



Available Online at eSci Journals
Journal of Business and Finance

ISSN: 2305-1825 (Online), 2308-7714 (Print)
<http://www.escijournals.net/JBF>



THE REPERCUSSIONS OF THE 2008 FINANCIAL CRISIS ON THE LABOUR MARKET IN TUNISIA

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ABSTRACT

This paper aims at studying macro aspect of the virulent impact of the 2008 financial crisis on the Tunisian economy during the 1970 – 2010 period using the Autoregressive Distributed Lag (ARDL). Our results prove that the crisis has a significant and negative effect on the real GDP per capita. They also show that the labour market was affected through two different transmission channels namely: the exports and the Foreign Direct Investments (FDI). We discovered that the FDI had a long run significant and positive impact on the real GDP per capita but at a weak coefficient. Similarly, we found that there was a bidirectional relationship between the real GDP per capita on the one hand, and the exports, the FDI and the unemployment rate respectively, on the other, which promoted the spread of the crisis in Tunisia.

Keywords: Global financial crisis, economic growth, labour market, ARDL, Tunisia.

INTRODUCTION

The financial and economic crisis of 2008 and 2009 has taken its toll on the world economy. It has caused the world economy to plunge in the most profound recession since World War II (FMI, 2009). After a period of relative growth from 2003 to 2007, the world economy plunged in a deep recession in 2008 and declined sharply in 2009. Consequently, the developing countries have witnessed important economic difficulties. The decline in production was accompanied by a drop in the employment growth and an increase in the unemployment rate.

Because of their high degree of openness and commercial integration with the developed countries, the contagion has quickly affected the developing countries (Downes, 2009).

The effect of the financial crisis spread through two different transmission channels: the commercial flows and the capital flows. The main effects in the developing countries manifested through the decline of the exports of goods and services, of the foreign direct investment and the limited access to the international

credit and remittances (Allen & Giovannetti, 2011). This type of exterior effects could affect the fiscal accounts, the labour market, poverty and other macroeconomic and socio economic variables.

The Tunisian commercial openness has led to a recession that has deeply influenced the general volume of its commerce. According to the International Monetary Fund (IMF) report 2010 “at the end of 2008 and beginning of 2009 there was a sharp decline in the exports of industrialised goods. This is due to the current economic recession in the European Union. The main result was the drop of the industrial production and the decline of the real GDP growth from about 4.6% in 2008 to 1.3% in the first trimester of 2009”. The Tunisian economy depended heavily on the EU particularly the exports, tourism revenues, the remittances and the FDI. More than the three quarters – about 90% - of the total revenues of Tunisia came from the EU in 2008.

Therefore, Tunisia depends potentially on fluctuations in EU growth. The exports of goods represent 47% of its GDP among which 76% were exports towards the EU. The main important partners of Tunisia in its exports and imports dealings are the EU, Libya and

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China. Thus, Tunisia's annual growth rate appears to have become increasingly synchronized over time with the annual growth rate of its main European trading partners.

Tunisia's labour market, consequently, was affected by the 2008 financial crisis and subsequent turbulence in Tunisia's main export-import dealing nations. In fact, employment has dwindled down at a faster pace than output. That is why overcoming the crisis calls for measures and policies aimed at creating new jobs and taking into account the needs of the future labour market.

It is obvious, then, that there is a strong relationship between the world economy and the Tunisian one, on the one hand, and a tight relationship between the financial system and the economic growth, on the other. Despite its weak financial system, Tunisia was urged to undertake different measures aiming at reorganizing the functioning of the financial sphere: lowering the interest rate, massive refinancing of banks, revising bank regulations etc. The objective is, then, to avoid the discordances of the financial system, which might hamper the economic growth and cause unemployment to go up.

The novelty of this paper lies in its examination of the impact of the global financial crisis on the already strained labour market (Dammak & Boujelbène, 2009). It explores the government policy in response to the crisis in the areas of employment creation, labour market services, and vocational education training. We applied the "Autoregressive Distributed Lag (ARDL)", an econometric technique suggested by Pesaran *et al.*, 2001, in order to establish the long run relationship between the variables under study.

The remaining of this paper is organised as follows: in section 2, we analysed the impact of the 2008 financial crisis on the Tunisian economy through several transmission channels. In section 3, we tried to examine empirically the real effect of this crisis not only on the economic growth but also on the labour market in Tunisia during the 1970 - 2010 period through two transmission channels: the exports and the foreign direct investment. Lastly, we concluded this study with an extensive discussion of the most important empirical results.

THE IMPACTS OF THE 2008 FINANCIAL CRISIS VIA POSSIBLE TRANSMISSION CHANNELS

Most of the Tunisian population relies heavily on the labour market as an important source of income. Since

this market is determined by profit, production level and demand for national and international goods and services, any shock on the products market - such as reduction of the exports level of goods and services and the decline of FDI's among others - would affect directly and indirectly the labour market. The Tunisian economy is sensitive to external economic shocks as it relies to a great extent on the economies of the EU countries whether for its exports of goods and services or the Foreign Direct Investments.

The direct effects of the new financial crisis on the economic growth are not so significant. This can be attributed to the diverse measures undertaken by the Tunisian government to reorganise the financial sphere functioning in spite of the weak financial market which is still emerging, narrow and offering limited services at more expensive informational and transactional costs than those of developed markets (Rejichi & Aloui, 2012). The objective of these measures is to avoid the financial system discordances which could hamper the economic growth. The external financing share in Tunisia, bond emission, securities issue and private loans seem to be very weak compared with other emerging countries. The banking system has very limited links with the international market and its activities are mainly financed by the domestic deposits representing 80% of the banks' resources.

Therefore, Tunisia was away from the direct impact of the 2007 subprime crisis and the banking crisis of the summer of 2008, which allowed Tunisia to avoid the devastating effects of a systematic financial crisis which shook violently the international financial markets.

However, all the economic indicators reflect a large scale deterioration of the economic activities and the awful situation of the labour market. The most significant impact of this financial and banking crisis seems to be through the real sector by the decline of the demand for the exports of goods and services and the drop of the FDI's. The real GDP growth rate went down from 6.3 to 3.0% during the 2007 - 2009 period, Perspectives Economiques en Afrique (2011). The unemployment rate grew from 14.1 to 14.7% during the same period.

a-The effects on the financial market: The financial crisis has altered the growth margin applied to loans on the international financial markets throughout the world, mainly in the emerging countries and Africa. In the case of Tunisia, these margins have grown swiftly by more than 200 basis points during the most difficult

periods of bank bankruptcies in the USA. Thus, Tunisia decided to postpone the resort to the international financial markets and turned to the local market to mobilise the necessary resources to finance its economic growth. The crisis affected the country's international financing means from 2007 onward. For instance, Tunisia's attempt to get funds from the Japanese financial market was faced with more stringent financial requirements. Therefore, facing a credit margin estimated between 45 and 50 basic points, Tunisia had to abandon 25 basic points to be able to mobilise some resources.

b-The impact of the commercial openness on the economic growth: The economic openness and the commercial integration established between developed and developing countries have played an important role in the spread of the financial crisis. However, the speed of this spread was determined with the degree of integration among countries. Therefore, the new recession of the global economy affected differently the developed countries and had rather adverse significant effects on the developing ones (Pham, 2010).

As far the international commerce is concerned, the 2008 financial crisis resulted in a decline of the volume of importations.

In Tunisia, there has been a drastic decline of the importations from 23637 (million dinars) in 2008 to only 19469.2 (million dinars) in 2009. These losses in the exports growth rates were not compensated by a reduction in the value of imports growth rates. Thus, Tunisia has not derogated to the pessimistic perspective towards the world trade in 2009 which was reflected by the poor perspectives of economic growth of the industrialised and emerging countries resulting in a weak world demand. The exports growth rate dropped by 7% whereas the imports growth rate lost only 4.7%. Certainly this economic and financial crisis affected badly the European textile - clothing consumption causing the Tunisian exports in these sectors to drop by 19% in November 2009 compared with november 2008. There has also been a world regression in demand of petroleum exports as well as phosphate and its derivatives on the international market. Furthermore, the decline of car sales in Europe caused the off-shore exports of mechanical and electric industries to drop. In 2009, the goods and services exports dropped in comparison with 2008 leading to a degradation of the commercial balance.

c-The impact on the Foreign Direct Investments:

The recession caused by the financial disruption is obvious in Tunisia by the flow of funds through the Foreign Direct Investment (FDI). This transmission channel of the 2008 financial crisis has a negative effect on the real sector. Globally, the FDI is a world tendency that dwindled by about 21% in 2008 and risked to worsen in 2009. This was clear in Tunisia when the FDI which represents a strong economic growth drive fell noticeably (Bashir, 1999). The net income of the FDI divided by GDP went down from 6.459 in 2008 to 4.032 in 2009.

This decline in the FDI accompanied by the exports decrease led to the degradation of the economic growth in Tunisia. The GDP growth rate per capita has also dropped from 5.32% to 2.09% over the period 2007 - 2009. The most affected sectors by this financial and economic crisis are those of textiles and manufactures. Shutting down enterprises and project postponing or cancellation has become more and more frequent in Tunisia. Substantial job losses have also been recorded with direct negative effects on the household standard of living. As a consequence the world growth slowdown has affected the Tunisian efforts to achieve its millennium objectives for an economic growth and a reduction of unemployment.

EMPIRICAL STUDY OF THE IMPACT OF THE FINANCIAL CRISIS ON THE LABOUR MARKET

Before investigating empirically this impact, we would present our model. Then we would show our methodology and empirical results

a- The model general framework: In this study, we examined the potential impact of the new financial crisis on the economic growth through two different transmission channels: The exports and the FDI's. These channels make up two important drives for the development process in the developing countries in general and particularly in Tunisia (Naudé, 2009, Phu Huynh *et al.*, 2010). It is acknowledged that any financial or economic shock might have a negative impact on the economic growth. However, according to Okun law, there is a negative macroeconomic relationship between production and unemployment. Nevertheless, any decrease in the production volume would be translated by a decrease in employment and an increase in unemployment. This relation was checked by several economists such as Smith (1975), Gordon (1984), Kaufman (1988), weber (1995), Lee (2000), Calmfors & Holmlund (2000), Moosa (2008),

Tingi & Ling (2011) and cazes, Verick & Al Hussami (2011). Their studies have resulted in an empirical validation of the relationship but with a substantial variation of the estimated coefficients through countries and time.

The economic theory and the empirical studies developed various arguments justifying the relationship between FDI, exportation and unemployment on the one hand and growth on the other. This generated a multitude of causal, probably reciprocal, relationships. Obviously, there are many variables that were used to explain a short and long run economic growth. This has made the choice of the variables to determine the contagious effect of the 2008 financial crisis on the economic growth and the labour market in Tunisia stringent. We used annual data covering the 1970 - 2010 period to carry out our empirical study about the real indirect impact of this crisis on the economic growth and the labour market in Tunisia through the above mentioned two transmission channels. The variables are identified as follows:

- GDP_t : gross domestic product per capita to reflect the economic growth
- X_t : exportation per capita
- FDI_t : foreign direct investment per capita
- U_t : total unemployment rate

The data relative to the exports, FDI's and GDP were collected from the Tunisian Central Bank. All these variables are expressed in millions of Tunisian Dinars. As for the total unemployment rate and the total population data, we used the statistics of the National Institute of Competitiveness and Quantitative Studies (l'Institut National de la Competitive et des Etudes Quantitative (INCEQ)).

The Real Effective Exchange Rate (REER), collected from the International Monetary Fund (IMF), was integrated in our model as a control variable. It was used at constant price of 2000. It added as a control variable since it plays a potential influential role in the economic growth through its regulatory effect of economic shocks. Moreover it has also an important role that influences the determinants of the economic growth such as the exports, the imports and the FDI.

All the variables used in our model are expressed in logarithm to be able to include the multiple effects of the time series. They are also adjusted by the GDP deflator to eliminate the influence of inflation. In addition, a dummy variable noted as DU-crisis that

takes the value of 1 from 2009 and 0 in all other periods to account for the appearance of the effect of the new financial crisis on the real GDP per capita over the studied period. Thus our model is written as follows:

$$\ln(GDP)_t = \alpha + \beta \ln(X)_t + \gamma \ln(FDI)_t + \delta \ln(U)_t + \varphi \ln(REER)_t + \mu DU - crisis + \varepsilon_t \quad (1)$$

With ε_t is an error term of null mean and a constant variance.

The parameters of the model measure the sensitivity of the variables relative to the economic growth. Typically, the expected signs of the set of the coefficients of the model (1) variables are:

$$\beta, \gamma, \varphi > 0 \text{ et } \delta, \mu < 0.$$

b- The econometric methodology: We estimate our model using a cointegration technique proposed by Pesaran *et al.* (2001), known as the Autoregressive Distributed Lag (ARDL) to be able to overcome the limitations of the conventional cointegration methods (Engle & Granger, 1987 and Johansen, 1991). These methods require the determination of the integration degree of the used variables and that the variables are integrated of the same order. This would lead inevitably to a stationarity pre-test of the variables. The most important advantage of the ARDL, however, is its ability to be applied to any degree of integration of the used variables: purely I(0), purely I(1) or a mixed degree of integration. The other advantage is that it has superior statistical properties with small samples (Cheung Lai, 1990). In fact, this method is relatively more efficient with small samples as it is the case for most of the empirical studies in the developing countries.

This study is designed to examine the possibility of a long run relationship between the real gross domestic product per capita which reflects the economic growth noted by real GDP per capita and the transmission channels (exports per capita and the foreign direct investment per capita noted by X and FDI respectively). We also added a total unemployment rate noted by (U) and a control variable: the Real Effective Exchange Rate noted by (REER) for the reasons in 3.a (The model general framework). To this end, we used the cointegration method suggested by Pesaran *et al.* (2001).

We would start by providing a brief description of the ARDL technique. This procedure classifies all the model variables as endogenous variables. The error correction model is expressed through the following equation:

$$\begin{aligned} \Delta \ln(GDP)_t = & a_0 + \sum_{i=1}^p b_i \Delta \ln(GDP)_{t-i} + \sum_{i=0}^p c_i \Delta \ln(X)_{t-i} + \\ & \sum_{i=0}^p d_i \Delta \ln(FDI)_{t-i} + \\ & \sum_{i=0}^p e_i \Delta \ln(U)_{t-i} + \sum_{i=0}^p f_i \Delta \ln(REER)_{t-i} + \delta_1 \ln GDP_{t-1} + \\ & \delta_2 \ln(X)_{t-1} + \delta_3 \ln(FDI)_{t-1} + \delta_4 \ln(U)_{t-1} + \\ & \delta_5 \ln(REER)_{t-1} + \delta_6 DU - crisis + \varepsilon_t \end{aligned} \quad (2)$$

With Δ representing the first difference operator, a_0 is the drift component, and ε_t is a null mean term with a constant variance, and the variables $\ln(GDP)$, $\ln(X)$, $\ln(FDI)$, $\ln(U)$ et $\ln(REER)$ which were defined above in this paper.

We started by the estimation of equation (2) by the Ordinary Least Square method in order to test the presence of a long run relationship between the variables through the value of the Ficher test to determine the significance of the number of lags of the variables of our model. We tested $H_N: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$ against $H_A: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$ hypothesis. We indicated the standardized test by the GDP by $H_A: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$. We jointly calculated the statistics of Ficher where the other variables of model (2) were used as dependent variables and noted by $F_X(X|GDP, FDI, U, REER)$, $F_{FDI}(FDI|GDP, X, U, REER)$, $F_U(U|GDP, X, FDI, REER)$ and $F_{REER}(REER|GDP, X, FDI, U)$.

The null hypothesis of the absence of a cointegration relation between the variables of our model could be rejected without taking into account the integration order of the time series if the computed F- statistic was higher than the upper bound of the critical values. However, if the computed F- statistic was lowered to the

bound, the information about the integrated variables order is necessary to make a decision about the long run relationships.

c- Empirical results: First, the tests on the effects of the transmission channels on the economic growth in Tunisia were conducted. The presence of a long run relationship between the retained variables was tested. Our results show the existence of a long run relationship between $\ln(GDP)$, $\ln(X)$, $\ln(FDI)$, and $\ln(REER)$. Our model (2) was estimated using the Ordinary Least Square (OLS) method to determine the number of delays (p) by the Schwartz-Bayesian Criterion (SBC). The null hypothesis $H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$ was totally rejected and a serious correlation was achieved with a number of delays (p=4) as suggested by (SBC). The computed F- statistic $F_{GDP}(GDP|X, FDI, U, REER) = 4.9662$ was higher than upper bound of the critical value obtained from Narayan at 5%. These results suggest the evidence of the existence of a cointegration relation between the economic growth and the transmission channels, the unemployment rate and the real effective exchange rate in Tunisia during the period under study. This process was conducted with the other variables of our model ($X, FDI, U, REER$). We also showed that the computed F- statistic was superior to the upper bound critical value of Narayan at 1%, 5% or 10%. Table 1 reports this as well as the results of the other models. From this table, we can conclude that there is a causality relationship between the variables of the model at a 5% significance level except for the real effective exchange rate.

Table 1: The bounds test for the existence of a level relationship

Model	Computed F Statistic	Lag	Significance Level	Critical bound*	
				F-Statistic	
				I(0)	I(1)
$F_{GDP}(GDP X, FDI, U, REER)$	4.966 ^a	4	1%	5.376	7.092
$F_X(X GDP, FDI, U, REER)$	5.101 ^a	3	5%	3.958	5.226
$F_{FDI}(FDI X, GDP, U, REER)$	3.954 ^a	3	10%	3.334	4.438
$F_U(U X, FDI, GDP, REER)$	6.834 ^a	3	-	-	-
$F_{REER}(REER X, FDI, U, GDP)$	2.649 ^b	3	-	-	-

Notes: the period of estimation: 1975-2010. Letter a indicates that the statistic is above the superior threshold and the letter b indicates that the value is below the inferior threshold. Source of the critical values: Narayan (2005).

* According to Narayan (2005), the existing critical values indicated in Pesaran *et al.* (2001) cannot be used for small sample sizes. Narayan (2005) provides a set of critical values for sample sizes ranging from 30 to 80 observations. In this study, we compare the calculated F- statistics with the critical values from Narayan (2005). For more details, see Narayan (2005).

However, only one cointegration relation was deduced: ARDL (p, q1, q2, q3, q4).

The long run model with the dummy variable for Ln(GDP)_t can be estimated as:

$$Ln(GDP)_t = \gamma_0 + \sum_{i=0}^p \gamma_1 Ln(GDP)_{t-i} + \sum_{i=0}^{q1} \gamma_2 Ln(X)_{t-i} + \sum_{i=0}^{q2} \gamma_3 Ln(FDI)_{t-i} + \sum_{i=0}^{q3} \gamma_4 Ln(U)_{t-i} + \sum_{i=0}^{q4} \gamma_5 Ln(REER)_{t-i} + \gamma_6 DU - crisis + \varepsilon_t \quad (3)$$

Using the Pesaran *et al.* approach (2001), we obtained the level of the parameters of the long run estimations of our model. The ARDL model (4, 1, 1, 4, 0) was chosen

according to the SBC criterion. The long run estimation results indicated in table 2 show that the coefficients are statistically significant at a 5% level except for the

Table 2: Estimated long run coefficients using ARDL model with a dummy variable tendency.

Equation (3): ARDL (4, 1, 1, 4, 0) selected by SBC. Dependent Variable is Ln(GDP)

Regression	Coefficient	Standard Error	t-ratio	t-probability
C	2.353	0.356	6.595	0.000
Ln(X)	-0.598	0.298	-2.006	0.063
Ln(FDI)	0.100	0.044	2.265	0.038
Ln(U)	-0.700	0.117	-5.946	0.000
Ln(REER)	1.009	0.173	5.808	0.000
DU-crisis	-0.208	0.015	-13.832	0.000

Table 3: Error correction representation for the selected ARDL model.

Equation (3): ARDL (4, 1, 1, 4, 0) selected by SBC. Dependent Variable is ΔLn(GDP)

Regression	Coefficient	Standard Error	t-ratio	t-probability
C	0.028	0.009	2.817	0.011
ΔLn(GDP) _{t-1}	-0.022	0.155	-0.147	0.884
ΔLn(GDP) _{t-2}	-0.040	0.132	-0.308	0.761
ΔLn(GDP) _{t-3}	0.020	0.116	0.180	0.858
ΔLn(GDP) _{t-4}	-0.003	0.069	-0.049	0.961
ΔLn(X) _t	0.105	0.049	2.113	0.048
ΔLn(X) _{t-1}	-0.112	0.040	-2.793	0.012
ΔLn(FDI) _t	0.019	0.009	2.095	0.050
ΔLn(FDI) _{t-1}	-0.005	0.007	-0.687	0.500
ΔLn(U) _t	0.216	0.252	0.856	0.402
ΔLn(U) _{t-1}	0.064	0.269	0.239	0.813
ΔLn(U) _{t-2}	0.193	0.259	0.745	0.465
ΔLn(U) _{t-3}	-0.119	0.242	-0.490	0.629
ΔLn(U) _{t-4}	-0.222	0.347	-0.641	0.529
ΔLn(REER) _t	-0.289	0.101	-2.858	0.010
ecm _{t-1}	-1.325	0.382	-3.464	0.002
ΔDU - crisis	0.084	0.031	2.639	0.016

R²=0.69 DW=2.20

exports coefficient which is statistically significant at a 10% level. The theoretically expected signs are checked except for the exports.

The short run coefficient estimations are shown in table 3. The equilibrium correction coefficient indicates the adjustment speed of the equilibrium repair in a dynamic model. The significant and negative sign of the error term prove the existence of a long term stable relationship.

Our main objective in this study was to answer the question whether the 2008 financial crisis has influenced the economic growth and the labour market in Tunisia? As discussed in section 2, this financial crisis has affected the Tunisian economy through many transmission channels and the most important, according to the empirical results, is the Foreign Direct Investment. Our results show that the FDI's are statistically significant for the economic growth at long run in Tunisia but with a weak coefficient. At short run, however, they are meaningless. This explains, to a large extent, that the liberalisation of the private capital investment did not really boost the economy in Tunisia. They had just a limited impact on the creation of skilled job positions. This is in total agreement with Vitullo (2008), and Harrison & Rodriguez-Clare (2009) who suggested that the sectors the foreign investors exploited are generally intense in labour but poor in highly developed technology. Bouoiyour (2010) also shows that "the liberalisation did not have any prospective effect in terms of employment and salaries but has enhanced Tunisia's specialisation in products that are intensive in low-qualified, good bargain labour but with a poor technological content".

On the other hand, these results could be also explained by the fact that the Tunisian educational system is not that initiator to private investment (whether domestic or foreign). It surely produces a qualified workers but that lacks integration in the economic circuit. The investors are looking for a low-qualified but cheap labour. This can be attributed to the fact that sectors with a high added value and that requires a qualified labour are not relatively developed in Tunisia.

As for the second transmission channel, our results show that the exports present a significant coefficient for a long run growth although it is negative. This negative significant sign allows us to deduce that the exports are less efficient to stimulate growth in a regime of protection. Nevertheless, the financial crisis

has a negative impact on the exports growth and thus on the revenues linked to exports (table 2). Our results are similar to those reached by Luis Carlos and Osvaldo (2009) for the case of the Bolivian economy. Concerning the coefficient of the control variable (the real effective exchange rate), however, our empirical results prove that it is positive and statistically significant (table 2). This indicates that the exchange rate policy could affect the economic growth directly or indirectly through the transmission channels (exports and FDI).

Also, according to our results, the estimated long run coefficient of the dummy variable is negative and statistically significant even though it was weak (table 2). This implies that the financial crisis has negatively and deeply affected the economic growth.

Just like several other empirical studies such as those of Tingi & Ling (2008), Nambiar (2009), Hoeven (2010), Balboa & Mantaring (2011), Kroeger & Meier (2011), Cazes *et al.* (2011) and Blunch & Sulla (2011), our empirical results show that the relationship between the real GDP per capita and the long run unemployment rate is negative and statistically significant. In addition, the crisis would negatively affect the labour market later. In other words, the global contagious effect of this crisis affects both the economic growth and the labour market. Similarly, Ionela (2009) shows that the commercial openness has a transmission effect of the economic and financial crisis from one country to another. He also stated that the labour market is affected by the crisis and that the unemployment increase is due to the decrease of the volume of several activities. Moreover, Cornilleau & Heyer (2010), proved that the crisis had negative consequences on the labour market of seven countries (France, Germany, Italy, Spain, UK, USA and Japan) and that the unemployment growth conceals the relative decline of production. Thus, our study testifies that the real effects of the crisis hit not only the developed countries but also the developing ones: Tunisia. Eventually, this study investigated the bidirectional causal relationship between the model variables except for the real effective exchange rate. This kind of relationship could engender more fragility of the economy in Tunisia and enhance the spread of the impact of the current financial crisis on the economic growth. Afterwards, we evaluated the stability of the long run relationship between the real GDP per capita, the transmission

channels, the unemployment rate and the control variable. We relied on the “CUSUM” and “CUSUM-squared” tests to evaluate the constancy of the long run

parameters. Figures 1 and 2 show clearly the stability of the coefficients during the estimation period.

Plot of cumulative sum of recursive residuals of resids ARDL_ECM

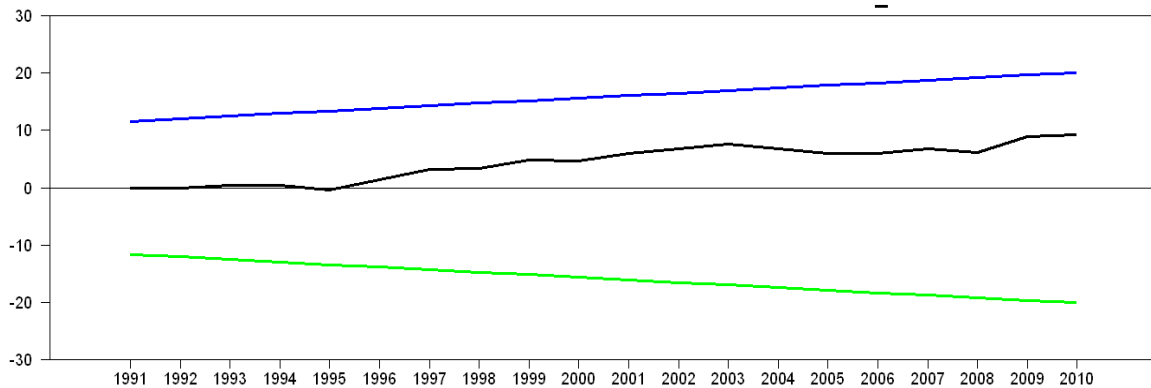


Figure 1: “Plot of CUSUM”

Plot of CUSUMSQ statistics of resids ARDL_ECM

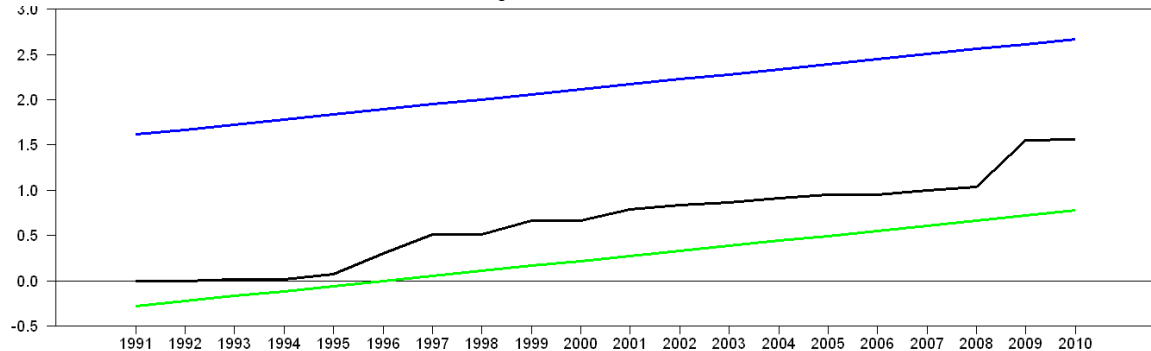


Figure 2: “Plot of CUSUM SQ”

CONCLUSION

The goal of this paper was to estimate the impact of the subprime crisis on the Tunisian economy. To this end, a linear growth regression was run using the Autoregressive Distributed Lag (ARDL) approach for the 1970-2010 period. As for the relationship between the variables of our model, the empirical results showed that their long run stability proved the existence of a bilateral relationship between them except for the real effective exchange rate. According to our descriptive analysis, we have remarked that during the post crisis years there has been a decrease of the exports volume and the FDI’s, as well. This causes an immediate negative impact on the economic growth and consequently on the labour market. On the other hand, our empirical results proved that the global financial crisis affected the Tunisian economic growth through two transmission channels causing unemployment to soar.

Our findings also showed that the FDI is the most important long run growth source in Tunisia. However, this variable might become the main cause of the spread of the current crisis in this country.

Relying on this study, we can deduce that Tunisia is required to take immediate financial and political measures at the short run to minimise the impact of the current financial crisis. Thus, promoting the high tech foreign investments to reduce unemployment rate higher for lower-skilled workers and enhance the internal investment. These two types of investment should be Complementary for both the economic growth and the development of the labour market. Nevertheless, whether the financial openness and the financial growth are the ideal way to promote exportation and whether the FDI’s and their impact on the economic growth and the labour market in developing countries in general and in Tunisia in particular could be the topic of future research studies.

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