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Impact Of The Instability Of Trade Flows On Economic Growth In Benin

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ABSTRACT

This article has discussed the impact of volatile trade flows on economic growth in Benin. The analysis is conducted by a VAR model inspired by the neoclassical production function. The study data are time series covering the period from 1980 to 2016. At the end of the study, it can be deduced that a shock on the degree of openness is negatively and significantly reflected on economic growth over two years. The variance of errors in the GDP growth rate explained by the degree of openness is 3.17%. The correlation coefficient between growth rate and openness errors is -0.56. There is a positive and significant contribution of the capital factor to growth from the 4th year. As for the labor factor, its positive effects on growth are statistically zero. In order to mitigate the effect of trade opening shocks on the level of growth, Benin should process its agricultural products locally, on the one hand, and diversify its export products, on the other.

Keywords: Trade opening, VAR model, time series, Benin.

INTRODUCTION

Since the advent of colbertism in the 17th century, openness to the outside has been seen as a source of economic growth. This idea, taken up by classical economists then, neoclassical, in the following centuries, experienced a spectacular development. This makes trade liberalization a source of convergence and a key element in the formulation of development strategies. Thus, in the 1980s, under the aegis of the Bretton Woods institutions, several countries, including those of sub-Saharan Africa, subscribed to such policies within the framework of the General Agreements on Tariffs and Trade (GATT). The results for countries like Brazil, India and Malaysia are very complimentary, unlike their African counterparts with whom they had practically the same growth levels (UNDP, 2014).

According to WTO statistics (2012), exports and imports from Brazil increased by 14% and 8.9% respectively between 2007-2012. In India, the situation is practically the same. Merchandise trade, as a percentage of GDP, increased from 30.1% to 40.3% between 2005-2011. As for Malaysia, not to mention China, which ranks first in the world, the ratios of exports and imports to GDP have greatly improved. They stood at 87.1% and 75.3% respectively in 2012 against 91.4% and 71.1% in 2009. The situation of these economies is explained by an increase in exports of manufactured products and a decrease in the weight primary products. In West African countries where exports are dominated by raw materials, the picture is less complimentary. In general, the ratio of exports to GDP on the African continent is 42% and that of exports 56%.

It should be noted that exports are dominated by agricultural products. In Benin, exports fell gradually from a value of 334.9 billion FCFA in 2008 to a value of 148.2 billion in 2012. A short recovery in exports in 2013 and 2014 with a respective value of 314 , 8 billion FCFA and 473.5 billion FCFA to end up at 259.9 billion FCFA in 2015. As for imports, they remained almost increasing over the period 2008-2015. Worth 974.6 billion in 2008, they reached the value of 1868.9 billion FCFA in 2013, before gradually falling to 1472.6 billion FCFA in 2015 (BCEAO, 2015). This change in foreign trade was not without effect on the rate of economic growth in Benin which went from 4.9% in 2008 to 2.1% in 2015 (World Bank, 2016).

Reading these data from the Beninese economy seems to support the analysis of the UNDP (2014) according to which foreign trade has a negative effect on growth if the structure of trade is dominated by agricultural products. Similar studies have been conducted by Minsky (1920) (cited by Labaye, 2011); Combes et al. (2000), who tried to explain the different economic and financial crises through economic and financial openness. UNDP (2014) proposed a comparative analysis based on the calculation of the external opening aggregates between the so-called emerging countries and the Ivory Coast which is a WAEMU country, like Benin. This paper differs above all from that of the UNDP by the adoption of the econometric model VAR, which would make it possible to appreciate structurally the effect of the instability of the trade flows, and especially, exports on growth.

Thus, this article which questions the link between the instability of trade flows and the growth rate addresses, in point 2, the literature review and the methodology used, in point 3. Point 4 presents and analyzes the results before the discussion, in its point 5. As for the 6th point, it exposes the conclusion and some suggestions.

LITERATURE REVIEW

Theoretical literature

Many theoretical developments in international trade have been made by various economic currents since the 18th century. In this study, we will content ourselves with recalling the classical, neoclassical theories and then, some new theories of international trade. Smith (1776), through the theory of absolute advantage, tried to demonstrate the value of openness between countries. For Smith, a country should not hesitate to import from abroad, which foreign producers can produce better than domestic producers. Analysis of his theory shows that a country can participate in trade when it has an absolute advantage in the production of a good. Under these conditions, exchanges contribute to well-being (Smith, 1776). In 1817, Ricardo advocated the possibility of countries participating in international trade without having an absolute advantage in the production of a good through the development of the theory of comparative advantage. He introduces the idea of the country's specialization in the good for which he has the highest productivity to justify his ideas.

Around the 1940s, Hecksher-Ohlin and Samuelson perfected Ricardo's (1817) idea of comparative advantage by suggesting a specialization in the production of the good for which the country has a relatively abundant endowment in factors of production. They explain the presence of international trade by the differences in endowments in factors of production in each country. Assuming two factors of production: capital (K) and labor (L), countries where capital is relatively abundant must export goods that use capital intensively and import goods whose production

requires the intensive use of the labor factor. But, in 1947, Leontief arrived at a contrary result on the basis of American data, which the theory describes as "Leontief paradox". It is important to note that all these authors have developed their theories under the assumption of a market of pure and perfect competition and, according to them, the external opening is a source of growth and well-being.

New theories of international trade explain international trade on the basis of market structure. For Ohlin (1933), Lerner (1932-1934) and Graham (1923) [all cited by Krugman and obstfeld (2009)], international trade would result from the existence of economies of scale. Others address the subject on the assumption of imperfect competition. They demonstrate the effect of protectionism through customs duties, taxes, state subsidies to local businesses, on the one hand, and cases of monopoly and oligopoly markets, on the other. Among these are Krugman and Obstfeld (2009), Rainelli (2002), Aubin and Norel (2000).

Empirical literature

Trade openness naturally exposes an economy to external shocks and potentially increases its instability. Experience shows that developing economies, in particular, small economies, are the most unstable (Combes et al. 2000). Trade openness increases the degree of exposure to external shocks, while trade openness policy mitigates or eliminates its effects. According to the “Dutch syndrome” model (Corden and Neary, 1982), the sudden increase in export earnings in one sector of the economy leads to rapid growth in this sector and, in general, to a lesser extent, growth in the non-tradable goods sector, but also a regression in the internationally tradable goods sectors which did not benefit from the boom, for example, the manufacturing sector.

This regression results from a transfer of labor and capital resources in favor of expanding sectors, and above all, from the appreciation of the real exchange rate linked to the increase in export earnings. When the fall in export earnings occurs, we witness, in part, the opposite phenomenon, in other words, a depreciation of the real exchange rate allowing the recovery of the tradable goods sector, while at the same time the sector regresses export subject to falling international prices and non-tradable goods production activities.

The fluctuation of the overall product resulting from the shock and the counter-shock is all the greater as these affect a larger part of the economy that is to say that the economy is more open. In addition, due to the adjustment costs linked to the internal reallocation of resources, trade opening increases the negative impact of instability on growth. The work on the “Dutch syndrome” highlights the positive relationship between trade openness and the instability of the growth rate. Rodriguez and Rodrik (2000) show that openness can push the countries concerned towards specialization in sluggish sectors with a total negative impact on growth. Bhagwati (1958; 2005) and Verdier (2004) follow the logic of slower growth for the countries that export primary products based on the theory of impoverishing specialization.

Bonjean et al. (1999) also make a theoretical analysis of the effect of fluctuations in exports on growth. For them, insofar as the instability of revenue generates risks, it modifies the overall behavior of economic agents, hence its influence on savings, investment and economic growth. The effects of risk on savings vary depending on whether it affects labor or capital income. According to Hesse (2008), export instability is one of the reasons for the benefits of export diversification.

The prices of primary products are very volatile and countries that depend on these products can suffer from export instability. The latter can lead to reduced investment by risk-averse companies, increase macroeconomic uncertainty and be detrimental to long-term economic growth. His analysis echoes that based on structural models of economic development, according to which countries that depend on primary products should diversify their exports by moving from primary products to manufactured products in order to obtain sustainable growth (Chenery and Syrquin, 1975). Export diversification can then help stabilize export earnings and long-term economic growth (Nath, 2009; Agosin, 2007).

MATERIALS AND METHODS

Methodological Review

In the economic literature, several methods are used to measure instability. These various methods can be classified into two main families: on the one hand, those measures the variability of an economic series, that is to say taking into account all the transient variations of a statistical series and, d on the other hand, those measuring economic uncertainty or the unpredictability of variations in total variability (Wolf, 2005). The first measurements follow directly from the definition of instability as differences between the realizations of a variable and its equilibrium value (Cariolle, 2008; Di Giovanni and Luvchenko, 2010).

Thus, instability is evaluated by the second order (standard deviation) or higher (Rancière et al. 2008) moment of the distribution of a variable around its mean or its equilibrium value. Other measures of instability are based on the residue or the explanatory power of econometric regressions. Pritchett (2000) offers three measures of instability. The first is based on the coefficient of determination of a regression of the growth rate on a linear temporal trend. The lower the coefficient of determination, the more limited the explanatory power of the time trend, the greater the instability.

The second measure is constructed on the basis of the difference between the growth rates before and after a break year identified by minimizing the sum of the squares of the residuals of a regression on a simple linear trend. The author also proposes a measure of economic instability consisting in calculating the standard deviation of the residue of a regression in the level of GDP on a mixed deterministic and stochastic trend. The usual measures of economic instability are therefore distinguished by the method of calculating the chosen reference value. A distinction is thus made between measures based on the variance of the series as a first difference, and measures based on the variance of the residue of a more complex modeling of economic series, and those based on the variance of the cycle identified via the application of statistical filters.

On the other hand, these differences fade with regard to the way of calculating the deviations from the reference value, since the literature limits the analysis of instability to the analysis of its variance, ie the average magnitude of the fluctuations. Cariolle (2008) points out that many authors have used the estimation of a VAR model proposed by Sims (1980) to assess economic instabilities. This option used by Lalimè (2010), Refafa and Adouka (2017), Mokhtaria (2017) is the one chosen to conduct this study which seeks to explain the link between the instability of trade flows and economic growth in Benin.

Specification of the model

The model of this study is based on the neoclassical production function under the assumption of constant returns to scale. The production function is written:

$$Y = f(K, L) \quad (1)$$

(Y) represents GDP. The Gross Domestic Product (GDP) is widely used by international institutions and researchers to measure the wealth of countries, in several studies. It serves as the basis for calculating the growth rate of the countries.

(K) denotes the capital used for production. The capital factor is a set of financial, material, buildings, etc. used in the production process. According to theory, it has a positive effect on production, and therefore on growth. For this case study on Benin, Gross Fixed Capital Formation (FBCF) is used as a proxy for capital.

(L) is the work factor. The labor factor in a country is nothing more than the labor available in that country. In the neoclassical model, the population is considered to be the workforce. Empirically, the indicators used to assess the work factor differed. Thus, the active population, employed active population, the educated active population were used in the studies. In this article, the choice is made on the active population, named POPA in the model. Its effect is positive on production.

The Analytical expression of (1) is:

$$Y = K^{\alpha}L^{\beta} \quad (2)$$

α, β the parameters of the equation, which are only elasticity's of production with respect to each factor.

Based on the consideration of Sala-i-Martin (1995), Nadia (2005) (cited by Lemzoudi, 2006), according to which there is a technological transfer resulting from the external opening for the benefit of the workforce, therefore of the work factor, the expression of the work factor can be written:

$$L = f(TECH) \quad (3)$$

TECH is the degree of openness. It is measured as the value of exports plus imports over GDP. For a country more involved in international trade, the opportunity will present itself to import goods and intermediate inputs essential to its growth but whose domestic production is unthinkable because of the high costs. This increase in costs is mainly due to the lack of technology or an unskilled workforce. New technologies introduced through new imports will be incorporated into domestic production, and productivity will be increased.

In addition, increased competition will force domestic firms to innovate and operate more efficiently. Thus, the work factor is influenced by the transfer of technology from the outside opening. The hypothesis of a negative sign is made in this study for the variable TECH.

Equation (1) becomes:

$$Y = f(K, L, TECH) \quad (4)$$

Its analytical expression is written:

$$Y = K^{\alpha}L^{\beta 1}TECH^{\beta 2} \quad \rightarrow \quad PIB = (FBCF)^{\alpha}(POPA)^{\beta 1}TECH^{\beta 2} \qquad (5)$$

With $\beta 1 + \beta 2 = \beta$
After the linearization of equation (5), the econometric expression of the model is written:

$$LogPIB = a_{0+}\alpha \, Log\, FBCF + \beta_1 \, LogPOPA + \beta_2 TC + £_t \qquad (6)$$

TECH being a ratio, we replaced it in the model by TC (we assumed TC = LogTECH).

Log is the natural logarithm, a0 (constant) represents the autonomous production and £ t the error term. The coefficients α, β1 and β2 will be interpreted as elasticity's.

Analysis technique

The data for this study comes from the national accounts of the National Institute of Statistics and Economic Analysis (INSAE), the balances of payments of the Central Bank of West African States (BCEAO) and from the World Bank Statistical Yearbook. These data cover the period from 1980 to 2016 (annual time series). Excel 7 software is used for entering the database. The econometric processing of this data is done by the Eviews 18 software. In a first step, the stationarity of all the variables is studied using the ADF test at the 5% threshold. Then, the Johansen co-integration test is carried out. A variable is qualified as stationary, if the calculated t-ADF value is less than t-tabulated at the 5% threshold. The software directly gives the probability of significance of the test hypothesis. This probability is used to decide.

Thus, a variable is stationary if the probability of significance of the t-ADF of the variable is less than 5%. The co-integration of the variables is verified by the Engle and Granger test, supported by that of Johansen. The conclusions of these tests judge the estimation of the VAR model appropriate. Hence the need to determine the number of delays using the AKAIKE (AIC) and Schwarz (SC) information criteria. The principle of the choice of delay number test consists in choosing the delay number which minimizes the AIC or SC values. After estimating the model, we carried out the tests for validation of normality and auto-correlation of the model. To conclude on the effect of shocks on the growth rate, the estimation and analysis of variance are carried out.

RESULTS

Stationarity test results

Table 1: Results of stationarity tests

	In Level		In Difference First		In second difference	
Variables	**Probability**	**Decision**	**Probability**	**Decision**	**Probability**	**Decision**
LPIB	0.0606	Non Stationary	0.0000	Stationary		
LFBCF	0.0079	Stationary				
LPOPA	0.1998	Non Stationary	0.063	Non Stationary	0.0263	Stationary
TC	0.2851	Non Stationary	0.0000	Stationary		

Source: the author's treatment

From the data in table 1, we conclude that the variable FBCF is stationary in level, the variables TC and LPIB are stationary in first difference and the variable LPOPA stationary in second difference. In the sense of Engle and Granger, there is therefore no possibility that these variables are co-integrated. This lack of co-integration is confirmed by the Johansen test. In view of these results, the error correction model is no longer compatible.

The autoregressive vector model (VAR) is the most appropriate. Thus, the following table presents the number of delays. The number of delays to choose is the one that minimizes the AKAIKE (AIC) and Schwarz (SC) information criteria. However, the variables LPIB and TC will be differentiated from order 1 and LFBCF from order 2 in the equations of the model.

Determining the delay order of the model

Table 2: Number of VAR delay

Number of delays (P)	**1**	**2**	**3**	**4**	**5**	**6**
AKAIKE (AIC)	-2.619	-2.618	-3.508	-4.515	-4.236	-4.026
Schwarz (SC)	-1.721	-0.985	-1.127	-2.370	-.812	-1.311

Source: the author's treatment

The number of delays which minimizes the information criteria (AIC) and (SC) is 4. The optimal number of delays is p = 4. Thus, the result of the VAR model is as follows.

From the data in table 1, we conclude that the variable FBCF is stationary in level; the variables TC and LPIB are stationary in first difference and the variable LPOPA stationary in second difference. In the sense of Engle and Granger, there is therefore no possibility that these variables are co-integrated. This lack of co-integration is confirmed by the Johansen test. In view of these results, the error correction model is no longer compatible.

The autoregressive vector model (VAR) is the most appropriate. Thus, the following table presents the number of delays. The number of delays to choose is the one that minimizes the AKAIKE (AIC) and Schwarz (SC) information criteria. However, the variables LPIB and TC will be differentiated from order 1 and LFBCF from order 2 in the equations of the model.

Model estimation

Table 3: Estimation of the VAR model

	D(LPIB)→Eq1	**D(D(LFBCF))**→Eq2	**LPOPA** →Eq3	**D(TC)**→Eq4
D(LPIB) (-1)	-0.009	0.235	2.598	0.117
	(0.321)	(0.804)	(3.587)	(0.036)
	[-0.029]	[0.292]	[0.724]	[-0.322]
D(LPIB) (-2)	-0.561	-0.469	-1.868	0.109
	(0.215)	(0.540)	(2.408)	(0.024)
	[-2.601]*	[-0.870]	[-0.775]	[-0.447]
D(LPIB) (-3)	-0.159	0.521	-1.342	0.038
	(0.207)	(0.518)	(2.311)	(0.235)
	[-0.768]	[1.00]	[-0.580]	[0.165]
D(LPIB)(-4)	-0.177	0.215	-0.532	0.066
	(0.123)	(0.308)	(1.377)	(0.140)
	[-1.437]	[0.696]	[-0.386]	[0.475]
D (D(LFBCF))) (-1)	-0.068	0.564	0.412	0.001
	(0.119)	(0.298)	(1.331)	(0.135)
	[-0.571]	[1.889]	[0.309]	[0.010]
D (D(LFBCF))) (-2)	-0.001	0.100	0.826	0.007
	(0.129)	(0.324)	(0.126)	(0.147)
	[0.009]	[0.310]	[0.570]	[0.050]
D (D(LFBCF))) (-3)	-0.056	-0.299	-1.230	-0.006
	(0.106)	(0.265)	(1.185)	(0.120)
	[-0.536]	[-1.125]	[-1.038]	[-0.056]
D (D(LFBCF))) (-4)	0.174	0.633	-0.024	0.022
	(0.077)	(0.195)	(0.870)	(0.088)
	[2.243]*	[3.244]	[-0.028]	[0.249]
LPOPA (-1)	**-0.640**	-0.489	-2.418	0.133
	(0.102)	(0.257)	(1.149)	(0.117)
	[-6.225]*	[-1.900]	[-2.104]	[1.143]
LPOPA (-2)	0.186	0.327	0.026	0.047
	(0.200)	(0.502)	(2.242)	(0.228)
	[0.926]	[0.651]	[0.011]	[0.206]
LPOPA (-3)	-0.590	-0.473	-1.169	0.096
	(0.118)	(0.297)	(1.325)	(0.135)
	[-4.972]*	[-1.591]	[-0.882]	[0.715]
LPOPA (-4)	0.042	0.226	0.658	0.100
	(0.198)	(0.497)	(2.219)	(0.226)
	[0.211]	[0.455]	[0.296]	[0.442]
D(TC) (-1)	-0.522	-0.066	2.470	0.568
	(0.265)	(0.663)	(2.959)	(0.301)
	[-1.972]*	[-0.100]	[0.834]	[1.885]
D(TC) (-2)	-0.928	-1.059	-7.526	0.078
	(0.265)	(0.664)	(2.960)	(0.301)
	[-3.500]*	[-1.595]	[-2.541]	[0.260]
D(TC) (-3)	0.733	1.776	-0.005	0.239
	(0.363)	(0.909)	(4.053)	(0.413)
	[1.019]	[1.954]	[-0.001]	[0.579]
D(TC) (-4)	0.089	-0.290	0.914	-0.344
	(0.252)	(0.632)	(2.821)	(0.287)
	[0.353]	[-0.458]	[0.323]	[-1.198]
R-squared	0.921	0.987	0.282	0.732
Adj. R-squared	0.831	0.972	0.10	0.427
Sum sq. resids	0.046	0.293	5.832	0.060
S.E. equation	0.057	0.144	0.645	0.065
F-statistic	10.261	68.377	3.218	5.398
Akaike information criterion	-4.515		Schwarz criterion	-2.370

Source: the author's treatment

From the data in table 1, we conclude that the variable FBCF is stationary in level; the variables TC and LPIB are stationary in first difference and the variable LPOPA stationary in second difference. In the sense of Engle and Granger, there is therefore no possibility that these variables are co-

integrated. This lack of co-integration is confirmed by the Johansen test. In view of these results, the error correction model is no longer compatible. The autoregressive vector model (VAR) is the most appropriate. Thus, the following table presents the number of delays. The number of delays to choose is the one that minimizes the AKAIKE (AIC) and Schwarz (SC) information criteria. However, the variables LPIB and TC will be differentiated from order 1 and LFBCF from order 2 in the equations of the model.

Model validation tests

Global validation of the model

The values of the Fischer statistic are greater than that displayed by the table (4.44) for equations 1, 2 and 4. These results are conjectured by the coefficients of determination R2 greater than 50% for the three equations. For equation (3) which expresses the active population as a function of the other variables of the model, F-statistic read is greater than F-statistic calculated. Likewise, its coefficient of determination (R2 = 28.2%) is less than 50%. This model is therefore not globally significant.

Jarque-Bera normality test According to the results in Appendix 1, the residuals of the model follow a normal distribution. The probability of the Jarque-Bera statistic is 0.928.

Self-correlation error test

The Lagrange Multiplier (LM) test leads to the rejection of the hypothesis of auto-correlation of the residuals of the equation (Prob = 0.886> 0.05) (see appendix 2).

Model stationarity test From the reading of appendix 3, we can conclude that the model is stationary, all the eigenvalues are inside the circle

Interpretation of statistical and econometric results

To better circumscribe the results of the study, more attention was paid to equations 1 and 4 (Eq1 and Eq2) in Table 3. Equation 1 (Eq1), translates the variation of GDP as a function of GDP lagged over 4 years and the other variables of the model over 4 years also. This relationship is globally significant (R2 = 92.1%; F-statistic = 10.26 > 4.44). Equation (Eq1) shows a negative relationship between the GDP growth rate of any year t and these previous values over 4 years. However, it is important to note that this relationship is significant two years later. This result seems to give meaning to Bhagwati's concept of impoverishing growth (1958). Benin’s exports dominated by primary products such as cotton, mahogany, and pineapple would explain this situation. Likewise, these exports with low added value are very little diversified.

The capital factor represented by the variable GFCF in the model has a negative but not significant sign over 3 years. From the 4th year, capital contributes positively and significantly to economic growth. The elasticity of growth of GDP with respect to capital is 0.17. The period of 3 years of negative effect of capital on GDP, can be interpreted as the time necessary for investments to become profitable following a shock. As for the work factor (POPA), it contributes negatively and significantly to the creation of wealth in the 1st and 3rd year, then, positively but, statistically nil at the 5% threshold in the 2nd and 4th year. This relationship could be explained by the import of low-tech goods or by the flight of skilled labor abroad.

The variable degree of openness (TC) has a negative and significant effect at the 5% threshold on the GDP growth rate over two years. This negative contribution would be due to the gradual fall in export values over the period under review. This fall in exports is attributed, at the same time, to the quantity of products, to the fluctuation of the prices of these products and of the exchange rate. The respective elasticities of the degree of openness over the first two years are -0.52 and -0.92. These elasticities are significant at the 5% threshold. Equation 4 is globally significant (R2 = 73.2%; F-statistic = 5.39). Individually, the coefficients of the variables in this equation are statistically zero. The calculated t-statistics are less than 1.959. Nonetheless, the following important conclusions can be drawn from the relationship: • the higher a country has a growth rate, the more it is open to the outside. The opening up to the rest of the world of a country with a high level of growth increases its chance of selling its essentially manufactured products, therefore, with high added value. All other things being equal, for this category of country, trade openness is profitable.

This result is similar to that of UNDP (2014) and CEA (2015); • there is a positive relationship between the work factor and open trade. This relationship would be due to a technological transfer between countries which participate in international trade; • external openness has a positive effect on gross fixed capital formation. This could be explained by the entry of foreign capital.

Analysis of the response function following a shock on the degree of openness

Figure 1 shows a close relationship between the degree of openness and the level of growth. Similar variations in these two variables prove that a shock on one is immediately transmitted to the other. As Benin is an underdeveloped country in which the goods produced are mainly agricultural, fluctuations in its exports in particular would reduce its degree of openness and, in turn, would translate into a fall in growth. All other things being equal, a fluctuation in commodity prices and the exchange rate would change the patterns of imports and exports which, in turn, influence the growth rate.

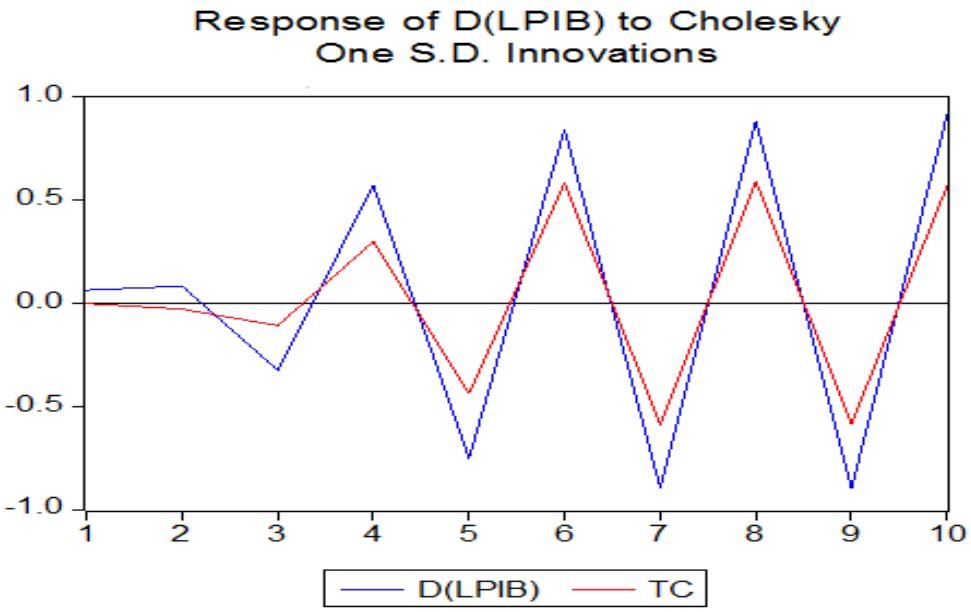


Figure 1(a): Curve of the response functions of the degree of openness and the GDP growth rate

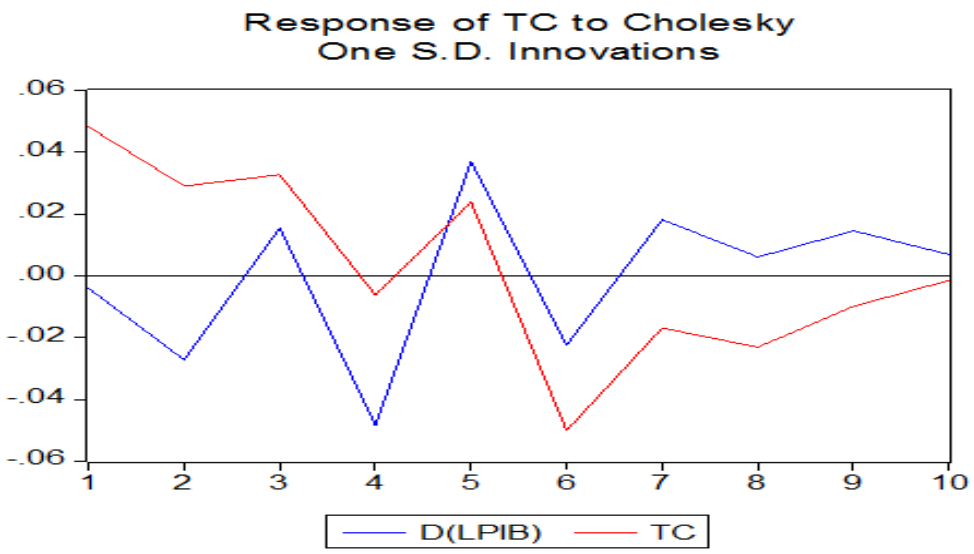


Figure 1(b): Curve of the response functions of the degree of openness and the GDP growth rate
Source: the author's treatment

Decomposition of the variance of the error

The objective of decomposing the variance of the error is to calculate, for each of the variables, its contribution to the variance of the error in percentage. When the variance of an error is large, we deduce that the studied economy is very sensitive to the shocks affecting this series. The variance of the growth rate error is explained on average at 3.17% by the variance of the degree of openness, at 1.18% by the variance of the capital factor, at 72.31% by the variance of the active population and at 23.31 by its own variance.

The negative effect of the degree of openness could be linked to the fall in exports over the period under review, the fluctuation in the price of goods and the exchange rate (all other things being equal). The small but significant effect of the degree of openness on growth is confirmed by the calculation of the residual correlation coefficient which, according to Cariolle (2008), measures the extent of instability. This coefficient between the residuals of GDP and CT is -0.56 (Annex 5). Ceteris paribis, a shock to trade openness would worsen the growth rate by around 56%.

DISCUSSION OF THE RESULTS

The negative relationship between the instability of the degree of openness and the economic growth obtained in this study is consistent with the results obtained by ECA (2015) on Côte d'Ivoire, Gyimah-Brempong (1991) on the countries of the Sub-Saharan Africa, Fosu (1992) on some developing countries including 30 from Sub-Saharan Africa and Oladipo (2017) on Nigeria. For CEA (2015), this relationship is justified by the dominance in Ivorian exports of agricultural goods. This same interpretation of the situation is made by Dodaro (1991), for whom this negative effect of trade opening on growth is due to the export of unprocessed products.

He argued that dependence on primary products has a negative impact on the economic growth of developing countries. Dawe (1996) having reached the same result, pointed out after Dodaro (1991) that this negative impact may have been offset by transfers of funds from outside to these

developing countries. Moran (1983) claimed a zero effect of export instability on long-term growth. However, he argued that in the short term, the negative effects of price and quantity fluctuations increase and negatively impact the GDP growth rate. As for Akilou (2009); Saminirina and Adamson (2013), in the short as in the long term, exports significantly increase the GDP growth rate. Similarly, the results of the work of Mehlum et al. (2006), Snyder (2006), and Brunnschweiler (2008) departed from that obtained in this study. They showed that the effect of commodities on growth is not necessarily negative. For the latter, the negative relationship is due to the quality of the institutions. Thus, subsequent research will strive to establish relationships between institutions, external openness and economic growth.

CONCLUSION AND SUGGESTIONS

Opening up to the rest of the world has been an economic goal of every country for decades. Whether from an economic, financial, cultural and political point of view, openness to the outside world is a source of opportunities and therefore of wealth. However, by contagion, any shock to an instrument of foreign policy can only be passed on to other countries. Thus, the present study which has examined the impact of the instability of trade flows on economic growth in Benin reveals that a shock on the degree of openness is negatively felt by economic growth. Likewise, in this context of shock, gross fixed capital formation contributes significantly to economic growth only from the 4th year and the contribution of the labor factor is negative. In order to protect the national economy from the effects of commercial instability, Benin should further diversify its export products, on the one hand, and ensure the local processing of certain raw materials, on the other.

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ANNEX

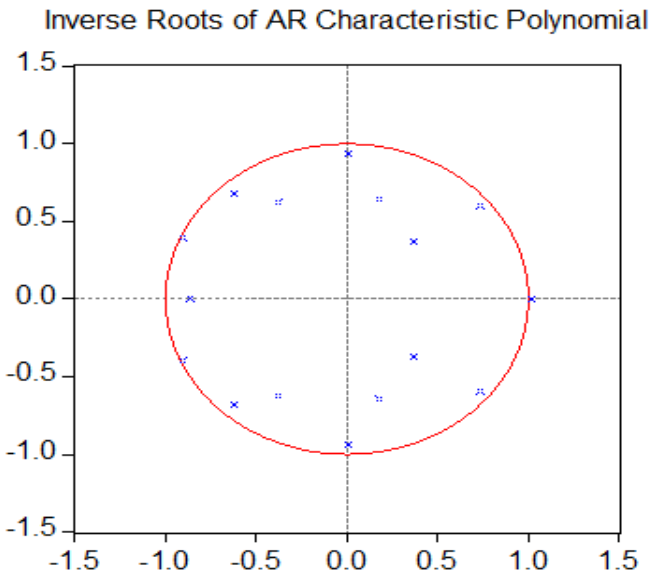
Jarque-Bera normality test

Component	Jarque-Bera	df	Prob.
1	10.372	2	0.056
2	10.274	2	0.059
3	10.316	2	0.058
4	10.166	2	0.062
Joint	41.129	8	0.0604

Auto correlation test

Lags	LM-Stat	Prob.
1	12.514	0.707
2	15.046	0.521
3	18.096	0.318
4	9.609	0.886
5	26.907	0.042

Model stationarity test



Variance Decomposition of D (LPIB)

Period	S.E.	D(LPIB)	D(D(LFBCF))	LPOPA	D(TC)
1	0.057	100	000	000	000
2	0.424	14.32820	7.790	77.511	0.37
3	1.224	23.20	1.331	74.142	1.323
4	2.745	24.516	0.346	72.021	3.115
5	5.152	24.759	0.215	71.315	3.709
6	8.895	24.783	0.147	70.866	4.202
7	14.952	24.640	0.191	71.060	4.107
8	24.907	24.551	0.227	71.220	4.000
9	41.623	24.490	0.251	71.331	3.926
10	69.776	24.482	0.259	71.367	3.891

Calculation of the error correlation coefficient

	D(LPIB)	D(D(LFBCF))	LPOPA	D(TC)
D(LPIB	1	0.373	-0.568	-0.560
D(D(LFBCF))		1	0.029	0.266
LPOPA			1	0.656
D(TC)				1