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Impact of Government Expenditures on Industrial Output in Nigeria

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Abstract

The major goal for government expenditure policies according to Keynes is to improve the effective demand which is aimed at increasing industrial output in developing countries like Nigeria. Therefore, this paper is an attempt to examine the impact of government expenditures on industrial output in Nigeria. Thus, the methodology of this paper is the time series data method which were sourced from the Central Bank of Nigeria statistical bulletin 2021 and the study also employed the Fully Modified Ordinary Least Squares (FMOLS) because the data were co-integrated at order 1(1) and the Johansen co-integration test result revealed that there are two (2) co-integrating equations. The R-Square of 98 percent suggests that government expenditures have a positive relationship with industrial output in Nigeria. Specifically, the result revealed that government capital expenditures have a positive and insignificant impact on industrial output in Nigeria. However, the government's recurrent expenditure was said to have a positive and significant impact on industrial output in Nigeria. Therefore, the study recommended that government should review the recurrent expenditures to be real sector and industrial output is driven to increase the impact of industrial output in Nigeria. Similarly, the government should design a mechanism to track the government capital expenditures in Nigeria to ensure that projects are industrial driven especially the infrastructural projects for industrial output in Nigeria.

Keywords: *Government, Expenditure, Industrial output, Capital, Recurrent*

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Background to the Study

Industrial output is a basic strategy for attaining the desired level of economic growth and development by any nation hence, developed and developing countries like Nigeria across the world develop and implement policies on industrialization (Echekoba and Ananwude, 2019). And these policies include government expenditure and deliberate fiscal policy implementation. Globally, most countries have deliberately initiated and used fiscal policy tools to improve the industrial sector because industrialization is believed to be a key driver of growth in any economy. Industrialization, therefore, is a process of building up a country's capacity to produce many varieties of products extracting raw materials and manufacturing semi-finished and finished goods (Ekpo, 2014). It is the process of building up a nation's capacity to convert raw materials and other inputs to finished goods and manufactured goods for other products or final consumption.

Theoretically, promoting economic growth and development through government expenditure is mainly viewed from two distinctive perspectives. The first is the Keynesian and endogenous theories proponents which posited that planned sectorial government expenditure is a veritable tool for achieving sustained growth (Jeff-Anyeneh, Ezu and Ananwude, 2019). Thus, government expenditure in Nigeria has witnessed a tremendous rise in recent years. The Central Bank of Nigeria statistical bulletin of 2021 revealed that from 2011 to 2015, government total expenditure increased by only 5.55%. It was N4, 712.06 billion in 2011, N4, 605.39 billion in 2012, N5, 185.32 billion in 2013, N4, 587.39 billion in 2014, and N4, 988.86 billion in 2015 while an increase from N7,813.7 billion in 2018 to N10,231.7 billion in 2021. On recurrent and capital expenditure analysis, recurrent expenditure grew by 13.50% from N3, 314.51 billion in 2011 to N3, 831.95 billion in 2015 and it increase from N5,675.2 billion in 2018 to N8,188.8 billion in 2021., however, it is sad that capital expenditure which is supposed to increase productive economic activities declined by 12.24% from N918.55 billion in 2011 to N818.37 billion in 2015 and from N1,682.1 billion in 2018 to N1,614.9 billion in 2021 (CBN, 2021).

While the expenditure pattern in Nigeria has shown a preference for recurrent expenditure compared to capital expenditure. Recurrent expenditure constitutes an average of 73.04% of total expenditure, while capital expenditure received a trifling 18.66%. Comparing the growth in total government expenditure and industrial output, it is clear that the industrial production index declined from 132 points in 2011 to 120.24 points in 2015 and declined from 115.97 points in 2019 to 102.31 in 2021 (CBN, 2021). Also, various governments have engaged in policies to improve industrial output as articulated by the National Economic Empowerment Development Strategy (NEEDS) document, Vision 20:2020 as well as the recently launched Nigerian Industrial Revolution Plan (NIRP) derive from their raisin deter. These reforms are many and touch every aspect of the Nigerian economy. Some of them are Public Sector Reform, Banking Sector Reform, Tax Reform, New Trade Policy, Foreign Exchange Market Reform, New Agricultural Policy, New Auto Policy, Oil Sector Reform, Privatisation and Commercialisation Policies among others (Nwaogwugwu, Ayodele & Ejumedia, 2016).

However, despite the continuous rise in government expenditure and various policies of government toward improving industrial performance in Nigeria the industrial production index and industrial output indices have continuously experienced a decline. Therefore, the paper seeks to empirically examine the impact of government expenditures on industrial development in Nigeria. While the specific objectives are to:

i. Examine the impact of government recurrent expenditures on industrial output in Nigeria.
ii. Examine the impact of government capital expenditures on industrial output in Nigeria.

Materials and Methods

Conceptual Review

The term "industry" refers to a group of businesses that are active in the process of industrialization. The introduction and expansion of industries in a specific location, region, or country are referred to as industrialization (Obioma and Ozughalu, 2010). Is also known as an increase in manufacturing's proportion of the Gross Domestic Product (GDP) and the occupations of the economically active population (Iwuagwu, 2009). Industrial development is simply put as strategies by the government in planning and setting up industries for employment creation, poverty alleviation, income equality, etc. which in turn results in growth in national output (Jeff-Anyeneh, Ezu and Ananwude, 2019). Industrial development is therefore a process that involves in by all the stakeholders to increase the production and manufacturing of output in a given country at a given period.

On the other hand, according to Adewara and Oloni, (2012), public expenditure can be defined in different ways as the expenditure of the central, state, and local governments; the total government expenditure plus the expenditure of public corporations. public expenditure reflects the decisions of the executive agencies and the legislative branch of government as to the proper field of government activities and the relative share of resources each field is to be allocated during a particular budget year. While, Adegboyo, Keji, and Fasina (2021), opined that government expenditure refers to the expenses that the government incurs for its maintenance and also for the society and the economy as a whole, and some governments are incurring expenditure to help other countries and that would also form a part of the total expenditure. It is conventional to classify public expenditure into various economic categories. Also, Iheanacho (2016), believed that government expenditure can be classified as recurrent expenditure and capital expenditure. Thus, recurrent expenditures are outlaid on goods and services which are used up in one fiscal year. On the other hand, capital expenditures are those on the capital project and real investments of the government which may be planned for more than one year.

Empirical Review

Ismaila and Imoughele (2015), examined the impact of fiscal policy variables on private-sector investment over 26 years. ARDL and Error-correction models were estimated to take care of long-run and short-run dynamics. The results indicate that fiscal policy has a long-run relationship with Nigeria's private sector investment confirmed by the co-integration test. The

study also revealed that government expenditure and gross fixed capital formation from the government have a positive and significant impact on private sector investment in Nigeria while budget deficit has a negative and significant effect on private sector investment in Nigeria. Also, Olawunmi and Ayinla (2017) examined the contribution of government expenditures to the achievement of sustainable private-sector investment in Nigeria using a slow private-sector investment model estimated with the use of the ordinary least square method. It was found that fiscal policy has not been effective in the area of promoting sustainable private-sector investment in Nigeria. The paper stated that factors such as wasteful spending, poor policy implementation, and lack of feedback mechanism for implemented policy evident in Nigeria which is indeed capable of hampering the effectiveness, of fiscal policy have made it impossible to come up with such a conclusion.

In the same year, Omitogun and Ayinla (2017), examined empirically the contribution of government expenditures to the achievement of sustainable private-sector investment in Nigeria. They used the Solow private sector investment model estimated with the use of the ordinary least square method and found out that fiscal policy has not been effective in the area of promoting sustainable private sector investment in Nigeria. They suggested that the Nigerian government should put a stop to the incessant unproductive foreign borrowing, wasteful spending, and uncontrolled money supply and embark on specific policies aimed at achieving increased and sustainable productivity in all sectors of the economy.

In another study, Echekoba and Amakor (2018), examined the impact of government expenditures such as expenditure on General administration, Defense, Education, and Health on the GDP of Nigeria. The Ordinary Least Square (OLS) method of estimation was used in the multiple regression analysis. The result revealed that expenditure on General Administration has a positive impact and significant relationship with economic growth; Expenditure on Defense has a negative impact but a significant relationship with GDP; Expenditure on Education has a positive and highly significant relationship with economic growth, and Expenditure on Health has a positive but insignificant impact on GDP.

Jeff-Anyeneh, Ezu, and Ananwude, (2019), also estimated the long-run and short dynamics between government expenditure and industrial development in Nigeria from 1981 to 2016 with the view to evaluating how the industrial sector has been influenced by variation in government expenditure. The Autoregressive Distributed Lag (ARDL) was the technique applied. The paper found that government expenditure has not positively affected industrial development in Nigeria both in the long run and short run. While Ebipre and Eniekezimene (2020) investigated the impact of government expenditure on economic growth in Nigeria between 1981 and 2016. The Ordinary Least Square (OLS) technique was used and the study revealed that GCE was inversely related to RGDP both in the short run and in the long run. GRE was positively related to RGDP both in the long run and in the short run and there was an inverse relationship between CPS and RGDP both in the short run and in the long run. However, with a low ECM (-1) of approximately 3% speed of convergence to equilibrium, in the long run, it is clear that the short-run dynamic disequilibrium was slow and statistically insignificant to converging to long-run equilibrium, implying that government expenditures have no long-run impact on economic growth in Nigeria.

While, Bingilar and Oyadonghan, (2020) examined the impact of government expenditure on economic growth in Nigeria and the study employed the Ordinary Least Squares (OLS) technique because the time series data were used and the results of the analysis showed that both the inflation rate and interest rate have no significant effect on Gross Domestic Product on the economic growth in Nigeria. While, Chandana, Adamu, and Musa (2021) investigated the impact of Nigerian government expenditure on economic growth and the study was disaggregated approach. The study employed Autoregressive Distributed Lag (ARDL) model. The key findings of the study are that capital expenditure has a positive and significant impact on economic growth both in the short run and long run while recurrent expenditure does not have a significant impact on economic growth both in the short run and long run.

Furthermore, Omankhanlen, Chimezie, and Lawrence (2021) examined the impact of Government expenditure on sustainable industrial development in Nigeria. The research adopted Johansen co-integration and vector error correction analysis. This research study found out that government revenue is statistically insignificant but has a positive effect on industrial development; Manufacturing Value added as a proxy (MVA), a 100% change in GREV will bring about 28% changes in manufacturing output, capital expenditure is however statistically significant and negatively impacts industrial output, a change in CEXP will yield less than a proportional change in MVA by about 52%, recurrent expenditure positively affects industrial growth, although its influence is statistically insignificant, a 100% rise in REXP will cause about 41% increase in manufacturing sector's growth. Also, a change in capital stock i.e. Gross Fixed Capital Formation (GFCF) will lead to a significant but inelastic and less than proportional change in MVA, thereby depicting an inverse relationship.

Ighoroje and Akpokerere (2021), examined the fiscal policy and industrial sector output in Nigeria from 1987 to 2019. Fiscal policy was disintegrated into government expenditure, tax revenue and budget deficit while industry sector output was measured as the GDP contribution from the industrial sector. The model developed was analysed using multiple regression methods based on Johansson cointegration Error Correction Modelling. The results revealed that fiscal policy has a long-run and short-run effect on industry sector output. The result also revealed government expenditure and budget deficit have a significant positive impact on industry sector output in Nigeria; while tax revenue has a positive but insignificant effect on industry sector output in Nigeria and the study concluded that fiscal policy drives the industrial sector output growth in Nigeria.

In another study, Ozuzu and Isukul (2021), examined the effect of government expenditure on the growth of the industrial sector output in Nigeria and the study used regression analysis in the estimation of the data. The study revealed that government capital expenditure has a positive and significant effect on the industrial sector; tax has a positive and significant effect on the industrial sector; monetary policy rate has a positive and significant effect on the growth of the industrial sector, while real interest rate has a negative and no significant effect on the growth of the industrial sector. Therefore, the study concluded that government policy has a significant effect on the growth of the industrial sector output in Nigeria.

Theoretical Framework

The theoretical framework of this study is rooted in the Keynesian fiscal policy model for government expenditure. In 1936, John Maynard Keynes' (1883-1946) "General Theory of Employment, Interest, and Money", criticized the classical economists to put too much emphasis on the long run. According to Keynes, "we are all dead in the long run". Keynes believed depression needed government intervention as a short-term cure. Therefore, the Keynesian model of government intervention revealed that there is a functional relationship between fiscal policy and industrial output through increased effective demand in the market.

That is increased effective demand through increased government expenditure will therefore increase the level of industrial output in the economy. Therefore, the theory established that there is a functional relationship between government expenditure indicators and industrial sector output indicators in Nigeria.

That is Thus, $Y = f(X)$, (1)

Y represents the industrial sector output indicator and X represents the government expenditure indicators which are government capital expenditures in Nigeria and government recurrent expenditures in Nigeria.

Research Design, Data Source, and Method of Analysis

The research design that will be adopted in this study is the *ex-post facto* research design. This is also called the Cause-Effect Research Design (Kerlinger & Rint, 1986). And will be adopted because of the research-specific objectives. The study adopted the secondary method of data collection. The study adopted the Fully Modified Ordinary Least Squares (FMOLS) to establish the impact of government expenditure indicators on industrial output in Nigeria. This is because the data were stationary at the first difference and co-integrated at order 1(1) and the Johansen co-integration test result revealed that there are two (2) co-integrating equations which justified the use of the Fully Modified Ordinary Least Squares (FMOLS) in this paper.

Model Specification

The study based on its specific objectives adopted and modified the work of Ozuzu and Isukul (2021), who examined government expenditure and its effect on the industrial sector in Nigeria with a functional model:

$$IG = f(\text{GEE}, \text{TAX}, \text{RIR}, \text{MPR}) \quad (1)$$

IG is the Growth of the industrial sector proxy by the contribution of industrial gross domestic product to total gross domestic product. GCE is the Government capital expenditure proxy capital expenditure to gross domestic product, TAX is the Tax revenue to gross domestic product RIR is Real Gross Domestic Product MPR is Monetary Policy Rate. Thus, to establish the relationship between industrial output and government expenditure we have the implicit function specified as:

$$indu = f(gr\ \exp,\ gc\ \exp) \quad (2)$$

The explicit function is captured as:

$$indu_t = a_0 + a_1 gr\ \exp_t + a_2 gc\ \exp_t + \eta \quad (3)$$

Where: $indu_t$ is the industrial output in Nigeria at time t, $gr\ \exp_t$ is the government recurrent expenditure in Nigeria at time t, $gc\ \exp_t$ is the government capital expenditure in Nigeria at time t, and ε_{ti} = Residual (Stochastic error often called impulses).

Presentation and Discussion of Results

Descriptive Analysis of Variables

Table 1: Descriptive Analysis of Variables

	INDU	GREXP	GCEXP
Skewness	1.487379	1.310879	1.300759
Kurtosis	4.564040	3.951597	4.321132
Jarque-Bera	16.47247	11.34460	12.41521
Probability	0.000265	0.003440	0.002014
Sum	396705.0	73475.90	22586.80
Sum Sq. Dev.	6.750009	2.080008	13762180
Observations	35	35	35

Source: Author's Computation from E-views 10.0, 2022.

Table 1 shows the descriptive statistics of the variables used and the result revealed that all the variables (ie. industrial output in Nigeria, government recurrent expenditure in Nigeria, and government capital expenditure in Nigeria) are mesokurtic as their kurtosis values are greater than three (3). Similarly, the probability of the Jarque-Bera shows all the variables are normally distributed at the 1%, 5%, and 10% normality tests.

Stationarity Test of Variables

Table 2: Unit Root Test Result

Variable	Augmented Dickey-Fuller (ADF) Test		
	@ Level	@ 1st Diff.	Status
INDU	-	-4.843389**	I(1)
EREXP	-	-8.755855**	I(1)
GCEXP	-	-6.998630**	I(1)
Asymptotic Critical Values			
1%	-3.661661	-4.273277	
5%	-2.960411	-3.557759	
10%	-2.619160	-3.212361	
**** implies significance at 1% level, **implies significance at 5% level and *** implies significance at 10%***			

Source: Author's Computation, using E- views 10, 2022

Table 2 shows the stationary test of the industrial output in Nigeria, government recurrent expenditure in Nigeria, and government capital expenditure in Nigeria. Thus, Table 2 of the ADF tests results revealed that all the variables (INDU, GREXP, and GCEXP) are stationary at first difference which means that they are integrated of order I(I) at a 5% level of significance. And requires the Johansen test to show if the variables are co-integrated.

Co-integration Test (Johansen)

Table 3: Co-integration Test (Johansen)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.466705	40.25081	29.79707	0.0022
At most 1 *	0.397270	19.50439	15.49471	0.0118
At most 2	0.081264	2.796962	3.841466	0.0944
*Trace test indicates 2 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level*				
***MacKinnon-Haug-Michelis (1999) p-values*				

Source: Author's Computation, using E- views 10, 2022

Table 3 shows the Johansen co-integration test results and from the table, the Trace Statistic shows two (2) co-integrating equations at a 5 percent level of significance. This implies that the variables are integrated and there is a long-run relationship among variables and this implies and suggests the use of Fully Modified Ordinary Least Squares (FMOLS) in the estimation of variables.

Presentation and Discussion of Regression Results

Table 4: Full Modified Ordinary Least Squares (FMOLS) Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GCEXP	0.781768	1.528779	0.511367	0.6127
GREXP	5.537495	0.391137	14.15743	0.0000
C	-794.0628	484.1668	-1.640061	0.1111
R-squared	0.986504			
Adjusted R-squared	0.985633			
S.E. of regression	1698.146			
Long-run variance	3556780			
F-Statistics				

Source: Author's Computation, using E- views 10, 2022

The R-square of 64 percent suggests that the model and the independent variables have a good fit explaining variation in the dependent variable which is the industrial output in Nigeria. The Fully Modified Ordinary Least Squares (FMOLS) parameters results revealed that the government capital expenditures have a positive impact on industrial output in Nigeria and which implies a unit change in government capital expenditures will lead to a 0.78-unit increase in industrial output in Nigeria. Similarly, government recurrent expenditures have a positive impact on industrial output in Nigeria and which implies a unit change in government recurrent expenditures will lead to a 5.53-unit increase in industrial output in Nigeria.

The probability values of the variables show that government capital expenditures have a positive and insignificant impact on industrial output in Nigeria while the government recurrent expenditures have a positive and significant impact on industrial output in Nigeria. These findings agreed with the works of Ighoroje and Akpokerere (2021) and Chandana, Adamu, and Musa (2021) who revealed that government expenditures have a positive impact on economic output and industrial output in Nigeria.

Hypotheses Testing

Table 6: Hypotheses Testing Results

Hypotheses	**Tc**	**Tt**	**Decision Rule**	**Remark**
$H_0: {}_1 = 0$ $H_1: {}_1 > 0$	0.5	2.05	> Tt Reject H_0 < Tt Accept H_0	**Accepted**
$H_0: {}_2 = 0$ $H_1: {}_2 > 0$	14.16	2.05	> Tt Reject H_0 < Tt Accept H_0	**Rejected**
Tc is the calculated T-Statistics, Tt is the table T -Statistics (Theoretical T-Statistics) and the decision rule is based on 5% level significance. While the Degree of Freedom is set as (N-K) = 33 (Gujarati & Sangeetha, 2007).				

Source: Author's Compilation, 2022

The hypothesis resulted concluded that **H_{01}:** Government capital expenditure has no significant impact on industrial output in Nigeria is **accepted** at a 5 percent level of significance given that the value of the calculated T-Statistics (Tc) of 0.5 is less than the value of the table T-Statistics (Tt) of 2.05 and this implies that government capital expenditure has no significant impact on the industrial output in Nigeria. While **H_{02}:** Government recurrent expenditure has no significant impact on the industrial output in Nigeria is **rejected** at a 5 percent level of significance given that the value of the calculated T-Statistics (Tc) of 14.16 is greater than the value of the table T-Statistics (Tt) of 2.05 and this implies that government recurrent expenditure has a significant impact on the industrial output in Nigeria.

Serial Correlation and Heteroskedasticity Test Results

The study carried out some post-test and residual diagnostic tests which are Serial Correlation, and Heteroskedasticity Tests (Breusch-Pagan-Godfrey). Thus, the results of each of them are presented in the Tables below and followed by an explanation of the results.

Table 7: Serial Correlation and Heteroskedasticity Test Results

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.173423	Prob. F(2,20)	0.8420
Obs*R-squared	0.545495	Prob. Chi-Square(2)	0.7613
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.273038	Prob. F(9,22)	0.3051
Obs*R-squared	10.95828	Prob. Chi-Square(9)	0.2786
Scaled explained SS	5.722285	Prob. Chi-Square(9)	0.7674

Source: Author's Computation, using E- views 10, 2022

Table 7 shows the serial correlation test of the paper using Breusch-Godfrey and the Heteroskedasticity Test using the Breusch-Pagan-Godfrey. Thus, the result of the Obs*R-squared value of 0.76 which is greater than 5 percent revealed that there is the absence of serial correlation in the model of the impact of government expenditures on industrial output in Nigeria. Also, the Heteroskedasticity Test using the Breusch-Pagan-Godfrey revealed that the Obs*R-squared value of 0.279 is greater than 5 percent which implies that there is an absence of heteroscedasticity in the model of the impact of government expenditures on industrial output in Nigeria.

Normality Test Results (Jarque-Bera)

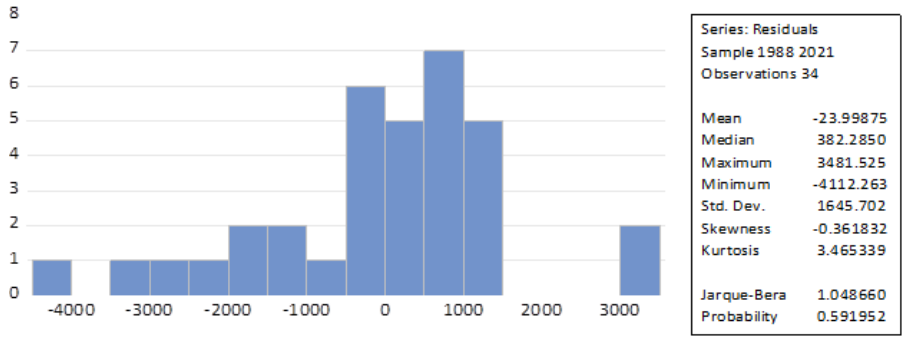

Figure 1: Normality Test Results (Jarque-Bera)

Figure 1 shows the Jarque-Bera and the probability of the model used for estimation. The Jarque-Bera and the probability values which are greater than 5 percent revealed that the model is normally distributed. This implies that the model of the impact of government expenditures on industrial output in Nigeria is normally distributed across observations.

Conclusion and Recommendations

In conclusion, the paper's findings have revealed that government expenditures have a positive impact on industrial output in Nigeria both in the short and long run. Specifically, the result revealed that government capital expenditures have a positive and insignificant impact on industrial output in Nigeria and this may be due to the fact that most capital projects in Nigeria are not industrial drive that is most capital projects are not focused on increasing the industrial output in Nigeria. However, the government's recurrent expenditures were said to have a positive and significant impact on industrial output in Nigeria this is because an increase in wages and salary increase effective demand according to the Keynesian theory of government expenditure. Therefore, the study recommended the following:

i. Government should increase by 10 percent the recurrent expenditures through the Ministry of Finance at all levels to be real sector and industrial output is driven to increase its significant impact of industrial output in Nigeria through effective demand.

ii. Similarly, the government should design a mechanism to track the government capital expenditures in Nigeria to ensure that projects are industrial driven especially the infrastructural projects for a massive increase in industrial output in Nigeria.

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APPENDIX I
Data Presentation

YEAR	INDU (₦B)	GCEXP (₦B)	GREXP (₦B)
1987	80.47	6.4	15.6
1988	102.94	8.3	19.4
1989	146.84	15.0	26.0
1990	175.15	24.0	36.2
1991	218.12	28.3	38.2
1992	341.66	39.8	53.0
1993	417.06	54.5	136.7
1994	553.96	70.9	90.0
1995	1132.05	121.1	127.6
1996	1530.05	212.9	124.3
1997	1557.54	269.7	158.6
1998	1379.20	309.0	178.1
1999	1609.82	498.0	449.7
2000	2388.83	239.5	461.6
2001	2328.41	438.7	579.3
2002	2650.03	321.4	696.8
2003	3525.14	241.7	984.3
2004	5145.43	351.3	1110.8
2005	6520.74	519.5	1321.3
2006	7822.11	552.4	1390.2
2007	8441.76	759.3	1589.3
2008	9874.38	960.9	2117.4
2009	9229.81	1152.8	2128.0
2010	13826.43	883.9	3109.4
2011	17853.11	918.5	3314.5
2012	19587.72	874.7	3325.2
2013	20853.85	1108.4	3689.1
2014	22213.01	783.1	3426.9
2015	19188.58	818.4	3831.9
2016	18641.17	653.6	4160.1
2017	25639.90	1242.3	4780.0
2018	33218.33	1682.1	5675.2
2019	39879.69	2289.0	6997.2
2020	43330.78	1614.9	8188.8
2021	55300.97	2522.5	9145.2

Source: Industrial and foreign trade data is CBN Statistical Bulletin, 2021