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MANUFACTURING IN OIL-PRODUCING COUNTRIES IN SUB-SAHARAN AFRICA: THE CASE OF CONGO-BRAZZAVILLE

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ABSTRACT

This article attempted to verify the effects of Dutch disease on the manufacturing industry in Congo using econometric tools and assessed the nature of the relationship between manufacturing sector growth and other macroeconomic variables such as the real effective exchange rate, government spending, etc. Econometric analyses found that the econometric results of the expenditure effect model and the resource reallocation effect model support the Dutch disease hypothesis in Congo. The country's economy has experienced the consequences of Dutch disease. We propose several solutions to protect against this scourge, which has a detrimental effect on the Congolese economy. First, the government must establish effective fiscal governance. Second, diversify the economy to limit fluctuations in national revenues, which depend exclusively on oil exports.

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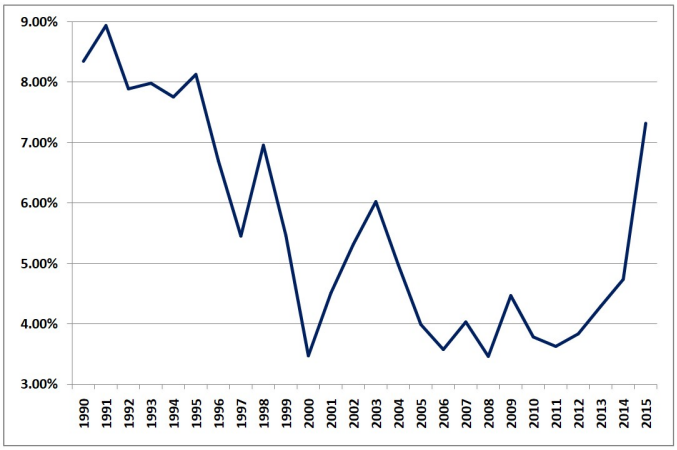
INTRODUCTION

Oil-producing countries in Sub-Saharan Africa have economies characterized by the dominance of exports of this raw material. The latter sometimes represents 80% of the country's wealth. However, the hydrocarbon sector is unable to drive development in other activities, particularly manufacturing, which is at a low level. For example, the manufacturing sector in Africa as a whole represents approximately $500 billion in value added, or just over 10% of GDP. On average, industry generates only $700 in GDP per capita, less than a third of that of South America and barely a fifth of that of East Asia (Jacquemot, 2018). The manufacturing sector in Sub-Saharan Africa is stagnating despite the fact that leaders in this part of the continent repeatedly recognize the importance of this vital sector of the economy. Obviously, industry plays a crucial role in development because it increases the value created in an economy by generating more activity along the value chains from raw materials to finished products. Similarly, industrialization boosts productivity by introducing new techniques and technologies, creates jobs, enhances workforce skills, promotes the formal economy, improves the economy in general, and contributes to social stability (AfDB, 2018). However, the strong dominance of oil in countries abundant in this raw material has several negative consequences for the economy. These consequences include fluctuations in overall income caused by the volatility of oil prices on the international market, currency overvaluation following a significant inflow of foreign currency, etc.

These countries struggle to accumulate significant revenues to finance development objectives or even reduce poverty. This issue has interested several authors such as Bellal (2013), who states that despite the enormous import capacities available to oil-producing countries in Africa, there is an absolute decline in activity in the non-oil sector of the economy, low productivity in industrial production, and a growing polarization of external sales towards oil. The Congo's economy remains heavily dependent on the oil sector, which accounts for approximately 42% of GDP, 80% of exports and 60% of domestic revenue (Republic of Congo, 2022). It has poor performance in non-oil industries despite the implementation of various development strategies in previous decades aimed at densifying the economy. After several years, it has been noted that Congo has not seized the opportunity offered to it by high world oil prices to diversify the structure of its productive base (Koutassila, 1988). The share manufacturing value added in GDP per capita never reached 10% from 1990 to 2015 (World Development Indicator, 2017). manufacturing value added in GDP per capita never reached 10% from 1990 to 2015 (World Development Indicator, 2017). These characteristics are consistent with the findings from the experiences of most oil or mining countries, which show that the negative effects in these countries are characterized by their total dependence on the extractive industry or natural resources sector and tend towards their exclusive development to the detriment of other sectors of the economy (Hani and Adala L., 2021). This phenomenon has been called Dutch disease.

This term was first used in 1977 in an article in The Economist (The_Economist, 1977) to describe the adverse effects on the manufacturing sector in the Netherlands following the discovery of natural gas in the 1960s. Thanks to these gas discoveries, the Dutch economy experienced an increase in wealth, but this positive development in the natural gas and oil sector had negative consequences for Dutch non-oil exports by strengthening the Dutch guilder.



Source: Designed by the author

Chart 1. Share of manufacturing value added in GDP per capita

The subsequent appreciation of the real exchange rate severely affected manufacturing sectors, which gradually became less competitive. This particular economic impact is known as Dutch disease. This article aims to verify with econometric tools the existence of the Dutch disease in the economy in Congo, particularly in the manufacturing sector, and to evaluate the nature of the relationship between the growth of the manufacturing sector and other macroeconomic variables such as the exchange rate, government spending, etc. The interest in diversification and the economic emergence of the country, which has been put forward in recent years in the agenda of public authorities in Congo by 2025, poses in particular the problem of the oil sector, which produces 80% of the national wealth and which has marginal links with the manufacturing industry.

Theoretical Foundations of the Dutch Disease *:* Dutch disease can occur when the export sector causes a shift of production factors from other sectors to the export sector. The prices of non-tradable goods and services also increase. This situation negatively impacts tradable goods sectors. Corden and Neary (1982) laid the foundations for this theory. They developed a framework based on a small open economy that provides two tradable goods with exogenous prices and one good with flexible prices.

Theoretical Foundations of Dutch Disease*:* Dutch Disease, according to Koutassila (1988), refers to the set of detrimental effects created in an economy by the expansion of the sector that produces natural resources. It results in sudden changes in resource allocation, with a contraction in sectors producing tradable goods and an expansion in sectors producing non-tradable goods. Relative price movements are believed to be at the center of these sectoral distortions. It should be noted that Dutch Disease can have several causes: the expansion of the natural resource sector, foreign aid in developing countries, and the influx of foreign direct investment.

The Effects of Dutch Disease: According to Dutch Disease theory, a sectoral boom leads to two main real effects: "spending effects" and "resource movement effects," which will manifest themselves in both the goods and factor markets. The following paragraphs reproduce the analyses of Aggab and Ait (2015).

Expenditure Effects: These effects are linked to the use of income. They concern the macroeconomic impacts of increased income generated by any external shock. However, a sectoral boom implies an initial increase in production in the tradable sector. Following the boom, the balance of payments surplus can be likened to an increase in aggregate income. If all income is spent and if goods in the non-tradable sector met consumer demand, this increase in income would translate into an increase in demand for these goods. Faced with a situation of excess demand over supply, there will be, regardless of any reallocation of resources, an increase in the domestic prices of non-tradable goods. Consequently, the relative prices of tradable goods fall, as the ratio of tradable to non-tradable goods prices declines: there is an appreciation of the domestic currency, leading to an increase in the production of non-tradable goods and a contraction in the production of tradable goods.

Reesource Reallocation Effect: For an exporting country, a positive external shock also leads to resource reallocations that are reflected in the goods and factor markets. Since the model assumes that the capital factor is fixed, this reallocation results solely in the shift of the mobile factor (labor) toward the expanding sector and the non-tradable goods sector. If the expanding sector is not landlocked, using the same production factors as other sectors of the economy, then the boom could produce a resource reallocation effect. Indeed, the difference between labor supply and demand by sector leads to a wage differential by sector, and therefore a shift of labor toward the sector offering the highest wages. Thus, when the price of the expanding sector increases due to the positive external shock, there will be an increase in labor demand in this sector as well as in the non-tradable goods sector. This increase in demand for labor in this sector as well as in the non-tradable goods sector therefore leads to a fall in the level of labor for the non-expanding tradable sector which sees its production fall because the economy is assumed to be at full employment and the supply of labor is fixed.

Dutch Disease Models: The Gregory model and the Corden and Neary model will be presented primarily. At this stage, the analyses of Koutassila (1988) were considered.

Gregory's Model: The idea that the development of natural resources implies a necessary relative decline in other sectors of the economy, particularly manufacturing, was put forward in 1976 by Gregory. He highlighted the predictable structural changes in Australia following the large-scale development of the mining sector. Gregory then developed a simple model outlining the effects of domestic prices on export supply and import demand. This model studies the role of the real exchange rate in the effects of a boom on exporting and importing sectors. The essence of his model is that mineral discoveries lead to an increase in export supply, which translates, in the external accounts, into a balance of payments surplus. The correction of this surplus (either through appreciation of the domestic currency or domestic inflation) increases the price of non-traded goods relative to the price of exports and imports. Pre-existing export industries or those competing with imports are affected accordingly.

Corden and Neary Model: This model, developed in 1982 by two authors, Corden and Neary, aims to understand the impact of Dutch disease. This model assumes the existence of a small economy producing two traded goods at fixed prices and one non-traded good at a flexible price. Mining and manufacturing goods, on the one hand, and services, on the other, respectively represent the two categories of goods. They are intended solely for final consumption. This model only considers the relative prices of traded goods. Each sector has a mobile factor (labor) and a specific factor (capital). The question is, what is the impact of the mining boom on the non-mining traded goods sector? The model stipulates that the latter produces two distinct effects: a resource reallocation effect and an expenditure effect. In an economy where there is perfect labor mobility, the expansion of the mining sector leads to a shift of resources towards this expanding sector and the non-traded goods sector. The demand for labor, which grows at the same rate in these two sectors, is absorbed by a significant supply. This displacement of labor leads to a decrease in production in the traded goods sector, resulting from the shortage of labor. The boom in the mining sector will produce a

surplus in the balance of payments, synonymous with an overall increase in income. This increase will lead to a rise in prices in the case where all the income is spent and the demand for goods in the non-traded sector increases. This mechanism is completely independent of any reallocation of resources. As a result, there will be an appreciation of the real exchange rate which will lead to an increase in the production of non-marketed goods and a decline in the production of marketed goods excluding mining, resulting in a deterioration in the trade balance.

LITERATURE REVIEW

Several publications have addressed the issue of Dutch disease. Two findings emerge from these studies: the verification of the Dutch disease phenomenon and its non-validation in certain countries. Regarding the initial studies, we present several authors on this topic. Kuikeu (2019), working on the countries of the Central African Economic and Monetary Community (CEMAC) and using a vector autoregressive (VAR) model, found that the potential factors contributing to Dutch disease in these economies are, on the one hand, the extreme volatility of commodity prices and the appreciation of the real exchange rate, on the other. Adeleke and Ngalawa (2014) conducted a study on six African countries (Nigeria, Algeria, Sudan, Gabon, Cameroon, and Egypt) between 1970 and 2010. The results of their study confirmed the existence of Dutch disease in these countries. Gbatsoron and Aor (2017) studied Dutch disease in the Nigerian economy from 1981 to 2014. The study's findings establish the existence of this syndrome in Nigeria during the study period. Saab (2010), working on Egypt, Jordan, Lebanon, and Syria, found that oil revenues, workers' remittances, and foreign subsidies were the main factors causing Dutch disease in these countries. Korobinikov (2014) analyzed Venezuelan economic indicators over the past three decades. The author concluded that this economy exhibits characteristics fairly typical of countries prone to Dutch disease. Despite the lack of analysis of the local currency exchange rate and a relatively rough analysis of the real wage rate, the most significant symptoms of Dutch disease are clearly detected. This means that the Venezuelan government has failed to transfer export revenues from the natural extraction sector to the creation of a strong and competitive manufacturing industry.

In other words, export revenues have been primarily spent on improving the well-being of today's citizens and, in a sense, have not been invested. Covi (20104) investigated the Russian economy's dependence on natural resources by highlighting the causes and consequences of this growth strategy. This study highlighted how the structure of the Russian economy was built to favor the energy industry at the expense of manufacturing. This strategy reinforced Russia's comparative advantage in natural resources. This action reduced the return on investment in the manufacturing sector, which faced the appreciation of the exchange rate. This has This ultimately led to the process of deindustrialization, which transformed Russia into a service economy. The resulting problem is that when a shock occurs, the economy is no longer able to mitigate its effects. Bajwa *et al.* (2019) analyzed the context of falling oil prices and the resulting fiscal problems in Saudi Arabia, as well as the country's overdependence on oil revenues. They found that Saudi Arabia exhibits all the symptoms of Dutch disease, although the diagnosis of this phenomenon remains to be confirmed. However, recently, policymakers have adopted a new initiative, such as Vision 2030, which will open the doors to diversification. As part of Vision 2030, the Saudi government is encouraging the private sector to establish a well-diversified manufacturing sector and a value-added supply chain. Looney (2016) also studied Saudi Arabia's industrial development, particularly the Dutch disease phenomenon. After considering the expected inflation rate, government spending, and the development of the oil sector, the author notes that this phenomenon is present in a large number of the country's economic activities and draws certain lessons related to the need to develop the industry. Issa and Harvie (2013), based on a study on Libya, find that additional oil revenues led to an increase in government revenue, public spending in the national economy, foreign asset stocks, production, and wages in the non-oil sector. However, the increase in oil revenues also had adverse consequences, particularly on the non-oil sector's trade balance, resulting from a loss of product competitiveness induced by an appreciation of the real exchange rate and an increase in imports stimulated by real income.

Regarding the findings of the non-validation of Dutch disease in other countries, the contribution of several authors is noteworthy. Hodge (2012) working on South Africa and using quarterly data for the period 1980-2010, he finds the following results: global growth is the most important determinant of the domestic manufacturing sector; while the real exchange rate has the expected sign which is negative, so there is no evidence of a specific effect of Dutch disease on the manufacturing sector in this country. Priyati (2009) analyzed the impact of the surge in oil and gas prices on the economy in Indonesia in 2007-2008. He finds that this induced a real appreciation of the national currency. Contrary to the theory of Dutch disease, it was accompanied by a growth in agricultural and manufacturing exports. Bellal (2013) analyzed the phenomenon of deindustrialization that characterized the economic trajectory of Algeria in recent years. The study noted the presence of symptoms of Dutch disease. However, the author believes that the phenomenon of deindustrialization is not caused by Dutch disease. For him, this evil seems to be induced more by a Institutional dynamics. Koutassila (1988), working on the Congo, finds that the link between the expansion of oil activity and the decline of traditional exports is not easy to establish in Congo. This brief literature review shows that there are studies that have highlighted the existence of Dutch disease in certain countries.

Table 1. Variables used in econometric models

	manufacturing value added as a percentage growth	real effective exchange rate in constant local currency	terms of trade in constant local currency	real price of oil in dollars per barrel	government spending in billions in constant local currency	the consumer price index (base 100: 2005)
Moyenne	4,270851	0,002045	229,494462	48,414006	700,521660	82,018672
Écart-type	8,688611	0,000677	320,788164	32,496385	349,107966	29,887540
Minimum	-18,750000	0,001349	-153,602331	12,280000	266,400000	33,150842
Maximum	23,633305	0,003778	920,483152	109,450000	1480,877171	135,868777

Source: Table designed by the author

METHODOLOGY

The methodology presents the descriptive and econometric analyses.

Descriptive Analysis: The variables presented in Table 1 were used in the econometric models. Manufacturing value added as a percentage of growth reflects a low contribution to economic growth. Real oil prices in dollars per barrel exhibit a fluctuating trend over the study period. Government spending is at a significant level. The average consumer price index is slightly high, reflecting relatively low inflation. The real effective exchange rate in constant local currency fluctuates less over the study period. The terms of trade in constant local currency show data indicating the deterioration of this aggregate.

Econometric Analysis: Our work aims to verify the existence or otherwise of Dutch disease in Congo. In the first phase, we will verify the expenditure effect hypothesis, and in the second phase, we will test the resource reallocation effect. Econometrically, Dutch disease is validated for a country if both hypotheses are verified. This

methodology was inspired by the work of Gasmi and Laourari (2017). The endogenous variable, the real effective exchange rate (REER), in constant CFA francs, is a function of the following exogenous variables:

$$TCER = f(PRP, TE, AEN, DG, TSM) \quad (1)$$

and
TSM : manufacturing value added as a percentage growth
PRP : Real price of oil in $/barrel;
TE :Terms of trade in constant CFA francs
AEN : Net foreign assets in constant FCFA
DG :;Government expenditure in billions of FCFA

Spending Effect Model : Regarding the spending effect, we will seek to verify the positive long-term relationship between the real exchange rate and the real price of oil using a few control variables such as the terms of trade, net foreign assets, and government spending. These variables are essentially annual and cover the period from 1990 to 2019. All variables come from the World Bank's World Development Indicator (WDI) database, apart from the REER and GWP obtained respectively from the IMF and OECD websites.

for the presence or absence of the unit root is greater than 5% (Table 2). This means that we will conduct a null test for the deterministic trend using a Fisher test. From the results of the table, it appears that the Fisher test using the Wald method requires us to move on to model 2. In this model, the test for the presence or absence of the unit root reveals a P-value greater than 5%. Performing the Fisher test to verify the nullity of the constant in the model, we obtain a P-value greater than 5% (0.087). We move on to model 1. Through the results of the test for the presence or absence of the unit root in this model 1, it appears that the REER is non-stationary. It is integrated of order 1 (I(1)). Proceeding in this way for the other remaining variables, we note that all the variables are non-stationary and integrated of order 1. Study of the cointegration of the series We use the Johansen test because we have several explanatory variables and they are all integrated of order 1. The results of the model test on the spending effect show that there is no cointegration relationship. This means that we will perform the Granger causality test to verify the feasibility of the VAR model. The results in the table below show that there is no causal link between the endogenous variable and the exogenous variables. Therefore, we will perform a level-based ordinary least squares model.

Table 2. Results of tests on model variables

Variables	MODEL 3				MODELE 2				MODELE 1	
	Root test	Conclusion	Test	Conclusion	Root test	Conclusion	Test	Conclusion	Root test	Conclusion
AEN	0,001	Student test	0,007	TS						
DG	0,039	Student test	0,001	TS						
IPC	0,709	Fisher test	0,193	We move on to model 2	0,979	Fisher test	0,000	I(1)+C		
PIB	1,000	Fisher test	0,001	I(1)+T+C						
PRP	0,507	Fisher test	0,115	We move on to model 2	0,723	Fisher test	0,420	We move on to model 1	0,710	I(1)
TCER	0,430	Fisher test	0,065	We move on to model 2	0,133	Fisher test	0,032	I(1)+C		
TE	0,928	Fisher test	0,398	We move on to model 2	0,573	Fisher test	0,393	We move on to model 1	0,241	I(1)
TSM2	1,000	Fisher test	0,011	I(1)+T+C						

Source: Author's calculation based on data from the World Bank (WDI), IMF and OECD

Table 3. Granger causality test of model 1

Pairwise Granger Causality Tests
Date: 07/26/20 Time: 04:13
Sample: 1990 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
PRP does not Granger Cause TCER	28	0.06275	0.9393
TCER does not Granger Cause PRP		0.43147	0.6547
TE does not Granger Cause TCER	28	0.31042	0.7362
TCER does not Granger Cause TE		0.24903	0.7816
DG does not Granger Cause TCER	28	0.03041	0.9701
TCER does not Granger Cause DG		0.53902	0.5905
TE does not Granger Cause PRP	28	0.43650	0.6515
PRP does not Granger Cause TE		1.31329	0.2884
DG does not Granger Cause PRP	28	1.12737	0.3411
PRP does not Granger Cause DG		3.01144	0.0689
DG does not Granger Cause TE	28	1.72905	0.1997
TE does not Granger Cause DG		0.13781	0.8720

Source: Designed by the author

Estimation Method: In time series econometrics, before estimating the parameters of a model, it is essential to study the characteristics of the variables to be used (endogenous and exogenous). These characteristics include the study of stationarity, cointegration, and causality. The cointegration test is performed using two approaches: the Engle-Granger approach and the Johansen approach.

Determining the Level of Integration of the Model Variables: We will verify whether the variables in both models are integrated to the same extent. To do this, we will apply the Augmented Dickey-Fuller (ADF) test for each variable. Starting with the REER (real effective exchange rate) unit root test, we observe that the P-value of the test

Spending Effect: Before interpreting the results of the spending effect model (Table 4), we note the validation of the model through tests (see Appendix 1). The correlogram test of the model's residuals shows that these residuals are stationary. The Breusch-Godfrey test reveals that the residuals are non-autocorrelated. Performing the Jarque-Bera test, we note that the residuals retained from Model 1 follow the normal distribution. We conclude that the estimated parameters are unbiased and efficient. According to our results from the spending effect model, two variables are significant. First, the real oil price (REP) significantly explains the real effective exchange rate. If the real oil price increases, this increases also the real effective exchange rate.

Table 4. Estimation of Model 1

Dependent Variable: TCER				
Method: Least Squares				
Date: 07/30/20 Time: 16:25				
Sample: 1990 2019				
Included observations: 30				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRP	0,000024	0,000011	2,328529	0,027900
TE	-0,000001	0,000001	-1,511587	0,142700
DG	-0,000002	0,000001	-3,515383	0,001600
C	0,002689	0,000241	11,177560	0,000000
R-squared	0.351548	Mean dependent var		0.002045
Adjusted R-squared	0.276727	S.D. dependent var		0.000677
S.E. of regression	0.000575	Akaike info criterion		-11.95936
Sum squared resid	8.61E-06	Schwarz criterion		-11.77253
Log likelihood	183.3904	Hannan-Quinn criter.		-11.89959
F-statistic	4.698504	Durbin-Watson stat		0.571428
Prob(F-statistic)	0.009448			

Source: Designed by the author

Table 5. MCE estimation for model 2

Dependent Variable: D(TSM)
Method: Least Squares
Date: 07/26/20 Time: 05:07
Sample (adjusted): 1991 2019
Included observations: 29 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TCER)	-2404.822	5490.119	-0.438027	0.6658
D(PRP)	0.013385	0.084277	0.158818	0.8753
D(IPC)	-1.311356	0.513725	-2.552644	0.0185
C	31.66323	10.27902	3.080374	0.0057
TSM(-1)	-0.793566	0.145665	-5.447885	0.0000
TCER(-1)	-8635.498	2895.388	-2.982502	0.0071
PRP(-1)	0.173111	0.069094	2.505426	0.0205
IPC(-1)	-0.178284	0.088275	-2.019638	0.0564

R-squared	0.668199	Mean dependent var	-0.213645
Adjusted R-squared	0.557598	S.D. dependent var	9.416784
S.E. of regression	6.263414	Akaike info criterion	6.736278
Sum squared resid	823.8373	Schwarz criterion	7.113464
Log likelihood	-89.67604	Hannan-Quinn criter.	6.854408
F-statistic	6.041552	Durbin-Watson stat	2.214013
Prob(F-statistic)	0.000597		

Source: Designed by the author

In the case of Congo, Bhattacharya and Ghura (2006) had already found that an increase in the world price of Congo's exported commodities (oil) would tend to increase the real effective exchange rate, for example by increasing domestic demand and exerting upward pressure on the prices of non-tradable goods. Second, government expenditures (G&E) have negative effects on the real effective exchange rate. On this subject, Gnimassoun (2012) states that the direction of this relationship is not a matter of consensus in the literature. For this author, the relationship between public consumption expenditures and the exchange rate is not necessarily linear and depends on the government's consumption structure. Under the assumption that public consumption expenditures are more oriented towards non-tradable goods, they should logically be accompanied by an appreciation of the exchange rate. This is often the case in developing countries where public consumption spending tends to be more oriented toward non-tradable goods (education, health, etc.). Thus, the expenditure effect hypothesis on the validity of the Dutch disease in Congo is verified. The econometric results of the expenditure effect model validated the Dutch disease hypothesis in Congo. The significant and positive relationship between the real price of oil and the exchange rate represents the relationship of interest in the expenditure effect model relative to the Dutch disease model.

Resource Reallocation: Effect Model This involves studying the positive relationship between the manufacturing output variable (here the variable of interest) and the real effective exchange rate variable, along with several control variables such as the real oil price and the consumer price index. With TSM, manufacturing value added as a percentage of growth, REER, the real effective exchange rate, GRP, the real oil price, and CPI, the consumer price index.

$$TSM = f(TCER, PRP, IPC)$$

This involves estimating the model in a single step since we have demonstrated that the following variables are cointegrated (TSM, TCER, PRP, CPI). The results of the model obtained are as follows:

The ECM model is valid because the error correction coefficient is negative, less than 1 in absolute value (-0.793566) and significantly different from zero at the 5% statistical threshold (P-value = 0.0000). Therefore, an error correction mechanism exists: in the long run, the

imbalances between manufacturing output (MSO) and the explanatory variables. We also note that the ECM is satisfactory and is overall significant (Prob(F-statistic) = 0.0006 <<< 0.05). Before interpreting the results of the short- and long-term model, we note that the tests for stationarity, non-autocorrelation, homoscedasticity, and normality of residuals, the parameter stability tests (simple CUSUM and squared CUSUM), and the Ramsey test are verified (see appendix). After having noted that all the assumptions of the model are validated, it is important to interpret the coefficients of the model. This involves interpreting the short and long term elasticities of the model by interpreting the error correction coefficient. The negative value of the restoring force (-0.793566) means that in the face of a shock, the adjustment towards equilibrium takes place at a speed of approximately 79% by the "feedback" effect. In other words, a shock on manufacturing production (TSM) in Congo observed during one year is completely absorbed after one year and three months. The model also reveals that in the short In the long term, for a significance threshold of even 10%, only the consumer price index (CPI) has a negative effect on manufacturing production. That is to say, in Congo, if the level of inflation falls, the manufacturing value added as a percentage of growth increases. However, Congo has experienced moderate inflation rates except for the year of the devaluation of the FCFA currency in 1994. It is observed that the level of consumer prices has not been a brake on manufacturing production. Congo is a member of the Bank of Central African States (BEAC), which pursues a low inflation policy with a community objective of 3%. Membership in a monetary zone governed by community disciplines in the conduct of economic policies is, however, beneficial for maintaining price stability. Indeed, countries generally constituted in a union and having adopted a fixed exchange rate regime achieve very good performance in terms of price stabilization (Ghosh *et al*., 1995). In the CEMAC, for example, since the reforms undertaken in the 1990s, inflation has averaged 3%, but with disparities between countries (Ntita *et al*., 2017). However, we note that in the long run, both explanatory variables significantly influence manufacturing value added as a percentage of growth (MSR). Indeed, the real effective exchange rate (REER) significantly explains manufacturing value added as a percentage of growth, with a negative sign. This result illustrates that the real effective exchange rate has reduced manufacturing value added as a percentage of growth.

More theoretically, an appreciation of the real exchange rate modifies the internal price structure, lowering the price of internationally tradable goods (in particular the prices of manufactured goods) relative to the price of non-tradable goods, which comprise the majority of services and certain locally consumed agricultural food goods; by increasing the cost of labor (expressed in tradable goods), it reduces the profitability of manufacturing production and the incentive to produce this type of good in preference to non-tradable goods and services (McMillan, Rodrik and Verduzco-Gallo, 2014). This is the basis of Rodrik's reasoning in favor of an undervaluation of the currency, giving a competitive advantage to tradable goods, in particular to manufacturing production. In the case of Congo, we can think that this effect delayed the development of the manufacturing sector. This result verifies one of the hypotheses of the resource reallocation effect that supports Dutch disease in a country. Regarding the oil price (PRP), it significantly explains manufacturing value added as a percentage of growth with a positive sign. The direction of this coefficient is unexpected and does not seem to correspond to the evolution of the manufacturing sector. The econometric results of the expenditure effect model and the resource reallocation effect mode confirm the Dutch disease theory in Congo.

CONCLUSION

This article attempted to verify the effects of Dutch disease on the manufacturing industry in Congo using econometric tools and assessed the nature of the relationship between manufacturing sector growth and other macroeconomic variables such as the real effective exchange rate, government spending, etc. Econometric analyses found that the econometric results of the expenditure effect model and the resource reallocation effect model support the Dutch disease hypothesis in Congo. The country's economy has experienced the consequences of Dutch disease. We propose several solutions to protect against this scourge, which has a detrimental effect on the Congolese economy. Firstly, the government must establish effective fiscal governance. Secondly, diversify the economy to limit fluctuations in national revenues, which depend exclusively on oil exports.

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