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Abstract:

In recent years, the volume of international aid has increased, from rich countries to poor countries. Despite the importance of this aid, developing countries have not even been able to catch up with emerging countries, contrary to the expectations of convergence theories. Thus, the purpose of this article is to examine the short and the long term impact of foreign aid on economic growth in the case of Tunisia. The paper opted to use a VECM model to examine the long-term relationship of foreign aid on growth. The data cover from the year 1980 to 2013 in the case of Tunisia. The results obtained through VECM model, three are statistically significant. The empirical results are showing that Official Developped Aid affects positively the Tunisian economic growth. On the other hand, there is a long-term relationship between the two variables. In addition, the effectiveness of aid in terms of economic growth is more important in the long term than in the short term.

Keywords: economic growth, Official Developped Aid, effectiveness, long-term relationship, VECM

JEL Classification: F35

1. Introduction

To reduce unemployment and ensure economic growth, investments are increasing and they hold great importance to the government. Its funding is through domestic savings, if sufficient, or by external financing, in case of its failure. This last category is made for developed countries by debt and the developing countries by debt and foreign aid.

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According to the Development Assistance Committee (DAC) of the OECD, aid is a statistic. It represents all donations and loans at sufficiently favorable terms (net of principal repayments) to specified countries, granted by public bodies in the pursuit of objectives of economic development and improvement of living conditions including excluding military activities. Thus, ODA has a moral aspect. It is considered as an act of international solidarity. It is a moral duty to compensation, under which a significant effort, in terms of percentage of GDP, was expected from donor countries.

The aid aims to stimulate growth in developing countries to extract poverty. But poor countries are mainly characterized by low capital stock. So, if help finances investment in these countries, it increases their capital stock. The production's capacity is proportional to the capital stock, while assistance will promotes economic growth in the countries in difficulty, and hence global development.

Thus, the aid becomes the largest program of humanity. Today, the underdeveloped countries have varied and enormous contributions in foreign aid. Either in the form of loans and/or grants, ODA has financed many projects and programs in developing countries, in multiple areas: education, health, infrastructure...

Nevertheless, the controversy multiply around the positive impact of ODA on growth. In this context, there are three theories that oppose this regard: The first shows the existence of a positive relationship to the extent that aid increases investment and capital stock, finance investment. Also, ODA transmitted technology and knowledge from rich countries to poor countries.

The second relationship is conditional. Indeed, under certain circumstances, aid can stimulate growth. Among these conditions, we can distinguish the characteristics of the recipient country and the practices and procedures of donors, On the other hand, the third relationship is negative (or absent). Here, the aid only increases corruption, deteriorates the quality of governance. ODA is necessarily absorbed in limousines and presidential palaces.

From today, Tunisia is unable to catch up with GDP levels seen in developed countries. The various partnerships and agreements, especially with the European Union and international aid have alternated, without real impact on its levels of development.

Indeed, Tunisia's GDP per capita (current US $) decreased in recent years from 4,342.676 in 2008 to 4,197.528 in 2012 despite the fact that net ODA received per capita (constant US dollars) greatly increased during this period from 36.302 to 94.365. The questions that arise are: why this deterioration of growth? And what is the effect of development aid on economic growth in the case of Tunisia?

So, in this framework, we try to elaborate theoretically and empirically the effectiveness of the international Aid in the case of Tunisia, using the software EVIEWS 8.

The majority of previous studies focus on short-term relationship, using the static model or the dynamic model but they neglected to examine the relationship between foreign aid and economic growth in the long-term run. Precisely, this work attempts to fill this gap by granting any major importance to the analysis of this long-term relationship (cointegration), which is our major expansion. In this context, we will study the long-term relationship between ODA and economic growth in the case of Tunisia for the period 1980-2013.

The rest of the document is organized as follows. Section 2 presents a review of the literature. Then, the paper presents the methodology used and results in section 3. The last section of the paper provides a conclusion.

2. Literature Review

Controversies multiply around the effectiveness of foreign aid. Sachs (2004) and Stiglitz (2002) argue that aid is positively correlated to growth. It contributed to the reduction of poverty. According to them, the abundant country of aid would have held even worse results. However, aid enhances economic growth as it increases savings and the stock of capital and finance investment. In addition, it increases worker productivity and transmitted technology and knowledge between poor and rich countries. However, diminishing returns remains ambiguous, if aid increases.

Similarly, Moolio and Kong (2016) showed that foreign aid has a positive long-term effect on economic growth in the case of four countries (Cambodia, Laos, Myanmar, Vietnam) in the region of ASEAN.

In the same context, Arndt et al. (2015) confirmed the effectiveness of foreign aid in terms of economic growth. Arndt et al. (2015) have focused on the role of international aid on immediate sources of growth: they have shown that development aid stimulates economic growth, promotes structural change, improves social indicators and reduces poverty.

However, other economists show the existence of a negative correlation between these two variables. Indeed, Peter Bauer is the pioneer of this thesis, arguing that the aid has a deterrent effect on investment, it influences the private sector and hinders development. Others (like Mosley (1980)) show no correlation between these two variables. The negative effect is mainly explained by the fact that aid is absorbed into limousines and presidential palaces, it encourages corruption.

Similarly, ODA leads to currency appreciation, reduces the profitability of the production of tradable goods, and negatively affect agricultural prices and producers incomes. In addition, aid can reduce savings, whether individuals (effect on the interest rate) or public and can increase the bad governments. What may persist bad economic policies and delay reforms.

Looking at the long-run relationship between economic growth and foreign aid, Mallik (2008) found that there is a long-term negative relationship between real GDP per capita and aid as a percentage of GDP, in the case of the six poorest and most aid-dependent African countries (Central African Republic, Malawi, Mali, Niger, Sierra Leone and Togo). Similarly, in the case of Egypt, Abd El Hamid Ali (2013) has shown that foreign aid is negatively and significantly correlated with short- and long-term economic growth.

While a third group of researchers claims that the relationship between these two variables is conditional. Indeed, some economists, such as Kaufmann and Pritchet (1997), argue that the World Bank's projects have a better performance in countries where civil liberties were more respected. As well, in the same context, Burnside and Dollar (1997, 2000a) have shown that the effectiveness of foreign aid depends on the quality of economic policies. These authors used a policy variable that depends on open trade, inflation and the budget deficit. In this context, Burnside and Dollar (2000) and Collier and Dollar (2002) affirm that the effectiveness of aid is conditional on the quality of economic policies, the quality of governance. Also, there are other factors that influence the effectiveness of aid as: vulnerability to external shocks, the socio-political system, the volatility of aid flows and the absorption capacity.

Indeed, Amprou and Chauvet (2004) show that economic growth in vulnerable countries may feel twice shocks which the first is direct, while the second is indirect through their influence on the quality of economic policies. So the effectiveness of aid is higher in countries suffering from shock even if they have poor policies.

About post-conflict situations, Collier and Hoeffler (2002) argue that these periods may approve two contradictory situations: first, rebuilding the country and with the logical collapse of wages, aid effectiveness decreases on the other hand, weak governments during these periods weakens efficiency. In addition, there are other circumstances such as export price shocks (Collier and Dehn 2001), climate disruption and the terms of trade (Guillaumont and Chauvet 2001), the quality of policies and institutions...

Similarly, practices and procedures of donors may also condition the aid-growth relationship. However, multilateral aid could be more effective than bilateral aid, and tied aid is supposed to be more productive than untied aid. In addition, donor programs are less effective if they set up a large bureaucracy.

We can say then that the direct relationship between aid and growth is not decided. So, some conditions remain crucial for the effectiveness of aid. The quality of governance is the most important.

3. Methodology and Results

Various methods have been used to understand the effectiveness of ODA in terms of economic growth. The authors neglected the long-term relationship, in this context we focus on the long-term relationship by using the Johansen model and the VECM model.

3.1. Model and choice of variables:

From a methodological point of view, we choose to evaluate the effectiveness of development assistance in terms of economic growth in the case of Tunisia. The data are obtained from the database of the World Development Indicators of the World Bank in 2013. Then, the equation to be studied is as follows:

$$Y_{it} = \tau_0 + \varphi_1 oda_{it} + \varphi_3 m2_{it} + \varphi_4 open_{it} + \varphi_5 inf_{it} + \varphi_6 pop_{it} + \pi_{it} \quad (1)$$

With: $\mathbf{Y_{it}}$ **:** Per capita growth rates (Burnside and Dollar, 2000), $\mathbf{oda_{it}}$ **:** Aid net received by resident divided by the GDP per capita (McGillivray et al., 2006), $\boldsymbol{open}$ **:** the trade opening that is measured by the sum of export and import relative to GDP (%) (McGillivray et al., 2006; Gries et al., 2009), $\mathbf{M2_{it}}$**:** The money supply (M2) divided by the interior product gross which measures the financial depth) (Burnside and Dollar, 2000), $\mathbf{pop_{it}}$: the population growth (annual%) (Ekanayake and Chatrna, 2010) which is a proxy for the labor force related to GDP (%) (McGillivray et al., 2006, Gries et al., 2009), $\mathbf{inf_{it}}$: the Consumer Price Index (McGillivray et al., 2006), $\boldsymbol{\pi_{it}}$ **:** The term of error $\boldsymbol{\tau_0}$ **:** The constant

The estimation of our model goes first by studying the short term relationship between aid and economic growth. Then we will study the long-term relationship between the two variables by applying the cointegration test.

3.2. Results

3.2.1. Determination of the number of lags

The choice of the optimum number of lags involves estimating our VAR (p) in order to find the order "p" between "0" and a certain order, which minimizes the Akaike criteria (AIC) and Schwartz criteria (SC). So, we estimate our VAR in several models ranging VAR with a ‘0’ lag to ’2’ lags. So we can say that the number of lags is equal to '2', as shown in the following table:

Table 1: Determination of the number of lags

Lag	AIC	SC

0	-12.17815	-11.90332
1	-28.49764	-26.57386
2	**-31.66392***	**-28.09119***

* indicates lag order selected by the criterion

3.2.2. Long term relationship

In order to study the long-term relationship, we Apply, first, the stationarity test for each variable, which is usually manifested by the Unit Root test.

Table 2: Unit root test results

	Stationarity in level		**Stationarity in first difference**
	trend and intercept	intercept	trend and intercept
oda	-2.370737	-1.903790	-6.372446*
	0.3877	0.3269	0.0000
Y	-1.941737	0.099183	-5.770191*
	0.6128	0.9614	0.0002
open	-2.781128	-1.788479	-5.408887*
	0.2128	0.3802	0.0005
m2	-2.207162	-0.385316	-3.891880*
	0.4715	0.9012	0.0228
pop	-1.341578	-2.100034	-4.473264*
	0.8604	0.2459	0.0058
inf	-2.513943	-0.193904	-9.503045*
	0.3197	0.9295	0.0000

Values in parentheses are probability: * significance at 5%

According to this table all variables are not stationary in level (not for DS). However, there are stationary in the first difference.

Second, Testing the long-term relationship's existence or not in our model is based on the Trace Statisctic and Max-Eigen Statisctic, as shown in the following table:

This is to check the cointegration test of Johansen (1988) based on the criterion of the value of the trace and of the proper value.

The hypothesis test is formulated as follows:

-If the statistic of the trace is greater than the value criticized then one rejects H0 therefore there exists at least one cointegration relation.

- If the trace statistic is less than the critiqued value, then H0 is accepted so there is no cointegration relationship.

For a significance level of 5%, the null hypothesis placing the existence of cointegrating relationship between the variables of the model is accepted if the value of the trace (TR) is less than the critical value tabulated. However, if the value of the trace is greater than its critical value, then there is no cointegration relation between the variables.

3.2.3. Test results

Table 3: Cointegration test results

No. of CE(s)	Eigenvalue	Trace Statistic	Prob.**	Max-Eigen	Prob.**
None *	0.893032	201.6259	(0.0000)	71.52711	(0.0000)
At most 1 *	0.803843	130.0988	(0.0000)	52.12281	(0.0001)
At most 2 *	0.764033	77.97595	(0.0000)	46.20996	(0.0001)
At most 3 *	0.477794	31.76599	(0.0293)	20.79018	(0.0557)
At most 4	0.259999	10.97581	(0.2130)	9.635308	(0.2370)
At most 5	0.041025	1.340498	(0.2469)	1.340498	(0.2469)

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level
Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

We conclude that the trace and the intrinsic value that is below the tabulated value at the 5% level indicates that there is one (1) cointegration relationship. Given the existence of cointegration relationship, we can then estimate the vector error correction model (VECM).

3.2.4. Identification of the cointegration relationship

The identification of the cointegration relationship between the variables is shown by the econometric estimation by LS (Least Square) which tends to assess the true impact of the exogenous variable on the endogenous variable in the long-term relationship.

Table 4: OLS model results

Variable	Coefficient
Oda	**0.032839****
	0.0498
Inf	-0.020259*
	0.0708
m2	0.423048***
	0.0060
Open	0.074053**
	0.0397
Pop	1.472176***
	0.0091
C	-17.01598***
	0.0053
R-squared	0.935917
Adjusted R-squared	0.924473
F-statistic	81.78619

In Tunisia, ODA is positively and significantly correlated with economic growth. In fact, a 1% increase in ODA will lead to 0.032839 increase economic growth. This confirms the ideas of Sachs (2004).

3.2.5. Causality test

Table 5: causality test results

Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
oda does not cause Y	35	2.79781	**0.0769**
Y does not cause oda		1.25843	**1.88398**

By applying the Granger causality test, we can synthesize as shown in the table below that the causal relationship between economic growth and ODA is unidirectional for the case of Tunisia. Indeed, we find that the null hypothesis (H0) that "Y" does not cause "ODA" is accepted (probability> 0.05). However, the null hypothesis (H0) that "apd" does not cause "Y" is rejected at the 5% level, Which explains that "apd" causes "Y", so this is a unidirectional causality.

This relationship is prejudged because aid flows are intended principally to improve the economic growth: poverty reduction, improvement of infrastructure, reducing unemployment, increasing investment...

3.2.6. Estimation VECM model

Table 6: Heteroscedasticity test

Heteroscedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.368312	Prob. F(3,30)	0.7764
Obs*R-squared	1.207777	Prob. Chi-Square(3)	0.7511
Scaled explained SS	1.120669	Prob. Chi-Square(3)	0.7721

According to the test Breusch-Pagan-Godfrey, 0.7764 the probability is greater than 5%, hence we accept the null hypothesis of homoscedasticity residues or error terms.

Table 7 : VECM model results

Long term relationship	
PIB(-1)	1.000000
ODA(-1)	0.275451*
	(0.06692)
INF(-1)	-4.107836
	(2.20286)
M2(-1)	-0.860898
	(0.54895)
OUV(-1)	-0.193601
	(0.49961)
POP(-1)	15.39342
	(7.66208)
C	-234.5227
Ajustment parameter	-0.059727
	(0.03038)
Short term relationship	
D(PIB(-1))	-0.373479
	(0.20149)
D(PIB(-2))	0.041086
	(0.21216)
D(ODA(-1))	0.025338**

	(0.01236)
D(ODA(-2))	0.002647**
	(0.01348)
D(INF(-1))	-0.075371
	(0.49292)
D(INF(-2))	-0.568858
	(0.51389)
D(M2(-1))	-0.324477
	(0.12798)
D(M2(-2))	-0.116756
	(0.14921)
D(OUV(-1))	0.025744*
	(0.05895)
D(OUV(-2))	0.127875*
	(0.06450)
D(POP(-1))	-0.326580
	(9.02632)
D(POP(-2))	-4.720670
	(8.97838)
C	0.142063**
	(0.04741)
R-squared	0.616932
Adj. R-squared	0.323997
F-statistic	2.106039

The opening trade (open) is positively and significantly correlated with the economic growth, in the short-term. This means that in the short term, liberalization will facilitate the transfer of technologies witch improve the productivity; it therefore has a positive impact on economic growth (Tiba et al (2015)).

For the others variables (pop, inf) are not significantly correlated with the economic growth in the short term, so no relationship between these variables and economic growth in the short term.

Therefore, Aid has a positive and significant relationship with economic growth. These findings are in line with those of Sachs (2004).

In the long term, only the foreign aid is significantly and positively correlated with the economic growth. So, a 1% increase in ODA will lead to 0.275451 increase economic growth. These findings are in line with those of Abd El Hamid Ali. (2013). We can conclude that the effectiveness of aid in terms of economic growth is more important in the long term than in the short term. In fact the coefficient of foreign aid is more important in the long run (0.275451) than in the short run (0.032839)

4. Conclusion

Since the existence of the aid to development, multiples discuss are interrogated on its fundamentals and measures of its impact. Such has been our temptation in full of this work, which has carried on the countries down returned. It is true that aid can be justified by the need for a policy of redistribution on a planetarium scale but also aims at fighting poverty.

Burnside and Dollar (1997) showed by the estimation of a model in the data of the panel that the coefficient "aid * economic policy" is positive and significant. They have finished that aid promotes growth when combined with sound policies. In addition, Burnside and Dollar (2004), with the interaction of the aid with the quality of governance measured by the CPIA, have shown the no significativity of the coefficient of the aid when the variable of interaction is significant. Besides, Easterly, Levine and Roodman (2003), in an analysis on another worldwide sample, were finding a coefficient "Aide * political economic" that is negative and not-significant.

To achieve our objective, we used a methodology based on a VECM model applied to the case of Tunisia. The results of our regression allow us to take a stand on the problem of aid. From a theoretical point of view, ODA appears to be more effective at increasing economic growth in developing economies. Our results suggest that aid flows should be aimed at improving and promoting Tunisia's economic growth in the short and long term. But, the effectiveness of aid in terms of economic growth is more important in the long term than in the short term. In fact the coefficient of foreign aid is more important in the long run (0.275451) than in the short run (0.032839).

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