

# The Impact of Economic Policies on Economic Growth in a Group of Arabic Countries: Empirical Verification using Non-Stationary Panel Model

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## Abstract

The economic literature shows the existence of a real impact of the economic policies on economic growth. Since the 1980s, these policies in Arab countries have experienced significant reforms that sought to give them more flexibility and efficiency. This work proposes a study of the impact of monetary, fiscal and exchange rate policies on economic activity of a group of Arab countries in that to estimate a growth function on these countries using the non-stationary panel data model. From the results found, it was possible to identify the impact of the economic policies on economic activity.

**Keywords:** monetary policy, fiscal policy, exchange rate policy, economic growth, non-stationary panel data model.

**JEL classification:** C23, E60, O40

## 1. Introduction

The question of the policy mix is now the subject of debate and discussion among economists and economic policy experts in the developed and developing countries. On the theoretical level, the problem of the policy mix, defined as the relationship between monetary policy and fiscal policy went through two different approaches, reflecting the conceptual changes that have affected the economic policies themselves. In a first approach, the policy mix is seen as a problem of optimal allocation of instruments to goals, according to Mundell (1962) and Fleming (1962), which are in relation to the main remarkable facts at that time, namely the opening of economies and capital mobility, recommends the allocation of monetary policy in the external balance and the allocation of fiscal policy to internal balance. Furthermore, the famous subsequent debate between monetarists and Keynesians concerning the adequate allocation results in underlying assumptions to the calculation of monetary and fiscal multipliers such the

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degree of openness of the economy, capital mobility, the nature of expectations and price flexibility. The second theoretical approach to the issue of the policy mix is studying the interaction between monetary and fiscal policies as a problem of coordination between the economic policy authorities. This new approach concerns strategic analysis of the policy mix, in relation to the independence of central banks and the European monetary unification. Our study will involve seven Arab countries namely; Algeria, Bahrain, Egypt, Jordan, Lebanon, Morocco and Tunisia; which do not present a problem of coordination between monetary and fiscal policies in the absence of central bank independence of these countries. That is why we will limit our research to the study of the first theoretical approach.

## **2. Literature review**

In order to accurately describe the evolution of the interaction between monetary and fiscal policies in the economic literature, it is necessary to define the policy mix and identify its characteristics through the various schools of thought starting from the classical school to the New Keynesian Economics.

For conventional, tight monetary policy is effective because of its immediate effect on the general price level. Indeed, the decrease in the money supply automatically leads to lower prices and therefore it is a purely disinflationary phenomenon. Therefore, the policy mix in favor of classical economists arises from a restrictive monetary policy and a passive fiscal policy. For Keynesians, and according to the IS-LM model, fiscal policy is more effective than the interest rate is elastic with respect to the LM curve, and the higher the rate of interest is elastic over IS, monetary policy is more effective. A combination of both expansionary macroeconomic policies will allow us to have the optimal policy mix to simultaneously achieve the objectives of growth and price stability. Moreover, according to Mundell Fleming model that considered the opening of the economy, and a fixed exchange rate regime, in the absence of capital mobility, fiscal and monetary policies are ineffective, and, and such circumstances, the policy mix is determined by two passive monetary and fiscal policies. However, in case of perfect capital mobility, fiscal policy becomes effective while monetary policy remains ineffective, and therefore the appropriate policy mix will comprise a dominant fiscal policy and a passive accompanying monetary policy. But if the exchange rate regime is flexible, so in the absence of capital mobility, adequate policy mix consists of two expansionary monetary and fiscal policies and in case of perfect capital mobility, the policy mix consists of a dominant monetary policy and fiscal policy of passive support. Finally, from the interpretation of the Keynesian Phillips curve, it was obvious that the proposed policy mix should consist of expansionary fiscal and monetary policies to stimulate activity and achieve full employment, but at the expense of inflation.

For post-Keynesian, the policy mix consists of a dominant fiscal policy and a passive accompanying monetary policy. While for monetarists, and through the interpretation of the Phillips curve extended period, the policy mix should have a combination of a dominant restrictive monetary policy and a passive fiscal policy.

Furthermore, and as regards to the new classical economists, we can say that they consider the absolute ineffectiveness of monetary policy is explained by the rational expectations that

economic agents constantly form and therefore the policy mix in this School has passive monetary and fiscal policies.

Finally, for the New Keynesian, in case of fixed exchange rate and perfect capital mobility, the policy mix is defined as the combination of a dominant fiscal policy and a support monetary policy. However, in case of flexible exchange rate regime, and always in the presence of perfect capital mobility, the policy mix will be composed of a dominant monetary policy and fiscal policy of passive support.

The following table summarizes our analysis:

**Table 1: the policy mix across the different schools of thought**

Theories	Policy mix
<b>The classics</b>	Restrictive monetary policy + passive fiscal policy
<b>The Keynesians</b>	Expansionary fiscal policy + Expansionary monetary policy
<b>(Mundell &amp; Fleming)</b>	Ch. Fi, SM* : passive fiscal policy + passive monetary policy.
	Ch. Fi, PM** : dominant fiscal policy + passive monetary policy.
	Ch. FI, SM*** : expansionist fiscal policy + expansionist monetary policy
	Ch. FI, PM**** : dominant monetary policy + passive fiscal policy
(Keynesian model +	Expansionary fiscal policy + Expansionary monetary policy
Philips equation)	
<b>The post-</b>	Dominant fiscal policy + Passive monetary policy
<b>Keynesians</b>	Passive fiscal policy + Dominant and restrictive monetary policy
<b>The monetarists</b>	
(LT Philips curve)	Passive monetary policy + passive fiscal policy
<b>The new classics</b>	Ch. Fi, PM : Dominant fiscal policy + Passive monetary policy
<b>The New Keynesians</b>	Ch. FI, PM : Passive fiscal policy + Dominant monetary policy

Beyond the theoretical side, Keynesian and monetarist theories have mostly fueled many empirical studies, particularly in the Federal Reserve Bank of St. Louis (Andersen and Jordan

1968; Keran, 1969 and Andersen and Carlson, 1970). In particular, Andersen and Carlson (1970) have developed and estimated a model, known as the St. Louis model, a name which expresses the change in the total current expenditure based on changes in the money supply and public spending. The objective of this model was first, to test the relative effectiveness of monetary and fiscal policies on economic activity, and secondly, to provide a forecasting tool of aggregate demand. The fundamental result that emerges is this method is that the impact of monetary policy is more important, faster and more predictable than that of fiscal policy.

In a later version of the St. Louis model, a specification in terms of growth rate was used (Carlson, 1978). Quarterly data with the United States over the period 1953-1978, the results show that the effects of public spending are close to zero while those in the money supply are significant.

Outside the United States, some authors, using mostly the St. Louis equation, reached mixed results: Keran (1970), Chowdhury (1988), Betten and Hafer (1983). The results of Keran (1970), about eight industrialized countries, have shown that the effects of fiscal policy were much more significant than those of monetary policy.

The study of Betten and Hafer (1983) for six industrialized countries (Germany, Canada, USA, France, Japan and the United Kingdom), concludes that monetary policy had a significant effect in all the countries studied, while the budgetary influence was significant in France and the UK.

Chowdhury (1988) apply the equation St. Louis to six European countries: Austria, Belgium, Denmark, Netherlands, Norway and Sweden. The results indicate that the impact of monetary policy on economic activity was higher in three countries (Denmark, Norway and Sweden), while fiscal policy was more efficient in Belgium and Holland. The results for Austria have not been satisfactory.

Recently Jiranyakul (2007) used data from Thailand between 1993 and 2004, to arrive at the absence of a cointegration relationship between economic growth, public spending and the supply of money but at the existence of a unidirectional causal relationship between economic growth, public spending and supply of the currency.

Ciftcioglu and Begovic (2008) studied the relationship between economic growth and several macroeconomic indicators for a number of European countries between 1995 and 2003, and among their results, it gives off the negative effects of inflation and foreign debt on economic growth and the positive effects of domestic investment, economic openness and budget deficit on economic growth.

Finally, Ullah and Rauf (2013) analyzed the impact of certain macroeconomic variables on economic growth for a number of Asian countries for the period 1990 to 2010, they were able to identify that economic growth is positively affected by foreign direct investment and negatively by exports while the labor force and taxation have no impact on economic growth.

### **3. Presentation of the model and methodology of the estimate**

In this section, we present the results and interpretations of our econometric analysis of the relationship between economic growth and economic policies.

### 3.1. Model presentation

Based on the model of Batten & Hafer (1983) increased student approaching Saint Louis as it was extended by several authors in recent years, the choice of this model is justified by the fact that it has been widely used by recent empirical studies on the relationship between economic growth and economic policy.

The estimates that follow will be based on a function of the following reduced form:

$$GDP_{it} = \alpha + \beta_1 G_{it} + \beta_2 EXP_{it} + \beta_3 M2_{it} + \beta_4 INF_{it} + \beta_5 RER_{it} + \varepsilon_{it}$$

with, *i* denotes countries (*i* = 1, 2, ..., *N*) and *t* represents time (*t* = 1, ..., *T*), GDP: the logarithm of GDP per capita calculated in constant 2005 dollars, *G* : the logarithm of the ratio of government consumption to GDP, EXP: the level of exports relative to GDP, M2: the logarithm of the monetary aggregate M2 as a percentage of GDP, INF: the inflation rate, RER: the logarithm of the index of real effective exchange rates,  $\varepsilon_{it}$ : the error term and ( $\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$ ) the vector of coefficients to estimate.

In what follows, we will try to advance this long-term relationship with panel data, taking into account the non-stationary series for a sample of 8 Arab countries for the period 1990-2013.

- We use GDP per capita as a variable determined for our sample.
- Exports account for changes in trade policy.
- Public spending measures fiscal policy.
- The monetary aggregate M2 shows the evolution of the money supply in circulation, it reflects the monetary policy.
- The inflation rate measures the degree of price stability which can influence the three previous policies.
- The index of the real effective exchange rate refers to the exchange rate policy.

### 3.2. Estimation methodology

A cointegration analysis on panel data provides a natural framework to examine the relationship between economic growth and its determinants.

#### Unit root tests

The study of the stationarity of all the variables is a necessary step in any study. In this study, we used the procedure of panel stationarity tests that are provided by Im & all (2003). These are the most used, when the time dimension is limited. The authors propose tests which allow the detection of the presence of a unit root in models using ADF statistics File.

**TABLE1: unit root test results**

Variables	GDP	G	EXP	M2	INF	RER
level	-0.676	-0.024	3.154	-0.490	1.328	-0.320
First difference	-2.381*	3.154*	8.894*	-7.236*	-8.372*	-8.484*

\* = signification at 1 percent, \*\* = signification at 5 percent, \*\*\* = signification at 10 percent.

Source: Author's calculation based IPS test results.

The IPS tests lead to the conclusion that all variables are not stationary in levels. The variables in the equation become stationary after first differentiating, so they are all integrated of order 1.

Having established that all series are integrated on the same order (1), we test the existence of a stable long-term linear relationship between these series.

**Cointegration Test**

Once the integration in the first series order is verified, we can proceed to the cointegration tests. The application of the test Pedroni (2004) brings us to the following results:

**TABLE2:Cointegration test results**

	Statistics	Probabilities
Panel v-Statistic	6.323262	0.0000
Panel rho-Statistic	5.147879	1.0000
Panel PP-Statistic	-5.087215	0.0000
Panel ADF-Statistic	-5.316128	0.0000
Group rho-Statistic	6.391372	1.0000
Group PP-Statistic	-5.004103	0.0000
Group ADF-Statistic	-5.262592	0.0000

\* = signification at 1 percent, \*\* = signification at 5percentet \*\*\* signification at 10 percent.

Source: Authors' calculations based on test results of Pedroni.

According to simulations of Pedroni (1999), for small sample sizes, the most powerful of the seven test is similar to the ADF test (Group ADF-Statistic). The cointegration tests of Pedroni (2004) presented in the table above show that there is a cointegration relationship between real GDP per capita and its determinants described by our theoretical model.

**Regression and Interpretation**

The long-term relationship previously detected can be estimated using different methods, but false choose the most efficient. Pedroni (2004) concluded that the FMOLS estimator is most effective in estimating cointegration relations panel data.

**TABLE 3: Results of the regression method by FMOLS**

Variables	Endogenous variable (GDP)				
	G	EXP	M2	INF	RER
	-0.116*	0.056*	0.152*	-0.111*	-0.084*

\* = signification at 1 percent, \*\* = signification at 5percent and \*\*\* signification at 10 percent.

Source: Authors' calculations based on the results of the regression method DOLS.

The negative sign given to public spending ratio is expected, since a large volume of non-productive expenditure reduces the growth rate for a given initial value of GDP, in other words, a significant handicap Directors growth, Barro (1990). The importance of the negative effect of government spending is about 11%.

The positive sign of the export coefficient is expected. For the policy of trade liberalization, literature indicates the existence of a possible positive causality between export growth and economic growth. A 1% increase in exports would increase 0056% of GDP per head.

Exports may be an acceleration engine for economic growth through various transmission channels to the real economy. The main channels are, firstly, a developed export sector improves the domestic and foreign investment, thus increasing capital accumulation. Moreover, the genesis of currencies, improves the balance of payments.

The results of our estimates show that each monetary policy based on the increase of money in circulation in the economy measured by the monetary aggregate M2 (translate it appears near the phenomenon of money creation by the national financial system) improved economic growth in the countries in our sample. Each 1% increase in M2 would increase 0152% of GDP per head.

As shown Renelt & Levine (1992), the rise in inflation rates disadvantages economic development since it leads to an internal imbalance with a lack of investor confidence in government policies. This lack of confidence leads to reduced production, lower exports, the worsening of the trade balance and economic recession. In our study, the increase in inflation rates of 1% inhibits economic growth 0.111%.

Finally, we note that the appreciation of the real exchange rate adversely affects long-term economic growth. The negative and statistically significant sign of the coefficient of the RER variable is consistent with the results predicted by the empirical work of Ghura & Grennes (1993) and Frankel & Rose (2002). By referring to our results, we can confirm the idea that undervaluation accelerates growth, whereas the overvaluation slows.

### **Causality Test**

In 1969, Granger led a causality test for time series then later in 2003 and for panel data. As the variables are I (1) and cointegrated, a model of error correction can be used to identify the causal direction.



**TABLE4: Causality test results**

Direction of causality →	GDP	G	EXP	M2	INF	RER
<b>GDP</b>	-	13.693*	42.712*	34.81*	82.44*	73.772*
<b>G</b>	0.137	-	23.017*	16.956*	6.714*	6.216*
<b>EXP</b>	8.520*	9.277*	-	97.085*	2.381***	19.335*
<b>M2</b>	2.452***	14.67*	2.679***	-	12.963*	25.32*
<b>INF</b>	37.033*	0.896	25.354*	31.431*	-	12.841*
<b>RER</b>	34.009*	10.1*	9.149*	16.092*	6.354*	-

\* = signification at 1 percent, \*\* = signification at 5percent and \*\*\* signification at 10 percent.

Source: Authors' calculations based on results of Grangers causality test .

The results in Table 4 show that there is a unidirectional causality of GDP to public spending to a level of significance of 1%. Ie an increase in GDP per head will cause an increase in government spending.

We also observe a bidirectional causality direction of other key variables GDP per capita.

#### 4. Conclusion

Through our study, we tried; based on the model of Batten & Hafer (1983) increased student approaching Saint Louis as it was extended by several authors in recent years; to demonstrate the impact of economic policies on growth for a number of Arab countries between 1990 and 2013 using panel data. At the end of our research, we found that fiscal policy by increasing public spending has a negative effect on real activity and a commercial opening to increase exports, positively affects economic growth. We could also clear that a monetary policy aimed at increasing the money supply within the meaning of M2, could boost economic growth, although an increase in the inflation rate would have a negative impact on the economic activity. Finally, an exchange policy based on the slip of the real exchange rate aims to improve the competitiveness of local products on international markets and subsequently the progress of economic growth.

Finally, based on the Granger causality test, we showed a unidirectional causality of GDP to DPUB and a bidirectional relationship between GDP and four other determinants.

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