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Effect Of Capital Expenditure On Kenya's Manufactured Exports To Uganda And Tanzania

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Abstract
Manufacturing had been identified as the first of the big four pillars in the Third Medium Term Plan (MTP) (2018-2022) of Vision 2030. Its implementation would not only support higher economic growth and faster job creation but also reduce the high cost of living thereby contributing to the high quality of life of all citizens by contributing at least 10 per cent of Kenya's GDP p.a. Nevertheless, little information existed on how various macroeconomic aggregates contributed to the growth of the manufactured exports in the country, therefore, creating a knowledge gap for policymakers when making significant decisions for boosting the growth of manufactured exports in Kenya. This study, thus, sought to determine the effect of capital expenditure on Kenya's manufactured exports to Uganda and Tanzania between 2007 and 2018. This study was anchored on Linder's hypothesis of trade and employed the gravity model. It adopted a correlational study design and used secondary panel data from the World Bank, Central Bank of Kenya, Kenya National Bureau of Statistics, and Kenya Export Promotion and Branding Agency. According to the equation, both random and fixed effect models were estimated. Results of the random effect model for Kenya's exports to Uganda and Tanzania indicated that the effect of KXM was positive and significant ($\beta 3 = 0.588$, p-value $0.000 < 0.05$). This study therefore recommends that the Government of Kenya and other stakeholders invest more in education, healthcare, and R&D, incentivize novel sectors like the information and communication technology sector, and deter corruption in development projects.
Keywords: *Manufactured exports, Capital expenditure*

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I. Introduction

The Third MTP of Vision 2030 projected that manufacturing would account for a minimum of 10 per cent of Kenya's GDP annually, given its substantial potential for job creation. This sector could catalyze the expansion of the agricultural sector, the largest employer in rural areas while presenting considerable prospects for enhancing exports and reducing imports. The proposed strategy involved increasing the proportion of manufactured goods in the regional market from 7 to 15 per cent by the year 2022. In light of the EAC's intra-regional exports experiencing a growth of 5.6 per cent, reaching USD 3.2 billion in 2018 from USD 2.9 billion in 2017, which underscores the value and potential of the trading bloc, it is noteworthy that Kenya's exports to its regional partner state only saw a modest increase of 0.1 per cent in 2018. This situation necessitates a critical reassessment of Kenya's regional export strategy. It is significant to note that Uganda and Tanzania represented 70 per cent of Kenya's exports to the East African Community, amounting to USD 0.914 billion out of a total of USD 1.3 billion in 2018. According to the data, they constituted Kenya's principal trade allies within the East African Community.

In light of the government's intention to elevate the proportion of manufactured goods in the regional market to 15 per cent, one of the overarching concerns that may affect the success of manufacturing exports is capital expenditure. Theoretically, Capital expenditure on infrastructure reduces production costs, provides access to modern technology, and raises economic returns to labour. Infrastructure, further, contributes to raising the quality of life by creating amenities, providing consumable goods, and contributing to macroeconomic stability. When the cost of production is reduced, more will be produced by the manufacturing firms at a lower cost and exported at competitive prices thereby boosting the quantities exported. Furthermore, should Kenya enhance its manufacturing exports, it would acquire essential foreign currency, concurrently elevating its manufacturing value addition index, thereby contributing positively to the nation's GDP. This study, therefore, sought to examine the effect of Kenya's capital expenditure on the growth of manufacturing exports from Kenya to Uganda and Tanzania.

II. Empirical Literature

Chikelu and Okoro (2016) investigated whether the sluggish expansion of the manufacturing sector in Nigeria was attributable to inadequate allocation of capital expenditure, as well as the existence of a causal relationship between capital expenditure and the growth of the manufacturing sector. This study used Johansen Co-integration analysis on the model's variables: Manufactured Output in Nigeria, Capital Expenditure, Foreign Direct Investment, Interest Rate, and Exchange Rate. The research demonstrated a favourable correlation between capital investment and manufactured production in Nigeria. Given the absence of relevant studies in the East African environment, it is essential to determine the generalizability of the results.

Nwanne (2015) examined the impact of government capital expenditure on the output of the manufacturing sector in Nigeria. The research employed quantitative time series data and multiple regression methods for analysis. The co- integration test results demonstrated a long-term link between the dependent and independent variables. It was also disclosed that capital expenditure on road infrastructure (CEXR) and telecommunications (CEXT) considerably influences the output of the manufacturing sector in Nigeria, whereas government capital expenditure on power has a small impact on the manufacturing sector in Nigeria.

Emmanuel and Oladiran (2015) examined the correlation between governmental spending and the output of the manufacturing sector in Nigeria. The analysis of government expenditure involved a disaggregation into capital and recurrent categories, focusing particularly on the impact of the capital component. The research utilized time series data spanning from 1970 to 2013. Following the correction of errors, the estimates indicated that government capital expenditure is positively correlated with the output of the manufactured sector in Nigeria, whereas recurrent expenditure has a detrimental impact on the output of the manufactured sector. The findings indicated that a one per cent rise in government capital expenditure led to an 11.2 per cent increase in output within the manufactured sector, whereas recurrent expenditure experienced a decline of 26.9 per cent. This research indicated a favourable correlation between capital expenditure and output in the manufacturing sector, thereby necessitating an examination of its impact on manufactured exports to the EAC to determine if analogous results may emerge.

The EAC Trade and Investment Report (2018) indicated that the East African economy grew by 5.7 per cent in 2018, an increase from 5.6 per cent in 2017. This was ascribed to heightened capital expenditure on infrastructure investments in roads, railways, and electricity, and augmented private consumption.

This study aimed to examine the effect of capital investment on Kenya's manufactured from Kenya to Uganda and Tanzania. The data presented here can help academics, business leaders, and policymakers in Kenya increase the regional market share of manufactured goods from 7% to 15% by 2022 (as per the MTP III) and, eventually, boost the country's export growth rate from 0.1% in 2018 to a higher level. The studies above indicate that none have addressed the impact of Kenya's capital spending on its manufactured exports to the East African Community, particularly to Uganda and Tanzania. Consequently, our work aims to address such deficiencies.

III. Methodology

The study adopted a correlational design and relied on secondary panel data from the World Bank, Central Bank of Kenya, Kenya National Bureau of Statistics, and Kenya Export Promotion and Branding Agency, which was analysed using Stata software.

Econometric Model

This study applied the following regression function to test the hypothesised relationship between manufactured exports to Uganda and Tanzania and capital expenditure:

Augmented Gravity Model

$$lnMXPkjt = \beta 0 + \beta 1ln(GDPkt) + \beta 2ln(GDPjt) + \beta 3ln(KXMkt) + \beta 4ln(DMDkt)\ \beta 5ln(POPkt) + \beta 6ln(DISkjt) + \beta 7ln(DGCkjt) + \beta 8ln(CMCkjt)\ \beta 9ln(CMBkjt) + \varepsilon kjt$$

The variables are defined as:

k: Kenya k

j: The two trading partners, that is, Uganda and Tanzania

t: Time

MXE: The monetary value of the bilateral trade flow in manufactured goods between Kenya and

Its trading partners are expressed in millions of USD. The gross domestic product is quantified as the absolute value of real GDP in USD, expressed in billions of USD.

DIS: the geographic separation, expressed in kilometers (KM), between Kenya's trading partners and its economic hubs

POP: The quantification of population magnitude expressed in millions
KXE: Capital Expenditure, quantified in millions of USD
DMD: Domestic debt, quantified in millions of USD
DGC: Absolute value of per capita GDP differential between Kenya and its trading partners measured in USD.
CMC: Common colony
CMB: Common border
ε: error term.

IV. Findings

Descriptive Statistics
Table 4.1 shows the descriptive statistics for manufactured exports and capital expenditure.

Table 4.1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
MXE	24	5.450e+08	1.620e+08	2.741e+08	8.452e+08	.038	1.989
KXM	36	2.070e+09	1.530e+09	7.382e+08	9.610e+09	3.468	17.49

Source: Author's Own Computation, 2024

From Table 4.1, Kenya's manufactured exports (MXE) reported a mean of USD 545.0 million, a minimum of USD 274 million, a maximum of USD 845.25 million, and a standard deviation of USD 162.0 Million. Further, the variable has a skewness of 0.038 (0<0. 038 <0.5) implying that the variable has a normal skewness and a kurtosis of 1.989 < 3 indicating a negative distribution i.e. it has lower values compared to the sample mean thus platykurtic.

Capital Expenditure (KXM) reported had a mean of USD 2,070 Million, a minimum of 738.2 million, and a maximum of USD 9, 610.36 million, and a standard deviation of USD 1,530 Million which is also a small variation from the mean. This indicates that all the EAC countries have similar capital expenditures. Further, it has a skewness of 3.468>0.5 meaning it has a positive skewness and kurtosis of 17.49>3 indicating positive distribution hence Leptokurtic meaning it has higher values than the sample mean.

Correlation Analysis

Correlation analysis helps to establish the type of relationship between different variables, that is, strength and direction. The relationship can either be negative, positive or neutral. If the correlation value is +1 or close to that, then there is a strong positive correlation. Similarly, if the correlation value is -1 or close to that, it means there is a strong negative correlation (Baker, 2018). However, if the correlation value is closer to 0, there is a weak correlation while 0 means it is neutral or there is no correlation. Pairwise correlation analysis was performed to determine the direction and nature of association between variables in this study and the results are shown in Table 4.2.

Table 4.2: Correlation analysis with level of significance

Variables	MXE	KXM
MXE	1.000	-0.806* (0.000)
KXM	-0.806* (0.000)	1.000

Source: Author's Own Computation, 2024 MXE- Manufactured Exports

KXM- Capital Expenditure

According to the correlation results in Table 4.2, manufactured exports (MXE) had a strong, negative and significant association with capital expenditure (KXM), as indicated by a correlational value of -0.806 and a p-value of 0.000 <0.05.

Panel Unit Root Tests

Having established the correlation and described the data, it was necessary to test for unit root among the time-variant variables. These are manufactured variables, capital expenditure, GDP and distance. The results are presented in Table 4.3.

Table 4.3: Unit Root Tests

	Levin Lin Chu			Haris-Tzavalis		
Variable	t-statistic	p-value	Conclusion	t-statistic	p-value	Conclusion
MXE	-1.955	0.025	1(2)	-4.653	0.000	1(1)
KXM	-4.150	0.000	1(1)	-5.242	0.000	1(0)

Note: I (0)= Integrated at Levels, I(1)= Integrated of First Order, I(2)= Integrated of Second Order Source: Author's Own Computation, 2024

Capital expenditure data was integrated at levels using the Haris-Tzavalis test, this meant that the null hypothesis of unit root data was rejected with a p-value of less than 0.05 and at the first difference using Levin Lin Chu. Manufactured exports was integrated at first difference using Haris-Tzavalis test and the second difference using Levin Lin Chu.

Regression results

Table 4.4 displays the output of the regression analysis.

Random and fixed effect models were estimated. The Hausman test was used to determine the best model for the gravity model between random and fixed effects. The random effect regression model (REM) was chosen. As Per the study objectives, the findings were discussed in the following sections based on the random effect model regression results shown in Table 4.4 below.

Table 4.4: Random Effect Regression Model

Random-effects GLS regression — Number of obs = 24
Group variable: Country_en~e — Number of groups = 2

R-sq
within = 0.283
between = 1.000
overall = 0.783

Obs per group:
min = 12
avg = 12.0
max= 12

corr(u_i, X) = 0 (assumed)

Wald $chi^2(1)$ = 195.010
Prob > chi^2 = 0.000

lnMXE	Coef.	St.Err.	t-value	p-value	(95% Confidence Interval)		Sig
lnKXM	0.588	0.150	3.90	0.000	0.292	0.883	***
lnDMD	-0.207	0.067	-3.08	0.002	-0.338	-0.075	***
lnPOP	0.208	0.063	3.30	0.001	3.299	0.851	***
lnGDP	0.588	0.151	3.90	0.000	0.293	0.884	***
lnDIS	-0.027	0.032	0.85	0.396	-0.036	0.090	*
CMC	0.068	0.023	2.96	0.003	0.023	0.113	***
CMB	-0.029	0.045	-0.65	0.513	-0.118	0.059	
Constant	13.515	1.275	10.60	0	11.017	16.013	***
Sigma_e	0. 164						
Sigma_u	0. 462						
rho		0. 888	(fraction of variance due to u_i)				

Source: Author's Own Computation, 2024

Results from the random effects model in Table 4.4 the probability of the F – Test is significant i.e. Prob (F-statistic) = 0.000< 0.05 showing all the independent variables affect Kenya's manufactured exports to Uganda and Tanzania. The overall R Square is 0.783 showing that the independent variables explained 78.30 % of the variations in the dependent variable while the remaining 21.7% is explained by other factors that are not under consideration by this study.

Post-Estimation Diagnostic Tests

The diagnostic assessments performed encompassed evaluations for multicollinearity, autocorrelation, and heteroscedasticity. The examinations were conducted to ascertain that the principles of classical linear regression remained intact and unbreached. Results are presented below.

Tests for Multicollinearity

Table 4.5: VIF Test for Multicollinearity

Variable	VIF	1/VIF
lnKXM	8.32	0.120
lnGDP	5.64	0.177
lnDIS	4.10	0.244
Mean VIF	**6.02**	

Source: Author's Own Computation, 2024

Table 4.5 delineates the findings of the multicollinearity assessment concerning the variables. The mean VIF value of 6.02 is below the threshold of 10, leading to the conclusion that multicollinearity is absent. In other words, the independent variables exhibit no intercorrelation

Test for Autocorrelation

Table 4.6: Test for Serial Autocorrelation

Variable	HR-stat	p-value	Reject Null Hypothesis	Interpretation
lnMXE	1.01	0.167	No	No evidence of first-order serial correlation
lnKXM	-1.41	0.158	No	No evidence of first-order serial correlation
lnGDP	0.98	0.326	No	No evidence of first-order serial correlation
lnDIS	-0.03	0.974	No	No evidence of first-order serial correlation

Source: Author's Own Computation, 2024

The data presented in Table 4.6 indicates that the p-values for all variables exceed 0.05, leading to the conclusion that the null hypothesis of no serial correlation cannot be rejected. Consequently, it is inferred that there exists no serial correlation among the error terms.

Test for Heteroskedasticity
Ho: Constant variance/homoscedastic H1: heteroscedasticity

Table 4.7: Breusch-Pagan / Cook-Weisberg Test Results

Chi-square	P-value
0.79	0.373

Source: Author's Own Computation, 2024

Table 4.7 indicates that the P-value of 0.373, being greater than 0.05, suggests that the null hypothesis was not rejected at the 5 per cent level of significance, interpreted as the absence of heteroscedasticity in the model. Consequently, it was determined that the variability of the errors remains consistent throughout the observations.

Discussions

The primary aim of the study was to determine the impact of capital expenditure on Kenya's manufactured exports to Uganda and Tanzania. The findings from the random effect regression model (Table 4.4 above) revealed that capital expenditure exhibited a positive and statistically significant coefficient of 0.588 (p-value 0.000 < 0.05). This suggests that a 1 per cent rise in capital expenditure results in a 0.588 per cent increase in Kenya's manufactured exports, assuming all other variables remain unchanged. Therefore, the results rejected the null hypothesis that Capital expenditure does not have an effect on Kenya's manufactured exports to Uganda and Tanzania.

The notable and affirmative correlation between capital expenditure and manufactured exports can be ascribed to the notion that infrastructure diminishes production costs, facilitates access to contemporary technology, and enhances economic returns to labour. Infrastructure additionally enhances the quality of life by establishing amenities, supplying consumable goods, and fostering macroeconomic stability. As production costs decline, manufacturing firms will increase output at reduced expenses, enabling them to export at competitive prices, thus enhancing the volume of exports. This outcome corroborated the theoretical anticipation of a favourable correlation between capital expenditure and manufactured exports.

The results of capital expenditure corroborate earlier research conducted by Falade and Oladiran (2015), which identified a favourable short-run correlation between manufactured output and government capital expenditure in Nigeria. Ekpo (1995) discovered that capital expenditure on transport and communication has a positive effect on private investment in Nigeria, which, in turn, contributes to the growth of the overall economy. Furthermore, Onakoya and Somoye (2013) investigated the influence of public capital expenditure on economic growth within the context of Nigeria. Furthermore, Eze and Ogiji (2014) examined the influence of fiscal policy on the output of the manufacturing sector in Nigeria. The findings indicate that government spending has a substantial impact on the output of the manufacturing sector, and there exists a long-term relationship between fiscal policy and manufacturing sector output in Nigeria. Lastly, Onakoya, Tella, and Osoba (2012) investigate the correlation between investments in telecommunication infrastructure and economic growth in Nigeria. The research revealed that investments in telecommunication infrastructure exert a considerable influence on economic output, both directly via industrial production and indirectly through the performance of various sectors, including agriculture, manufacturing, oil, and other services.

Nonetheless, this research presents a divergence from previous conclusions drawn by Samson (2013), who examined the correlation between government spending and economic expansion within Nigeria's industrial sector. The research indicated a noteworthy inverse correlation between governmental expenditure and the industrial segment of the economy. The findings indicate the necessity for a strategic allocation of public funds towards productive sectors in Nigeria. Furthermore, Nurudeen and Usman (2010) observed that the increasing total government capital expenditure has not resulted in significant development within Nigeria.

In conclusion, the research conducted by Nurudeen and Usman (2010) alongside Samson (2013) provides insights into the rationale behind the capital expenditure coefficient being recorded at 0.588 rather than a higher value. Corruption within governmental capital initiatives leads to an escalation in project expenses, with the excess funds being siphoned off into private hands. Consequently, projects that are perceived as expensive may, in fact, possess diminished value, thereby skewing the anticipated relationship with public benefit. Moreover, the research indicates the necessity of directing financial resources towards productive sectors. This assertion is corroborated by the findings of Onakoya and Somoye (2013), which suggest that certain traditional sectors may be witnessing diminished returns on investment. Consequently, there arises a compelling need to allocate investments towards innovative sectors, such as telecommunications, which exhibit increasing returns to scale, as posited by Ekpo (1995) and further supported by Onakoya, Tella and Osoba (2012).

Consequently, the findings disprove the initial null hypothesis, indicating that capital expenditure indeed influences Kenya's manufactured exports to Uganda and Tanzania.

V. Conclusion & Recommendations

Conclusion

The study examined the nexus between capital expenditure and Kenya's manufactured exports to Uganda and Tanzania, using panel data from 2007 to 2018. The findings from the regression output revealed that capital expenditure had a significant positive effect on the performance of Kenya's manufactured exports to Uganda and Tanzania, with a regression coefficient ($\beta 3$) of 0.588 and a p-value of $0.000 < 0.05$. This means that capital expenditure has a positive effect on manufactured exports. A coefficient of 0.588 means that holding other factors constant, a unit increase in capital expenditure increases manufactured exports by 0.588 units. The study concludes that capital expenditure boosts the performance of Kenya's manufactured exports to Uganda and Tanzania.

Recommendations

To enhance the efficiency of capital the government should invest in R&D and invest and incentivize novel sectors like the information and communication technology sector. Also, vigilance against public resource leakage and pilferage for capital projects will help have finance used in the right way. Therefore, deterrent measures should be enforced.

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