The Impact of Exchange Rate Regime on Economic Growth in Developing Countries (1980-2012)

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Abstract— **The aim objective of this research is to test the impact of exchange rate regime on economic growth in a sample of 18 less development countries during the period from 1980 to 2012,to achieve that we will used econometrics to extress the variable quantified and choosing the most suitable system (fixed, intermediate or flexible) with economic growth. The model used is a pro to type economic growth equation that relates the growth rate of real per capita GDP to a set of explanatory variables that includes investment to GDP ratio, government consumption to GDP ratio, total gross enrollment ratio for secondary education, index of openness, terms of trade, credit to private sector, index of civil liberties, index of political stability and the dummy variables representing the types of the exchange rate regime using Panel Data about the classification of the systems we will used the realisted common classification (Reinhart and Rogoff 2004, Levy-Yeyati and Sturzenegger 2005). These economic results show the positive relationship between the exchange rate regime and economic growth and give support to the hypothesis that if the developing countries adopt a fixed exchange rate regime, they will attain a higher growth rate than if they adopt a flexible regime or a intermediate regime.**

Index Terms— **Exchange rate regime – Classification of exchange rate regime – Economic growth – Panel Data.**
JEL Classification :C31, C33, O4.

I. INTRODUCTION

The exchange system has known a several stations in its development after the collapse of the system of "Bretton Woods" and the system of stable exchange rates states have worked in several exchange rate that differs from country to another depending on its economic policy, some states chose exchange systems fixed and other countries have adopted systems of floating exchange and others resorted to the intermediate exchange systems between flotation and stability. In a time of fierce international competition and economic blocs where the prevailing law in order to stay is a competitive advantage and the ability to shocks especially those of economic crisis the world has seen recently so that the strongly influenced many on the emerging markets and the stability and macroeconomic balance including economic growth and this result waves Liberation fiscal and financial movements of foreign capital where was the exchange rate regime is the inappropriate one of the most important reasons accordingly resorted majority of the States to put different exchange rate , but they need to be further developed through realize the stabilizing financial conditions and more independence of monetary policy , and at the same time, maintaining the stability of our currencies should not be at the expense of exaggeration in the exchange rate and killing the rates of economic growth needed, this has led to the emergence of the problem of classification of the exchange rate systems that you see that there is a discrepancy between the official regulations declared by the state and regulations actual that adopt it according to the main determinants and the economic policies adopted. to change the order used by the International Monetary Fund from official regulations "Jure" to the actual systems "Facto" which prompted the establishment of important studies and discussions specialist on the subject and through them we have selected Category realistic that will be used in this study a classification natural for Reinhart and Rogoff (2004) and classification of Levy-Yeyati and sturzenegger (2005) by volatilization method because it has to be the selection and adoption of an appropriate exchange rate regime would achieve the ideal state .

The majority of the economic literature exposed to the subject of the overall economic performance of the exchange systems so tried many theoretical studies and experimental determine the relationship between macroeconomic performance and the exchange systems adopted that are either been fixed or intermediate or flexible and that in the economies of all industrialized nations emerging and developing countries, so that was the four key areas that are: growth , inflation , volatilization and crises gliding through the works of Mundell (1995), Ghosh et Al (1997), (2001) Perrault, Bailliu, Lafrance about the rate of growth and the exchange system and this is what will be addressed through this study, in addition to the work of Ghosh et Al (2003), Edward et Mendoza (2003) about the relationship between inflation and systems, and the work Hausman et Gavin (1996) was about the volatilization of macroeconomic and exchange systems , and finally work Obstfeld (1994) and krugman (1999) about the exchange rate systems crises .

The selection process between the different exchange rate systems and how the impact of these regulations on the macroeconomic variables considered one of the topics that are still in dialectic between researchers and those interested in macroeconomic policy, so the matter of choice of exchange rate regime, the optimal and most effective in achieving better economic performance of the most important and the most difficult that concerned the International Studies at the moment especially after developments vast known of

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these systems in developing countries, in particular the extent of their impact on macroeconomic stability where the primary purpose of this topic paper is to try to know the best quality of the exchange rate regime that it can achieve a higher economic growth especially in developing countries.

And an attempt to achieve this goal we decided to split this work to the following sections, where firstly will show the most important theories about the choice of exchange rate systems so from which we can deduce the most prominent determinants of this choice. secondly will we devote to provide and evaluate various applied studies and pilot that tested the relationship between exchange rate regimes and economic growth , and then followed in the third section to identify the research methodology , which includes the standard method used in the study, concerned to panel data through the study sample that is composed of 18 developing country be divided into three groups according to classification realistic joint between RR and LYS, and in the latter is reached results that illustrate the nature of the relationship between the exchange rate systems and economic growth.

II. A LITERATURE REVIEW ON THE IMPACT OF EXCHANGE RATE REGIME ON ECONOMIC GROWTH

1. Theoretical framework

Economic growth is a complex phenomenon affecting by the variables several social, economic, political, cultural and other , has intensified the debate between supporters of fixed and floating exchange rate systems because the continuity of the shift in exchange rate systems as a result of the variation in performance between different countries puts us in front of the problem of choosing the ideal exchange rate system which can achieve better economic performance , according to **Frankel (1999)** there is no exchange rate system is ideal absolute but there is an exchange rate system is ideal specific to each state that what can brings us to study the determinants of choice of exchange rate regime introduced in various economic literature by a number of economists both for literature ancient or modern which dealt the relationship between exchange rate regimes and economic growth , so that suggests **Bailliu and Al (2002)** that the effect of exchange rate regimes on economic growth can be either directly through mechanisms that operate to prevent or mitigate the impact of shocks on macroeconomic variables and access to economic stability. With following a brief explanation of the mechanisms for this topic :

- according to the theory **M.Friedman (1953)** the determination of the exchange rate system ideal in terms of his agreement with the objectives underlined by the government will be providing factors of stability of internal and external by independent economic policies like exchange rate policies, the return variables to its equilibrium in the long run will vary according to systems followed so that he defended his theory on the flexible system, it is attributed to him that he gives a faster adjustment after trauma by reducing the volatility of macroeconomic variables while the fixed system leads to deformities in the real exchange rate resulting in poor resource allocation.
- And then appeared to ask about the relationship between the currency and the state through the theory of Optimum Currency Area-, so that the standards fall within the three properties offered by each of **R.Mundell** in his famous article of **1961** , which according to him the basic requirement for idealism within economic zone is the freedom of the factors of production, under this condition the fixed exchange rate system will be within the region and the system of floating in other countries , but **Mackinnon (1963)** has added factor the degree of integration or trade openness as a factor for the ideal whenever the economy was open and independent whenever the fixed systems exchange gave advantages because it allows to the economies vulnerable to the vagaries of exchange to be stable , while considered **Kenen (1969)** as a prerequisite for an optimal monetary zone is the nature of specialization of economies through diversification in production and consumption. So that the idea is centered in that whenever lower the specialty economics of the group and increase diversification in production, whenever the vulnerability to shocks is less.
- In the vicinity of an exhibition of various types of cracks and international crises had to be to do some of the theories that are looking at **" The nature of the shocks and macroeconomic stability "** so these studies return to each of the **Fisher 1977, Flood 1979, Turnovsky 1977, Frankel and Aizenman 1982** has pointed out that choosing the ideal exchange system must take into account the nature and severity of the crisis on the one hand and the economic structure of the state on the other hand , in addition to proposals **Poole 1970** with a number of economists **Henderson 1979, Boyer 1978, Mackinnon 1981** about selecting the best system based on the repetition of the type of trauma experienced by economy as they saw the advantage performance fixed exchange rate system to stabilize the output in the face of domestic monetary shocks , while a flexible exchange system is the best in the face of local real shocks .
- With regard to the theoretical work of each of the **Barro and Gordon (1983)** Voamalhma linked to **" The credibility of monetary policy "** in determining the system of exchange, so the efficiency of the fixed system in the fixation of the monetary policy by compared with the flexible system is due to the adopt credibility in light of modular system on the personal appreciation to achievement this stability while the flexible order depends on automatic mechanism to achieve.

As for the indirect effect of exchange rate regimes on economic growth are by the impact of systems on the basic determinants of growth such as investment and foreign trade and capital flows from abroad, and the development of the financial sector , and we will be show it as follows:

- According to the opinion of **Ghosh (1997)** and **Aizenman (1994)**, the exchange rate systems could affect the investment through its impact on capital accumulation, in their view the fixed exchange systems are best than systems floating in increased domestic and foreign investment and this is due to

the decrease of uncertainty which caused the increase the rate of investment.

- With regard to the relationship between the exchange rate systems and the degree of economic openness, the growth literature has confirmed on the positive relationship that binds them , so see **Edwards (1998)** that openness leads to increased growth rate of economies, especially in developing countries on the one hand some considered that the system of fixed exchange works to increase rates of international trade and knead what might result from a reduction in the volatility of nominal exchange rates and the low degree of uncertainty and reduce the cost of hedging against currency risk, which works to increase the degree of trade openness , on the other hand the others including the study of **Nilsson (2000)** so that supports the idea that floating exchange rates are working to increase the rates of international trade as it works to increase exports because they eliminate the problem of incompatibility of the exchange rate, which means that the nominal exchange rate does not reflect the real exchange rate in the long term .
- **Bailliu and Al (2000)** also proposes that the effect of the exchange rate regime on economic growth through capital flows is an indirect effect due to the impact on the size and quality of capital flows from abroad, also point out that capital flows stimulate the growth of the largest under the order Floating compared to the arbitrator fixed and rigid system, which will be a catalyst for speculative capital flows.
- As for literature theory that dealt with the impact of drainage systems on economic growth through the development of the financial sector because it is known that the presence of developed financial markets is one of the advantages of flexible systems , he noted **Bordo and Flandreau (2001)** that states that have the financial sector developed tend to adopt flexible exchange rate system so that Hedda latter helps to absorb shocks, exchange rate and knead by supply tools preventive and cover the currency risk and therefore have a positive impact on growth . while see all of the **Aizenman and Hausmann (2000)** that profits are larger for developing countries with markets weak financial and adopting systems of fixed exchange compared to industrialized countries that adopt systems of flexible exchange , however, Chang and **Velasco (2000)** opposed the idea of compatibility of the financial sector weak with a fixed exchange rate system because this can lead to banking crises and means knead preference adopt a flexible exchange rate system on fixed exchange rate system in the development of the financial sector and hence economic growth . As **Levine (1997)** has confirmed that the evolving financial system is essential for economic growth , regardless of the type of drainage systems adopted .
- In recent years, the attention is increased on the theory which consider the most recent in comparison with the precedent theories, these works back to **Calvo and Reinhart (2000)**, refers to identify the most important causes of "**The phenomenon of fear of floating**" according to the financial and structural characteristics of the emerging economies, so that many developing countries do not find in the adoption of the fixed system an optimal option in addition to its refusal to adopt a flexible system to prevent the big moves in the exchange rate, and so will be far from the standards of commitment to a fixed exchange rate and thus will tend to prefer to mediate between the two maximum systems exchange rate.

Based on the foregoing can identify the most important determinants of the factors to choose the ideal exchange rate regime on the one hand and its associated regime on the other hand, will be summarized in the following table:

Table N°01: Factors influencing the choice of the ideal exchange rate system.

Criterion	Explanation of the criterion
Volume and degree of the economic openness	- Whenever the degree of the openness in relation to the economy was largest whenever the proportion of the trade was largest and thus the fixed exchange rate system is suitable for this kind and it is due to the lack of or reduced costs of the international trade and the reduction of associated risks.
Inflation rates	- If state-level inflation is higher than the level of its trading partners so the concerned state should apply a flexible exchange system and this in order to cope with external shocks.
External And internal shocks	- The impact of the crisis regarding the selection of the optimization exchange system is very difficult and has been tackle to him in the past, as it can be said that the property acquired from a floating exchange system makes him best, however, if there are economies emerging open to international trade in a big way, the system of fixed exchange becomes the ideal in this case.
The degree of capitals movement	- Whenever the movement of capital was large, whenever the maintain of a fixed exchange rate system was difficult, which becomes vulnerable to speculators.
The degree of flexibility of prices and wages	- Whenever the real wage was stable whenever the need for greater flexibility of the exchange system and to cope with the shocks and external crises.
The degree of credibility of the monetary authorities	- Whenever of the central bank in fighting inflation was effectiveness, whenever the need to adopt a fixed exchange rate system is greater, because in this case get credibility through flotation is very expensive.
Fixing prices system:	- When prices are fixed in the currency of the consumer, and under a flexible exchange system the level of consumption remains stable, but this will change if the latter prices were installed in the currency of the product whether it's under the fixed exchange rate regime or floating.
Tradable and non-tradable Goods	- In the case of non tradable goods, the degree of exchange rate flexibility is increases, so that in the absence of supply shocks, changes in demand will suck in large part to changes in commodity prices, non-tradable.

Source : Laetitia Ripoll, -Choix du Régime de change: Quelles Nouvelles?-, LAMETA: Université de Montpellier I, 22/02/2001, p06-07.

We can observe from this table that whenever countries were enjoying of active and flexible economies whenever systems floating exchange are the most ideal and vice versa, but he cannot take these factors at once in determining the ideal exchange system , according to **Rogoff et Obstfeld (1998)** assert studies done by **Mundell** regarding - **The Impossible triangle -** so come to the conclusion: " Can not for the country at the same time installs the rates of exchange with staying on the free movement of capital and the continued application of monetary policy serve the economic interests of the Interior."

2. Some empirical evidence

In the light of precedent theoretical analyzes , it can be concluded that the effects produced by the exchange rate regime are multiple and sometimes contradictory , but the ultimate impact can not be determined , so a several studies of contemporary economic study are focussed on the relationship between economic growth and the exchange systems by using econometric methods and arrangements of exchange used and provided by the Ghosh et Al (2003), Bubula, Otker-Robe (2002), Levy-Yeyati and Sturzenegger (2002), Reinhart and Rogoff (2004) , which describes the steps laid down by the states and successively recent events so that it may benefit from this trials to reach the right decision in the selection process between the exchange rate systems through standards and certain grounds .

The evolution of the economic history of the countries and the trend towards global openness in addition to the diversity of media analysis standard to do many economists studies to verify the relationship entirely and directly between the exchange systems and economic growth, and this in order to provide assistance to policy-makers, especially as the integration and development of the local economy is important for continuity and accelerate growth.

In an ancient study of **Baxter and Stockman (1989)** used a sample of 49 countries, for compared some economic variables (production, consumption, foreign trade, real exchange rate) in the period from 1949 to 1986, but they did not find a difference in the behavior of this topic variables given the exchange rate regime applied. As well as **Mills and Wood (1993)** who used the United Kingdom data between 1955 and 1990 reached the absence of the effect of exchange rate regime on economic growth, and also **Rose (1994)** to achieve the same result with Germany from 1960 to 1992.

In a study of **Ghosh et Al (1997)** through the use of data 136 countries from 1960 to 1989 reached to the presence of weak evidence supports the relationship between systems and growth where declining growth rate under the fixing system because of the increased rate of investment and the same result for the flexible but The middleware did not show her

relationship , and in **2003** returned the same test , but using a sample of 165 countries during 1973 to 1999 and concluded that the state that have a flexible and fixing system record a weak inflation. in their eyes the fixed systems that achieve the best economic performance . has been shown to the contrary during the study carried out by each of **Perrault , Bailliu and Lafrance (2001)** for 25 emerging economy during 1973-1998 using some economic variables (FD, OPEN, GOV, INVEST, GDP) and tested in a manner plucks generalized GMM Generalized Method Of Moment) (the result was the most flexible systems that carry a positive effect growth in particular countries that have relatively well-developed financial sector and vice versa .

The study **Levy-Yeyati and Sturzenegger (2003)**, using their realistic classified for a sample composed of 183 developed and developing countries during the period 1974 to 2000 by testing some of the variables (SEC, INVEST, GDP, POP, GOV, CIVIL, TT, OPEN) by way of intermediate variables and the method of least squares OLS and found that the relationship apply in developing countries without advanced. In their views the floating systems in developing countries are associated with growth rates greater then followed by fixed systems, and systems middleware occupies ranked third . And vice evidenced study of **Rogoff and Al (2004)** for 160 developing countries , emerging and advanced during 1940 and 2001 by analyzing the behavior of real GDP , depending on the classification realistic for Reinhart and Rogoff (2004), also the aimed of this study is to be sure of the fact that some of the task theories as- Fear of Floating theory- and the theory of - Bipolar View - , at the same year and using the previous classification of RR researchers, **Huang and Malhotra** concluded to the same conclusion but added variable of the financial crisis of the sample is composed of 12 Asian developing and emerging countries, and 18 advanced Europe states in the period 1976-2001 .

During the year **2005**, both of **Coudert and Dubert** are doing a study on 10 Asian countries during 1990 to 2001 by using their own classification and the way of (Pooled Mean Group) (PMG) on a set of variables (EDU, OPEN, POP, INVEST, GDP1990, GDP) and have concluded there is a negative effect of the systems fixed and intermediate on growth, while the flexible systems not showing any significant effect. In addition to the study of **Paolo Garofalo** in the same year and conducted on a single state is Italy from 1861-1998 to test variables (TT, POP, OPEN, INVEST, GDP) by the way of least squares and use the sample estimate intermediate variables two-stage (2SIV) The result is a link systems exchange intermediary in Italy with high growth rates, and the results of fixed exchange rate system was not moral and this at odds with the hypothesis of solutions corner . in another study conducted on a single state that is Tunisia by **Hammas Hanene and Salem Saleh in 2006** using the test causality for Granger during the period 1960-2003, which found that relationship is bi-directional and the ideal exchange rate price chosen should necessarily work to improve the level of economic growth of nations.

With regard to studies conducted on the MENA countries, all of **M.BenBouziane and A.Benamar (2007**) are doing studied the 13 countries of the MENA countries during the period 1970-2003 depending on their classification on RR (2004) and LYS (2005) so they divised the sample into two sections (hard and mediator) and by using model of VAR and PMG, they reached that variation macroeconomic variables used in this topic study (NER, IMP, EXP, FDI, CPI, GDP) in the case of system mediator of these countries is smaller than the variation of this topic variables in the case of fixing system. The **Sfia.M.Daly** has tested a range of variables for 17 countries of the MENA economy during 1990 to 2000 and using the classification of Bubula and Otker-Robe (2002) with the result that tests in the exchange rate regime of these countries have been affected in the last decade by international precautions , and in the year **2009** the researcher accompanied by **Mouley Sami** by changing the previous classification and rely on the formal classification for FMI and realistic classification of RR (2004) and LYS (2005) for the 15 countries of the MENA from 1977-2007 They concluded through the formal classification that States which is characterized by a degree opening up high and a high level of trade must that are moving toward fixed systems , and vice versa for the classification realistic (the trend toward flexible systems) .

By using the three realism classifications Ghosh et Al (2002), LYS (2003), RR (2003) in the study of **Harms and Kretschman (2008)** on 167 countries advanced, emerging and developing countries for the period 1974-1999 through the test variables (POP, GOV, TT, OPEN, INVEST , GDP) in a manner of OLS and GMM, the result was similar in the sample of developed countries, and refers to the increase in the rate of growth to a flexible exchange rate, while varied in the sample emerging and developing countries, so according to the RR (2003) and Ghosh et Al (2002) rated, a positive effect of the fixing system on the growth was appears, and vice versa for the classification of LYS (2003).

During the last two years have proved studies of **Ndanbendia and Al Hayky in 2011**, on the 15 countries of sub-Saharan Africa (SAA) during 1980-2004 using the method of OLS and the test of simultaneous integration on variables (FD, REER, INVEST, GDP) that the volatility of the real exchange rate negatively affects growth. for them it is necessary to do an in-depth reform of the financial system in the countries of SAA to reduce real and financial shocks resulting from the stability of the real effective exchange rate. And using the same previous method on a set of variables (INVEST, GOV, REER, TT, INF, RGDP), the study looking at the relationship between the exchange rate system and the overall economic performance in East Africa in **2012** for each of the **Stosky, Ghazanchyan, Adedeji and Maehle** during 1990-2010 , so focused on the seven countries (Ethiopia , Kenya , Malawi , Mozambique , Tanzania , Uganda , Zambia) with the use of official classification in addition to the classification of Bubula, Otker-Robe (2002) and the result was that the exchange rate regime affects positively on the performance of economic growth .

Based on the above it can be said that the results of these empirical studies did not reach a finding a clear guide application confirms the relationship of exchange rate regimes with economic growth , and this is due to the essential difference in both the methodologies underlying the classifications used by the researchers because the formal classification of user differs from the classification realistic applied as a result of certain pressures exposed to the economy or through selected sample in the study, including knead the time scale for each study or set of variables that have been tested or the manner and form user to this test in

addition to the data sources , which may have also played a role in this difference . the most of its show that systems floating exchange associated with high growth rates for industrialized economies, while the performance is bad in emerging and developing economies, and vice versa for the effects of inflation , and the systems of fixed exchange are the most surrender to crises, especially in emerging economies , but this does not negate the positives of the system hard for this topic economies (emerging and developing countries) . lately appeared suggestions on determining the impact of systems middleware through the presence of a new theory in this field which is (Corner Solution), which recommends the need to abandon the exchange systems middleware for the benefit of a regular corner either installation strict or free-floating , in addition to that there are other views contradictory view that middleware systems are the best option for developing countries.

3. The Econometric Analysis of the Impact of Exchange Systems on Economic Growth in Developing Countries

1) Research methodology and model used

The research methodology is in use standard approach to test the validity of the hypothesis that the study that say that there were the effect of exchange systems on economic growth and it differs from one system to another is done using time-series data CT (Panel Data), these models has gained recently attention , especially in the economic studies because they take into account the effect of the change of time and the impact of change in the difference between the units of CT, so the first step is the examination of the privacy of homogeneity or heterogeneity of the general path of the data. at the level of econometrics due to the test of equal coefficients model studied in the individual dimension , but on the economic level , the tests specifically back to check whether the theoretical model studied identical for all nations or otherwise if there are specific state privacy .

In the beginning, we tested the hypothesis structure homogeneity full (constants and transactions are identical), so if you find statistics Fisher calculated by testing homogeneity greater than the statistics Fisher tabular and therefore will be rejected this hypothesis, and then are tested and the presence of individual effects and so with the assumption that the coefficients **βi** fixed All vocabulary. After the completion of these tests will rely on the form below:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it}$$

So what:

y_{it} **:** Represents the dependent variable of the state i in period t.

α_i: Represents the effect of each country with a fixed time.

β: Symbolizing the parameters to be estimated for each independent variable.

x_{it}: represents a Matrix of a number of independent variables of the state i in period t, where i to symbolize the number of countries and t denotes a period of time.

ε_{it}: Represents the value of the random error of the state i in period t.

This type of model can distinguish the two cases from which to learn about the type of effects used for the parameter α_i whether to follow either:

Fixed effects model: α_i , which is a group of border fixed for each unit.

Random effects model: α_i, which is a within the random error component compound.

Although the texts of the analysis record indicates that the fixed effects are most suitable for data CT across countries, but it can not be sure of that until after the use of the test of **Hausman (1978)** in order to find out which of the effects are considered more appropriate to estimate the model, both models were fixed effects or models random effects in order to determine which of the two models should be selected and used in the model so that the null hypothesis is as follow:

$$\begin{cases} H_0: E(\alpha_i/X_i) - 0 \\ H_1: E(\alpha_i/X_i) \neq 0 \end{cases}$$

So that:

H0: Is the null hypothesis when the random effects model is appropriate in this case are relying on the method of least squares generalized GLS.

H1: is the alternative hypothesis when the fixed effects model is appropriate in this case are relying on the method of least squares with dummy variable OLS.

The formula of the test is as the following form:

$$H = (\hat{B}_{OLS} - \hat{B}_{GLS})' \ [Var(\hat{B}_{OLS} - \hat{B}_{GLS})]^{-1}(\hat{B}_{OLS} - \hat{B}_{GLS})$$

So follow **H** under the null hypothesis distribution **(X^2)** with the degree of freedom **k**, any number of independent variables, and if found that the calculated value of a statistical test is greater than tabular value is rejected the null hypothesis that supported the preference model random effects, and accept the alternative hypothesis that say that the fixed model effects is best.

With regard to the drafting of model study, although there are many experimental studies mentioned above , however, this study is characterized of the rest of the other studies being the study of contemporary dealt a period of time modern until 2012 , compared with previous studies that dealt with the period in 2004 only with the use of a combination of variables and work the test in order to discover the nature of the relationship between actual exchange rate regimes and economic growth, Based on this topic of Applied Studies and a private study all of Perrault et Al (2001), LYS (2003), Rogoff And Al (2004), Huang and Malhotra (2004), Coudert and Dubert (2005) and in the same way will be to use the following function growth to study the effect of exchange rate regimes on economic growth :

$$Y = f(InvGDP, GOV, SEC, FD, Open, TT, CIVIL, POLSTAB, Fix, int, Float).$$

$$y_{it} = \alpha_i + \beta_1 InvGDP_{it} + \beta_2 GOV_{it} + \beta_3 SEC_{it} + \beta_4 FD_{it} + \beta_5 OPEN_{it} + \beta_6 TT_{it} + \beta_7 CIVIL_{it} + \beta_8 POLSTAB_{it} + \beta_9 Fix_{it} + \beta_{10} Int_{it} + \beta_{11} Float_{it} + \xi_{it}.$$

So what:

Y: Represents a growth rate of per capita GDP (GDPPC), it is obtained by dividing real GDP by the total population, it is the dependent variable as an indicator of economic growth, which commonly used in the theory of internal growth proposed by (. Lucas (1988), Romer (1986.1990).

InvGDP : Represents investment as a percentage of GDP is calculated by dividing the total fixed capital formation (GFCF) to GDP, has been confirmed by several studies on

investment and significant positive impact on growth as a study LYS (2003) and the study of Barro (1991).

GOV: represents a growth rate of government consumption to GDP, so see all of Bailliu et Al (2002) and LYS (2001) and William (2006) that there is a negative effect of government consumption on economic growth, and the other hand, others have found a positive effect of the relationship, including the study Garofalo (2005).

SEC: represents a human capital variables may take on the form of the growth rate of the number enrolled in secondary education , and the results of all studies of LYS (2001) and (2004) Edwards and Levy-yeyati to signal positive sign by statistics.

FD: represents a measure of the evolution of the financial sector and is calculated by the loan in the local private sector to the GDP, has shown many of the studies and the existence of a positive relationship between the two variables as a study positive Levine, Loayza et Beck, 2000.

OPEN: represents the index of openness to international trade and is obtained by dividing the sum of exports and imports to GDP , has shown most of the studies on the positive relationship with growth , including the study of Bailliu and Al (2001) Contrary to this view, others argue that it can be to open up a negative impact on growth .

TT: represents the rate of the international exchange trade, it is calculated by price index of the country's exports to the price index of imports denominated in dollars, so that proved in several studies , including the study **of Harms and kretschmann (2008)** with a positive relationship between the two variables .

CIVIL: represents a democratic freedom index or index of civil liberty, so that most of the studies were in favor of a positive relationship between democratic freedom and economic growth.

POLSTAB: a political stability index (political stability and lack of violence), so that is a barrier to economic growth means that there is an inverse relationship between the two variables.

In addition to the dummy variable of the three types of systems rate exchange:

Fix: expresses the fixed exchange rate system, so that takes the value 1 if the system used is hard and takes a value of 0 in the other.

Int: expresses the exchange system mediator, so that takes the value 1 if the system used is the mediator and takes the value 0 in the other.

Float: expresses the flexible exchange rate system, so that takes the value 1 if the system used is flexible and takes the value 0 in the other.

Has been relying on a sample of countries is composed of 18 developing countries, in which the exchange systems differs from one state to another, so that they are divided into three groups (fixed, intermediate and flexible) by Category realistic common for RR (2004) and LYS (2005) in the following form:

- The first group belong to countries that have adopted a system of fixed exchange: Saudi Arabia, Kuwait, Bahrain, Oman, UAE and Jordan.
- The second group belong to countries that have adopted the system of exchange mediator , namely: Algeria, Tunisia, Morocco, Egypt, Mauritania, Syria and Iran.
- The third group belong to countries that have adopted a flexible exchange system, namely: Malaysia, India, Turkey, Indonesia, Chile.

Moreover, this standard study based its analysis on annual data covering the period from 1980 to 2012 (36 years old), which was adapted from a variety of sources including: »World Bank WDI, Research Center Statistical, Economic and Social Research and Training Centre for Islamic Countries SESRIC, UN statistics UNSD, data source, particularly in African countries Open Data Africa, in addition to the site's Freedom in the world.

2) **methodology**:

As we have stated previously that he will be initially tested Hausman order to determine the appropriate model for this study If the calculated value of a statistical test is greater than tabular value is rejected the null hypothesis and accept the alternative hypothesis that the model fixed effects is best compared to the model of random effects , the next Table shows results obtained after Hausman testing, based on the program Eviews 6:

Table N°02: Hausman test results (Fixed versus Random Effets)

The value of the test (Chi-Square.Statistic)	P-Value
30.603	(*)0.0013

Notes : (*) Significant at the 5% . **Source :** author's estimation results.

Depending on the results of the table showed test Hausman high statistical value (Chi-Sq. Statistic) value of 30.60 and after comparing the value spreadsheet when the degree of freedom of 11 (number of independent variables) and the level of significance of 5% are rejected imposition nihilistic , indicating a correlation between the effects of states and variables explanatory use shall be fixed effects model is appropriate and best for our thoughtful and this result is similar to what is expected.

Estimate model parameters using the fixed effects model :

After results of Hausman's test will appreciate the model parameters using a fixed- effects model using ordinary least squares method OLS, and pro table illustrates this:

Table N°03: The study model parameters estimated using by fixed effects.

Dependent Variable : Represents per capita GDP growth (GDPPC).
Period: 1980 - 2012 T= 33 N= 18 Total number of Panel : 33 × 18 = 594

Independent variables:	**Fixed effects model:**
Constante	-2545.643 (-3.536)***
INV	123.56 76 (19.342)***

GOV		-207.3986 (-22.965)***
SEC		66.18049 (25.668)***
FD		41.23021 (16.023)***
OPEN		-29.60069 (-12.989)***
TT		69.92791 (48.992)***
CIVIL		-824.2157 (-16.899)***
POLSTAB		-53.28899 (-0.451)
FIX		3266.887 (5.837)***
INT		1546.654 (2.796)***
FLOAT		2173.427 (3.882)***
Number of observations		594
R- squared		0.885231
Adjusted R- squared		0.884929
Prob (F- statistic)		0.000000
Fixed Effects	Algeria	-5523.643
	Morocco	-1912.722
	Tunisia	-2784.717
	Egypt	-4350.114
	Syrian Arab Republic	-795.7497
	Iran	-4041.924
	Kuwait	11903.96
	Bahrain	2030.031
	Jordan	-1663.899
	Oman	3018.418
	Saudi Arabia	3955.234
	United Arab Emirates	24921.90
	Turkey	-2773.373
	Chile	-6450.785
	India	-6636.252
	Malaysia	-3926.352
	Indonesia	-7812.155
	Mauritania	2842.133

Notes: statistics are in parentheses. *** Significant at1% or less, ** Significant at5% or less, Significant at 10% or less.

Source: Personal elaboration from the estimation results.

Statistical analysis is based on the measurement tools of economic as test of the quality of the model by comparing the statistical results with the economic theory and make sure whether they are compatible or contradict it , Proceeding from the results shown in the table it can be said that the relationship between the dependent variable and the explanatory variables is very strong and knead through the correlation coefficient (R2 : R-squared) , which is approaching 1 this shows the results obtained are as good as we note a significant form through F value of statistical as well as the majority of parameters variables moral and referring compatible with economic theory, regardless of the parameters systems except variable political stability , this shows that the model is able to explain the changes that occur in the rate of growth of per capita GDP and the ability of independent variables to explain the change in the dependent variable . Thus can be expressed on the results of this study are as follows:

at the 5% level, the parameter **(α_0)** morale and adversely affect the economic growth also note that the values differ from one country to another, depending on the specificity of each state.

at the 5% level, the variable **INV** and Representative of total fixed capital formation to GDP is significant and positive, that is means that there is a direct correlation between the two variables and this result of the approval of stated in economic theory, which also supports the study LYS (2003), and this demonstrates the importance of investment spending to

increase growth rates in GDP also creates productive investment in the economy by matching income.

The variable **GOV** and that design all government spending. so it is a moral and it referring is negative, as an increase in the proportion of government consumption leads to lower growth rate means that there is an inverse relationship between the two variables is compatible with economic theory sign by differences at the level of 1 %, which the findings of the study all of Bailliu et Al (2001) and LYS (2002), because the government consumption indirectly affect growth by influencing the decisions of the private sector through taxes imposed by governments and others argue that the taxes used to finance purchases of government reduce the incentive of the private sector to invest because of lower investment returns and low motivation to work and thus reduced the number of hours the worker.

with regard to the rate of growth of the number enrolled in secondary education **SEC** has found Is a direct correlation between this variable and economic growth because the rate of human capital growth to physical capital with a certain level of per capita initial output by 1% will lead to the achievement of high rates of economic growth rate of 66.18%, which means that an increase in the proportion of education contribute to the increase of human capital, which in turn increases the production, and this has been demonstrated in this study through a significant and positive variable at the 5% level consistent with economic theory, as well as the study of Edwards and Levy-yeyati (2004).

The same result for the scale development of the financial sector **FD** and expressed by the local loan of private sector, it means that there is a direct correlation positive between this variable and economic growth sign by differences at the level of 5%, so that measures the extent of the development of the banking system in the granting of loans and advances to the private sector and its role in gathering information and diversify risk and to mobilize savings the more the country's financial system to be developed by high growth rates of 41.23% and because it allows the optimum allocation of productive resources and this has been confirmed by experimental studies for each of the (Hnatkovska et Loayza (2003) and Levine (2004).

As for the index of openness to world trade represented by **OPEN** is a significant and negative at the level of 5 % is evidence of an inverse relationship between the two variables , and this result does not correspond with what stipulated in economic theory, but they agree the study Lassana Yougbaré (2009) so that the increase in the index opening at a rate of 1 % leads to a reduction in the growth rate increased by 29.60% , and could be due to geographical factors through distance from major markets, as well as the majority of countries used in the study adopted by a large margin in exports on oil prices, which means that competition may hinder the process of scientific innovation as a result of reduction in expected profits as intervention in international trade would be beneficial for growth if it stimulates the production sector to invest in innovative research for goods that represent the comparative advantage of countries .

the signal rate of the international exchange of trade expressed by **TT** came positive and Statistically significant at the level of 5% means that there is a direct correlation between this variable and economic growth in a manner consistent with the economic theory and empirical study of both Harms and kretschmann (2007), so that the increase in the rate of international trade by 1% to increase the growth rate of 69.92% and explain this relationship positive belief that the idea of the terms of trade would increase revenue of producers and this in turn will increase the investment in the capital and then production within the economy and thereby increase the per capita income.

On the other side, the index of civil liberty **CIVIL** is significant at the level of 5 % and a negative signal because the order of the degrees of freedom takes the form of reverse so that represents a number of 1 degree of freedom Top, while The number 7 represents the degree of freedom at least , so that most of the studies were in favor of a positive relationship between economic growth and freedom democracy by providing the enabling environment to accelerate growth or through its impact on the determinants of growth, infrastructure and this has been confirmed by a study of each of Limongi (1993) and Behrman (1999) that democracy is a positive influence on growth through the protection of private property , which in turn will stimulate savings and investment and thus working on increase human capital and improve its quality .

The same result for the index of political stability **POLSTAB** Despite the lack of significance of this variable, however, referring negative is the theoretically correct, so that this variable expresses shock state, whether failed or successful, including wars, but it is considered an obstacle to economic growth and thus affect the activities economic, financial and so the fact that some of the countries involved in the study suffered in the recent period of wars and political instability, including Tunisia, Syria and Egypt.

Finally, with respect to exchange rate systems of the three, whether **fixed or intermediate or flexible** has proved this study, a correlation supports the hypothesis that suggests the existence of the effect of the nature of the exchange systems on economic growth. in this sample of countries has shown form a significant transactions dummy variable for exchange rate regimes , so that showed results coefficient fixed systems was significant and positive at the level of 1 % with increasing positive system hard on the system floating and the mediator, if the State adopted a fixed exchange rate system in a given year , they will increase in the rate of growth of per capita GDP higher than in the case of applied modular system and the mediator , and can be interpreted this result to a number of reasons may be states used in the study are more vulnerable to monetary shocks, and thus show the importance of the fixed system to isolate these shocks on the one hand. as well as to check the credibility of monetary policy by increasing the investment rate and trade on the other. regarding the regulations floating was the second option for these countries shows that through the evolution of the financial sector , because increasing the degree of this variable leads to the absorption of exchange rate fluctuations and provide a means of coverage and financial intermediation , which included the use of funds of capital flowing in productive investments , while occupies systems middleware ranked third , and so these findings support the views of supporters of the theory corner or theoretical polar in the selection of exchange systems appropriate and support the hypothesis impossible trinity of disappearances future exchange systems middleware and check whether the installation strict hand or free-floating on the other hand remains systems middleware in their non-

sustainable and that the findings of the study each of Lassana Yougbaré (2009) and Harms and kretschmann (2007).

CONCLUSION

A lot of developing countries Has take a number of economic reforms in order to keep pace with the evolution of the global economy , principally reconsider the choice of exchange rate regime which is able to give a strong push and support to the national economy , so we have tried through this study highlight the nature of the relationship between the exchange systems and economic growth in light of the changes that occurred at the global level and after the presentation of the various theoretical literature and experimental studies that have addressed the same subject , and after the use of curriculum time series data CT (Panel Data) concluded that the weakness of the developing economies is not a result of the selection system of exchange but it is a result of institutional weaknesses and structural and adoption in particular on primary industries and extractive. Thus can be summarized results of this study in the following points :

The study proved the existence of a positive relationship between the exchange systems and economic growth for a group of developing countries under study, so that the best rate of economic growth has been associated with systems of fixed exchange followed by flexible systems and middleware systems occupies third place.

Preference to move away from systems and middleware-oriented solutions corner. as The higher the degree of financial integration in developing countries, which is characterized by systems of financial fragile, so that produces fear of floating in the emerging countries of defects structural built-in error principled and high debt in foreign currencies, as well as the preference reduce the degree of flotation and orientation towards stability greater the degree of response of prices to the exchange rate.

The result of this study support the hypothesis impossible trinity and the choice between independence and stability through the disappearance future systems middleware being the main cause of all violent crises that hit emerging economies , so that the developing countries in this case prefer the stability of macroeconomic or go about choosing the positives systems floating and flexibility high due to the weak financial integration and lack of development of financial markets Frankel (2000) and Fisher (2001), but this does not mean ignoring the benefits of systems middleware as stated Williamson (2000) that it allow the state swap between credibility and flexibility in the choice of exchange rate regime and useful to countries that want to switch from fixed to flexible system .

The new financial globalization impose on developing countries follow a policy of gradual liberalization of their financial systems , banking and economic reforms and to join the World Trade Organization through the lifting of restrictions of foreign trade , so that has become an inevitable trend towards the gradual flotation fact impose themselves on developing countries .

Finally, what can be said that the exchange system may be one aspect of the policies used macroeconomic as evidenced by this study and other studies is similar but the results of that research have been mixed, some studies have proved that the fixed system to achieve higher growth and others are among the contrary on the other samples so it does not can determine the exchange rate regime suitable for every time and any place.

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Appendix 1 : The results of the fixed effects model.

Dependent Variable: GDPPC?
Method: Pooled Least Squares
Date: 04/21/14 Time: 17:50
Sample: 1980 2012
Included observations: 33
Cross-sections included: 18
Total pool (balanced) observations: 594

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2545.643	719.7929	-3.536632	0.0004
INV?	123.5676	6.388422	19.34244	0.0000
GOV?	-207.3986	9.030696	-22.96596	0.0000
SEC?	66.18049	2.578318	25.66808	0.0000
FD?	41.23021	2.573051	16.02386	0.0000
OPEN?	-29.60069	2.278789	-12.98966	0.0000
TT?	69.92791	1.427313	48.99270	0.0000
CIVIL?	-824.2157	48.77036	-16.89993	0.0000
POLSTAB?	-53.28899	118.0170	-0.451537	0.6516
FIX?	3266.887	559.6125	5.837766	0.0000
INT?	1546.654	553.0814	2.796432	0.0052
FLOAT?	2173.427	559.7610	3.882776	0.0001
Fixed Effects (Cross)				
_ALG--C	-5523.643			
_MAR--C	-1912.722			
_TUN--C	-2784.717			
_EGY--C	-4350.114			
_SYR--C	-795.7497			
_IRN--C	-4041.924			
_KWT--C	11903.96			
_BHR--C	2030.031			
_JOR--C	-1663.899			
_OMN--C	3018.418			
_SAU--C	3955.234			
_ARE--C	24921.90			
_TUR--C	-2773.373			
_CHL--C	-6450.785			
_IND--C	-6636.252			
_MYS--C	-3926.352			
_INDO--C	-7812.155			
_MRT--C	2842.133			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.885231	Mean dependent var	6608.561
Adjusted R-squared	0.884929	S.D. dependent var	9578.519
S.E. of regression	3249.230	Akaike info criterion	19.01293
Sum squared resid	1.13E+11	Schwarz criterion	19.03267
Log likelihood	-101614.1	Hannan-Quinn criter.	19.01959
F-statistic	2937.330	Durbin-Watson stat	0.444179
Prob(F-statistic)	0.000000		

Appendix 2 : The results of the random effects model
Dependent Variable: GDPPC?
Method: Pooled EGLS (Cross-section random effects)
Date: 04/21/14 Time: 17:55
Sample: 1980 2012
Included observations: 33
Cross-sections included: 18
Total pool (balanced) observations: 594
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2588.751	1451.222	-1.783842	0.0745
INV?	123.2199	6.386753	19.29305	0.0000
GOV?	-206.6945	9.023817	-22.90544	0.0000
SEC?	66.21315	2.575008	25.71377	0.0000
FD?	41.07626	2.571461	15.97390	0.0000
OPEN?	-29.19985	2.274831	-12.83605	0.0000
TT?	70.03337	1.426360	49.09936	0.0000
CIVIL?	-821.8368	48.73679	-16.86276	0.0000
POLSTAB?	-31.54210	117.7174	-0.267948	0.7887
FIX?	3270.259	559.5977	5.843946	0.0000
INT?	1540.230	553.0730	2.784858	0.0054
FLOAT?	2166.210	559.7473	3.869978	0.0001
Random Effects (Cross)				
_ALG--C	-5478.674			
_MAR--C	-1895.264			
_TUN--C	-2789.289			
_EGY--C	-4322.902			
_SYR--C	-787.9530			
_IRN--C	-4019.507			
_KWT--C	11859.20			
_BHR--C	2033.435			
_JOR--C	-1685.531			
_OMN--C	2974.237			
_SAU--C	3932.771			
_ARE--C	24857.26			
_TUR--C	-2732.525			
_CHL--C	-6444.325			
_IND--C	-6583.657			
_MYS--C	-3960.352			
_INDO--C	-7775.195			
_MRT--C	2818.275			

Effects Specification	S.D.	Rho
Cross-section random	5347.207	0.7303
Idiosyncratic random	3249.230	0.2697

Weighted Statistics

R-squared	0.477498	Mean dependent var	164.7146
Adjusted R-squared	0.476960	S.D. dependent var	4496.878
S.E. of regression	3252.210	Sum squared resid	1.13E+11
F-statistic	887.2827	Durbin-Watson stat	0.442642
Prob(F-statistic)	0.000000		

Appendix 3 : Hausman test results

Correlated Random Effects - Hausman Test

Pool: POOLRAN

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	30.603878	11	0.0013

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
INV?	123.567645	123.219929	0.021322	0.0173
GOV?	-207.398623	-206.694455	0.124193	0.0457
SEC?	66.180487	66.213153	0.017058	0.8025
FD?	41.230209	41.076263	0.008184	0.0888
OPEN?	-29.600689	-29.199846	0.018023	0.0028
TT?	69.927908	70.033369	0.002719	0.0431
CIVIL?	-824.215700	-821.836791	3.272886	0.1885
POLSTAB?	-53.288994	-31.542103	70.623892	0.0097
FIX?	3266.886864	3270.258803	16.612006	0.4081
INT?	1546.654498	1540.229678	9.366870	0.0358
FLOAT?	2173.426622	2166.209785	15.366763	0.0656

Cross-section random effects test equation:

Dependent Variable: GDPPC?

Method: Panel Least Squares

Date: 04/21/14 Time: 18:06

Sample: 1980 2012

Included observations: 33

Cross-sections included: 18

Total pool (balanced) observations: 594

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2545.643	719.7929	-3.536632	0.0004
INV?	123.5676	6.388422	19.34244	0.0000
GOV?	-207.3986	9.030696	-22.96596	0.0000
SEC?	66.18049	2.578318	25.66808	0.0000
FD?	41.23021	2.573051	16.02386	0.0000
OPEN?	-29.60069	2.278789	-12.98966	0.0000
TT?	69.92791	1.427313	48.99270	0.0000
CIVIL?	-824.2157	48.77036	-16.89993	0.0000
POLSTAB?	-53.28899	118.0170	-0.451537	0.6516
FIX?	3266.887	559.6125	5.837766	0.0000
INT?	1546.654	553.0814	2.796432	0.0052
FLOAT?	2173.427	559.7610	3.882776	0.0001

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.885231	Mean dependent var	6608.561
Adjusted R-squared	0.884929	S.D. dependent var	9578.519
S.E. of regression	3249.230	Akaike info criterion	19.01293
Sum squared resid	1.13E+11	Schwarz criterion	19.03267
Log likelihood	-101614.1	Hannan-Quinn criter.	19.01959

F-statistic	2937.330	Durbin-Watson stat	0.444179
Prob(F-statistic)	0.000000		