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Exchange Regime Choice with Multinomial Panel Data: Case of the North Africa Countries

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ABSTRACT: The objective of this paper is to identify the determinants of exchange regime choice for North Africa Region. The target is to provide an empirical framework suitable for describe and determine the factors having a significant influence on the development of the choice of the regime of exchange. The empirical approach is based on a model of multinomial probit with panel data. The choice of this new approach is justified by the need for collecting the dynamics of the choice of exchange regime, without having recourse to an orthodoxy design (binomial), and by collecting individual heterogeneity between the various countries of the panel. The results obtained affirm that the financial development, the economic growth and monetary creation constitute the principal determinants of exchange regime. Other variables are also significant; it acts in particular of the level of the foreign debt, the inflation and the rate of opening. As, the results affirm as the fixed regimes of countries of the panel are largely explained by the dependence to external flows and of the importance of monetary reserves in the design of exchange and monetary policies. Being dependent on the exogenous creation of the currency, the worldwide choose a fixed regime of exchange by drawing more and more interventionism on the level of the exchange market.

Keywords: Exchange rate regime; multinomial panel data; economics growth.
JEL Classifications: E42; F41

1. Introduction

One of the great economic problems with which the developed and developing nations are the choice of the exchange regime that contributes to economic development and to allow a constant and durable economic growth. Several types of regimes are used by the countries in the world and this choice takes account of several considerations. Thus, the choice between the fixed and floating regime's, depend on the specificities of each country and the level of development as it could reach as well on the economic plan as institutional and financial. Several works analyzed the choice of the exchange regime in the direction where various explanations were advanced on the theoretical level and were tested from an empirical point of view.

The theory of the optimal monetary areas considered, for example, that the macroeconomic or size variables are the determinants (economic size of the country, the capital account, the structure of the financial market, etc.) of the choice of the regimes (Mundell, (1961), McKinnon (1963)). In addition, other considerations were retained to identify the determinants the exchange regime of which, in particular, institutional and political factors (independence between monetary policy and budgetary and that of the central bank) (Cukierman et. al., 1992).

For this purpose, work of Juhn and Mauro (2002) while drawing from several potential determinants concluded that no empirical consensus or results seems to be conclusive. Thus, the majority of empirical work cannot slice in favor of the principal variables affecting the choice of a regime of exchange compared to others. However, it is to be stressed that empirical work affirms

that some variables have a positive incidence on the description of the choice of the exchange regime while referring to a framework of maximization of the social well-being.

Polemic on the impossibility of providing a consensual framework concerning the choice of exchange regime is due primarily to the incompatibility between the empirical results and reality of the studied countries, to the insufficiency of the periods of analyzes, complexity and the limits of the econometric approaches used and to the influence of some specific elements of order on the development of the determinants used what makes difficult the explanation of the choice.

The insufficiency of the results of the work is due initially to the difficulty in stopping unanimous and classification regimes of exchange. Thus, on the literature several classifications are present. Until the end of the Nineties, only classify swears of the IMF was used in empirical work. However, Calvo and Reinhart (2002) stressed there were large disparities between the regime stated of swears by the country and the regime in force. On this register, several other classifications were worked out to provide a more practical based on the facts (Levy Yeyati and Sturzenegger (2001, 2003) and Reinhart and Rogoff (2002)).

As well as the problem of classification, another obstacle remains in the choice of the empirical method to use to quantify the choice of the regime of the exchange. Indeed, most the studies use data of transverse sections whose dependent variable is binary nature to discriminate between the regime of the fixed and flexible exchange. From this view, the specification saved in these studies does not describe to develop an exchange regime and this bad specification conditions the results existed. Several authors suggest the use of specification more adapted to the economic reality of the countries by using a multinomial variable ordered or not ordered (Von Hagen and Zhou, 2006).

Beyond these difficulties the greatest problems of the choice of the exchange regime lie in the euphoric number of being able to intervene in to explain this choice. Thus, to provide a list of variables able to predict the choice, it is necessary to control several variables to extract some most important. In this direction, it is convenient to resort to all the explanatory theories of the choice of exchange regime and to deduce thus the exogenous variables from them to test.

In this paper, we are interested in the choice of the regime of exchange for the case of Morocco. The objective is to provide an empirical making it possible to define the principal determinants of the choice exchange regime. On this register, an approach with panel data was suggested by including other countries of similar economic level, it acts of Algeria, Tunisia, Jordan, Egypt and Libya. The originality of our step is summarized in two: first the recourse to panel data makes it possible to collect also individual diversity, temporary dynamics, thus helping the analysis of to develop the choice of the regime of the exchange. Then, unlike most the studies, we choose a multinomial specification to explain the choice of the regime of the exchange. Thus, a model probit multinomial with panel data was estimated for the case of the countries in the panel. In addition, a binary specification was also used to check the results earned.

The excess of this paper is like a continuation. The following section analyzes various classifications of exchange regime. Then, the section three analyze of the determinants of the choice of regime of exchange while referring to the theoretical involved executives. Last, the last section has adopted the method and the results existed in the studied countries.

2. Classifications of the Regimes of Exchange

In a context marked by a rise of the movements of capital and the succession of the crises, the question of the choice the ideal exchange regime knew a renewed interest which appeared by a growing number of works on the subject.

Indeed, the results of this work highlighted broad dissensions and divergences. These divergences are due mainly to the typology of classification of the regimes of exchanges. We can thus distinguish two large currents. The first uses the systems of exchange officially stated by the countries, called regimes “de jure”. The second current relates to work drawing of the put regimes into force, called “in fact”.

2.1. Classification: « the jure »

For a good number of economists, to classify an exchange regime in such or such category has always represented a big challenge. Indeed, since the beginning of the Fifties, the IMF classified the systems of exchange of the countries only and simply assuming their official declaration.

The "Exchange arrangements and exchange limits" formed the principal database on the official regimes of exchange which publish the purposes or commitments of the authorities on policy of exchange. The step suggested is based on the principal of the self-classification of the countries by themselves and no remark is made to check or not these statements so eyes are in conformity with the practices.

At the beginning, this classification considered only two categories, namely regime of fixed and different exchange, for then changing/moving and distinguishing four categories which are stowing compared with a currency or a basket of currency, flexibility limited, flexibly directed and the free-floating.

This step suggested by the IMF offers the advantage of an approach "Forward-looking" or expectation since she plays a key in to formulate expectations which decide the credibility of the authorities and thus makes it possible to influence the decisions of the economic agents. Another advantage returns to the fact of covering a broad panel of country over one rather long and regularly updated period.

However, the divergence between this official classification and the real practices of the countries on exchange made it far from credible since it reduces the transparency about control of the policy of exchange, like its negotiable instruments on the real degrees of autonomy of the monetary policy. According to Calvo and Reinhart (2000), official classifications often include "disguised regimes" what returned the conclusions of empirical work which uses them not satisfactory (Calderón and Schmidt-Hebbel, 2008).

2.2. Classification: « the fact »

The critics on De Jure classification conduct several researchers to propose other approaches to classify the exchange regimes. On this register, the new approach of classification basis either on the regimes stated by the countries corrected their economic and financial data (the new classification of the IMF (1997), Ghosh et al. (1997), Bubula and Ötker-Dress (2002),), or on an analysis purely "de facto" which is independent of the regime's official (Levy-Yeyati and Sturzenegger (1999), Reinhart and Rogoff (2002)).

For the first approach, the IMF developed a new step having for objective to correct the statements of the countries by taking account of the variations of the exchange market. This method led to a classification made up of the eight headings going of the regimes without currency specific to the free-floating regime.

However, this approach remains limited since she considers annual statistics dating from the Ninety what could skew the results of empirical work which is based on the classification. To exceed this limit and by adopting a quasi-similar approach to that of the using IMF of the extra information's, Bubula and Ötker-Dress (2002), proposed an at the same time annual and monthly classification.

In the same direction, Ghosh et al. (1997) proposed, a classification of the exchange regime for better seizing the practical changes on the matter. The step is based at the same time on the statements "de jure" and observing the frequencies of the changes in the parities of foreign exchange rates to distinguish between the regimes according to the frequency from the interventions from the monetary authorities.

These qualified methods "of hybrid" use the official declarations to justify classifications "in practice" cannot distinguish with it only if the regimes adopted in the fact result from a political decision or simply without the shocks.

To the difference in these classifications, the approach of Levy-Yeyati and Sturzenegger (1999) forward a step based firstly and only on the analysis of the behavior of the financial variables representative of the degree of interventionism by the monetary authorities in the markets. Thus, by doing a statistical analysis by regrouping to volatilities of the foreign-exchange reserves and the nominal foreign exchange rate at a level and variation, the two authors proposed a bill of material

made up of four regimes of exchange (fixes, the crawling pegs, floating managing and strict flexibility).

In addition, the step exposed by Reinhart and Rogoff (2002) forward another identification of the regimes of exchange taking account of the periods of severe macroeconomic disturbances. It rests, in fact, on an analysis made up combining a statistical analysis and a descriptive analysis of developing exchange regimes by considering the developments of markets.

This classification known as "natural" highlighted at the same time a detailed classification containing fifteen headings of exchange regime, and a classification containing five types of regimes (a new heading "fair floating" was introduced to classify the countries on strong inflation - more than 40% yearly).

In this work, we used to classify Reinhart and Rogoff (2002) for many of the reasons. Indeed, it uses information, at the same time, quantitative and qualitative, all while being based on developing foreign exchange rate on the market, which reflects best the negotiable instruments of the policies of exchange on the economy. Also, this approach has the advantage of the proposed the smallest part of missing observations.

3. Determinants of Choice of Exchange Rate Regimes

The knowing question, if a country can choose the exchange rate regime, which it likes or if it's choice is limited to some regime, even with only one, is important. Several causes can affect the alternatives which are offered in each country. Work having studied the determinants of exchange regime choice puts the point on the adjustments at the shocks, the theory of the model monetary areas, the approach of financial integration (the impossible trinity, bipolarize and notion of the fear of floating), like about the political new approach of the economy.

3.1. Optimal monetary zones

The results of empirical work on the regimes of exchange were marked by broad disparities. Nevertheless, a conclusion has the unanimity among this work: considering a system of exchange depends on the characteristics and specificities on each country. These specificities include several elements of which the nature of the shocks with which the countries are confronted.

Indeed, it is traditionally known the effectiveness of exchange regime is measured through its capacity to absorb the shocks. Thus, the nature of the shocks remains a basic in the choice of exchange regimes. This importance is because of the various implications which these shocks involve on the basis of the economy. For this purpose, the traditional model of the Mundell-Fleming teaches us that a real shock, the attractiveness of the floating regimes believes since it allows a systematic adjustment towards balance . On the other hand, the fixed exchanges are much justified for the nominal shocks because they impose a discipline and credibility on the economic policies thus allowing a better stability of the economy. In the same way, whereas the adjustment against an asymmetric shock is impossible with the fixed regimes, it is done through fluctuating the national currency to restore the competitiveness of the products for the flexible exchanges.

It is in this spirit the theory of the optimal monetary areas clarifies the economical conditions to adhere to so the costs of adjustment of the policies of stabilization against the shocks are the least low possible. Also, this theory states the circumstances in which a group of country with interest to form a monetary union through the adoption of a currency or several currencies whose foreign exchange rates are fixed. A common currency is noted as « serious and has durable commitment» since it is with a renouncement with foreign exchange rates like instrument of the economic policy. This theory, then sought to identify the correct working paragraphs which could replace in an effective way of adjustment the flexibility of the exchange ensues.

Thus, opportunity of adhering or not to a monetary area is thus estimated assuming makes by the theory which is to correlate the economic situations (Importance of the symmetrical shocks), the effectiveness of the adjustment as well as the characteristics of the economies.

3.2. Bipolarize and incompatibility triangle

In a context of financial globalization and increased mobility of the capital, the serious attacks which followed one another during the Nineties were the sign of instability of the intermediate regimes of exchange, especially with the appearance broad running of the literature adopting the

thesis of "hollowing out" which positioned in favor of the bipolarize which stipulates the countries whose financial markets are integrated into the worldwide markets will not be able to preserve intermediate regimes and will be forced to choose one of the "solutions in corner", namely the regimes of fixed exchanges or the total flexibility of the exchange.

This view joined the thesis of the "triangle of incompatibility" which measures the loss of the capacity of a country to express an economic policy in all sovereignty. This constrained triangle monetary authority of a country to be chosen between the freedom of the choice of the exchange regime (to fix foreign exchange rate for the needs for the relative stability of the prices), freedom in the control of a monetary policy independently (for the needs for macroeconomic stabilization) and freedom of a mobility of the capital (for needs for efficiency and flexibility). Indeed, According to Mundell, it is not possible for a country to have these three freedoms at the same time. Only two are attainable simultaneously, which invariably involves the impossibility of the third.

3.3. Fear of floating

According to certain observers, the popular assumption allowed a dynamics towards the solutions in a corner which related to all the areas of the world. Indeed, a vast majority of the developed nations and emergent made the choice of the pure wave, then, whereas most of the developing countries have continued to anchor their currencies to the one of the principal currencies or a basket of currencies. The debate with the turn of the choice of the regime of exchange seemed finished.

The work of Calvo and Reinhart (2002) started again this debate, one showing that little country let's their currencies float freely. These countries intervene in a discretionary way to stabilize the exchange rate of their currencies. This "fear of floating" is ascribable to a certain number of reasons, including two which seems important to us. The first is the existence of a high pass-through foreign exchange rates towards the prices of the goods and services, (a high transmission of the variations of the exchange in the general level of the prices), whereas the second reason lies in the structure of the debt.

For this purpose, the excessive instability of foreign exchange rates can especially have serious damage with the existence of a high pass-through of foreign exchange rates towards the general the prices and this because of the inflationary history and the indexing of the economy. Indeed, the dependence with the imported products makes that any variation of exchange will have effects all the more marked on the domestic prices the country is strongly depend on outside. Also, in answer to the variations in foreign exchange rates, the "expenditure switching effect" allows an adjustment of the request of the domestic goods following a change in the relative price between these goods and the foreign goods. This rise of the demand for domestic goods will then cease to increase the overall demand and under certain conditions, to exacerbate the inflationary tensions.

Also, the emerging developing countries and is characterized by relatively weak financial sectors compared to the developed economies. This made that the degree of foreign debt is generally high with the incapacity of the national currency with to exert its function of the monetary unit abroad. These countries are then victims of which one calls the "original sin" who translates the incapacity of these economies to borrow in their own currencies. Thus, the tendency is the creation of liabilities in currencies which make very great the risk of the "currency mismatch", since the fluctuations of exchange lead to imbalances important, since the dimension of the dollarized liabilities becomes higher than that of the assets, which leads to serious financial problems and obstacle the effectiveness of the monetary policy and the good performance of the financial system.

3.4. Economic policy approach

According to the current of the political saving in reforms, Kydland and Prescott (1997) and Barro and Gordon (1983) works, the consideration of exchange regime is forwarded as being arbitrated between the advantages of a discretionary economic policy and credibility to ensure by a policy governed by rules, imposing a discipline.

Beginning of the year 90 was marked by a tendency of the "happy medium", in particular with the acceleration of the flow of the capital due to the opening of the national markets and the elimination of the barriers partitioning the various national markets of the capital. The idea is that the intermediate regimes made it possible to combine best pure undulation and strict fixity.

One of the partisan of the solution halfway, Williamson (1993), estimates that the regime fixed, unless they do not allow a monetary union, often give place to undervaluation's or overvaluation rather expensive. While the floating with a random dynamics to disconnect from the principal fundamental of the economy. Thus, the solutions with "same way" are the best alternatives insofar as the floating of foreign exchange rate with in margins makes it possible to mitigate the negotiable instruments of the fluctuations, to adapt foreign exchange rate according to the fundamental ones, to guarantee a certain degree of flexibility of the monetary policy and to ensure a better reaction against the speculative attacks and exchanges crises.

For Williamson, there exists a foreign exchange rate, which depends on the balance of the financial market and flows of optimal capital to the economy, called "Fundamental Equilibrium Exchange Rate" (FEER) that the countries must determine. Indeed, the misalignment compared to this rate of balance is forwarded like the principal one determining the choice of the regimes of exchange because of the negative negotiable instruments which it can caused by the economy. The intermediate regimes are of this fact the solution which allows the reduction, even cancellation, of this misalignment.

However, because of increasing financial integration and the failure of the intermediate systems in Russia, Brazil, Mexico and the countries of East-Asia, these systems lost many of their farms and became increasingly insupportable.

Several critics were formulated, especially by the economists of the current "new orthodoxy", who estimate that the problems of these intermediate regimes lie in their defects of credibility. Thus, the economies adopting these regimes were often unable to devaluate in time with considerable losses of monetary reserves. According to Yeager (1998), these solutions of the medium rather constitute "a traditional juxtaposition of beautiful words than the association of coherent policies and institution".

For Calvo (2000), in a context of broad reversals of flows of capital with an asymmetry of information on the markets, the economies are much more likely with the phenomena of banking panics, imitations and of contagion. Against this no sustainability, these economies would not have any more the choice but to choose solutions, allowing of the elevated levels of transparency and credibility.

Indeed, certain economists stress the importation of this concept of credibility in the choice of the regimes of exchange and this independently of the structural characteristics of the economies: a regime of exchange is viable only in the long term insofar as the markets are convinced of the capacity of the authorities in the continuation of the objectives which they laid down. According to Frankel et al. (2000), the degree of credibility and discipline brought by the regimes of exchange tends increased as have it approaches towards the fixity.

The fixed regimes are attractive by their simplicities and their rigors to found by a commitment of the authorities which ensures a "fame" constituting the base of public confidence, thus allowing, through a code of conduct of the economic policies by playing the part of nominal anchor for inflationary anticipations, to encourage the trade and the investment between country by reducing the costs of the transactions and the risks of the volatilities of exchange.

4. Estimate and Results

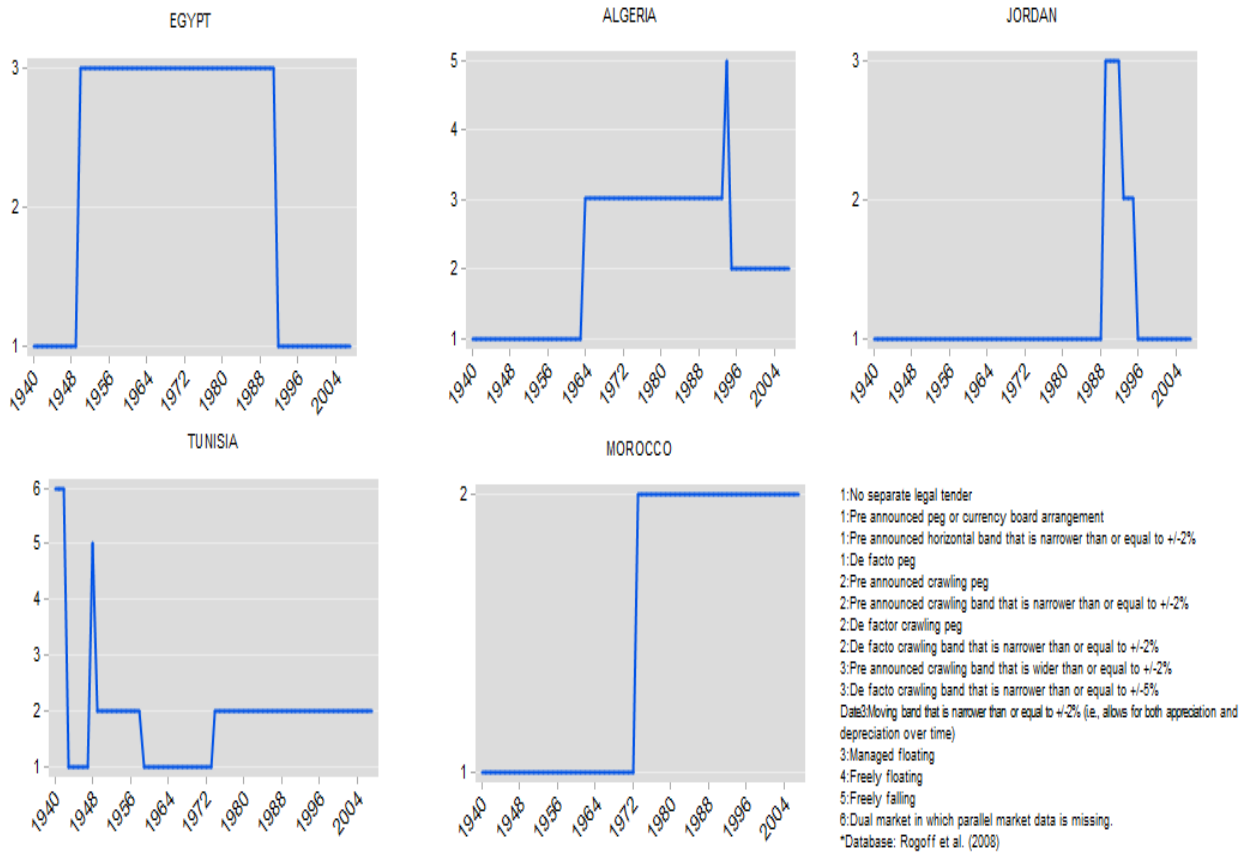
We choose this paper to exploit two types of models to check the determinants of the regime of exchange in the similar countries and close to the Moroccan economy. The first model is largely used in the empirical literature for this exercise; it acts of a binomial model. In addition, the second is of more important ambition since it takes account of the character multinomial and of the transition countries of a regime to another container.

By taking account of individual dynamics temporal, specifying the model is in panel data, what allows more analysis and of interpretation. Thus, the first model is based on an estimate of the likelihood of transition from a fixed regime to a regime from more flexible exchange (classifying the IMF was saved in this direction). The binary variable which was saved is following form:

$$\begin{cases} P = 1;\ more\ floating\ regime \\ P = 0;\ fixed\ regime \end{cases}$$

The models censured on the left can be estimated only according to nonlinear approach. Two specifications are largely used, logit or probit. These roles, although they are almost identical, several authors prefer to use a logistic specification because of its simplicity and the possibility of using it in the presence of panel data.

Figure 1. evolution of exchange regime for panel countries.



However, the use of this modeling east fixes with several constraints. At first, the estimate of the data of panel for discrete models cannot be done in a manner usual using the maximum likelihood (method often used for the model probit and logit) because of the existence of the specific effect which impact the value of the estimators. Then, to specify this effect fixes mainly models it to use. Indeed, if fixed effect, only the model logit is to be imposed, while the model probit is absolute because of the complexity of calculation and the inconsistency of the estimator existed. However, the recourse for a random purpose gives more advantage to the model probit because in particular with the flexibility of the normal distribution. Thus, the choice like the specific effect (random or fixes) is settling in to specify the model to estimate (Maddala (1987)).

To choose between the fixed and random effect, the test of Hausman was used with the purpose of comparing the estimate for fixed purpose and that for the purpose has random effect. It should be noted that the estimate using the fixed effect makes by the recourse to the conditional maximum likelihood, while, that's for a random purpose requires the use of usual maximum likelihood. On this register, the Hausman test compares the two estimators in order to manage to check the nature of the specific negotiable instruments (table 1).

Table 1. Hausman test

Hausman test	
Khi-deux stat.	2.48 (0.8709)

The results obtained using this test affirms that one is in the presence of the effect not correlated with the exogenous variables. From this point of view, the specification probit is more consistent compared to the logistic model. Indeed, the model probit for random purpose is based on the analysis of the multivariate normal distribution by supposing that the correlation between the errors is non-existent. In this direction, the estimate of the model probit for random purpose, based on the maximization of the multivariate normal distribution, can be carried out according to three alternative methods, that of Heckman (1981), Avery et al. (1983) and lately that of Chamberlain which supposes a linear relation between the random effect and the exogenous variables. In general, the logistic specification (in binomial case we considered probit and logit are similar) in data of panel is written following form:

$$G(y_{i,t}) = \int_{-\infty}^{\beta X} \emptyset(v)dv \qquad (1)$$

With: there the binary variable taking securities 0 and 1 and ∅(v) is the density of the normal law. The exogenous variables integrated in the model that is described in the preceding section. For this reason, we can write that:

$$G(y_{i,t}) = \int_{-\infty}^{\sum_{t=1}^{T}\sum_{i=1}^{n} x_{i,t}+\mu_i+\varepsilon_{i,t}} \emptyset(v)dv \qquad (2)$$

The recourse to a nonlinear model requires the use of method of specific estimate other than least the square ordinary (OLS) one and in particular method of maximum likelihood (Maddala (1987)), the representation is following form:

$$L_c(\beta) = \prod_{i=1}^{N} \Pr\left[y_{i,1}, \ldots\ldots, y_{i,T} | \sum_{t=1}^{T} y_{i,t}, X\right] \qquad (3)$$

The whole of the explanatory variables forwarded in the preceding section were tested in order to lead to those which can be retained in the model of early alarm. On this register, the specification selected is following form:

$$G(y_{i,t}) = \int_{-\infty}^{cr\_m+inflation_{i,t}+ouverture_{i,t}+output_{gap_t}+cr_{pib_{i,t}}+dette\_rnb_{i,t}+\mu_i+\varepsilon_{i,t}} \emptyset(v)dv \qquad (4)$$

With:

cr_m: Monetary growth;

$inflation_{i,t}$: Inflation rate;

$ouverture_{i,t}$: The rate of opening calculated according to the relationship between the sum of exports and imports and GDP;

$output_{gap}$: Output-gap (HP filter);

$cr_{pib_{i,t}}$: The ratio credit compared to the nominal GDP;

$dette\_rnb_{i,t}$: The overall debt compared to the rough national revenue;

μ_i : Individual effect;

ε : Model error.

The first model fell under an optics of analysis of the choice of the exchange regime by adopting a binary design (fixed and others). In the second model suggested, the objective is to go beyond the choice between two alternatives. The objective is to explain why choose such a regime compared to a panoply of other regimes. In other words, the multinomial model adopted in this party of the analysis aims at also explaining the transition between several regimes from exchange while holding in account from temporal dynamics from the studied countries (given of panel).

Broadly the theoretical framework of this last model can be described easily in the following way. Each country (i) with a choice between several alternatives (j), during a given period (t). In this

direction, each country will have to maximize its utility of such kind to lead to a satisfaction and a maximization of its wellbeing. This can be expressed by adopting the following specification:

$$\Pr(j|X_{it},\alpha_i) = \frac{e^{X_{it}\beta_j+\alpha_{ij}}}{\sum_{k=1}^{j} e^{X_{it}\beta_k+\alpha_{ik}}} \qquad (5)$$

As the choice of the probability depends largely on the specific negotiable instruments, then in this case, it is necessary to take into account their distribution. Thus we can rewrite the maximum likelihood to be maximized in order to solve this model of the following form:

$$L = \prod_{i=1}^{N} \int_{\infty}^{\infty} \prod_{t=1}^{T} \prod_{j=1}^{J} \left\{ \frac{\exp(X_{it}\beta_j + \alpha_j}{\sum_{k=1}^{J} \exp(X_{it}\beta_k + \alpha_k} \right\}^{d_{ijt}} f(\alpha) d\alpha \qquad (6)$$

While dijt=1 when the choice of individual I is the alternatives J during the period T, otherwise it is equal to 0. To initialize the function of maximization, it is considered that the unobservable coefficients and specific effect are equal to 0. Also and to facilitate the estimate it is supposed that the unobservable effect independently and are identically distributed (iid) and follow a multivariate normal distribution. Also, is as very model for random purpose the fundamental assumption of weak exogeneity is accepted. By adhering to these assumptions, the method of Gauss-Hermit was adopted in order to maximize this function of likelihood by using the Bayesian approach.

The estimates were carried out on annual data going of 1980 to 2007; the choice of this period is justified by the availability of the last classification of the IMF. The countries of analysis are those comparative in Morocco and which are in a more or less similar economic situation. Five countries were includes: Algeria, Tunisia, Jordan, Egypt and finally Morocco. In addition, the explanatory variables forwarded above were stopped according to the theoretical bases forwarded in the first sections of this work.

Table 2. Results of probit model

Exogenous variables	**Probit model (panel data)**
Credit to GDP	10.903513***
Output gap	7.3798709*
Inflation	27.448064***
Monetary growth	16.796987***
Opening rate	-4.201307
Debt to RNB	5.150027***
Intercept	-13.6614***
KhiD	18.311496
AIC	46.331915
BIC	69.865054
Significant at 1% (***), 5% (**) et 10% (*)	

The results of estimate of the first binary model shows clearly that the choice between the regime of fixed and floating exchange is dependent on the development of the characteristics of the economies of the countries of Africa North. On this register, the financial development, the level of inflation and the growth of the money supply are the principal determinants of the exchange regime choice.

The results obtained are convincing. Thus, with regard to the model probit, the determinants of the choice of the regime of exchange for the countries of the analyzed panel are those enacted by the theory. In this direction, the increase in the level of financial development (credit on the GDP), in the output gap and the money supply (describing the rise of the inner demand) mainly explains the choice of a more flexible regime of exchange (table 2). The inflation and the level of the debt compared to the income also contribute, in a positive way, with the choice of the more flexible regime of exchange.

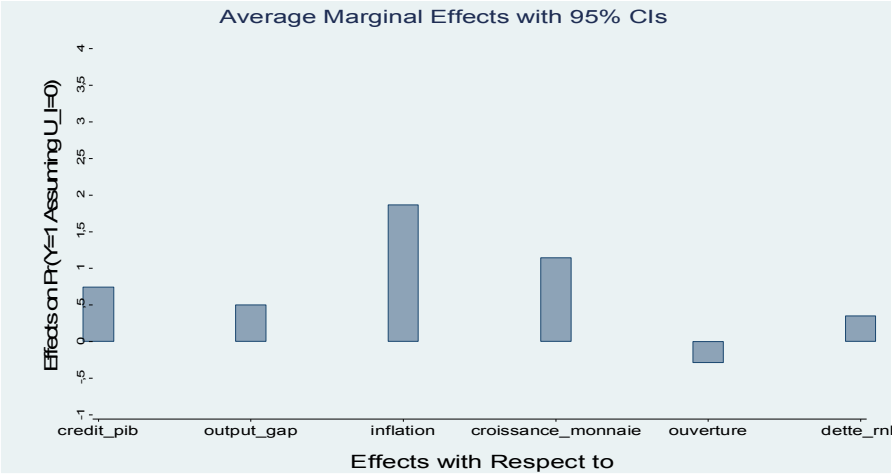
Table 3. results of multinomial model

Variable	Multinomial model (panel data)
state 1 : y=1	
Credit to GDP	-12.661929***
Output gap	-1.857208
Inflation	-19.559814*
Monetary growth	-13.584441**
Opening rate	-13.584441**
Debt to RNB	-2.5343363*
Intercept	6.9192945***
state 2 : y=2	
Credit to GDP	12.269392**
Output gap	1.0701086
Inflation	46.346767***
Monetary growth	20.64668*
Opening rate	-8.2076303**
Debt to RNB	4.1432801**
Intercept	-12.854452**
AIC	174.49701
BIC	221.56328
Simulation rank	16
Significant at 1% (***), 5% (**) et 10% (*)	

Table 4. marginal effects with probit model

Credit to GDP	0.7422201
Output gap	0.50236
Inflation	1.868435
Monetary growth	1.143399
Debt to RNB	0.3505708

Figure 2. marginal effects with probit model

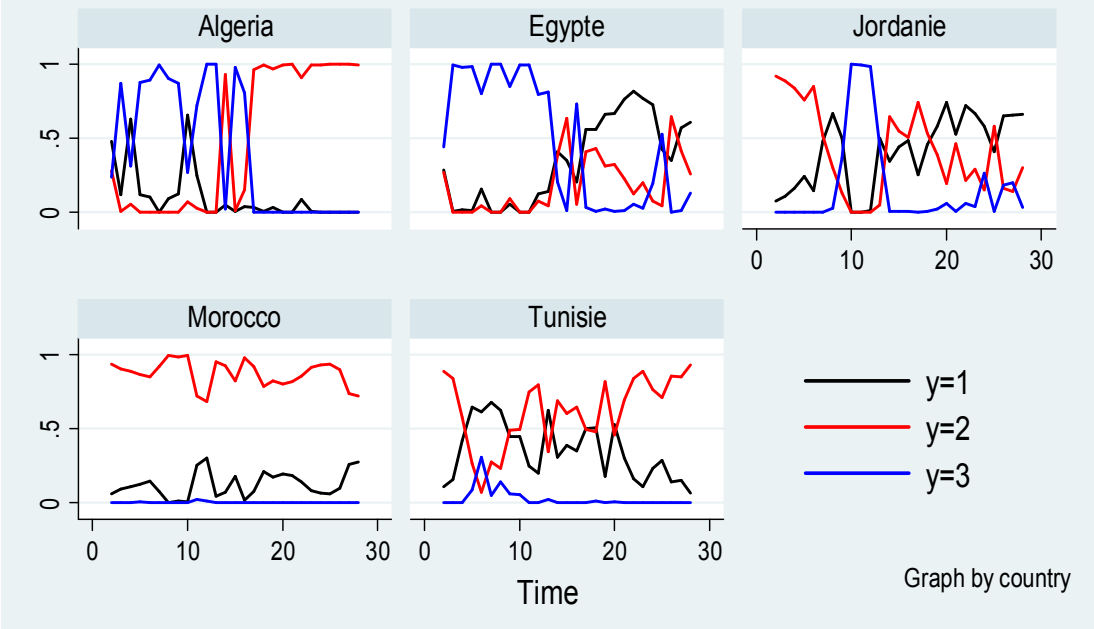


This known as, the analysis of the marginal effect, affirms this official report. Indeed, the financial development and the growth of the money supply contribute actively to the transition towards a more flexible regime of exchange making it possible to control the exogenous shocks being able affected the domestic economy. In addition, the other variables also have similar effect, but remain with marginal impact (table 4, figure 2).

On another register, the model multinomial assists the results obtained by the binary model. Thus, the probability of forwarding towards a flexible regime of exchange for the studied countries is positively correlated with the growth to the economy, the rise of the production and also to the increase in the overall debt compared to the gross income available. On the other hand, the impact of

these variables is reversed at the time of the choice of an intermediate regime of exchange, where one attends a negative effect of these variables on the probability of transition towards an intermediate regime. This is explained largely by the fact why this intermediate regime is closer to a fixed regime of exchange than of a regime of pure floating.

Figure 3. Average marginal effects with multinomial model



On the basis of result obtained it arises that the choice of the regime of exchange is conditioned by several macroeconomic elements which recall the development of the economic conditions of the studied countries. In this direction and for the case of Morocco, the macroeconomic factors indicate that the monetary conditions enormously exploit the choice of the regime to adopt. Indeed, the increase in the money supply and that of inflation, on the other hand indicate a rising of the funds coming from outside what resulted in an improvement of the capital account especially during the period 2000 and 2007. Thus, the choice of the regime fixes was adapted less during the period relating to the end of the years 2000 because of the improvement of the reserves and also the economic capacity of the country to face transitory shocks. However during the last period one noticed that the probability of the more flexible regime of exchange was regressed because of the beginning of the deceleration of flows bound for Morocco what makes difficult the choice of a regime of exchange more flexible.

5. Conclusion

The analysis of the choice of the regime of exchange is a crucial importance for an economy under development. This question less and less tackled in the developed nation remains prone to more ink in the emergent countries and to weak income. A regime of exchange conditions the macro-economic equilibrium of the country mainly. Thus, a skewed choice of a regime of exchange can involve a systemic crisis having fatal consequences on the good being of the economic agents.

On the political plan, the enumeration of the determinants of the regime of exchange makes it possible to rationalize the choice of the regime of exchange and returns the decision to be taken in this direction, more pragmatic and considered. The objective of this paper was to formulate an empirical analysis of the factors being able to influence the choice of the regime of exchange for the case of Morocco. We chose several variables macroeconomic and financial in order to collect their effect and their capacity to explain the choice of the regimes of exchange adopted by the countries of the panel.

Two approximate was adopted; the first has recourse to a design binomial, such as using in the empirical majority of work. However, the second approach borrows a new way by adopting a modeling multinomial panel data.

The results obtained are more or less convincing in the direction where they attest that the financial and economic development supports the transition to a more flexible regime. However and on the basis of analysis of the dynamic marginal effect, it arises that the fluctuations of the macroeconomic and financial variables can have effect on the probability of choice of the regime of exchange. This can be explained by the fact that with each time the economic conditions undergo a change of the economic situation, the regime of exchange is impacted via the interventions in currency.

All in all, our study indicates that the output gap, the ratio of financial development and the increase in the money supply are the principal determinants of the choice of the regime of exchange. Thus, of the shares on the three macroeconomic factors (policy expansionist or different) can have negotiable instruments helping with the transition towards a more flexible regime of exchange. Also, identification of these variables as being able influenced the choice of the regime of exchange allows an effective monitoring of the adopted regime and facility the formulation of adequate policies. Nevertheless, the empirical results remain limited in the direction where the variables which were saved do not describe overall the reality of the studied economies. This error of specification is to be taken into account during interpretation of the results and under the terms of their future exploitation.

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