

The impact of trade openness on the unemployment: case of Algeria**تأثير الانفتاح التجاري على البطالة : حالة الجزائر****Dib Lamia**

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Received: 18/12/2022**Accepted:** 30/03/2023**Published:** 31/03/2023**Abstract:**

The main objective of this research paper is to empirically evaluate the theoretical relationship between unemployment and some macroeconomic determinants including among others trade openness and gross domestic product per capita in the short and long run in Algeria. The main question of this study is to know what's the impact of trade openness on unemployment, An ARDL model was used over the period 1990-2018 and this was done using a program called EVIEWS 9.0. The empirical results of this study reveal that trade openness have negatively and statistically significant effect on unemployment and GDPper capita affects unemployment negatively and statistically significant, according to the chosen variables as well as the period and the model.

Keywords: unemployment; trade openness; economic growth; ARDL model; Algeria.

JEL Classification Codes: F20, F2, C3.

ملخص:

الهدف الرئيسي من هذه الدراسة هو البحث في العلاقة النظرية بين البطالة وبعض محددات الاقتصاد الكلي بما في ذلك الانفتاح التجاري ونصيب الفرد من الناتج المحلي الإجمالي على المدى القصير والطويل في الجزائر. السؤال الرئيسي هو معرفة مدى تأثير الانفتاح التجاري على البطالة، استخدمت الدراسة نموذج ARDL خلال الفترة الزمنية 1990-2018، وتم ذلك باستخدام برنامج يسمى EVIEWS 9.0. قدرت نتائج الدراسة التجريبية أن الانفتاح التجاري له تأثير سلبي ودلالة إحصائية على البطالة و نصيب الفرد من الناتج المحلي الإجمالي له دلالة إحصائية واثار سلبي على البطالة ،حسب المتغيرات المختارة، كذلك المدة والنموذج.

الكلمات المفتاحية: البطالة، الانفتاح التجاري، النمو الاقتصادي، نموذج ARDL ، الجزائر

تصنيفات JEL: F20، F2، C3.

INTRODUCTION:

In the wake of the global financial crisis, rising unemployment rates (UNRs), on one hand, and greater openness to trade by developing countries, on the other hand, have often been subjected to a high level of scrutiny through research. Some major consequences of the financial crisis, especially in the US, are observed through the considerable negative impacts on business activities, financial markets, household consumption and uncertainty about the future. In particular, the spillover effects of the crisis on the economies of developing countries cannot be overemphasised. (Herzer, 2012, pp. 396-414) Have argued that the spillover effects in developing countries were transmitted through a drastic fall in the demand for exports and a decline in the inflow of foreign capital and investment. Hence, given the peculiarities of such a crisis, its further impact is reflected in a drop in the productivity of labour, employment generation and overall economic performance (Marelli, Choudhry, & Signorelli, 2013, pp. 63-86). Moreover, considering the volume of world trade and greater openness in developing regions, studies of the labour market have sought to explain the growth trend in unemployment statistics. A question under consideration has been 'Does opening up to international trade create or destroy jobs ?' (Davidson & Matusz, 2004, pp. 1-56).

Algeria and the rest of the countries in the world, with the exception of certain countries in south-east Asia, have been facing a crisis since the mid-1970s, one of the main consequences of which is the rise in unemployment., the causes are complex, difficult to define and, even more, to control, and the most knowledgeable economists are far from agreeing on the diagnosis and the treatment to be proposed.

Unemployment began to manifest itself in a marked way in Algeria from 1986 following the economic crisis engendered by the collapse of the price of oil, which engaged the country in important economic, financial and budgetary reforms without however modifying the regulation the credit market or the labor market (Adair & Bellache, 2009, pp. 1765-1783).

These measures led to an imbalance in the labor market and triggered Algeria's transition from a relatively low level of unemployment (8.7% in 1984) during the socialist regime (1962-1985) to endemic unemployment which particularly affected the juvenile population. Driven by the redistribution of the oil rent, a whole series of reforms has appeared since 1989 aimed at promoting the employment of young job seekers with the financial support of the public authorities.

The growth in trade has generated economic expansion, but can also be accompanied by an increase in long-term unemployment depending on the sectors of activity that are developing, according to the UNIGE economists

These Keynesian-inspired orientations, based on the redistribution of state revenues in favor of the most disadvantaged social classes, can be classified into "three generations of devices"

The first generation covering the period from 1989 to 1997 and born following the revolts of October 1988, came to mitigate the negative effects of the PAS on the labor market which ended in massive job cuts in the economic public sector and by a fall in household purchasing power. Period which led to the creation, from 1994, of the National Unemployment Insurance Fund (NUIF), the Social Development Agency (SDA) and the National Youth Employment Support Agency (NYESA). These institutions then help to produce the first effects on the labor market.

The second generation covers the period from 1998 to 2007 and will give birth to the National Employment Agency (ANEM) (Adair & Bellache, 2018, pp. 1765-1783), the National Microcredit Management Agency (ANGEM) in addition to the ADS, as well as a set of sector programs.

Finally, the third generation still in progress started in 2008 and was characterized by the drafts of a National Employment Policy and the Fight against Unemployment.

Following on from previous policies, new measures were taken after the events of January 2011; labor market policies have been strengthened, waiting jobs revised and the informal sector targeted. The unemployment rate in May 2019 was 11.4% against 11.7% in September 2018, according to official figures published by the National Statistics Office (ONS) (Office National des Statistique, 1990-2018). However, the employment policies and programs undertaken so far have not slowed down the trend of increasing unemployment, nor reduced the extent of exclusion from the world of work, including young people, women and men, are the subject. On the other hand, the share of young people aged 15 to 24 seems to decrease in the long term (15% in 2030 and 13.5% in 2045) while it stands at 29.6% in 2019 (Office National des Statistiques, Activité emploi et chômage, 2019). (Jean & Nicoletti, 2002, p. 33) and (Nicoletti & Scarpetta, 2005, pp. 1-50) find that product market reforms improve labor market performance.

Research problem

Based on the above, the following problem has been formulated :

Do trade openness have a positive significant effect on unemployment in Algeria over the period 1990-2018 ?

Research Hypotheses :

In the light of the problem, the following hypothesis was put forward:

- Trade openness have a positive effect on unemployment in Algeria according to the chosen variables as well as the period and the model.
- Trade openness have a negative effect on unemployment in Algeria according to the chosen variables as well as the period and the model.

Research Objectives :

Through this research paper, we seek to achieve a set of goals summarized below :

- To contribute to the general body of economic literature on both trade openness and unemployment ;
- To investigate into significant relationship between variables in Algeria ;
- know the important role as well as the effect of trade openness has on unemployment.

Research structure

The study covers both theoretical and practical sides. The first one, cites some studies of trade openness and unemployment. The second exposes the empirical methodology and data description by the use of the model ARDL over the time period 1990-2018 and this is done using a program called EVIEWS 9.0. The third interprets the economic results to draw conclusion.

1. Revue of literature :

When countries trade, demand for goods and therefore total output can increase. This increase can be associated with an increase in jobs. If more jobs are created, the demand for labour can increase while labour supply stays constant.

(Valadkhani, 2003, pp. 21-33) stated, a measure of output gap is included in the equation, where unemployment is specified as a function of the gap between actual and potential output. It is expected that if actual output become less than the potential output, unemployment should increase and this means The coefficient of output gap is expected to be positive indicating that an increase in this variable $> 2 \alpha$ that 0. results in higher unemployment.

(Kingdon & Knight, 2004, pp. 198-222) studied the unemployment in South Africa using the probit model. The study was conducted using two national household surveys for the mid-1990s. The results indicate that unemployment in South Africa is determined by among others, race, education, age, gender, home ownership, location.

(Feldmann, 2009, pp. 76-90), examined the effects of labor regulation on unemployment (from 2000 to 2003) all over the world by using data on 73 countries. The estimated results ascertained that there was a positive relationship between severe regulations and unemployment. Furthermore, there was a positive relationship between female unemployment and increased centralized bargaining. The author mentioned that the effects of labor regulation were more significant among young individuals. However, there was no significant effect of minimum wages policy on unemployment.

(Feenstra, 2010, pp. 1-28) for example, describes and discusses the development of the wages of “non production” relative to “production” workers in US manufacturing from 1958 to 2006. If we interpret this ratio as the relative wage rate of high-skilled to low-skilled labour, the data clearly shows that the relative wages of unskilled labour fell considerably and constantly from 1986 to 2000. This observation has been the basis for the expanding literature on trade and the wage gap in the USA that also sparked our research interest with its focus on Switzerland.

(Eita & Ashipala, 2010, pp. 1-13), Their study investigates the causes of unemployment in Namibia for the period 1971 to 2007. The analysis is carried out through an extensive review of the relevant literature, microeconomic and macroeconomic models of unemployment. The unemployment model (with macroeconomic variables) is estimated using the Engle-Granger two-step econometric procedure. The results revealed that there is a negative relationship between unemployment and inflation in Namibia. Unemployment responds positively if actual output is below potential output, and if wages increase. An increase in investment causes unemployment to decrease significantly. The results provide evidence that the Phillips curve holds for Namibia and unemployment can be reduced by increasing aggregate demand. It is important to increase output up to the country’s potential, and there is a need for wage flexibility (workers need to reduce their wage demands) in order to decrease unemployment in Namibia. Increasing investment will reduce unemployment significantly.

The relationship between trade openness and unemployment has previously been examined. The theoretical paper of (Helpman, Itskhoki, & Redding, 2010, pp. 1239-1283) demonstrates that opening an economy to trade leads to ambiguous effects with respect to unemployment. In their paper they construct a model where unemployment is caused by the tightness of the labour market and the hiring rate. The tightness of the labour market refers to the fraction of workers looking for work that are matched with a firm and the hiring rate refers to the fraction of the matched workers that are hired. This model illustrates that opening up to trade keeps the tightness of the labour market constant or decreases it, which leads to a similar or lower

rate of unemployment. Oppositely, opening up to trade decreases the hiring rate, which increases the unemployment rate.

(Felbermayr, Prat, & Schmerer, 2011, pp. 741-758) have studied the impact of trade openness on unemployment. They have done this by using cross-sectional and panel data from 20 OECD countries with five-year averages variables over the period 1983-2003, and found remarkably small but significant, negative effects. Felbermayr et al. (2011) used two-staged least squared (2SLS) regressions for the cross-country analysis and general methods of moments (GMM) approach for the panel analysis.

(Hasan, Mitra, Ranjan, & Ahsan, 2012, pp. 269-280) studied the relationship between unemployment and trade liberalisation in India. In this study they focused on industry-level and state-level analyses by using labour force survey data and have found a significant, negative relationship. Data from 15 states for 1987-1988, 1993-1994, 1999-2000 and 2004-2005 have been used to run ordinary OLS and 2SLS regressions

(Gozgor, 2013, pp. 1018-1037) examined the impacts of four different measures of trade openness and globalization on the unemployment rate in the G7 countries: Canada, France, Germany, Italy, Japan, the United Kingdom (UK), and the United States (US). The results of estimation found evidences that, along with macroeconomic indicators and market size, all the measures of trade openness and globalization are significantly and negatively associated with the unemployment rate.

(Maqbool, Mahmood, Sattar, & Bhalli, 2011, pp. 191-208), This study analyzed the determinants of unemployment in Pakistan over a period of 1976-2012 by examining the empirical relationship among the unemployment, population, foreign direct investment, gross domestic product, inflation, and external debt. It is hypothesized that these factors exert a strong impact on unemployment rate in the economy of Pakistan. Autoregressive Distributed Lag (ARDL) approach has been applied to test determinants of unemployment. Empirical results revealed that gross domestic product, population, inflation, and foreign direct investment are significant determinants of unemployment in Pakistan in short-run as well as long-run. The CUSUM and CUSUMSQ are showing that the model is structurally stable within the 5% of critical bounds. The Phillips curve exists in Pakistan both in short-and long-run.

The study of (Trimurti & Komalasari, 2014, pp. 5-9) investigated the economic growth, inflation, minimum wage and unemployment data for seven province in Indonesia between the years of 2004 to 2012. Regression Analysis with SPSS 18 to examining the empirical relationship among the economic growth, inflation, minimum wage and unemployment. The results of the study revealed that while the economic growth and unemployment variables have insignificant effects on the unemployment, the inflation and unemployment variables have positive and significant effects on unemployment, the minimum wage and unemployment variables have insignificant effects on unemployment.

Recent trade models, which introduce some labour market frictions, as used by (Brecher & Chen, 2010, pp. 990-1000), (Davis & Harrigan, 2011, pp. 26-36), (Helpman & Itskhoki, 2010, pp. 1100-1137), (Larch & Wolfgang Lechthaler, 2011, pp. 838-858), (Mitra & Ranjan, 2010, pp. 219-229), imply that relative unemployment between different types of labour may be affected by trade liberalization in a variety of ways. Moreover, these models come to the

conclusion that international trade may also affect the overall unemployment level in an economy positively or negatively. In empirical analyses, a negative effect of trade on overall unemployment is found by (Felbermayr , Prat, & Schmerer, 2011, pp. 741-758) and by (Gozgor, 2014, pp. 1018-1037) in cross-country analyses, by (Francis & Zheng, 2011, pp. 1657-1671) for NAFTA. In a cross-country analysis and for Germany show that in the case of inflexible factor prices an increase in the relative unemployment rate between skilled and unskilled labour can to some extent be linked to trade which the former call an “inequality-unemployment trade-off”.

(Nassar & Biltagy, 2017, pp. 1-10) The purpose of their article was to study the poverty, employment, investment, and education relationships in Egypt. The article presented a macro-level analysis and concentrates on promoting economic growth from below and restructuring economic activities in favor of deprived regions. The study started with a general overview of poverty in Egypt that establishes the beginning for the macro exploration so as to recommend macro policies for fighting poverty. The results ascertained that the decrease in the earnings of individuals can describe the correlation between poverty and employment. Economic growth is believed to be the principal motivation for job creation and extension of social programs that aim at overcoming poverty.

(Warrad, 2018, pp. 179-183), The objective of the research paper was to empirically evaluate the theoretical relationship between unemployment and some key macroeconomic determinants including among others trade openness policy and real economic growth for Arab countries. The main question of the study was whether achieving economic growth and liberalizing international trade contribute to creating more jobs and hence resulting in less unemployment. The study utilized a cross time series sample covering the period 1990-2015 for seven selected Arab countries. The study estimated the unemployment model using panel WLS. The study provided evidence of large and significant impact of trade openness on unemployment rates in the selected Arab countries when taken as one pooled group. On the other hand, as expected real economic growth affected favorably unemployment rates in this group of countries.

(Mohler, Weder, & Wyss , 2018) The topic of the paper has been motivated by the rising unemployment rate of low-skilled relative to high-skilled labour in Switzerland. Between 1991 and 2014, Switzerland experienced the highest relative increase in the low-skilled unemployment rate among all OECD countries. A natural culprit for this development is “globalization” as indicated by some mass layoffs in Switzerland and as commonly voiced in public debates all over the world. The analysis, which was based on panel data covering the years 1991 to 2008 and approximately 33,000 individuals employed in the Swiss manufacturing sector, did not, however, confirm this presumption. There is no strong evidence for a positive relationship between import competition and (low-skilled) individuals’ likelihood of becoming unemployed.

2. Empirical methodology and data description

The study aims to examine the relationship between trade openness and unemployment in Algeria in the short and long run based on the model ARDL over the time period 1990-2018 and this is done using a program called EVIEWS 9.0.

In order to try to provide an answer to our objective, we wanted to issue two hypotheses, which will be subject to econometric verification.

H₀: Trade openness have a positive effect on unemployment in Algeria according to the chosen variables as well as the period and the model.

H₁: Trade openness have a negative effect on unemployment in Algeria according to the chosen variables as well as the period and the model.

The variables that were retained for our empirical analysis are:

• **UN**: Unemployment is the dependent variable which represented the growth of unemployment.

Unemployment refers to the share of the labor force that is unemployed but available for and looking for work. Definitions of the labor force and unemployment differ by country.

• **OPEN**: Trade openness is the rate of trade openness; it is calculated by the sum of exports and imports of goods and services measured as a share of gross domestic product

• **GDP per capita (annual %)**: Gross domestic product per capita is an economic indicator that compares the levels of wealth created by different countries, because it calculates the ratio between the value of a country's final output and its population over a defined period.

A simple model is used to examine the variations in unemployment rate in Algeria, there are number of factors which influence the unemployment rate.

The functional form of the model is as:

$$UN = f(OPEN, GDP)$$

The function can also be represented in a linear econometric format thus:

$$UN = \alpha_0 + \alpha_1 OPEN + \alpha_2 GDP + \varepsilon_t$$

Where:

α_0 : The constant term

α_1, α_2 : are the estimation coefficient to be estimated

ε_t : is the error term

Data sources

The data sources used for the study are World Development Indicators (WDI) published by the World Bank and United Nations Conference on Trade and Development (UNCTAD). The time span to be covered in the study is 1990-2018.

3. Empirical results

Economic interpretation of the results

3.1: ADF and PP stationary test:

(Dickey & Fuller, 1979, pp. 427-431), (Phillips , 1987, pp. 277-301) suggested stationary methods: the primary difference for non-stationary series of the DS type (Differencing Stationnary) or the deviation from the trend for non-stationary series of the TS type (trend Stationary).

Table n°1 shows the order of the integration of the variables. We have applied unit root test to examine the order of integration.

Table (1): Unit root Analysis

Variables	ADF		PP	
	Level	First difference	Level	First difference
UNEM	-0.511 (0.8746)	-3.790*** (0.0081)	-0.778 (0.8098)	-3.790*** (0.0081)
OPEN	-0.707 (0.8290)	-4.578*** (0.0012)	-0.756 (0.8159)	-4.565*** (0.0012)
GDP	-3.275** (0.0260)	-8.508*** (0.0000)	-3.193** (0.0311)	-9.905*** (0.0000)

*, ** and *** indicate the significance at 1%, 5% and 10% levels respectively
Values in parentheses are probabilities

Source: Author's estimate of results using E Views 9.0

The test results in Table n°1 shows that only GDP is stationary at the level but OPEN and UN are stationary at the first difference. We reject H_1 for OPEN and UNEM in the first difference.

3.2: Co-integration test:

In the next step, we examine whether a long and short run relationships exist among our variables using ARDL approach. To analyze the co-integration of variable it is necessary apply the information selection criterion for determine the number of optimal lag existing in our model based on the value of Akaike information criterion (AIC).

The results are represented in the table n°2.

Table (2): VAR Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-142.2689	NA	9.460547	10.76066	10.90464	10.80347
1	-82.67168	101.5360*	0.224400	7.012717	7.588645*	7.183970*
2	-72.14286	15.59825	0.206422*	6.899471*	7.907345	7.199165
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Author's estimate of results using E Views 9.0

According to the results obtained in table 2 from the AIC information criteria the number of lag that minimize the criteria AIC is 2 lag.

3.3: Bound testing for cointegration:

To test the long run effect of trade openness on unemployment in Algeria we use Pesaran's (Pesaran et al., 2001) Bounds test. The ARDL bounds test can be performed by using the F-statistics or Wald test to check the significance of the lagged coefficient of variables. Table n°3 summarizes bound test results:

Table (3): Bound testing for cointegration

Test Statistic	Value	K
F-statistic	7.064168	2
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Source: Author's estimate of results using EViews 9.0

The Wald test of joint significance is performed and the calculated F-statistics value is compared with both the upper and lower bounds critical values by Pesaran et al. (2001) at (1%, 5%, 10%) significance level. In our estimation we find that there is a long-run relationship between the variables because F-statistics value (7.06) is more than both the upper and lower bounds critical value at 1%,

2.5%, 5% and 10% level of significance. This suggests that UNEM, GDP and OPEN are co-integrated in the long-run and are moving together.

3.4: Estimated Long-Run Coefficients for selected ARDL model

Table 4 shows the results of long-run coefficients under ARDL method. After finding the existence of co-integration among the variables, we further estimate the long run effects of trade openness, GDP on unemployment.

Table (4): Estimated Long-Run Coefficients for selected ARDL model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPG	-0.194675	0.571746	-0.340492	0.7370
OPEN	-10.335124	0.816267	-12.661454	0.0000
C	124.578842	8.256705	15.088202	0.0000

Source: Author's estimate of results using E Views 9.0

Results reveal that, in the long run, the coefficient of trade openness to be negative and statistically significant. The OPN increase of 1% leads to a decrease in unemployment growth of 10%. This result is explained by the fact that the trade openness leads to the creation of businesses which leads to job creation which leads to decrease in unemployment.

The coefficient of GDP also has a negative and statistically significant impact, thus the increase of GDP of 1% leads to a decrease in unemployment growth of 19%. According to economic theory Gross domestic product is negatively related to unemployment which is logical as rise in GDP will lead to decrease in unemployment.

3.5: Error Correction Representation for the selected ARDL Model

We examine the short-term relationship between model variables using the error correction model includes short-term dynamics with long-run equilibrium

Table (5): Error Correction Representation for the selected ARDL Model

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CHOMA(-1))	0.290526	0.107383	2.705497	0.0136
D(GDPG)	0.381406	0.116070	3.285994	0.0037
D(OPEN)	-2.903099	1.471212	-1.973271	0.0624
CointEq(-1)	-0.476924	0.083664	-5.700454	0.0000

Source: Author's estimate of results using E Views 9.0

According to the results of the table 5, the coefficient of the ECM is (-0.47), which is

negative and statistically significant (prob= 0.0000) this means that any deviation from the long-run equilibrium between variables is corrected in the short run. This result gives validity of our model, our variables have also short run equilibrium relationship.

Conclusion:

The research area of the study is to investigate the impact of trade openness on unemployment in Algeria over the period from 1990-2018, the empirical analysis has used ARDL approach to test the short-term and long-term relationship between the model variables. For this reason, the basic hypothesis is as follows: "there is a statistically significant positive relation between Openness trade and unemployment.

Empirical results from the study can be summarized as follows: firstly, trade openness have negatively and statistically significant effect on unemployment, in the long run, the coefficient of trade openness to be negative and statistically significant. This result is explained by the fact that the trade openness leads to the creation of businesses which leads to job creation which leads to decrease in unemployment. Secondly, GDP affects unemployment negatively and statistically significant, this can be justified by the fact that the increase in gross domestic product is accompanied by economic programs that generate new employment opportunities, to absorb the growing workforce, whether by the government sector or the private sector. According to these results we accept the null hypothesis and we reject hypothesis 1.

Although unemployment is a phenomenon known to all the countries of the world at different levels of economic development, the latter has characteristics, causes and specific consequences in Algeria. Unemployment strongly influences the Algerian economy. it is responsible for a fall in consumption which generates logically a drop in production, an increase expenditure rates which actually represent expenses, which leads increase the economic difficulties of the State which must more often go into debt.

Recommendations

- Encouraging the creation of businesses by young people
- The need to work to increase investments by creating a safe and stable environment to attract more capital for the establishment of productive projects capable of creating real job opportunities.
- A quality education and reassessment of higher education policies to align higher education outcomes with labor market requirements to reduce unemployment .
- Adapted training
- Promoting learning
- The favor of jobs of the future

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