

Economic Studies

Analyzing the Policy Trilemma's Options

*Evidence from Selected Arab countries*

Elwaleed Ahmed TALHA



صندوق النقد العربي  
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**Arab Monetary Fund**

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## **Contents**

ABSTRACT.....	4
Introduction.....	5
Literature reviews .....	6
Explaining the trilemma's options .....	8
Data, methodology, and modeling .....	11
Variables (definition and sources) .....	11
Model structure .....	12
Models' outcomes.....	14
<i>Policy option 1</i> .....	14
<i>Policy option 2</i> .....	15
<i>Capital mobility</i> .....	16
<i>Exchange rate arrangements</i> .....	17
Policy Discussions .....	18
Policy recommendations.....	19
Reference List .....	20

### **Tables**

Table (1) The practice of the trilemma's scenarios in Arab countries .....	9
Table (2) variables (definition and sources) .....	11
Table (3) Modelling outcomes.....	14
Table (4) Gain and Loss related to policy options. ....	18

### **Figures**

Figure (1) Policy trilemma's scenarios .....	8
Figure (2) The commonly used policy options in Arab countries.....	9

**ABSTRACT:**

This paper aims to examine some policy options related to the trilemma using data for 17 Arab countries over the period 1970 to 2021. It employs the panel least square method to figure out the impact of policy options on GDP growth as a dependent variable along with other explanatory variables. Interestingly, the paper finds that one of the three policy trilemma options has a propensity to be effective. The analysis reveals that countries that are maintaining fixed exchange regime, free capital mobility, and monetary non-autonomy are more likely better off compared to other countries. The results also show that capital mobility usually yields better GDP growth compared to capital restrictions.

**Keywords:** economic growth, exchange rate, monetary policy, capital flows

**JEL:** B17, E5, F4, E52, F38, F31

## **I. Introduction**

Economic theory tells us that the policy trilemma, also known as the impossible trinity, implies that a country must choose between free capital mobility, fixed exchange rate, and monetary autonomy. It could be summarized in *Figure (1)*, where each corner represents an articulate policy option that is mutually exclusive while the three bases of the triangle tend to be mutually exclusive. Corners point to the trilemma, while at least two triangle's bases signify alternatives that a country is likely to pursue.

The notion of the policy trilemma points out that having the three corners of the trilemma in the international economy is less likely to occur, meaning that the government chooses between three mutually exclusive alternatives related to the monetary policy and international trade. These three policy options are free capital mobility, fixed exchange rate, and monetary autonomy. However, the main concern is how governments could optimally deal with these options.

Exchange rate arrangement is intrinsic to the formulation of the policy trilemma in the sense that it acquires great importance among the economic variables. A country has to choose between a fixed regime, or a flexible regime. In either one, the regime must be chosen carefully based on the country-specific factors.

On the other hand, capital flows controls are another important policy option. Some countries fully liberalize the capital account allowing capital to move freely across borders. While others impose controls to contain capital movement (in-flow and out-flow).

In the same context, monetary policy framework compliments the two components of the policy trilemma (exchange rate, and capital mobility). A country has to choose between monetary autonomy or non-autonomy. The autonomous monetary policy allows the central bank to drive the monetary policy vehicle independently without external influences. Whereas non-autonomous points to that the central bank follows the monetary policy direction of the pegged country, meaning that it steers the interest rate in accordance with the rate in the pegged country.

The objective of the paper is to assess the impact of policy options related to the trilemma on economic growth using independent dummy variables. To achieve this objective, the

paper is formatted as follows: section (II) reviews previous works on policy trilemma and different outcomes concluded by scholars. Section (III) examines the theoretical characterization of the trilemma and Arab countries policy choices. Methodology and modelling cover the estimation method, variables, data sources, and hypothesis testing are examined in section (IV). The estimated results are discussed in section (VI). Finally, recommendations are presented in section (VII).

## **II. Literature reviews**

Over the last decades, the topic of the policy trilemma has been investigated broadly across the literature. *Cevik and Zhu (2019a)* and *Devereux & Engel (2005)* argued that independent monetary policy, a fixed exchange regime and free movement of capital cannot occur simultaneously. *Taylor and Feenstra (2008)* found that it is hard for the government to control the three options simultaneously, one of the three corners should be dismissed. Recently, *Georgiadis & Zhu, (2019)* assess the empirical validity of the trilemma by estimating Taylor rule-type monetary policy reaction functions.

Furthermore, *Rey (2014)* concluded that flexible exchange regimes are insufficient for governments to adopt monetary policy autonomy in the existence of a large capital flow. Similarly, *Georgiadis and Zhu (2019b)* reached out to an identical result is that under floating exchange rate and capital controls, the policy rate at the home country tends to be less responsive to the policy rate at the trading partners. While *Klein and Shambaugh, (2013c)* confirmed that full capital controls or floating exchange regimes help countries pursue independent monetary policy.

Recently *Cevik and Zhu (2019b)* demonstrated that monetary autonomy helps a country to achieve inflation targeting, while *Bleaney, et al., (2012)*, concluded that pegged regimes with capital restrictions make countries pay more attention to monitoring global interest rates. *Kose and Prasad, (2004)* found that easing restrictions on capital accounts while maintaining fixed exchange rate regime under inconsistent domestic macroeconomic policies has been followed by a crisis in many countries. Restrictions on capital flows are typically imposed to limit downward or upward pressures on the exchange rate. *Bakker and Chapple (2002)* argued that

capital restrictions protect the domestic economy from exogenous disturbances and reduce severe exchange rate fluctuations caused by volatile capital flows.

Several papers addressed the relationship between the exchange rate and economic growth. *Ghosh , et al, (1996)* pointed out that the exchange rate regime can influence economic growth through investment or increased productivity. Pegged regimes have higher investment, while floating regimes have faster productivity growth. On the net, per capita GDP growth is slightly faster under floating regimes. *Khondker, et al, (2012)* found that in the long-run exchange rate depreciation causes an increase in the aggregate output, while in the short-run might cause a slowdown in growth in Bangladesh.

However, *Karahan, (2020)* found that there is a negative causal relationship between exchange rates and economic growth in Turkey. An IMF's paper on the GCC Monetary Union—Choice of Exchange Rate Regime, *Khan, et al., (2008)* finds that a more flexible regime allow to adjust to real shocks better than under a fixed exchange rate regime, but the structural and institutional characteristics of the GCC countries, the challenge of choosing an alternative nominal anchor, and the need to implement a number of financial reforms and decision-making processes to operationalize a floating regime suggest that moving to a float is more of a longer-term option.

*Combes, et al, (2017)* argued that capital inflows can directly support economic growth by easing restrictions on domestic resources but can also indirectly weaken growth through the appreciation of the real exchange rate. *Soto, (2000)* found that there is a robust correlation between capital flows (FDI and portfolio equity flows) and economic growth, while portfolio bond flows are not significantly linked to economic growth.



### III. Explaining the trilemma's options

The foremost intuition behind the triangle in *figure (1)*, is that a country can choose two out of three options, as follows:

**Figure (1) Policy trilemma's scenarios**

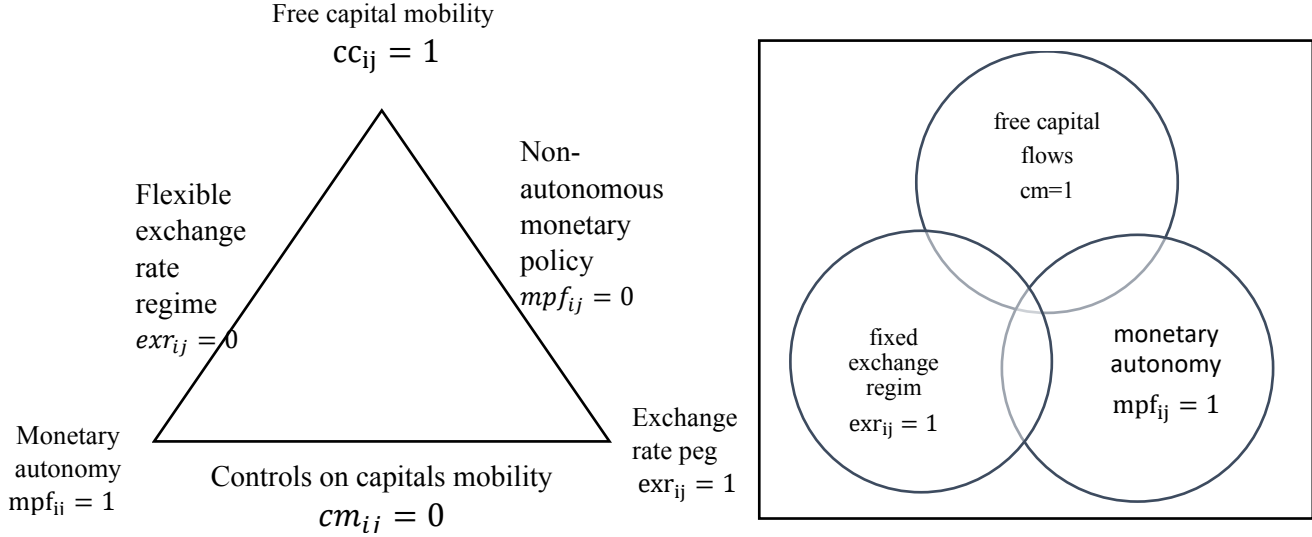


Figure (1) indicates that the three policy options on the corners are mutually exclusive. The probability of having free capital mobility cannot happen simultaneously with the probability of adopting a fixed exchange regime and maintaining monetary autonomy. In contrast, the triangle's bases could also be mutually exclusive in some situations; however, in very extreme cases, capital restrictions could be associated with non-autonomous monetary policy and flexible exchange regime.

- $cm_{ij}$  refers to capital mobility and takes the value (1) when the country operates under free movement of capital and the value (0) under capital restrictions.
- $mpf_{ij}$  stands for monetary policy framework and takes the value (1) as the country adopt monetary autonomy and (0) means monetary non-autonomous.
- $exr_{ij}$  refers to the exchange rate arrangements and takes the value (1) as the country pursues a fixed exchange regime, and (0) otherwise.

## Analyzing the Policy Trilemma's Options

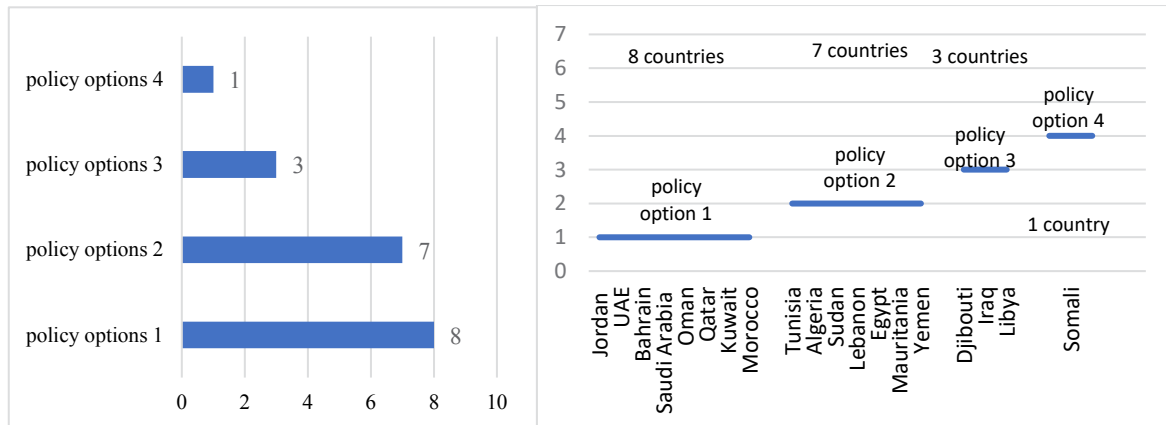
### Evidence from Selected Arab countries

**Table (1) The practice of the trilemma's scenarios in Arab countries**

The country	Monetary policy management		Exchange rate arrangements <i>De facto</i>		Capital mobility		
	Autonomy -1-	Non-autonomy -0-	Fixed -1-	Float -0-	Free -1-	Restrictions -0-	
Jordan		✓	✓		✓		
UAE		✓	✓		✓		
Bahrain		✓	✓		✓		
Tunisia	✓			✓		✓	
Algeria	✓			✓		✓	
Djibouti		✓	✓			✓	
Saudi Arabia		✓	✓		✓		
Sudan	✓			✓		✓	
Syria		✓		✓		✓	
Somali	✓			✓	✓		
Iraq		✓	✓			✓	
Oman		✓	✓		✓		
Qatar		✓	✓		✓		
Comoros		✓		✓	✓		
Kuwait		✓	✓		✓		
Lebanon	✓			✓			
Libya		✓	✓			✓	
Egypt	✓			✓		✓	
Morocco		✓	✓		✓		
Mauritania	✓			✓		✓	
Yemen	✓			✓		✓	

Source: IMF (2021), Annual Report on Exchange Arrangements and Exchange Restrictions

**Figure (2) The commonly used policy options in Arab countries**



Source: constructed from table (1)

Table (1) demonstrates the commonly used policy options across Arab countries. It categorizes the practice of policy options into four groups and reveals that the majority of Arab countries follow options (1) and (2) as it is explained below, few of Arab countries follow option (3) and (4). More precisely, Table (1) and figure (2) summarizes that there are 8 Arab countries adhere to policy options (1), mostly oil exporters, and 7 Arab countries follow policy options (2), mostly oil importers.

**Policy options (1): Free capital mobility  $cm_{ij} = 1$ , pegged exchange rate  $exr_{ij} = 1$ , and monetary non-autonomy  $mpf_{ij} = 0$**

These three policy options take the value 1, and 0 otherwise. If an economy chooses to fix its currency against another country, and have free capital mobility, independent monetary policy is not feasible. In this case, a pegged exchange regime, non-autonomous of monetary policy, and free movement of capital are non-mutually exclusive, meaning that they work together simultaneously under the non-autonomous monetary policy, such as when the central bank adjusts the interest rate in accordance with the monetary policy direction in the pegged country. This option typically applied to EU countries where each country fixed its currency to the Euro and the country's monetary policy follows the ECB's monetary direction. Across Arab region, these policy options are followed by GCCs, in addition to Jordan and Morocco.

**Policy options (2): capital controls  $cm_{ij} = 0$ , a flexible exchange regime  $exr_{ij} = 0$  monetary autonomy  $mpf_{ij} = 1$ .**

These policy options are also adopted among many Arab countries such as Tunisia, Algeria, Sudan, Lebanon, Egypt, Mauritania, and Yemen. Under these options, a country imposes restrictions on capital mobility to protect the severe fluctuations in the currency value. This sometimes happens when the foreign exchange market forces are the drivers of the currency, and the central bank maintains monetary autonomy. However, policy makers must monitor the monetary policy directions in trading partners.

**Policy options (3): Free capital mobility  $cm_{ij} = 1$  flexible exchange regime  $exr_{ij} = 0$ , monetary autonomy  $mpf_{ij} = 1$ .**

Under this option, an economy can choose to maintain the autonomous monetary policy, and also have free capital mobility, in this case the country needs to maintain floating exchange regime because fixed exchange regime and free capital mobility are mutually exclusive. This policy option followed by Somalia.

**Policy options (4): capital controls  $cm_{ij} = 0$ , a Pegged exchange regime  $exr_{ij} = 1$  monetary non-autonomy  $mpf_{ij} = 0$ .**

Few Arab countries are adopting these policy options such as Djibouti, Iraq, and Libya. Even though a Pegged exchange regime along with monetary non-autonomy are non-mutually exclusive, the economy is more likely to miss the advantage of interest rates

differential, hence the gain of free capital flows. However, these countries might have other policy objectives behind capital controls imposition.

#### **IV. Data, methodology, and modeling**

##### **i. Variables (definition and sources)**

The analysis is based on four main variables:  $GDP_{ij}$  growth, and three dummy variables representing the three main options capital mobility  $Cm_{ij}=1,0$ , monetary policy frameworks  $EXR_{ij}=1,0$ , and exchange rate arrangements  $mpf_{ij}=1,0$ . Because these dummy variables are not the only determinants of growth. We added some continuous variables representing the core drivers of economic growth such as capital formation, and FDI.

**Table (2) variables (definition and sources)**

Variable symbol	Definition	Source
$GDP_{ij}$ ( <i>Dependant, continues</i> )	Real GDP growth is defined as GDP's annual percentage change at market constant prices.	World Bank's world development indicators database.
$Cm_{ij}$ ( <i>Independent, dummy</i> )	Capital flow is a dummy variable a country can be given the value '1' if it imposes no controls on capital mobility, and zero otherwise	database developed by <i>Chinn and Ito (2021)</i> , measuring the financial openness of 182 countries for the period (1970-2019),
$EXR_{ij}$ ( <i>Independent, dummy</i> )	Exchange rate arrangements. a country can be given the value '1' if it adopts a pegged regime, and zero otherwise	IMF (2021), Annual Report on Exchange Arrangements and Exchange Restrictions
$MPF_{ij}$ ( <i>Independent, dummy</i> )	Monetary policy framework is also classified as a dummy variable, a country can be given the value '1' if there is monetary autonomy and zero otherwise	IMF (2021), Annual Report on Exchange Arrangements and Exchange Restrictions
$FDI_{ij}$ <i>independent continues</i>	Foreign direct investment (% of GDP) refers to direct investment equity flows in the reporting economy. It is the sum of equity capital, reinvestment of earnings, and other capital	World Bank's world development indicators database.
$CF_{ij}$ <i>independent continues</i>	Capital accumulation: Gross capital formation (% of GDP) (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	World Bank's world development indicators database.
$years_{ij}$ <i>years of education</i>	Years of education (duration) refers to the number of grades (years) in the school.	World Bank's world development indicators database.

## ii. Model structure

The paper applies the Panel Ordinary Least Squares (OLS) method on multiple regression models<sup>1</sup> that incorporates real GDP growth as a dependent variable and three independent variables representing the policy trilemma. The model is designed for a panel of 17 Arab oil -exporting and importing countries<sup>2</sup> covering the period from (1970 – 2021).

The model below stemmed from Chinn, Ito, and Joshua's (2016) paper entitled "notes on the trilemma measure" which measures each policy option separately. In a different way, our model tests the three policy options simultaneously and evaluates their viability in relation to economic growth.

$$\Delta y_{ij} = \beta_0 + \delta_0 \begin{bmatrix} \mathbf{Po01}_{ij} \\ \mathbf{Po02}_{ij} \\ \mathbf{exr}_{ij} \\ \mathbf{cm}_{ij} \end{bmatrix} + \beta_1 CF_{ij} + \beta_2 FDI_{ij} + \beta_3 edu_{ij} + u_{ij} \quad (1)$$

$$\Delta y_{ij} = \beta_0 + \delta_0 \mathbf{Po01}_{ij} + \beta_1 CF_{ij} + \beta_2 FDI_{ij} + \beta_3 edu_{ij} + u_{ij} \quad (2)$$

$$\Delta y_{ij} = \beta_0 + \delta_0 \mathbf{Po02}_{ij} + \beta_4 CF_{ij} + \beta_5 FDI_{ij} + \beta_6 edu_{ij} + u_{ij} \quad (3)$$

$$\Delta y_{ij} = \beta_0 + \alpha_0 \mathbf{cm}_{ij} + \beta_7 CF_{ij} + \beta_8 FDI_{ij} + \beta_9 edu_{ij} + u_{ij} \quad (4)$$

$$\Delta y_{ij} = \beta_0 + \gamma_0 \mathbf{exr}_{ij} + \beta_{10} CF_{ij} + \beta_{11} FDI_{ij} + \beta_{12} edu_{ij} + u_{ij} \quad (5)$$

Where  $\beta_1, \dots, \beta_{12}$  are parameters on continuous variables. In our model above,  $\delta_0$ ,  $\partial_0$ ,  $\alpha_0$ , and  $\gamma_0$  denotes to parameters on dummy variables to further highlight the interpretation of the parameters associating binary variables.  $\Delta y_i$  represents the percentage change in real GDP, which is economic growth.  $Po01_{ij}$ ,  $Po02_{ij}$ ,  $cm_{ij}$ ,  $exr_{ij}$  are dummy exogenous variables denotated to policy option (1), policy option-2, capital mobility, and exchange rate arrangements respectively. While  $CF_{ij}$ ,  $FDI_{ij}$ ,  $edu_{ij}$  are

<sup>1</sup> Consider the population regression of log GDP Y, where Y= ln (economic growth), against four dummy variables, and three continuous variables.

<sup>2</sup> Arab oil-importing countries included in this paper are (Tunisia, Morocco, Sudan, Egypt, Lebanon, Syria, Djibouti, Comoros, and Mauritania). Arab oil exporters included in this paper are (Saudi Arabia, UAE, Oman, Bahrain, Qatar, Kuwait, Algeria, and Iraq)

continuous variables refers to capital formation, foreign direct investment, and years of education respectively.

Recalling the definitions of dummy variables in table (1), and figure (2), we can re-write model “1” as follows. This interpretation would be applied to other models from equation (2) to equation (5).

$$\Delta y_{ij} = \beta_0 + \delta_0 \mathbf{Po01}_{ij} + \beta_1 CF_{ij} + \beta_2 FDI_{ij} + \beta_3 edu_{ij} + u_{ij} \quad (6)$$

$$\delta_0 = E(Y/Po01 = 1, cf, fdi, edu) - E(Y/Po01 = 0, cf, fdi, edu)$$

$$\delta_0 = E(Y/Po01, cf, fdi, edu) - (Y/Po01, cf, fdi, edu)$$

In equation (6), we consider Arab countries that follow policy options 1, which is (*Free capital mobility*  $cm_{ij}=1$ , *pegged exchange rate*  $exr_{ij}=1$ , and *monetary non-autonomy*  $mpf_{ij} = 0$ ) as the benchmark group meaning that countries that adopt this option take the value “1”, while “zero” otherwise. There are other factors that affect the GDP such as capital formation, FDI, and education.  $\delta_0$  refers to the difference in GDP between countries following policy option 1, and countries following other policy options.

### iii. Models' outcomes

The analysis generates the following results on table (1)

**Table (3) Modelling outcomes**

<b>Dependant variable log (GDP)</b>		<b>model (1)</b>	<b>Model (2)</b>	<b>model (3)</b>	<b>model (4)</b>
Intercept					
	<i>Coefficient</i>	5.40	8.52	6.65	7.12
	<i>Std. Error</i>	0.38*	0.53*	0.60*	0.52*
policy option (1) (dummy)					
	<i>Coefficient</i>	1.98			
	<i>Std. Error</i>	0.08*			
policy option (2) (dummy)					
	<i>Coefficient</i>		-1.40		
	<i>Std. Error</i>		0.11*		
exchange rate regime (dummy)					
	<i>Coefficient</i>			0.32	
	<i>Std. Error</i>			0.12*	
capital mobility (dummy)					
	<i>Coefficient</i>				1.33
	<i>Std. Error</i>				0.11*
capital formations					
	<i>Coefficient</i>	0.002	0.02	0.03	0.04
	<i>Std. Error</i>	0.004*	0.005*	0.006*	0.005*
FDI					
	<i>Coefficient</i>	0.09	0.00	-0.04	-0.05
	<i>Std. Error</i>	0.01*	0.01*	0.02**	0.02*
years of education					
	<i>Coefficient</i>	0.25	-0.75	-0.62	-0.80
	<i>Std. Error</i>	0.06*	0.07*	0.09*	0.08*

\*Significance level <0.01, \*\*<0.05, \*\*\*<0.1

#### Policy option 1

$$\Delta y_{ij} = \beta_0 + \delta_0 \text{PoO1}_{ij} + \beta_1 \text{CF}_{ij} + \beta_2 \text{FDI}_{ij} + \beta_3 \text{edu}_{ij} + u_{ij} \quad (6)$$

$$\delta_0 = E(Y/\text{Po1} = 1, cf, fdi, edu) - E(Y/\text{Po1} = 0, cf, fdi, edu)$$

$$\delta_0 = E(Y/\text{Po1}, cf, fdi, edu) - (Y/\text{Po1}, cf, fdi, edu)$$

Where  $\text{PoO1}_{ij}$  denotes to policy option (1), which includes free capital mobility, pegged exchange rate, and monetary non-autonomy. We consider policy option-1 as a

base group, meaning that countries that adopt this option take the value “1”, while “zero” has been given to countries following policy options other than option-1.

It is interesting to measure the average difference in log GDP between Arab countries that follow policy option (1) and Arab countries that follow other policy options and have the same levels of capital formations, FDI flows, and years of education as Arab countries that follow policy option (1). The coefficient on PO1 measures this difference. This is related to policy trilemma options, or characteristics linked with the trilemma that have not been adjusted for in the regression. To be more specific, countries with PO1 are predicted to optimize their level of well-being by 140 dollars more than other Arab countries.

Calculating the coefficients for the other variables is a simple process. In this context, the model suggests that a positive and statistically significant relationship exists between capital formation and the log of GDP. It is anticipated that a nation's GDP will expand by 1.9 percent for every one percent increase in capital accumulation. The relationship between FDI and GDP is shown to have no meaningful bearing on the model's findings.

It is informative to compare the coefficient on PO1 in this model to make estimation when all other explanatory variables are dropped from the equation. The intercept is the level of GDP when PO1=0, so countries adhered to other policy options are expected to increase the GDP by 540 dollars per year. However, when PO1=1, the level of GDP would be  $5.4 + 1.98 = 7.38$  or 738 dollars. This conclude that countries pursuing (Free capital mobility  $cm_{ij} = 1$ , pegged exchange rate  $exr_{ij} = 1$ , and monetary non-autonomy  $mpf_{ij} = 0$ ) are more likely to be better off.

### **Policy option 2**

$$\Delta y_{ij} = \beta_0 + \partial_0 PoO2_{ij} + \beta_4 CF_{ij} + \beta_5 FDI_{ij} + \beta_6 edu_{ij} + u_{ij} \quad (3)$$

$$\delta_0 = E(Y/Po2 = 1, cf, fdi, edu) - E(Y/Po2 = 0, cf, fdi, edu)$$

$$\delta_0 = E(Y/Po2, cf, fdi, edu) - (Y/Po2, cf, fdi, edu)$$

Where,  $PoO2_{ij}$  refers to capital controls, a flexible exchange regime, monetary autonomy. Conversely, policy option-2 is considered as the benchmark group in model (2), meaning that countries follow this option take the value “1”, and “zero” elsewhere.



This model tries to explain another scenario of the policy trilemma, is when  $PoO2_{ij} = 1$  meaning that a country adopts capital controls  $cm_{ij} = 0$ , a flexible exchange regime  $exr_{ij} = 0$  monetary autonomy  $mpf_{ij} = 1$ . This policy option is different from the previous one. Similarly, we consider policy option-2 as a base group, meaning that countries that adopt this option take the value “1”, while “zero” has been given to countries following policy options other than option 2.

This model for policy option (2) reveals the average difference in log GDP between Arab countries that follow policy option (2) and Arab countries that follow other policy options and have the same levels of capital formations, FDI flows, and years of education. The coefficient on PO2 measures this difference. Countries with a PO2 are predicted to witness a decrease in the level of well-being by 140 dollars less than countries that followed policy options other than policy option (2).

If we assume that  $PO2=0$ , then the level of GDP would likely increase by 852 dollars, this is more than the amount when  $PO2=1$ , which is predicted to maximize the GDP with lower level  $(8.5+(-1.4))=7.12$  or 712 dollars.

This is another evidence that countries pursued (Free capital mobility  $cm_{ij}=1$ , pegged exchange rate  $exr_{ij}=1$ , and monetary non-autonomy  $mpf_{ij}=0$ ) tend to be better off compare to countries pursued capital controls  $cm_{ij}=0$ , a flexible exchange regime  $exr_{ij}=0$  monetary autonomy  $mpf_{ij}=1$ .

The intercept is the level of GDP when  $PO2=0$ , so countries adhered to other policy options are expected to increase the GDP by 852 dollars per year. However, when  $PO2=1$ , the level of GDP would be  $8.52+(-1.40)=7.12$  or 712 dollars. This conclude that countries pursuing (Free capital mobility  $cm_{ij}=1$ , pegged exchange rate  $exr_{ij}=1$ , and monetary non-autonomy  $mpf_{ij}=0$ ) are more likely to be better off.

#### **Capital mobility.**

$$\Delta y_{ij} = \beta_0 + \alpha_0 cm_{ij} + \beta_7 CF_{ij} + \beta_8 FDI_{ij} + \beta_9 edu_{ij} + u_{ij}$$

$$\delta_0 = E(Y/cm = 1, cf, fdi, edu) - E(Y/cm = 0, cf, fdi, edu)$$

$$\delta_0 = E(Y/cm, cf, fdi, edu) - (Y/cm, cf, fdi, edu)$$

unlike previously mentioned models, this model explains the average difference in log GDP between Arab countries that have free capital movements across borders

(CM=1) and Arab countries that impose restrictions on movement of capital (CM=0) and have the same levels of controlled variables. The dummy variables are statistically significant and positively correlated with the GDP. Interestingly, the model points out that countries with no restrictions on capital are expected to increase their GDP by  $7.12+1.33=8.44$  dollars higher than countries that impose restrictions on capital where their GDP is expected to raise by 712 dollars.

The effect on  $\Delta y_i$  of  $cm_{1i}$  holding  $exr_{2i}$  and  $mpf_{3i}$  constant, could depend on the value of  $exr_{2i}$  and so on. In other words, there is likely an interaction between having the capital flows restricted and monetary autonomy so that the impact on economic growth of a country is different for monetary autonomous and non-autonomous.

### **Exchange rate arrangements**

$$\Delta y_{ij} = \beta_0 + \gamma_0 \mathbf{exr}_{ij} + \beta_{10} CF_{ij} + \beta_{11} FDI_{ij} + \beta_{12} edu_{ij} + u_{ij}$$

$$\delta_0 = E(Y/exr = 1, cf, fdi, edu) - E(Y/exr = 0, cf, fdi, edu)$$

$$\delta_0 = E(Y/exr, cf, fdi, edu) - (Y/exr, cf, fdi, edu)$$

This model explains the effect of exchange rate arrangements as dummy variable, controlled by other factors, on the level of GDP. Where  $EXR=1$  refers to countries maintaining a fixed exchange regime,  $EXR=0$  to countries maintaining a flexible exchange regime. It is revealed that countries with a peg regime are expected to raise their level of GDP by  $665+0.32=6.98$  or 698 dollars higher than countries maintaining a flexible regime, with estimated gain around 32 dollars.

Industrial nations, which had largely closed capital accounts under the Bretton Woods system of fixed exchange rates, adopted this Policy Option 2 from 1939 to 1973. *Kose & Prasad, (2012)*. And according to *Khan et al (2008)*, Fixed exchange rates are more effective in achieving macroeconomic and financial stability in reaction to domestic nominal shocks (such as shifts in money demand).

**Table (4) Gain and Loss related to policy options.**

		Various policy options (dummy variables)			
		Policy option 1	Policy option 2	Exchange rate	Capital mobility
The dummies	one	7.38	7.12	6.98	8.44
	Zero	5.40	8.52	6.65	7.12
<b>gain/loss</b>		<b>1.98</b>	<b>-1.40</b>	<b>0.32</b>	<b>1.33</b>

This table illustrates countries' gain / loss from policy options as defined previously, providing a better view for different scenarios.

## V. Policy Discussions

According to these results, policy option 1 tends to be optimal for exporters, especially in terms of the mechanism of choosing the exchange rate regime. Consistent macroeconomic policies are necessary when choosing an exchange rate regime. For instance, it would be appropriate if a flexible regime is complemented by strong institutional framework and a suitable nominal anchor for monetary policy. Conversely, pegging the currency is typically a viable option with a thriving credit and capital market as well as a robust monetary transmission mechanism. And strong fundamentals that ensure low misalignment between equilibrium exchange rate and actual exchange rate.

Therefore, countries such as GCCs, in addition to Jordan and Morocco operating under this option are carefully tracking down the direction of the monetary policy in the pegged country. In contrast, if the pegging country maintained a different monetary policy stance from that of the pegged country, this could disrupt the macroeconomic fundamentals and reduce the central bank's ability to pursue effective monetary policy.

Some countries impose restrictions on capital accounts to safeguard themselves from risks resulting from variation in capital mobility. However, it seems quite difficult to maintain a fixed exchange rate regime along with restricted capital account, unless these two policy options have carefully been supported by robust institutional settings, and sound macroeconomic policies.

Across the entire policy options, continues variables' coefficients tend to be consistent with theory and empirics. For instance, capital formation in the economy is a crucial driver for economic growth as it leads the production vehicle to produce more goods and services. The analysis demonstrates that capital stock contributes positively to economic growth in oil exporters.

## **VI. Policy recommendations**

The following policy recommendations are suggested.

- Consistent macroeconomic policies are necessary when choosing an exchange rate regime. For instance, it would be appropriate if a flexible regime is complemented by strong institutional frameworks and a suitable nominal anchor for monetary policy. Conversely, pegging the currency is typically a viable option with a thriving credit and capital market as well as a robust monetary transmission mechanism. And the absent of persistent misalignment between real exchange rate and equilibrium exchange rate.
- It is advised that a country pay more attention to the interest rates in the pegged country and liberalize its capital account alongside a fixed exchange rate regime. Liberalizing the capital account must be associated with robust institutional settings, sound economic policies, and a well-developed financial market.
- If the country chooses the exchange rate as a nominal anchor, it has to ensure adequate reserve in anticipation of any sudden capital flight that could put depreciation pressures on the currency. Therefore, the central bank needs to work on building adequate official reserves. This would allow the central bank to intervene to smooth severe volatility.
- countries maintaining flexible regime should have independent monetary policy and the central bank has to have the full authority to conduct the monetary policy away from any influences. In this case, these countries need to enhance the exchange rate flexibility to protect their economies from exogenous and endogenous shocks. Therefore, gradual easing of capital controls while shifting gradually to a flexible exchange rate regime yields better outcomes.

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