

Inflation targeting: Study by the co-integration of the Morocco case during 1980 to 2018

استهداف التضخم : دراسة قياسية باستخدام التكامل المشترك
لحالة المغرب خلال الفترة 1980-2018

Doc Oujdi djamila*, Dr Naima Baroudi

University of Tlemcen, Algeria.

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Abstract: This study aims to know the extent of success of the application of the inflation targeting policy in Morocco, where a standard study was carried out during the period 1980-2018 and this is based on the model of joint integration, and it was concluded that this policy cannot be applied in Morocco.

Keywords: inflation, targeting inflation, co-integration.

Résumé : Cette étude vise à connaître le degré de réussite de l'application de la politique de ciblage de l'inflation au Maroc, où une étude standard a été réalisée au cours de la période 1980-2018 et qui est basée sur le modèle de co-intégration, et il a été conclu que cette politique ne peut pas être appliquée au Maroc.

Mots- clés: inflation, ciblage de l'inflation, co-intégration.

ملخص: تهدف هذه الدراسة إلى معرفة مدى نجاح تطبيق سياسة استهداف التضخم في المغرب، حيث تم القيام بدراسة قياسية وذلك خلال الفترة 1980-2018 وهذا بالاعتماد على نموذج التكامل المشترك، وقد تم التوصل إلى أنه لا يمكن تطبيق هذه السياسة في المغرب.
كلمات مفتاحية: التضخم، استهداف التضخم، التكامل المشترك.

I- Introduction :

Inflation is a phenomenon and an economic problem while may affect the economies of developing and developed countries alike, and this phenomenon is almost characterized by regularity and frequency in its occurrence. Its causes have been linked to many different factors, which ultimately leads to a change in the value of the currency and a rise in the prices of various goods and services, and this is accompanied by many effects on the economic and social level.

Bank Al-Maghrib's goal is to prepare and implement inflation control in order to preserve the purchasing power of citizens and provide the appropriate conditions for investment and economic growth, as the bank has set up a system of analysis and forecast based on an integrated approach

* Oujdi djamila

cantered on an inflation model as well as with the transition to a policy targeting inflation and the gradual adoption of a more exchange rate system Flexibility, and be able to anticipate the future direction of the macroeconomic complexes, especially inflation, monetary conditions and assess the effects of the realization of the risks surrounding the central path of these expectations. An assessment of the economic situation and its expectations in the medium term is presented in the quarterly report on the policy of targeting inflation, which is prepared by the interests of Bank Al-Maghrib and submitted to members of the Council. After approval by the latter, this report will be published on the same day as the meeting of the Council.

I.1. Statement of the problem:

From this standpoint, the research problem can be developed as follows:

To what extent has Morocco been able to implement an inflation targeting policy?

I. 2. Research hypothesis:

- Inflation in Morocco is affected by the increase in the amount of money.
- The inflation targeting policy is achieved by providing the necessary conditions.

I. 3. Previous studies:

Among the most important previous studies that dealt aside in this matter, are the following:

- A Study by **Masson, Savastano, Sharma (1997)**, entitled: « The Scope for Inflation Targeting in Developing Countries ». The researchers studied the application of the inflation targeting policy in developing countries, then the researchers concluded that most of these countries do not have the initial requirements for adopting the inflation targeting policy either because of currency instrument fees that have become a primary source of funding or because of a lack of consensus in Views on low inflation are a key goal, or both (Paul R. Masson and Savastano and Sharma, 1997,37).
- A Study by **Yuzo Honda (1998)**, entitled²:“Some Testes on the Effects of Inflation Targeting in New Zeland, Canada and the UK”. Through this study, he discussed the effects of targeting inflation on macroeconomic variables using the VAR model, using four variables: the inflation rate, the real GDP growth rate, the short-term nominal interest rate and the rate of change in the nominal exchange rate during the period 1978-1997 for each of New Zealand. , Canada, and the United Kingdom.

Initially he estimated this equation for each variable in each country, calculating the residual squared sum, using data under the previous policy system i.e. before targeting (1978 to 1989 for New Zealand, from 1978 to 1990 for Canada, and from 1978 to 1992 for the United Kingdom) and calculating a standard of statistics Chow test The results showed that the null hypothesis cannot be rejected, that is, there is no structural change in all countries at the 5% level of significance, and he provided two explanations for the results obtained:

- It is that targeting inflation may have major impacts on macroeconomic variables.
The number of parameters in the model may be very large in relation to a number of experimental observations.

Finally, he said, the effectiveness of targeting inflation is at least questionable, according to current evidence, so further investigations must be undertaken in order for data to be available and alternative models developed (Yuzo, 2000, 6).

- A Study by **Kadioglu, Ozdemir, Yilmaz (2000)**, entitled :“Inflation Targeting in Developing Countries” The researchers discussed the application of the inflation targeting policy and the initial conditions that must be met in developing countries by analysing the characteristics of the inflation targeting system in developed countries, and examining the scope of inflation targeting in developing countries, and the results indicated that the majority of developing countries are not fulfilled The pre-conditions for targeting inflation require stronger models to explain the dynamics of the economy and make inflation expectations successful. They also stressed in their research paper that it may be too early to implement an inflation targeting system for some developing countries, but there are some cases that have proven successful results. For example, success in the Chilean country is due to the lack of financial deficits, in addition to strict regulations and supervision of the financial system (Kadioglu and All, 2000, 2-50) .
- A Study by **André Minella (2001)**, entitled: “Monetary Policy and Inflation in Brazil (1975-2000): a VAR Estimation” The researcher has tried to study the relationship between monetary policy and the basic elements of the macro-economy that involve the relationship between production, inflation, interest and money in Brazil using the self-regression model of the VAR estimate in the period from 1975 to 2000.

Through this study, three different periods of inflation changes were compared, represented in a moderate increase in inflation during the period from 1975 to 1985, high rates of inflation from 1985 to 1994, and low rates of inflation from 1994 to 2000, and the main results obtained through the study were as follows :

- Monetary policy shocks have major implications for production.
 - Do not stimulate a decrease in the inflation rate during the first two periods, but there are other indications that it has gained the ability to influence prices after adopting a real targeting plan.
 - Monetary policy does not usually respond quickly or effectively to the rate of inflation and output in the recent period, which is illustrated by the degree of interest rate response to financial crises, and positive interest rate shocks are accompanied by a monetary decline during the three periods, with continued inflation to a lesser degree in the third period, especially after the adoption of inflation targeting In the year 1999 (André, 2001, 3-35) .
- A Study by **Eser Tutar, David Orden, Richard Ashley, Christina Hilmer (2002)**, entitled:“Inflation Targeting in Developing Countries and Its Applicability to the Turkish Economy” Where they dealt with the application of targeting inflation in the Turkish economy during the period (1980-2001), using four different VAR models, first they used a model that includes two variables: money supply and prices, and then they added other monetary policy tools such as interest rates and exchange rates Nominal in order to assess its contribution to the VAR system for Turkey, and in the end they added the real GDP series to know its effects at the price level, as this series includes seasonal models, and this study concluded that there are two conditions in Turkey to target inflation, namely:
 - The independence of the central bank, if Turkey makes amendments to the law of the central bank and solves its problems with the public treasury to give it freedom from financial hegemony.
 - The only goal in Turkey is price stability, and this goal has been given priority as well as exchange rate flexibility.

After the standard study on the relationship between monetary policy tools, the results obtained were that there is a direct relationship between monetary policy tools, but they are weak, and at the same time they concluded that inflation is not stable and unpredictable. In

other words, the monetary policy tools of the money supply, interest rates and exchange rates do not contain any predictable information about inflation, nor does it show a stable link that enables this, in addition to that inflationary expectations are among the main reasons for high inflation rates in Turkey. Therefore, monetary authorities should strive to reduce the impact of inflation expectations to adopt more transparent policies, by informing the public about changes in monetary policy while explaining the reasons for these changes as well as the goal of the new policy (i.e. inflation targeting policy) (Eser and All,2002, 1-85).

- A Study by **Ahmed Khalid (2005)**, entitled⁶: “Economic Growth, Inflation, and Monetary Policy in Pakistan: Preliminary Empirical Estimates” The researcher has handled two types of topics in Pakistan:

- The main indicators of inflation in Pakistan, although these indicators help policymakers to predict the course of the future of inflation and develop policies to reduce it within the scope of targeting, through conducting Cranger causal tests to determine the main indicators of inflation in Pakistan.
- Finding the determinants of inflation in Pakistan, which enables the development of a prediction model for inflation, which is an important part of the inflation targeting policy. The model was as follows:

$$\Delta CPI_t = \alpha(L)\Delta CPI_{t-1} + \beta(L)\Delta Y_{t-1} + e_t$$

$$\Delta Y_t = \alpha(L)\Delta Y_{t-1} + \beta(L)\Delta CPI_{t-1} + u_t$$

The results indicated that both imported inflation, currency issuance and openness earnings; the cause of inflation in Pakistan, as imported inflation, deficit ratio in gross domestic product, currency issuance profit, monetary mass, low exchange rate and domestic credit may be important determinants of inflation in Pakistan, and the mechanism for predicting the movements of these variables would help the State Bank of Pakistan to reduce inflation within its scope of purpose, which could use this preliminary analysis as a step forward to develop a more comprehensive and systematic model for the econometric system in order to address these issues in more detail. He also added that it is ideal to use at least the quarterly data for inflation expectations, and it is also important to decide which definition of inflation is appropriate for the situation in Pakistan and would analyse policy alternatives that help to understand a policy that best suits the economic environment in Pakistan (A. M. Khalid,2005, 961-974.

- A Study by **Michael Dotsey (2006)**, entitled: “A Review of Inflation Targeting in Developed Countries”. Dotsey assessed five developed countries (New Zealand, Canada, Australia, the United Kingdom and Sweden) that had targeted inflation for at least 10 years and that had good inflation rates before targeting inflation, and also studied the economic performance of those five countries together with the performance of six non Targeted for inflation (the United States, Germany, Japan, France, Italy and the Netherlands), and the results showed that targeting inflation is associated with a decrease in inflation, and that inflation expectations are more stable in countries targeted for inflation, besides that it appears that the policy of targeting inflation is compatible with economic activity The strongest, the brightest Also recognize that the inflation targeting framework guarantees accountability by setting numerical targets that are obtained during specific periods, and the issue of accountability and transparency has increased between central banks targeting inflation and the public. The inflation targeting framework has been successfully adopted in

developed countries, which has encouraged emerging countries in transition to combat high inflation (M.Dotsey, 2006, 10-20).

I. 4. Objectives of the study:

The aims of this study lies in studying the phenomenon of targeting inflation in the country of Morocco and knowing the limits of its application.

II– Inflation targeting Policy:

II.1. Definition of inflation

Inflation is defined as: “an unexpected rise in prices, as it is generated by an increase in the size of the cash-flow stream, by a greater percentage of the increase in the supply of goods and services.” (Al-Shafi'i, 1990, 91).

And he knows: "It is the increase in the amount of money that leads to higher prices, whether that increase appeared through the money supply, or through the demand for money." (Magdy, 78).

The multiplicity of special concepts of the word inflation has led to the existence of multiple types of it, where some types of inflationary trends are determined by the extent of the state's control of the credit system and its control of the movements of the general levels of prices and their influence, since under this criterion there are three types of inflationary trends: (apparent free) inflation Restricted (pent-up) and latent (hidden) inflation (Al-Shammari, 2007, 404).

II.2. Inflation targeting policy

In the early 1990s, many countries of the world adopted a new monetary policy in which monetary tools were used and aimed at achieving specific inflation rates that should be reached, and then use interest rates or other lending costs to reach this rate. This policy was built on the assumption that lending costs were inversely proportional to rates Inflation, and on this basis, the costs of short-term lending are raised if inflation rates exceed the desired goal, and if inflation rates decline, rates of lending costs are reduced to reduce the possibility of a slowdown in the economy.

II.2.1. Definition of a policy of inflation targeting

Eser Tutar (2002) defines inflation targeting as: "a monetary policy system characterized by public announcement on the official goal of fields or a quantitative (numerical) target for the inflation rate for a period of one or more periods, with the apparent recognition that reducing and stabilizing inflation is the primary goal of monetary policy (Eser, 2002, 1).

Kenneth N. Kuttner (2004) summarizes that there are two ways of thinking about defining inflation targeting as the first relates to the observed or apparent characteristics of the targeting policy framework, and the second method relates to the optimization of this policy as a basis for managing monetary policy. It follows from the first way of thinking that the easiest way to distinguish inflation targeting is, of course, by self-advertising. If the central bank announces inflation goals, we say that it applies the policy of targeting inflation, and this is called: “The practical definition of inflation targeting Definition of Inflation Targeting (Kenneth, 2004, 7).

If the practical definition takes its model from the point of view of its authors, such as Bernanke and Al (1999), it is best described as a framework for monetary policy rather as a broad rule, which has four characteristics (Kenneth, 2004,8).

- The declared commitment to price stability as a primary objective of monetary policy, however price stability should not be the only goal of achieving stability in production and other purposes.
- There is a digital target for inflation. Often, but not always, there will be a specified period to return to the target after any gaps.

- A high degree of transparency in monetary policy that regularly publishes detailed reports on economic conditions and inflation expectations. Often the central bank reports on inflation include GDP growth and other macroeconomic variables.
- The accountability mechanism is often the target of inflation, and this requires the central bank to take specific measures such as publishing an interpretation or sending an email to the government.

II.2.2. The conditions of the emergence of inflation targeting policy

The achievement of these countries to low and stable rates of inflation encouraged a number of developing countries to adopt such a policy, namely, Chile and Poland in 1999, Colombia, Korea and South Africa in 2000, Hungary, Iceland, Mexico, the Philippines and Peru in 2002, and more than 40 countries targeted to reach a level Low and stable from inflation, but only 18 of them are classified as countries that fully meet the terms of targeting inflation (Kenneth, 2004, 9).

The achievement of monetary policy goals is linked to the extent of the relationship that links the final goal to the intermediate targets in the stage that preceded the end of the eighties, where the prevailing belief was the validity of the hypothesis based on the ability of central banks to control intermediate targets and that there is a close relationship between them and the final goals.

The collapse of the Bretton Woods system in the early 1970s made exchange rates ineffective as intermediate targets, and monetary pools emerged as new controllable intermediate targets that well reflect the goal, especially with the rising trend of monetary ideas in those periods. The following table shows the indicators of countries that targeted inflation (Taiba Abdel Aziz, 2005,10-12).

III- Policy targeting inflation in Morocco

In 2006, Bank Al-Maghrib was given a new position, included in Law 76-03, which officially aims to strengthen the independence of the central bank in managing monetary policy. Article 27 of the law states that "the bank may not provide financing to the state, or act as guarantor of its obligations."

In the wake of the global economic crisis in 2007 and the ensuing recession, especially in Europe, Moroccan banks reduced their lending volume due to the crisis of the sectors affected by the crisis. Therefore, Bank Al-Maghrib has increasingly pumped liquidity to enable banks to continue lending. This money was used to purchase treasury bonds at an average rate of 3.5%, to be paid to Bank Al-Maghrib at a rate of 3.25% after one or three months. Reaping 0.25% without risk knowing that the state is in increasing need of liquidity, due to the budget deficit, a gift to banks, offset by the narrowing of public expenditures and the deprivation of Moroccans of public services to pay debts. The state is obliged to pay higher interest rates than it would have paid if it had been funded directly from the central bank. Consequently, Article 27 of this statute of Bank Al-Maghrib is a real burden on the state budget. Preventing the state from resorting to the central bank to finance its expenditures, opens the way for financial markets and banks to invest in public debt, which raises the cost of servicing the debt. Taxes on companies are reduced and investors are exempt from them. In order to reduce the budget deficit, the rich - the least taxable - resort to borrowing and enable them to accumulate profits in the form of interest (central bank of Morocco).

III.1. A standard study for implementing the inflation targeting policy in Morocco

The study was based on the Yuzo Honda study 1998 entitled: "Some Testes on the Effects of Inflation Targeting in New Zeland, Canada and the UK"

It was based on studying the relationship between the inflation rate, the real GDP growth rate, the short-term nominal interest rate and the rate of change in the nominal exchange rate, using the self-regression model VAR during the period from 1978 to 1992. In this study, however, Dependence on the following variables: GDP, Interest rate, Inflation rate and Exchange Rate.

III.1.1. Variables used

- **Dependence on the following variables GDP:** It is the market value of all locally recognized final goods and services that are produced in a country during a specific time period. Per capita GDP is often considered an indicator of the country's standard of living. GDP relates to national accounts, which are macro-economic items. The gross domestic product should not be confused with the gross national product (GNP) that allocates production according to ownership.
- **Interest rate I:** It is the price that the central bank pays on commercial bank deposits, whether it is an investment for one night or for a month or more. This price is an indication of interest rates with commercial banks that should not be less than the price of the central bank, and the interest rate helps the central bank to control the supply Cash in circulation by changing this price up and down in the medium term. And raising interest means curbing borrowing operations and thus reducing the level of liquidity in the market, which leads to a decrease in the rate of inflation (high prices).
- **Inflation rate INF:** It is an economic term that expresses the extent of the change in the prices of commodities towards increase significantly during a certain period of time, where it has an opposite term expressing the amount of change in the prices of goods and services towards decline, and is called the rate of deflation, and the rate of inflation, or deflation is calculated in relation to For a specific year it is considered a reference point, for comparison to be made.
- **Exchange rate TC:** It is the ratio on which foreign exchange is obtained by national cash, and it is an important means of influencing the allocation of resources between economic sectors and the profitability of export industries and the cost of imported resources.

In our study we relied on the period 1980-2018 which covers 39 views and it was obtained from the World Bank website (<https://www.worldbank.org>).

Also, I have used the Eviews 10 program to obtain the results.

III.1.2. Model tests

The standard study passes through several stages, starting from stability to the relationship study in the short and long term, where an idea was given on each stage. In these tests we go through the following stages:

- Study the stability of time series based on the Dickey-Fuller test (DF):** One of the most important tests for unit root detection in the time series is the Dickie-Fuller test given by D. Dickey et W. Fuller in 1979, and we explain this through the following equation (Dickey & Fuller ,1979, 427-428):

$$Y_t = pY_{t-1} + e_t \dots (1) \quad -1 \leq p \leq 1$$

Where e_t represents random error. The existence of the nihilistic hypothesis which states the unit root and consequently the timing of the time series is not tested by means of a test. (T) The nihilistic hypothesis (H0) that is tested and the alternative hypothesis (H1) can be formulated as follows:

$$\begin{cases} H_0: \rho = 1 \text{ ou } \delta = 0 \\ H_1: \rho < 1 \text{ ou } \delta < 0 \end{cases}$$

Where equation (1) is one of the three cases in which the time series still lives, and the following are the formulas of the three cases:

$$Y_t = \alpha + \delta Y_{t-1} + \beta_t + e_t \dots \dots \text{trend and Intercept}$$

$$Y_t = \alpha + +\delta Y_{t-1} + e_t \dots \dots \text{Intercept}$$

$$Y_t = \delta Y_{t-1} + e_t \dots \dots \text{None}$$

If the calculated value t_{cal} is smaller than the tabular value t_{tab} ($t_{cal} < t_{tab}$), we reject the numeric hypothesis H_0 at the chosen degree of significance α and say that the variable Y_t is stable, and vice versa.

B. A study of time series stability based on the Dickmanted Dickey Fuller test ADF: If the time series is self-related to a high degree of time lag, the Dickie Fuller test is not useful any longer, which prompted Dicky and Fuller in 1981 to improve the previous model while retaining the same previous assumptions (nihilism and alternative), which is called the Dicky-Fuller test The ADF extender, assuming that the time series is subject to the self-regression model the conditions tested are as follows (Dickey & Fuller, 1981,1057).

$$\Delta x_t = \rho x_{t-1} - \sum_{j=2}^p \phi_j \Delta x_{t-j+1} + \varepsilon_t \dots \dots \text{None}$$

$$\Delta x_t = \rho x_{t-1} - \sum_{j=2}^p \phi_j \Delta x_{t-j+1} + c + \varepsilon_t \dots \dots \text{Intercept}$$

$$\Delta x_t = \rho x_{t-1} - \sum_{j=2}^p \phi_j \Delta x_{t-j+1} + c + bt + \varepsilon_t \dots \dots \text{Trend and Intercept}$$

We will apply the extended Dickey -Fuller unit root test to every variable at the level, if the unit root is present, we re-apply the test at the first difference. The results are shown in the following table:

Table 1: Test-Dickie Fuller Expanded Unit Root

Variables		Level			1 st difference		
		None	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept
INF	t-statistic	-2.037574	-2.531881	-3.826237	-9.620097	-9.715319	-9.791119
	Prob*	0.0413	0.1162	0.0259	0.0000	0.0000	0.0000***
GDP	t-statistic	1.568841	1.078194	-0.856752	0.337036	-1.337225	-12.25265
	Prob*	0.9689	0.9965	0.9499	0.7771	0.6012	0.0000***
I	t-statistic	-0.626373	-0.318748	-3.259285	-5.006183	-5.041780	-5.069409
	Prob*	0.4393	0.9127	0.0886	0.0000	0.0002	0.0011**
TC	t-statistic	0.710524	-4.079975	-3.516644	-4.177317	-4.149140	-4.196200
	Prob*	0.8645	0.0029	0.0518	0.0001	0.0025	0.0108*

The Source: Prepared by the researcher, based on Eviews 10.

*** / ** / *: rejection of the null hypothesis (the existence of the root of the unit) at a significant 1%, 5%, 10% on the sequence.

These tests are done by comparing the tabular value and the calculated value. If the tabular value is greater than the calculated value, the series is unstable, and vice versa. From Table 1 we note that all the variables are unstable at the level, so we had to take the test at the first difference and therefore we notice that all the variables are stable in the sense that

they are integrated from the first degree (with varying moral degrees), then we have the possibility of a simultaneous integration.

C. A study of the stability of time series, based on the Phillips et Perron 1988 test: This test is used in the event that there is a correlation between random errors, or the heterogeneity of error variations in the Dickie-Fuller model where the test passes in five stages (Perron and Phillips, 1988, 335-346)

- Estimate the normal Dickie-Fuller test model using the generalized least squares method.
- Estimate the variance in the short term.

$$\widehat{\sigma^2} = \frac{1}{n} \sum_{t=1}^n e_t^2$$

- Estimate the variance in the long run, With the number of delays l defined according to the Newey-West method ($l \approx 4(n^{1/10})$ 29)

$$S_t^2 = \frac{1}{n} \sum_{t=1}^n e_t^2 + 2 \sum_{i=1}^l \left(1 - \frac{i}{l+1}\right) \frac{1}{n} \sum_{t=i+1}^n e_t e_{t-i}$$

- Philips-Byron statistical calculation.

$$\text{With } t_{\hat{\delta}}^* = \sqrt{k} \left(\frac{\hat{\delta}-1}{\hat{\sigma}_{\hat{\delta}}} \right) + \left(\frac{n(k-1)\hat{\sigma}_{\hat{\delta}}}{\sqrt{k}} \right)$$

- Compare the calculated statistic with the tabular.

Phillips-Perron maintains the same assumptions as Dickie Fuller

$$\begin{cases} H_0: \delta = 0 \\ H_1: \delta < 0 \end{cases}$$

The comparison is the same as we did on the Dickie-Fuller test and the Dickie-Fuller test expanded.

Table 2: Philips-Perron test for unit root

Variables		Level			1 st difference		
		None	Intercept	Trend and Intercept	None	Intercept	Trend and Intercept
INF	t-statistic	-1.949885	-2.283434	-3.729217	-10.21873	-14.25275	-27.85800
	Prob*	0.0500	0.1823	0.0323	0.0000	0.0000	0.0000***
GDP	t-statistic	12.62971	4.340695	-0.597147	-3.618070	-7.920366	-10.71608
	Prob*	1.0000	1.0000	0.9734	0.006	0.0000	0.0000***
I	t-statistic	-0.620316	-0.653032	-3.182878	-5.006183	-5.028828	-5.069409
	Prob*	0.4420	0.8464	0.1031	0.0000	0.0002	0.0011**
TC	t-statistic	0.528834	-3.897245	-3.454946	-4.053461	-3.963850	-3.957537
	Prob*	0.8256	0.0048	0.0591	0.0002	0.0041	0.0192*

The Source: Prepared by the researcher, based on Eviews 10.

*** / ** / *: rejection of the null hypothesis (the existence of the root of the unit) at a significant 1%, 5%, 10% on the sequence.

So, as we note that even through the Philips-Byron test we have the same reading in the sense that the variables are stable at the first difference i.e. integral of the first degree (with varying moral degrees).

III.1.3. Cointegration Testing

The first stage in this method is to test the simultaneous integration of different variables. We will then estimate the above equation using the usual least squares method (OLS) and then test the long-term coefficients to see if they are statistically interpreted simultaneously. This test is known as the Bounds Test. It can be mathematically formulated as follows:

$$\begin{cases} H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0 \\ H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0 \end{cases}$$

Where the null hypothesis (H_0) indicates the negation of a synchronous integral relationship between the variables. To perform the test, we use the WALD Test, where we compare the calculated statistic value (F-Stat) with the values of the Pesaran table and others (2001), so if it is greater than the value of the upper bound (I (1) - Upper Bound) then we By rejecting the null hypothesis, if it is less than the lower limit (I (0) - Lower Bound) we cannot reject the null hypothesis; if this value is between the two terms, we cannot approve the test results.

The absence of the degree of stability in the time series used in the model confirms the absence of the long-term relationship between the stable variables of the same degree, this test is based on the existence of a long-term relationship between the variables, and to achieve this the following two conditions must be met:

- All variables are stable at the same level.
- This level is greater than I (0).

So, we will test the joint integration of variables of the same degree. The results are as shown in the following table:

Table 3: Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.755553	89.32747	47.85613	0.0000
At most 1 *	0.481733	37.20347	29.79707	0.0058
At most 2	0.252679	12.88464	15.49471	0.1191
At most 3	0.055380	2.107996	3.841466	0.1465

The Source: Prepared by the researcher, based on Eviews 10.

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

From the above table λ_{trace} is greater than the critical value at the 5% level of significance and thus we accept the hypothesis H_1 , which means there is a relationship of joint integration, as the number of vectors of joint integration is

$r=2$ at the 5% level of significance between the variables, which indicates a long-term balance relationship between some of the variables, that is, they do not move away from each other in the long term, so that similar behaviour appears.

Since there is a cointegration relationship between variables, this allows us to perform error correction factor test, and the results are as shown in the following table:

Table 4: Bound test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-439.6476	NA	305436.2	23.98095	24.15511	24.04235
1	-276.2270	282.6734	106.4226	16.01227	16.88304	16.31926
2	-237.3122	58.89814*	31.87830*	14.77363*	16.34101*	15.32621*

The Source: Prepared by the researcher, based on Eviews 10.

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion.

Table 5: Vector Error Correction Estimates

Cointegration Eq:	CointEq1	CointEq2
INF(-1)	1.000000	0.000000
GDP(-1)	0.000000	1.000000
I(-1)	1.182474 (0.23839) [4.96016]	-836.0448 (217.365) [-3.84626]
TC(-1)	1.108777 (0.36620) [3.02781]	1631,901 (333.895) [-4.88747]
C	-20.19962	-10243.84

The Source: Prepared by the researcher, based on Eviews 10.

Through the table 5, we note that the error correction factor was negative and significant, which confirms the reliability of the relationship results in the long term. On the other hand, this parameter gives us an idea of how quickly the model can be modified in the long run.

As shown in Table 5, the inflation rate factor is significant at 5% and it has a positive impact on the interest rate.

We note, according to the joint integration test, that there is a degree of stability in the time series between some of the variables used in the model, which confirms the existence of a long-term relationship between stable variables of the same degree. This means that there is a relationship between these variables in the long term, as there is a short-term relationship between the variables, due to the incompatibility of results at the same level, where all the variables were at the same level except for the growth of the GDP. This confirms the existence of relative integration in the Moroccan monetary policy, and it must be rectified to give more effectiveness and strength to monetary policy in addressing the imbalances in the economy.

IV- Conclusion:

Among the most important economic problems that have arisen around the debate, opinions and theories that societies have suffered from different economic and political systems, and the different degree of economic and social development, the problem of inflation, which has multiple definitions. True and accurate whenever the task of eliminating it is easy, and inflation has several

types that can be divided according to the sector in which it occurred and according to the degree of employment, according to the degree of state supervision of prices, according to the source and according to severity, and all of these types have reasons to occur that may be caused by demand or On costs, through economic and social structures, or through the monetary factor or profit result.

As a result of the foregoing, the theories explaining this phenomenon have multiplied, including the traditional monetary theory that refers the cause of inflation to changes between the amount of money offered and the size of the available product of goods and services, and the Keynesian theory that interpreted inflation as the result of an imbalance between employment and national income with effective total demand, and the theory of resulting inflation On raising the expense that explains inflation that is due to higher production costs in general, and wages in particular, in addition to the contemporary theory that is based on the evolution of the change in the amount of money between national product or real national income, and on the other hand on the change that occurs On the speed of money circulation, and to address the problem of inflation, countries used several policies, the first of which is monetary policy, by raising the discount rate, the compulsory reserve ratio in addition to using open market operations and the fiscal policy of tax control, public debt oversight and public spending, price control policy, and policy of controlling Wages.

Targeting inflation is a framework for monetary policy through which the central bank can achieve low inflation rates in the short term and reach to maintain price stability in the long term. Targeting is the explicit declaration of a rate or area in which actual inflation rates can change.

Then we examined the standard study of the Kingdom of Morocco in order to know the effect of the study variables on inflation, which is represented in gross domestic product GDP, inflation rate, interest rate and exchange rate during the period from 1980-2018 using the Eviews 10, and using the joint integration model, as we tested Stability, using both the Dickey-Fuller and Philips-Perron test, where we found that all the variables are stable at the first difference and therefore we tested the cointegration to the stability condition at the same level, so we found all the variables stable at the first difference during the study period, which means that it exhibits similar behaviour in the long term, and in return, we find that the application of this policy even after Morocco relied on the flexible exchange system did not succeed, meaning that the Kingdom of Morocco has not yet been able to implement this policy due to the lack of conditions for its application represented by the independence of the Moroccan Central Bank, the strength of the financial structure and the development The banking system, and in the end we can only say that Morocco is not yet eligible to implement this policy..

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