INFLUENCE OF COMMERCIAL BANKS' WEIGHTED INTEREST RATE ON CONSTRUCTION INDUSTRY GROWTH RATE IN KENYA

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Abstract

The importance of construction industry in any economy cannot be overemphasized. This is due to the major role played by this industry in building construction, dam construction and many other major infrastructure developments in the economy. In Kenya, this industry is indispensable. Over and above the above-stated roles, it is also a major contributor to the country's gross domestic product (GDP). In line with this, this study sought to establish whether the industry's growth rate is affected by interest rates due to its heavy reliance on borrowed funds. To achieve this goal, data was obtained from the Kenya National Bureau of Statistics (KNBS) and the Central Bank of Kenya (CBK). Time Series data was collected using an abstraction sheet for two variables; Construction Output Growth Rate (COGR) and Commercial Banks's Weighted Interest Rate (CBWR) for 48 years (1977 – 2024). Data was analysed using EViews software version 10. Analysis was done in three ways which included graphical, correlation and regression analysis. Results showed that construction industry output growth rate is impacted by commercial banks' interest rates. Graphically, it is observed that if CBR rises, COGR drops, even though not immediately. Correlation analysis showed that COGR and CBWR are inversely correlated with a coefficient (r) of -0.336. Finally, the first differences of COGR were regressed on the first differences of CBWR and gave an R^2 value of 0.000074 in the current year of construction. But when COGR is regressed on lagged CBWR by one (1) year up to thirteen (13) years, the R^2 value changed to 0.365 with a regression coefficient (β) of -0.481438 indicating that COGR is negatively impacted by CBWR, but not in the current year of construction but much later. These findings can be used to inform policy formulation for the construction industry growth in Kenya.

Key Words: Construction Industry Output, Time Series, First Differences

Introduction

Construction industry is globally recognized as a key contributor to any economy's gross domestic product (GDP). Several researchers have pointed this out indicating that an economy cannot stand in the absence of the construction industry [1-3]. The industry is viewed from this perspective due to the important role that it plays in the economy. These roles involve provision of physical infrastructure and constructed facilities such as roads, railways, airports, seaports, and buildings. The industry is also charged with the role of demolition and maintenance of the physical infrastructure and the constructed facilities.

While the industry performs the above-stated roles, it also employs the unemployed. This ranges from unskilled to skilled and professional workers in the industry. In the year 2023, the industry recorded an employment growth of 2.1% growth rate in the public sector. This is an increase from 9,500 people in 2022 to 9,700 employees in 2023, KNBS[4]. The construction industry in the private sector also experienced similar growth in employment during the same period as observed in KNBS[4]. It recorded a growth of 1.8%, which increased the number employed by the industry to 226,300 people in 2023.

From the foregoing observations, the importance of the construction industry to the economy cannot be overemphasized. For the industry in Kenya to continue playing this pivotal role, it is necessary to point out the challenges the industry faces such as growth fluctuations. This study sought to determine what causes fluctuations in growth of construction and Industry in Kenya. and stunted growth of the industry in Kenya. In this regard, this paper examines whether interest rates may be one of the causes of these fluctuations and if they can be used as a policy instrument to control and manage the industry for steady growth.

The objective of this study was to establish whether the impact of commercial banks' weighted interest rates can be used to control and manage the construction industry in Kenya at macro- macro-level for the growth trajectory of the industry. The industry growth rates fluctuate a lot as opposed to an ideal steady growth as envisaged in Vision 2030. This means that the industry in Kenya, as it is, cannot meet the demand for constructed facilities

in the country. There is indeed a need for a policy instrument to guide and enable the industry to achieve or realize the goals of Vision 2030. The study followed the path taken by Bickerton[1], who studied the London Interbank Offered Rate (LIBOR) and the UK's construction industry output as reported in 2013.

Method

This study adopted a quantitative strategy and longitudinal research design. The quantitative research approach emphasizes on quantification of data in both the way it is collected and the manner it is analyzed [5]. A longitudinal research design is adopted in this study because the data collected is ordered in time. Data was obtained from the Kenya National Bureau of Statistics (KNBS) and the Central Bank of Kenya (CBK) and analyzed using bivariate regression analysis, which falls under time series analysis. The two-time series variables in this study are construction output growth rate (COGR) and commercial banks' weighted interest rate covering forty-seven (47) years. Data analysis was conducted using EViews version 10, incorporating graphical analysis, correlation analysis, stationarity tests, and regression analysis. The construction output growth rate (dependent variable) was regressed against commercial banks' interest rate (independent variable) using first-difference transformations.

Regression was carried out by applying the standard time series bivariate regression model to the construction output growth rate and the following regression equation was formulated as follows: -

$$\mathbf{COGR_t = \alpha + \beta_1 CBWR_t + \beta_1 CBWR_{t-1} \ldots\ldots + \varepsilon_t}$$

Where:

$\mathbf{COGR_t}$ = Construction Output Growth Rate in a specific year

$\mathbf{CBWR_t =}$ Weighted Interest Rates of Commercial Banks in a specific year

$\boldsymbol{\beta}$ = Regression Coefficient

$\boldsymbol{\varepsilon}$ = Error Term or Residual

α = Intercept - the $COGR_t$ value when independent variables are zero-rated

The hypothesis in this study is that construction output growth rate levels are impacted by interest rates in Kenya. Therefore, the research hypothesis (H_1) is expressed

mathematically in the study as $\beta_i \neq 0$ for a single coefficient of regression, and the null hypothesis is taken as (H_0) such that $\beta_i = 0$. Therefore, the null hypothesis can be stated as follows:

H_0: Construction output growth rate levels in Kenya are not influenced by commercial banks' weighted interest rates in Kenya.

Data

I. Graphical Analysis

This is usually important in any work involving econometrics, where economic data for economic variables is analyzed. In this case, economic variables are the construction industry growth rate (COGR) and commercial banks' weighted interest rate. Data for the two variables was collected from 1977 to 2024 and graphically presented in Figures 1, 2 and 3.

Fig. 1: Construction Output Growth Rate (%) 1977 - 2024

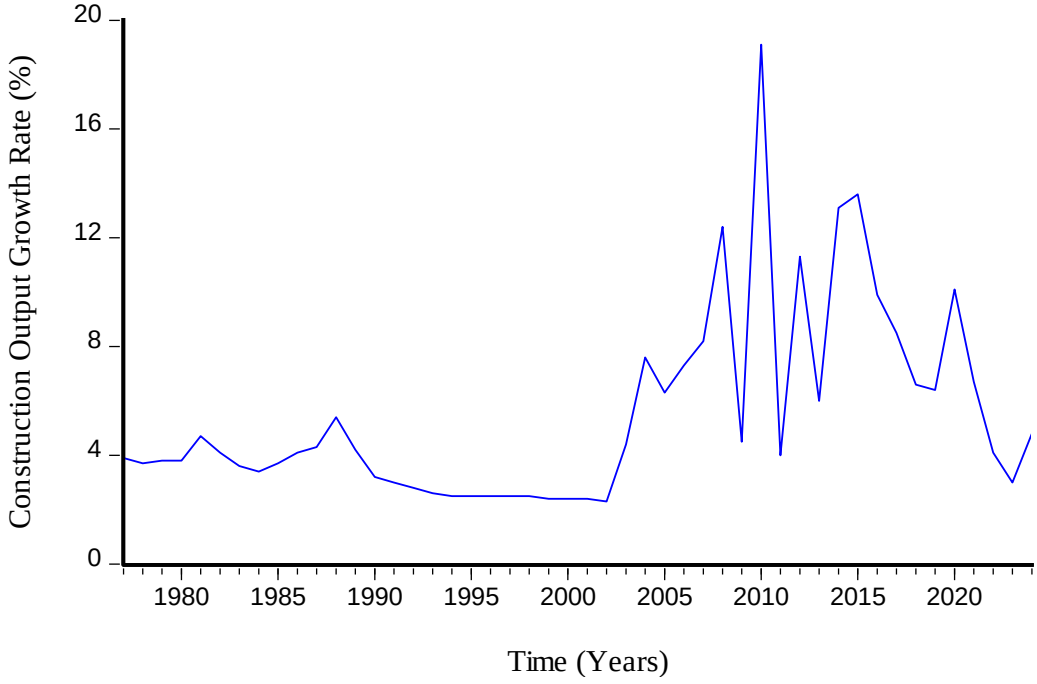


Fig. 2: Commercial Bank Weighted Interest Rate (%) 1977 - 2024

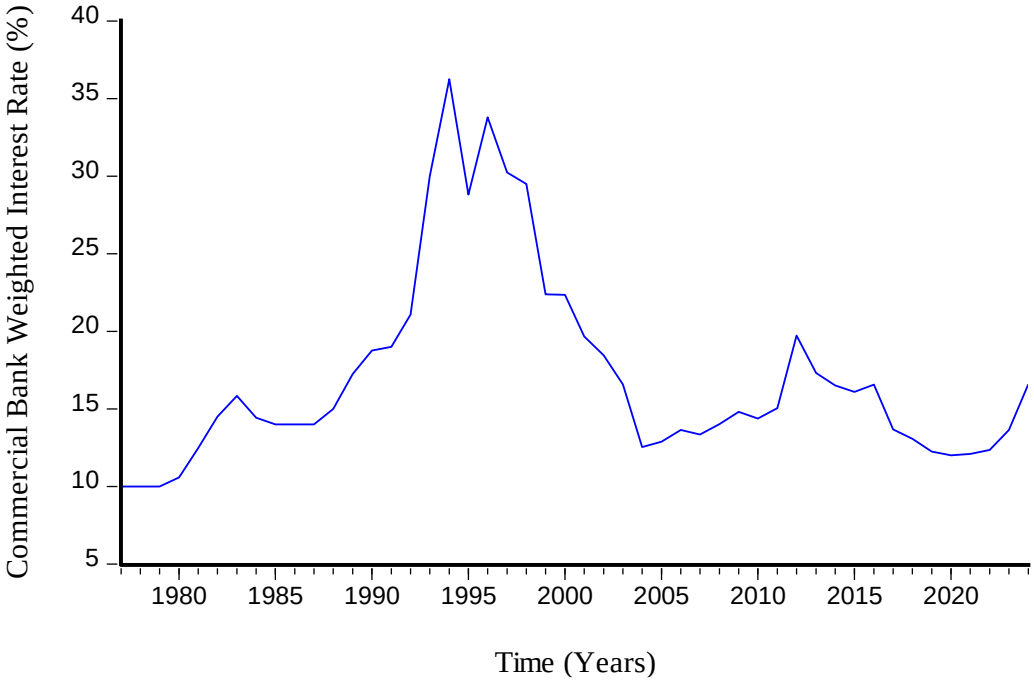
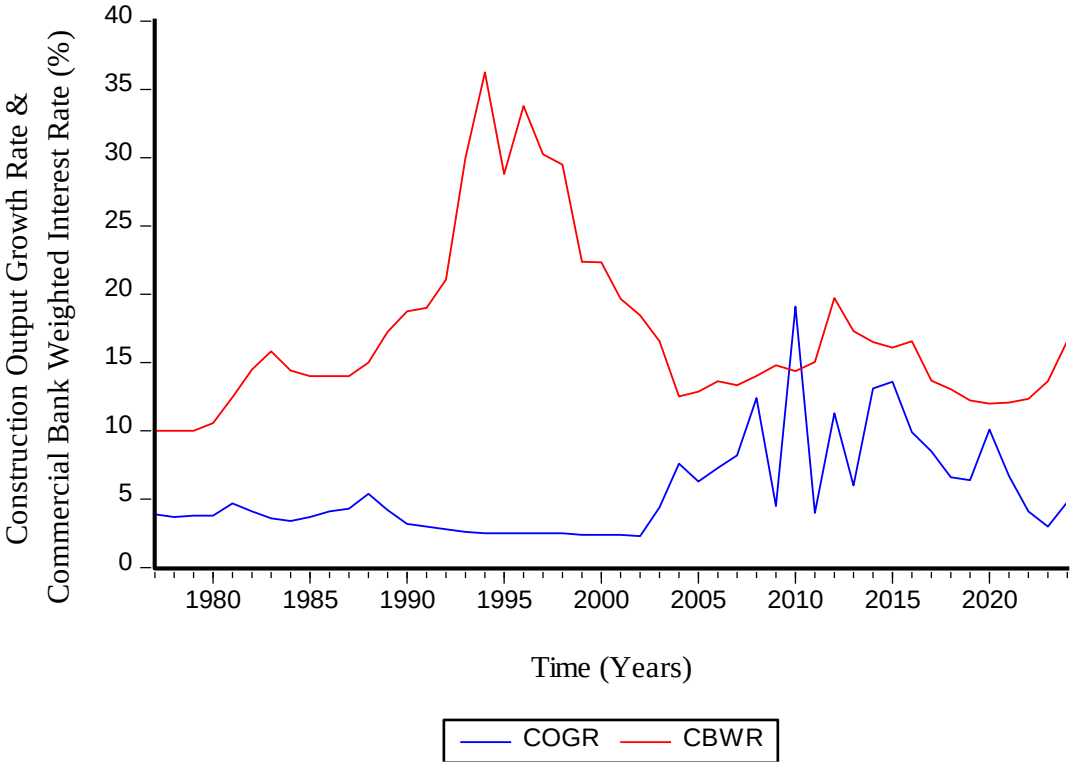


Fig. 3: Construction Output Growth Rate &
Commercial Bank Weighted Interest Rate (%) 1977 -2024



II. Correlation analysis

Table 1: Correlation Coefficient (r)

	COGR	CBWR
COGR	1.000000	-0.335755
CBWR	-0.335755	1.000000

Table 1 above displays the result of the correlation analysis. Construction output growth rate (COGR) is inversely correlated to commercial bank-weighted interest rate. This relationship is denoted by a correlation coefficient (r) of -0.336. Thus, when interest rates go up, it suppresses growth rate of the construction industry in Kenya and vice versa.

III. Stationarity Tests

Table 2: Unit Root Test Results for Undifferenced COGR

Null Hypothesis: COGR has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.719090	0.4152
Test critical values:	1% level	-3.581152	
	5% level	-2.926622	
	10% level	-2.601424	

Table 2 displays the stationarity test results for COGR before differencing. The indicated p-value of 0.4152 is clear proof of the presence of a unit root in this data. Therefore, the null hypothesis that COGR has a unit is upheld.

Table 3: Unit Root Test Results for First Differences of COGR

Null Hypothesis: D(COGR) has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-17.24598	0.0000
Test critical values:	1% level	-3.581152	
	5% level	-2.926622	
	10% level	-2.601424	

The first differences of COGR data are stationary. These results are confirmed by a p-value of 0.0000 as indicated in table 3.

Table 4: Unit Root Test Results for Undifferenced CBWR

Null Hypothesis: CBWR has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.752640	0.3989
Test critical values:	1% level	-3.577723	
	5% level	-2.925169	
	10% level	-2.600658	

The unit root test results of the undifferenced CBWR are displayed on Table 4 above. The p-value of 0.3989 indicates the presence of a unit root, which is not desirable for time series data. Therefore, the first difference transformation is necessary to make the data stationary.

Table 5: Unit Root Test Results for First Differences of CBWR

Null Hypothesis: D(CBWR) has a unit root

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.480847	0.0000

Test critical values:	1% level	-3.581152
	5% level	-2.926622
	10% level	-2.601424

The unit root test results for the first differences of CBWR indicate stationarity. The results are shown in Table 5, where the p-value is 0.0000. This shows that the data can be analysed further and give accurate results.[6]

IV. Regression Analysis

Once it was confirmed that data for all the variables were stationary, regression analysis followed. COGR was regressed on CBWR in the current year and lagged by 1 to 13 years. The regression results are displayed on Tables 5 and 6.

Table 5: Regression Results of First Differences of COGR and CBWR

Included observations: 47 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.017437	0.589325	0.029589	0.9765
D(CBWR)	0.012207	0.210944	0.057870	0.9541
R-squared	0.000074			

Table 6: Regression Results of First Differences of COGR and CBWR Lagged Up to 13 Years

Dependent Variable: D(COGR)

Method: Least Squares

Date: 03/13/25 Time: 13:58

Sample (adjusted): 1991 2024

Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	0.015828	0.853645	0.018541	0.9854
D(CBWR)	-0.106751	0.309806	-0.344574	0.7342
D(CBWR(-1))	-0.047908	0.310702	-0.154192	0.8791
D(CBWR(-2))	0.236104	0.302889	0.779508	0.4453
D(CBWR(-3))	-0.124089	0.301890	-0.411042	0.6856
D(CBWR(-4))	0.047166	0.323792	0.145667	0.8857
D(CBWR(-5))	-0.114541	0.323436	-0.354139	0.7271
D(CBWR(-6))	-0.325237	0.316418	-1.027874	0.3169
D(CBWR(-7))	0.164583	0.317689	0.518064	0.6104
D(CBWR(-8))	-0.063414	0.326030	-0.194503	0.8478
D(CBWR(-9))	-0.055089	0.316884	-0.173848	0.8638
D(CBWR(-10))	0.317383	0.298411	1.063575	0.3009
D(CBWR(-11))	-0.395891	0.298229	-1.327474	0.2001
D(CBWR(-12))	0.476004	0.302446	1.573849	0.1320
D(CBWR(-13))	-0.481438	0.308686	-1.559635	0.1353
R-squared	0.364857	Mean dependent var		0.047059

Discussion

The results, as shown on Table 5, indicate that the commercial bank-weighted interest rate does not affect construction output in the current year of construction. From the table, the R^2 value and regression coefficient (β) are 0.00 and 0.012, respectively, which translates to no impact at all in the current year. However, the regression results of COGR on CBWR lagged by up to 13 years show a negative impact. The results from Table 6 show an R^2 value of 0.365 and a regression coefficient (β) of -0.481.

Conclusions

Results showed that Interest rates had no immediate significant impact on the growth of Kenya's construction industry, as indicated by a close to zero coefficient of determination (R^2). However, a lagged regression model demonstrated a stronger explanatory power, with a significant R^2 value, suggesting that commercial banks' weighted interest rates influence

construction output growth rate with a time lag. These findings highlight the lagged effects of commercial banks' weighted interest rates on the construction industry output growth rate and provide insights for economics and policy interventions.

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