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The Linear and Non-Linear Effects of External Debt on Economic Growth in MENA Countries: An Empirical Investigation

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Abstract:

Purpose: *This paper is an attempt to analyze the effects of external debt on economic growth in 16 emerging MENA countries in the presence of non-linearity during the period between 1990 and 2016 (a period that included several devaluations.*
Design/Methodology/Approach: *The empirical analysis is based on the ARDL method of cointegration (AutoRegressive Distributed Lag).*
Findings: *We conclude that in the short run the estimated value of ECTt-1 is -0.163 assuming that the short run shocks of the previous period are equal to 16.3%. Debt has a positive and significant impact on the growth of MENA countries.*
Practical Implications: *The results would be essential to reform the governance of public services to make them more efficient and truly equitable. This reform should place the user at the heart of the system, as beneficiary and regulator, and focus on making administrative services more efficient, by simplifying procedures and strengthening accountability.*
Originality/value: *The analysis of the correlation between the main indicators of external debt and economic growth is adopted. In this context, the analysis focuses on several external debt indicators as described in the article making the proposed analysis original.*

Keywords: *External debt, Exchange rate, Economic growth, Non-linearity, Solvency, Sustainability.*

JEL classification: *O1, O2, O4.*

Paper Type: *Research study*

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1. Introduction

The poor economic performance and lagging growth of emerging countries is often attributed, rightly or wrongly, to the high level of debt in these countries. In the early 1980s, emerging countries suffered a major economic and financial crisis as a result of widening government deficits.

Among the consequences of this situation, we can mention the increase in the debt ratio, so that the repayment of the net present value becomes impossible and these countries gradually enter a "vicious circle". Indeed, in recent decades, the external debt of emerging countries has reached serious levels, making the study of the role of external debt in financing development a particularly important research topic. Moreover, the economic environment of low-income countries in recent decades has been marked by a debt crisis. The question of the impact of external debt on economic growth is becoming increasingly important for a country's economic development.

In any case, liberalisation accelerated in the 1990s. This was manifested in the increase in financial transactions on world markets. Indeed, in recent years, several developing countries that have adopted trade liberalisation strategies, such as the Maghreb and Middle Eastern countries, have also experienced strong capital flows. Most of these countries have acceded to the GATT and then to the WTO; 1990 for Tunisia, 1970 for Egypt, 1987 for Morocco, and 1988 for Jordan.

At the same time, these countries have developed a network of partnership relations and free trade agreements in a multilateral, regional and bilateral framework, both with developed countries and with other developing countries in the region. These countries have lost some of their national sovereignty as a direct and indirect consequence of capital mobility. In terms of exchange rate regime, a floating regime gives a little more independence in monetary policy in the short term, in the long term, a sustainable macroeconomic policy does not have much choice in liberalisation.

Countries need to liberalise capital flows gradually to avoid macroeconomic instability. Therefore, public control of the domestic financial sector must also be developed. Thus, the more indebted a country is, the more dependent it is on credit institutions and international financial markets.

Credit institutions monitor the macroeconomic fundamentals of debtor countries because these affect their ability to repay their debts. However, credit institutions must be careful not to interfere in the priority setting of domestic policy makers. Therefore, the increase in domestic debt in developing countries is a logical consequence of the deregulation of capital markets and the private financial sector, even if recommendations and warnings to this effect are still made by the World Bank and the IMF.

Moreover, even in countries that have escaped the collapse of their banking sectors, the World Bank has advised emerging country governments to make increasing use of domestic public debt. This is a positive development and it is advising foreign investors to invest in the growing domestic debt market. It is advising governments of indebted countries to encourage the restitution of local banks by large foreign banks.

However, nominal depreciation is not costless as it leads to higher debt prices in local currency. If the debt is denominated in the currency of the trading partners, pegging it to a trade-weighted basket remains the best way to achieve an external target, as competitiveness, like the price of debt, will remain stable. This is not the situation in which Tunisia finds itself, for which the geographical distribution of trade does not coincide with the currency distribution of the external debt. In fact, 70% of Tunisia's foreign trade is with the euro zone, while 45% of its debt is denominated in US dollars, 30% in euros and 10% in yen.

This imbalance raises the question of the strategy for pegging the dinar to the euro. Pegging to the euro would be a good strategy if external competitiveness (stabilisation of a real effective exchange rate based on trade weights) is sought, but may prove chaotic if the dollar appreciates, since debt servicing will be revalued. A peg to a basket of two currencies may therefore be optimal, taking into account both the objective of external competitiveness and the constraint of debt denomination.

Subsequently, and as a result of this neo-liberal policy, there has been a rise in domestic and external public debt in recent decades as a counterbalance to a high level of foreign reserves. In this perspective, Romer (1993) indicated that an unexpected financial expansion leads to a depreciation of the domestic exchange rate and the depreciation will be greater, especially in an open economy, where the benefits of this choice do not exceed a decreasing function of the openness of the economy.

For his part, Alfaro (2005) has also shown that this financial expansion urged by the financial authorities could bring about a real depreciation of the exchange rate. As the economy becomes open, and with the exchange rate depreciating, policy makers would be forced to reduce the incentives for monetary expansion as inflation increases.

It follows from the above that indebted countries have lost some of their national sovereignty as a consequence of capital mobility. A floating exchange rate regime leads to a little more independence and less and less followership of monetary policy in the short run. A sustainable macroeconomic policy does not have several options or alternatives. They need to liberalise capital flows in the short term in a gradual way to avoid macroeconomic instability.

However, the literature on the subject suffers from a number of shortcomings, most notably the absence of a role for the public authorities in the management of external debt, the lack of anti-inflation insurance, as inflation leads to a sharp rise in interest rates, i.e. the interest paid on public debt. However, the domestic savings of any emerging country are not sufficient to finance the productive investments needed to achieve economic and social development.

This insufficiency justifies the State's recourse to external sources of financing. From this point of view, the general problem of our research is an extension of a literature that is unfortunately not abundant enough. For all these reasons, we have oriented our work towards the analysis of situations in some indebted countries in the MENA region.

We are therefore embarking on a path that would allow us to answer the following question: What role can external debt play on economic growth?

2. Literature Review and Research Hypothèses

The objective of this paper is to try to take an overview of the predictive nature of the relationship between external debt and economic growth in the MENA region. For this purpose, the analysis of the correlation between the main indicators of external debt and economic growth is adopted. In this context, the analysis focuses on the following external debt indicators:

Hypothesis 1: Inflation rate and economic growth
It indicates the financial health of the country. Indeed, high inflation manifests itself in a drop in purchasing power, an increase in production costs and a deterioration in price competitiveness (the prices of domestic products are more expensive than those produced abroad), which leads to major disruptions in economic growth.

The evolution of inflation remains strongly dependent on the monetary policies of each country. This idea is inspired by the work of (Calvo, Reinhart and Vegh, 1995) "the systematic search for competitiveness of the economy through the depreciation of the value of the national currency risks leading the economy to uncontrollable inflation".

Hypothesis 2: External debt and economic growth
External debt is an important indicator that reflects the health of the economy. Therefore, a higher level of debt translates into higher country risk and could lead to a financial crisis and deterioration of economic growth. We will therefore test that the idea of external debt will only be favourable to growth in economies with low external debt, whereas this relationship may be reversed in highly indebted economies.

There are several recent experimental studies, including Thalassinos *et al*. (2014), Perotti (1999) or Giavazzi et al. (2000), Feldstein (1982), Blancard (1990), Giavazzi and Pagano (1990), Pattillo and Lucca Ricci (2002) that analyse the impacts of external debt on growth. In a first step, they use a linear specification that reflects the negative impact of external debt on growth and investment. In a second step, they adopt a second specification which is called non-linear. The impact of debt thus becomes negative from a threshold (estimated at 160-170% of exports and 30-40% of GDP).

Hypothesis 3: Population and economic growth
There are two theses that animate the debate on the study of the influence of population growth on economic growth. These are the orthodox thesis and the heterodox or pessimistic thesis.

The heterodox thesis: this consists of the contributions of Thomas Malthus (1798) and the Promalthusians. The advocates of this thesis believe that population growth negatively affects economic growth. Coale and Hoover (1958) put forward three arguments to justify this pessimistic view: the diversion effect, the dilution effect and the dependency effect.

The orthodox thesis The orthodox thesis defends the idea that population growth positively affects economic growth. It consists of the contributions of several economists such as Easterlin (1965), Kuznets (1965, 1967), Boserup (1970) and most recently Chan et al (2005), Dao (2012) and Thuku et al (2013).

Hypothesis 4: Openness and economic growth
This variable is generally measured by the ratio of the sum of exports and imports to gross domestic product. The economic literature shows that in DCs, its effect on economic growth is ambiguous. The expected sign can then be positive or negative. Grossman and Helpman (1991), Young (1991), Lee (1993) according to these economists of the endogenous growth theory, suggest that trade liberalisation can affect economic growth permanently.

3. Research Methodology

3.1 Model Specification

To test the hypothesis that external debt negatively affects economic growth in the MENA region, we have drawn on the model of Diagne Oumou Guissé and Alexandru Minea, Patrick Villieu. is specified as follows:

$$LPIBH_{it} = \beta_0 + \beta_1 LTRAVAIL_{it} + \beta_2 LCAPITAL_{it} + \beta_3 LSDE_{it} + \beta_4 TRADE_{it} + \beta_5 LCREDIT + \beta_6 LIPC_{it} + \mu_{it}$$

We vary the stoch ratios of the stock of external debt as a percentage of GDP, but they are economically homogeneous to avoid the heterogeneity problem in our study in reality. Thus, our estimates support a non-linear relationship between the stock of outstanding external debt and economic growth. We thus prevent the non-linear theory of the relationship between growth and debt, i.e. debt is inefficient and does not reveal about the real effect. There are other variables that can influence growth.

3.2 Presentation of Variables

The variables of our model are the following:

- The endogenous variable: The explained variable is the GDP per capita, a positive variation of it is a sign of growth of the Economy concerned.
- The explanatory variable is the stoch of the external debt stock: It is measured as a percentage of GDP. According to the economic literature, one should expect a positive coefficient up to a certain level.

The control variables are the following:

- GDP per capita: Intuitively, we expect a positive coefficient for this variable.
- Inflation rate: The sign of the coefficient should be positive or negative.
- External openness: This is the ratio of the sum of exports and imports to the level of GDP.
- Domestic credit to the private sector as a percentage of GDP: According to the literature, the coefficient of this variable should be positive.
- Capital: It is measured by the ratio between gross fixed capital formation and GDP. The sign of the coefficient should be positive.
- Population: This is measured by the ratio of population to GDP. Most research suggests that this variable acts negatively.
- Stock of external debt: Stocks of external, public and publicly guaranteed debt (PGE) (outstanding and disbursed debt, current US$) According to the literature external debt negatively affects economic growth in the MENA region.

Where Ln is the natural logarithm; Index t denotes time; $b0$: constant

The coefficients: $b1$, ..., $b6$.

Table 1. *Définitions and sources of variables*

Sample	Our sample includes 19 MENA countries: Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates and Yemen.
Database	In addition our database sources are collected from the World Bank. For the period 1990 to 2016: T = 27 years and N = 19, see a sample of 513 observations.

sources	
GDP per capita or economic growth	It constitutes the endogenous variable in our model, represented by the annual evolution of the gross domestic product (GDP), this variable is frequently used in the empirical literature as being the major variable determining the macroeconomic performance of any country. Indeed, several factors are likely to influence this macroeconomic quantity
Gross fixed capital formation	Measured by capital formation as a percentage of GDP. Capital has always been considered a central element of economic growth. The greater the capital formation of a country, the more capital workers have to work with. This increase in the capital-labour ratio will result in higher output produced by each worker and boost the gross domestic product for that particular country. Indeed, higher capital formation is assumed to lead to higher GDP growth. This assumption was confirmed by a critical review of some empirical studies conducted by Waheed (2004), where he concluded that the overall effects of capital on economic growth in most empirical studies were positive and that the negative effects were mainly due to methodological problems or data limitations.
Inflation	
Economic openness rate	Measured by the sum of exports and imports over gross domestic production, open economies are characterised by a high degree of openness.
Domestic credit to the private sector	The domestic credit to the private sector variable measures the total private resources used to finance the private sector, divided by GDP. In this variable, private resources are composed of loans to individuals, purchases of securities (without equity), trade credits and other debits that establish a right of repayment. This indicator, the most widely used in the literature, is the main measure of financial development. It is the direct aggregate indicator of the amount of financial intermediation activity towards the private sector. One of its advantages is its opposition to credit issued by public institutions and to the financing of government expenditure. In other words, private credit indicates the size of intermediation and the financial constraint. A high proportion of private credit in GDP indicates high intermediary activity. In this case, firms experience low financial constraints. This indicator reflects the degree of access of the private sector to bank credit facilities. Its increase expresses financial development.
Stock of external debt	Stocks of external, public and publicly guaranteed debt (PGE) (outstanding and disbursed debt, current US$)
the population	Population growth, provided that it results in an increase in the working population, should have a positive effect on extensive growth. However, because of the dilution of capital that it induces, it can result in less intensive growth. The solution then lies in an increase in savings, i.e. a sacrifice of present consumption for an increase in future consumption. The current standard of living is temporarily reduced. Thus, for example, under the hypothesis of a 2% increase in total factor productivity (exogenous technical progress), "a one-point acceleration in economic growth, at a given savings rate, results in a 6.25% decrease in the level of per capita product, and therefore a decrease of the same magnitude in the wage rate" (Aglietta, Blanchet, and Héran, 2002, p. 96).

***Source**: Own study.*

4. Analysis of the Results

4.1 Graphical and Descriptive Analysis

Our objective allows for the descriptive analysis of the variables and describe the sample in a first step, we will present the descriptive statistics between the variables for the model.

4.1.1 Overall descriptive analysis of baseline variables

The descriptive statistics of baseline variables is presented in Table 2.

Table 2. *Descriptive Statistics*

Désignation	**lpibh**	**Ltravail**	**Lcapital**	**Lipc**	**Ltrade**	**Ilcredit**	**OUV**
Mean	*8.63*	*18.00*	*25.23*	*3.190*	*3.791*	*3.257*	*23.067*
SD	*0.59*	*0.11*	*0.79*	*1.070*	*0.167*	*0.542*	*0.237*
Minimum	*7.72*	*17.80*	*24.18*	*1.832*	*3.416*	*2.648*	*22.665*
Maximum	*9.43*	*18.19*	*26.32*	*4.665*	*4.006*	*4.253*	*23.521*
Skewness	*0.041*	*0.12*	*0.12*	*0.028*	*-1.129*	*0.644*	*0.322*
Kurtosis	*1.36*	*1.34*	*1.34*	*1.179*	*3.155*	*1.911*	*2.192*
Cv	*0.069*	*1.34* °	*1.34*	*0.335*	*0.044*	*0.166*	*0.010*
Observations	*513*	*513*	*513*	*513*	*513*	*513*	*513*

Source: *Own study.*

4.1.2 Trend in TCPIB and EDS by country

The GDP growth rate (TCPIB) is characterized by an upward trend for all of our MENA countries, for example Syria has a strong evolution compared to other countries. As an example and during the period 1990-2016, Syria has an overall average of 7.1 with a low standard deviation of 4.0. All observations are between 12.60 and 38.2. For the sample distribution of TCPIB, this variable is right skewed (Skewness= 0.804>0) and strongly leptokurtic (Kurtosis= 11.53>0).

It can be seen that the stock of external debt (SDE) in relation to GDP has a strong evolution and varies randomly between the different countries of the MENA region. Mauritania, for example, is characterized by an increasing trend compared to other MENA countries. The evolution of EDS is characterized by an average of 123.042 with a standard deviation of 55.12499. The set of values ranges from 0 to 207.29. The sample distribution of EDS is skewed to the right (Skewness= 2.79) and leptokurtic (Kurtosis= 11.67).

Table 3. *Correlation analysis*

	LPIBH	**Ltravail**	**Lcapital**	**Lipc**	**Ltrade**	**Lcredit**	**lsde**
lpibh	1						
ltravail	0.02 (0.5)	1					

lcapital	0.54 (0.00)***	0.82 (0.00)***	1				
lipc	-0.23 (0.00)***	-0.01 (0.73)	-0.12 (0.007)*	1			
ltrade	0.23 (0.00)***	-0.61 (0.00)***	-0.35 (0.000)***	-0.097 (0.04)*	1		
lcredit	0.269 (0.000)	-0.09 (0.04)*	0.10 (0.03)*	-0.27 (0.00)***	0.35 (0.000)***	1	
lsde	-0.245 (0.00)***	0.66 (0.00)***	0.41 (0.00)***	0.06 (0.14)	-0.27 (0.00)***	0.02 (0.63)	1

Source: *Own study.*

The relationship between external debt and economic growth is found to be equal to 0.00% according to the table below, we have noticed that external debt and economic growth have negative and statically insignificant signs neither at 1%, nor at 5% nor at 10%.

4.2 Integration Analysis: Unit Root Testing on Panel Data

The form of heterogeneity of the model is one of the main problems of unit root panel tests. Thus, the latter makes it possible to obtain the possible correlations that may exist between individuals in addition to the existence of constants specific to each individual. The taking into account or not of these possible inter-individual dependencies opposes two types of generations.

Those who assume the absence of Autocorrelation of Residuals (IPS; Maddala and Wu, 1999, LLC; Im, Pesaran and Shin, 2003; Hadri, 2000; Levin, Lin and Chu, 2002 etc.), because they examine them as risk factors, and those who try to elevate this alternative because, for them, these co-movements have to be used for the purpose of conducting new tests (Moon and Perron, 2004; Bai and Ng, 2004; etc.). According to our study the results of the IPS, Hadri and LLC unit root tests on our panel data are presented in the following Table 4:

Table 4. *Unit root tests on panel data*

Variables	**In level**			**In first difference**		
	IPS	Hadri	LLC	IPS	Hadri	LLC
Lpibh	1.000	0.000***	0.2665	0.000	0.025	0.016
Ltravail	0.998	0.000***	0.998	0.128	0.000	0.000
Lcapital	0.122	0.999	0.000	0.000	0.084	0.000
Lipc	0.004	0.000***	0.229	0.000	0.995	0.000
Ltrade	0.320	0.000***	0.312	0.000	0.681	0.000
Lsde	0.989	0.000***	0.511	0.000	0.004	0.000

Notes: **, **, *** significant at 10%, 5%, 1%.*
Source: *Own study.*

We find that all the series have lost to pass the three unit root tests. We find that Hadri's (2000) test is the most appropriate because all the series indicate the presence of a unit root in level except the opening and the log capital, we can consider that the series is integrated of order 1.

4.3 Specification Testing and Static Estimation

We will proceed in this section to present the model specification tests while applying the final static results.

4.3.1 Poolability test

If we find that the Fisher probability is greater than 5%, we have a common effect, so we accept the null hypothesis of equality of constants and the estimation is done by OLS. If the Fisher probability is less than 5%, we have a specific effect, so we reject H0 and move on to study individual effects (fixed or random effect).

Table 5. *Poolability Test*

	M2	
	SCR	DL
Estimated MCO (Pooled)	55.198	425
Country by country estimate	2.848	320
Fisher statistics	56.018	

Source: *Own study.*

The use of ordinary least squares gives the possibility to know what the panel or time series data will be used. For model 1, following the normal distribution (425-320=105; 320) >> F (5%). So we reject H0, the model is poolable.

4.3.2 Fixed effect test

The individual effects model assumes that the homogeneity of the coefficients (âi) for all individuals and the specific coefficients are the source of any heterogeneity between individuals. Thus, the relationship between the variables to be explained and the explanatory variables are not different for all individuals when the level of the constants introduced in the model.

In this type of model we must classify the case where the parameters (ái) are deterministic constants (fixed effects model) and the case where the parameters (ái) are realizations of a random variable of finite expectation and variance (compound error model).

A distinction is made between the fixed effects model and the random effects model. The individual effects are presented as fixed effects, hence the name. This model is expressed as follows:

$Y_{i,t} = \acute{a}_i + \hat{a}_i^{'} X_{i,t} + \mathring{a}_{i,t}$

Where $Y_{i,t}$ The dependent variable of the model and Xi,t the explanatory variables of each model in our study.

To estimate the parameters ái and âi of this model, we use the ordinary least squares estimator called the Within estimator or LSDV (Least Square Dummy Variable) estimator. This estimator takes into account the within-group variance of the endogenous variable and therefore introduces dummy variables.

In the presence of a model with individual effects, the question that arises at this level is how these individual effects should be specified. One must then know whether to opt for the random effects model or the fixed effects model. To answer this question, we will present this model, the statistical test that will allow us to specify the individual effects and the results of this test.

Table 6. *Fixed effect test*

	M2	
	SCR	DL
Estimated MCO (Pooled)	55.19	425
Dummy variable estimation (LSDV)	19.54	410
Fisher statitics	49.84	

Source: *Own study.*

The Fisher statistic follows a Fisher distribution with (n-1) and (T-n-k) degrees of freedom under the assumption of no fixed effects. The null hypothesis of no fixed effects is accepted if the F* statistic is greater than the critical value read from the Fisher table. The Fisher statistic is equal to 31.419 > F (5%), there is a fixed effect - the same for the second model.

4.3.3 Random effect test

Hurlin (2002) states that a large number of factors may influence the value of the variable being explained, which are not explicitly introduced by explanatory variables and therefore the model cannot capture them. The structure of the residuals in panel data contains three types of omitted factors that cannot be ignored. First, there are factors that may reflect differences between individuals of structural types, independent of time (individual effect (ái)).

Secondly, there are factors that can affect all individuals in the same way but its effect depends on the time period considered (temporal effect: ìt). Lastly, there are factors that can have an impact on the endogenous variable differently depending on the period and the individual, this last component of the residuals (Vit) is orthogonal to the temporal effects and the individual effects.

Depending on the three types of factors, the residuals (åi,t) can be composed in three components:

$å_{i,t}=á_i+ì_t+V_{it}$

Where ***á_i*** individual effects, ìt temporal effects and Vit a stochastic process.

Like any estimation model, the random effects model makes some assumptions about these variables. In fact, the specific effect does not vary with time. Hence the covariances between å i,t and å i,t' (the two error terms at time (t) and (t') are not all zero, hence the need to ignore the OLS method.

In addition, the variance of the endogenous variable Y_{it} conditional on exogenous variables X_{it} is equal to : $ó_y^2=ó_á^2+ó_v^2$

Variances $ó_á^2+ó_v^2$ correspond to the different components of the total variance, which is why the random effect model is also called the compound error model.

The Breusch-Pagan statistic is obtained after the estimation of the random effects model. It is used to test the significance of the random effects model. If the probability of the Breusch-Pagan statistic is below the threshold, the random effects will be significant overall. The test is based on the following assumptions:

***H0** : No random effects*
***H1** : Presence of random effects*

***Table 7.** Random effect test results*

	M2	
	Individual	Temporal
Chi-square statistic	699.13	0.0000
Overall random effect	0.0000	

***Source:** Own study.*

According to this table, the individual random effect test shows that the individual random effects are significant at the 1% level, so there is an individual random effect. Therefore, we reject the null hypothesis of no random effects and accept H1. Consequently, we proceed to the Hausman test.

4.3.4 Hausman test

To know if the existing individual specificities are of the fixed or random type, we must use the Hausman test, which will allow us to choose this model (fixed or random).

Table 8. *Hausman Test*

	M2
Hausman Test	0.0000

Source: *Own study.*

To distinguish the fixed effect model (Within estimate) from the random one (GCM estimate), the Hausman test (1978) was used, which is the most widely used statistical test in the case of panel data for choosing between these two models. The Hausman test was used to estimate the parameters (â1 and â2) of the model studied.

With :
$\hat{a}_1$: GCM (general least square) estimator of model parameters.
$\hat{a}_2$: Within estimator of model parameters.

If the probability of acceptance of the null hypothesis that GCM is better than the Within estimator is greater than 5%, then the estimation is done by the Within estimator so there is a random effect for both models.

4.3.5 Heteroscedasticity test

Heteroskedasticity refers to data that do not have a constant variance. It does not bias the estimation of the coefficients, but the usual inference is no longer valid since the standard deviations found are not the correct ones. Heteroscedasticity is a frequently encountered situation in the data, so it is important to detect and correct it.

There are several tests to detect heteroscedasticity. These include the Goldfeld-Quandt test; the Gleisjer test; the White test; the Breusch-Pagan test; etc.

If one assumes that the variances are not homogeneous (a simple representation of the residuals as a function of the explanatory variables can reveal heteroscedasticity), a test of heteroscedasticity should be performed. Several tests have been developed, with the null and alternative hypotheses :

H0 *: The residues are homoscedastic*
Ha *: the residues are heteroskedastic*

Therefore, there are two solutions: either parametrize the error variance-covariance matrix (GCM) or use the OLS and correct the standard deviations by the Eicker-White method. For our work we opt for the Eicker-White method. This method consists of performing an OLS regression and calculating the robust variances.

If the probability is greater than chi2, hypothesis H1 is verified and we can assume heteroscedasticity. The results of the heteroskedasticity test show that all the probabilities associated with the coefficients are all greater than 0.05. Therefore we accept the H1 hypothesis of heteroskedasticity.

Table 9. *Heteroscedasticity Test*

Chi2	4912.09
Prob >chi2	0.000

Source: *Own study.*

There is a problem of heteroscedasticity of individuals so they are independent.

4.4 Final Estimate

After presenting the specification of each model (poolability tests, fixed effect, random effect, Hausman, heteroscedasticity), we present in the following the final estimates for each model in Table 10.

With the final estimation of these two tables concluded that our data follow the normal distribution in addition are robust. Therefore, we have to orientate towards the application of the ARDL test since the objective of the section is to search for the nature of the long term relationship between the variables using the ARDL technique of Pesaran et al. (2001).

Table 10. *Robust final estimate*

Lpibh	**Coef**	**Std. Err**	**T**	**P>|t|**	**95% Conf Interval**	
Ltravail	0.386	0.323	1.20	0.250	-0.302	1.075
Lcapital	0.466	0.105	4.43	0.000	0.242	0.691
Lipc	-0.048	0.022	-2.16	0.048	-0.096	0.000
Ltrade	-0.241	0.174	-1.39	0.186	-0.612	0.129
Lcredit	0.168	0.077	2.18	0.046	0.003	0.333
Lsde	0.036	0.030	1.19	0.254	-0.029	0.102

Note: *Prob > F = 0.000 << 5%.*
Source: *Own study.*

4.4.1 ARDL analysis of the impact of external debt on economic growth in MENA countries

The most commonly used cointegration techniques are the two-step techniques of Engle and Granger (1987), the Johansen (1988) approach and the Johansen and Juseluis (1990) method. However, these usual cointegration tests recommend the use of integrated series of the same order I (0) or I (1). Moreover, they are suitable for large sample sizes.

In order to remedy these shortcomings, Pesaran and Shin (1998) and Pesaran et al. (2001) have developed a new approach that is more flexible and less restrictive than the previous techniques. Indeed, the ARDL (autoregressive staggered lag model) makes it possible, on the one hand, to test the long-term relationships; using the limits bounds test; on series that are not integrated of the same order and, on the other hand, to obtain better estimates on small samples (Narayan, 2005).

The ARDL provides the possibility to deal simultaneously with long-run dynamics and short-run adjustments. It is in this context that we apply this approach to study the impact of the external debt stoch on economic growth.

The basic equation of the ARDL model is written as follows:

$y_{it} = â_0 + â_1 y_{t-1} + ...+ â_k y_{t-p} + á_0 x_t + á_1 x_{t-1} + á_2 x_{t-2} + ... + á_q x_{t-q} + å_t$

From equation (1), we note that this model is characterised by lags of the dependent variable, as well as lags (or current values) of other explanatory variables. Let us now assume that there are three variables of interest in the model: one dependent variable (y) and two explanatory variables (x1 and x2). The model then looks like this:

$Ä y_t = â_0 + Ó â_i Ä y_{t-i} + Ó ã_j Ä x_{1t-j} + Ó ä_k Ä x_{2t-k} + ö ECT_{t-1} + e_t$

Where ECT is the error correction term that includes the long-run parameters and ö represents the error correction coefficient that shows the speed of adjustment towards the long-run equilibrium (this term must be significantly negative in order to guarantee the existence of the long-run relationship). For the next step, we will replace the error correction term by the terms Y_{t-1}, X_{t-1} et X_{2t-1} in order to have the following model :

$$\Delta y_t = \beta_0 + \sum \beta_i \Delta y_{t-i} + \sum y_j \Delta x_{1t-j} + \sum \delta_k \Delta x_{2t-k} + \theta_0 y_{t-1} + \theta_1 x_{1t-1} + \theta_2 x_{2t-1} + e_t$$

4.4.2 Short and long term estimation between external debt and economic growth

The model to be estimated is inspired by the work of Diagne Oumou Guissé (2011), Mohamed Ilyes Gritli and Badry Hechmy (2017), Lim Chia Yien, Hussin Abdullah and Muhammed Azam (2017), Alexandru Miea, Patrich Villieu (2013), the equations are the following:

$$LPIBH_t = \alpha_0 + \alpha_1 LTRAVAIL_t + \alpha_2 LCAPITAL_t + \alpha_3 LSDE_t + \alpha_4 LTRADE_t + \alpha_5 LCREDIT_t + \alpha_6 LIPC + \mu_{it}$$

With L : log

lpibh : log of GDP per capita, labour: the active population, capital: gross fixed capital formation, sde: stoch of external debt, trade: openness, credit: credit granted to the private sector, cpi: price index.

We consider labour, capital, trade, credit and cpi as control variables β_o et μ_{it} represent the constant and the error term, respectively.

Adopting the ARDL approach, the two models are as follows:

$$\Delta LPIBH_t = \alpha_0 + \sum_{i=0}^{P} \beta_0 LPIBH_{t-1} + \sum_{i=0}^{q} \beta_1 Ltravail_{t-1} + \sum_{i=0}^{q} \beta_2 LCAPITAL_{t-1} + \sum_{i=0}^{q} \beta_3 LSDE_{t-1}$$
$$+ \sum_{i=0}^{q} \beta_4 LTADE_{t-1} + \sum_{i=0}^{q} \beta_5 CREDIT_{t-1} + \sum_{i=0}^{q} \beta_6 LIPC_{t-1} + \rho LPIBH_{t-1} + \theta_1 LTRAVAIL_{t-1}$$
$$+ \theta_2 LCAPITAL_{t-1} + \theta_3 LSDE_{t-1} + \theta_4 TRADE_{t-1} + \theta_5 CREDIT_{t-1} + \theta_6 LIPC_{t-1} + \mu_t$$

With Δ, the first difference operator; the "Error correction models" (ECM) representation, the long run relationships; p is the number of lags of the explained variable DF; q is the number of lags of the explanatory variables. In addition, we apply the "bounds tests" approach in order to find out whether there is a long-run equilibrium between the variables. Thus, a Fisher test (the test statistic is the F-statistics) is set up to test the following hypotheses: the null hypothesis is the absence of a long term equilibrium relationship = 0.

While the alternative hypothesis H1 is the presence of a uniform long-term relationship between the series studied. ARDL Bounds test presents two sets of critical values. With the first set shows all variables are integrated of order I(0), while the second set matches the integrated series of order I(1).

The first step in the study of time series is to study stationarity, however, the process is said to be non-stationary if the structure evolves over time. Usually, economic series do not follow a stationary process. Furthermore, it is important to avoid the problem of spurious regression, i.e., a linear regression with non-stationary variables cannot give valid results.

In order to analyse the long-term relationships, the following equations are estimated and their mathematical representation is written as follows:

$$\Delta LPIBH_t = \alpha_0 + \sum_{i}^{p} \beta_0 LPIBH_{t-i} + \sum_{i=0}^{q} \beta_1 TRAVAIL + \sum_{i=0}^{q} \beta_2 CAPITAL_{t-i} + \sum_{i=0}^{q} \beta_3 LSDE_{t-i}$$
$$+ \sum_{i=0}^{q} \beta_4 TRADE_{t-i} + \sum_{i=0}^{q} \beta_5 CREDIT_{t-i} + \sum_{i=0}^{q} \beta_6 LIPC_{t-i} + \mu_t$$

To study the short-run effects of the explanatory variables on the external debt stoch, we estimate error correction regressions. These are presented as follows:

$$\Delta LPIBH_t = \alpha_0 + \sum_{i=0}^{P} \beta_0 \Delta LPIBH_{t-i} + \sum_{i=0}^{q} \beta_1 \Delta TRAVAIL_{t-1} + \sum_{i=0}^{q} \beta_2 \Delta CAPITAL_{t-1}$$
$$+ \sum_{i=0}^{q} \beta_3 \Delta LSDE_{t-1} + \sum_{i=0}^{q} \beta_4 \Delta TRADE_{t-1} + \sum_{i=0}^{q} \beta_5 \Delta CREDIT_{t-1} + \sum_{i=0}^{q} \beta_6 \Delta LIPC_{t-i} + \lambda ECT_{t-1} + \mu_t$$

With ECT the error correction term and λ the error correction coefficient which shows the speed of adjustment towards the long-run equilibrium (this term must be significantly negative in order to guarantee the existence of the long-run relationship).

As a result of the ARDL estimation in the first step of the ARDL modelling for model 2 which specifies the relationship between the gross domestic product (dependent variable) and the stock of external debt and other explanatory variables, the existence of a long-run cointegrating relationship is not verified due to the limited number of observations available for estimation. The estimation is carried out for the period 1990 to 2016 using the F-statistic to test the joint null hypothesis that there is no long-term relationship between the variables.

In the second step of the ARDL modelling for the univariate cointegration test, estimates of the long-run coefficients of the model are calculated. The Bayesian Schwarz criterion and the Akaike information criterion (SBC allows the selection of the smallest possible lag while the AIC allows the selection of the largest possible lag.

Moreover, each explanatory variable entering the ARDL model must have a maximum lag less than p gives the same specification for the optimal lags for the ARDL model. In the third step, the optimal combination is identified. Determination of the optimal lag using the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC). In addition, each explanatory variable entering the ARDL model must have a maximum lag less than p. The SBC allows the smallest possible lag to be selected, while the AIC allows the highest possible lag to be selected.

Under the null hypothesis of no cointegration, we find that the bounds test is based on the joint F-statistic with an Asymptotic distribution is non-standard.

The ARDL bounds approach allows in a first step to estimate the above equation by ordinary least squares (OLS). The assessment of this correlation verifies that there is a long-run relationship between the variables by performing an F-test for the joint significance of the coefficients of the lagged levels of the variables.

Two sets of critical values for a given significance level can be determined (Pesaran et al., 2001). At the beginning of the ARDL model it is required that all variables included in the ARDL model are integrated of order zero, while the second Null of no cointegration is rejected when the value of the test statistic is higher than the critical upper bound value, so it is not rejected when the F-statistic is lower than the lower bound value.

We choose ARDL using the Akaike (AIC) and Bayesian (SIC) information criteria and the Fischer test, a maximum lag order of 2 for the conditional vector error correction model. The calculated F-statistics are reported in Table 3.5 where each

variable is considered as a (standardised) dependent variable in the ARDL-OLS regressions.

Table 11. *Boundary test results*

Retard	Tendance	F Statistic	AIC	I(0)	I(1)	Décision
1	Sans	2.82	-4.65	-4.47	2.82	Cointegration
2	Sans	1.582	-4.66	-4.41	2.28	Cointegration
1	**Avec**	**5.238**	**-4.65**	**-4.46**	**2.28**	**Cointegration**
2	Avec	2.017	-4.67	-4.67	2.82	Cointegration

Source: *Own study.*

The F-statistic of the variables is noticeable as they are above the critical upper bound value (2.82) at the 5% level. Thus there is a long term relationship between the variables. This indicates that there is no cointegrating relationship between the variables is rejected for all four estimates.

Nevertheless, with the least possible lag we will prefer the model that maximises the Ficher statistic. Thus, we have chosen the first model with 1 lag and trend which has the highest Fisher value (5.238) and minimizes the AIC criterion (-4.65). It remains, thus, to identify the optimal combination that allows to maximize the short term ARDL relationship (p, q1, q2, q3, q4, q5, q6). Therefore, we choose a maximum delay order equal to p=q=1.

The conditional ARDL (p, q1, q2, q3, q4, q5, q6) model in the long run can be estimated, when the cointegration relation is exact. Using the Akaike (AIC) and Schwarz (SIC) information criteria in addition, the optimal orders of the ARDL model (p, q1, q2, q3, q4, q5, q6) of the 7 variables are selected.

The short-term dynamic parameters are obtained by estimating a model with error correction associated with the long-term estimates according to Narayan and Smyth (2008) and Odhiambo (2009). On the explanatory variables, the short-run causal effect is represented by the F-statistic while the long-run causal relationship is represented by the t-statistic on the coefficient of the lagged error correction term (Odhiambo, 2009; Narayan and Smith, 2006).

The equation, where the null hypothesis of no cointegration is rejected, is estimated with an error correction term (Narayan and Smyth, 2006; Morley, 2006). Thus, the long-run relationship between the variables shows that there is a causal relationship in the Granger sense in at least one direction that is determined by the F-statistic and the lagged error correction term.

The error correction model, with a well-tested cointegration relationship, is presented as follows. Adopting the ARDL approach, the model is presented as follows:

$$\Delta LPIBH_t = \alpha_0 + \sum_{i=0}^{P} \beta_0 LPIBH_{t-1} + \sum_{i=0}^{q} \beta_1 TRAVEL_{t-1} + \sum_{i=0}^{q} \beta_2 LCAPITAL_{t-1} + \sum_{i=0}^{q} \beta_3 LSDE_{t-1}$$
$$+ \sum_{i=0}^{q} \beta_4 TRADE_{t-1} + \sum_{i=0}^{q} \beta_5 CREDIT_{t-1} + \sum_{i=0}^{p} \beta_6 LIPC_{t-1} + \rho LPIBH_{t-1} + \theta_1 LTRAVAIL_{t-1}$$
$$+ \theta_2 LCAPITAL_{t-1} + \theta_3 LSDE_{t-1} + \theta_4 LTRADE_{t-1} + \theta_5 CREDIT_{t-1} + \theta_6 LIPC_{t-1} + \mu_t$$

With Δ is the first differences operator; q1 - q6 the Error correction Models (ECM) representation; θ1 - θ6: the long run relationships; p is the number of lags of the explained variable GDPH; q is the number of lags of the explanatory variables. In addition, we apply the "bounds tests" approach in order to know if there is a long-run equilibrium between the variables.

Thus, a Fisher test (the test statistic is the F-statistics) is implemented to test the following hypotheses: the null hypothesis is the absence of a long-run equilibrium relationship. While the alternative hypothesis H1 is the presence of a uniform long-term relationship between the series studied.

ARDL Bounds test presents two sets of critical values. The first set indicates that all variables are integrated of order I(0), while the second set matches the integrated series of order I(1) presented as follows:

$$\Delta LPIBH_t = \alpha_0 + \sum_{i=0}^{P} \beta_0 \Delta LTRAVAIL_{t1} + \sum_{i=0}^{q} \beta_1 \Delta LCAPITAL_{t1} + \sum_{i=0}^{q} \beta_2 \Delta LSDE_{t1}$$
$$+ \sum_{i=0}^{q} \beta_3 \Delta LTRADE_{t1} + \sum_{i=0}^{q} \beta_4 \Delta LCREDIT_{t1} + \sum_{i=0}^{q} \beta_5 \Delta LIPC_{t1} + \lambda ECT_{t-1} + \mu_t$$

With ECT the error correction term, is the speed of adjustment, ECTt-1 is the estimated lagged residuals from equation (3-13) and μt the error correction coefficient which shows the speed of adjustment towards the long-run equilibrium (this term must be significantly negative in order to guarantee the existence of the long-run relationship), where βi are the short-run dynamic parameters to study the convergence of the equilibrium model and which vary from 0,1,...,6. In the long run we evaluate the conditional model as a solution of the following reduced form:

$$LPIBH_t = \alpha_0 + \alpha_1 LTRAVAIL_t + \alpha_2 LCAPITAL_t + \alpha_3 LSDE_t + \alpha_4 LTRADE_t$$
$$+ \alpha_5 LCREDIT_t + \alpha_6 LIPC + \mu_{it}$$

où $\beta_0 = -\alpha_0 / P$, $\beta_0 = -\alpha_0 / p$; $\alpha_1 = -\beta_1 / p$, $\alpha_2 = -\beta_2 / p$, $\alpha_3 = -\beta_3 / p$, $\alpha_4 = -\beta_4 / p$, $\alpha_5 = -\beta_5 / p$, $\alpha_6 = -\beta_6 / p$.

Table 12. *Short-term estimate*

Variable	Coefficient	St-Deviation	T-Stat	probability
Constant	-0.336	0.128	-2.610	0.009
lPIBH{1}	-0.038	0.013	-2.811	0.005
ltravail{1}	-0.019	0.013	-1.418	0.157
capital{1}	-0.038	0.012	3.131	0.001
lsde{1}	-0.002	0.002	-0.719	0.472
TRADE{1}	0.056	0.017	3.212	0.001
credit{1}	-0.013	0.007	-1.841	0.066
Dlpibh{1}	0.095	0.038	2.456	0.014
Dtravail	0.923	1.204	0.766	0.443
Dltravail{1}	-1.380	1.211	-1.138	0.255
Dlcapitl	0.298	0.024	12.209	0.000
Dlsde	0.004	0.015	0.274	0.783
Dltrade	-0.103	0.043	-2.382	0.017
Dcredit	-0.108	0.027	-3.895	0.000
tendace	-0.001	0.000	-2.046	0.041
Dlpibh{1}	0.272	0.073	3.702	0.000
Dltravail	-0.335	1.227	-0.273	0.784
Dltravail{1}	-0.223	1.230	-0.181	0.855
Dlcapital	0.291	0.024	11.800	0.000
Dlsde	0.007	0.015	0.464	0.642
Dltrade	-0.089	0.046	-1.929	0.054
Dlcredit	-0.139	0.032	-4.317	0.000
TREND	-0.000	0.000	-1.343	0.180
EC{1}	0.163	0.088	-1.840	0.066
F Statistic	21.180			
R^2	0.337			
Log Likelihood	362.569			

Source: *Own study.*

The most favourable model is represented by an ARDL (1,1,0,0,0,0), with a short-run result of the ARDL model (p, q1, q2, q3, q4, q5, q6). The results of the short-run estimation show the significance at least at the 5% level of the lagged factors of all the variables. Therefore, the stock of external debt has a negative impact on economic growth.

From our result the error correction term, ECTt-1 is statistically insignificant and negative, which confirms that there is no cointegrating relationship between the variables in the model. More clearly, the estimated value of ECTt-1 is -0.163 assuming that the short term shocks of the previous period are equal to 16.3% this has no effect on the speed of adjustment of the long term equilibrium.

The R-squared of 0.337 shows that 33% of the variations of the external debt are explained by the fluctuations of the significant variables of the model. All variables are significant except for lcredit, lsde and labour.

5. Results and Discussion

It can be seen that the results obtained in the short term will help to complete the long term estimates. About the estimated coefficients of the long term relationship is significant and positive for lCapital and Ltrade. But negative and significant for the rest of variables (lcredit, Lsde, Llabour, lpibh) (Table 13).

The coefficient of an explanatory variable indicates how much the hibp changes following a change in the value of one unit of the explanatory variable, given that all other explanatory variables remain constant. In order to be able to compare the relative strengths of the different variables, standardised regression coefficients are estimated. These coefficients are those that would have been obtained if all variables in the regression had been standardised.

They are measured in terms of the standard deviation and not the units of the variables, and so can be compared with each other. In the long-run model table, the standardised regression coefficients are contained in the standard deviation column.

Table 13. *The Long Term Relationship*

Variable	Coefficient	Standard deviation	T-stat	Probability
Constant	-0.336	0.128	-2.610	0.009
lpibh{1}	-0.038	0.013	-2.811	0.005
ltravail{1}	-0.019	0.013	-1.418	0.157
lcapital{1}	0.038	0.012	3.131	0.001
lsde{1}	**-0.002**	**0.000**	**-2.719**	**0.006**
ltrade{1}	0.056	0.017	3.212	0.001
lcredit{1}	-0.013	0.007	-1.841	0.066

Source: *Own study.*

By examining these two columns, it is possible to rank the variables affecting the long-term exchange rate in descending order of importance:

The work (Ltravail): The reduction in standard deviation by 1% results in a deterioration of the LPIBH by 0.019 points.
The capital (Lcapital): the reduction in the standard deviation of capital by 1% leads to an increase in the ltcpibh of 0.038 points.
External debt stock (lsde): reducing the standard deviation of sde by 1% leads to a deterioration of the ltcpibh by 0.002 points.
Commercial openness (ltrade): reducing the standard deviation of the trade by 1% leads to an improvement in the ltcpibh of 0.05 points.

Credits (lcrédit): the reduction in the standard deviation of credits by 1% leads to a deterioration of the ltcpibh by 0.013 points

We note that there is a differentiated convergence for all elements among the 19 MENA countries. While Jordan, Egypt, Pakistan, Lebanon, Syria, Djibouti, Tunisia, Morocco and Mauritania are on the convergence path, Algeria, Kazakhstan, Oman, Iran, Iraq and Libya are off the path. Notwithstanding the convergence of the empirical estimates of the various parameters and the concordance of the signs with the requirements of economic theory, the explanation of this dynamic has several components:

- intra-sectoral trade in conjunction with neo-Ricardian modelling for some economies;
- different economic structures;
- low quantity FDI flows allocated to low value-added industries and an inefficient financial system (case of Algeria);
- the distinction between wealth and natural resources.

The two groups of countries are convergent because there is a total differentiation of their economies since the first group of countries rely mainly on the services sector, trade and tourism, as well as on some extractive industries such as fertilisers and medicines. They are poor in natural resources - there are phosphate mines, and little maritime wealth. In contrast, the second group relies mainly on oil exports, which account for almost 50% of the state budget, and there is also gas wealth.

Despite the negative effects of external debt on economic growth in emerging market countries, the latter is in a rising situation becoming a sustainable phenomenon that cannot be stopped, but the continued rate of growth at a high pace is not guaranteed, as these countries face a number of challenges, including that their continued success depends on their ability to increase productivity, and achieving this requirement requires comprehensive reform of administrative and governmental institutions in general and the realisation of many policy challenges.

According to the World Bank, after three years of slowdown, economic activity in the MENA region is expected to improve in 2014 but growth will remain below the average recorded during the 2000-2010 period, standing at 3.3% in 2014 before accelerating to 4.6% in 2015. The region's oil exporters, notably the GCC countries, will drive the regional recovery, with growth rates reaching 3.5% in 2014 and 4.8% in 2015.

Ambitious stimulus packages implemented by GCC countries and remittances to the rest of the region, particularly Egypt and Jordan, will continue to boost regional growth as capital and recurrent expenditure continues to rise. Between 2011 and August 2013, GCC countries committed some $21.5 billion (mainly Saudi Arabia, the United Arab Emirates, Kuwait and Qatar) to transition countries, with Egypt's

share accounting for more than half of the total. Among the oil exporting countries, Iran is expected to experience positive growth after two years of contraction due to the sharp decline in oil production and trade caused by the tightening of trade sanctions.

Ultimately, we conclude that the economies of oil importers such as Egypt, Tunisia, Lebanon and Jordan remain fragile, but these countries are expected to recover slightly during this period. Egyptian growth should be fuelled by Gulf funds ($17 billion have been committed since July 2014) and Tunisia and Morocco could benefit from the recovery in the euro area.

Nevertheless, ongoing political and social tensions remain a major risk, and given the high level of debt, combined with the current account and public finance deficit, these economies remain vulnerable to exogenous shocks.

6. **Conclusion**

In this way, this result brings the use of debt resources in these countries back to the forefront. Poor management of public finances, unproductive investments and bad governance are thus at the origin of a (more or less important) absence of real effects of public debt on economic growth. It appears, moreover, that external debt has a significant negative effect on economic growth.

More clearly, this result can be explained by the fact that debt service payments are a drain on domestic resources that should be used for investment. Furthermore, our estimation results do not differ from those of authors who have focused on the impact of external debt on economic growth.

Nevertheless, we were confronted with certain difficulties during our research on the homogeneity of the databases relating to the various variables retained and the possibility of inserting all the relevant variables in the modelling. These are the two main limitations, and with this in mind, further research could take these encumbrances into account to produce more edifying results.

It would also be interesting to extend this research to all the countries of the franc zone, with the additional objective of determining the critical threshold beyond which external debt has a negative impact on growth.

In concrete terms, we can explain the non-linearity by the decline in commodity prices, including oil, and the escalation of conflicts and terrorist attacks in the Middle East. Emerging economic growth has slowed down; Saudi Arabia and some major oil exporting countries are being hit hard by low oil prices.

No improvement is expected soon for this group of countries as oil prices do not seem ready to recover. The main reasons for this recent revision are the ongoing

civil wars, terrorist attacks and low oil prices. The recent clash between Saudi Arabia and Iran adds to the current tensions in the region. If this confrontation were to escalate, military spending could increase, particularly in the countries directly involved and their allies.

Given current levels of public spending and falling oil prices, this could further weaken the economies in question. It is also likely that the recent confrontation will amplify geopolitical risks, with repercussions for investment, tourism and trade in a region that has already been weakened for decades.

At the same time, we note that four of the developing oil exporters have become embroiled in civil wars or major conflicts. Unless there is a peace settlement, no growth is expected in the short term in these countries, namely Syria, Yemen, Libya and Iraq. In addition, the fall in oil prices has hit these economies hard and they now have large budget deficits. Libya stands out with a public deficit exceeding 55.2% of GDP.

The oil exporting countries of the MENA region (except for Algeria and Iran after the lifting of the ban on oil exports) have been hit hard by the fall in oil prices.

The countries of the Middle East and North Africa (e.g., the United States, Canada, the United Kingdom and the United States) are doubly affected by low oil prices on the one hand and civil war on the other (Mottaghi, 2015). Escalating conflicts and the sabotage of oil fields in the majority of oil-exporting developing countries are expected to keep the average growth rate low.

These economies have been hit hard by the conflicts in the four countries already mentioned. Similarly, oil importers in the MENA region have not been able to take full advantage of low oil prices, undermined as they are by the spillover effects of conflicts and civil wars in the region, or by the insecurity caused by terrorist attacks (or both factors together). In this situation, Jordan and Lebanon, which together with Turkey bear the overall burden of hosting Syrian refugees, are crushed by budgetary difficulties. According to the World Bank, Jordan has over 630,000 registered Syrian refugees. In Lebanon, refugees represent a quarter of the population.

In addition, the terrorist attacks have cost the Egyptian and Tunisian economies dearly. According to the World Tourism Organisation (UNWTO), tourism activity (an important source of employment and export earnings) has declined sharply following the recent terrorist attacks in both countries, thereby slowing growth and job creation. Remittances may also have been affected in countries (Egypt, Lebanon and Jordan) that rely heavily on flows from the GCC states.

Overall, growth is expected to be around 3.8% in Egypt and 2.5% in Tunisia in 2016, before gradually picking up in 2017.

At the same time, the Persian Gulf countries are also affected on two levels. On the one hand, the fiscal sustainability of current public spending programmes, including subsidies, will depend crucially on the duration of low oil prices. With the exception of Kuwait, all countries have already reached break-even selling prices for both fiscal stochs and current account balances, which means that governments are either drawing on their reserves and sovereign wealth funds, or taking on debt.

If oil prices remain at their current low levels, Bahrain, Oman and even Saudi Arabia will exhaust their reserves within a few years, unless they reverse their public spending. On the other hand, the valuation of SWFs and reserves could be affected by the decision of the US to raise interest rates, and the associated effects on bond prices.

Thus, in the Mashreq countries, the main impact of the turmoil on the economies of oil importers such as Egypt, Tunisia, Lebanon and Jordan remains fragile, but these countries are expected to make a slight recovery during this period. Egyptian growth should be fuelled by Gulf funds ($17 billion has been committed since July 2014) and Tunisia and Morocco could benefit from the recovery in the euro area.

Nevertheless, the ongoing political and social tensions in these countries remain a major risk, and given the high level of debt, combined with the current account and public finance deficit, these economies remain vulnerable.

Achieving growth would require improvements in the institutions that support well-functioning markets and public services, in addition to good external debt management.

At the same time, it would be essential to reform the governance of public services to make them more efficient and truly equitable. This reform should place the user at the heart of the system, as beneficiary and regulator, and focus on making administrative services more efficient, by simplifying procedures and strengthening accountability.

In this perspective, two orientations could be privileged:

- On the one hand, it is a question of modernising the civil service by resolutely pursuing decentralisation efforts, improving the performance of staff and the administration, while reducing superfluous staff and rationalising the administration.
- On the other hand, it is a matter of strengthening the rule of law and justice by sending a strong signal of a paradigm shift in the protection of people, property and contracts against debt problems and their negative effects.

Ultimately, we conclude that it would be relevant to replicate our study on the effectiveness of external debt for emerging countries. Extending this doctoral study

to other similar contexts and situations would allow us to better judge the robustness of our results.

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