The Impact of Manufacturing and Construction Sectors on Economic Growth in Tanzania: A Disaggregation Approach Analysis

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Abstract

Manufacturing and construction sectors play important roles in economic growth in Tanzania. The present study aims to examine the impact of these sectors in economic growth. The study investigates the impact of manufacturing and construction sectors on economic growth in Tanzania using secondary data spanning from 1970 to 2020. The study employs Time series analysis particularly, bivariate regression analysis a disaggregation approach since all sectors were found to be highly collinear. Empirical results in unit root reveal that all variables are non-stationary at level and stationary at first difference. The integration using graphical presentation finds variables have long run relationship implying that manufacturing and construction sectors are moving together with gross domestic product as a proxy of economic growth in Tanzania. Further, the findings show that manufacturing and construction sectors have positive contributions to economic growth and it is statistically significant at five percent level of significance. Stability amongst the sectors on economic growth over the period of study was found to be unstable. Therefore, the empirical results shed light to the government on improving manufacturing and construction sectors by making some policy interventions in the respective sectors in order to bring stability in future. And this is possible since these sectors have a long run relationship as pointed out in cointegration results. Thus, improving manufacturing and construction sectors will boost the economic growth in Tanzania at large.

Keywords: Manufacturing, Construction, Economic Growth and Disaggregation Approach Analysis

1.0 Introduction

Manufacturing and construction sectors are among the most important sectors that contribute to the economic growth of the country (Wangwe et.al 2014). In fact, Tanzania's manufacturing sector has been transformed over time due to changes in the national industrial policies**.** In that context, the importance of manufacturing sector to the economic growth varied according to the various national policies implemented since independence. Regardless of the changes in national policies, manufacturing sector in Tanzania and its contribution to national economy has been improving over time (Wangwe, et al 2014). Congruent to the manufacturing sector, construction sector in Tanzania also plays an important role in the economic development. The Tanzanian construction sector is made up of the Ministry of Works, Transport and Communication and its agencies, consultative body, regulatory boards and clients, suppliers of construction materials and equipment,

consulting firms, construction enterprises, private firms, and professional associations (Kikwasi and Escalante, 2018, p4). In real sense, construction sector goes beyond the contribution on economic growth rather it is a key enabler for social and economic development in Tanzania and the world at large.

Manufacturing and construction sectors in Tanzania have diversified effect on employment creation, which in turn has multiplier effects in other sectors besides the national economic sector (Roshan, 2017). It is clear that manufacturing sector increases the productivity and thereby stimulating the structural change in other sectors. Again, manufacturing attracts the economies of scale in other sectors as service and agriculture. Furthermore, the manufacturing sector contributes to economic growth in many ways including stimulating rapid technological changes in other sectors; facilitating the quick economies of scale, and an easy integration into global production networks (Su & Yao, 2016). In line to that, the manufacturing and construction sectors in Tanzania work as complementary sectors in influencing the economic development. This is because improving manufacturing sector will attract good infrastructures and a good construction sector will attract manufacturing sector at large and in turn improving the economic development of the respective country such as Tanzania.

This paper examines the contributions of the manufacturing and construction sectors in economic growth in Tanzania. In deed there is a consensus from studies that these sectors have positive influence in economic growth; however, their impact on economic well of a country will depend on the institutional framework of the respective country (Szirmai & Verspagen 2011). Therefore, the present study intends to examine impact of these sectors on the economic growth of Tanzania. This study is important in Tanzania as it will contribute to the ongoing debates on the significance of the manufacturing and construction sectors in the economic growth of developing countries such as Tanzania. Thus, the empirical findings from this study will shed light on the contributions of these sectors in the Tanzanian economy.

1.1 Literature review

Theoretical and empirical literatures have confirmed the presence of positive influence of manufacturing and construction sectors to the economic growth in the countries under study. For instance, Erol and Unal (2015) investigated the role of construction sector in economic growth in Turkey. They employed time series analysis and granger causality. The study found that construction sector was not a key driver of the economic growth in Turkey. Again, Berk and Bicen (2017) examined the Investment in Construction and Economic Growth in Turkey. A study found a positive influence of construction on the economic growth in Turkey. Thus, studies on the contribution of construction sector to the economic growth in Turkey produced conflicting results.

Contrary to Erol and Unal (2015), Kikwasi and Escalante (2018) investigated the role of the construction sector to the economic growth in Tanzania. Using content analysis, the study findings revealed a positive correlation between construction sector and economic growth; however, some bottlenecks were identified including limited access to land, construction permits, skills, and availability of materials and equipment that hinder the potential of the sector in playing its role in leading to significant improvement of the economic growth in Tanzania. Khaertdinova et al. (2021) investigated the economic development of the

construction industry as the basis for sustainable development of a country. The study used statistics from the World Bank, countries in the European Union and the Russian Federation in the period from 2000 to 2020. The study findings revealed that the construction sector made a significant contribution to the economic potential of the country under study. It is instructive to undertake further study to determine the contribution of the construction sector to economic growth in Tanzania since construction is among the sectors which are earmarked as having the potential of influencing economic growth of a country.

Having seen the studies on the contribution of construction sector to economic growth, it is instructive to look at studies that examined the contribution of manufacturing sector to economic growth of a nation. A study by Lugina et al. (2022) analysed the effect of industrialization on economic growth in Tanzania. The findings revealed a positive relationship between manufacturing and economic growth in Tanzania. However, Kivyiro (2023) investigated the Effect of Mining, Manufacturing and Agricultural Foreign Direct Investment on Economic Growth of Tanzania and found that FDI inflows in manufacturing had a negative and statistically significant effect on economic growth in Tanzania over the period under the study. These conflicting motivated the current study into using a different approach see if it would bring similar or different results t. In the same vein, Rweyemamu et.al (2023) and Mbelwa (2023) studied the manufacturing sector and economic growth in Tanzania and found that manufacturing industries had a positive impacton economic growth in cintrast to the findings in a study by Kivyoro (2023). Thus, the current study employs disaggregated sectoral approach to examine the impact of manufacturing sector on economic growth in Tanzania.

In another study, Szirmai (2011) examined the manufacturing and economic development using a mix of statistical analysis of secondary data. The study concluded that manufacturing continued to be an important sector in accelerating growth in developing countries, which is consistent to the findings in other previous studies such as Szirmai and Verspagen (2011) who examined the manufacturing and economic growth in developing countries. The study employed newly constructed panel dataset of annual value-added shares (in current prices) for manufacturing, industry, and agriculture and service sector for the period between 1950 and 2005. The empirical findings revealed that there was a moderate positive impact of manufacturing on economic growth in developing countries under the study. Furthermore, they found an interesting interaction effects of manufacturing with education and income gaps in the respective countries. In fact, the findings of all these previous studies were congruent with the theoretical perspective that manufacturing improves the economic growth; thus, undertaking a study in Tanzania is imperative to determine whether or not the findings will concur or disagree with the stipulated economic theory.

Apart from Szirmai and Verspagen (2011), Wangwe et al. (2014) investigated the performance of the manufacturing sector in Tanzania: challenges and the way forward. Using a cross cutting approach from a wide range of different experts on manufacturing and taxation.

> *Consultations took place with the Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA), the Confederation of Tanzania Industries (CTI), the National Bureau of Statistics (NBS), Ministry of Industry, Trade and Marketing (MITM), and the Tanzania Revenue Authority (TRA) to understand the key policy issues related to Tanzania's manufacturing developments* (Wangweet al 2014 p2).

The study found that manufacturing growth over the last ten years helped to sustain the economic growth particularly Gross Domestic Product (GDP) in Tanzania. However, the study identified challenges such as the dependence in imported intermediate goods thus impairing the intra-industry linkages in the country.

Su and Yao (2016) examined the role of the manufacturing as a key engine of economic growth for Middle Income Economies. Using panel data from final constructed annual dataset she covered 187 economies from 1950 to 2013. The study found a positive influence of manufacturing sector on economic growth of middle-income economies both in short and long time basis. Again, manufacturing pulled up other sectors such as service sector in the countries under study. Apart from improving economic growth manufacturing sector also accelerated the pace of technology and utilization of human capital in middle income economies. Generally, manufacturing sector was found as a key engine of economic growth for middle income economies under the period of study. Similar findings to the findings in a study by Su and Yao (2016) were reported in a study by Okon and Osesie (2017) who examined the impact of manufacturing sector on economic growth in Nigeria from 1981 to 2015 using ordinary least square method. The study findings revealed that there was a positive relationship between manufacturing output and economic growth in Nigeria under the period of study. In fact, the findings are similar to the findings on previous studies (see Szirmai & Verspagen, 2011; Wangwe et al., 2014). With all these findings it is important to examine the contributions of manufacturing sector in Tanzania since manufacturing sector is among the key sectors earmarked to have the potential of improving the economic growth.

Similar to Okon and Osesie (2017) study in Nigeria Afolabi and Laseinde (2019) also conducted a study on the impact of manufacturing sector output on economic growth in Nigeria from 1981 to 2016 using Autoregressive Distributed Lag (ARDL) model. They found that manufacturing sector had positive influence on economic growth in Nigeria. Furthermore, Umaru et al. (2022) investigated whether the manufacturing output significantly predicted economic growth in Nigeria. The study employed Auto Regressive Distributed Lag Model (ARDL) and OLS technique from 2010Q1 to 2020Q4. The study found that manufacturing output had positive influence and significantly improve the economic growth in Nigeria. Thus, findings from Nigeria motivated the study in Tanzania e since manufacturing sector is one of the sectors which are expected to pull the economic growth in developing countries Tanzania being one of them.

1.2 Theoretical Framework

Manufacturing and construction sectors are considered as among the key economic drivers in developed and developing countries (Berk & Bicen, 2017; Kikwasi & Escalante, 2018; Rweyemamu et al., 2023). In this context, the impacts of manufacturing and construction on economic growth in Tanzania is analysed using the disaggregated approach since these sectors have a high level of multicollinearity such that multiple regression analysis would result into wrong coefficients and signs. To avoid such a problem the disaggregated approach was imperative. Model formulation is presented in section three.

2.0 Methodology

This study employed time series analysis to examine the contributions of manufacturing and construction sectors on the economic growth in Tanzania from 1970 to 2020. Data were collected from the data base of Ivan Kushir's Research Centre which deals with macroeconomic variables globally. In order to capture the intended goals, the study used disaggregated approach analysis since these sectors have a likelihood of multicollinearity.

In this study, before estimating the relationship amongst variables, the study conducted the unit root test since these data are in time series running from 1970 to 2020 and many time series data have a problem of non-stationary which might affect model formulation. Thus, the research checked for unit root in order to avoid spurious regression. Formulation of these models were adopted from previous studies including Gabriel et. al. (2020) and Baig et. al. (2020).

Furthermore, in order to minimize the problems of outliers and heteroscedasticity, the research instituted natural logarithms in every variable under study as shown in the models below. Models were formulated to examine the contributions of manufacturing and construction sectors on economic growth in Tanzania.

Economic Growth (GDP) = F (Man) .... (1)

Economic Growth (GDP) = F (Cons) .... (2)

Where GDP is Gross Domestic Product, Man is manufacturing values and Cons is construction values. All these variables' values are in millions of US$ from the data base of Ivan Kushnir's Research Centre. In order to examine the contributions of these sectors on economic growth, the aforementioned models were transformed into econometrics modelling and instituted the error terms so that they can easily be measured. The present study employed these variables and periodization due to the availability of data in the data base.

Model one: Impact of manufacturing sector on economic growth

$$LNGDP_t = \propto + \beta LNMan_t + \varepsilon_t \text{.. (3)}$$

Where,
LNGDP is a natural logarithm of GDP, α is constant, β is a coefficient of changes, LNMan is natural logarithm of manufacturing values and ε is error term

Model two: Impact of construction sector on economic growth

$$LNGDP_t = \propto + \beta LNCons_t + \varepsilon_t \text{.. (4)}$$

Where,
LNGDP is natural logarithm of GDP, α is constant, β is a coefficient of changes, LNCons is natural logarithm of construction values and ε is error term

2.1 Unit root test

This study tests a unit root using Augmented Dickey Fuller (ADF) rather than Dickey Fuller (DF) test. ADF is more powerful than DF test as such this study employed the powerful test for unit root. All the OLS regression output were under stationary variables whose regression outputs are not spurious (meaningless). Again, it is worth noting that if the residuals of the regression at level are stationary then outputs at level is also not spurious rather it represents a long-term relationship of coefficients (Granger and Engle, 1987, Gujarati, 2004 and Utkulu, 2012). In this context, the present study considers all these conditions in the regression analysis so as to produce robust results**.**

2.2 Co integration Test

This study employed the graphical presentation of the co integration amongst the variables namely, Gross Domestic Product, manufacturing values and construction values. This is the appropriate test since the study used the bivariate regression analysis. However, in bivariate regression analysis, the Engle-Granger residuals cointegration could be appropriate. Co integration means moving together, then graphical presentation can show this movement clearly (Gujarati, 2004).

2.3 Structural break

Similarly, in time series structural break, it is imperative to determine the stability of the variables under study. The present study employed the proposed tests by Brown et al. (1975). In this test, Brown et. al. (1975) proposed two main tests that is "cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ)" tests (Brown et al., 1975 in Dufour, 1982). The decision criteria states, "If the plots of the CUSUM and CUSUMSQ fall within 5% critical bound then H_0 is not rejected, and if any test one bound is crossed then the null hypothesis will be rejected (Dufour, 1982; Hosein, 2007).

3.0 Discussion of findings

This article investigated the relationship between dependent variable and independent variables namely manufacturing and construction values under the study period, unit root, co integration and structural break (stability amongst the variables).

3.1 Unit root results

The Augmented Dickey –Fuller (ADF) test results reveal that all variables at level are non-stationary thus they are integrated of order one *I(1);* and at first difference, all variables are stationary thus they are integrated of order zero *I(0)*. Thus, all models formulated in this study are in the same order of integration as required implying that all the results are not spurious since no model has a different order of integration say I(1) against I(0) in the regression analysis.

Table 1: Unit Root Test Results at Level and at First Difference

AT LEVEL		
COEFFICIENTS		
Variables	With constant without trend	Order of Integration
LNGDP	-0.664126	*I(1)*
LNMan	-0.752795	*I(1)*
LNCons	0.582873	*I (1)*
FIRST DIFFERENCE		
COEFFICIENTS		
Variables	With constant without trend	Order of Integration
LNGDP	-4.610635	*I(0)*
LNMan	-5.256881	*I(0)*
LNCons	-8.229799	*I (0)*

Source: Researchers' computation 2022: with constant without trend: Test critical values: 1%, 5% and 10%, Notes: If variables are integrated of order one *I(1)* means variables are non-stationary. If variables are integrated of order zero *I(0)* means variables are stationary

3.2 Co-integration Results

Having confirmed that all the variables are in the same order of integration, the present study used the graphical presentation to determine the cointegration amongst the variables that is whether the manufacturing and construction sectors are cointegrated with economic growth in Tanzania. In fact, cointegration means to see whether these variables have a long-term relationship or they are moving together under the study period. This is quite important to establish since it can be used in policy interventions.

3.3 Manufacturing sector and Economic growth

The empirical evidence from bar and line graphs shows that there are cointegration amongst the variables. That is manufacturing sector has a long-term relationship with economic growth in Tanzania. This implies that if the government wants to improve economic growth in Tanzania it should pay attention to the manufacturing sector. Increasing manufacturing sector pulls up the economic growth in Tanzania. See Figures 1 and 2 for more clarification regarding cointegration between manufacturing sector and Gross Domestic Product as a proxy of economic growth in Tanzania. It is important to note that ser01 in the figure stands for Gross Domestic Product and ser02 in the figure represents the Manufacturing sector.

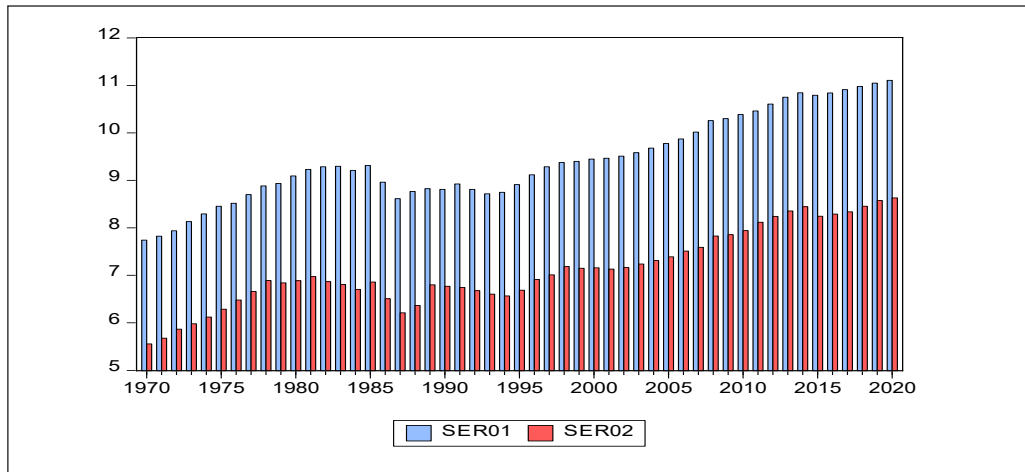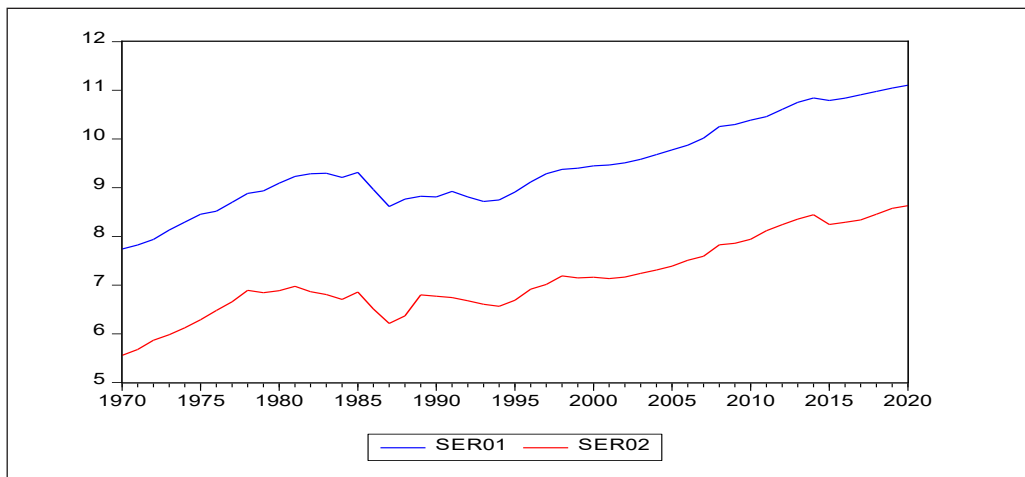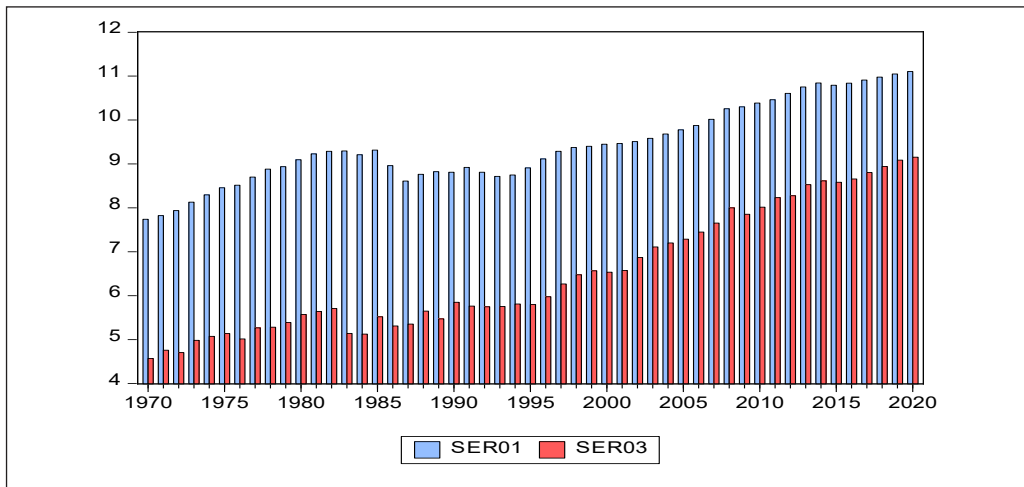**Figure 1: Cointegration between Manufacturing and Gross Domestic Product in Tanzania**

Figure 2: Cointegration between Manufacturing and Gross Domestic Product in Tanzania

Source: Researcher's computation, 2022

3.4 Construction sector and Economic growth

The study also examined the cointegration using bar and line graphs. The findings revealed that there is a cointegration amongst the variables. In other words. The construction sector has a long-term relationship with economic growth in Tanzania. This implies that improving construction sector will trigger the economic growth in Tanzania. Thus, the construction sector is among the most important players in economic growth in Tanzania. Figures 3 and 4 indicate a cointegration between the construction sector and Gross Domestic Product as a proxy of economic growth in Tanzania. Note that ser01 in the figure stands for Gross Domestic Product and ser03 represents the construction sector.

Figure 3: Cointegration between Construction and Gross Domestic Product in Tanzania

Figure 4: Cointegration between Construction and Gross Domestic Product in Tanzania
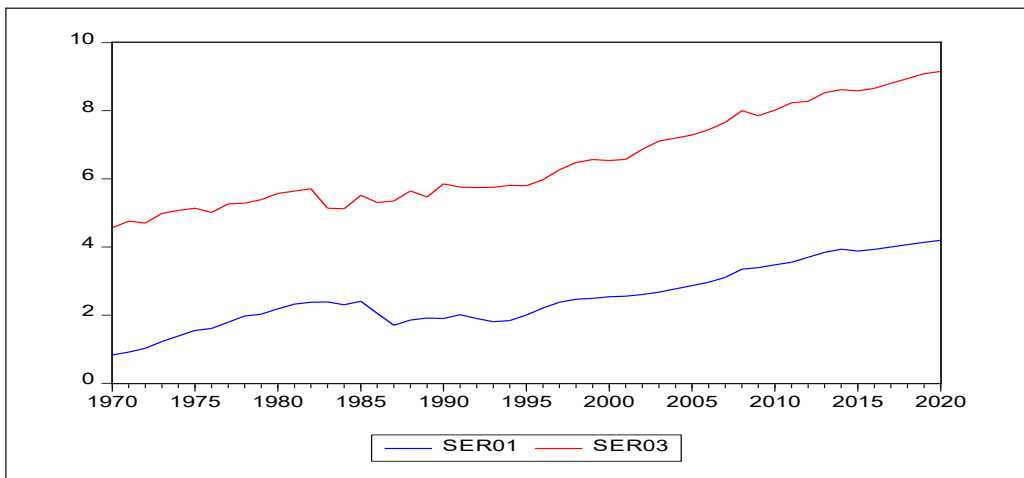
Source: Researcher's computation, 2022

3.5 Regression Results

3.5.1 Manufacturing sector and Gross Domestic Product

The empirical results from the regression analysis indicates that the manufacturing sector and Gross Domestic Product in Tanzania have a positive relationship. The study results found the expected sign and coefficient of (1.130016), which is positive a sign and is statistically significant at five level of significance. Keeping other factors constant, this implies that 1 percent increase in manufacturing sector would increase the Gross Domestic Product in Tanzania by 1.130016 per cent (See Table 4.2). The findings are in line with the findings in other studies (i.e., Szirmai, 2011; Szirmai & Verspagen, 2011), where they examined the manufacturing and economic growth in developing countries using panel data and found a positive influence of manufacturing on economic growth in the respective

countries. Also, Wangwe et al. (2014) examined the correlation between manufacturing and economic growth in Tanzania and found a positive relationship between manufacturing and economic growth in Tanzania. Elsewhere, Su and Yao (2016) and Okon and Osesie (2017) studied the impact of manufacturing on economic growth in Middle Income Economies and Nigeria in particular. Their findings reveal positive influence of manufacturing on economic growth. Thus, all the findings from previous empirical studies concurred with the findings of the current study indicating that manufacturing sector has positive influence on economic growth in the countries under study. Therefore, manufacturing sector can be used as a driver for economic growth in Tanzania. This is supported by findings from other researchers (i.e., Lugina et. al., 2022; Rweyemamu et al., 2023; Mbelwa, 2023) who conducted studies in Tanzania and found positive influence of manufacturing sector on economic growth in Tanzania.

3.5.2 Construction sector and Gross Domestic Product

A similar expectation was reported in the construction sector indicating a positive and statistically significant sign at five per cent level of significance with a coefficient of (0.628312). This implies that 1 per cent increase in the construction sector would increase the Gross Domestic Product by 0.628312 per cent in Tanzania while keeping other factors constant (See Table 4.2. Similar findings are reported in other studies (i.e. Kikwasi & Escalante, 2018; Khaertdinova et al, 2021). All these studies found a positive contribution of construction sector in the economic growth in Tanzania, European and Russian Federation countries. In this context, the construction sector remains a significant economic driver in the countries under study.

Table 2: Coefficients results

Model 1				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.535197	0.158340	-34.95776	0.0000
LNMan	1.130016	0.022083	51.17175	0.0000
Model 2				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.57262	0.165182	-9.5206669	0.0000
LNCons	0.628312	0.024821	25.31378	0.0000

Source: Researcher's computation, 2022.

3.6. Structural Break Results

3.6.1 Manufacturing Sector and Economic growth

Manufacturing sector and economic growth in Tanzania have shown unstable contribution over the study period since the CUSUM and CUSUM of squares plots falls outside of the critical bounds at 5 percent level of significance as shown in figures 5 and 6 below. This result suggests a positive influence but unstable contribution under period of study.

See Figures 5 and 6 where all the plots crossed the critical bounds.

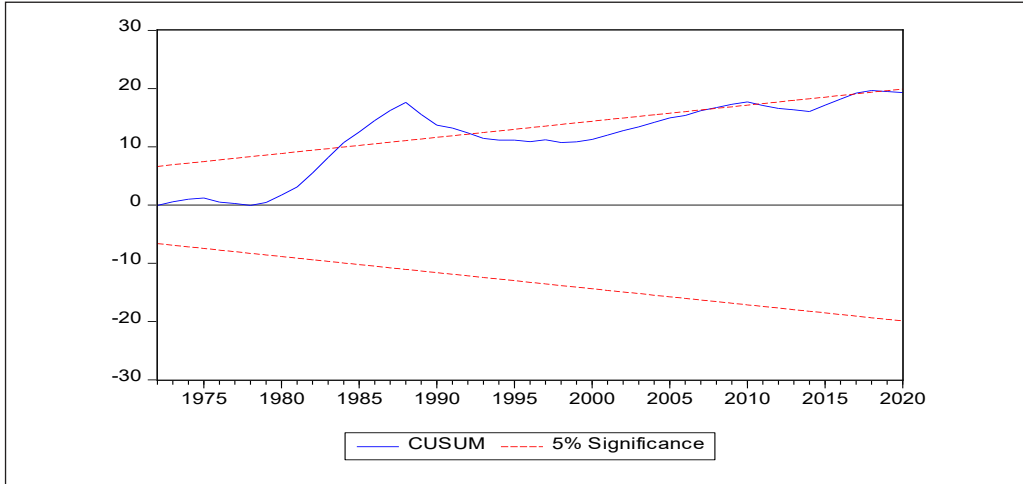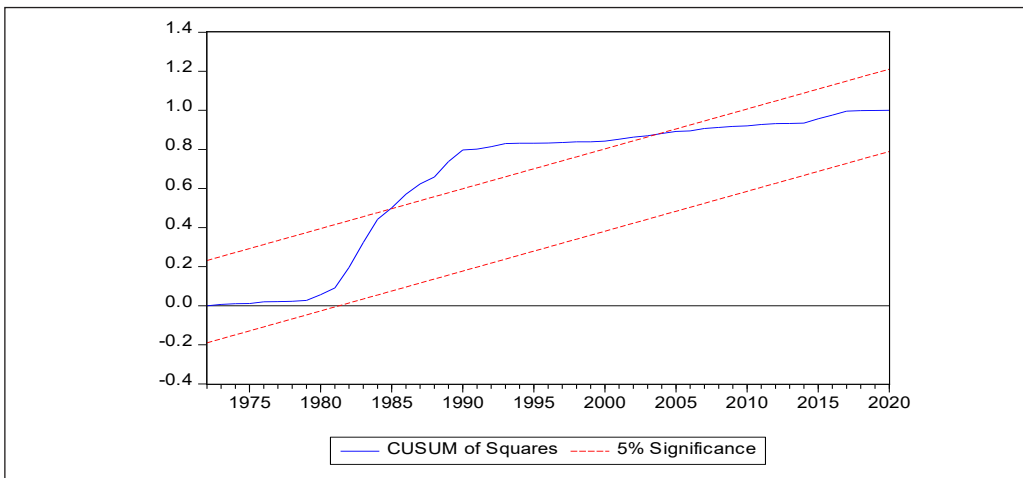**Figure 5: Manufacturing sector and Economic Growth-CUSUM Plots**

Figure 6: Manufacturing sector and Economic Growth-CUSUM OF SQUARES Plots

Source: Researcher's computation, 2022.

3.6.2 Construction Sector and Economic Growth

The study results indicated that there is unstable contribution of the construction sector to the economic growth in Tanzania. The CUSUM of squares critical bound is crossed thus the hypothesis of stable contribution was rejected. This implies that even though the construction sector has a positive impact to economic growth, its contribution is not stable over time under study period. Thus, the government ought to improve the construction sector to make it have a stable contribution to the economic growth in future. Figures 7 and 8 represent the structural break results as described above.

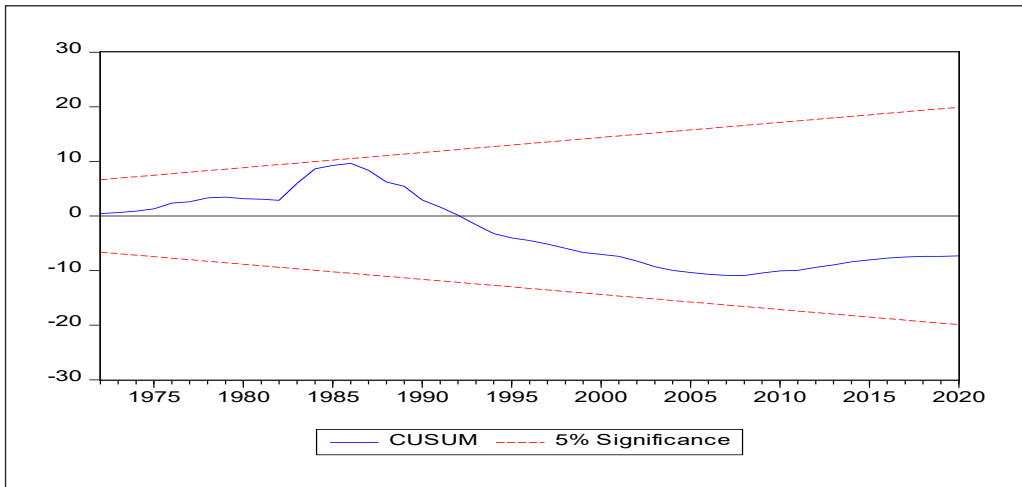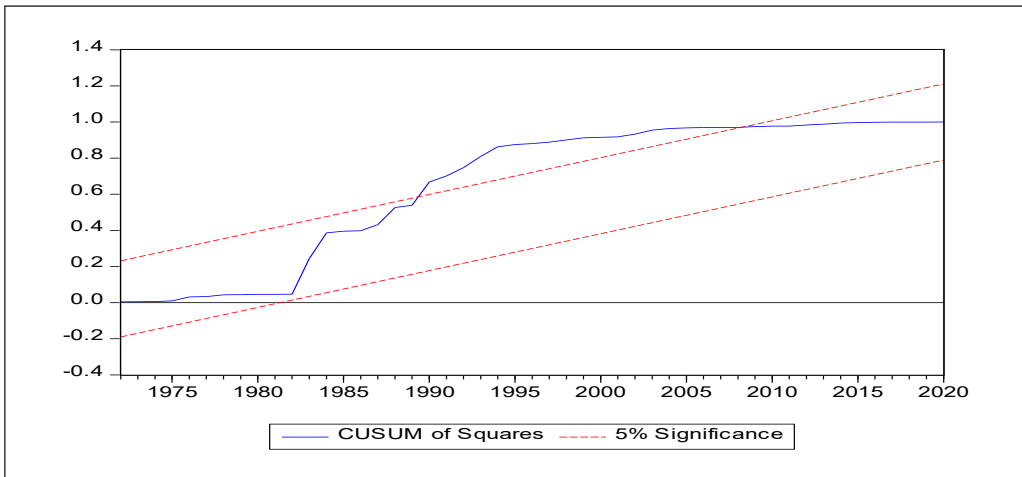**Figure 7: Construction sector and Economic Growth- CUSUM Plots**

Figure 8: Construction sector and Economic Growth-CUSUM of SQUARES- Plots

Source: Researcher's computation, 2022.

4.0 Conclusion and Recommendation

The empirical results of the current study indicate that all sectors under the study have a positive contribution to the economic growth in Tanzania since all the empirical results have the expected coefficients and signs. The findings reveal a positive relationship amongst the variables under the study. All sectors have a positive contribution to economic growth and are statistically significant at a five level of significance. This implies that manufacturing and construction sectors have significant contributions to economic growth in Tanzania. The findings are robust since unit roots results confirmed that all the variables at level are non-stationary and stationary at first difference thus all the model formulations are properly modelled and the findings are not spurious. Furthermore, these sectors have cointegration with economic growth, that is, they have a long-term relationship as presented in line and

bar graphs above. Therefore, having a long-term relationship means the government can use that cointegration results for policy interventions or formulation for future.

Regarding stability amongst the variables the findings revealed unstable contributions of manufacturing and construction sectors on economic growth under the study period. Thus, based on the findings the study shed light to the government on the need of taking measures such as creating the enabling environments such as good policies to new investors in manufacturing and construction sectors. All these sectors have a long-term relationship with economic growth thereby any government interventions in the manufacturing and construction sectors can improve the economic growth in Tanzania.

References

Afolabi. A and Laseinde O. T: (2019): Manufacturing Sector Performance and Economic Growth in Nigeria, International Conference on Engineering for Sustainable *World, Journal of Physics:* Conference Series 1378 (2019) 032067 IOP Publishing doi:10.1088/1742-6596/1378/3/032067.

Baig, I. A., Ali, M. S., Salam, A., & Khan, S. M. (2020). Agriculture, manufacturing and economic growth in India: a co-integration analysis. *Journal of Economics and Business*, 3(3).

Berk, N., & Biçen, S. (2017, April). Causality between the construction sector and GDP growth in emerging countries: the case of Turkey. In 10th Annual International Conference on Mediterranean Studies (pp. 10-13).

Brown, J. Durbin and J. M. Evans (1975): Techniques for Testing the Constancy of Regression Relationships over Time: *Journal of the Royal Statistical Society*. Series B (Methodological) Vol. 37, No. 2 (1975), 149-192.

Dufour, J. M (1982). Recursive stability analysis of linear regression relationships: an exploratory methodology. *Journal of Econometrics* 19, 31-76. Retrieved from www2.cirano.qc.ca/~dufourj/.../Dufour_1982_JE_RecStabAnalLinReg.p

Erol. I and Unal. U (2015): Role of Construction Sector in Economic Growth: New Evidence from Turkey, Online at https://mpra.ub.uni-muenchen.de/68263/ MPRA Paper No. 68263, posted 08 Dec 2015 19:57 UTC

Gabriel, L. F., de Santana Ribeiro, L. C., Jayme Jr, F. G., & da Costa Oreiro, J. L. (2020). Manufacturing, economic growth, and real exchange rate: Empirical evidence in panel data and input-output multipliers. PSL Quarterly Review.

Granger C. W. J & Engle, R. F (1987). Co-Integration and error correction: representation, estimation, and testing. Econometrica, 55(2), 251-276. Retrieved from http://links.jstor.org/sici?sici=00129682%2819870 3%2955%3A2%3C251%3ACAECRE%3E2.0.CO%3B2-T

Gujarati, D. N. (2004). "Basic econometrics," 4th edition. USA: United States Military Academy, West Point. Online book.

Hosein, S. R (2007). Demand for money in Iran: An ARDL approach: MPRA Paper No. 8224. Retrieved from athttp://mpra.ub.unimuenchen.de/8224/

Khaertdinova,A, Maliashova, AandGadelshina.S(2021): Economic development of the construction industry as a basis for sustainable development of the country, E3S Web of Conferences 274, 10021 (2021) https://doi.org/10.1051/e3sconf/202127410021

Kikwasi, Geraldine J.; Escalante, Cecilia (2018) : Role of the construction sector and key bottlenecks to supply response in Tanzania, WIDER Working Paper, No. 2018/131, ISBN 978-92-9256-573-2, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, https://doi.org/10.35188/UNU-WIDER/2018/573-2.

Kivyiro, P. T. (2023). The Effect of Mining, Manufacturing and Agricultural Foreign Direct Investment on Economic Growth of Tanzania. International Journal of Finance and Accounting, 2(1), 106-119.

Lugina, E. J., Mwakalobo, A. B. S., & Lwesya, F. (2022). Effects of industrialization on Tanzania's economic growth: a case of manufacturing sector. *Future Business Journal*, 8(1), 1-11.

Mbelwa, G. (2023). Assessing the Effects of Manufacturing Sector on Economic Growth in Tanzania (Doctoral dissertation, Institute of Accountancy Arusha (IAA)).

Okon, E.O and Osesie, S. W (2017): Hazardsof Manufacturing Sectorand Economic Growth in Nigeria, IJSSHE-*International Journal of Social Sciences, Humanities and Education* Vol. 1, 1, 1-16, ISSN 2521-0041.

Roshan K. Pandian (2017): Does Manufacturing Matter for Economic Growth in the Era of Globalization?, Social Forces, Vol. 95,3, 909–940, https://doi.org/10.1093/sf/sow095

Rweyemamu, M., Aikaeli, J., & Ruvanda, E. (2023). Manufacturing Exports and Economic Growth in Tanzania. *Tanzanian Economic Review*, 12(2).

Su, Dan; Yao, Yang (2016): Manufacturing as the key engine of economic growth for middle-income economies, ADBI Working Paper, No. 573, Asian Development Bank Institute (ADBI), Tokyo

Szirmai, Adam (2011): Manufacturing and economic development, WIDER Working Paper, No. 2011/75, ISBN 978-92-9230-442-3, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki.

Szirmai, A and Verspagenm, B(2011): Manufacturing and Economic Growth in Developing Countries, 1950-2005, UNU-MERIT Working Papers, ISSN 1871-9872, Maastricht Economic and social Research Institute on Innovation and Technology, UNU-MERIT, Maastricht Graduate School of Governance MGSoG.

Umaru, A, Egede, Y and Ayubu, J (2022): Does Manufacturing Sector Output Significantly Predict Economic Growth in Nigeria? *Asian Journal of Economic Modelling*, 2022, Vol.10(2): 136-145.

Utkulu, U (2012). How to estimate long run relationships in economics: an overview of recent development. Retrieved from in 10/07/2013:kisi.deu.edu.tr/utku.utkulu/dosyalar/How_to_estimate.

Wangwe, Samuel et al. (2014): The performance of the manufacturing sector in Tanzania: Challenges and the way forward, WIDER Working Paper, No. 2014/085, ISBN 978-92-9230-806-3, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, https://doi.org/10.35188/UNU-WIDER/2014/