MOROCCO'S EXCHANGE RATE POLICY AND PUBLIC DEBT ECONOMETRIC STUDY

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Abstract: The Moroccan economy has been looking for decades to encourage trade openness in order to achieve economic development and to achieve stable economic growth. In order to do so, the public authorities have also tried to find an exchange rate policy that would allow its evolution to be controlled over time. Economic theories and empirical research in this field confirm that a change in the exchange rate will have an impact on economic magnitudes.

In this context, the objective of this article is to test the impact of the Moroccan Dirham's exchange rate on debt. In other words, we will analyses the effects of the misalignment and volatility of the TCR on outstanding treasury debt over the period 1998-2018. Using a simple methodological approach, the study uses VAR and causality techniques to meet the objective of our study. An overall reduced theoretical model as well as the tools of the structural VAR methodology (causality within the meaning of Granger, impulse-response functions, decomposition of the variance of the forecast error) are used.

1. Introduction

External debt has become a key concern for Moroccan economic policy-makers, and its increase is one of the reasons why the government has decided to change the direction of its economic policy. In this respect, comparing a country's external position with that of other countries has become difficult due to the diversity of financial assets.

During the 1990s, the countries of the southern and eastern Mediterranean embarked on a process of gradual liberalization of their economies, involving both the financial and real sectors. These changes were accompanied by a series of gradual adjustments to their exchange rate policies. One of the major concerns was to arbitrate between a slightly volatile currency and limited exchange rate misalignments (over/undervaluation). After the oil shock, most industrialized countries ran trade deficits and resorted to external financing, even though the major countries had debts, albeit at very low levels. The currency crises particularly affected several emerging countries, which for their part decided to pursue structural policies aimed at increasing their degree of integration into the various financial markets.

Indeed, a significant number of these affected countries, either for reasons of competitiveness or credibility, as in Central and Latin America and East and Southeast Asia, have opted for intermediate regimes based on transforming their currency into a hard currency.

In 1986, the Moroccan authorities decided to retain the idea of pegging the dirham to a basket of mainly strong currencies, such as the French franc, the US dollar and the German mark....

This principle offers the advantage of avoiding the risks of a heavy foreign debt burden when the latter is denominated in one of the currencies in the basket, as well as the advantage of lending real credibility to the fight against inflation. This policy also has the advantage of limiting exchange rate volatility, with its agitating and disruptive effects on direct investment and trade flows.

In this respect, this work empirically examines the effects of exchange rate policy on economic activity and foreign debt, answering the following questions**: Has the exchange rate policy decided by the authorities had disruptive effects on the real exchange rate of the dirham? Does Morocco's flexible exchange rate have a negative impact on foreign debt, in terms of increasing the debt burden?**

This article is in line with recent empirical work on the intermediate exchange rate regimes of the Moroccan economy in the face of current global conditions, which studies the effect of the exchange rate of the Moroccan dirham on foreign debt.

The approach adopted in this work is a deductive one. We first use the descriptive method, describing the structure and evolution of Moroccan foreign debt in the face of changes in the exchange rate, using a set of data collected from national and international organizations. It will then be the subject of an econometric approach based on the study of time series and causality analysis in the Granger sense, by verifying the existence or otherwise of a causal relationship between external debt and the Moroccan exchange rate. Based on the data collected, the econometric study will be carried out using EVIEWS software.

I- Review of the literature :

The question of indebtedness has become an important issue for economists as a number of developing countries borrowed heavily on capital markets in the early 1980s and saw their financial situation worsen. Countries such as Mexico, Argentina and other Asian countries were unable to meet their financial obligations and had to suspend debt payments during this period of crisis.

Since then, the issue of indebtedness has become a major concern for political decision- makers, and economists have stepped up their research in this field, in the hope of finding ways to reduce foreign debt. Some results have suggested that the public deficit, weak exports, high interest rates, the exchange rate, increased public spending, the unprofitability of financed projects, etc. are the main causes of the increase in these countries' external debt. In our study, we focus on the effects of the exchange rate on external debt servicing.

Choosing an exchange rate regime for a developing country is always a difficult decision. The real exchange rate, which expresses the relative price of domestic goods compared with foreign goods, influences the whole price structure, with financial, economic and social impacts. A country's choice of exchange rate regime calls into question its economic policy, its room for maneuver and its macro-economic adjustment strategy.

1- Exchange rate regimes: History and classifications

In the beginning, the choice of exchange rate regime was absolutely straightforward. The advanced countries had been using the gold standard, which symbolized efficient macroeconomic and financial exchange. The desire to avoid currency crises at the end of the Second World War prompted the Americans in 1944 to organize the Bretton Woods conference[1] to regulate the international monetary system around fixed exchange rates. The Bretton Woods system was set up to define the contours of a new international financial architecture, including all currencies were defined in relation to the US dollar, the only currency now convertible into gold, the Gold Exchange Standard.[2]

However, this system was unable to cope with American current account deficits, which undermined the dollar's gold parity, or with the expansion of world trade, which demanded more and more liquidity. Indeed, by the end of the 1970s, the world's fixed exchange rate system had been definitively abandoned, to be replaced by a system of floating exchange rates, in which certain countries attempted to stabilize their currencies against each other. The U.S. dollar no longer seemed totally credible as an international currency, and in this respect the European currency snake[3] appeared capable of ensuring a degree of stability, a system set up by the European Economic Community (EEC) in 1972. The snake's aim was to reduce exchange rate

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[1] The Bretton Woods Conference or United Nations Monetary and Financial Conference was held from 1er to 22 July 1944 in the United States to regulate the International Monetary System (IMS) after the end of the Second World War.

[2] One ounce of fine gold corresponds to 35 US dollars.

[3] The European Monetary Snake was a system set up on April 24, 1972 by the European Economic Community under the Basle Agreement, involving 9 states. The European Monetary Snake (EMS) was an economic mechanism in operation from 1972 to 1978.

differences and fluctuations between the various currencies of the member states of the EEC to ± 2.25%.[4]

In 1978, the European Monetary System (EMS)[5] put an end to the monetary snake, which had shown its limitations due to the numerous devaluations that characterized it, and the participation only for brief periods of the two main European countries, France and Italy. To date, it represents the most successful example of exchange rate cooperation since the demise of the Bretton Woods system. The primary aim of the EMS was to create a zone of exchange-rate stability in Europe, using the euro as a benchmark currency, and to harmonize the economic situations of the member states, particularly in terms of inflation and interest rates. The nine members of the European Union at the time officially joined the EMS, thus accepting the principle of fixed parities and the accompanying measures.

Until the early 1990s, the EMS was remarkably stable, but then ran into difficulties. Each currency had a fluctuation margin of ±2.25% in relation to the reference rate (6% for some currencies), but from 1993 onwards, this margin was increased to ±15%, marking the transition to a floating exchange rate regime.

Definition and typology

A country's exchange rate regime is part of the monetary policy adopted by the monetary authorities. This policy determines how the exchange rate of a country's currency behaves in relation to other currencies on the foreign exchange market. The exchange rate regime largely represents the monetary authorities' overall intervention in the foreign exchange market. Indeed, the range of exchange rate regimes has broadened considerably over time, from free floating to extreme fixity. These regimes are grouped into three categories: floating regimes, fixed exchange rate regimes and intermediate regimes.

-   *Fixed exchange rate regime*

The exchange rate under this system is set equitably by the monetary authorities. The foreign exchange market is balanced by the intervention of the central bank, which buys foreign currencies if demand exceeds supply, and sells foreign currencies if demand falls short of supply. The central bank of the currency concerned buys or injects its own currency into the foreign exchange market to stabilize prices. In a fixed exchange rate regime, the price of a currency does not change, but remains correlated to that of another currency, e.g. the dollar, the euro, etc.

This fixed regime may be accompanied by the non-convertibility of the currency concerned, in the absence of foreign exchange markets enabling domestic and foreign companies, as well as private individuals, to buy or sell it freely. This can only be achieved through the intervention of the central bank itself. By adopting a fixed exchange rate regime, the central currency of the country concerned is covered by the central bank's foreign exchange reserves.

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[4] Belgium, France, Italy, Luxembourg, the Netherlands and the Federal Republic of Germany, Denmark, Ireland and the United Kingdom.

[5] The European Monetary System was agreed at the Bremen Conference in July 1978. It came into effect on January 1, 1979.

- *Floating exchange rate regime*

The floating exchange rate regime is determined by the confrontation of supply and demand for currencies on the foreign exchange market, without the intervention of monetary authorities. The latter can use monetary policy to intervene on these markets in order to influence the evolution of the exchange rate and defend a given parity. In some cases, the authorities intervene to reduce exchange rate fluctuations deemed to be excessive. This is known as independent floating, in the absence of government intervention. The United States, Canada, Great Britain, Japan, Australia and South Africa are current examples of countries with a floating exchange rate.

- *Intermediate exchange rate regime*

Between the two extreme fixed and floating regimes, there are intermediate regimes. These fall into the categories of *crawling pegs*[6] and crawling bands. In the crawling band system, the central bank authorizes a band of exchange rate fluctuation around a reference central parity, which is itself modified periodically. These modifications are designed to avoid or reduce exchange rate misalignment, and the authorities are also committed to intervening to keep the exchange rate within the fluctuation band.

2- Public external debt and its evolution:

The lack of resources in developing countries has encouraged the widespread use of international lending as a means of financing development. Most developing countries find it difficult to cover their budget and trade deficits. In such cases, external borrowing becomes unavoidable due to the weakness of domestic savings and grants.

According to the IMF (2006), gross external debt: "is equal to the amount, at a given date, of outstanding unconditional actual current liabilities, which involve an obligation for the debtor to make one or more payments to repay principal and/or pay interest, at one or more future points in time, and which are owed to non-residents by residents of an economy."

The World Bank defines public external debt as "the debt contracted each year by a government or state with partner countries and international financial institutions, to finance its economic and social development efforts".

Over the past 30 years, the economic context of all developing countries, particularly those in Africa, has been marked by excessive indebtedness. The governments of these countries have been obliged to enter into agreements with international institutions in order to achieve a balance in the management of their public finances.

The financial resources available to the authorities were also insufficient (tax and domestic savings). Thus, there was great diversity between what developing countries wanted to achieve in relation to available resources. However, recourse to debt external financing was the only option left to offset the shortfall in capital needed to finance economic development and kick-start the economy. However, these arrangements led to the inability of these countries to free themselves from dependence on external financing and to a circle of external public

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[6] crawling pegs is a regime in which exchange parities can be revised by a succession of small change.

indebtedness. As a result, debt increased considerably, and debt servicing became increasingly unbearable for some countries, exposing them to greater exchange-rate risk, as exchange rates fluctuate continuously on the currency markets.

What's more, the exchange rate risk of emerging economies is higher than that of industrial economies, due to the limited use of risk-hedging instruments and the high cost of diversifying foreign trade and accumulating foreign exchange reserves. As domestic savings and financing are low, these countries are obliged to borrow in foreign currencies, so debt servicing is exposed to the risk of exchange rate fluctuations.

A number of emerging countries have experienced debt crises in the face of major disturbances, such as unexpected developments or crises. Yet the need for a reasonable monetary policy that does not destabilize the exchange rate is one of the necessary conditions for harmonious economic development.

The monetary regime introduced in Argentina in 1991, known locally as the Convertibility Law, had all the features of the Currency Board[7]: "fixed exchange rate against the dollar, backing of all domestic monetary issuance on dollar-denominated assets, prohibition on the Central Bank financing domestic agents or sterilizing capital movements in the balance of payments"[8]. Argentina's success is all the more remarkable in that it is the first time an institution of this type has been set up in such a large country. The system was created in Argentina to replace a regime of flexible exchange rates, with the reserve currency being the US dollar, and the exchange rate set at 1 dollar to 1 peso.

Choosing between floating and pegging the exchange rate means choosing between flexibility and credibility. For many emerging countries, pegging the exchange rate is no longer a necessary condition for inflation control and credibility.

Since the mid-1990s, intermediate regimes have been at the heart of the crises affecting most emerging countries. These regimes have proved vulnerable to massive capital outflows. All attempts to defend themselves have resulted in sharp rises in interest rates and losses of reserves, which have weakened banking systems and ultimately led to recession. On the other hand, the instability of intermediate regimes is called into question by the experiences of countries (Poland, Chile, Hungary) that have managed to maintain sliding-band regimes for varying lengths of time without crisis.

In December 1987, Mexico began a stabilization program. An economic solidarity pact was signed to adopt a price and wage freeze with the aim of containing price rises and reducing inflation. In order to achieve rapid disinflation, a fixed peg to the dollar was announced in February 1988. This fixed peg was replaced in 1989 by a sliding peg pre-announced in 1989. Mexico switched to a sliding band regime in November 1991, given the massive influx of capital that accompanied economic stabilization and reform. Despite the gradual widening of the fluctuation band from 1.2% in 1991 to 8.7% around 1993, the exchange rate regime was not very flexible. The pace of disinflation was slow, resulting in real appreciation and a considerable current account deficit.

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[7] A currency board is a monetary regime based on an explicit commitment to maintain the exchange rate between the national currency and another foreign currency, and to ensure automatic convertibility of the national currency.
[8] Sgard Jérôme. "What they say afterwards: The Argentine currency board and its tragic end." Revue d'économie financière, n°75, 2004. Les systèmes de change fixes : la Zone franc ; P :130.

- **Exchange rate regimes and rising financial imbalances**

From the late 1990s onwards, the rise in international financial imbalances was largely linked to the nature of the exchange rate regimes implemented in the various countries. The Mexican, Thai and Brazilian crises are three examples of capital account crises that triggered defaults on public debt, led to sharp currency depreciation and weakened public finances.
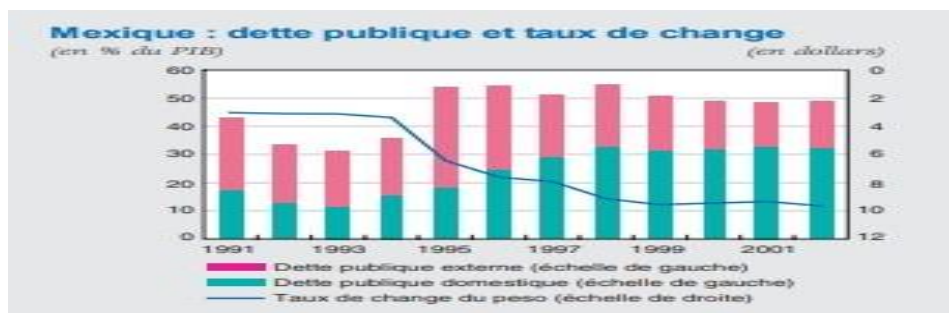
Sources: A.Bachellerie and B. Couillault Soutenabilité de la dette publique et crises des pays émergents :présentation des concepts et des instruments de diagnostic, Banque de France, Revue de la stabilité financière, N°6, Juin 2005 ; P73

Mexico (1994-1995)

- Widening current account deficit (9.8% in 1993, 7% in 1994), financed by capital inflows, largely short-term.
- Against a backdrop of tightening US monetary policy and domestic political unrest, capital outflows (March- April 1994), falling reserves and the issue of short-term government securities indexed to the dollar: the "Tesobonos".
- Another crisis of confidence in November, and the peso floats on December 22. A $50 billion rescue plan is put in place by the US Treasury and the IMF, to avoid a default on public debt.
- Overall, between 1994 and 1996, public debt increased by 18 points of GDP.

Sources: A.Bachellerie and B. Couillault Soutenabilité de la dette publique et crises des pays émergents :présentation des concepts et des instruments de diagnostic, Banque de France, Revue de la stabilité financière, N°6, Juin 2005 ; P73

Thailand (1997-1998)

- Strong GDP growth (5.9% in 1996), widening current account deficit (7.9% in 1996),
- real appreciation of the baht, capital inflows (9.2% of GDP in 1996); fragile banking sector.

- Capital outflows at the end of 1996, accelerating, banking crisis, interventions to support the exchange rate.
- July 1997: baht floats, losing 20% in one month; $4 billion IMF program.
- Further fall of the baht, strengthening of the IMF program and strong slowdown
- Between 1997 and 1999, public debt increased by 19 points of GDP.

Sources: A.Bachellerie and B. Couillault Soutenabilité de la dette publique et crises des pays émergents :présentation des concepts et des instruments de diagnostic, Banque de France, Revue de la stabilité financière, N°6, Juin 2005 ; P73

Brazil (1998-2002)
- Weak growth; significant public deficits (-7.9% in 1998) and current account deficits (-4.3% in 1998).
- Following the Asian and Russian crises, capital outflows and interest rate hikes; December 1998:
- $42 billion rescue plan, including $18 billion from the IMF; floating of the peso in January 1999.
- Public debt increased by 9 points of GDP in 1999.
- In the run-up to the presidential elections in October 2002, concerns over the level of public debt pushed spreads to 1,500 basis points, and the real depreciated sharply (-18% between March and June). A new $30 billion IMF program is approved.
- Public debt increased by 10 points of GDP in 2002.

In the wake of the Mexican (1994), Asian (1997) and Brazilian (1999) crises, the view became widespread that all regimes other than institutionally rigid pegs and totally free floats are unstable. The debate seemed closed until the Argentine crisis (2002), which demonstrated the harmful effects of rigid pegging and the importance of flexibility, as well as the need to replace nominal pegging of the exchange rate with an inflation-targeting policy. Increasingly, several "emerging countries are abandoning exchange rate management in favor of inflation targeting and floating their currencies".[9]

3-   Review of empirical literature

The literature on the effects of exchange rates on foreign debt is recent, so there are few studies on the subject. Notably with the Asian debt crisis, the crisis of South American states and the

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[9] A.Bachellerie and B. Couillault Soutenabilité de la dette publique et crises des pays émergents :présentation des concepts et des instruments de diagnostic, Banque de France, Revue de la stabilité financière, N°6, Juin 2005 ; P74.

US debt problem, literature and studies have begun to appear to investigate the effects of the exchange rate on external indebtedness. Some authors have tried to determine the optimal libelation of foreign debt in order to reduce the cost of exchange rate fluctuations on debt servicing. However, other authors have tried to determine the economic factors that impact the currency composition of debt servicing.

Krugman (2003) has studied the effects of the exchange rate on debt. According to him, "the current account measures the magnitude and direction of international borrowing". In other words, a depreciation in the real exchange rate leads to a deterioration in a country's short- term trade balance, since most export and import orders are placed several months in advance. In other words, an initial fall in the current account can occur when the value of imports ordered in advance increases relative to domestic products. According to **Krugman**, in the event of a current account deficit, the government is obliged to borrow the difference in the currency of its main export partner in order to minimize exchange rate costs. He puts forward "the idea that it is sometimes in the interest of creditors to grant debt reductions in order to increase debtors' probability of repayment."[10]

Miller (1997) demonstrated in a model where foreign inflation and government spending are stochastic, that denominating debt in foreign currency can be more advantageous than using indexed debt instruments when the foreign and domestic economies are positively correlated, and the foreign economy increases its own inflation rate in the event of high government spending. In this case, domestic taxes can be smoothed out, or stabilized, even if the public debt is issued in foreign currency.

As for **Giavazzi** and **Pagano (1990),** they show that the viability of a fixed exchange rate system can be improved by lengthening the average maturity of debt, by spreading the amounts to be renewed as evenly as possible at each period, or by issuing in foreign currencies. They consider that a crisis on the foreign exchange market can be described by an increase in the probability of devaluation of certain currencies. When such a crisis occurs and affects a particular country, the increased probability of devaluation causes an increase in the domestic nominal interest rate when capital is perfectly mobile. If the securities issued carry fixed coupons, the crisis will lead to a fall in the price of government debt securities.

Empirically, several models have analyzed the link between different macroeconomic variables and the real exchange rate (REER), in order to demonstrate the existence of a positive or negative impact. To calculate the equilibrium RER, the choice of model depends on the countries studied.

Edwards (1989) carried out a study of 12 developing countries, covering a period from 1962 to 1984, to verify the impact of trade restrictions on the real exchange rate. **Edwards (1989, 1998)** and **Elbadawi (1994)** carried out comparable work using the BEER[11] (behavioral

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[10] É.Berr & F.Combarnous , "Une autre lecture de la soutenabilité de la dette", Revue Tiers Monde 2007/4 n° P ; 792, ISSN 1293-8882 ISBN 9782200923952

[11] BEER (Behavioral Equilibrium Exchange Rate) is an econometric model whose aim is both to explain theoretically how the TCR is determined and to report empirically on its evolution. This approach consists of selecting a set of fundamental economic variables that can influence the long-term TCR, and then seeking cointegration relationships between the TCR and these variables in order to determine its equilibrium level.

equilibrium exchange rate) and NATREX[12] (real and natural exchange rate) models, which are better suited to either large developed economies or countries with developing economies. These studies define the equilibrium ERR as the relative price of non-tradable goods compared to tradable goods, and consider that this equilibrium depends on the simultaneous behavior of markets.

of these two goods. Econometrically, analysis of the TCR's behavior is mainly based on reduced-form equations, linking the TCR and the fundamental economic variables acting on internal and external equilibria (Egert and Lahreche, 2002)[13]. Using cointegration analysis, Elbadaoui (1994) verified the equilibrium real exchange rate (TCR) for Chile and Ghana from 1965 to 1990, and for India from 1965 to 1988. Their studies show that the TCRs of the selected countries are not constant over time.

II-   Morocco and its exchange rate policy

Historically, the exchange rate in Morocco was always linked to the French franc, until May 13, 1973, but from that date onwards the Moroccan government decided to stabilize the effective exchange rate against a basket of foreign currencies made up of the main trading partners, in order to maintain exchange rate equilibrium and have a regime that was easy to manage.

1. Openness and exchange rate policy in Morocco

Since 1993, when it joined the IMF (Article VIII), Morocco has made the dirham convertible for current transactions[14]. In order to make a success of this new stage, a number of important measures have been taken to help increase foreign capital flows and boost the Moroccan foreign exchange market. These measures include: giving local companies the possibility of negotiating their international transactions while protecting themselves against foreign exchange risk

the power granted to banks to execute and quote directly among themselves the various buy and sell orders of their customers, without the intervention of Bank Al-Maghreb; foreign investors benefit from a free transfer of the capital invested, and of the corresponding income automatically. In addition, the transfer of foreign exchange earnings is carried out directly by the banks, and is not subject to any authorization from the Foreign Exchange Office. Indeed, as part of Morocco's new monetary policy aimed at boosting capital markets, other important measures have been taken, such as liberalizing interest rates, unblocking credit, refinancing the these include the central bank's new regulations, the easing of compulsory employment, the

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[12] The NATREX (Natural Real Exchange Rate) or natural TCR is defined as the TCR that ensures balance of payments equilibrium in the absence of cyclical factors, notably production (at potential), speculative capital flows and changes in foreign exchange reserves.

[13] Khaled Chnaina, "Les effets de la variabilité du taux de change réel sur le commerce extérieur. Cas de la Tunisie", PhD thesis in economics under the supervision of Serge Rey, Bordeaux, Université de Pau et des pays de l'adour, 2013, p.15.

[14] According to circular n°1606 adopted by the Office des Changes in September 1993, current operations cover the following items: foreign trade operations "incidental expenses, international transport costs, insurance and reinsurance costs, foreign technical assistance costs, travel expenses, foreign investment income, savings on income of foreign individuals resident in Morocco, and all other expenses which, by their nature, are considered current, but cannot be classified under one of the aforementioned headings.

stimulation of interbank competition and new prudential rules. As a result, foreign companies wishing to set up in Morocco can obtain financing directly from local banks, taking advantage of the benefits attributed to non-resident status (the possibility of financing investments in Morocco in foreign currency, with freedom to transfer income), as well as the benefits associated with resident status (access to dirham-denominated assets or loans).

Between 1990 and 2000, the dirham appreciated by 17% (and 22.5% against EU15 countries), which further reduced the competitiveness of the exposed sector. The lack of competitiveness of Moroccan products should have prompted the authorities to devalue the currency several years ago. Instead, they focused their efforts on consolidating the financial system and easing the debt burden. It was not until April 2001 that the authorities de facto devalued the dirham by 5%. They changed the weighting of the various currencies making up the basket, giving greater prominence to the euro at the expense of the dollar, to better reflect Morocco's anchorage in the euro zone.

The Ministry of the Economy and Finance, after consultation with Bank Al-Maghrib, decided in January 2018 to launch the first stage of the transition to a new, more flexible exchange rate regime, where the parity of the Moroccan dirham is determined within a band of fluctuations of plus or minus 2.5% compared with plus or minus 0.3% previously, in relation to a central rate set by Bank Al-Maghrib on the basis of a basket of currencies made up of the US dollar and the euro at 40% and 60% respectively. In this case, the central bank intervenes by selling or buying currencies through auctions, enabling the development of the Moroccan interbank market.

This new stage of band widening was a transition to a long-term managed floating regime, requiring a significant role for the Central Bank to ensure the smoothing of exchange rate fluctuations. The introduction of this new flexible exchange rate regime has been the subject of intense debate between proponents and opponents of a flexible regime. The former argue that it needs to be well adapted to cushion exogenous shocks, and that this decision could make Morocco more attractive to foreign investors, and that with a more flexible exchange rate, the dirham quotation system would become an instrument to support exports. On the other hand, the latter reject the idea, because after this further widening of the fluctuation band, the State would then have to bear the consequences of higher inflation and higher prices imports. In other words, even with the conditions for success in place, caution is still called for. Since March 9, 2020, Morocco has moved on to the second phase of its exchange rate reform. However, after consultation with Bank Al-Maghrib, the Ministry of the Economy and Finance ordered a widening of the dirham's fluctuation band from 2.5% to 5% in relation to a central rate set by the central bank, based on a basket of currencies composed of the euro (EUR) and the US dollar (USD), at 60% and 40% respectively.

This expansion is part of the ongoing process of reforming the exchange rate regime, which was initiated in January 2018, and comes after the objectives assigned to the first phase were achieved. The second phase is being undertaken in a favorable domestic macroeconomic and financial context marked by an appropriate level of foreign exchange reserves, controlled inflation, a balanced financial sector and sustainable public debt.

The reform of the exchange rate regime, which is a gradual, orderly and voluntary process spread over several stages, will strengthen the capacity of the Moroccan economy to absorb external shocks, improve growth and sustain competitiveness. BAM continues to ensure the smooth operation of the foreign exchange market, and will intervene on this market to ensure its liquidity, if necessary, in accordance with its status.

2-   Morocco's exchange rate and foreign debt

In the context of a floating exchange rate regime, monetary policy has regained a wide margin of freedom. This approach, which Morocco announced in January 2018, is a first step towards the fixed exchange rate regime adopted by the Kingdom since independence. This change in exchange rate regime will have no impact on the role of the central bank (BAM), which will continue to intervene on the foreign exchange market to ensure its liquidity.

Figure 1: Exchange rate of the dirham
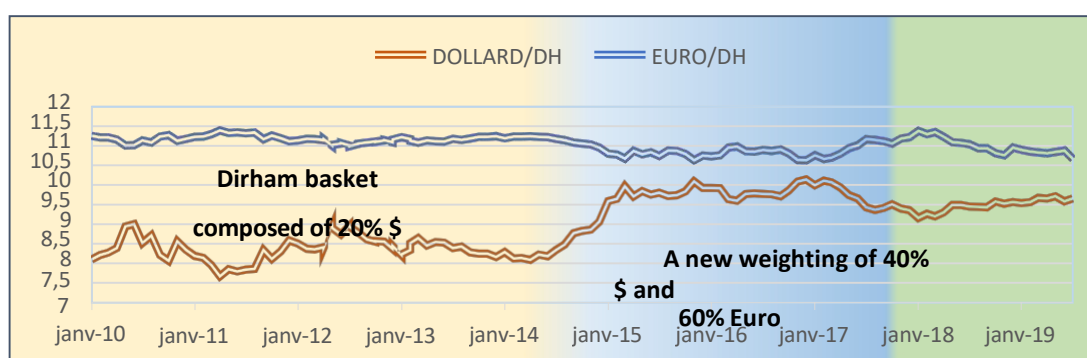
Source: Author

Contrary to concerns, the Moroccan dirham appreciated against the basket. This result is mainly due to the fall in the average price of oil, which should be explained by a reduction in foreign currency outflows following a lower energy bill.

The Moroccan dirham rate is set on the basis of a basket composed of 40% dollar and 60% euro. The European currency is expected to continue its downward trend against the dollar. On the international foreign exchange market, the euro depreciated by 0.4% against the dollar in March. It traded at an average of 1.13 USD versus 1.14 the previous month. In April 2019, the EUR/USD pair is observing an exchange rate between 1.12 and 1.13, a weaker level that confirms the absence of obvious catalysts to support the European currency. The ECB's confirmation of a cautious approach and concerns over the slowdown in Europe do not give cause for optimism, despite a reduction in the risks of a "Hard Brexit"[15]. While the initial results of the new exchange rate regime reform are positive, the widening of the band remains very weak in terms of influencing macroeconomic indicators or operator behavior.

Exchange rate dynamics in Morocco

Faced with unstable exchange rate fluctuations and a difficult economic climate, the study and monitoring of exchange rate trends is essential for a country like Morocco, which is seeking to

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[15] Note de conjoncture N°266/April 2019 ; Ministère de l'économie et des finances : Direction des études et des prévisions financières ; P.11

improve its international standing and protect itself against the risks that can be caused by excessive exchange rate fluctuations. Until 1990, the real exchange rate of the Moroccan dirham remained stable in the face of a considerable appreciation in the nominal exchange rate. Subsequently, the nominal value of the dirham underwent a further devaluation of around 9.25% in the middle of the same year.

Figure 2: Nominal and real effective exchange rate of the dirham (1990-2018)
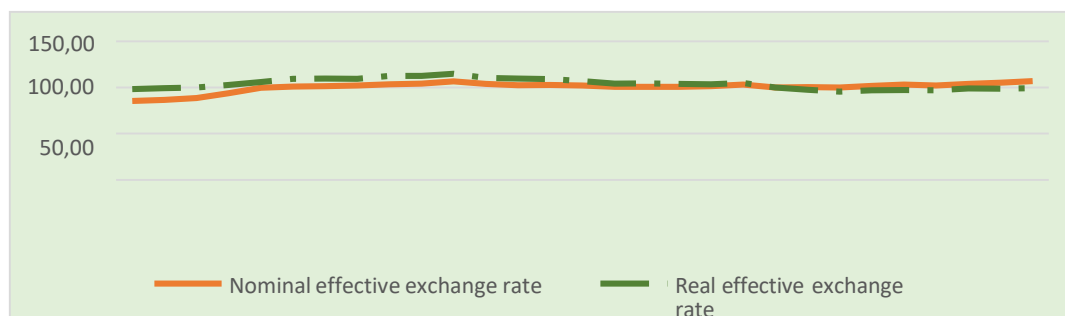
Source: Author

The evolution of the REER over this analysis period reveals a number of distinct trends.

Phase 1: Real appreciation of the dirham

Over the period (1991-1995), the REER appreciated by 11.0% in real terms, due to a 13% appreciation against the dollar, 10.2% against the euro, 26.7% against sterling and almost 7% against the group of emerging countries. This appreciation of the Moroccan dirham against the main emerging countries is due to the exchange rate depreciations experienced by these countries over the period.

Phase 2: Slight stability in the dirham's REER

Between 1996 and 1997, Morocco's external value of the dirham remained slightly stable in real terms, with a real appreciation of 3.5% against the European currency. This appreciation of the dirham's REER against the euro was offset by a real depreciation of 9.6% against the United States, due essentially to the 8.5% nominal depreciation of the Moroccan dirham against the dollar, as well as the 6.4% real depreciation of the dirham against the group of main competitors developing countries.

Phase 3: Resumption of the dirham's real appreciation

Between 1998 and 2000, the dirham's REER resumed its real appreciation of 11.8% against the euro and 5.5% against the currencies of emerging countries, as well as its real depreciation against the dollar of 11.9%, the latter due to the size of the national currency's nominal depreciation against the dollar of 10.3%.

Phase 4: Real depreciation of the dirham

During the 2e quarter of 2001, the Moroccan authorities decided to devalue the dirham by around 5%. This decision was prompted by a change in the composition of the currency basket, with greater emphasis on the European currency than on the dollar. The dirham exchange rate

depreciated slowly between 2001 and 2014. The Moroccan dirham's peg to a reference basket composed solely of the euro and the dollar, has facilitated the establishment of a solid nominal anchor for monetary policy in order to achieve national macroeconomic stability. Publications and reports by the Bretton Woods institutions often consider the Moroccan economy and the level of the Moroccan exchange rate to be broadly in line with economic fundamentals.

Public external debt

Figure 3: Trends in outstanding foreign debt and debt servicing (1998-2018)
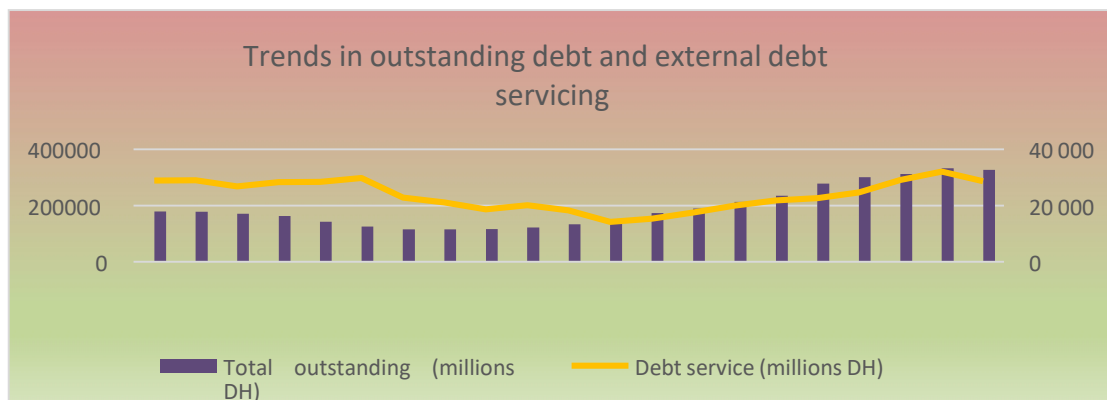
Source: Author

Morocco's public debt has been steadily deteriorating since the mid-2000s, driven by the weight of the budget deficit. Treasury debt peaked at 692 billion DH at the end of 2017, up 5% year-on-year. It represents 65.1% of national GDP. These levels are approaching the threshold of sustainability, warns Bank Al-Maghrib in its annual report. In less than ten years (2008- 2017), Treasury debt has risen by 366 billion DH, or an average of 41 billion DH a year. Clearly, the room for maneuver on debt leverage is shrinking.

The year 2018 was marked, for the first time since 2004, by a decline in outstanding public external debt[16] of 6.0 billion DH compared with 2017, settling at 326.6 billion DH, at the end of 2018. This change in outstanding public external debt is explained, mainly, by the 3.4% drop in outstanding Treasury external debt and the 1% drop in EEPs (Public Establishments and Enterprises) external debt, according to MEF's 2018 debt report.

In addition, the external component of the Treasury's debt continues to represent around 20% of the total, more or less limited, which is likely to relatively reduce the vulnerability of the debt to exchange rate fluctuations, especially as these could gradually increase as Morocco advances in its process of making the exchange rate regime more flexible. "In relation to GDP, our economy's external public debt remains close to the average for middle-income countries, at around 29% of GDP.

GDP on average. Moreover, the weight of short-term debt remains fairly low, at around 13% on average over the last three years, which helps to reduce the vulnerability of the macroeconomic framework, all the more so as external public debt is exclusively for medium

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[16] Outstanding public external debt is made up of the outstanding external debt of the Treasury, EEPs, CTs (local authorities), state-guaranteed external loans of the Public Banking Sector and Public Utility Institutions.

and long maturities"[17]. Finally, it should be pointed out that the average cost of both external and domestic debt continues its downward trend.

III- Methodology

1- The econometric method

This second part will present the study's methodology and the econometric approach used to empirically estimate the impact of the new exchange rate policy on Morocco's foreign debt.

In our study, we will use a multiple linear model on time series with causality analysis in the sense of Granger. Econometric estimation will be carried out using EVIEWS software on the basis of the data collected.

Our model refers to variables selected on the basis of empirical work dealing with the existence of a long-term link between certain fundamental factors and the Moroccan real exchange rate (RER). The exchange rate has undergone significant changes in Morocco in recent years, which may affect the country's macroeconomic variables. Theoretically, exchange rate fluctuations are directly linked to macroeconomic variables such as external debt, GDP, FDI, trade openness and domestic debt.

The idea of using VAR models by SIMS in (1980) is to analyze and forecast the economy. This model was based on the observation that the restrictions imposed a priori on the structural forms of traditional macroeconomic models are unjustified and need to be challenged. In a correctly specified general equilibrium model, each variable in the model depends a priori on all the other variables in the system. This idea leads to the use of VAR models.

VAR models have three advantages: firstly, they allow us to explain a variable in relation to its lags and in terms of the information contained in other relevant variables, which raises problems of Cointegration. In a VAR model, we also have a very large information space at our disposal, and lastly, this method is fairly simple to implement.

This involves both estimation and testing procedures. The preliminary steps in VAR modeling are:

- Study of variable stationarity
- Determining the optimum number of delays
- Cointegration study
- VAR model study

2- Specification of data used

To highlight the impact of exchange rate variations on treasury debt, it is necessary to choose appropriate variables. The software used in this study is Eviews, suitable for performing VAR regressions. The data used in the estimation are annual from 1998 to 2018, provided by the World Bank and the Ministry of Economy and Finance. For our analysis, we use the following variables:

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[17] Annual Report of the Economic, Social and Environmental Council, 2018, P ;60

Table 1: Presentation of variables used in model estimation

Variables	Description	Frequency temporal	Period	Source
TRE	Economic growth rate	Annual	1998-2018	The World Bank
EDT	Treasury debt outstanding	Annual	1998-2018	Ministry of t h e Economy and Finance
SB	Budget balance: Ordinary income (excl. VAT CL) less ordinary expenditure	Annual	1998-2018	Ministry o f Economy and Finance
IPC	Inflation rate: the rate of change of CPI	Annual	1998-2018	Ministry of t h e Economy and Finance
TCR	Real exchange rate	Annual	1998-2018	The World Bank
CIT	Interest expense	Annual	1998-2018	Ministry of t h e Economy and Finance

Source: Author (EVIEWS)

2-1- The model to be estimated:

The VAR model with "5" variables and "p" lags in our study is written as follows: $Yt = A0 + A1\ Yt\text{-}1 + A2\ Yt\text{-}2 + A3\ Yt\text{-}3 + A4\ Yt\text{-}4 + A5\ Yt\text{-}5 + A6\ Yt\text{-}6 + vt$

- Y1t: Real exchange rate;
- Y2t: Treasury debt outstanding;
- Y3t: Budget balance;
- Y4t: Inflation rate;
- Y5t: Growth rate;
- Y6t: Interest expense;

To model the link between the exchange rate and treasury debt, we will estimate our model using the VAR method, following its steps to find the results and interpret them.

2-2- Stationarity test:

Unit root test (Dikkey-fuller):
For our study, we opted for the Augmented Dickey-Fuller (ADF) test, which enables us to test non-stationarity conditional on the specification of the model used. The test procedure starts by testing the unit root of the most general model, i.e. "model 3", and follows the steps of the ADF test until we obtain a series that is stationary.

Assumptions:
- H0: Unit root (non-stationary)
- H1: Non- unit root (stationary)

Table 2: ADF unit root test on model variables

Variables	Model (3) with constant and trend	Model (2) With constant	Model (1) without constants or trends
TCR	Trend not significant (prob=0.3550>0.05)	The constant is not Significant (prob=0.2375>0.05)	**We accept H0 from Unit Root,** Non-stationary **process (prob=0.1213>0.05**
EDT	The t-statistic of the test is greater than the critical value at the 5% threshold. (-1.114293>-3.673616),	The constant is not Significant (prob=0.4481>0.05)	**We accept H0 from Unit Root,** Non-stationary **process(prob=0.9905>0.05)**
TRE	Trend is significant (prob=0.0004>0.05) **Stationary** process		
SB	Trend not significant (prob=0.7929>0.05)	The constant is Significant, (prob=0.0018<0.05),and H0 of Unit root is rejected, so the process is **stationary**	
IPC	Trend not significant (prob=0.5539>0.05)	The constant is Significant, (prob=0.0002<0.05), and we reject H0 of root Unitary, so the process is **Stationary**	
CIT	**The t-statistic of the test is greater than the critical value at the 5% threshold. (-2.343614>-3.673616), so we do not reject H0.**	**The constant is not Significant (prob=0.3866>0.05)**	**We accept H0 from UnitRoot,** non-stationary **process (prob=0.9204>0.05)**

Source: Author (EVIEWS)

According to the various Dickey-Fuller tests, we find that the Budget Balance (SB), the Inflation Rate (CPI) and the Economic Growth Rate (ERR), are stationary processes. For the other three variables, the trend and the constant are not significant in models 1 and 2 respectively, and we accept the H0 hypothesis in step 3. These variables are therefore of the Difference Stationary (DS) type, i.e. they are not stationary. We need to differentiate them and test the stationarity of the series in first difference.

According to the first-difference ADF unit root test, the Real Exchange Rate (REER) and Interest Expense (CIT) variables are integrated of order 1 (I (1)) and the Outstanding Treasury Debt (EDT) variable is integrated of order 2 (I (2)).

DTCR ⟶ I (1)
DCIT ⟶ I (1)
DDEDT ⟶ I (2)

In this case, a Granger Cointegration test is not necessary, since not all variables are integrated at the same level. The Vector Autoregressive (VAR) method will be our analysis method.

2-3-VAR model estimation

We choose the model with p*=1, which minimizes the Akaike and Schwarz information criteria. We will therefore estimate this model:

✓ DTCR = a0 + a1DTCR (-1) + a2 DDEDT (-1) + a3DCIT (-1) + a4SB (-1) + a5IPC (-1) + a6 TRE (-1) + vTCR

✓ DDEDT = b0 + b1DTCR (-1) + b2 DDEDT (-1) + b3DCIT (-1) + b4SB (-1) + b5IPC (-1) + b6 TRE (-1) + vDDEDT

✓ DCIT = c0 + c1DTCR (-1) + c2 DDEDT (-1) + c3DCIT (-1) + c4SB (-1) + c5IPC (-1) + c6 TRE (-1) + vDCIT

✓ SB = d0 + d1DTCR (- 1) + d2 DDEDT (-1) + d3DCIT (-1) + d4SB (-1) + d5IPC (-1) + d6 TRE (-1) + vSB

✓ IPC =e0 + e1DTCR (-1) + e2 DDEDT (-1) + e3DCIT (-1) + e4SB (-1) + e5IPC (-1) + e6 TRE (-1) + vIPC

✓ TRE = f0 + f1DTCR (-1) + f2 DDEDT (-1) + f3DCIT (-1) + f4SB (-1) + f5IPC (-1) + f6 TRE (-1) + vTRE

Table N°3: model estimation VAR

		DDEDT	DTCR	IPC	SB	TRE
DCIT (-1)	0.484451	-0.399413	-0.028980	-0.072823	-4.406493	0.303954
	[1.51535]	[-1.08006]	[-0.25785]	[-0.01984]	[-0.47568]	[0.13168]
DDEDT (-1)	0.435021	-0.467105	0.019823	-3.028056	-9.703506	-2.444431
	[1.54575]	[-1.43485]	[0.20035]	[-0.93702]	[-1.18992]	[-1.20294]
DTCR (-1)	0.890520	0.140410	-0.395174	-12.01606	11.27530	-5.543848
	[1.06344]	[0.14495]	[-1.34232]	[-1.24964]	[0.46468]	[-0.91689]
CPI (-1)	-0.025948	-0.023087	0.013335	-0.265234	1.071046	-0.031881
	[-0.94714]	[-0.72854]	[1.38459]	[-0.84314]	[1.34923]	[-0.16117]
SB (-1)	-0.001806	0.003857	-0.005780	0.049801	0.802823	0.121203
	[-0.25256]	[0.46634]	[-2.29911]	[0.60654]	[3.87477]	[2.34755]
TRE (-1)	-0.003463	-0.022384	0.007115	0.081952	-0.741769	-0.684592
	[-0.10919]	[-0.61010]	[0.63807]	[0.22502]	[-0.80713]	[-2.98938]
C	0.012387	0.032978	-0.025428	0.214944	-0.237894	1.304895
	[0.41420]	[0.95332]	[-2.41856]	[0.62594]	[-0.27453]	[6.04316]

Source: Author (EVIEWS)

- *DCIT = 0.012387+ 0.890520 DTCR (-1) + 0.435021DDEDT (-1) + 0.484451 DCIT (-1) - 0.001806 SB (-1) - 0.025948 CPI (-1) - 0.003463 TRE (-1) + eDCIT*

  R²= 0.465304

- *DDEDT = 0.032978 + 0.140410 DTCR (-1) - 0.467105 DDEDT (-1) - 0.399413 DCIT (-1) + 0.003857 SB (-1) - 0.023087 CPI (-1) - 0.022384 TRE (-1) + eDDEDT*

$$R^2 = 0.305002$$

- *DTCR = - 0.025428 - 0.395174 DTCR (-1) + 0.019823 DDEDT (-1) - 0.028980 DCIT (-1) - 0.005780 SB (-1) + 0.013335 IPC (-1) + 0.007115 TRE (-1) + vTCR*

$$R^2 = 0.444937$$

- *IPC =0.214944 - 12.01606 DTCR (-1) - 3.028056 DDEDT (-1) - 0.072823 DCIT (-1) + 0.049801 SB (-1) - 0.265234 IPC (-1) + 0.081952 TRE (-1) + eIPC*

$$R^2 = 0.334848$$

- *SB = -0.237894+ 11.27530 DTCR (-1) - 9.703506DDEDT (-1) - 4.406493 DCIT (-1) + 0.802823 SB (-1) + 1.071046 CPI (-1) - 0.741769 TRE (-1) + eSB*

$$R^2 = 0.795089$$

- *TRE = 1.304895- 5.543848 DTCR (-1) - 2.444431DDEDT (-1) + 0.303954DCIT (-1) + 0.121203 SB (-1) - 0.031881 CPI (-1) - 0.684592 TRE (-1) + eTRE*

$$R^2 = 0.561210$$

We obtain a VAR of order 1, but we note that a large number of the coefficients associated with the lagged terms are not significantly different from 0, since the Student's t value of these coefficients is lower, in absolute value, than the critical value read in the Student's table for a threshold α= 5%, i.e. 1.96. The modulus roots are less than 1, so our VAR is indeed stationary.

2-4- Verification of VAR stationarity:

We can check the stability of the VAR using EVIEWS, which gives us the mathematical conditions for stationarity, as shown in the table below:

Table N°4: VAR stability conditions

Roots	Modules
0.809852	0.809852
-0.673092	0.673092
-0.226465	0.504702
-0.226465	0.504702
-0.384128	0.384123
0.175467	0.175467

Source: Author (EVIEWS)

We see that all modulus roots are less than 1, so our VAR is indeed stationary.

Interpretation of estimation results:

The aim of the study is to show the impact of the real exchange rate on outstanding treasury debt, the budget balance, the inflation rate, the growth rate and the interest cost of debt in Morocco.

- *outstanding treasury debt and the real exchange rate:*

This result is not significant at the 5% level. Variations in the real exchange rate have a positive effect on outstanding treasury debt, i.e. an increase in the real exchange rate leads to an increase in outstanding treasury debt of 0.140410.

- *interest expense and real exchange rate:*

The results of the estimate show that the real exchange rate has a positive impact on interest expense on debt in Morocco. An increase in the exchange rate generates an increase in interest expense of 0.890520.

- *inflation rate and real exchange rate:*

The estimation results show that the real exchange rate has a negative and insignificant impact on the inflation rate in Morocco. An increase in the exchange rate leads to a decrease in the inflation rate of -12.01606.

- *the ordinary balance and the real exchange rate:*

The estimation results follow the same logic as the theory and confirm our expectations by proving that the exchange rate has a very positive influence on the ordinary balance, so that when the exchange rate increases by one point, the budget balance rises by 11.27530. This result is not significant at the 5% level.

- *growth rate and real exchange rate:*

The estimation results show that the exchange rate has a negative and insignificant impact on the growth rate in Morocco. An increase in the exchange rate leads to a decrease in the current year's growth rate of -5.543848.

The real exchange rate therefore influences outstanding treasury debt, interest charges, the ordinary balance and economic growth, which is consistent with reality.

2-5-Causality study:

The analysis of causal relationships between economic variables enables a better appreciation of economic phenomena. It provides additional information on the anteriority of economic.
This makes it easier to apply optimized economic policy. We then proceed to test for causality in the GRANGER sense, using the VAR (1) representation estimated above.

Test hypothesis:

✓ $Y2t$ does not cause $Y1t$, if the following hypothesis is accepted H0: $b11 = b12 = ... = b1p$

✓ $Y1t$ does not cause $Y2t$, if the following hypothesis is accepted H0: $a12 = a22 = ... = a2p$
Decision rule at threshold $\alpha = 5\%$:

✓ If the p-value > 5%, then the H0 hypothesis is accepted.
Here are the results of the GRANGER causality test between the study variables, again using EVIEWS software:

Table N°5: Granger non-causality test

Null assumptions	F-statistic	Probability
DTCR does not Granger Cause DCIT	0.03358	0.8569
DCIT does not Granger Cause DTCR	2.11082	0.1656
DTCR does not Granger Cause DDEDT	047345	0.5019
DDEDT does not Granger Cause DTCR	0.89015	0.3604
DCIT does not Granger Cause DTCR	0.01397	0.9074
DTCR does not Granger Cause IPC	3.50434	0.0796
SB does not Granger Cause DTCR	2.82174	0.1124
DTCR does not Granger Cause SB	5.96394	**0.0266**
TRE does not Granger Cause DTCR	0.61327	0.4450
DTCR does not Granger Cause TRE	0.27764	0.6055

Source: Author (EVIEWS)

Causality test between DTCR and DCIT:

The causality test shows that, at the 5% threshold, there is no causal relationship between the real exchange rate and interest expense, in the Granger sense.

Causality test between DTCR and DDEDT:

The two null hypotheses are accepted. There is no causality between outstanding treasury debt and the exchange rate, in Granger's sense.

Causality test between DTCR and IPC:

The two null hypotheses are accepted. The associated probabilities are greater than 5%, so there is no causality between the inflation rate and the exchange rate, in Granger's sense.

Causality test between DTCR and SB:

The null hypothesis that the real exchange rate does not cause the ordinary balance is rejected, in the Granger sense. As the associated probability is less than 5%, it should be noted that reverse causality is statistically rejected.

Causality test between DTCR and TRE:

The two null hypotheses are accepted. There is no causality between the economic growth rate and the exchange rate, in Granger's sense.

3-   Interpreting the results:

Following Granger causality tests, we found a relationship, namely that our differentiated DTCR series influences our SB series, all other series showed no causal relationship, and this finding can be explained by the fact that there are not necessarily immediate economic links between them.

3-1- Impulse response functions:

Impulse response functions can be used to trace the dynamics of one variable in response to a shock to another variable in the system, using the dynamics of the system to simulate this response. Using EVIEWS software, we will generate graphs of impulse response functions.
In order to provide a graphical representation that is consistent with our study, we have chosen to focus on the following 5 graphs:
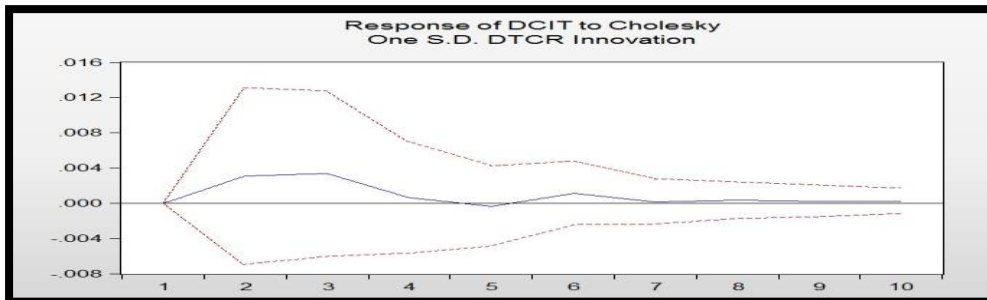
Figure 1: Fiscal balance response to a shock to the real exchange rate
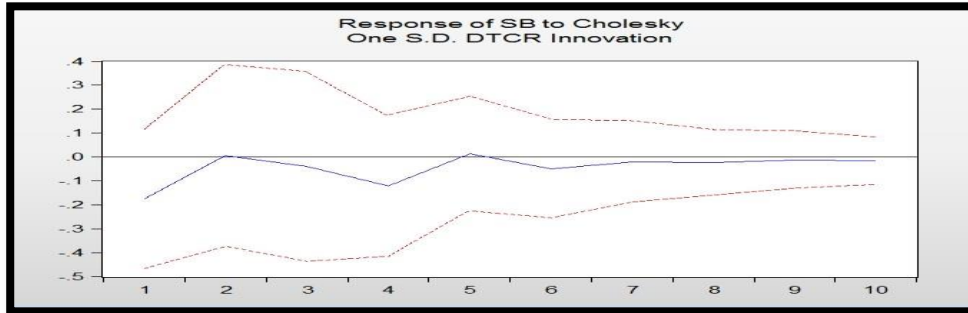
Source: Author (EVIEWS)

A positive shock to ordinary balances has a negative effect on the exchange rate, but the effect gradually diminishes over the medium and long term.
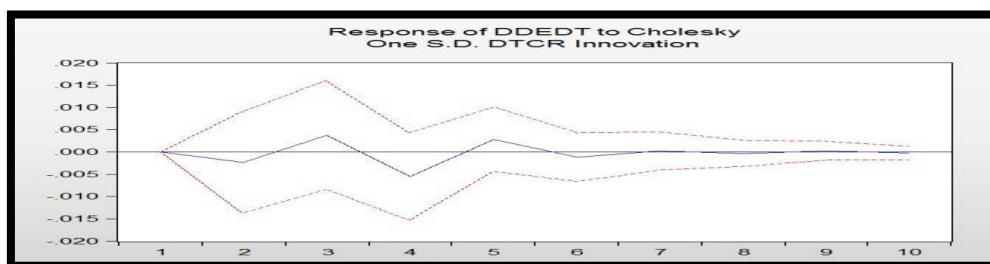
Figure 2: Response of interest expense to a real exchange rate shock

Source: Author (EVIEWS)

The effect was positive from the first year onwards, before fading back to its original level.
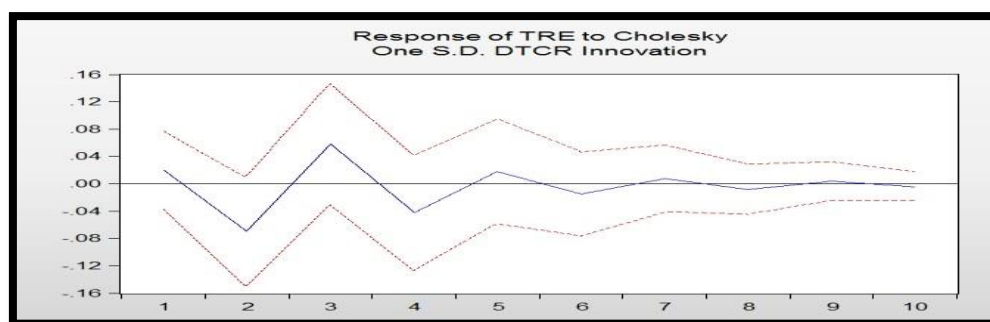
Figure 3: Response of outstanding debt to a real exchange rate shock

Source: Author (EVIEWS)

A positive shock to outstanding treasury debt has a negative effect on the exchange rate, but the effect gradually diminishes over the medium and long term.
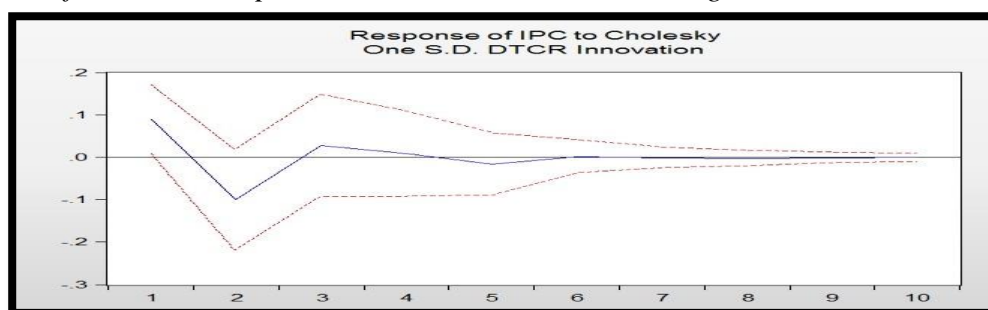
Figure 4: Growth rate response to a shock to the real exchange rate

A positive shock to the economic growth rate has a negative effect on the exchange rate for the first eight years, but the effect gradually diminishes over the medium and long term.

Figure 5: Inflation rate response to a shock to the real exchange rate

The effect of the exchange rate on the inflation rate is negative for the first six years. This effect is cancelled out in the eighth year, before rapidly returning to its normal long-term level.

3-2- Variance decomposition:

We use the forecast error variance decomposition to calculate the contribution of each innovation to the error variance. We write the error variance at a horizon h as a function of the error variance attributed to each of the variables, and then add each of these variances to the total variance to obtain its relative percentage weight.

- 21% of the variance in the forecast error of the real exchange rate is due to its own innovations; 25% to the economic growth rate; 21% to innovations in the ordinary balance, 21% to innovations in interest charges, 5% to innovations in outstanding treasury debt, and 4% to innovations in the inflation rate.
- 43% of the variance in the budget balance forecast error is due to its own innovations 25% to the economic growth rate, 21% to innovations in the real exchange rate, 5% to innovations in outstanding treasury debt, 4% to innovations in interest charges, and 4% to innovations in the inflation rate.
- 44% of the variance in the growth rate forecast error is due to its own innovations, 22% to innovations in outstanding treasury debt, 14% to innovations in interest charges, 9% to

innovations in the ordinary balance, 8% to the inflation rate, and 0.5% to innovations in the real exchange rate.

- 77% of the variance in the forecast error of the Treasury's outstanding debt is due to its own innovations, 9% to innovations in interest charges, 6% to innovations in the growth rate, 3% to innovations in the growth rate, 1% to innovations in the real exchange rate and 4% to innovations in the ordinary balance.

- 63% of the variance in the interest expense forecast error is due to its own innovations, 19% to innovations in outstanding treasury debt, 7% to innovations in the ordinary balance, 6% to innovations in the inflation rate, 2% to innovations in the real exchange rate and 0.08% to innovations in the growth rate.

- 32% of the variance in the inflation rate forecast error is due to its own innovations, 30% to innovations in outstanding treasury debt, 22% to innovations in the real exchange rate, 9% to innovations in interest charges, 4% to innovations in the budget balance and 0.23% to innovations in the growth rate.

3-3- Interpretation:

Following the econometric tests carried out, we found a relationship, namely that our differentiated series DTCR influences our series DDEDT and SB is respectively Treasury Debt Outstanding and Budget Balance. The results showed that the series did not exhibit causal relationships, and this finding can be explained by the fact that there are not necessarily immediate economic links between the exchange rate and public debt in Morocco. According to these results, a major shock to the exchange rate has no direct impact on public debt. This can be explained by Morocco's relatively low level of external debt servicing, as well as the fact that the transition to an intermediate exchange rate regime was recent, which gives us less visibility of the data and therefore of the economic effects of the exchange rate in Morocco.

Conclusion:

VAR processes enable us to assess the performance of macro-econometric models, and to study the impact of macroeconomic shocks and their transmission channels. In our article, we demonstrated the existence of a causal relationship between the real exchange rate and public treasury debt in Morocco. We were thus able to estimate our econometric model using Granger causality testing, impulse response testing and variance decomposition.

Based on the results of the econometric estimation of our model, we note that the results are in line with reality: the real exchange rate in Morocco has a positive impact on public treasury debt, debt interest charges and the ordinary balance.

This positive relationship and the significant impact of the exchange rate on debt are reflected in the new exchange rate policy adopted by Morocco, aimed at gradually consolidating the budget and introducing new reforms to support growth, while gradually moving towards a more flexible exchange rate regime in the medium term.

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