects for accelerated growth than would be generated by the typical process of industrial evolution according to static comparative advantage" (p.10). Others define industrial policy broadly as the tool of structural transformation and business environment improvements. Among these, Warwick (2013) adopts the definition of Pack and Saggi (2006) and defines industrial policy as "any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention" (p. 19). This study uses the industrial policy definition of Warwick by taking into consideration the pervasive market failure that hinders structural change and the presence of poor business environment in low-income countries like Ethiopia.

In terms of scope, different kinds of literature categorized industrial policy into two types, namely horizontal/functional and vertical/selective. While horizontal policies dealt with the operation of markets in general, selective industrial policies aimed to promote certain industries and firms over others (UNCTAD, 2016). Horizontal or functional industrial policy is the provision of inputs that can be utilized by firms across different sectors, such as transport infrastructure for transport and other services (Felipe, 2015). Nevertheless, several authors have argued that the distinction between functional and selective industrial policy might be less relevant than what the literature has suggested, as "even the most 'general' policy measures favor some sectors over others" (Salazar-Xirinachs et al., 2014:20; Rodrik, 2008).

Debates and theoretical justifications of industrial policy

The debates for and against the industrial policy are highly linked with the issues of market failure and government failure. While the proponents of the industrial policy argue market failure as their justifications, the opponents argue government failure as the base of their arguments. Apart from the oldest argument of the infant industry, there are three specific arguments in favor of an industrial policy that constitute the main theoretical justifications namely dynamic scale economies and knowledge spillovers; coordination failures; and informational externalities (Pack and Saggi, 2006).

On the other hand, the opponents of industrial policy justified government failure as the bases of their argument. As it is reviewed by Di Maio (2014), in most of the literature, two main arguments are presented against the industrial policy. The first is that the government has no better information to intervene effectively and to select better sectors or activities. The second is related to rent-seeking and corruption behavior and activities of the government officials.

By taking these debates and controversies, different authors have categorized the stands into three major theoretical approaches of industrial policy. According to Cohen (2006), in addition to the two mainstream approaches, that is, structuralist approaches and neoclassical approaches, a pragmatic approach inspired by new growth and development theories has emerged as the third category of industrial policy theoretical approach.

Structuralist approach

This approach justifies and favors the intervention of the government to overcome the pervasive market failures in developing countries. Government intervention justified mainly through the infant industry argument, which is associated with trade protection. From the structuralist perspective, "both functional and selective interventions are needed to promote development, and that governments are capable of carrying them out" (Kosacoff and Ramos, 1999, P. 46). The structuralist approach proposes an industrial policy that focuses on capital-intensive industries. After independence, most of the leaders in Africa and other least developed countries aspired to catch up with the developed nations. To that end, they engaged in heavy and capital-intensive industries in the 1950s and 1960s based on the import-substitution strategies of structuralism. However, the strategy failed to achieve sustained growth, while it

consumed limited domestic resources and increased foreign debt, thereby significantly affecting the long-term development of the countries (Lin, 2012, Noman and Stiglitz, 2012).

Neoclassical approach

This approach proposes market mechanisms as the best instrument to solve market failures and alleges government failures to justify its minimalist state prescriptions. As it is explained by Kosacoff and Ramos (1999), the neoclassical approach assumes that “markets are perfect and lead to optimal resource allocation, thereby leading to the maximization of growth” (p. 46). This approach believes structural transformation would take place automatically without the intervention of the government (UNICTAD, 2016). The neoclassical economists strongly oppose the sectoral or vertical industrial policy. As it is mentioned by Cohen (2006) their criticism against sectoral industrial policies is that “the state has neither the necessary information nor adequate incentives to make better choices than the market” (p. 88).

Privatization, liberalization, and deregulation were among the "Washington Consensus” prescriptions implemented in Africa and other developing countries in the 1980s and 1990s. Nevertheless, none of the prescriptions were successful in achieving sustained and long-term economic development in most of the developing countries (Rodrik, 2008; Noman and Stiglitz; 2012; Linand Monga, 2013; Wade, 1990). Most of the SSA countries’ economies have not shown any structural transformations from low productivity sectors to higher ones. Instead, their economy is mainly characterized by premature deindustrialization as it is defined by Rodrik (2016, p. 2) as “turning into service economies without having gone through a proper experience of industrialization". Consequently, many people (41%) in SSA are still living under the poverty line (World Bank, 2018b).

Pragmatic approach

This was initiated based on the new growth and development theories, which advocates the necessity of striking a balance between the role of government and the market (Primi and Peres, 2009). The ‘information externality’ argument of Ricardo, Hausmann and Dani Rodrik (2002) is among these justifications. New Structural Economics (NSE) is also one of the newly emerged development thinking.

NSE is a framework of “rethinking economic development and industrial policy based on the analysis of the nature of modern economic growth” (Lin, 2014, p. 54). It postulates that sustained economic development is the result of changes in factor endowments (given at a time and changeable over time) and continuous technological innovation (Lin, 2012). Structural transformation in developing countries requires “the upgrading of the factor endowment structure from one that is relatively abundant in labor and natural resources to one that is relatively unabundant in the capital, the introduction of new technologies, and the corresponding improvement in infrastructure to facilitate economic operations” (Lin, 2012, p. 7).

According to the NSE, both a facilitator state and an efficient market are vital for successful economic development. An efficient market is essential for coming up with relative prices that can reflect the relative abundances of factor endowments, and a facilitating state is essential for rapid industrial upgrading, economic diversification, and technological innovation because of the need to address externalities and solve coordination problems (Lin, 2012). For such a facilitating state, industrial policy is a useful instrument for prioritizing the use of limited government resources. NSE acknowledges the contribution of the industrial policy in modern economic development both in history and in the present. Lin (2014) argues that “all countries that have transformed their economy have had governments that played a proactive role in assisting individual firms in overcoming the binding constraints” (p. 52). Hence, NSE justified industrial policy as a useful instrument for such a facilitating state and proposed an industrial policy that targets industries that have a latent comparative advantage at present and facilitating the industrial upgrading (Lin, 2012; Lin, 2014; Lin and Monga, 2017). According to Lin (2014), latent comparative advantage refers to “an industry in which the economy has low factor costs of production, but the transaction costs are too high, due to inadequate soft and hard infrastructure, to be competitive in domestic and international markets” (p. 62).

However, there are critics on the comparative advantage conforming industrial policy approach of the NSE. For instance, Chang in the debate with Justin Lin argued that state intervention should not just be about facilitating the exploitation of a country’s comparative advantage, but the comparative advantage should be merely used as the baseline and that a country needs to upgrade its industry (Lin and Chang, 2009). Although both Lin and Chang agreed that the government has to target strategic industries, they have differences in how the industries can be selected and which sectors can be targeted.

Labor-intensive focused industrialization pathway

The comparative advantage of a nation depends on its factor endowments. According to Case and Fair (2002) in Chari et al. (2013), "the Heckscher-Ohlin theorem

explains that the source of the comparative advantage of nations comes from its factor endowments" (p. 52). The principal goal of a nation is to produce a high and rising standard of living for its citizens, and the ability to do so depends on the productivity with which a nation's labor and capital are employed (Porter, 1990, p. 76). It is evident that developing countries are endowed with relatively abundant labor or natural resources but have relatively scarce capital (Lin and Monga, 2013). Thus, a developing country which is relatively endowed in labor resource has to focus on labor-intensive sectors and gradually has to shift to capital-intensive sectors to foster industrialization.

Different empirical studies clearly show that labor-intensive focused industrial policy is one of the success factors of the late industrialized nations. Sugihara (2007) argued that the East Asian late industrialization path is mainly a labor-intensive manufacturing pathway built on quality labor resources cultivated in the traditional sector. According to Dinh et al. (2012), "labor-intensive light manufacturing led the economic transformation of most of the successful developing countries". Labor-intensive light manufacturing industries, such as textiles and clothing, leather goods, agricultural processing, and woodworks have represented the leading edge in the industrialization process both historically and today (Dinh et al., 2013).

Labor-intensive manufacturing industries have received particular attention in China's post-1978 reform and opening-up program. Wen (2016) states that China's growth miracle since the 1978 reform is based on the notion of comparative advantage with the correct development strategy relying first on labor-intensive industries and shifting gradually to capital-intensive technologies. Sahoo and Bhunia (2014) conclude that the policy measure used to transfer its rural labor surplus into the town and village enterprises was one of the policy successes that drove China's rise as a manufacturing powerhouse. According to Brandt et al. (2016), "labor-intensive sectors like garments and beverages were designated by the government as competitive industries".

One of the remarkable features of China's economic development is its rural industrialization. In 1978, only 9.5% of the rural labor force was engaged in industrial activities, and only 7.6% of rural income originated from the non-farm sectors; by 1996, 29.8% of the rural labors were working in the local industry, and non-farm income accounted for 34.2% of total rural income (Lin and Yao, 2006). China has successfully used Special Economic Zones to transform its economy from an agricultural to an industrialized based (UNDP, 2015). According to Zeng (2015), China's best practices are at the forefront of using industrial parks to achieve a far-reaching economic transformation. Furthermore, the labor-intensive clusters have promoted China's industrialization and helped employ many migrant workers (Wang and Mei, 2009).

The post-WWII trend of economic development of developing countries is mainly characterized by the sharp performance difference of East Asian countries and Sub-Saharan Africa (SSA) countries. Africa's experience with industrialization has been disappointing: the average share of manufacturing in GDP in SSA was 10% in 2010 (unchanged from the 1970s), and the SSA's share of global manufacturing has fallen from about 3% in 1970 to less than 2% in 2010 (Page et al., 2016). Despite the relatively abundant labor advantage, most SSA countries have not yet unlocked the labor-intensive light manufacturing potentials. The competitiveness of the light manufacturing industries in SSA countries is affected by binding constraints such as input supply problems, lack of access to industrial land and finance, poor trade logistics, and the limitations of entrepreneurs' and workers' skills (Dinh et al., 2012). As different studies confirmed that the industrial parks established in SSA are not successful in most cases. According to Farole (2011), the African zones included in the study have underperformed because of ineffective strategy and planning, such as focusing on sectors in which the country lacks a comparative advantage. The Export Processing Zone programs in Africa have largely failed in achieving the intended objectives (Mosle, 2019).

CONCEPTUAL FRAMEWORK AND RESEARCH METHODOLOGY

NSE proposed the Growth Identification and Facilitation (GIF) Framework to guide the role of government in the dynamics of structural transformation. The framework aimed to help policymakers in developing countries to identify the industries and ways of removing binding constraints to facilitate private firms' entry into those industries. The framework is designed based on the theories of comparative advantage and the advantage of backwardness as well as the successful and failed experiences of industrial policies (Lin, 2012). The GIF framework has the following six comprehensive steps (Lin and Monga, 2010, pp. 22-23).

Step one: the government in a developing country can identify the list of tradable goods and services that have been produced for about 20 years in dynamically growing countries with similar endowment structures and a per capita income that is about 100-300% higher than their own.

Step two: among the industries in that list, the government may give priority to those in which some domestic private firms have already entered spontaneously, and try to identify: the obstacles that are preventing these firms from upgrading the quality of their products; or the barriers that limit entry to those industries by other private firms.

Step three: some of those industries on the list may be

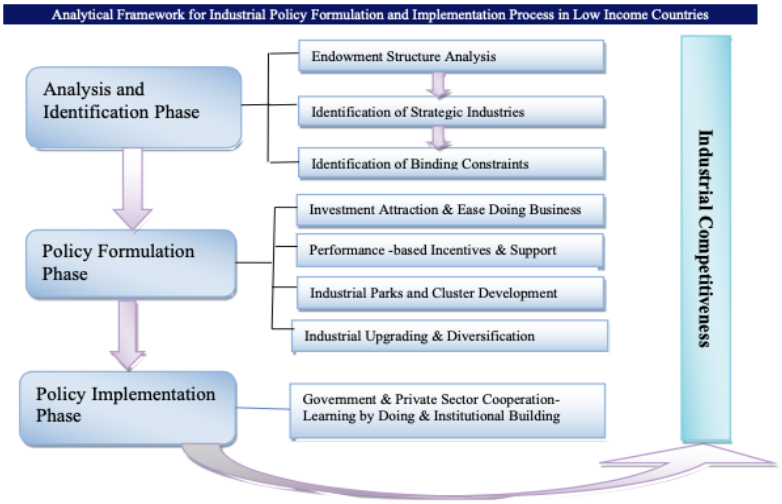

Figure 1. Analytical framework of the study. Source: own formulation based on GIF and GIFIUD.

entirely new for domestic firms. In such cases, the government could adopt specific measures to encourage firms in the higher-income countries identified in the first step to invest in these industries.

Step four: in addition to the industries identified on the list of potential opportunities for tradable goods and services in step 1, developing country governments should pay close attention to successful self-discoveries by private enterprises and provide support to scale up those industries.

Step five: in developing countries with poor infrastructure and an unfriendly business environment, the government can invest in industrial parks or export processing zones and make the necessary improvements to attract domestic private firms and/or foreign firms that may be willing to invest in the targeted industries.

Step six: the government may also provide limited incentives to domestic pioneer firms or foreign investors that work within the list of industries identified in step 1 to compensate for the non-rival, public knowledge created by their investments.

According to UNIDO (2015), “Lin’s NSE approach has generated a great interest in the world’s development community”. Based on the NSE principles and GIF approach, UNIDO developed Growth Identification and Facilitation for Industrial Upgrading and Diversification (GIFIUD) as a development tool for low-income developing countries in accelerating structural transformation. GIFIUD acts at three levels- Analysis Phase, Strategy/Policy Establishment Phase, and Implementation Phase (UNIDO, 2015). The Analysis Phase encompasses three steps, namely, identification of latent comparative advantage, identification of industrial sectors and, identification of binding constraints on selected industries. Targeted FDI promotion, focused industrial upgrading and modernization, industrial parks and cluster development, and special incentives for newcomers are the Strategy/Policy Establishment focuses. The implementation phase focuses on UNIDO technical cooperation (capacity building on policy implementation).

GIFIUD uses most of the proposals of GIF and added two more factors- the industrial upgrading and diversification in the policy establishment phase and UNIDO technical cooperation as the implementation phase. Categorizing the GIF steps into three levels is the proper approach. However, the implementation level factor is narrowly scoped only with the role of UNIDO.

Thus, this study uses the NSE approach of GIF by taking into consideration the contribution of UNIDO with its toolkit, GIFIUD, with some modification. The three levels of building blocks adjustment of GIFIUD is adopted with some naming adjustments, as shown in Figure 1. The UNIDO technical cooperation factor of the policy implementation stage is replaced by government and private cooperation through learning by doing and institutional building approach.

As shown in Figure 1, the analytical framework of this study encompasses three phases and eight essential factors. The analysis and identification phase comprise three sequential steps: identification of factor endowment, identification of strategic sectors, and identification of binding constraints. The policy formulation phase mainly focuses on the formulation of strategies and policies that are important in tapping the potential and overcoming the binding constraints in the identified strategic sectors. The primary focus areas are investment attraction and ease of

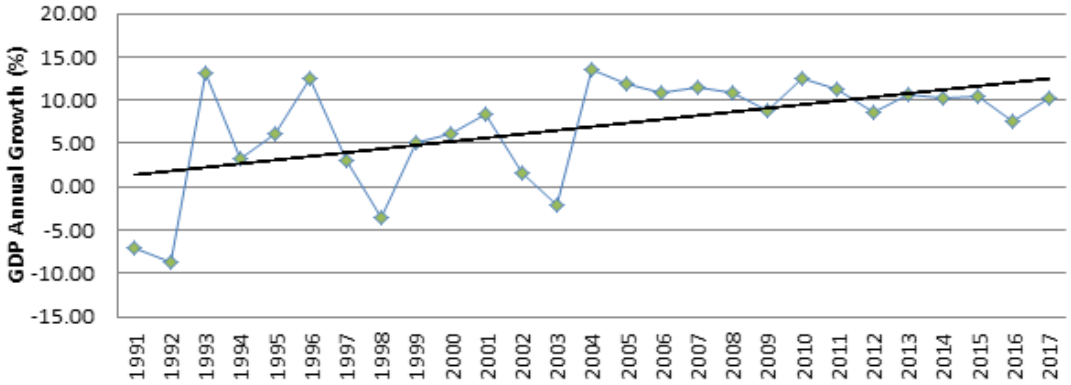

Figure 2. GDP Annual Growth (%) in Ethiopia (1991-2017). Source: World Bank (2018a).

doing business, industrial upgrading and diversification, performance-based incentives and supports, and industrial park development. The implementation phase focuses on government and private sector cooperation through learning by doing and institutional building.

A mixed research method, both quantitative and qualitative, is used as a research strategy. Both secondary and primary data gathering methods are used. The secondary data has been mainly gathered from the Central Statistics Agency of Ethiopia, the National Planning Commission, and other public institutions, previous researches, the reports of the government, and different organizations. The World Bank's Development Indicators database, and World Trade Integrated Solution, ILO, and other international data sources are used.

The primary data was mainly gathered through a structured survey questionnaire. Interviews and field visits have been conducted as a supportive tool for the survey. The firm-level survey has been done through a structured questionnaire in the medium and large-scale manufacturing firms of the textile, apparel, leather, and leather products sectors. According to the Ethiopian Central Statistics Agency (CSA) (1995-2017), the total number of textile and leather medium and large-scale manufacturing firms is 269.

The sample size of the study is 80 manufacturing firms (30% of the total population). The sample manufacturing firms have been selected using purposive sampling selection methods. Size, ownership, and location of the manufacturing firms are considered in the selection of the sample. The primary data collected from 80 manufacturing firms is processed and analyzed using Statistical Product and Service Solutions (SPSS), an IBM product since 2009 (Hejase and Hejase, 2013, p. 58).

Economic growth and transformation trends in Ethiopia

The government of Ethiopia adopted Agricultural Development Led Industrialization (ADLI) in 1994 as the primary economic strategy. Various sector-specific strategies and policies such as rural and agriculture development, industrial development, and urban development strategies and policies have been formulated and implemented since 2003 within the developmental sate approaches. Following the implementation of the strategies and policies, Ethiopia has become one of the fastest-growing economies by registering rapid economic growth. It has registered an annual GDP growth in 1991-2003 and 2004-2017 of 2.9% and 10.6%, respectively (Figure 2). As the data clearly shows, the economic growth pace has increased significantly after the government had formulated economic sector policies. Following the economic growth, the per capita real GDP of the country has also grown from 136 US dollars in 1992 to 863 US dollars in 2017 (Ministry of Finance and Economic Development (MOFED), 2018). Moreover, the share of the population living below the national poverty line has declined from 45.5% in 1996 to 23.5% in 2016 (Ethiopian National Planning Commission (ENPC), 2018). Encouraging results have also been registered in infrastructure, education, health, and other economic and social sectors.

As far as the structural change is concerned, the contribution of agriculture to GDP has declined from 51.9% in 2004 to 35.8% in 2017 (Figure 3). The contribution of the service sector, on the other hand, has increased from 34.1 to 38.9% in the same years. The commerce sub-sector in the service played a lion share. The contribution of industry (including construction) has also increased from 11.4 to 25.3%, and the construction sector contribution has risen from 7.2 to 18% in the same years. However, the contribution of the manufacturing industry to the structural change remains very weak despite the slight incremental trends noticed since 2015 after a long period of stagnation.

According to International Labor Organization (ILO) (2018) estimated data, the employment share of the agriculture sector has decreased from 85% in 2000 to 68% in 2017. The share of the industry has increased

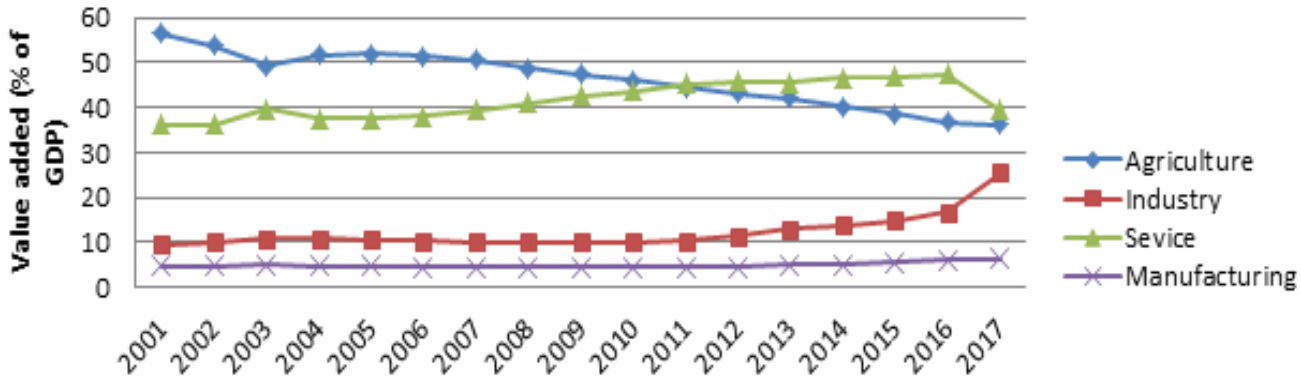

Figure 2. Economic sectors value added (% of GDP) 2001- 2017 in Ethiopia. Source: own compilation from National Bank of Ethiopia (NBE) (2017).

from 3.7% in 2000 to 9% in 2017, and the service sector had also increased from 10.5 to 22.4% in the same years. Construction is the major contributor to employment within the industrial sector. However, agriculture still played a predominant role in terms of job creation. Nearly 70% of the labor force is engaged in agriculture, mainly in low labor productivity sectors. The manufacturing contribution to employment is meager which is estimated below 2%.

Hence, the structure change trend that has been noticed for the consecutive 14 years in Ethiopia is not from low to high productive sectors. The performance of the manufacturing industry, which is expected to play an engine role in structural transformation, is weak despite the incremental trends in terms of value-added annual growth. The manufacturing sector has registered 12.6% of value-added yearly average growth from 2004 to 2017 (World Bank, 2018a). However, the contribution of the manufacturing industry to the GDP is low (only 6.3% in 2017), which is lower than the 8% of the low-income economies average and 10% of SSA average in 2017 (World Bank, 2018a). The manufacturing contribution to the merchandise exports (12.5% of the total export in 2017) is low and far from 23.9% of the Sub-Saharan Africa average as well. Its contribution to employment is also small.

In general, the trends of the Ethiopian economic performance show the presence of prospects and challenges to sustain rapid economic growth. As a prospect, the rapid economic growth of the country has been accompanied by social and economic development gains. On the other hand, the economy has been encountered with macroeconomic and structural challenges. Unemployment, inflation, shortage of foreign currency, debt burden, and unfavorable trade deficit are among the challenges. The economy has not yet begun the structural transformation from agriculture to manufacturing. Thus, enhancing the industrialization process has become critical in sustaining the rapid economic growth of the country.

POTENTIALS OF LABOR-INTENSIVE MANUFACTURING IN ETHIOPIA

Labor as major factor endowment in fostering industrialization

Ethiopia is the second-most populous country in Africa after Nigeria and 12th among the countries in the world with a population size estimated at nearly 105 million in 2017 (United Nations, 2017). The annual population growth had shown a declining trend from 3.5% in 1991 to 2.8% in 2015, and it has the most considerable population density relatively among its neighbors with 105% in 2017 (World Bank, 2018a). Ethiopia is a youthful nation with significant potential for the working population. 56% of the population is with the age range of 15-64, and 41% of the population is below the age of 15 years.

According to the Ethiopian Ministry of Education (2017) data, nearly 50% of the total population of the country, that is, 51,595,198 of students were enrolled at different levels of education (From pre-primary to postgraduate levels) in 2017. The same data source shows that undergraduate enrolment (government and private) had increased from 447,693 in 2010/11, to 593,571 in 2013/14. Likewise, total Masters' enrolment in public higher education institutions increased from 7,211 in 2007/08 to 27,643 in 2013/14. The number of graduates reached 290,813 total graduates in 2017 in TVET (31,097), undergraduate (141,700), and postgraduate levels (18,016).

The availability of inexpensive skilled and semi-skilled labor, with daily laborer $2/day and salaries of fresh university graduates $100-200/month, provides for a high potential to be competitive in labor-intensive industries (Ministry of Industry of Ethiopia (2016)). In general, Ethiopia has untapped labor-potential to be competitive in labor-intensive industries. On the other hand, the economy is not generating the required job opportunities for the rapidly growing working force, including the

graduates of the higher education institutions. Currently, the country is experiencing unemployment challenges. According to the CSA (2018b) survey, the rate of urban unemployment in Ethiopia increased to 19% in 2018. Most of the working force is also engaged in low productivity sectors, mainly in agriculture. Therefore, a labor-intensive focused industrialization pathway is both a means and an end for Ethiopia. As a means, the country has to utilize its primary factor endowment potential, which is labor, to sustain its rapid economic growth and transform its economy. As an end, the economy has to generate sufficient jobs for the highly growing labor force.

Land and related resources as industrialization potential

The land size of Ethiopia is 1,140,331 sq. Km and ranking 8th in Africa and 27th in the World. 45% (513,000 sq.km of the total land) is arable and suitable for agriculture, and 10 million hectares of irrigable land (only 3% utilized). Ethiopia has a suitable climate for agricultural production and productivity. It has a surprisingly temperate climate due to its elevation. Ethiopia has an elevated central plateau varying in height from 2,000 to 3,000 m above sea level. It is also suitable for the production of food crops - cereals, pulses, oilseeds, a wide range of fruits and vegetables, coffee, tobacco, sugar cane, tea and spices, forestry (including rubber tree plantation, fiber crops: (cotton, jute) animal husbandry among others (Ethiopian Investment Commission EICb, 2017). This shows that the country has huge potential for agro-processing industries. Moreover, the country has a huge land potential suitable for the production of cotton for the textile and garment industries. The estimated land area suitable for cotton cultivation, 3 million hectares, was equal to about 10% of the global cotton area in 2015/2016. At the same time, less than 3% of the 3 million hectares suitable for cotton cultivation is presently under cotton cultivation.

Ethiopia also has a raw material potential for leather manufacturing industries. Ethiopia is the first in Africa in the livestock population. According to CSA (2018a), the country has 60.4 million, 31.3 million, and 32.7 million cattle, sheep, and goats respectively in 2017. The country has potentials quality sheepskin suitable for the glove, shoe upper, and other leather products. It also has a potential of goat skins with high tensile strength.

Ethiopia is endowed with water resources with great potential for electric power generation. Ethiopia has the second-largest hydropower potential in Africa after to DR Congo. Ethiopia has estimated potential up to 45,000 MW, and approximately 30,000 MW is expected to be economically feasible. The country has around 124 billion cubic meter surface water resources potential and more than 30 million cubic meter ground water potential, and the hydro power generation potential of major Rivers and Rift valley lakes is also estimated about 160,000 Megawatt/year (Ayalew, 2018). The Grand Ethiopia Renaissance Dam with 6450 MW, which is under construction, is the largest hydroelectric power plant in Africa and the seventh-largest in the world. The electric power production price of the country is also one of the cheapest in the world.

Capital as scarce factor endowment

Ethiopia's GDP at the current price is 80.6 billion USD in 2017 (National Bank of Ethiopia NBE, 2017). In terms of GDP, Ethiopia is 66th in the world (World Bank, 2018a). Its tax revenue of GDP is very low (11.6% in 2017). Above all, the country's economy is challenged by the debt burden. International Monetary Fund (IMF) (2020) states the situation as "Notwithstanding recent policy restraint, external risks have increased, and the updated, Debt Sustainability Analysis (DSA) suggests that Ethiopia is at high risk of debt distress" (IMF, 20201: 9).

In general, Ethiopia is currently characterized as a labor abundant and capital scarce country in a relative sense. It is also relatively endowed with resources such as land suitable for agriculture, water, and livestock. The country also has a suitable climate for a variety of agricultural products and livestock productions, including products such as cotton and leather, which are essential inputs for the labor-intensive manufacturing industries.

Identification of strategic industries

Selection of benchmarking countries

According to Lin and Monga (2010), the benchmarking countries have to fulfill three criteria: 100 to 300% higher (or a similar per capita income about 20 years ago); dynamically growing for the last 20 years, and have identical endowment structure. Based on the first criteria (per capita income), countries that have GDP per capita about 100-300% higher than Ethiopia in 2017 are listed in Table 1 and countries that had a similar per capita income 20 years ago as Ethiopia in 2017 are listed in Table 2. Among the list of countries in the two tables, countries that have registered more the 6% average GDP annual growth are selected using the second criteria. As a result, 12 countries: Cambodia, Ghana, Nigeria, Myanmar, Angola, Vietnam, Uzbekistan, Lao PDR, India, Timor-Leste, and China are identified.

Population size and structure of their economy, mainly the MVA, are used to identify countries that have similar endowment structure to Ethiopia. Countries with relatively small size and low population density, as well as the contribution of the manufacturing sector to the GDP, are taken as the screening criteria. Timor-Leste with 1.3 million and Lao PDR with 6.9 million have the smallest population size. Cambodia, Ghana, Angola, and Uzbekistan, with 16, 28.8, 32.4, and 29.9 million respectively; they also have smaller population size than

Table 1. Countries with GDP per capita about 100-300% higher than Ethiopia.

Country	GDP per capita, PPP, 2017	Percent to Ethiopia	GDP annual growth 1998-2007	GDP annual growth 2008-2017	GDP annual growth 1998-2017
Ethiopia	1729.9	100.0	6.3	10.1	8.2
Bangladesh	3524	203.7	5.4	6.3	5.8
Mauritania	3597.6	208.0	5.5	3.4	4.4
Cote d'Ivoire	3601.0	208.2	0.8	5.7	3.2
Cambodia	3645.1	210.7	9.5	6.2	7.9
Zambia	3689.3	213.3	5.5	6.1	5.8
Marshall Islands	3819.2	220.8	1.7	1.4	1.5
Papua New Guinea	3823.2	221.0	2.0	5.1	3.5
Ghana	4227.6	244.4	4.9	7.3	6.1
West Bank and Gaza	4449.9	257.2	3	5.5	4.2
Sudan	4466.5	258.2	6.7	3.4	5.1
Honduras	4541.8	262.5	4.3	3.2	3.7
Congo, Rep.	4881.4	282.2	3.4	3.4	3.4
Pakistan	5034.7	291.0	4.7	3.7	4.2
Moldova	5190.0	300.0	3.5	3.8	3.7
Nicaragua	5321.4	307.6	4	4.1	4
Nigeria	5338.5	308.6	7.9	4.4	6.2
Tonga	5425.6	313.6	1.5	2.1	1.8
Myanmar	5591.6	323.2	12	7.9	9.9
Angola	5819.5	336.4	10.6	4.3	7.4
Samoa	6021.6	348.1	4.4	1.3	2.9
Vietnam	6171.9	356.8	6.6	6	6.3
Cabo Verde	6222.6	359.7	9	2.2	5.6
Uzbekistan	6253.1	361.5	5.7	7.9	6.8
Lao PDR	6397.4	369.8	6.4	7.7	7.1
India	6426.7	371.5	7.2	7	7.1
Timor-Leste	6570.1	379.8	21.1	-0.4	8.5
Bolivia	6885.8	398	3.3	5	4.1

Source: own computation from World Bank (2018a), world development indicators.

Ethiopia. Angola (23.9 people per sq.km of land area) and Lao (29.7 people per sq.km of land area) have the lowest population density.

In terms of MVA contribution in GDP, Timor-Leste, Ghana and, Angola, and Lao PDR have low performance; despite some improvements in recent years, the performance of Nigeria is also low. The economic growth of these countries is mainly achieved by the contribution of natural resources. Therefore, Timor-Leste, Ghana, Angola, Lao PDR, Cambodia, and Nigeria are excluded from the list in the screening process. As far as India is concerned, the contribution of manufacturing to GDP is relatively low and has shown a stagnated trend. Thus, China and Vietnam are selected as a benchmark of Ethiopia based on the GIF criteria.

Identification of tradable goods

After the selection of the benchmark-countries, the next step is to identify tradable goods produced in these target countries, where Ethiopia would have potential comparative advantages. A typical way of completing this task is to quantify what produced and compare aggregate export of each subsector at the beginning of the 20th year in 1995 with the level of production at the end of the 20th year in 2015 and analyze the trend.

As it is shown in Table 3, the export performance of China clearly indicates that the labor-intensive industries played a significant role at the earlier years and show declining trends in later years. For instance, textile and clothing, footwear, and food products ranked 1st, 3rd, and 7th, respectively, in 1992. Machine and electronics products have taken the leading role from textile and clothing since 2000, and the role of other labor-intensive industries has been declining over time in terms of their share from the total exports.

Table 4 shows that the performance of Vietnam's export has also shown similar trends, even though labor-intensive products are still playing a lion share. The

Table 2. Countries with a similar per capita income level 20 years ago to Ethiopia's in 2017.

Country	GDP per capita, PPP	Percent from Ethiopia	GDP annual growth 1998-2007	GDP annual growth 2008-2017	GDP annual growth 1998-2017
Ethiopia	1729.9	100.0	6.3	10.1	8.2
Senegal	1765.8	102.1	4.6	4.4	4.5
Bosnia and Herzegovina	1826.1	105.6	7.0	1.6	4.5
Kiribati	1891.1	109.3	2.0	2.4	2.2
Vietnam	1954.8	113.0	6.6	6.0	6.3
Sudan	1960.6	113.3	6.7	3.4	5.1
Lao PDR	2023.6	117.0	6.4	7.7	7.0
Zambia	2029.5	117.3	5.5	6.1	5.8
India	2036.8	117.7	7.2	7.0	7.1
Ghana	2066.2	119.4	4.9	7.3	6.0
Kenya	2204.4	127.4	3.8	5.0	4.4
Uzbekistan	2242.1	129.6	5.7	7.9	6.7
Georgia	2294.8	132.7	6.6	3.7	5.2
Cameroon	2383.7	137.8	4.3	4.2	4.3
Solomon Islands	2399.5	138.7	0.7	4.1	2.4
Cabo Verde	2423.3	140.1	9.0	2.2	5.8
Angola	2465.4	142.5	10.6	4.3	7.6
Zimbabwe	2488.3	143.8	-4.4	5.1	0.1
China	2564.1	148.2	10.0	8.3	9.2
Moldova	2605.4	150.6	3.5	3.8	3.7
Vanuatu	2609.4	150.8	2.9	2.6	2.8
Tuvalu	2666.8	154.2	2.3	2.6	2.4
Nigeria	2750.1	159.0	7.9	4.4	6.2

Source: own computation from World Bank (2018a), world development indicators.

textile and clothing products took the leading role from fuel products in 2010, and machines and electronics took the prominent part from textile and clothing in 2015. On the other hand, the rank of machine and electronics export has increased from 6th in 2000 to 1st in 2015 Indian export.

As it is mentioned earlier, the sectors to be selected as a target have to be beginning to decline in the comparator/benchmarking countries. Revealed Comparative Advantage (RCA) analysis can be used to identify the sectors that are declining in the export share of the benchmarking countries identified as a benchmarking for Ethiopia. The analysis includes Ethiopia just to show the overall trend. The primary purpose of the RCA analysis is, therefore, to identify tradable goods over which the benchmarking countries have begun losing comparative advantages. The RCA of Ethiopia and benchmark countries (China and Vietnam) in selected product categories shows that Ethiopia has the lowest in capital intensive industries (Machine and electronics and metal products), and emerging RCA in labor-intensive manufacturing (textile and clothing and footwear) (Table 5). Despite the differences among the countries, the benchmark countries, on the other hand, have the highest RCA in labor-intensive manufacturing sectors with the declining trend, and the emerging RCA in Capital intensive manufacturing.

Thus, the manufacturing sectors are evaluated, and the strategic sectors are selected using the two main criteria-the RCA advantage status in benchmark countries and the factors production potential of Ethiopia. Based on these criteria, products such as textile and apparel, leather and leather products; meat and meat products; and other agro-processing products are the major strategic sectors to be targeted. The country has already exported some of the products in these sectors.

In general, the analysis clearly shows Ethiopia has factor endowment potential and latecomer's advantage in labor-intensive light manufacturing industries in its current stage of development. Therefore, the labor-intensive focused industrialization pathway is a feasible strategic direction. The performance of the sectors and the binding constraints that affect their competitiveness are analyzed in the following section.

Performance and binding constraints of labor-intensive industries

The third step of the identification stage of the analytical

Table 3. China's major export in selected years (1992-2015).

Product categories	Export (US$ million)	Rank	Product categories	Export (US$ million)	Rank
	1992			**2005**	
All products	84940.01		All Products	761953.41	
Textiles and clothing	24617.17	1	Mach and Electronics	322008.13	1
Mach and electronics	11542.53	2	Textiles and Clothing	107661.24	2
Footwear	5144.00	3	Metals	57085.50	3
Fuels	4692.42	4	Transportation	28409.98	4
Metals	4550.88	5	Plastic or Rubber	23285.51	5
Vegetable	4419.61	6	Footwear	22773.07	6
Food products	3294.81	7	Stone and Glass	17789.72	7
Hides and skins	2912.52	8	Fuels	17622.65	8
Animal	2783.25	9	Hides and Skins	15600.62	9
Stone and glass	2289.94	10	Wood	12683.30	10
Transportation	2096.52	11	Food Products	11196.04	11
Plastic or rubber	1828.98	12	Vegetable	8566.20	12
Wood	1698.62	13	Animal	6700.68	13
Minerals	924.90	14	Minerals	3297.50	14
	1995			**2010**	
All products	148779.50		All Products	1577763.8	
Textiles and clothing	35877.67	1	Mach and Electronics	698387.52	1
Mach and electronics	27667.21	2	Textiles and Clothing	199534.31	2
Metals	12079.53	3	Metals	110807.95	3
Footwear	8158.6	4	Transportation	88874.75	4
Hides and skins	5642.6	5	Plastic or Rubber	49790.6	5
Fuels	5332.11	6	Footwear	43910.21	6
Food products	4627.02	7	Stone and Glass	39758.82	7
Vegetable	4594.67	8	Fuels	26674.61	8
Animal	4473.68	9	Wood	23593.42	9
Stone and glass	4408.64	10	Hides and Skins	23245.7	10
Plastic or rubber	4281.45	11	Food Products	19370.28	11
Transportation	3969.63	12	Vegetable	16294.55	12
Wood	3255.08	13	Animal	12017.23	13
Minerals	1388.6	14	Minerals	3700.65	14
	2000			**2015**	
All products	249202.55		All Products	2273468.2	
Mach and electronics	72884.73	1	Mach and Electronics	957412.79	1
Textiles and clothing	49378.69	2	Textiles and Clothing	273464.73	2
Metals	16608.45	3	Metals	176567.35	3
Footwear	11958.41	4	Transportation	107214.63	4
Transportation	9267.56	5	Plastic or Rubber	86355.11	5
Plastic or rubber	7948.91	6	Stone and Glass	85553.7	6
Fuels	7855.47	7	Footwear	68210.44	7
Hides and skins	7505.21	8	Wood	40190.57	8
Stone and glass	6566.98	9	Hides and Skins	35038.67	9
Vegetable	5333.44	10	Food Products	27911.22	10
Food products	5165.51	11	Fuels	27903.74	11
Wood	4531.76	12	Vegetable	22950.32	12
Animal	4352.89	13	Animal	17356.89	13
Minerals	1345.27	14	Minerals	3815.16	14

Source: own computing from wits data.

Table 4. Major exports of Vietnam in selected years (2000-2015).

Product Categories	Export (US$ Million)	Rank	Product Categories	Export (US$ Million)	Rank
	2000			**2010**	
All Products	14482.74		All Products	72236.66	
Fuels	3824.76	1	Textiles &Clothing	13303.73	1
Textiles & Clothing	2095.36	2	Mach and Elect	10221.16	2
Vegetable	1968.18	3	Vegetable	8011.39	3
Animal	1583.01	4	Fuels	7979.70	4
Footwear	1507.92	5	Footwear	5404.35	5
Mach and Elect	1151.17	6	Plastic or Rubber	4306.74	6
Plastic or Rubber	294.53	7	Animal	4260.81	7
Wood	262.69	8	Stone and Glass	3666.31	8
Stone and Glass	214.25	9	Metals	2791.48	9
Hides and Skins	195.9	10	Food Products	2078.86	10
Food Products	193.56	11	Wood	1411.24	11
Metals	126.93	12	Transportation	1281.35	12
Chemicals	111.85	13	Chemicals	1234.40	13
Transportation	99.87	14	Hides and Skins	1104.44	14
Minerals	40.14	15	Minerals	343.26	15
	2005			**2015**	
All Products	32447.13		All Products	162016.704	
Fuels	8358.05	1	Mach and Elect	57413.103	1
Textiles and Clothing	5308.42	2	Textiles &Clothing	27270.008	2
Vegetable	3372.49	3	Footwear	12783.604	3
Footwear	3184.43	4	Vegetable	12115.606	4
Mach and Elect	2736.46	5	Metals	5713.503	5
Animal	2593.61	6	Animal	5201.102	6
Plastic or Rubber	1352.19	7	Plastic or Rubber	5189.806	7
Food Products	729.16	8	Fuels	4996.602	8
Metals	678.78	9	Food Products	4746.803	9
Wood	540.44	10	Hides and Skins	3286.406	10
Stone and Glass	475.79	11	Wood	3270.803	11
Hides and Skins	420.24	12	Transportation	3111.909	12
Transportation	396.25	13	Chemicals	2592.408	13
Chemicals	340.76	14	Stone and Glass	2421.602	14
Minerals	129.75	15	Minerals	1081.303	15

Source- Own Computing from WITS data

framework of this study is the identification of the binding constraints that affect the competitiveness of the manufacturing firms in targeted industries. Thus, the performance of the labor-intensive sectors vis-à-vis the capital-intensive industries and the binding constraints that affect their performance is analyzed as follows. As Figure 4 shows, the labor-intensive industries are playing a significant role in terms of MVA share. While food and beverages, non-metallic mineral products, apparel, and furniture contributed 62% of the total MVA in MLSMI, the capital-intensive manufacturing sectors such as basic iron and steel and chemical and chemical products contribution is very low. In SSMI, the labor-intensive manufacturing industries, food products except for grain mill, furniture, and apparel contributed 68% of the total MVA. Moreover, Figure 5 shows that the labor-intensive sectors contributed the largest share in job creation. In SSMI food products, furniture and apparel contributed 63% of the total employment. In MLSMI, food products and beverage, textile, apparel, and leather products contributed 54% of the total job. The contribution of capital-intensive sectors such as metal and chemical is very low both in SSMI and MLSMI. Ethiopia's export is mainly dominated by primary agriculture products and is exported without value addition. Given this basic fact, the labor-intensive manufacturing sectors mostly textile,

Table 5. Revealed comparative advantage (1995-2016).

Type	Product Category	Country	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Labor Intensive Manufacturing	Textile and Clothing	China	3.3	3.0	2.7	2.7	2.7	2.7	2.6	2.4	2.2	2.3
		Vietnam		2.5	3.4	4.7	4.7	4.1	4.1	4.1	3.7	3.5
		Ethiopia	0.6	0.3	0.4	0.7	1.0	1.0	1.3	1.1	0.8	1.1
	Footwear	China	8.1	7.0	4.8	4.1	4.1	3.9	3.7	3.3	3.0	2.9
		Vietnam		18.8	18.6	14.9	13.8	11.9	11.1	11.4	10.2	9.8
		Ethiopia	0.0	0.1	0.1	0.5	0.5	0.9	1.3	1.3	1.5	1.9
	Machine and Electronics	China	0.8	1.1	1.7	1.9	2.0	2.1	2.1	2.0	1.9	1.8
		Vietnam		0.2	0.3	0.7	0.9	1.4	1.6	1.6	1.5	1.5
		Ethiopia	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3
Capital Intensive Manufacturing	Metal	China	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1
		Vietnam		0.1	0.2	0.4	0.5	0.5	0.4	0.4	0.4	0.4
		Ethiopia	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0

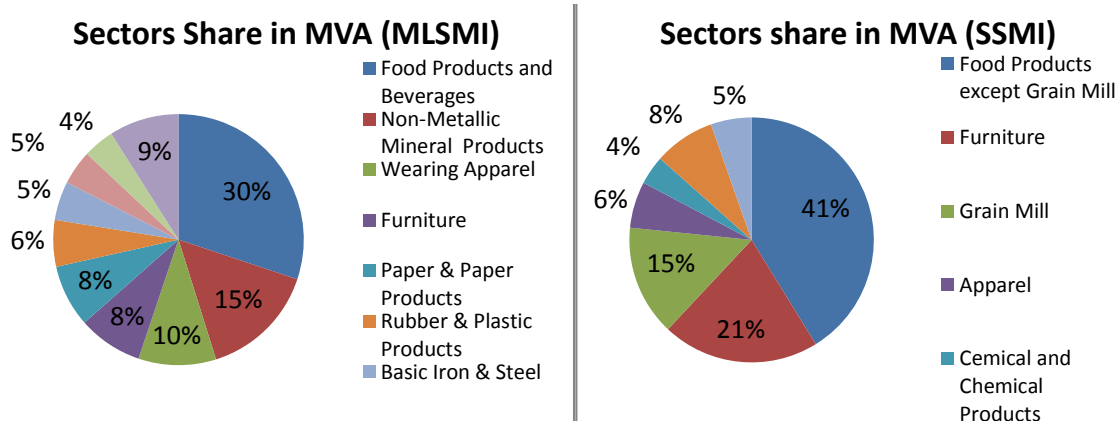

Figure 3. MVA by sub-sectors in SSMI and MLSMI (2017). **Source:** own computation from CSA (1995-2017), CSA (2002, 2009, 2017) Surveys.

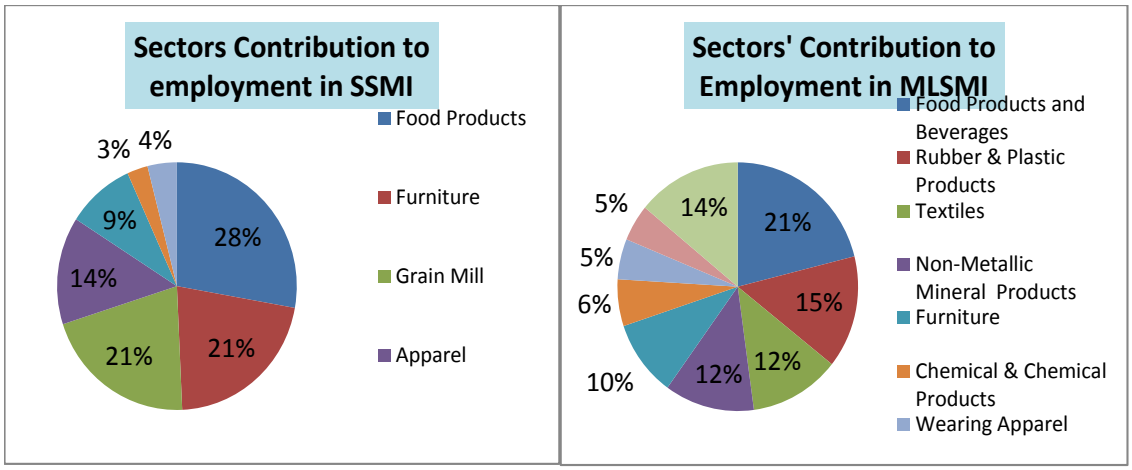

Figure 5. Employment by sub-sectors in SSMI and MLSMI (2017). **Source**: own computation from CSA (1995-2017), CSA (2002, 2009, 2017) Surveys.

Table 6. Summary of Major constraints that affect the manufacturing firms' performance.

Rank	Job creation and labor productivity	Installed investment utilization	Export production
1	Employees' turnover	Raw material supply problems	Shortage of foreign currency
2	Weak working culture	Shortage of foreign currency	Low labor skill
3	Low-quality education and training	Shortage of skilled labor	Shortage of raw materials
4	Weak employees' motivation system	Shortage of electric power	Low market demand
5	Lack of adequate on job training	Shortage of working capital	Transport cost

Source: own survey

apparel, and leather and leather products have registered promising results in terms of export earnings (NBE, 2017). Despite such promising performances, the labor-intensive manufacturing sectors are performing far below the potential and expectations. Therefore, it is critical to understand the reasons for the low performance of the sector. As the analysis of the survey result of this study show, the manufacturing firms' performance is affected by binding constraints as summarized in Table 6. The top five constraints for each performance category of the manufacturing sector are identified. The job creation and labor productivity performance of the manufacturing firms are mainly affected by employees' turnover, weak industrial working culture, low-quality education and training system, and ineffective employees' motivational systems. Shortage and quality of raw materials, shortage of foreign currency, and shortage of skilled labor force are the top critical problems that affect the performance of manufacturing firms in the utilization of their installed investment.

In general, these constraints can be categorized into weak input-output linkages, financial constraints, the skill of employees (low productivity), access to electric power, and transport cost. These are the major factors that currently need a policy focus to unlock the potentials of Ethiopia in labor-intensive industries.

Industrial policy formulation and implementation in practice

The industrial policies in Ethiopia are explained in a broader and selective approach in different policy, legal, and strategic planning documents. The Industrial Development Strategy of Ethiopia (IDSE) adopted in 2002 is a comprehensive strategic document that encompasses the basic principles, the strategic sectors, and the implementation directions of industrial development (Ethiopian Ministry of Information, 2002). The strategy puts seven guiding principles of industrial development: focusing on labor-intensive industries, export-led industrial development, agricultural led industrial development, the integration of foreign and domestic investors and partnership among stakeholders, the leading role of the government, and an engine role of the private sector.

Textile and garment industries; meat and leather industries; agro-processing industries are selected as the strategic manufacturing sectors. The horizontal industrial policy directions are also stated in the strategy document. Creating macroeconomic stability, modernizing the financial system, creating dependable physical infrastructure services, developing useful human resource, and creating efficient civil service and judiciary system that supports development are the principal directions.

Within these broader perspectives, the performance and practical experiences are analyzed based on the five key policy areas identified in the analytical framework of this study.

Investment attraction and ease of doing business

The effectiveness of government services such as investment and business licenses, land supply, electricity supply, water supply, tax administration, and the like have significant impacts on the attraction of new investors as well as in enhancing the competitiveness of the existing manufacturing firms. The surveyed manufacturing firms were requested to rank the efficiency of the government services based on ten variables with five-level evaluation categories. As it is shown in Figure 6, the average efficiency level of all the ten indicators is 2.8 points, which means that the satisfaction level of the respondents is only 56%. The investment license/renewal, trade license, and import and export permit are relatively efficient, and land supply, electric power supply, and telecommunication services are inefficient services.

In addition to the efficiency, affordability of services (payments and fees paid for government services) is one of the essential factors to improve the investment climate. As indicated in Figure 6 the mean of the ranking of the 9 indicators is 2.43 out of 5, which is below 50%. Fees and payments for license and work permit, water, and electric power are relatively cheap, while loan interest rates, transport for import and export, and bank loan interest rates are expensive services.

Incentive and supports

The government of Ethiopia has designed different

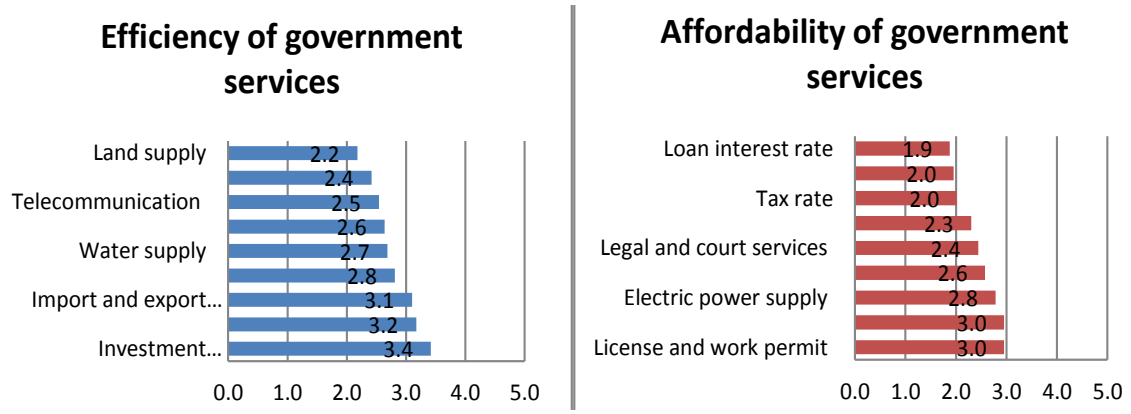

Figure 4. Efficiency and affordability of government services. **Source**: own survey.

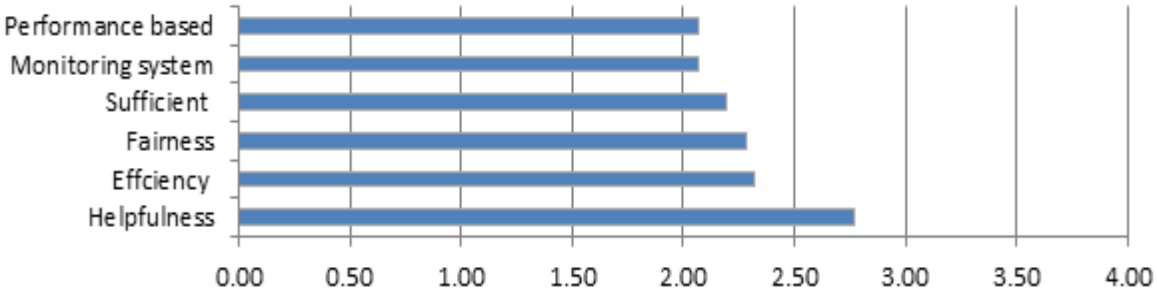

Figure 5. Performance of incentives and supports. Source: own survey.

incentive mechanisms for investors. Various fiscal and non-fiscal incentives are provided to the manufacturing and other economic sectors (Ethiopian Investment Commission (EIC)a, 2017). All the manufacturing sub-sectors are eligible for customs duty exemptions, that is, 100% of the imported capital goods and 15% of the spare parts. In terms of income tax exemption, different categories are ranging from 1 year to six years. The investors who are investing out of Addis Ababa and its surroundings have some preferential treatment with 1 or 2 years of income tax exemptions. In terms of the different industrial groups and sub-sectors, the incentive ranges from 1 year to 6 years. The range of income tax exemption in other textile and leather products varies from 2 to 6 years, except the tanning of unfinished leather, which is not eligible for income tax exemption.

The surveyed manufacturing firms were requested to rank the incentives and supports of the government based on six variables with four-level evaluation categories (Figure 7). The average mean point of the ranking is 2.28 (57%). The lowest ranking is given to the performance-based and managed by strong institutional mechanisms. The respondents also recommended that more focus needs to be given for the performance and the strategic importance of the industries. Most of them believe the incentive mechanism provides no significant difference between the strategic sectors selected by the government and other sectors.

Industrial parks and clusters

Ethiopia is implementing an industrial parks program to accelerate its industrial development. The construction of industrial parks was started by the government, private and/or jointly between government and the private sector, during the first GTP (2010/11 2015/16) period (ENPC, 2016a). Seventeen federal government industrial park projects are under development in different parts of the country (Industrial Parks Development Corporation (IPDC), 2018). Bole Lemi, Hawassa, Kombolcha, Mekele, and Addis Industrial village are operational. Others are at a different stage of construction and preparation for construction. When most of these federal government parks are completed and are fully functional, they are expected to create around 250,000 jobs. To date, the national operational parks have created 36,563 jobs. The country is also planning to construct 19 agro-processing industrial parks in different parts of the country by the regional states. Most of the federal, as well as the

regional state industrial parks, are dedicated to labor-intensive industries, mainly textile, apparel, leather, and leather products.

One of the Chinese overseas Special Economic Zones (SEZ) called Easter Industrial park is the first pioneer park established in Ethiopia. The park is located in Dukem, which is around 40 km from Addis Ababa. As Ethiopia's first industrial park, since its inception seven years ago, “Eastern Industrial Park has been showcasing the positive impact of Chinese industrial development and has become a place for manufacturing excellence and a platform for developing and transferring skills” (UNIDO, 2018, p. 23). Huajian Light Industrial City is another private owned Chinese industrial park being operational recently. Modjo Industrial Zone, owned by Taiwanese George Shoe, is also another private industrial park.

The surveyed manufacturing firms were asked to rank the overall performance of the industrial parks. Availability of the employees’ residence services, availability of incentives for low salary employees, and the linkage with the local economy are the factors with the weakest performance.

The new attempt of industrial park development had shown results in export performance in labor-intensive manufacturing firms. However, it is difficult to conclude the feasibility of the current industrial parks to return the public investment incurred to them. The assessment of this study shows there is a limitation in conducting a proper feasibility study to establish industrial parks. There are no specific and clear criteria to select the location of the industrial park in Ethiopia. The absence of resident services and the lack of incentive mechanisms for low wage employees are critical problems. The cluster-based industrialization approach has not gotten the necessary attention by government policies. As far as the knowledge of this study researcher, the only attempt of the clustering approach is the establishment of the leather clusters in Addis Ababa with the assistance of UNIDO.

Industrial upgrading and diversification

The selection of proper strategic sectors is the foundation of industrial policy formulation and implementation. From the Ethiopian context, manufacturing sectors, which are labor-intensive and using mainly agriculture products for production, are the strategic sectors to foster successful industrialization. Indeed, the industrial strategy of the country has been designed based on this fundamental principle. The Strategy also foresees the industrial upgrading within the strategic sectors as well as from light and labor-intensive industries to heavy and capital-intensive industries.

The strategy sets the industrial upgrading directions in the textile and leather industries in terms of export. It is clearly explained that the focus of the export to be from cotton to apparel and textile, exporting of apparel or garment is the priority area at the earlier stages. In the leather industry also upgrading from hides and skills to finished leather and leather products is the major strategic direction. One of the experiences of how the government policy can facilitate the upgrading of industries is the upgrading of the tanneries production from unfinished leather to finished leather. To facilitate this process, the government levied 150 export taxes to the unfinished leather products. The main objective of the policy is to export value-added products and to solve the raw material shortage of leather product factories. This policy intervention forced the tanneries to upgrade their production activities from unfinished leather to finished leathers.

However, the industrial upgrading and diversification in Ethiopia are not managed with clear roadmap and policy directions. There are inconsistencies in priority sectors and policy approaches in the national plans of the country as well.

Government and the private sector cooperation

The cooperation between government and the private sector is vital for successful industrial policy implementation. The private sector is an engine for industrial development in the market economy, and the main role of the government is to guide and facilitate the industrialization process. They have to work in collaboration and synergy to achieve the intended objectives. The establishment of the joint council at the national level and forums at different levels, information exchange, and the like are useful mechanisms to institutionalize the cooperation.

The industrial associations are serving as the platform to link the government institutions and the manufacturing firms. The Textile Industry Association and the Leather Industry Association are among such platforms. 63% of the surveyed manufacturing firms are members of one of these associations. Among the members of the associations, 54% responded that the associations are weak or very weak in carrying out their responsibility. The remaining 46% responded that the associations are strong or very strong.

The manufacturing firms were asked to rank the performance of the cooperation between the government and the private sector. The average mean point is 2.53 out of 5 points. This shows the cooperation between the government and the private sector in general, and in some factors such as the consultation on laws and policy formulation, joint forums and councils, and conducting regular meetings, in particular, is weak (Figure 8).

In terms of the government institutions, the Ministry of Industry is the main policy-making federal government body responsible for the manufacturing industry. Under

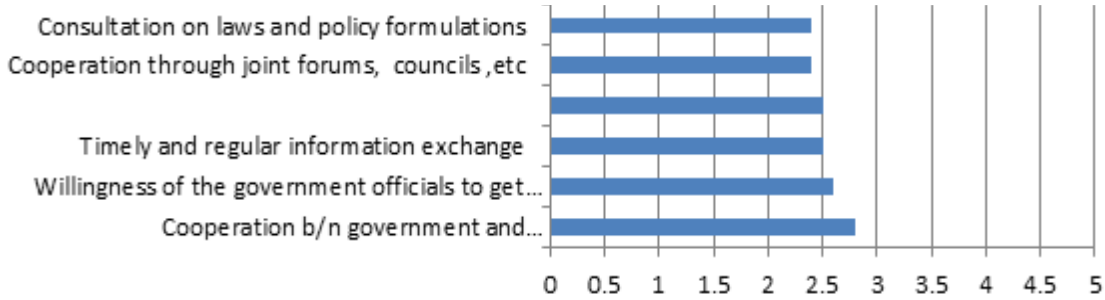

Figure 6. Performance of government and private sector cooperation.
Source: own survey.

the Ministry of Industry of Ethiopia, 9 sector-specific federal institutions are established. Establishing a sector-specific institution is very important for facilitation and support. However, there is no clear coordination strategy between the industry sector institutions and other sectors, such as agriculture, following the value chain. For example, the effectiveness of the leather product manufacturing is linked to the livestock sector to get quality and sufficient raw material. Similarly, the ginning manufacturing industries' effectiveness is determined by the supply of cotton plantation. However, this study reveals that the institutional coordination along the value chain is very weak in Ethiopia. The coordination between the federal and regional institutions is also very weak.

CONCLUSION AND POLICY IMPLICATIONS

This paper argues that industrial policy should be tailored to factors endowment structure of a country to transform its economy. Accordingly, the findings of this study show that Ethiopia's labor-intensive focused industrialization policy direction is the proper pathway as far as its factor endowment potential is concerned. Labor-intensive focused industrialization is both a means and an end for Ethiopia. As a means, the country has to utilize its primary factor endowment potential (labor) to transform its economy. As an end, the economy has to generate sufficient jobs for the highly growing labor force.

The semiskilled and trainable youth workforce, suitable climate and fertile land, the largest livestock population, and hydroelectric power generation capacity are the significant potentials of the country. This study has also confirmed that Ethiopia has a latecomer's advantage over labor-intensive manufacturing industries mainly because of the rising wages in China (the largest labor-intensive manufacturing exporter) and other transforming economies. The revealed comparative advantage analysis confirmed that the benchmarking countries (China and Vietnam) have started losing their comparative advantage in labor-intensive manufacturing goods because of the rising labor cost.

Thus, Ethiopia currently has the potentials and latecomer's advantage to be competitive in labor-intensive industries such as textile, apparel, finished leather, footwear, glove, and agro-processing products. Therefore, the study's findings are in line with the Growth Identification and Facilitation (GIF) of the NSE that mainly proposed countries have to target sectors that have a latent comparative advantage. Moreover, the findings are in line with the studies conducted on the industrialization pathway of East Asian countries reviewed in the literature review section, such as Sugihara (2007), Dinh et al. (2012), Wen (2016), and Brandt et al. (2016).

On the other hand, this study confirmed that the competitiveness of the existing labor-intensive manufacturing firms is affected by binding constraints such as weak input supply problems, financial constraints, the skill of employees (low productivity), electric power supply constraints, and high logistic costs. This finding is also in line with the existing studies such as Dinh et al. (2012), which identified the binding constraints of labor-intensive manufacturing industries in Africa. The study also prevails that industrial policy formulation and implementation in Ethiopia are relatively weak in facilitating input-output linkage within the value chain, the cooperation between the government and the private sector, the linkage of industrial parks with the local economy, and improving doing business environment. The technology advancement such as robotics technology may negatively impact labor-endowed countries like Ethiopia. However, their impact is likely to be relatively low in manufacturing sectors like garments in the short run.

Thus, unlocking the huge potentials and overcoming the labor-intensive manufacturing industries' binding constraints require enhancing proactive and robust industrial policy formulation and implementation. This study suggests the following five policy domains to foster the industrialization process in Ethiopia at its current stage of development.

First, facilitating the linkage between the agriculture and the labor-intensive manufacturing sectors is vital in fostering structural transformation. The coordination

failures in input-output linkage along the value chain have to be addressed with proper policy and institutional mechanisms. Establishing national councils in the strategic sectors such as textile, leather and agro-processing industries is helpful to coordinate the fragmented activities of different institutions of the federal government and regional states. Moreover, there is a need to formulate and implement a rural industrialization strategy to transform the agriculture potential into a competitive advantage.

Second, enhancing industrial park and cluster-based industrial development is critically important to foster a structural transformation from agriculture to the manufacturing industry. This study confirmed that the new attempts of industrial parks development had shown results in export performance in labor-intensive manufacturing firms. However, the industrial parks have a weak linkage to the local economy. There are no specific and clear criteria to select the location of the parks, and the absence of resident services and the lack of incentive mechanisms for low-wage employees. Ethiopia has to learn from the success stories from China and other East Asian countries. Solving the challenges through proactive government policy is the primary lesson from successful countries like China. The new attempts of the integrated agro-industrial parks development in the regional states have to be enhanced. Likewise, a proper feasibility study has to be conducted before establishing industrial parks with predetermined and precise location selection criteria. A cluster-based industrialization approach is highly recommended to overcome the weak economies of scale disadvantages of the manufacturing firms in the country.

Third, strengthen the cooperation between government and the private sector through institutional mechanisms and learning by doing approach is paramount important. The current institutional arrangements are not robust enough to enhance the interaction and cooperation between the government and the private sector. The performance-based monitoring system has to be strengthened with strong institutional setups. The government institutions responsible for the coordination and facilitation of industrialization have to be strengthened. The activities among different federal institutions and between the federal government and regional states need to be coordinated through proper legal and policy frameworks.

Fourth, improving the doing business environment is vital in unlocking the country's labor-intensive manufacturing potential. Currently, Ethiopia is ranked 159 out of 190 countries in ease of doing business (World Bank, 2020). This study is also confirmed that the manufacturing firms are negatively affected by doing business-related constraints. Thus, reforming government institutions needs to be enhanced to deliver better services and facilitate the industrialization process.

Finally, clear policy facilitation of industrial upgrading and diversification along the endowment structure changes is essential in fostering successful industrialization. Upgrading and diversifying within the strategic labor-intensive manufacturing sectors as well as from the labor-intensive focused industries to capital-intensive and technology-intensive industries requires a clear roadmap and policy directions.

Contributions and implications for further research

From a policy perspective, the study provides research-based feedbacks for the policymakers. The research is timely and relevant to understand the efficacy of the labor-intensive focused industrial policy through systematic and scientific analysis. Accordingly, the study came out with findings, policy implications, and recommendations within the perspectives of the theoretical foundations and practical experiences. From the academic perspective, the study shows that the NSE has proposed valuable ideas and a framework for industrial policy formulation and implementation in developing countries.

However, this study implies that the NSE approaches can be enriched by including the implementation aspects such as cooperation between government and private sector and institutional building through learning by doing in the Growth and Identification Framework. The policy domains recommended in this study, such as the value chain linkage, feasibility studies on industrial parks, industrial upgrading and diversification, and cooperation between government and the private sector, require depth researches. Above all, the political aspect of the industrial policy in the Ethiopian context requires further study.

CONFLICT OF INTERESTS

The author has not declared any conflict of interest.

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REFERENCES

Altenburg T (2010). Industry Policy in Ethiopia. Discussion Paper/Deutsches Institutfür Entwicklungspolitik ISSN 1860-0441.

Altenburg T (2011). Industrial policy in developing countries: Overview and lessons from seven country cases (No. 4/2011). Discussion

paper.
Ayalew DW (2018). Theoretical and Empirical Review of Ethiopian Water Resource Potentials, Challenges and Future Development Opportunities. International Journal of Waste Resources 8:4.
Brandt L, Ma D, Rawski TG (2016). Industrialization in China. The Spread of Modern Industry to the Periphery since 1871.
Carbonnier G, Chakraborty P, Dalle ME (2010). Asian and African development trajectories revisiting facts and figures. International Development Policy | Revue internationale de politique de développement.
Central Statistics Agency of Ethiopia, CSA (1995-2017). Surveys on Medium and Large Scale Manufacturing Industry Survey
Chari F, Mushanyuri BE, Mzumara M (2013). Comparative advantage of Ethiopia and the role of international purchasing.
Chenery H (1979). Structural Change and Development Policy: World Bank Research Publication, Washington DC.
Cohen E (2006). Theoretical foundations of industrial policy. EIB Papers 11(1):84-106.
Di Maio M (2014). Industrial Policy in Currie-Alder, B., Kanbur, R., Malone, D. M., and Medhora, R. (Eds.). (2014). International development: ideas, experience, and prospects. OUP Oxford.
Dinh HT, Palmade V, Chandra V, Cossar F (2012). Light manufacturing in Africa: Targeted policies to enhance private investment and create jobs. The World Bank.
Dinh HT, Rawski TG, Zafar A, Wang L, Mavroeidi E, Tong X, Li P (2013). Tales from the development frontier: How China and other countries harness light manufacturing to create jobs and prosperity. The World Bank.
Ethiopian Investment Commission EIC (2017a). Incentives Packages. http://www.investethiopia.gov.et/index.php/investment-process/incentive-package.html
Ethiopian Investment Commission EIC (2017b). An Investment Guide to Ethiopia. http://www.investethiopia.gov.et/index.php/news-resources/publications/132-pulications/964-eic-publications.html
Ethiopian Ministry of Education (2017). Education Statistics: Annual Abstract 2009 E.C (2016/2017). http://lib.moe.gov.et/get/PDF/Clare%20Winton-ESAA%202009%20E.C_21.pdf
Ethiopian National Planning Commission (ENPC) (2018). The Second Growth and Transformation Five Year Plan (GTP II) Midterm Review Report. https://www1.undp.org/content/dam/dagethiopia/documents/GTP%20II%20MIDTERM%20REV%20Summarized%20%2012%2011%20%202018%20final_2.pdf
Ethiopian Ministry of Information (2002). Industrial Development Strategy of Ethiopia. http://www.tralac.org/files/2012/12/Industry-Development-Strategyy-of-Ethiopia.pdf
Farole T (2011). Special Economic Zones in Africa: comparing performance and learning from global experiences. The World Bank.
Felipe J (2015). Development and modern industrial policy in practice: issues and country experiences: Edward Elgar Publishing.
Felipe J (2018). Asia's Industrial Transformation: The Role of Manufacturing and Global Value Chains (Part 1). Asian Development Bank Economics Working Paper Series P 549.
Gebreeyesus M (2016). Industrial policy and development in Ethiopia: Evolution and present experimentation, Brooking Institution. https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/9780198776987.001.0001/acprof-9780198776987-chapter-2
Hejase AJ, Hejase HJ (2013). Research Methods: A Practical Approach for Business Students, 2nd ed., Masadir Incorporated, Philadelphia, PA, USA.
International Labor Organization (ILO) (2018). ILOSTAT data 2018 estimation. https://ilostat.ilo.org/data/
Industrial Parks Development Corporation (IPDC) (2018). Industrial Parks in Ethiopia. https://www.ipdc.gov.et/service/parks/
International Monetary Fund (IMF) (2020). Federal Democratic Republic of Ethiopia: Country Report No. 20/29. https://www.imf.org/en/Publications/CR/Issues/2020/01/28/The-Federal-Democratic-Republic-of-Ethiopia-2019-Article-IV-Consultation-and-Requests-for-48987
Kosacoff B, Ramos A (1999). The Industrial Policy Debates. CEPAL Review 68:35-60.
Lin JY (2012). New Structural Economics: A Framework for Rethinking Development and Policy, Washington, DC: World Bank.
Lin JY (2014). Industrial Policy Revisited: A New Structural Economics Perspective. China Economic Journal 7(3):382-396.
Lin JY, Monga C (2010). Growth Identification and Facilitation. World Bank Policy Research Working Paper, 5313.
Lin JY, Monga C (2013). Comparative advantage: The silver bullet of industrial policy. In Stiglitz, JE, Lin JY, and Patel, E. (ed.) Industrial Policy Revolution. Palgrave Macmillan, London 1:19-38.
Lin JY, Monga C (2017). Beating the odds. Princeton University Press.
Lin JY, Yao Y (2006). Chinese Rural Industrialization in the Context of The East Asian Miracle. China Center for Economic Research, Beijing University.
Lin JY, Chang HJ (2009). Should Industrial Policy in developing countries conform to comparative advantage or defy it? A debate between Justin Lin and Ha-Joon Chang. Development Policy Review 27(5):483-502.
Mosle S (2019). Special economic zones: An effective instrument for growth in Africa?
National Bank of Ethiopia (NBE) (2017). Annual Report (2017/18). https://nbebank.com/wp-content/uploads/pdf/annualbulletin/Annual%20Report%202017-2018/Annual-report-2017-2018.pdf
Noland M, Pack H (2003). Industrial policy in an era of globalization: Lessons from Asia (Volume 69). Peterson Institute.
Noman A, Stiglitz JE (2012). Strategies for African development. Good growth and governance in Africa: Rethinking development strategies pp. 30-47.
Nzau M (2010). Africa's industrialization debate: a critical analysis. Journal of Language, Technology and Entrepreneurship in Africa 2(1):146-165.
Oqubay A (2015). Made in Africa: industrial policy in Ethiopia. Oxford University Press, USA.
Pack H, Saggi K (2006). Is there a case for industrial policy? A critical survey. The World Bank Research Observer 21(2):267-297.
Page J, Tarp F, Rand J, Shimeles A, Newman C, Söderbom M (2016). Manufacturing transformation: comparative studies of industrial development in Africa and emerging Asia. Oxford University Press, p. 336.
Pitelis CN (2006). Industrial policy: perspectives, experience, issues. International Handbook on Industrial Policy P 435.
Porter ME (1990). The competitive advantage of nations Harvard business review. Harvard Business Review P 91.
Primi A, Peres NW (2009). Theory and practice of industrial policy: evidence from the Latin American experience. eclac.
Robinson JA (2009). Industrial policy and development: A political economy perspective. elibrary.worldbank.org.
Rodrik D (2016). Premature deindustrialization. Journal of Economic Growth 21(1):1-33.
Rodrik D (2008). Normalizing Industrial Policy. The World Bank on behalf of the Commission on Growth and Development, Working Paper No.3.
Sahoo P, Bhunia A (2014). China's Manufacturing Success: Lessons for India. IEG Working Paper No. 344.
Salazar-Xirinachs JM, Nübler I, Kozul-Wright R (2014). Transforming economies. Making industrial policy work for growth, jobs and development. Geneva.
Stiglitz J, Lin J, Monga C, Patel E (2013). Industrial policy in the African context. The World Bank.
Sugihara K (2007). The second Noel Butlin lecture: labour-intensive industrialisation in global history. Australian Economic History Review 47(2):121-154.
Syrquin M (1988). Patterns of structural change. Handbook of Development Economics 1:203-273.
United Nations Conference on Trade and Development (UNCTAD) (2016). Virtual Institute Teaching Material on Structural Transformation and Industrial Policy: United Nations, Geneva.
United Nations Development Programme (UNDP) (2015). If Africa Builds Nests, Will the Birds Come? Comparative Study on Special Economic Zones in Africa and China. Working Paper No. 06.
United Nations Industrial Development Organization (UNIDO) (2015). A Technical Note on the Analytical Framework of Growth Identification

and Facilitation for Industrial Upgrading and Diversification (GIFIUD).
Wade R (2015). The role of Industrial Policy in Developing Countries, in Calcagno AF, Dulling S, Márquez-Velázquez A, Maystre N, Priewe J. (Eds.). Rethinking development strategies after the financial crisis. UN, pp .67-79.
Wade R (1990). Governing the market: Economic theory and the role of government in East Asian industrialization. Princeton University Press.
Wang J, Mei L (2009). Dynamics of labor-intensive clusters in China: Relying on low labor costs or cultivating innovation?
Wen Y (2016). Making of An Economic Superpower, The Unlocking China's Secret of Rapid Industrialization. World Scientific.
World Bank (2018a). World Development Indicators (1991-2017). World Bank database.
World Bank (2018b). Poverty and shared prosperity 2018: piecing together the poverty puzzle.
World Bank (2020). Doing business - Ethiopia 2020. The World Bank.
Zeng DZ (2015). Global experiences with special economic zones: Focus on China and Africa. The World Bank.

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Do disaggregated manufacturing sectors matter in Nigeria's economic growth: VECM approach?

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The research used vector autoregressive (VAR) and the vector error correction mechanism (VECM) technique to see whether disaggregated manufacturing sectors had any effect on Nigeria's economic growth over the last 49 years (1970-2018). The productivity of the oil refining subsector is an effective tool for economic growth, according to empirical findings; the coefficient is positive and meaningful in the short run and insignificant in the long run. A further review of the findings reveals that the other sub-sector identified as M3 in the study plays an important role in Nigeria's long-term economic growth, with variance decomposition results indicating positive fluctuations. The study recommends that the manufacturing sector must be acknowledged not only as a promoter for wealth creation, poverty alleviation, and employment generation but as a major sector for enhancing economic growth

Key words: Manufacturing, oil refining, vector error correction mechanism (VECM), Nigeria.

INTRODUCTION

The mechanism that drives economic growth has been discussed for a long time by economists in the last two decades. According to Libanio and Moro (2009), "a revived interest on this topic arose with the upsurge of 'new growth' (or 'endogenous' growth) models, after Romer (1986, 1990) and Lucas (1988)". In comparison to neoclassical growth models, one of the key features of this "new" approach is the importance of increasing returns to scale.

Nigeria's economic growth since 1970 has not been broad-based and also, not delivered significant poverty and unemployment reduction. GDP growth rate reduced from 25% in 1970 to 0.85 in 2017; despite the policies introduced, the unemployment rate moved from 4.8% to 18.8% in the same period (CBN, 2018). By the year 2015 before the economic recession, the unemployment and underemployment rate had reached a peak of 29%. In the same year, life expectancy was 53.1, lower than those of Brazil (74.7) and Ghana (61.5). In addition, 46% of the country's population lived below the poverty line, according to the World Bank's Human Development Indicators (HDI) report (NESG, 2018).

The above development could be attributed to failure to achieve inclusiveness and the pattern and dynamics of economic growth in the past four decades. The pattern can be simply explained by the phrase 'service led growth'. Data from the CBN (2018) show that, from 1999 to 2018, the services sector contributed 57.3% to real GDP growth. This growth was led by key sub-sectors such as trade, telecoms, real estate, and financial

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services. The production sector such as manufacturing only accounted for 8.6% of overall growth during the same period. The growing service sector and rising unemployment suggest that value addition in the service sector is low, relative to the production sector.

Manufacturing has the characteristics that make it the engine of growth, according to Kaldor (1966), as stated by Penélope and Thirlwall (2013), for two main reasons. To begin with, manufacturing has rising returns, both static and dynamic, while land-based activities and petty services have declining returns. Second, as the manufacturing sector grows and employs more people.

According to NESG (2018), the Herfindahl-Hirschman Index of 2,646 (HHI) reveals that Nigeria's manufacturing sector is weak, less competitive, and highly concentrated. A market with an HHI of less than 1,500 is regarded as a competitive marketplace; an HHI of 1,500 to 2,500 is a moderately concentrated marketplace, and a market with an HHI of 2,500 or greater to be a highly concentrated marketplace (Hayes, 2021). This development has caused competitive industries to relocate their factories abroad like Dunlop and Michelin. However, a few key industries such as beverages, textiles, cement, and tobacco kept the sector afloat but operated below half their capacity. The manufacturing GDP data from CBN (2018) show that, between 1981 and 2018, only three out of thirteen sub-sectors contributed 78.6% to its overall output. These three sectors include food, beverage and tobacco (56.4%), textile, apparel, and footwear (16%), and cement (6.2%). The remaining 21.39% is shared among wood and wood products; pulp paper and paper products; chemical and pharmaceutical products; non-metallic products, plastic, and rubber products; electrical and electronic, basic metal and iron and steel; motor vehicles and assembly including other manufacturing (NESG, 2018).

It is important to assess the manufacturing sector's output in Nigeria. This will help determine the relative efficiency of the sub-sectors. Knowing the relative efficiency of manufacturing sub-sectors in terms of economic growth could help the government plan its programs and policies, especially in terms of determining which industries should be prioritized.

The remainder of the study is organized as follows: Section two discusses relevant literature and information on the manufacturing sector and economic growth, Section three outlines the methodology, Section four focuses on empirical results, section five discusses the findings, and Section six concludes and offers recommendations.

LITERATURE REVIEW

Chukwuedo and Ifere (2017) used an eclectic model that combined Kaldor's first law of growth and the endogenous growth model to examine the relationship between manufacturing production and economic growth in Nigeria from 1981 to 2013. Real gross domestic product, manufacturing production, contract intensive money, gross fixed capital, and labor force are among the study's variables. The study discovered that the manufacturing sector's output, capital, and technology are the most important determinants of Nigeria's economic growth. The findings also revealed that the labor force and the efficiency of institutions had little impact on economic development. Emmanuel and Saliu (2017) used the ordinary least square (OLS) methodology to examine the effect of the manufacturing sector on economic growth in Nigeria from 1981 to 2015. In the investigation of manufacturing output, government expenditure, investment rate, and money supply, the report used the following variables as the dependent and independent variables: gross domestic product, manufacturing output, government expenditure, investment rate, and money supply.

The study discovered that the output of the manufacturing sector, capital, and technology are the key determinants of economic growth in Nigeria. The results also showed that the labour force and quality of institutions do not influence economic growth in the economy. Emmanuel and Saliu (2017) investigated the impact of the manufacturing sector on economic growth in Nigeria for the period 1981-2015 by employing the ordinary least square (OLS) technique. The study utilized the following variables such as gross domestic product as the dependent variable while the independent variables include manufacturing productivity, government expenditure, investment rate, and money supply in the investigation of the impact of the manufacturing sector on the Nigerian economic growth. The findings revealed that manufacturing productivity has a positive impact on Nigeria's economic growth. Chemical, physical, and psychosocial hazards are among the major hazards confronting Nigeria's manufacturing sector, according to the findings.

Szirmai and Verspagen (2015) used manufacturing value added (MVA) as an indicator for manufacturing production to re-examine the role of manufacturing as a growth factor in developed and emerging economies from 1950 to 2005. MVA has a fair positive impact on economic growth, according to their findings. Using Ordinary Least Square (OLS) regression, Obioma et al. (2015) looked at the impact of industrial development on Nigeria's economic growth from 1973 to 2013. GDP, manufacturing production, overall savings, foreign direct investment, and inflation rate were the variables they looked at. The study concluded that the impact of industrial production on economic growth is not statistically important, and it is recommended that the government and its agencies ensure political stability as well as implement strategic policies that will provide a level playing field for foreign investors, thereby improving the establishment of industries, especially manufacturing

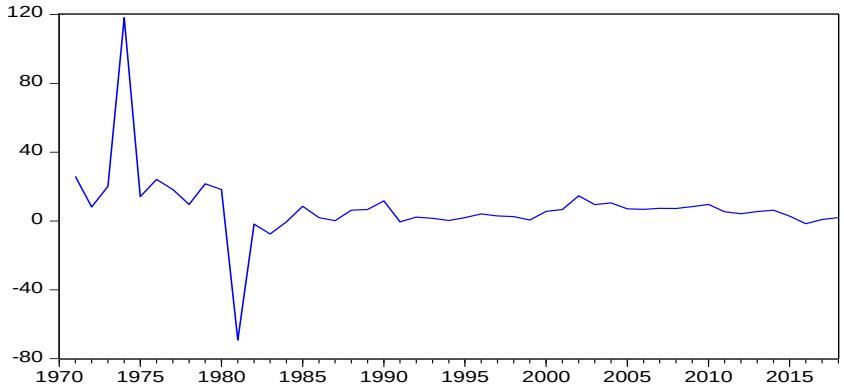

Figure 1. GDP growth rate (1970-2018). Source. CBN, 2010 and 2018.

industries.

From a Kaldorian viewpoint, Rioba (2014) investigated the importance of the manufacturing industry for Kenya's economic growth. The research used time-series data from 1971 to 2013. Manufacturing output growth rate, non-manufacturing output growth rate, and manufacturing employment growth rate were used as dependent variables in the analysis. The data were analyzed using the traditional least square method. According to the study, there is a positive relationship between manufacturing production and economic growth in Kenya, but it is insufficient to spur increased growth.

Adugna (2014) used the Kaldorian method to investigate the effect of the manufacturing sector on Ethiopian economic growth. The research used time series data from 1980 to 2010. The dependent variable was real gross domestic product (RGDP), and the independent variables were manufacturing sector production (MF), manufacturing number of employment (EMP), and manufacturing sector labor productivity (LPDRT). Both descriptive (ratio and percentage) and econometric (double log multiple regression analysis) methods were used to analyze the data. According to the research, a unit shift in the manufacturing sector boosts economic growth by 42 percent. That is, increased manufacturing sector growth can have a variety of effects on the national economy.

Inakwu (2013) investigated the effect of Nigeria's manufacturing sector on economic growth. Time series data from 1980 to 2008 were used in the research. The impact of manufacturing output (MANGDP), investment (INVEST), government expenditure (GOVEXP), and money supply (M2) and the log of real Gross Domestic Product was examined in this report (LRGDP). The data were analyzed using the traditional least square method. The findings suggest that manufacturing and economic growth have a positive and important relationship during the study period.

In Nigeria, Obamuyi et al. (2012) looked into the relationship between bank lending, economic growth, and manufacturing production. The research used time series data spanning the years 1973 to 2009. Manufacturing production (MOT) was used as the dependent variable, with Bank Lending (BLD), Lagged Value of Manufacturing (LVM), Inflation Rate (INFL), Maximum Lending Rate (MLR), Capacity Utilization (CAPU), Financial Deepening (FDP), Exchange Rate (EXR), and GDP as the independent variables. Co-integration and vector error correction model (VECM) techniques were used to analyze the results. The study's findings show that in Nigeria, manufacturing capacity utilization and bank lending rates have a major impact on manufacturing production. The nation, however, was unable to create a link between manufacturing production and economic growth. According to the report, government should make a concerted effort to review manufacturers' and lending institutions' lending and growth policies, as well as provide an effective macroeconomic climate to promote investment-friendly lending and lending by financial institutions.

Facts on Nigeria's manufacturing sector and economic growth

With the exception of 1975 and 1978, the Nigerian economy grew steadily in the second decade of independence (Figure 1). Between 1970 and 1980, real gross domestic product (GDP) grew at a rate of 6.7 percent per year. However, negative growth emerged in the early 1980s, but this was reversed with the introduction of SAP, with real GDP growing at a rate of 4% annually from 1988 to 1997. For much of the three decades following the discovery and extraction of oil, annual growth averaged less than 3% (National Population Commission, 2004). The Nigerian economy has recently experienced a significant acceleration in growth, with real GDP rising by 10.4, 6.9, 7.8, and 7.8%, respectively.

Nigeria's economy expanded by just 2.7% in 2015, a

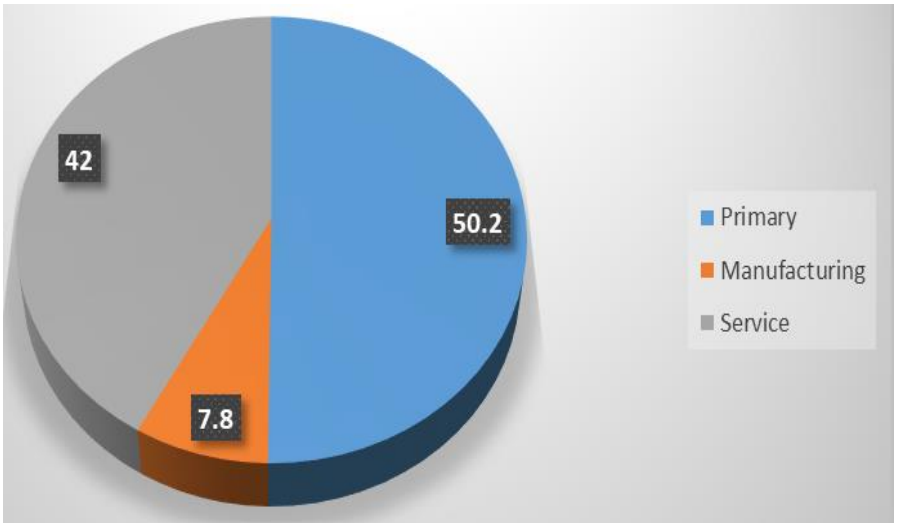

Figure 2. Composition of Sectoral GDP 1970-1980.
Source: CBN Statistical Bulletin 2010.

far cry from the 6.3 percent growth it experienced in 2014. Growth has been on a downward trend since the drop in oil prices in mid-2014, and the economy has entered a recession. After experiencing negative growth for the first two quarters of 2016, it continued to deteriorate in 2016 (-0.4 percent and -2.1 percent year-on-year in real terms, respectively). GDP contracted by 2.2 percent in the third quarter, owing to a sharp drop in the country's oil production, as well as electricity, fuel, and foreign exchange shortages. Inflation doubled to 18.8% (projected) at the end of 2016, up from 9.6% at the end of 2015. This was mostly due to rises in fuel and electricity prices, as well as the weakening of the Nigerian naira during the year (NESG, 2018).

According to studies by Onakoya (2017), Oburota and Okoi (2017), and Okon and Osesie (2017), Nigeria's manufacturing industries have performed well in the manufacture of products for the country in the last decade. Products are exported to other countries, and Nigerians are increasingly purchasing goods produced in the country. According to the industrial output index, the manufacturing sector grew from 145.9 in 2006 to 152.2 in 2007. The value of 132.6 rose by 0.69 percent over the first half of 1996, but fell by 0.2 percent in the second half of the same year. The increase in production compared to the same time in 1996 was attributed to the increase in mining and manufacturing production by 1.0 and 0.4% respectively.

Figure 2 depicts the structure of Nigeria's GDP from 1970 to 1980. It demonstrates the primary sector's supremacy, which includes agriculture, mining, and quarrying (including crude oil and gas). The primary sector contributed roughly 59 percent of GDP in 1970. However, between 1970 and 1980, this share averaged 50.2 percent, reflecting a slow transition from primary to secondary and tertiary operations. The service sector contributed 42%, while manufacturing contributed 7.8% (CBN, 2010).

In Nigeria, the secondary sector, which includes manufacturing and its thirteen sub-sectors, contributes the least to GDP. Figure 2 depicts Nigeria's primary sector's intense dominance in GDP and the manufacturing sector's marginal contribution between 1970 and 1980.

The primary sector contributed 34.2 percent of GDP on average between 1981 and 2018. Despite the fact that the primary sector's contribution to GDP has decreased, it still accounts for more than a third of Nigeria's production. The service sector contributed 57%, while manufacturing contributed 8.8% (CBN, 2018). Due to its relative size and linkage impact, the manufacturing sector is correlated with a higher growth contribution than conventional sectors. As famously stated in Kaldor's (1966) first growth rule, a country's GDP growth is positively linked to the growth of its manufacturing sector.

Data from the CBN (2018) show that a negative growth of the manufacturing sector is associated with a negative growth of the economy. The oil boom era started in 1973 as a result of the embargo placed by the USA on Arab oil, the economy became heavily dependent on oil and the industrial sector also depended on imported inputs, machinery, and raw materials. By this time, oil revenue represented almost 90% of foreign exchange earnings and about 85% of total exports. While the boom afforded the government much-needed revenue, it also created serious structural problems in the economy (NESG, 2018). The exchange rate regime encouraged imports with the economy heavily dependent on imports; almost everything was imported, from toothpicks to toothpaste dispensers. There was no serious attempt to invest the

Table 1. Variables Measurement and Sources of Data.

Variable	Measurement	Sources of Data
Economic growth (RGDPPC)	RGDP per capita	https://www.indexmundi.com/facts/nigeria/gdp-per-capita
Manufacturing (MVA)	Manufacturing value-added	World Bank Development Indicators, Online 2019
MA^1	Oil Refining Output (in billions)	CBN Statistical Bulletin, 2010,2018
MA^2	Cement; food, beverages and tobacco; textile, apparel, and footwear; wood and wood products; pulp paper and paper products; chemical and pharmaceutical products; non-metallic products, plastic, and rubber products; electrical and electronic, basic metal and iron and steel; motor vehicles and assembly output	CBN Statistical Bulletin, 2010, 2018
MA^3	Other Manufacturing Output	CBN Statistical Bulletin, 2010, 2018

Source: Researcher's Compilation, 2020.

windfall from oil in viable projects. Except for the huge expenditures on education and construction of dual carriage highways in some parts of the country, Nigeria would have had nothing to show from the oil boom era (NESG, 2018). The manufacturing sector's growth increased from 24% in 1973 to 150% in 1974. The remarkable increase appears misleading and must be interpreted with caution if industrialization is seen to imply the process of developing the capacity of the country to master and locate, within its borders, the industrial production process. The whole industrial production process is the production of raw materials; production of intermediate products for other industries; fabrication of the machines and tools required for the manufacture of the desired products and of other machines and tools; skills to manage factories and to organize production processes (Okon and Osesie 2017)

Declining oil revenues, disequilibrium in the balance of payments, growing unemployment, increasing rate of inflation, and political instability, all confirmed that demand-induced policies were no longer effective. By 1978, a country that had thought that foreign exchange was not a constraint on development went borrowing on the Euro-dollar market. Despite the oil boom, the private sector remained weak. The existing macroeconomic policies continued to encourage consumption rather than production. The economy was consuming what she was not producing. The austerity measures introduced by the military administration under General Olusegun Obasanjo in 1977 were short-lived because structural problems were not addressed.

A sharp fall of 150% growth rate of the manufacturing sector in 1974 to 0.4% in 1975 is believed to contribute to the negative economic growth of 5.2% in 1975. Years that the manufacturing sector experienced negative growth in Nigeria were associated with negative growth of the economy or growth rates that were not more than 3%. The manufacturing sector experienced negative growth rate in 1981 (55.3%), 1983 (33.8%), 1984 (12.8%), 1986 (3.0%), 1992-1995 (3.4%), 1998 (12.3%) and 2016 (9.4%). In all these years, the economy had a negative growth rate (Figure 2).

METHODOLOGY

The study employed the use of secondary data that were mainly sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of 2010; 2018 and the World Bank. The scope of the study covers the period between 1970 and 2018. All data will be converted into a log-log equation for time series processing. Thus, the coefficient can be interpreted as an elasticity. The variables and their sources are presented in Table 1.

Model specification

To test for the manufacturing sub-sector that mostly drive economic growth in Nigeria, the following equation is specified:

$$GDPPC = MA^1, MA^2, MA^3, MVA$$

The above model in Equation 1, can further be reduced to an econometric form where all other variables take their log form. The model is thus specified as follows:

$$LGDPPC = \beta_0 + \beta_1 \ln MA^1 + \beta_2 \ln MA^2 + \beta_3 \ln MA^3 + \beta_4 \ln MVA + \mu$$

Where μ denotes the error term; *ln* is natural logarithm; β_0 = intercept or autonomous parameter estimate; $\beta_1 ..... \beta_4$ = Parameter estimate associated with the determinants of economic growth in Nigeria. Hence, $\beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 > 0;$ meaning that all the slope coefficients are expected to be positive except. MA^1 is the log of manufacturing output in oil refining, MA^2 is the log of manufacture output in cement; food, beverages and tobacco, and textile while MA^3 is the log of the output in apparel, footwear, wood and wood products, pulp paper and paper products, chemical and pharmaceutical products, non-metallic products, plastic and rubber

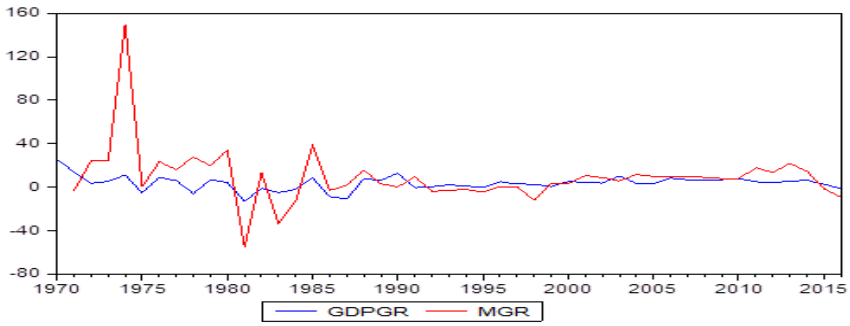

Figure 3. Relationship between Nigeria's Manufacturing Growth and Economic Growth (1970-2016). Source: CBN Statistical Bulletin (2012, 2018).

Table 2. ADF and PP unit root test result.

Variable	ADF test statistic				PP Test Statistic			
	Constant	Constant and trend	None	First difference	Constant	Constant and trend	None	First difference
LGDPPC	-0.32	-0.79	0.89	-6.20*	-0.65	-0.97	0.72	-6.28*
LMVA	-1.86	-1.90	-0.93	-6.78*	-1.94	-1.97	-0.93	-6.78*
LMA1	-0.57	-2.44	1.04	-8.80*	0.38	-2.26	1.47	-8.84*
LMA2	2.09	-3.00	3.18	-4.08*	1.08	-2.60	4.57	-4.20*
LMA3	1.26	-2.91	2.99	-3.90*	1.60	-2.48	4.66	-3.94*

Source: Calculations by the researcher from Eviews 9, 2021. (ADF) Notes: At 5%, test critical values (at level: constant = -2.94, constant and trend = -3.50, none = -1.94, while at First difference = -2.92); P-value = Probability value, * denotes stationarity. (PP) Notes: At 5%, test critical values (at level: constant = -2.94, constant and trend = -3.50, none = -1.94, while at First difference = -2.92); P-value = Probability value, * denotes stationarity.

products, electrical and electronic, basic metal, iron and steel, motor vehicles and assembly and other manufacturing not included in M^1 and M^2 while MVA is Manufacturing value-added as a measure of manufacturing activities.

SERIES TREND ANALYSIS

Data in time series also shows rising or declining patterns, as well as fluctuations. As a result, trend analysis is needed before unit root testing in order to determine if the series has a unit root. Trend analysis can be used to see if a sequence is stationary around a constant or if it has a trend that can be used in unit testing. The series exhibit a random walk with drift and pattern, according to the results of the graphic shown in Figure 3. The series are non-stationary since they represent a trend with a pattern of significant fluctuations. This gives the impression that the data series is non-stationary in levels, and that any regressions involving such variables would lead to serious errors in inferences, that is, spurious regression (Greene, 2003).

Stationarity test

We test unit root by first checking the series at level, including a constant, then constant and trend, taking into account the properties of our series. We do, however, have none in order to investigate our series further. We then put the sequence to the test at the first difference. The analysis will use the Augmented Dickey-Fuller (ADF) method to perform unit root tests, which will be validated by the PP test (Ihugba, 2020).

When measured at a level with a constant, constant and trend, or zero, all variables are non-stationary, as indicated by the asterisk. It is concluded that the series are non-stationary at a level since they are not stationary when measured at constant and trend. All variables, however, are stationary at first difference, as shown by the asterisk. As a result, the Phillips–Perron (PP) test validates the ADF test results.

The unit root test of Phillips–Perron

The PP test has an advantage over the ADF test in that it corrects for heteroscedasticity and serial correlation in error terms (u_t). PP tests are often based on a serially correlated regression error term and do not entail lag selection. Table 2 shows that the series are non-stationary at level but stationary at first difference, based on the results of the PP test. The variables are depicted

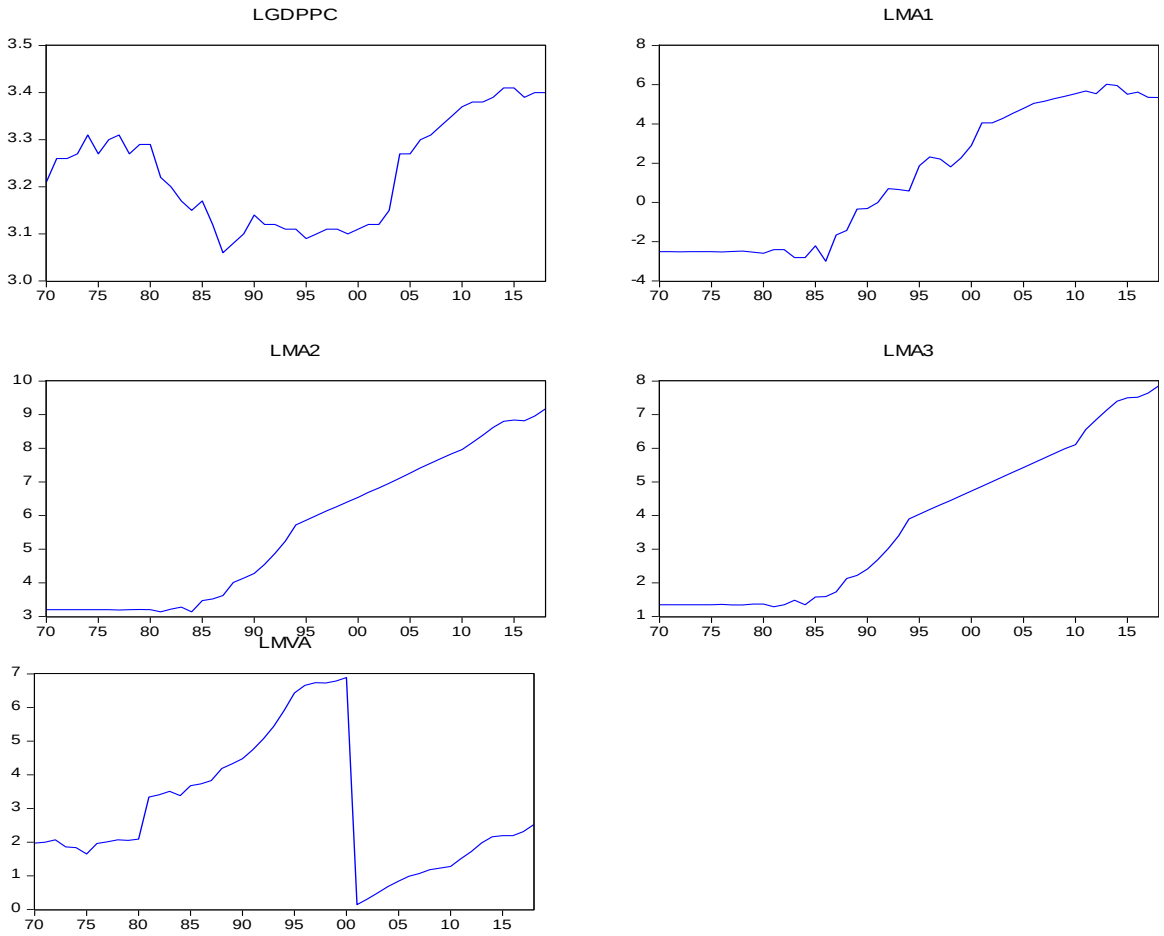

Figure 4. The series in their raw (undifferentiated) form. Source: researcher's computation using Eviews 9.

Table 3. VAR lag order selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-311.8136	NA	2.56e-08	13.73675	14.16976	13.89970
1	153.8977	693.6126*	1.24e-14	-0.931818	4.264341*	1.023531*
2	297.7682	146.9316	1.13e-14*	-1.905030*	8.054275	1.842723

Source: Researcher's estimates from Eviews 9, 2021. * indicates the lag order chosen by the criteria.

in their differenced form in Figure 4. The use of the VAR model for estimation is justified as a result of this result.

Lags determination

Table 3 shows the results of lag-order selection. The FPE, HQIC, LR, and SBIC selection criteria indicate a lag order of one, while the

AIC selection criteria show a lag order of two and the lowest value.

As a result, the work will continue with further lag checks (2).

Test of cointegration

The next move is to conduct a cointegration test after ensuring that all variables are incorporated to order one I(1). Because there are multivariate time series, Johansen's (1988) multivariate cointegration technique is used to see if there are stable long-run relationships between disaggregated three sub-components of the manufacturing sector, manufacturing value-added, and GDP per capita (Table 4).

Since the trace statistic value is greater than the critical value (103.6329>69.81889) and the likelihood value is less than 5% (P-value = 0.000), the null hypothesis is

Table 4. Cointegration results.

Hypothesized No. of CE(s)	Trace statistic	0.05 Critical value	Prob.**	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical value	Prob.**
None *	103.6329	69.81889	0.0000	None *	53.83526	33.87687	0.0001
At most 1 *	49.79767	47.85613	0.0325	At most 1	20.18489	27.58434	0.3285
At most 2	29.61278	29.79707	0.0525	At most 2	16.97820	21.13162	0.1731
At most 3	12.63458	15.49471	0.1289	At most 3	10.90485	14.26460	0.1590
At most 4	1.729731	3.841466	0.1884	At most 4	1.729731	3.841466	0.1884

Source: Eviews 9, 2021 calculations by the researcher. Note: According to MacKinnon-Haug-Michelis (1999), p values; *indicates rejection of the hypothesis at the 0.05 mark. At the 0.05 mark, the trace test reveals 2 cointegrating eqn(s); the max-eigenvalue test reveals 1 cointegrating equations.

Table 5. Vector error correction model result.

Cointegrating equation	CointEq1	Std. error	t-Statistic		
C	-6.690859				
LGDPPC(-1)	1.000000				
LMA1(-1)	5.090643	0.76240	6.67716		
LMA2(-1)	-2.226620	0.40792	-5.45845		
LMA3(-1)	1.381431	0.36399	3.79525		
LMVA(-1)	0.405899	0.05403	7.51192		
Error correction	D(LGDPPC)	D(LMA1)	D(LMA2)	D(LMA3)	D(LMVA)
CointEq1	-0.04973	-0.19722	-0.01294	0.038397	0.401114
D(LGDPPC(-1))	-0.04762	-0.37045	-0.29005	-0.22613	-1.7818
D(LGDPPC(-2))	-0.02645	-0.42904	-0.06575	0.066075	3.538203
D(LMA1(-1))	0.302153	0.271638	0.321536	0.235759	-0.30394
D(LMA1(-2))	0.094099	0.152012	-0.44726	-0.4286	-1.06119
D(LMA2(-1))	-0.28726	-0.67197	0.145071	0.031336	1.520474
D(LMA2(-2))	-0.15695	-0.60216	0.324429	0.582297	0.091769
D(LMA3(-1))	0.19582	0.361972	0.190332	0.315526	-0.90087
D(LMA3(-2))	0.208217	0.814519	0.013887	-0.15559	0.098339
D(LMVA(-1))	0.023567	0.046262	0.023375	0.010594	-0.07755
D(LMVA(-2))	0.007197	0.030888	-0.02812	-0.03063	-0.13202
C	-0.00375	0.011888	0.046614	0.047401	-0.06558

Source: Computations of the researcher from Eviews 9, 2021.

rejected by trace test statistics (MacKinnon et al., 1999). This result indicates that at least one cointegrating vector exists. The null hypothesis that there are no cointegrating equations is also dismissed based on the Max-Eigen results. Since the Max-Eigen Statistic is greater than the critical value (53.83526> 33.87687), and the likelihood value is less than 5% (P-value = 0.000), this is the case. After we've established that the vectors have a long-term relationship, we'll look at how that relationship came to be.

Estimation of vector error correction model (VECM)

Two Vector Auto-regression Models (VAR and VEC) have been developed using the same variables in an attempt to determine the appropriate model on the empirical relationship between economic growth, disaggregated three sub-components of the manufacturing sector, and manufacturing value-added in Nigeria. The error correction term in the VECM systems method is used to estimate a causal association between endogenous variables. The short-run test results are presented in Table 5.

The error correction term of the target variable is negative (-0.049) and that of LMA1 (-0.197), LMA2 (-0.012), and LMA3 (0.0384). The result of the LGDPPC equation reveals a negative relationship between LGDPPC and its first and second lagged values. A positive relationship is revealed between LGDPPC and

Table 6. Error correction result for Model II.

Variable	Coefficient	Std. error	t-Statistic	Prob.
ECT	-0.049727	0.015234	-3.264165	0.0025
D(LGDPPC(-1))	-0.047622	0.153875	-0.309484	0.7588
D(LGDPPC(-2))	-0.026454	0.137145	-0.192893	0.8482
D(LMA1(-1))	0.302153	0.075775	3.987495	0.0003
D(LMA1(-2))	0.094099	0.070364	1.337315	0.1900
D(LMA2(-1))	-0.287263	0.117775	-2.439076	0.0201
D(LMA2(-2))	-0.156949	0.114359	-1.372427	0.1789
D(LMA3(-1))	0.195820	0.101729	1.924914	0.0626
D(LMA3(-2))	0.208217	0.102334	2.034685	0.0497
D(LMVA(-1))	0.023567	0.006828	3.451475	0.0015
D(LMVA(-2))	0.007197	0.006684	1.076769	0.2892
C	-0.003750	0.006217	-0.603246	0.5503

Source: Computations of the researcher from Eviews 9, 2021.

the first lagged value of LMA1 including the first lagged values of LMA3 and LMVA. The first and second lag values LMA2 are negatively related to economic growth. This implies that the growth of LMA2 is inimical to the long-run economic growth of Nigeria. The result of the LMA1 equation reveals a positive relationship with its first lagged value and LMA3 and LMVA. This implies that the growth of LMA3 and LMVA is good for the growth of LMA1 (oil refining). LGDPPC and LMA2 are unfavorable to the growth of LMA1 in the long run.

LMA2 which comprises output in cement; food, beverages, tobacco, and textile is positively related with its first and second lag values, LMA1 (-1) and the first and second lag values of LMA3. LMA3 comprises output in apparel and footwear, wood and wood products, pulp paper and paper products, chemical and pharmaceutical products, non-metallic products, plastic and rubber products, electrical and electronic, basic metal and iron and steel; motor vehicles and assembly also show a positive relationship with its first lagged value and the error correction term is positive (0.038) indicating no long-run relationship (Table 5).

In Table 5, VAR has defined and estimated a simultaneous equation using the VECM method. The simultaneous equation calculated under VAR using the VECM method, on the other hand, only provides coefficients, standard deviations, and t-statistics, but no likelihood values. As a result, the simultaneous equation must be estimated as a basis for calculating the effect of manufacturing sub-sectors and manufacturing value-added on Nigerian economic growth. The analysis uses OLS to estimate the simultaneous equation to determine the effect of the explanatory variables on Nigeria's economic growth.

Since the error correction term (ECT) is significant and negative, the results for the error correction term coefficient in Table 6 theoretically indicate a long-run relationship between the dependent variable (economic growth) and the explanatory variables (disaggregated three sub-components of the manufacturing sector and manufacturing sector value-added) for Nigeria in the period 1970-2018. The ECT signifies the frequency at which the long-run and short-run estimates are adjusted for disequilibrium (Engle and Granger, 1987). According to the VECM figures, 0.05 percent of the disequilibrium between long-run and short-run estimates is corrected and brought back to equilibrium on an annual basis. With a p-value of 0.00 at a 1% confidence level and a corresponding standard error of 0.015234, this value is significant.

In line with the Apriori expectation, the log of MA1 (oil refining output) has a positive and important relationship with economic growth. Findings also show that, a 1% rise in LMA1 would result in a 30% increase in LGDPPC. A 1% increase in the second lag of LMA2 (output in cement; fruit, beverages, tobacco, and textile) would reduce economic growth by 29%, and it is significantly linked to economic growth. Economic growth and LMA3 have a positive significant relationship. A 1% rise in LMVA would increase economic growth by 0.02 percent in the long run, according to the first lag of LMVA.

Diagnostic tests

Autocorrelation residual LM test

The Godfrey LM test will support the null hypothesis of no serial autocorrelation for two lags because their p-values are greater than the significance values of 0.05, whereas the null hypothesis of serial autocorrelation will be rejected for one lag because its p-values are less than the significance values of 0.05. As a result, we can assume that there is no serial autocorrelation since the

Table 7. LM Test of Breusch-Godfrey serial correlation.

F-statistic	2.102292	Prob. F(2,32)	0.1387
Obs*R-squared	5.342166	Prob. Chi-Square(2)	0.0692

Source: Computations of the researcher from Eviews 9, 2021.

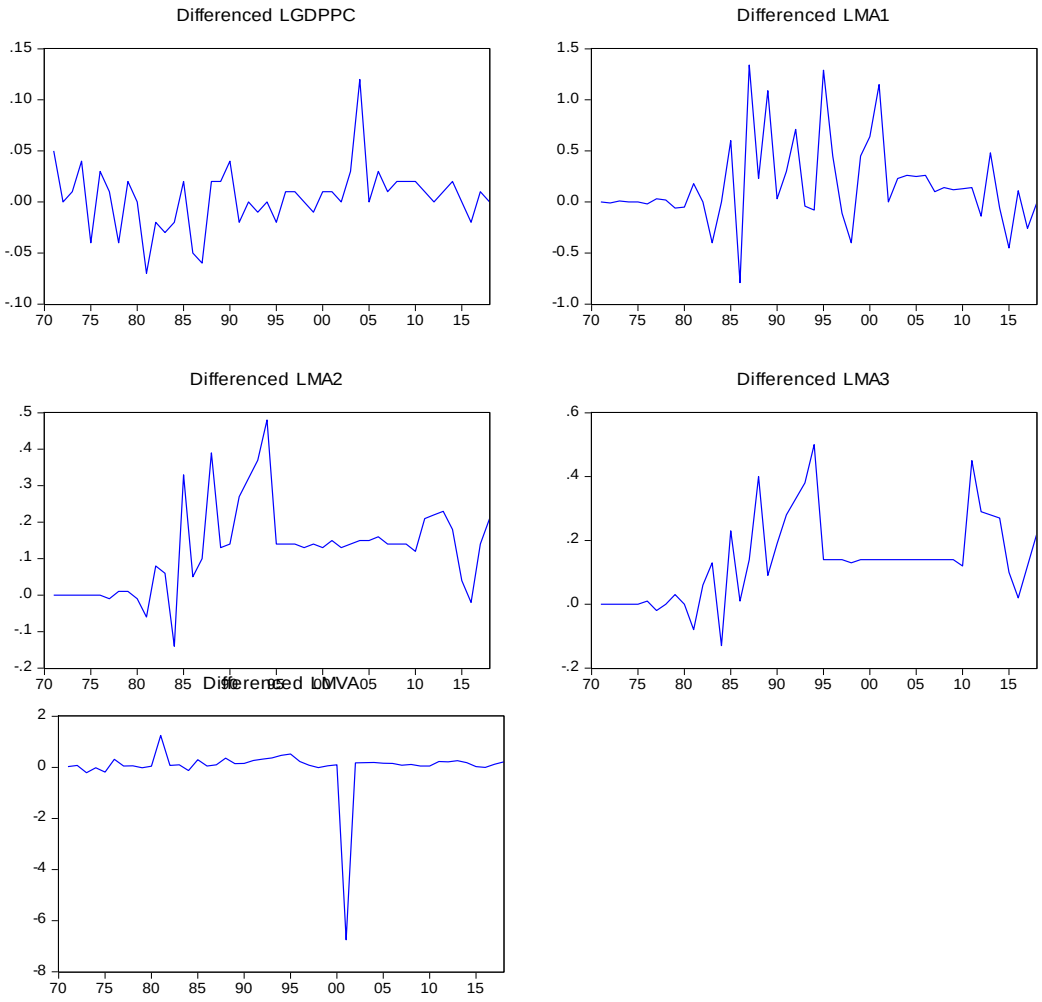

Figure 5. The series in their differenced form. Source: researcher's computation using Eviews 9.

null hypothesis is accepted by the majority of the lags (Table 7).

Stability test

CUSUM and CUSUM – SQ test for stability

Since the CUSUM, CUSUMSQ test statistic, and recursive coefficients are all verified to be within the 5% critical bounds of parameter stability, Figures 5 to 7 shows that there is no instability. This implies we support the null hypothesis and assume that our parameters are stable and, as a result, do not have any misspecification.

We conclude that our equation is true based on these checks.

Residual normality test

The Jarque-Bera statistic of 10.64 with a likelihood of 0.005 shows the null hypothesis is rejected at a 5% significance stage, based on the findings from Figure 9. This demonstrates that residuals are not usually distributed, which is unfavorable. Non-normality in the residuals, according to Harris (1995), is not a concern

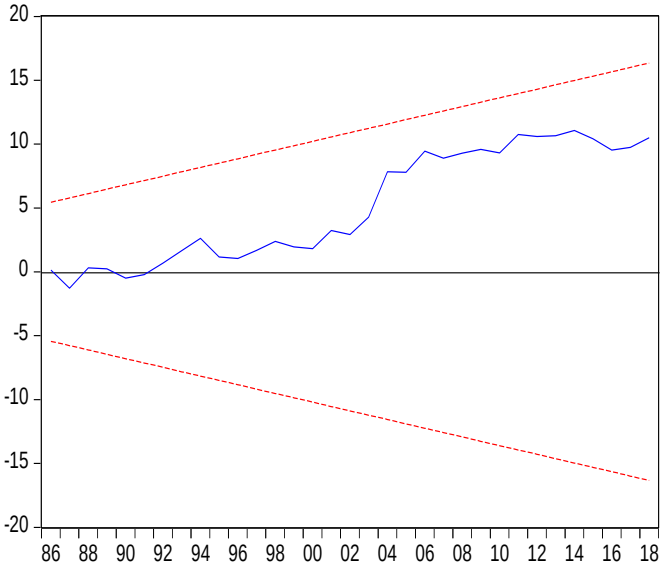

Figure 6. Plot of residuals CUSTUM.

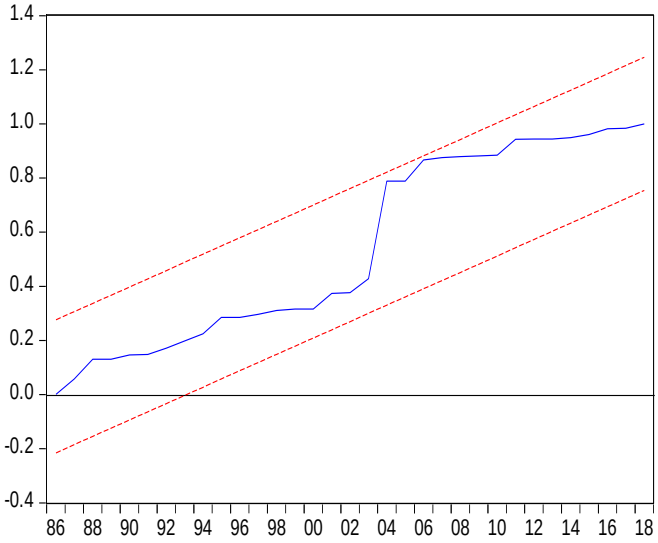

Figure 7. Plot of residuals CUSUMSQ.

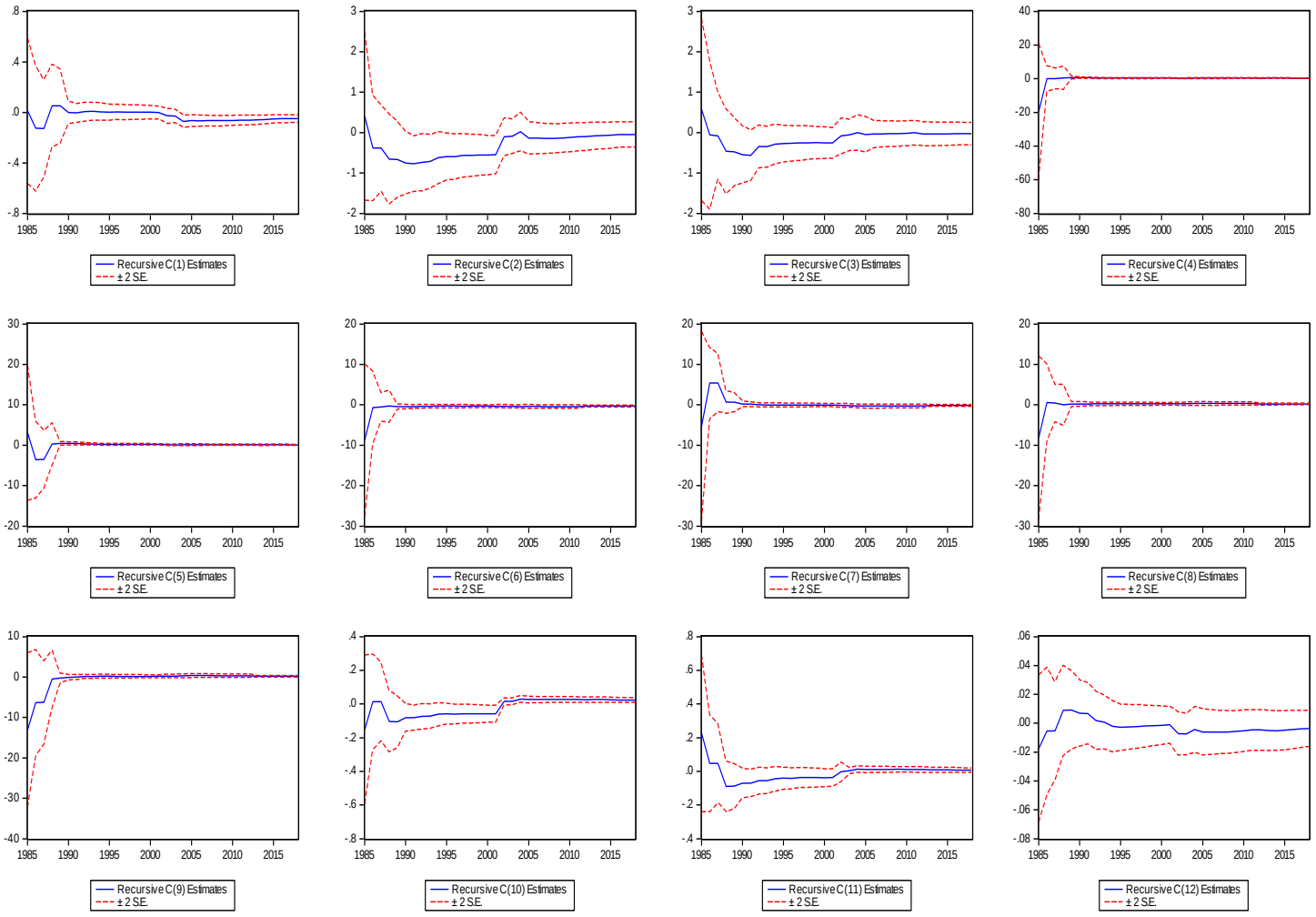

Figure 8. Recursive coefficients test.

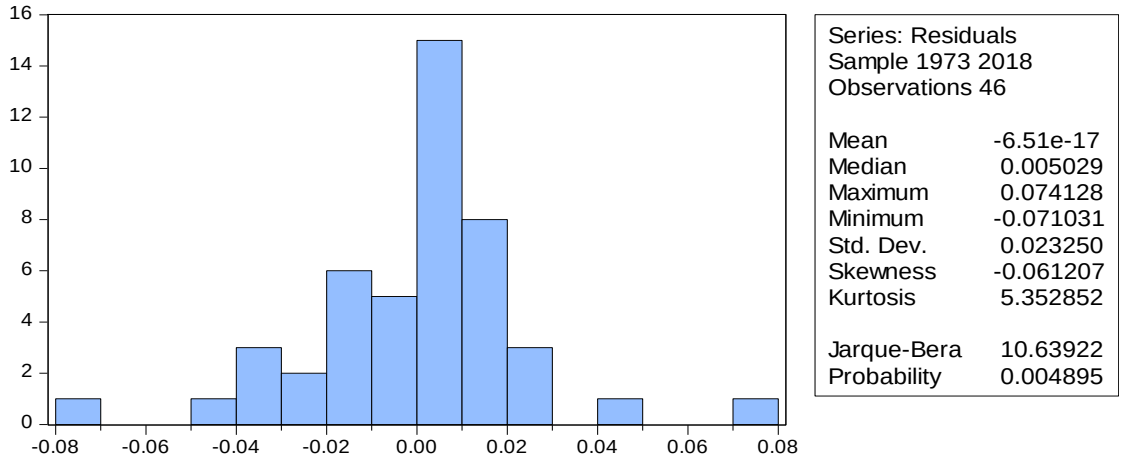

Figure 9. Jarque-Bera normality test.

Table 8. Breusch-Pagan-Godfrey and ARCH Tests for heteroscedasticity.

	Breusch-Pagan-Godfrey	ARCH	Breusch-Pagan-Godfrey		ARCH	
F-statistic	0.855328	0.329119	Prob. F(27,18)	0.6149	Prob. F(2,41)	0.7214
Obs*R-squared	13.77954	0.695240	Prob. Chi-Square(27)	0.5423	Prob. Chi-Square(2)	0.7064
Scaled explained SS	16.38403		Prob. Chi-Square(27)	0.3570		

Source: Computations of the researcher from Eviews 9, 2021.

(Figure 8).

The tests for heteroscedasticity show that the variance is constant. At the 5% critical point, the observed R-square likelihood values for the Breusch-Pagan-Godfrey Test and the ARCH test are not important. As a result, the LGDPPC systems equation is stationary and homoscedastic, making it suitable for economic analysis (Table 8).

Simultaneous equation short-run simulation and Analysis

Table 9 shows the outcomes of the short-run test. The Chi-square joint statistics probability values show that there is a short-run relationship between the explanatory variables and the independent variable. The null hypotheses (H0): β5=0 would be dismissed because the p-value of the chi-square test for the log of MA1 (oil refining output) is equal to 0.00, which is less than 0.05. Thus, LMA1 induces LGDPPC in the short run. The Chi-Square test p-value for LMA2 is 0.02, which is less than 0.05, indicating that the null hypotheses (H0: β2=0) will be dismissed, implying that LMA2 triggers LGDPPC in the short term. As a result, we can deduce that production in cement, food, beverages, tobacco, and textiles has a negative effect on economic growth in the short term.

The null hypothesis (H0): β5=0 will also be rejected for LMA3 because its chi-square test p-value is equal to 0.02 which is less than 0.05. As a result, output in apparel and footwear, wood and wood products, pulp paper and paper products, chemical and pharmaceutical products, non-metallic products, plastic and rubber products, electrical and electronic, basic metal and iron and steel, motor vehicles and assembly will cause economic growth in the short run. Ex-ante forecasting using impulse response and variance decomposition tests is the next step.

Impulse response

As indicated by LGDPPC shocks, the impulse response forecast indicates that Nigeria's future economic growth as a result of oil refining production is optimistic. A one standard deviation positive own shock causes LGDPPC to increase by 0.033 in the short run, but by 0.032 in the long run. LGDPPC will decrease in the short term but increase in the long term as a result of LMA2 innovations. According to the findings, a one positive standard deviation shock to LMA2 causes LGDPPC to decrease by -0.003, while LGDPPC increases by 0.008 in the long run. Further evidence demonstrates that adjustments to LMA3 would boost LGDPPC in the short and long term. LGDPPC would increase by 0.003 in the short run and by

Table 9. Wald tests and short-run test.

Dependent Variable: DLGDPPC			
Variable	**Chi-square test**	**Prob.**	**Relationship**
DLMA1	17.8	0.00	Short-run causality
DLMA2	7.45	0.02	Short-run causality
DLMA3	7.74	0.02	Short-run causality
DLMVA	12.4	0.00	Short-run causality
ALL	21.1	0.00	Short-run causality

Source: Computations of the researcher from Eviews 9, 2021.

Table 10. Impulse response analysis.

Period	Response of LGDPPC			
	LGDPPC	**LMA1**	**LMA2**	**LMA3**
1	0.030850	0.000000	0.000000	0.000000
2	0.032582	0.002251	-0.002684	0.002517
3	0.035427	-0.000753	0.000593	0.007710
4	0.035603	0.001444	0.006681	0.006468
5	0.032488	0.004037	0.007931	0.000977

Source: Computations of the researcher from Eviews 9, 2021.

Table 11. Variance decomposition.

Period	Response of LGDPPC			
	LGDPPC	**LMA1**	**LMA2**	**LMA3**
Short-run	99.5	0.1	0.2	0.2
Long-run	95.5	0.2	0.7	1.2

Source Computations of the researcher from Eviews 9, 2021.

0.0001 in the long run as a result of a positive standard deviation shock to LMA3 (Table 10).

Variance decomposition

Impulses, innovations, and shocks to economic growth account for 99.5 percent of economic growth variations in the short run. In the long run, however, the economic growth own shock fluctuations fall to 95.5 percent. Meanwhile, in the short-run, shocks to LMA1 account for 0.1 percent of economic growth fluctuations. Economic growth variations due to LMA1 advances rise to 0.2 percent in the long run. Shocks to LMA2 account for 0.2 percent in the short term, and shocks to LMA3 account for 0.2 percent. Shocks to LMA2 account for 0.7 percent in the long run, while shocks to LMA3 account for 1.2 percent (Table 11)

DISCUSSION

The error correction term coefficient implies a long-run relationship between the dependent and independent variables in theory. According to CBN (2018), oil refining contributed just 4.1 percent to manufacturing output, which may explain why the coefficient of oil refining output (LMA1) is positive and important in the first lag but negligible in the second lag, despite being positive. The sub-sectors' contribution to the manufacturing sector's overall output (4%) indicates that the sub-sector is less sustainable. One of the ten sub-sectors is oil refining.

After accounting for nearly 80% of the manufacturing sector's total output, output in cement, food, beverages, tobacco, and textiles (LMA2) has a negative and negligible relationship with economic growth in its second lag. This demonstrates that LMA2 has been working in extremely unfavorable conditions, including inadequate power (infrastructure), poor transportation, political uncertainty, poverty, lack of financial resources, and corruption. As a result, many textile businesses have failed in the last 20 years. Owing to high energy costs, smuggling of textile products, and limited access to finance, they faced increasing operating costs and weak sales. Several of them have had to lay off employees.

The majority of the factories have ceased production

today. According to official report from NESG (2018), the textile industry in Nigeria is currently operating at less than 20% of its production capacity, with a workforce of less than 20,000 people. Furthermore, the cotton-growing industry has ceased to exist, depriving thousands of smallholder farmers of a source of income. Furthermore, we import a substantial portion of our clothing products from China and European countries. This trend indicates that cement, food, beverages, and tobacco account for the bulk of the manufacturing sector's 80 percent contribution.

The manufacturing sector, for example, expanded at an annual rate of 12% on average between 2005 and 2014, owing largely to rising market demand. The key point here is that major changes in LMA1 and LMA3 are yet to be reported. This justifies the need for policy realignment that could aid in the development of the country's indigenous manufacturing technological capability.

Furthermore, the LMA3 coefficient has a negative and important association with economic growth, which contradicts our Apriori expectations. In the short run, the past value of LMA3 does not cause economic growth.

CONCLUSIONS AND RECOMMENDATIONS

Manufacturing sub-sectors have the potential to expand the economy, but policymakers and other stakeholders must recognize the numerous and long-term benefits that the sub-sectors will bring. As a result, the government must close loopholes that have hampered the manufacturing sector's success over the last 49 years, and the Nigerian spirit of entrepreneurship must be reignited. It must upgrade our deteriorating physical infrastructure (electricity, roads, rail, and seaports and airports) and build a business-friendly climate. Through investing in skills and technology development, the government will assist in the development of locally based knowledge and technology, freeing the country from the stranglehold of importation.

Without rapid structural transformation of our manufacturing sector, achieving Sustainable Development Goal 8--"higher levels of productivity of economies through diversification, technical upgrading, and innovation, particularly through an emphasis on high value-added and labor-intensive sectors"—will be a mirage. However, there is hope for a better future for this country if our policymakers learn from the experiences of Brazil of South America, China, Singapore, and other fast-developing Asian countries. This hope must be based on the government's ability to develop the will, commitment, and capacity to implement policies and programs that will turn around the Nigerian manufacturing sector's fortunes, allowing it to resume its position as a unique engine of growth (wealth creation, employment generation, and poverty alleviation). The study recommends that our manufacturing sector should be recognized as a major sector for enhancing national growth and development as well as a catalyst for creating wealth, generating jobs, and alleviating poverty. As a result, it must be given due consideration and priority in the overall scheme of things.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

Adugna T (2014). Impact of the manufacturing sector on economic growth in Ethiopia: A Kaldorian approach. Journal of Business Economics and Management Science 1(1):1-8.

CBN Statistical Bulletin (2010). Annual report and statement of accounts. https://www.cbn.gov.ng/OUT/2011/PUBLICATIONS/STATISTICS/2010/INDEX.HTML

CBN Statistical Bulletin (2012). Annual report and statement of accounts. https://www.cbn.gov.ng/out/2013/sd/2012%20statistical%20bulletin%20contents%20and%20narratives_finalweb.pdf

CBN Statistical Bulletin (2018). Annual report and statement of accounts. https://www.cbn.gov.ng/documents/statbulletin.asp

Chukwuedo SO, Ifere EO (2017). Manufacturing subsector and economic growth in Nigeria. British Journal of Economics, Management and Trade 17(3):1-9.

Emmanuel OO, Saliu WO (2017). Hazards of the manufacturing sector and economic growth in Nigeria. International Journal of Social Sciences, Humanities, and Education 1(1):1-16.

Engle RF, Granger WJ (1987). Cointegration and Error correction: Representation, Estimation, and Testing, Econometrica 55:251-76.

Greene WH (2003). Econometric analysis. 5th Edition, Prentice Hall, New York.

Harris RJ (1995). Using cointegration analysis in econometric modeling. Harvester Wheatsheaf: Prentice-Hall.

Hayes A (2021). Herfindahl-Hirschman index (HHI). Available at: https://www.investopedia.com/terms/h/hhi.asp.

Ihugba OA (2020). Population growth in Nigeria: implications for primary school enrolment, Journal of School of Arts and Social Sciences. 8(1):229-250.

Inakwu UA (2013). An assessment of the impact of the manufacturing sector on economic growth in Nigeria: A research project. Caritas University, Amorji-Nike, Enugu, Nigeria.

Johansen S (1988). Statistical analysis of cointegration vectors. Journal of Economic Dynamics and Control 12:231-254.

Kaldor N (1966). Causes of the slow economic growth of the United Kingdom, Cambridge University Press, Cambridge.

Libanio G, Moro S (2009). Manufacturing industry and economic growth in Latin America: A Kaldorian approach. Mimeo, Federal University of Minas Gerais, Brazil. Available at: https://core.ac.uk/download/pdf/6338361.pdf.

Lucas RE (1988). On the mechanics of economic development. Journal of Monetary Economics 22:4-42.

MacKinnon JG, Haug AA, Michelis L (1999). Numerical distribution functions of likelihood ratio tests for cointegration, Journal of Applied Econometrics 14(5):563-577.

Nigeria Economic Summit Group (NESG) (2018). The manufacturing sector and Nigeria's economic growth pattern: redesigning policy intervention for inclusive growth. Available at: www.nesgroup.org/policy---briefs/.

Obamuyi TM, Edun AT, Kayode OF (2012). Bank lending, economic growth, and the performance of the manufacturing sector in Nigeria. European Scientific Journal February edition, 18:3. ISSN: 1857-7881(print). E-ISSN: 1857-7451.

Obioma BK, Anyanwu UN, Kalu AU (2015). The effect of industrial

development on economic growth (An empirical evidence in Nigeria 1973-2013). European Journal of Business and Social Sciences 7(13):160-170.
Oburota CS, Okoi IE (2017). Manufacturing subsector and economic growth in Nigeria. British Journal of Economics, Management and Trade 17(3):1-9.
Okon EO, Osesie SW (2017). Hazards of the manufacturing sector and economic growth in Nigeria. International Journal of Social Sciences, Humanities, and Education 1:1.
Onakoya AB (2017). Does manufacturing matter for economic growth in the Nigerian case? A confirmatory test of Kaldorian first growth law. Babcock Journal of Economics, Banking, and Finance 4:253-274.
Penélope P, Thirlwall AP (2013). A New interpretation of Kaldor's first growth law for open developing economies. Available at: https://www.econstor.eu/bitstream/10419/105584/1/1312.pdf.
Rioba ME (2014). Manufacturing industry and economic growth in Kenya: A Kaldorian approach. A research project. University of Nairobi, Kenya.
Romer P (1986). Increasing returns and long-run growth. Journal of Political Economy 94(5):1002-1037.
Romer P (1990). Endogenous technical change. Journal of Political Economy 98(5, Part 2):S71-S102.
Szirmai A, Verspagen B (2015). Manufacturing and economic growth in developing countries, 1950–2005. Structural Change and Economic Dynamics 34:46-59. Available at: http://www.pressacademia.org/archives/jbef/v8/i2/6.pdf .

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The effects of interest rate on economic growth: Further insights from the Gambia

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The main objective of this paper is to examine the effects of interest rate on economic growth in Gambia over the period 1993 to 2017. The Vector E rror Correction Model (VECM) is used to check the relationships between the dependent variable (Gross Domestic Product) and independent variables (Real Effective Exchange Rate and Real Interest Rate), both in the short-run and long-run. Post estimation tests, including Lagrange Multiplier test for residual autocorrelation were also conducted for autocorrelation, as well as Jarque Bera to test for stability and to check whether residuals are normally distributed. The empirical evidence indicates that there is no short-run association between the growth of the Gambian economy and interest rate but that there is a long run connection that runs from real interest rate and real exchange rate to GDP. Based on these findings, the paper recommends for the government through the Ministry of Finance and Economic Affairs to prudently manage the Gambia's budget by avoiding unnecessary expenditures that could lead to budget deficits.These budget deficits are key drivers that cause interest rates to rise, which in turn are inimical to economic growth.

Key words: Gross domestic product, real interest rate, real exchange rate, Vector Error Correction Model (VECM).

INTRODUCTION

The debate over the precise effects of interest rate on economic growth remains an unfinished business. Existing research shows vast variations in the use of interest rate as a policy tool for reviving economic growth. On the one hand, research has shown that decreasing the interest rate due to expansionary monetary policy may revive the economy because of increased economic activities (Jelilov, 2016), thereby creating a positive and statistically significant impact on economic growth (Campos, 2012). On the other hand, slow economic growth which may be due to a tight monetary policy via a relatively high interest rate regime can lead to a fall in the economic growth (Foo, 2009), which may be due to the negative and statistically significant impact of interest rate (Udoka, 2012). Yet, others, including Hansen and Seshadri (2014) found no significant relationship between interest rate and economic growth.

For the strand of the literature that adheres to the view that reducing interest rate may help increase aggregate demand, critics contend that such a policy move is of

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limited effect because of the disorders in the credit marke t, particularly those in developing countries. On the other hand, others contend that raising the real interest rate would stimulate saving and increase the efficiency of investment, leading to the increase in economic gro wth (Odhiambo and Akinboade, 2009; Gleb, 1989).

Abebiyi (2002 as cited in Joseph et al., 2018:67) opined that the desire of any economy is to have sustained economic growth, but this macroeconomic objective cannot be achieved in the face of volatile and rising interest rate. Furthermore, Haron (2004) states that interest rate levels and velocity are used to assess the impact of financial liberalization on economic growth. Darrat and Dickens (1994 as cited in Mutinda, 2014:1) argue that a high interest rate environment is important in the performance and the returns of any given investment.

In Gambia, interest rates have remained among the highest in Africa, although in recent years, the average T-bill rate has declined from 17.5% in October 2016 to around 6.8% in May 2018 due to the fall in domestic debt levels (Central Bank of the Gambia, 2019). However, interest rate payment in 2017 remained at 42% of government revenue (excluding grants) (Ibid).

Critics blame this relatively high interest rates in Gambia on the profligacies and macroeconomic policy failures of the previous governments and the current administration that designed and implemented inefficient and wasteful economic policies, thus creating perennial budget deficits over the years, which successive governments have been financing through increased borrowing. This increased borrowing in turn increases interest rates. In line the standard Keynesian theory, there is causal link between budget deficits and interest rates, hence the crowding out hypothesis which postulates that increased government borrowing to finance budget deficits for example can lead to significant increases in the real interest rate, which in turn has the negative effect of reducing the lending capacity of a country's economy, thereby depressing business investments[1]. On the other hand however, the Ricardian neutrality or equivalence asserts that budget deficits do not have any statistically significant relationship with interest rates (Mukhtar and Zakaria, 2008).

Despite these markedly different positions, the dominant view is that budget deficits are linked to high interest rates, which in turn are inimical to economic growth. It is from this perspective that the paper will examine the effects of interest rates on economic growth in Gambia from 1993 to 2017. There is anecdotal evidence in Gambia that suggests that the level of interest rate negatively affects economic growth; however, this assertion has not been empirically tested. Therefore, a significant gap exists in the empirical literature about the effects of interest rate on the economic performance of a country, particularly in the context of Gambia.

Consequently, the two fundamental questions that need to be addressed are, what are the consequences of rising interest rate on the performance of a country's economy and are there any policy implications of these effects? The study attempts to provide answers to these important questions by using the Vector Error Correction Model (VECM) to examine the long-run and the short-run causal relationships between gross domestic product on the one hand and real interest rate and real effective exchange rate on the other.

LITERATURE REVIEW

The impact of interest rate on economic growth has in recent years been extensively examined, although the attention devoted to the experience of developing countries such as Gambia in this regard has thus far been limited. This section of the paper will review this recent research with a view to identifying possible gaps in the current literature.

Jaymeh and Drabi (2010) conducted a study on the impact of key macroeconomic variables such as interest rate, and inflation on the performance of the economy of Jordan. The results of this study indicated that the Jodanian economy was affected by interest rate, while its real growth rate was impacted by inflation rate. In another study, Maiga (2017) assessed the effect of interest rate on the Nigerian economy during the period 1990-2013. The results from the study found that interest rate did not have a major effect on growth; nevertheless, the study suggested that the Nigerian economy can benefit from lower interest rate which in turn will have a positive effect on investment.

Harswari and Hamza (2017) investigated the impact of interest rate on the economies of selected countries in Asia. The target population of this study is 48 countries while the sample of 20 companies was selected using the convenient sampling technique. The results indicated that the impact of interest rate on GDP was negative and statistically significant, but that although inflation had a negative impact on foreign direct investment, this was statistically insignificant.

Moyo and Pierre (2018) examined the effect of interest rate reforms on the performance of SADC countries from 1990 to 2015. The results showed that reforms of interest rates do have a positive impact on the performance of the economies of SADC countries. Another attempt was made by Bosworth (2014) to examine how variations in interest rates can influence economic growth in the context of Kenya. The results from the study showed that the link between real interest rates and economic growth in the case of Kenya was statistically weak.

As the forgoing brief review of the literature indicates the relationships between interest rate and economic growth remains ambiguous and therefore open to more

[1]https://www.investopedia.com/terms/c/crowdingouteffect.asp

than one interpretation. As a result, this paper will attempt to provide further insights into how interest rate affects economic growth, focusing specifically on Gambian experience, and thereby help shed more light on the precise relationship between these two macroeconomic variables.

DATA AND METHODOLOGY

A thorough review of the relevant recent literature reveals that the most notable variables that can affect economic growth with the exception of interest rate, include exchange rate (EXR), foreign direct investment and inflation rate (Chughtai et al., 2015).

In this paper, however, we decided to drop some variables, including foreign direct investment and inflation because these variables are notably known to be inaccurate and unreliable in Gambia and could lead to inaccurate results. As a result, we used Gross Domestic Product as dependent variable and Real Effective Exchange Rate and Real Interest Rate as independent variables.

Nature and scope of data

This paper specifically aims to assess the extent to which interest rate affects the growth of Gambian economy. In order to achieve this objective, the paper relies on data from the World Development Indicators (WDI) and from the official website of the Central Bank of the Gambia (CBG). The macroeconomic time series data used in this context are therefore GDP (% growth), real effective exchange rate index and real interest rate (annual %) for the Gambia during the period 1993 to 2017.

Technique of data analysis

This particular research made use of so many techniques in an effort to further understand the nature of the relationship between interest rate and the performance of Gambian economy. Thus many steps were followed in analyzing the data using the Stata 13.0 software.

The first step has to do with the model specification, after which the following tests were conducted: Stationary test, Johansen cointegration test, Optimal lag selection(AIC,HQIC,SBIC), preconditions for Johansen co integration test, that is, to test variables whether they are non-stationary at level and stationary at first difference. Once these conditions were fulfilled, the second Johansen co-integration test, as well as the vector error correction model VECM were conducted. Finally, a post-estimation test, which includes autocorrelation at lag order, Jarque- Bera test for normality and stability test were conducted.

Model specification

The preferable model for this particular research is the vector error correction model (VECM) because the time series vary and are not stationary at the level term. However, the data are mostly stationary at first differential, that is, I (1). The coefficients on the Econometrics model in (2) could be defined such that β_0 is the intercept, β_1 and β_2 are the slop parameters and μ_1 is the error term. The economic model takes GDP_1 as a function of Real Effective Exchange rate (RX) and Real Interest rate in annual % (Rint_n).

Definition of variables

GDP_1= Gross Domestic Product
Rx=Real effective exchange rate
Rint_n=Real interest rate in (annual %)

Economic model

$$GDP_1=f(Rx, Rint\_n) \quad (1)$$

Econometrics model

$$GDP_1=\beta_0+\beta_1 Rx+\beta_2 Rint\_n+\mu \quad (2)$$

A Log model however produces the coefficients of the elasticity for the dependent variable vis-à-vis the explanatory variables. As a result, we transformed all the variables of interest into logarithms.

Therefore, equation (2) is transformed thus:

$$LnGDP_1 = \beta_0+\beta_1 LnR_X+\beta_2 LnRint\_n+\mu \quad (3)$$

Vector error correction (VEC) model

$$gdp_1=\alpha+\sum^{k}_{i=1}\beta_1 rx\square_{-1}+\sum\beta_{2rint}\_nt\text{-}2+\mathcal{M}_1\square \quad (4)$$

A Vector Error Correction Model (VEC) as in (4) is a restricted VAR designed for use with non-stationary series that are known to be integrated. The VEC has cointegration relations built into the specification so that it restricts the long run behavior of the endogenous variables to converge to their cointegration relationships while allowing for short run adjustment dynamics.

EMPIRICAL EVIDENCE AND DISCUSSION

This section presents the empirical evidence of the study, including the results of the diagnostic tests from the unit root test, Johansen Cointegration, Optimal Lag Selection, and Vector Error Correction Model, as well as the post estimation test involving LM test and Jarque Bera test. All the tests have been computed using Stata 13.0.

Stationarity/unit root test

The first stage of the empirical process involves a test for unit root. This is necessary because the co-integration test can be applied only to variables that are non-stationary in level (contain a unit root). There are different approaches to test for stationarity, but in this study the Augmented Dicky-Fuller test is used, since it is the most widely used test in the literature. The results from the test show that GDP1and real interest rate (rint_n) are stationary and Real Effective Exchange rate (RX) is non stationary. Since there exists non stationarity in testing of the variables, this leads us to run the Johansen Co-integration test (Table 1).

From the Johansen Co-integration results in Table 1, it can be seen that there is one co-integrated system of

Table 1. Johansen cointegration test.

Maximum rank	Parms	LL	Eigenvalue	Trace statistic	5% critical value
0	12	-11.866582	-	30.2946	29.68
1	17	-0.69525695	0.62145	7.9520*	15.41
2	20	1.5343485	0.17624	3.4927	3.76
3	21	3.2807206	0.14089		
Maximum rank	**Perms**	**LL**	**Eigenvalue**	**Max statistic**	**5% critical value**
0	12	-11.866582	-	22.3427	20.97
1	17	-.69525695	0.62145	4.4592	14.07
2	20	1.5343485	0.17624	3.4927	3.76
3	21	3.2807206	0.14089		

Source: From the Authors' computation using Stata13.0.

Table 2. Optimal lag selection.

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-32.1643				0.005716	3.34898	3.38136	3.4982
1	-6.62294	51.083	9	0.000	0.001199	1.77361	1.90315*	2.37048*
2	3.32323	19.892	9	0.019	0.00117*	1.6835*	1.91019	2.72802
3	10.3343	14.022	9	0.122	0.001679	1.87293	2.19677	3.3651
4	20.8672	21.066*	9	0.012	0.002112	1.72694	2.14793	3.66677

Source: From the Authors' computation using Stata 13.0.

equation and variables are co-integrated, which is supported both by the trace statistic and max statistic. At the first instance, we reject the null hypothesis for the trace statistic since it is greater than the 5% critical value, which indicates that the model is significant at that level. This result further shows a cointegration among the variables exists, which suggests a long run relationship between them.

From the lag selection, the preferable number to be selected for AIC is the option with the least amount and it has two (2) lags the same as FPE (Table 2). However, the same decision criteria applies with HQIC and SBIC of which all of them have a similar lag of one (1). From the computation, only LR has four (4) lags. Therefore, more emphasis will be given to AIC since it seems the most appropriate option to be selected among the rest and it has a lag of two (2).

Definition of the variables

GDP1= Gross Domestic Product
D_gdp1= First difference of GDP
Rint_n= Real Interest Rate
Rx= Real Effective Exchange Rate in (annual %)

Table 3 presents the results of the coefficients of the Vector Error Correction Mode in (4). The co-integration equation shown in the Vector Error Correction Mode (3) indicates that there is a long run causality between the dependent and independent variables. However, for the VECM more emphasis will be laid only on the first equation (_cel) which depicts the casualty level of the variables. The error correction term in Table 3 shows that a long run relationship that runs from rint_n and Rx to gdp1 exist and that the coefficient is non-positive and the p-value is also significant. For example, the coefficient of _cel is -1.66 and the P-Value is 0.00 which is significant under 5% CV.

Interpretation of coefficients

This section looks at all the independent variables in the model and their relationship to the dependent variable and also to ascertain whether they are significant or not. Variables such as, Rint_n (LD, L2D) have positive effect on gdp1 but it is not significant. RxLD have negative effect on gdp1 but it is not significant; however RxLD2 have positive effect on gdp1 and is significant.

Checking for short run causality

1st short-run causality rint_n

Test ({D_gdp}: LD. Rint_n L2D rint_n)

Table 3. Vector error correction model (VECM).

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
D_gdp1 _ce1 L1.	-1.659001	0.4614637	-3.60	0.000	-2.563453	-0.7545487
gdp1	0.4811952	0.3513761	1.37	0.171	-0.2074893	1.16988
LD.	0.1908964	0.257818	0.74	0.459	-0.3144177	0.6962104
L2D.						
rint_n	0.0012801	0.001114	1.15	0.251	-0.0009034	0.0034636
LD.	0.0010874	0.0009716	1.12	0.263	-0.0008169	0.0029917
L2D.						
Rx	-0.1276905	0.0869839	-1.47	0.142	-0.2981759	0.0427948
LD.	0.2206478	0.0928601	2.38	0.017	0.0386453	0.4026503
L2D.						
_cons	0.0363298	0.0112969	3.22	0.001	0.0141883	0.0584713

Source: from the Authors' computation using Stata 13.0.

Table 4. Lagrange multiplier test for residual autocorrelation.

Lag	chi2	df	Prob > chi2
1	3.7542	9	0.92683
2	5.6270	9	0.77659

Source: From the Author's computation using Stata 13.0.

(1) {D_gdp1} LD. rint_n=0
(1) {D_gdp1} L2D. rint_n=0
Chi2 (2) = 1.53
Prob > chi2= 0.4663

The results from the first short run shows that p-value is more than 0.05, then we accept the null hypotheses which says that there is no short run relationship between Real Interest Rate (LD, L2D) and Gross Domestic Product.

2nd Short- run causality Rx

Test ({D_gdp1}: LD. Rx L2D.rx)
(1) {D_gdp1} LD. rx=0
(2) {D_gdp1} L2D.rx=0
Chi2 (2) =5.75
Prob > chi2 = 0.0564

The results from the second short run also shows that p-value > 0.05, then we fail to reject the null hypotheses which says, that there is no short-run causality running from Real Effective Exchange Rate (LD, L2D) to Gross Domestic Product.

Post estimation test

Since the p-value is greater than 5%, it clear from the LM test in Table 4 that we fail to reject H0. Therefore we do not have autocorrelation. Since the probability values of the two lag orders (0.9 and 0.8) are greater than the 5% critical value; therefore we accept the null hypothesis that there is no autocorrelation at lag order.

Definition of variable

D_gdp1= First difference of the Gross Domestic Product
D_rint_n=First Difference of Real Interest Rate
D_rx=First Difference of Real Effective Exchange Rate

A large Jarque Bera results indicate that the residuals are not normally distributed. From the outcome of the test shown in Table 5, it can be seen that the results are normally distributed, hence all the variables from the test have probability values that are more than the 5% critical value. In this situation, we will fail to reject Null Hypothesis that residuals are normally distributed

The output shown in Table 6 shows the eigenvalues of the companion matrix and their associated moduli.
Table 6 shows that two of the roots is 1 and the Vector Error Correction Model (VECM) indicates two modulus on the companion metrics. The output in Table 6 further indicates that there is a real root at about 0.86, indicating stationarity within the variables. Thus, the results from the

Table 5. Jarque Bera Test.

Equation	chi2	df	Prob > chi2
D_gdp1	1.363	2	0.50584
D_rint_n	1.411	2	0.49388
D_rx	0.079	2	0.96127
ALL	2.853	6	0.82706

Source: From the author's computation using Stata 13.0.

Table 6. Eigenvalue stability condition.

Eigenvalue	Modulus
1	1
1	1
-0.8563462	0.856346
0.5407477 + 0.5587762i	0.777585
0.5407477 - 0.5587762i	0.777585
-0.3422616 + 0.6703724i	0.75269
-0.3422616 - 0.6703724i	0.75269
0.1008612 + 0.417308i	0.429324
0.1008612 - 0 .417308i	0.429324

Eigenvalue and the Modulus indicate that the model is stable, thereby confirming the stationarity condition of the variables.

Conclusion

The study made use of several tests so as to ascertain the effects of interest rates on economic growth in Gambia. The Augmented Dicky-Fuller test was used to establish the stationarity of some of the variables and thereby show that some of the variables are not stationary at level but eventually become stationary by taking the first difference.

The results show that there is a long run relationship between real interest rate and real exchange on the one hand and gross domestic product or economic growth on the other, since the coefficient on the error correction term or speed of adjustment is negative and the P-valve is significant.

The study also shows that in the short run, there is no relationship between from real interest rate and gross domestic product or economic growth and that there is no link between real exchange rate and gross domestic product.

Therefore, the main conclusion that can be drawn is that interest rates have a negative impact on the performance of Gambian economy in the long run but in the short run there is no link between interest rates and economic growth in the context of Gambia.

Recommendation

Based on the findings in this research, the paper recommends for the government through the Ministry of Finance and Economic Affairs in the Gambia to prudently manage the country's budget in two ways. First, by either avoiding unnecessary expenditures or by diversifying its revenue sources in the long-run and thus avoid running budget deficits, because such deficits put upward pressure on interest rates, which in turn negatively impacts economic growth in Gambia.

CONFLICT OF INTERESTS

The Authors have no conflicts of interest to declare.

REFERENCES

Bosworth PB (2014). Interest Rate and Economic Growth: Are they related? Centre for Retirement Research at Boston College Working Papers WP#2014-8, Cambridge, MA. https://crr.bc.edu/wp-content/uploads/2014/05/wp_2014-8.pdf

Campos NF (2012). Two to Tangle: Finance, Instability and Economic Growth in Argentina since 1890, with Karanasos M and Tan B. Journal of Banking and Finance 36(1):290-304.

Chughtai MW, Malik MW, Aftab R (2015). Impact of Major Economic Variables on Economic Growth of Pakistan. Acta Universitatis Danubius: Oeconomica 11:2.

Foo ZT (2009). Impact of Interest Rate And Exchange Rate On The Stock Market Index In Malaysia: A Cointegration Analysis. Unpublished master's thesis, University Science Malaysia, George Town, Malaysia.

Harswari NB, Hamza MS (2017). The Impact of Interest Rate on Economic Development: A study on Asian Countries. International Journal of Accounting & Business Management 5(1):2289-4519.

Hansen BE, Seshadri A (2014). Uncovering the Relationship between Real Interest Rates and Economic Growth, Working Papers wp303, University of Michigan, Michigan Retirement Research Center.

Jelilov G (2016). The Impact of Interest Rate on Economic Growth Example of Nigeria. African Journal of Social Sciences 6(2):51-64.

Joseph BU, Ogwa AO, Dooter MI (2018). Effects of Interest Rate on Economic Growth in Nigeria. International Journal of Advanced Academic Research / Social and Management Sciences 4(1):66-76.

Maiga FK (2017). Impact of Interest Rate on Economic Growth in Nigeria. Pyrex Journal of Business and Finance Management Research 3(3):98-111.

Moyo C, Pierre LR (2018). Interest rate reforms and economic growth: the savings and investment channel. MPRA Paper 85297, University Library of Munich, Germany. https://mpra.ub.uni-muenchen.de/85297/1/MPRA_paper_85297.pdf

Mukhtar T, Zakaria M (2008). Budget Deficits and Interest Rates: An Empirical Analysis for Pakistan. Journal Of Economic Cooperation 29(2):1-14.

Mutinda DM (2014). The Effect of Lending Interest Rate on Economic Growth in Kenya Master's thesis, University of Nairobi Nairobi, Kenya). Retrieved from https://chss.uonbi.ac.ke/sites/default/files/chss/Musyoka%20Dan%20Project-2-1%20pdf.pdf.

Odhiambo NM, Akinboade OA (2009). Interest rate reforms and financial deepening in Botswana: An empirical Investigation. Economic Notes 38(1/2):97-116.

Udoka C (2012). The Effects of Interest Rate Fluctuation on the Economic Growth of Nigeria, 1970-2010. International Journal of Business and Social Science 3:20. [Special Issue – October].

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