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Econometric Assessment of Relationship Between Trade Openness and Unemployment in Africa: The Case Study of Democratic Republic of Congo

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Abstract

This study aims to assess relationship between trade openness and unemployment in Democratic Republic of the Congo (DRC) concerning the period from 1991 to 2017. After using Vector Error Correction (VEC) model, the result showed a weak impact of trade openness on unemployment in the long-run. In addition, all explanatories variables: terms of exchange and inflation have each, a weak impact on unemployment. Indeed, results of computer fitting using Augmented Dickey-Fuller (ADF) Test revealed that all variables are stationary. Results have shown also that when trade openness increases about one percent; unemployment increases about 0.46 percent. That is correct for DRC because, expanding of trade openness leads to closing of local firms and by consequence, increases unemployment, but weakly. In addition, once the exchange terms varies about one percent, unemployment decreases about 0.72 percent. It means that, amelioration of exchange terms leads to increasing of purchase power for imported products, but it leads too at increasing of profits on exportations matters. Then enterprises of exportations matters, which constituted the main source of currency recipes for economy, are incited to increase their productions. Moreover, when inflation increases to one percent, unemployment increases at 0, 05 percent. According to the fact that unemployment does not react greatly to shocks of explanatories variables give evidence that government must support and help the firms to increase their capacity of innovation. Moreover, it must help enterprises to escalate as well, their competitiveness in the international concurrence. That will facilitates them to adapt their hiring politics to international competition.

Keywords

Trade Openness, Unemployment, Vector Error Correction

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1. Introduction

While economic internationalization is intensifying, unemployment remains a big macroeconomic problem in Republic Democratic of Congo (DRC). However, economists consider that trade openness tends to promote employment [1-3]. Moreover, several merits of trade openness acknowledged following literature. It brings about the economic growth and that leads to creation of jobs. It causes too, the technology transfer and allows countries to penetrate markets everywhere and to increase their competitiveness [4]. We note that opinion on this question divided. Some findings show that trade

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openness increases unemployment [5-7]. While, others researchers found no impact of trade openness on unemployment [8-9]. Others by versus, found that trade openness reduces unemployment [10-11]. That shows a contradiction between results, which is at the base of several explanations.

Some among reasons in the literature tend to justify these controversies. One of them is the difference between development levels of countries, the bad quality of institutions and business environment, which should play an important intermediary role [12]. Others explain these polemics by the difference between structures of economies [3]. For developed countries, it is explained by the presence of social costs connected to international trade competition by the incapacity of industries to resist in the struggle. In fact, several reasons explain the different results obtained about relationship between trade openness and unemployment. This means that others realities should contribute to understand varied results [13].

In one side, international trade competition cans lead to heavy social costs in a country, when national firms do not be able to resist in the competition. They can lose the part of their market and reduce employment in closing activities or decreasing wages. In the other side, it cans lead to an improvement of competitiveness of local industries or enterprises, which should create employment. Each dimension could arrive in a country depending of its particular characteristics. In DRC, the rate of trade openness passed from 30% in 1991 to 117% in 2017 but the rate of unemployment passed from 4.397% in 1991 to 5.05% in 2017. DRC belongs to numerous under-regional African organizations. This implies that the rate of its trade openness continues to increase and it is very important to assess the relationship between it and other macroeconomics variables, particularly, unemployment. We note that this last is a permanent macroeconomic problem in DRC.

In addition, while international trade is taking a larger role in the economics of each country, it is also important to find out how will trade impact individuals and specifically employment [14]. Thus, this study contributes in the literature on trade openness and unemployment by two ways. Initially, it assesses for first time the relationship between trade openness and unemployment in DRC by using vector error correction (VEC) model. That helped us to know if trade openness is reducing unemployment in DRC like pretends the theory of international trade [13]. The VEC model serves to detect the long-run relationship, which is important in the question of economic development. Then, it gives an explanation on the finding, which aided to understand the particular reasons of the state of relation established for DRC.

The remainder of this study is organized as following: section 1 delivers the small literature review, the section 2 offers data and methodology and at last, the section 3 provides the results and their discussion.

Several studies interested the relationship between trade openness and unemployment. It found that there is no relationship between trade openness and unemployment in Kenya, both in the long term and short term, by using VEC model [15]. The impact of globalization on unemployment in case of Pakistan for the period of 1980-2017 was examined. The using of ARDL co-integration techniques to estimate the relation between variables lead to results, which show that globalization in the shape of trade openness has a significant positive impact on unemployment [16]. It found that trade openness is playing the expected favorable effect on unemployment in the Arab region [17]. However, a finding shows that an increase in trade openness results in lower aggregate and youth unemployment in the region. However, the magnitude of the effect of trade openness on youth unemployment is higher than that of aggregate unemployment [18]. The long-term relationship between trade openness and unemployment in 17 transition economies between years 1998- 2014 was assessed. The using of dynamic heterogeneous panel data analysis methods; leads to results showed that there is a significant relationship between trade openness and the rate of unemployment and that trade openness has a reducing effect on unemployment [19]. However, it found that trade openness worsens unemployment rate both in the short-run and long run [20]. Yousef [21] explored the net effect of trade openness on the Saudi employment by using annual data of 1980-2015 and by using ARDL cointegration technique. He found that trade openness, government spending on education (…) have positive impacts on the employment in long run while mix evidence of these variables are found on employment in the short run with different lag effects.

Adekunle [14] found after using panel data for low-income and high-income countries that trade impacts negatively the unemployment rate. It means that increase in the level of trade brings about decrease in unemployment. Ebaidalla [22] investigated the causes of youth unemployment in SSA during the period 1991–2012. Its study used panel data method for a sample of 30 SSA countries; and it focused on the impact of economic, demographic and institutional factors as well as natural resources. It examined the determinants of youth unemployment for both the aggregate and gendered levels. The empirical results show that GDP growth, trade openness, and (…) have negative and significant effect on total, male and female youth unemployment [14]. Nwaka *et al.,* [7] investigated the empirical relationship between trade policy and

unemployment in Nigeria using vector error correction (VEC) methodology. Their findings revealed that in the long run, increase in real output and income per capita lead to a decline in unemployment, but trade openness policy is associated with an increase in unemployment.

However, unemployment is an indicator of weak income and underdevelopment in the developing countries. That means, openness leads to underdevelopment in Nigeria. Belenkiy *et al*., [23] review the recent theoretical and empirical studies that link international trade flows and trade policies to aggregate unemployment rates. They found that theoretical models demonstrate a complex and often, ambiguous relationship between trade and aggregate unemployment rates. Whether trade increases or reduces unemployment depends in a complicated way on the industry composition of a country's output and on differences in labor market frictions across industries and countries. The empirical studies, on the other hand, offer a story that is simpler and consistent. They generally found that an expansion in international trade reduces a country's aggregate unemployment rate in the long term (*sic*).

Anyanwu *et al.* [24] used empirical estimates and available cross-sectional time series data over the period, 1980 and 2010. His results suggest that a higher level of intra-African trade reduces both the aggregate, female and male youth unemployment in Africa. Felbermayr *et al.* [25] analyzed the panel data from 20 OECD countries and the cross-sectional data on a larger set of countries. Their findings suggest that a 10 percent increase in total trade openness reduces unemployment by about one percentage point. Dutt *at al* [26] found strong evidence for the Ricardian prediction that unemployment and trade openness are negatively related (…). It means that protectionism increases unemployment rates both across countries and within countries over time (*sic*). Yet, Matusz [27] suggest that trade improves productivity in a country and reduces the unemployment rate.

In literature, we identify a gap with three aspects. Firstly, there is not an analysis on this question especially for DRC, yet it is a history-opened country to international trade. Secondly, scarce studies used the VEC model to analyze the relationship between trade openness and unemployment. Thirdly, there is not an explanation about a relationship for DRC. That is why this study has vocation to fill this gap and propose the solution for unemployment according trade openness.

2. Data analysis and Methodology

The time series data of this study from World Bank and Central bank of Congo; concerning the period from 1991 to 2017 in DRC. These data are formulated in constant dollars of 2011. In fact, it permitted the comparison through years because inflation and deflation impacts are pruned. DRC was chosen because of the lack of data on the nexus between trade openness and unemployment until now. However, unemployment is a permanent and big macroeconomic problem in there. We used the unit root and Johansen tests; respectively to identify, if the variables are stationary and to detect the relation of long term between them. The VEC model is employed to assess the long run relationship between trade openness and unemployment. E-views 9 analysis software package was used to examine data.

Unemployment is the dependent variable and the main explanatory variable is the trade openness. The others following variables are for to control the effect of trade openness on unemployment. It is about exchange terms and inflation. Sure enough, the variation of terms of exchange should perhaps, impact on unemployment in DRC. For, if the prices of exportations matters decrease, economy must increase the volume of their production to maintain the recipes in foreign currency. That reality compels firms to hire and then, unemployment decrease; all things being equal by elsewhere. In addition, since 1958, Phillips found a relationship between inflation and unemployment. Two years after, Samuelson and Solow confirmed this negative correlation following that, when unemployment is weak; inflation is strong and vice versa, Blanchard *et al* [28]. That is why in this study, inflation and exchange terms served to control the impact of trade openness on unemployment.

For become, the general VAR model condensed form is as below:

$$X_t=\alpha_0+\beta_1\sum^{k}_{t=1}x_{t=j}+\varepsilon_t$$

and the VEC model becomes:

$$\Delta Xt=Ao+\Phi Xt\text{-}1+\sum^{k}_{t=1}\Gamma_{j\Delta}X_{t\text{-}j}$$

We expressed the econometrical existing relationship between trade openness and unemployment including control explanatories variables as below:

$$UR_t=\alpha_0+\beta_1TOR_t+\beta_2ET_t+\beta_3InflR_t+\varepsilon_t;$$

resulting from that, the linear form must be written:

$$LUR_t=LTOR_t+LET_t+LInflR_t+\varepsilon_t;$$

where, UR denotes unemployment rate, TOR symbolizes trade openness rate, ET indicates the exchange terms and InfR stand for inflation rate.

3. Results and Discussion

The table 1 gives the results of computer fitting using Augmented Dickey-Fuller (ADF) Test, and revealed that all variables are stationary.

Table 1. Condensed of unit test results.

Variables	ADF test at first difference	Integration order	Stationnarisation
LUR	Stationary	I (0)	Stationary at first difference
LTOR	Stationary	I (0)	Stationary at first difference
LET	Stationary	I (0)	Stationary at first difference
Linfl	Stationary	I (0)	Stationary at first difference

To identify a long-run relationship, Johansen test indicates one cointegration normalized between variables as presented in the table 2.

Table 2. Output of Johansen test.

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
LUR	LET	LTOR	LINFLR	
-11.88704	-2.487657	-0.738750	-0.731280	
15.10909	-4.148568	2.598131	0.262932	
16.05001	8.055696	-6.699190	-0.835755	
7.026026	8.539032	-3.560088	-0.513242	
Unrestricted Adjustment Coefficients (alpha):				
D (LUR)	0.000228	-0.005661	0.001626	-0.000137
D (LET)	0.006974	0.013745	0.012328	-0.006291
D (LTOR)	0.002013	0.011541	0.022377	0.004952
D (LINFLR)	0.244363	-0.005179	-0.035906	0.008368
1 Cointegrating Equation (s): Log likelihood 427.9901				
Normalized cointegrating coefficients (standard error in parentheses)				
LUR	LET	LTOR	LINFLR	
1.000000	0.209275	0.062148	0.061519	
	(0.24997)	(0.16465)	(0.02771)	

Following this Johansen test result, we established the long run relationship by using vector error correction, which brings the result below:

Table 3. Output of Vector Error Correction estimation.

Cointegrating Eq:	CointEq1
LUR (-1)	1.000000
LTOR (-1)	-0.462304
	(0.08229)
	[-5.61794]
LET (-1)	0.728594
	(0.13487)
	[5.40233]
LINFLR (-1)	-0.057891
	(0.01476)
	[-3.92315]
C	-5.098953

$$LUR = 5.098 + 0.46\,LTOR + 0.05\,LINFLR - 0.72\,LET$$

Following that when trade openness increases about one percent; unemployment increases about 0.46 percent. That is correct for DRC because, expanding of trade openness leads to closing of local firms and by consequence, increases unemployment, but weakly. In addition, once the exchange terms varies about one percent, unemployment decreases about 0.72 percent. It means that, amelioration of exchange terms leads to increasing of purchase power for imported products, but it leads too at increasing of profits on exportations matters. Then enterprises of exportations matters, which constituted the main source of currency recipes for economy, are incited to increase their productions. By corollary, they hire and unemployment decreases. Moreover, when inflation increases to one percent, unemployment increases at 0,05 percent. In fact, when inflation rises, local firms should not resist to the situation and prefer to stop activities by dismissing labor force, which increases unemployment in a weak proportion. For all these interpretations, all things being equal by elsewhere. For to support this evidence, we look for to detect the impulse responses of unemployment from explanatories shocks that results follow:

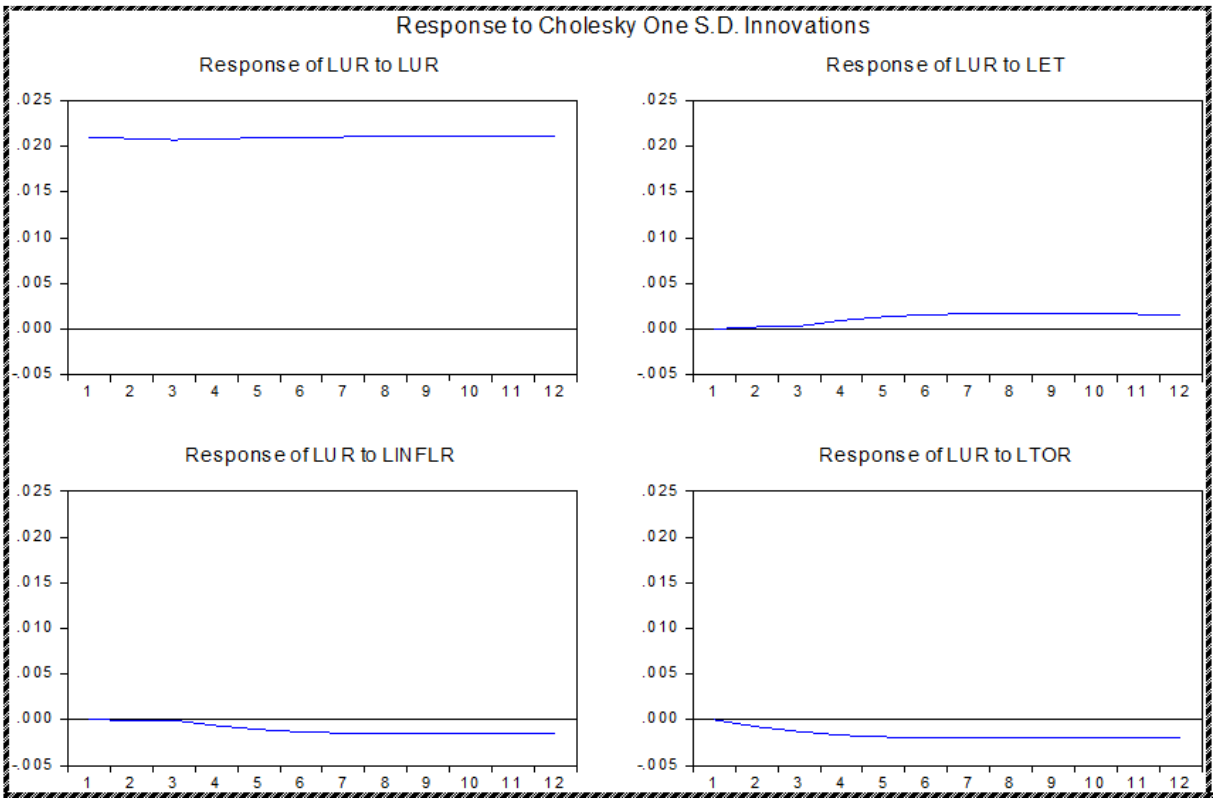

Figure 1. Impulse response functions for Democratic Republic of the Congo.

Subsequent this result, the unemployment does not react greatly to shocks of explanatories variables. It means only that these variables have a weak impact on unemployment and confirm the previous VEC assessment.

When competition theory stipulated that development process must be led by big organizations, it means that these have responsibility to apply some economic politics to decrease unemployment, which is among indicators of poverty in developing countries in general and DRC in particular. Generally, these big organizations (World Bank, Monetary International Funds and World organization of trade) impose to developing countries, to widen trade openness and practise budget austerity. Here, respectively, the first only interested us. Following these big organizations, it leads to economic growth and this last conducts to decrease unemployment. However, the macroeconomic politics of IFI created the dangerous social problem, particularly the unemployment and by consequence, the bad social condition. If elsewhere, trade openness leads to decrease unemployment and to improve the social condition, it is not the same reality everywhere. Sure enough, reducing unemployment passes by firms. If these last, have a necessary competitiveness to resist face to international concurrence; or if they are able to adapt their politics to environment changes. On the contrary, all macroeconomic politics can fall to diminish unemployment.

In DRC, we experiment the sporadic firms without a necessary competitiveness. That cans explain why trade openness falls to lessen unemployment in DRC. It means that capacity of trade openness to decrease unemployment in a country depends of density or number of firms and their capacity to innovate. Moreover, they must adapt their hiring politics to environment changes, which permits to maintain employment in the country.

At last, the sporadicalness of firms in DRC must be explained. Sure enough, some enterprises closed because they should not resist to the international competition. Others fall in bankrupt after zaïrianisation. Besides, the local capacity of creation firms is weak and the business environment is bad, which characterized by political crisis, war repetition, weak grant of credit, bad infrastructure and so one.

The result of the present study approaches that of Getuma [15] for his survey in Kenya; using VEC model like us. However, it does not corroborate the evidence of Ali *et al* [16] found at Pakistan; because he discovered a significant positive impact of trade openness on unemployment. We must point out the difference between methodologies and particularities of these economies. It is the same thing for Awad-Warrad [17], who obtained a positive impact on unemployment in Arab countries and the similar for Kılıç *et al* [19] with a reducing effect on unemployment. Following this result, an increasing of trade openness about one percent,

increases too unemployment at 0.46 percent. That contradicts the evidence of Felbermayr *et al* [25]*;* they found that 10 percent increase in total trade openness reduces unemployment by about one percentage point. It is necessary to underline the difference in used models and regions concerned by these studies.

It corroborates the result of Nwaka *el al.,* [7] in Nigeria. They used VEC like us and obtained that trade openness intensifying incites as well, the increasing of unemployment. We can point out the using the alike model to explain this corroboration. It is the identical result for Isiaka [20] always for Nigeria although; he used ARDL techniques estimation.

4. Conclusion and Suggestions

The aim of this study was to assess the nexus between trade openness and unemployment, which is a permanent macroeconomic problem in DRC. Following using VEC model, the evidence showed a weak and positive impact of trade openness on unemployment. In addition, inflation is in positive association with unemployment. Sure enough, when trade openness increases firms have tendency to close or diminish their activities. By consequence, that increases unemployment. For that, the weak competitiveness of enterprises in international concurrence and their difficulties to adapt their hiring politics to international environment changes, explain this reality. This result involves that government must support and help the firms to increase their capacity of innovation. In addition, it must help enterprises to escalate as well, their competitiveness in the international concurrence. Next, we are going to look for answer the question following that, why firms in DRC have not a high competitiveness.

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