

## Impact of Manufacturing Sector on Economic Growth in Tanzania

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### **Abstract**

*This study examines the impact of key manufacturing variables on economic growth in Tanzania using time series data from 1990 to 2022 and a Vector Autoregressive (VAR) model. The results show a positive long-run relationship between economic growth and key variables: Manufacturing Output (MFO), Capital (CP), and Foreign Direct Investment (FDI), while labour (LB) has a negative long-run impact on growth; specifically, a unit increase in manufacturing output leads to a 2.6 percentage increase in economic growth, Capital increases growth by 1.05 percent, and FDI by 0.49 percent. Conversely, a unit decrease in labour results in a 1.24 percentage decline in economic growth. Similar results are also observed in the short run case. The study highlights that manufacturing output, capital accumulation, and FDI drive economic growth in both the short and long runs. This research underscores the importance of manufacturing output, increased capital investment and foreign direct investment to promote both short term and long-term industrial growth in Tanzania. Policy measures should focus on supporting manufacturing diversification, addressing potential labor displacement, and improving infrastructure to ensure inclusive and sustainable economic growth. The findings suggest that while the manufacturing sector is vital for economic growth and development, its future success will depend on adapting to technological changes and ensuring the workforce is equipped with the necessary skills to thrive in a modern, capital-intensive economy.*

**Keywords:** Manufacturing sector, economic growth, VAR model, Tanzania

**JEL Classification:** L6, O47, C22

### **1. Introduction**

The manufacturing sector has long been regarded as a key driver of economic growth and development. Historically, manufacturing has been integral to the economic transformation of both more developed and less developed countries, contributing to job creation, technological innovation, increased productivity, and export diversification (Evans, 2015). In Tanzania, however, despite various policy initiatives and substantial potential in manufacturing, the sector has not been able to achieve the expected level of growth and contribution to the national economy, which remains largely dependent on agriculture and services (NBS, 2020).

The role of the manufacturing sector in fostering economic development is widely recognized in development economics. According to the structural transformation theory, growth in manufacturing is crucial for a country's transition from an agrarian economy to an industrial one. Manufacturing promotes technological innovation and provides more stable and higher-paying jobs compared to agriculture, thus contributing to poverty reduction and improving income equality.

For many developed countries, industrialization has been the primary engine of economic growth. In contrast, many sub-Saharan African countries, including Tanzania, have faced challenges in fully capitalizing on manufacturing as a growth driver. A notable example is the success of industrialization in countries such as South Korea, India, and China, where strategic investments in manufacturing have led to rapid economic growth and poverty alleviation (Rodrik, 2016).

Despite policy efforts like the National Five-Year Development Plans and Vision 2025 aimed at industrialization, Tanzania's manufacturing sector has underperformed, contributing less to GDP compared to agriculture and services. This underperformance is attributed to challenges such as low productivity, limited technological innovation, inadequate infrastructure, labor skill mismatches, and limited access to finance and FDI. Notably, there is a lack of empirical research specifically examining the impact of manufacturing on Tanzania's economic growth. This study aims to address this gap by investigating the reasons behind the manufacturing sector's underperformance, focusing on factors like low productivity, labor market issues, and infrastructure limitations. The ultimate goal is to identify barriers and provide insights for leveraging the manufacturing sector for sustainable economic growth in Tanzania. The objective of the study is to investigate the impact of key manufacturing variables on economic growth in Tanzania. The variables of concern are manufacturing output, capital, foreign direct investment (FDI) and labour.

## **2. Literature Review**

### **2.1 Theoretical literature review**

The Endogenous and Exogenous Growth Theories provide essential frameworks for analyzing how the manufacturing sector impacts economic growth. These theories help explain the roles of manufacturing output, capital, foreign direct investment (FDI), and labor in driving economic development.

Endogenous Growth Theory emphasizes that economic growth is driven by internal factors within the economy, such as human capital, innovation, and technological advancement. Models like Romer's (1990) and Lucas's human capital theory highlight how investment in education, training, and R&D can sustain long-term growth. The application of this model to the study are in, firstly, human capital and labor where skilled labor enhances productivity and innovation within the manufacturing sector. Secondly, innovation and technological progress where investment in R&D leads to technological advancements and efficiency, supporting sustained manufacturing growth. Thirdly, increasing returns to scale, as manufacturing expands, investments in capital and labor generate higher returns, reinforcing economic development. The implication of the model is that endogenous growth theory suggests that capital investment and FDI enhance productivity in manufacturing. Knowledge spillovers, innovation, and policy support play crucial roles in fostering sustained growth within the sector.

The Exogenous Growth Theory, a key concept in neoclassical economics, asserts that external macroeconomic factors primarily drive economic growth. According to this theory, elements such as technological progress, tax policies, and tariffs influence growth but remain beyond the control of individual firms (Chirwa & Odhiambo, 2018). This perspective contrasts with the Endogenous Growth Theory, which emphasizes the role of internal forces in shaping economic expansion. In the context of this study, technological advancements in the manufacturing sector serve as an external variable that can impact economic growth (ibid).

Exogenous growth theories, notably the Solow-Swan model (1956) and the neoclassical growth model, assert that economic growth is driven primarily by external factors such as technological progress, capital accumulation, and population growth—elements that operate independently of the economic system itself. A core assumption of this theory is that technological advancements occur at a steady rate, uninfluenced by the economy's current state, making them exogenous forces in the growth process.

Application of the model to the study guides it through in understanding the following:

**Technological Progress:** Exogenous growth theory highlights the critical role of technological advancements, particularly in manufacturing, in enhancing productivity and stimulating economic growth. Innovations in manufacturing technologies can lead to greater efficiency, improved output quality, and overall industrial expansion, positioning technology as an external force that drives progress.

**Capital Accumulation:** The Solow-Swan model identifies capital accumulation—encompassing both physical and human capital—as a significant growth factor. Manufacturing industries depend on investments in machinery, infrastructure, and skilled labor, illustrating how capital fosters long-term economic expansion.

**Labor Force:** The neoclassical growth model often treats labor as an exogenous variable, meaning its availability and quality are determined outside the model. In this study, the observed negative correlation between labor and economic growth might reflect the increasing reliance on capital and automation in manufacturing, potentially diminishing labor’s direct contribution to growth. Implication of the model is that technological advancements and capital accumulation are likely to be analyzed as external drivers of growth within this framework. Additionally, the study can explore how foreign direct investment (FDI)—as an external inflow—stimulates manufacturing and strengthens its role in broader economic development.

## 2.2 Empirical Literature

According to traditional economic theory, manufacturing is a key driver of economic development. This view is rooted in the work of economists like Kaldor (1967), who argued that industrial growth leads to higher productivity, technological advancements, and job creation. Similarly, Evans (2015) suggests that growth in manufacturing output is positively correlated with increases in GDP, as it stimulates demand across other sectors, particularly agriculture and services. This is particularly important in developing economies, where industrialization is often seen as a path to sustainable growth and poverty reduction.

In Tanzania, however, the manufacturing sector has not yet fully capitalized on its potential. Despite significant investments and policy initiatives such as the *National Industrialization Policy* (2011), which aimed to boost manufacturing through modernization and diversification, its contribution to GDP has remained relatively low. The sector accounted for only about 9-10% of GDP in recent years, a figure far behind agriculture and services (World Bank, 2020).

Kingu, (2023) study indicate that manufacturing and construction sectors have a positive correlation with economic growth. Time-series analysis shows that these sectors move in tandem with GDP, reinforcing their importance in Tanzania’s economic development.

Despite its potential, Tanzania’s manufacturing sector faces challenges such as inadequate infrastructure, limited access to capital, and policy inconsistencies. Empirical investigations suggest that improving industrial policies and investment strategies can enhance the sector’s contribution to economic growth (Edward & Ngasamiaku, 2021). Empirical evidence underscores the importance of manufacturing in Tanzania’s economic expansion. Strengthening industrial policies, increasing investment, and addressing structural challenges can further boost the sector’s role in sustainable growth.

In Tanzania, manufacturing has been an area of focus in various national development plans. The National Strategy for Growth and Reduction of Poverty (NSGRP) and Vision 2025 both emphasize the need for industrialization, recognizing the potential of the manufacturing sector to drive economic diversification and growth. Despite these efforts, Tanzania’s manufacturing sector has been characterized by a number of challenges, which have prevented it from becoming a significant driver of economic growth.

One of the main obstacles is **low productivity** within the manufacturing sector. Many firms in Tanzania face challenges related to outdated technology, poor infrastructure, and limited access to financing, which has hindered their ability to expand production and become more competitive (Lugina et al., 2022). Additionally, there is a significant mismatch between the skills of the labor force and the needs of the manufacturing sector. The education system in Tanzania has not sufficiently prepared workers with the technical and vocational skills required for modern manufacturing, further limiting the sector’s potential (Mwakalobo & Lwesya, 2021).

Another challenge is the limited foreign direct investment (FDI) in the manufacturing sector. FDI is crucial for the transfer of technology, access to global markets, and capital inflows, all of which are essential for the development of a competitive manufacturing industry. While Tanzania has attracted FDI in sectors like mining and services, manufacturing has not received similar levels of investment, partly due to unfavorable investment climates such as poor infrastructure, high energy costs, and regulatory bottlenecks (Lwesya, et al., 2022).

Moreover, the structural dependence on agriculture continues to dominate Tanzania's economy, contributing about 25% of GDP while employing over 60% of the workforce (Tanzania National Bureau of Statistics [TNBS], 2020). This heavy reliance on agriculture limits the focus and resources available for industrial development, leaving the manufacturing sector underdeveloped. In general the manufacturing production growth in Tanzania showed a general positive trend and relatively high; it was 8.7 percent in 2008 (Kapunda, 2017:182).

In recent years, the Tanzanian government has attempted to address these challenges by focusing on industrialization as a core driver of economic transformation. **The** Second National Five-Year Development Plan (2016-2020) emphasizes the need to increase the manufacturing sector's contribution to GDP by improving productivity, fostering industrialization, and enhancing the role of small and medium-sized enterprises (SMEs) in the sector. The plan also highlights the importance of infrastructure development, such as improving transportation, energy supply, and access to technology, as critical enablers of manufacturing growth (Lugina et al., 2022).

Despite these efforts, the manufacturing sector's contribution to Tanzania's GDP remains relatively small compared to agriculture and services, indicating that further interventions are needed to unlock its potential. In this context, it becomes crucial to understand the factors that have contributed to the manufacturing sector's underperformance and identify strategies to enhance its role in driving economic growth.

### 3. Methodology

This study adopts a quantitative research design utilizing time series data to examine the relationship between the manufacturing sector and economic growth in Tanzania. Time series analysis enables the identification of long-term trends, patterns, and causal relationships over a 30-year period (1990–2020). The paper assesses how manufacturing output, sectoral employment, and other key factors have influenced Tanzania's economic trajectory. The study relies on secondary data collected from reputable sources covering the period 1990–2020. The data sources were World Bank Database which provides macroeconomic indicators such as GDP growth, sectoral contributions (agriculture, manufacturing, and services), inflation rates, and trade statistics. National Bureau of Statistics (NBS) Tanzania supplies data on manufacturing output, employment trends, and industry-specific contributions to GDP. Bank of Tanzania offers financial insights relevant to industrial growth and economic performance. Tanzania Investment Centre (TIC) provides information on foreign direct investment (FDI) in manufacturing and sectoral development trends. This structured approach ensures robust data analysis, allowing for meaningful insights into the manufacturing sector's role in Tanzania's economic growth. The variables and measurement was given as economic growth as dependent variable measured as GDP Growth Rate measured in annual percentage change in the Gross Domestic Product (GDP) of Tanzania. Independent variables are Manufacturing Output measured as Manufacturing value-added (MVA) or industrial production index, and control variables Manufacturing Employment: measured as the number of people employed in the manufacturing sector, capital: Annual percentage change in the capital stock, and FDI in Manufacturing measured as Foreign direct investment inflows into the manufacturing sector.

The paper estimated the following model

$$GDP_t = \beta_0 + \beta_1 MFO_{1t} + \beta_2 CAP_{2t} + \beta_3 LAB_{3t} + \beta_4 FDI_{4t} + \varepsilon_t \quad (1)$$

Where; Y represent output a proxy for economic growth, CAP represent Capital stock, LAB represent labor, FDI as foreign direct investment inflow in manufacturing sector and  $\varepsilon_t$  as stochastic disturbance term.

## 4 Results and Discussion

### 4.1 Results

**Table 1: Short-run Model Results**

Variables	Coefficient
Manufacturing Output	1.432584 (1.454)
Capital stock	0.274775 (0.334)
Labour	-3.954638 (2.034)
Foreign Direct Investment	0.716821 (0.182)

Source: Authors computation from available data.

**Table 2: Long-run Model Results**

Variables	Coefficient
Manufacturing Output	2.6488* (0.777)
Capital stock	1.0473* (0.334)
Labour	-1.236* (0.138)
Foreign Direct Investment	0.4904* (0.175)

Source: Authors' computation from available data.

The short-run model in **Table 1** showed no relationship as all variables were not significant, however the long-run model in **Table 2** had shown significant long-run relationship. The analysis shows that economic growth (y) has a positive long-run relationship with capital accumulation, foreign direct investment, and manufacturing output, while labor has a negative long-run relationship with economic growth. Key findings includes manufacturing output (2.64) implying a 1 percentage increase in manufacturing output leads to a 2.64 percentage rise in economic growth, highlighting its strong impact. Capital accumulation (1.047): A 1 percentage increase in capital accumulation results in a 1.05 percentage increase in economic growth, reinforcing the importance of investment. Labor (-1.236): A 1 percentage decrease in labor correlates with a 1.24 percentage decline in economic growth, suggesting labor constraints may hinder expansion. Foreign Direct Investment (0.49): A 1 percentage increase in FDI leads to a 0.49 percentage boost in economic growth, showing its moderate yet positive influence. These findings indicate that manufacturing output and capital investment are key drivers of economic growth, while labor constraints pose challenges. Strengthening industrial production and attracting FDI can contribute to sustainable economic development.

### 4.2 Discussion

The study's findings indicate that while short-term fluctuations in economic growth do not exhibit significant relationships with key variables, the long-run model demonstrates clear connections between economic growth, manufacturing output, capital accumulation, foreign direct investment (FDI), and labor dynamics. These results provide valuable insights into the structural drivers of Tanzania's economy and highlight the importance of industrial and investment-led strategies.

Manufacturing output presents the strongest positive relationship with economic growth. Given this substantial effect underscores the crucial role of industrial expansion in Tanzania's long-term economic performance. The manufacturing sector acts as a catalyst for: increasing productivity and technological advancements, enhancing value addition to raw materials, particularly in agriculture-based industries,

creating employment opportunities within the formal and informal economy, and expanding export capacity, which can improve trade balances and foreign exchange earnings. Given these findings, investment in manufacturing infrastructure, technology, and skills development will be essential for sustaining economic growth. Tanzania's industrial policies should focus on strengthening domestic manufacturing capabilities, enhancing global competitiveness, and supporting innovation-driven production. Capital accumulation reflects the critical role of investment in machinery, infrastructure, and financial resources. Capital-intensive industries, especially in manufacturing, directly contribute to increased production efficiency and output. To enhance capital accumulation, policies must prioritize: Access to financing for manufacturers, especially small and medium-sized enterprises (SMEs); development of modern industrial parks and production facilities; and incentives for reinvesting profits into technological innovation and capacity-building initiatives. Furthermore, for Tanzania to maximize FDI-driven industrial expansion, policymakers should: Improve the business environment, reducing bureaucratic barriers for foreign investors, promote partnerships between foreign enterprises and domestic firms to enhance knowledge transfer, and strengthen investment-friendly policies, including tax incentives for industries that advance technology adoption and local workforce development. To mitigate labor-related challenges, workforce development strategies should focus on: Expanding technical and vocational education programs to align skills with industrial needs, encouraging labor market reforms that promote flexibility and employment security, and enhancing automation and technological training to improve labor productivity without sacrificing job creation.

## 5. Conclusion

The findings clearly demonstrate that manufacturing output, capital accumulation, and FDI are essential drivers of long-term economic growth in Tanzania. However, labor-related inefficiencies remain a challenge, emphasizing the need for reforms in workforce development and productivity enhancement. To foster sustainable economic growth, Tanzania's policymakers should invest heavily in manufacturing expansion through infrastructure development and industrial innovation, enhance capital mobilization by facilitating better access to financing and modern production facilities, attract and optimize FDI with investor-friendly policies and strong domestic-industry collaborations, and improve labor productivity through technical training, automation adaptation, and education system improvements. A well-balanced approach integrating industrial policy, investment strategies, and labor force development will be key to maximizing Tanzania's economic potential and ensuring inclusive and sustainable growth.

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**Appendices**

**1. Short run model estimation**

**Table 3: Vector Error Correction Model Results**

Endogenous variable	Exogenous variables	Coefficient	Std. Error	t-value	P-value	[95% Conf. Interval]	
D.y	LD.GDP growth rate	-0.8683568	0.236779	-3.67	0.000	-0.1.33244	-.4042785
	Y LD	-.0236773	.1573433	-0.15	0.880	-.3320684	-.287138
	MFO LD.	1.432584	1.453772	0.99	0.324	4.281524	1.416737
	CAP LD.	.274775	.3335646	0.82	0.410	-.3789997	.9285497
	LAB LD	-3.954638	2.034229	-1.94	0.052	-7.941651	.032375
	FDI LD	0.716821	.1822465	0.39	0.694	-.2855145	.4288787
	_cons	-0.085781	.87308	-0.01	0.992	1.719783	1.702653

Source: Author’s Compilation Using STATA (2024)

**2. Long run model estimation**

**Table: Johansen Normalization Restriction Imposed Results**

Beta (Variables)	Coefficient	Std. Error	z-value	P-value	[95% Conf. Interval]	
ECT (_ce1)						
Y	1	.	.	.	.	.
MFO	2.648835	.7776567	3.41	0.001	4.172623	1.125048
CAP	1.047359	.1521067	6.89	0.000	.7452353	1.345483
LAB	-1.2362	.1380826	-8.95	0.000	-1.50637	-.9655626
FDI	.49042889	.1749085	2.80	0.002	.1476145	.8352433
_cons	11.93571	.	.	.	.	.

Source: Author’s Compilation Using STATA (2024)