

# Optimal Exchange Rate Regime and Economic Growth: Case of Emerging Country

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## Abstract

This study aims to identify the optimal exchange rate regime that ensures the highest growth for emerging country. Based on a sample of 24 emerging country over the period 1974-2008, our results show that during the first 1974-1984 decade, the fixed regime offers the best growth compared to the flexible and intermediate regimes with a 3.5% rate. From 1985 to 2008, the two-polar-regimes offer approximately the same level of growth with a slight preference for the flexible regime. However, the intermediate regime has the highest average growth rate (2.79%). Moreover, our model reveals that the intermediate regime provides the emerging country with the highest growth rates.

**Keywords:** Exchange Rate Regime, Growth, Emerging Country.

## Introduction

The choice of the exchange rate regime has been the center of controversial debates in international forums in recent years, after a series of economic crises, notably the last financial crisis which has affected many countries. These crises have initially hit the European country (1992) (EMS) and later, emerging country in Asia (1997) and Mexico (1994). These crises have been caused by the choice of an inadaptable exchange- rate regime (Edwards 1996; Edwards and Levy-Yeyati 2003).

Thus some economists (Chang and Velasco 2000; Harris 2002) suggest that the main lesson of the 1990 crisis is that it must be left free floating exchange rate regimes. Others have questioned the merits of the flexible exchange rate regimes, the fact that these plans will be the cause of the macroeconomic instability, Calvo and Meshkin (2003). Therefore theorists like (Williamson 2000; Reinhart and Rogoff 2004) adopt halfway- exchange arrangements between free float and pure fixity known as intermediate exchange rate regimes which are more vulnerable to crises and have considerable opportunities regarding adjustment to shocks. While opponents of the regime as (Frankel 1999 and Fischer 2001) assume that it is the worst and it shows the limits of the two regime corners.

The monetary authorities are then ambiguous before choosing the best exchange rate regime. Hence the authors realize the importance of the concept of an optimal currency

regime, which ensures a high level of credibility of the monetary authorities. This concept is especially tremendously important for emerging country.

Moreover, the empirical literature available through a large number of authors such as (Freidman 1953; Mundell 1961; Helpman 1981; Mills and Wood 1993; Obstfeld and Rogoff 1998; Haris 2000; Levy Yeyati and Sturzenegger 2003; and Baillu Musay 2003) showed that there is an obvious relationship between the choice of an appropriate exchange- rate regime and economic growth which can be accounted for by either the adjustment mechanism for macroeconomic imbalances, which affect the country or by the effect of the choice of the exchange- rate regime on the determinants of growth.

However, the predictions provided by economic research devoted to the question are tainted with shortcomings and indisputable ambiguities, because of the sensitive specificity of the exchange rate regime and the growing relationship with the classification adopted in the studies.

Thus, the optimal exchange rate regime will be directly associated with good economic growth. Our work fits into this reflection. It aims to examine the relationship between the exchange rate regime and growth from the growth determinants such as the level of investment, the degree of openness to international trade and the accumulation of knowledge on the one hand, the state variables related to growth such as physical capital, human capital, the level of inflation and the role of the state, without neglecting the specific effects of each country, on the other hand.

It would be plausible to take a stand in that great theoretical debate and then provide a clue for the key issues. These include whether the fixed exchange rate can accelerate economic growth through price stability and the low inflation it brings about? country with high growth end up by adopting either a flexible regime to benefit from growth, or the half way plans that include a fixed component and flexible terms of economic growth? So what is the optimal exchange- rate regime in terms of growth?

The studies focused on the effect of the choice of the exchange- rate regime on economic factors such as: production, investment, savings ... but few of these studies have yielded clear results. Moreover, their approaches are tainted with shortcomings and gaps in the undeniable fact that the nature of the exchange rate regime and growing relationship is very sensitive to the chosen typology.

Therefore, we propose in our work to clarify the relationship between the choice of an exchange rate regime and economic growth, in 24 emerging country during the 1970- 2008 period.

Our research contributes to the literature through several axes. The first is to consider the context of emerging country bearing certain characteristics. These are middle-income country that are still trying to improve their economic features by adopting reform programs designed to achieve stability against developed country.

There was a shift from a closed economy to an open economy which guarantees better economic performance. The second is to consider a fairly broad study- period that covers the period following the collapse of the Bretton Woods system from (1974) to (2008),

characterized by economic changes globally. The third priority is to adopt a set of state variables, to ensure that the coefficients associated with exchange rate regimes of the deferent variables only detect the effect of the exchange rate regime choice on growth and without being influenced by other variables; a set of variables used as growth determinants and dummies representing the different exchange rate regimes while integrating other economic variables strongly linked to the growth and exchange rate regime adopted, such as the accumulation of knowledge through scientific research and the role of the State in creating a good institutional framework. Add to all this the last era and to consider the official classification of the IMF (de facto) (1999) which is more appropriate than the classification (de jure), originally used by the IMF and that has proven ineffective in identifying the relationship growth- exchange rate regime. Indeed, this member- country classification is implemented on the simple statement of these countries, which makes these little credible jure classifications and results of empirical research used more ambiguous than the other. Therefore in (1999), the IMF has changed its classification-methodology for the of exchange rate regimes with a more clear classification (de facto).

This paper is outlined as follows; in the first section, we present the literature review of the relationship between the exchange rate regime and economic growth. In the second section, we shall explain our empirical methodology. In the third section, we present the econometric Approach. In the last section, we display the empirical results.

### **I. The Literature Review**

Some supported the existence of a positive relationship between the flexible regime and growth (Lys 2000) on a sample covering the (1974-1999) period, found that the fixed exchange rate regimes are associated with low growth rates and in (2002), they deduced that a flexible system enables the rapid reallocation of resources following a real shock in the presence of short-term fixed prices. (Levy-Yeyati and Struzengger 2003) on a sample of 183 country for the period (1974-2000), found that the country adopting a flexible exchange rate recorded an annual growth rate of 0.78% which is higher compared to other country.

To reinforce these interpretations in the long run, the data are calculated by an average variable and the exchange rate regime is measured by the percentage of years in which a fixed plan is adopted.

Estimates show that the flexible exchange regime is favorable for growth. Similarly for a study that comprises 25 emerging country during (1973-1998), Baillu and al. (2002) found that the flexible exchange rate regimes are associated with faster growth, but only for country that are open to global capital flows and those which set up a well-developed financial system.

Reinhart and Rogoff (2002) also found that growth is higher under a floating regime and the half-way plans are negatively and significantly related to growth. Rogoff and al. (2004) add that the relationship between the IMF exchange rate regimes and growth depends on the degree of financial and economic development of achieved by these country and their degrees of integration into the international markets as floating regimes are associated with a high growth for the developed country and in the developing country, fixity is neutral with respect to growth, and has an effect that is quite contrary to the emerging country.

Some supported the existence of a positive relationship between the intermediate regime and growth. Ghosh and al. (2003), 21 for the middle-income country and high income during

the 1970 -1997 period, found that the intermediate regimes are most effective for the development of growth than the flexible regime.

Several studies have shown the existence of a positive relationship between the fixed regime and growth. In this sense, De Grauwe and Schnabl (2004) carried out an exchange-rate regime classification and concluded that the relationship is positive between the fixed exchange regime and growth. However, Bleaney and Francisco (2007) show that the classification (Reinhart-Rogoff) reduces the effect of floating regimes compared to other types of classification (FMI; LYS; Schambaugh (2004); Bubula and Otker-Robe (2002)). They show that pure stowage, was linked to lower growth, but the floating regime is not linked to faster growth. Thus, the exchange regime is not a determinant of economic growth and the same conclusion was drawn by Klein and Shambaugh (2010).

## **II. Empirical Methodology**

We seek through this part to empirically validate the relationship between the choice of the exchange regime and economic growth. Specifically, we intend to verify the validation of the hypothesis exchange regime affecting economic growth in the country.

### **II.1. Hypotheses Development**

Many studies (Friedman 1953; Mundell 1961; Helpman 1981; Mills and Wood 1993; Obstfeld and Rogoff 1998; Haris 2000; Levy Yeyali and Sturzenegger 2003; Baillu and Musay 2003) attempted to examine the relationship between the exchange regime and growth. Nevertheless, the findings are often contradictory, but their common point is that this relationship depends on the adopted exchange rate regime; the study- period and the sample used. Certainly the results found in the context of emerging country are divergent from those yielded in the developing country. Indeed, the latter have specific characteristics beside the effect of a particular exchange regime on growth through its effect on determinants such as investment, international trade, and financial development.

In emerging markets the fixed regime can positively or negatively influence the level of investment and thus growth.

These emerging economies that are trying to move from a closed economy to an open economy benefit from the fixed regime. It is effective for growth as it reduces transaction costs. However, the flexible regime causes a rapid return to the exchange rate on the balance which increases the benefits of trade openness and growth. As for the intermediate regimes, they have a favorable impact on international trade and growth.

Moreover, these emerging markets are characterized by weak financial institutions, and an undeveloped financial sector, which requires a flexible regime (Baillu and al 2001; Reinhart and Rogoff 2002 and Rogoff and al. 2004).

In contrast, profits generated in terms of growth of a fixed system are higher in case of financial sector development De Grauwe and Schnabl (2004), and intermediate regimes remain the most suitable for this growth Ghosh and al. (2003).

Thus, all throughout our work, we strive to identify the exchange rate regime that provides high economic growth.

## II.2. Sample Selection

In our analysis we focus on the choice of exchange regime (24) of emerging country. And in order to have a wide range of exchange regimes, the study will cover the period following the collapse of the Bretton Woods system from 74 to 2008.

Based on the work of Reinhart and Rogoff (2004); the taxonomy stated by the IMF (2002) and up to (2008), which generates eight sections<sup>1</sup> including (Fisher, 2001) classifies the group as follows: The first three schemes are fixed, the three secondnes are intermediate and the last two are flex plans

All the macroeconomic variables are from are by The World Bank (Word Development Indicator (2010))

And the data related to the classification of the IMF exchange rate regime (de facto) for the emerging country are drawn from the (Exchange arrangements and exchange restrictions) IMF annual reports.

### Variables' Measurement

#### ▪ Economic growth " GDP growth"

Measured by the real growth rate for domestic product gross (GDP) per capita expressed in annual percentage

#### ▪ Physical capital stock "GDP capita "

Measured as GDP per capita (in constant monetary unit of each country at the beginning of each period)

#### ▪ Stock of human capital "Education"

The average number of high school years' schooling in the total population aged less than 25 years

#### ▪ Inflation rate "inflation"

This is the rate of change of consumer price indices for the annual data

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<sup>1</sup>The eight sections are: 1Exchange rate regimes with no separate legal tender currency unions, dollarization or Eurosation 2 Currency edge, 3 Fixed anchors against a currency or a currency basket with a fluctuation margin(+ or -1%), 4 The fixed exchange rate within a fluctuation band, 5 The crowling pegs, anchors with central parities adjusted each time according to the fixed rules preannounced according to a set of quantitative indicators, 6 The crowling bands, crowling pegs with strips of + or -1%, 7 The managed float, response without obligation pre announced at a target path for the exchange rate, free, 8 Flutter whose exchange rate is determined by the market(free float)

According to the vision of the classification of exchange rate regimes, we will adopt that of Fisher,(2001), which clustered them as follows: Fixed regimes : 1-2-3; Intermediate regimes : 4-5-6; Flexibles regimes : 7 and 8

- **Role of state "Debt"**

This variable represents public consumption on GDP or public debt on GDP or the state budget on GDP

- **Investment rate "capital format "**

This variable is measured by gross fixed capital formation to GDP; (GFCF / GDP).

- **Openness to international "trade"**

Measured by the ratio of the sum of exports and real imports to GDP; (trade = I + X / GDP)

- **Financial development degree "Domestic credit"**

Measured by the ratio of credit to the private sector on GDP

- **Background "Research"**

Measured by the number of scientific research laboratories within the university, or the size of the budget for the development of scientific research conducted in universities or by the number of scientific publications.

- **Exchange rate regime "EXR"**

It is based on the work of Reinhart and Rogoff (2004) classification and the IMF (2002 to 2008) classification which generates eight headings.

Thus, the exchange rate regime "EXR" of each country is ranked each year as fixed, intermediate, or flexible as classified (de facto) by the IMF. Each category of the exchange system is designated by a dummy variable that takes the value (1) if the exchange rate regime for that variable is passed and the value (0) otherwise.

### Econometric Approach

Our econometric approach involves two basic steps. The first step, presents an econometric model description. The second step examines a method of econometric estimation that seeks the optimal exchange rate regime that ensures high growth in the emerging country. That is why we implemented the following model:

$$TCGR_{it} = \alpha_i + n_t + \alpha EXR + \beta DTVC + \delta VCET + \varepsilon_{it}$$

With:

**TCGR<sub>it</sub>**: The growth rate of gross domestic product per capita of country (i) at time (t)

**$\alpha_i$**  : The effect specific to the country i.

**$n_t$**  : The temporal effect.

i: index country and t: time index

**EXR**: This is a vector that includes dummy variables to represent the exchange rate regime adopted. Flexible intermediate-(model) (1) Fixed-flexible (model (2)) fixed intermediate-(model (3)).

**DTVC**: Vector determined growth: including the investment rate, the openness to international trade, the accumulation of knowledge for each country and each year.

**VCET**: State vector: This includes the variable stock of physical capital, human capital stock, inflation and the role of the state in each country and each year.

**$\varepsilon_{it}$**  :Error Term

The econometric method used in our work is distinguished by the use of doneness to Panel. Indeed, this tool allows us to take into account two dimensions at once: one for the country and one for the time, which are indicated respectively by indices (i) and (t).

It is interesting to identify the effect on each country for a period of a well-defined time. This effect which can be fixed or random will be established to distinguish the test of Husman to

choose if the coefficients of the two estimates have a fixed or random effect. But given the particular nature of the Panel data, this technique has correlation problems between variables.

To limit these problems we conducted three regressions (see Table 1) to test the relationship of the classification of the exchange regime with growth:

- flexible intermediate- (model (1))
- fixed-flexible - (model (2))
- fixed intermediate- (mode (3))

### Empirical Results

We start our empirical results with the presentation of the descriptive statistics of the first variable which is the focus of our work namely the exchange rate regime and growth and then the control variables.

#### IV.1. Descriptive statistics

##### **A- Descriptive statistics of the exchange regime rate**

Figure I show the annual breakdown of the number of country in our sample adopting different categories of exchange rate regimes (fixed, flexible, and intermediate) during the 1974-2008 period.

According to this graphic, in 1974, 79% of the sample country adopted the fixed component while 21% plan to adopt the flexible regime. Between 1974 and 1997 there was an increase of country adopting the flexible regime and the intermediate regime, against a decline of country adopting the fixed regime. Indeed, in 1997, we note that 82% of the country adopted the flexible regime against 8% for each of the two schemes, flexible and intermediary. From 1997 until 2005, the trend was reversed again as we witnessed a rise in the number of country adopting the fixed regime against a drop in the number of country leaning towards the flexible and intermediary regime.

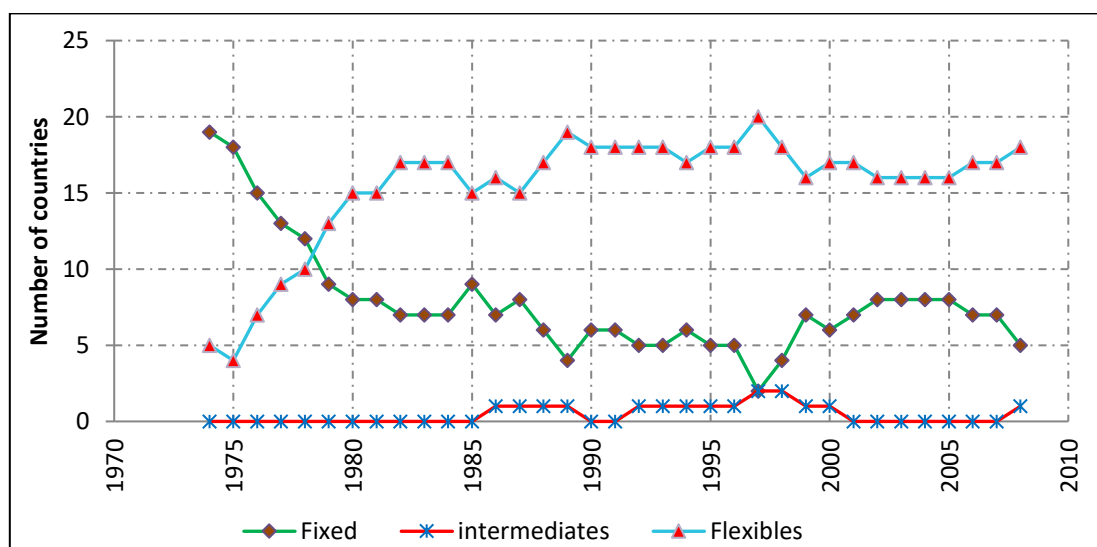


Figure I. Evolution of the number of country adopting different exchange rate regimes

Figure II shows the evolution of the average growth in the different categories of exchange rate regimes (fixed, flexible and intermediate) during the 1974 -2008 period. According to this chart, we can notice that during the first 1974-1984 decade, the fixed regime offers the highest growth compared to the flexible scheme with a 3,5% rate against 1,2%.

From 1985 to 2008, we see that the two polar regimes offer a growth level that is very close to a slight preference for the flexible regime where an average growth of 2,61% and 2,76% was achieved respectively. However, during this period, although the half-way plan is the least adopted by the country mentioned in the sample, it shows that the average growth rate is the highest (2,79%) and mark the two extreme values' growths which are 6,751% in 1988 and 9,01% in 2008.

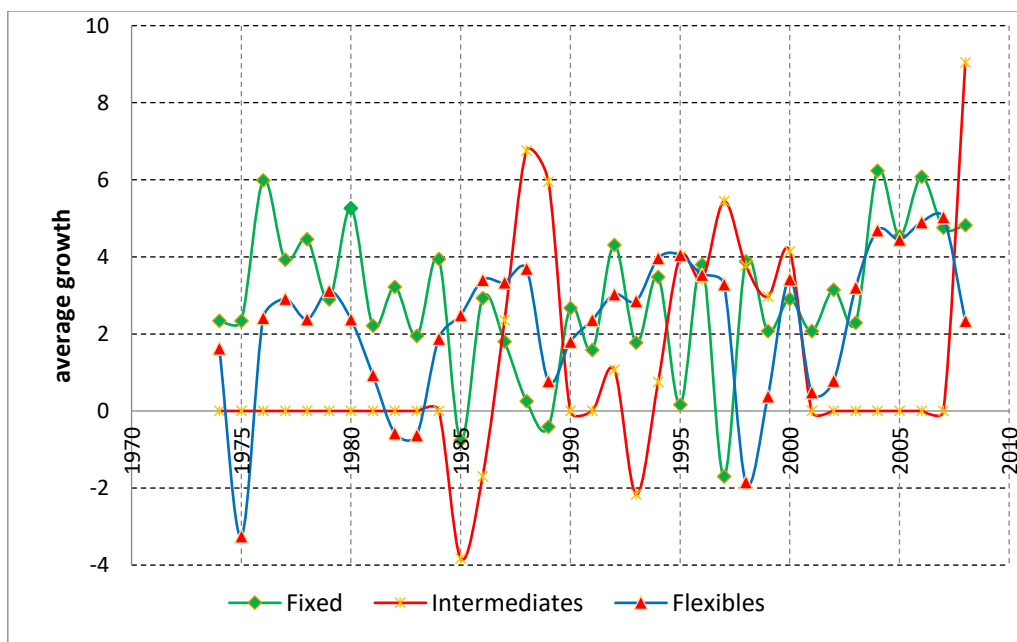


Figure II. Average growth under different exchange rate regimes for country in our sample

**B- Descriptive statistics for growth**

The descriptive statistics of the variable growth for the entire sample are displayed in the following table

Table I

*Descriptive statistics of growth rate*

This table shows the statistic descriptive of growth rate where : <b>gdpgrowth</b> : Real growth rate for domestic product gross (GDP) per capita expressed in annual percentage.					
Variable	mean	median	Standard deviation	maximum	minimum
<b>Growth rate (PIB)</b>	0,937	0,980	2,382	19,919	-16,511

According to the results released, showing that the emerging country have an average GDP growth rate of 0,94% (the median is 0,98%) with a minimum of -16,51% and a maximum of 19,92%. This significant difference between the minimum and the maximum reflects that the



importance of the observed standard deviation is 2,38%. In other words, there are huge fluctuations in growth rates for the country selected in our sample.

The following chart (Figure III) shows the average growth and the sample median.

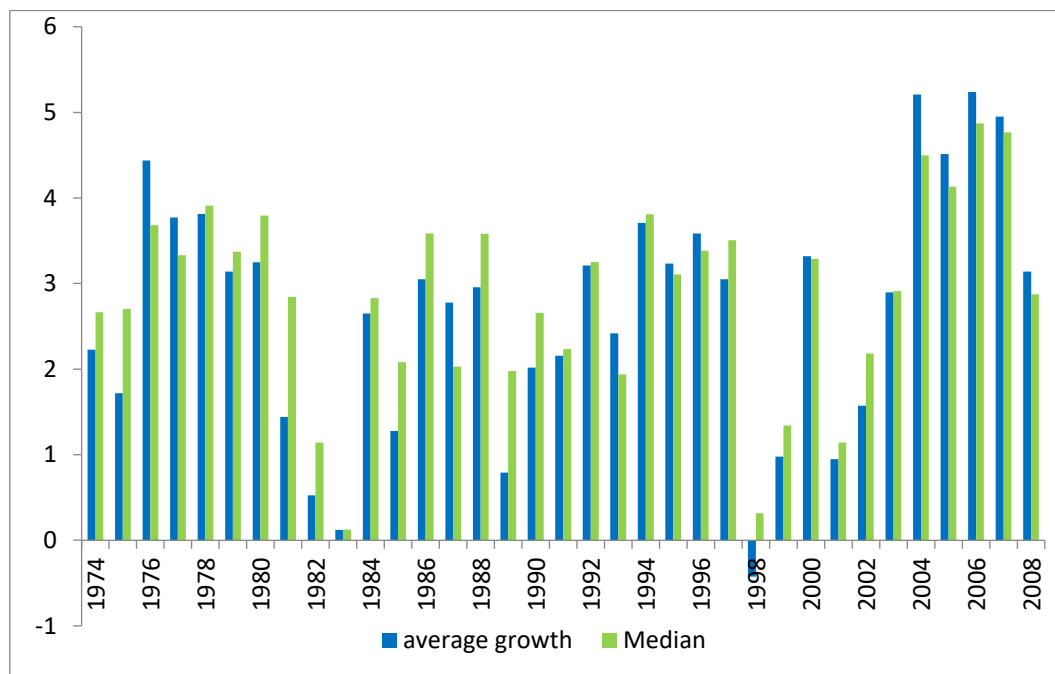


Figure III. Distribution of average growth for the country of the sample

**C- Descriptive statistics of the control variable**

The descriptive statistics of the control variables are presented in the following table:

Table II

*Descriptive statistics of control variables*

This table shows the descriptive statistics of our variables; where:

**gdpCapita**: GDP per capita (in constant monetary unit of each country at the beginning of each period), **Education**: The average number of high school years' schooling in the total population aged less than 25 years, **Research**: number of scientific research laboratories within the university, or the size of the budget for the development of scientific research conducted in universities or by the number of scientific publications, **Debt**: public consumption on GDP or public debt on GDP or the state budget on GDP, **Capital format**: gross fixed capital formation to GDP, **Domestic credit**: ratio of credit to the private sector on GDP, **Trade**: the ratio of the sum of exports and real imports to GDP, **Inflation**: the rate of change of consumer price indices for the annual data, the exchange rate regime.

Descriptive statistics of control variables	Physical capital stock "GDP capita "	Education	Research	Role of state "Debt"	Investment rate "capital format "	Domestic credit	Openness to international trade	Inflation rate "inflation"
Mean	3327,34	6,07	2744,52	60,34	23,36	45,73	57,29	55,55
median	2401,53	6,00	926,00	56,46	22,51	33,32	51,71	9,29

<b>Standard deviation</b>	3014,71	0,93	5891,53	32,80	5,84	32,59	35,20	362,33
<b>maximum</b>	15457,85	8,00	65300,50	190,08	43,59	173,69	220,41	7481,66
<b>minimum</b>	136,26	3,00	50,00	5,22	11,96	6,32	9,01	-7,63

Based on these results, the emerging country have a stock of physical capital of 3327,34 (the median is 2401,53) with a minimum of 136,26 and a maximum of approximately 15457,85. This substantial difference between the minimum and the maximum reflects the importance of the observed standard deviation which is 3014,71. Therefore, there are huge variations in this variable for the sample.

Besides, the average human capital stock is 6,07 (the median is 6) with a minimum of 3,0 and a maximum of 8,0. This small difference between the minimum and the maximum reflects a low level of the standard deviation found which is 0,793. However, the role of the state variable is 60,34% (a median of 56,46%) with a minimum of 5,22% and a maximum of 190,08%. In other words, it accounts for the state role in the developing country involved in promoting investment, building the infrastructure and achieving economic development by financing through debt. For the variable investment, the average is 23,36% (a median of 22,51%) with a minimum of 11.96% and the maximum is 43,59%.

The average degree of financial development is 45,73% (a median of 33,32%) with a minimum of 6,32% and up to 173,69%. This indicates that the emerging country have invested in their financial development. As for trade openness variable, the average is 57,29% (the median is 51,71%), showing that the emerging country undertake a significant import export trade. The average inflation is 55,55% (a median of 9,29%) with a minimum of -7,63% and a maximum of 7481,66%. These rates appear to be very high and beyond it is a characteristic of emerging country.

*Results of the model estimation*

The estimation results of our model are presented in the following table

Table III

*Results of the estimation of the effect of exchange rate regimes adopted on growth*

This table shows the estimation of the effect of exchange rate regimes adopted on growth; where:						
<b>gdpgrowth</b> : Real growth rate for domestic product gross (GDP) per capita expressed in annual percentage,						
<b>gdpCapita</b> : GDP per capita (in constant monetary unit of each country at the beginning of each period), <b>Education</b> : The average number of high school years' schooling in the total population aged less than 25 years, <b>Research</b> : number of scientific research laboratories within the university, or the size of the budget for the development of scientific research conducted in universities or by the number of scientific publications, <b>Debt</b> : public consumption on GDP or public debt on GDP or the state budget on GDP, <b>Capital format</b> : gross fixed capital formation to GDP, <b>Domestic credit</b> : ratio of credit to the private sector on GDP, Trade: the ratio of the sum of exports and real imports to GDP, <b>Inflation</b> : the rate of change of consumer price indices for the annual data, the exchange rate regime, " <b>EXR</b> " of each country is ranked each year as fixed, intermediate, or flexible as classified (de facto) by the IMF. Each category of the exchange system is designated by a dummy variable that takes the value (1) if the exchange rate regime for that variable is passed and the value (0) otherwise.						
gdpgrowth	Intermediate-flexible (model1)		Fixed-flexible (model2)		Fixed-intermediate (model3)	
	Coefficient	Tstudent	Coeff	Tstudent	Coeff	Tstudent
gdpCapita	-0.0000831	-1.39	-0.0000831	-1.39	-0.0000831	-1.39
Education	0.1747171	0.93	0.1747171	0.93	0.1747171	0.93
Research	0.000107	2.04**	0.000107	2.04**	0.000107	2.04**
Debt	-0.0168276	-2.39**	-0.0168276	-2.39**	-0.0168276	-2.39**
Capital format	0.260864	6.18**	0.260834	6.18***	0.260864	6.18***
Domestic credit	-0.0072991	-0.97	-0.0072991	-0.97	-0.0072299	-0.97
Trade	-0.0078043	-1.42	-0.0078043	-1.42	-0.0078043	-1.42
Inflation	-0.0007224	-1.84*	-0.0007224	-1.84*	-0.0007224	-1.84

This table shows the estimation of the effect of exchange rate regimes adopted on growth; where:

**gdpgrowth**: Real growth rate for domestic product gross (GDP) per capita expressed in annual percentage,

**gdpCapita**: GDP per capita (in constant monetary unit of each country at the beginning of each period), **Education**: The average number of high school years' schooling in the total population aged less than 25 years, **Research**: number of scientific research laboratories within the university, or the size of the budget for the development of scientific research conducted in universities or by the number of scientific publications, **Debt**: public consumption on GDP or public debt on GDP or the state budget on GDP, **Capital format**: gross fixed capital formation to GDP, **Domestic credit**: ratio of credit to the private sector on GDP, Trade: the ratio of the sum of exports and real imports to GDP, **Inflation**: the rate of change of consumer price indices for the annual data, the exchange rate regime, "**EXR**" of each country is ranked each year as fixed, intermediate, or flexible as classified (de facto) by the IMF. Each category of the exchange system is designated by a dummy variable that takes the value (1) if the exchange rate regime for that variable is passed and the value (0) otherwise.

gdpgrowth	Intermediate–flexible (model1)		Fixed –flexible (model2)		Fixed-intermediate (model3)	
	Coefficien t	Tstuden t	Coeff	Tdestuden t	Coeff	Tdestuden t
intermediate	3.567815	2.60***	-	-	3.526089	2.54**
Flexible	0.0417259	0.08	-3.526089	-2.54**	-	-
Fixed	-	-	-3.567815	-2.60***	-0.417259	-0.08
Constant	-2014525	-1.11	1.55329	0.71	-1.972799	-1.2
F(10,197)	11.12	-	11.12	-	11.12	-
p-value	0.0000	-	0.0000	-	0.000	-
Random effect chi2(10)	105.57	-	105.57	-	105.57	-
p-value	0.0000	-	0.000	-	0.000	-
Husman khi2(8)	23,01	-	23.01	-	23.01	-
p-value	0.0034	-	0.0034	-	0.0034	-

(\*): significant at 10%; (\*\*): significant at 5%; (\*\*\*) Significant at 1% level - numbers in parenthesis matching  $P > |t|$

Table III exhibits the results of the three regressions for the all the sample. We note a positive and significant relationship between growth and explicative variables such as the rate of investment, the expense of the State, knowledge accumulation, and inflation. However, the physical capital, the human capital, the degree of financial development and trade openness are not statistically significant with growth for the emerging country.

**In model 1**, we note that the flexible exchange rate regime has no impact on economic growth in the emerging country. However, the effect of the intermediate exchange rate regime is significant at (1%) and is positively related to economic growth.

Moreover, the intermediate exchange rate regime is more related to growth than the floating regime. This is consistent with the conclusion of Ghosh, and al. (2003) who found that the intermediate regimes are more related to growth than the floating regime. This can be accounted for by the adoption of an inappropriate exchange rate regime in the emerging country. Thus, we can conclude that the intermediate regime affects economic growth through its positive effect on the other determinants of growth such as investment. Indeed, the most competitive country in terms of growth are those that have achieved the highest investment rate, so investment is a key factor for growth in the emerging country.

Likewise, knowledge accumulation is positively and significantly related to economic growth in the case of an intermediate regime. This variable indicates the level of scientific research carried out in universities. This sign suggests that the most important factor that affects growth is due to the achievement of a high level of technical progress which motivates more and more innovations and facilitates the transition of technological research.

It should be noted that the stock of physical capital is not important for growth whereas the stock of human capital has a positive sign. Indeed, education allows a better knowledge dissemination and skill acquisition. Financial development has no impact on growth, which is consistent with the results of (Krugman 1980) which shows that the financial systems in the emerging country are poorly developed. In fact, this result may be due to the misallocation of investment credits and the high cost of credits.

The openness to international trade is not statistically significant with growth. This result can be accounted for by the fact that trade can be composed mostly of finished products and does not contribute to good growth. Indeed, investors rely more on the domestic market because of the high degree of risk in the country.

The role of the state is significant but influences negatively the growth in emerging country. Indeed, this variable represents the state expenditure on infrastructure, education, health etc. to achieve domestic growth.

**In model (2)**, we note that the flexible regime has a negatively and statistically- significant relationship with growth. Similarly, the fixed regimes have a negative effect on growth. Besides, we detect a positive and significant relationship between knowledge accumulation and investment. In addition, the role of the state variables and inflation are both significant and negatively affect growth.

Our findings highlight a negative and a significant impact of the fixed exchange rate regime on growth. However, this impact is smaller than the impact of the flexible regime on growth. This can be explained by the existence of a high rate of investment. Thus, we can associate a lower growth under both the fixed and flexible regimes. It is worth noting that according to the IMF (2000), the emerging markets, whose growth rate is associated with the flexible regimes, have suffered less than those with fixed regimes.

The majority of empirical studies (Fisher 2001; Bleaney and al 2010; Ghosh and al 2010) emphasize the importance of the flexible regime that seems to have a slight advantage compared to the fixed exchange rate regimes in terms of growth. This is accounted for by the flexibility of the rate which realizes the swift adjustment of the relative prices following asymmetric shocks at the nominal stiffness.

In Model (3), we find that the sign of the fixed regime coefficient remains negative but the statistical significance of the estimated coefficients decreases and lies below the critical threshold. Nonetheless, the intermediate exchange rate regime has a positive effect growth as highlighted in the model (1).

This regression is characterized by a significant and positive relationship between the variables investment and knowledge accumulation and the GDP growth rate and other variables such as the role of the State and inflation which are significant and negatively affect growth.

According to our three regressions, inflation remains significant and negatively influences growth, regardless of the adopted exchange rate regime. We cannot also assert that the flexible rate regime is necessarily accompanied by high inflation. Similarly, we cannot also ascertain that inflation was lower in the emerging countries which have opted for an intermediate regime.

The three regressions have revealed that the intermediate regimes are associated with the highest economic growth, while the fixed and flexible regimes generate the lowest growth rates.

Thus, in the case of emerging country, the appropriate exchange rate regime is the intermediate exchange regime which improves the economic performance and influences growth.

### **Conclusion**

The objective of this work is to answer questions about the effect of the choice of exchange rate regime on economic growth from its impact on the determinants of growth in 24 emerging markets during the 1974 -2008 period. To do so, we considered the explanatory variables suggested by the optimal currency theory area and we also passed the official classification of the IMF exchange rate regime (de facto). The application of the approach of the panel regressions with the fixed effects allowed us to obtain the following results.

The two extreme regimes, the fixed exchange rate, permanently and freely floating above, raise serious problems in the context of emerging economies.

Compared to the two extreme regimes intermediate and fixed exchange rate regimes, we can say that the regime put path allows the fixed exchange rate to adjust to temporary price fluctuation and keep some degree of monetary autonomy compared to the flexible regime. The intermediate regimes, by constraining the fluctuation of the normal exchange rate can guarantee a nominal anchor in domestic prices.

The fact that the fixed exchange rate regime generates huge restrictions for economic the policy and that the flexible exchange rate regime does not ensure steady growth and increases the rate of inflation, the most appropriate formula for emerging economies, is not in the extremes but in the intermediate exchange rate regime. The adoption of the exchange rate regime presents considerable opportunities vis-à-vis adjustment to the shocks and fitness with the economic conditions.

The main conclusion that emerges from this work is that corner solutions are actually impassable in the context of the emerging markets .So, given the fragility of extreme regimes and given the important role of investment and knowledge accumulation associated with low levels of inflation, the intermediate regimes are most relevant in terms of economic growth in the emerging country. Moreover, the intermediate regime is the source of a wide variety of exchange rate regimes since it combines a fixed component and another floating. Thus, this plan will keep some degree of exchange rate flexibility to adjust the price preserving the role of the currency as a nominal anchor.

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