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The effect of the fiscal and monetary policies interaction on the economic growth in Morocco – An ARDL approach.

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Abstract

This research paper aims to empirically investigate the effect of the interaction between fiscal and monetary policies on the real GDP growth in Morocco. We use Auto-Regressive Distributive Lag Bounds Model (ARDL Bounds test) for co-integration and the Error Correction Model (ECM) in the ARDL, for the period from Q1-2000 to Q2-2023 to analyze the short-run and long-run effects. The main results conclude that there is a co-integration between fiscal and monetary policies and they both affect GDP growth in Morocco which reflects their key role in promoting growth. At the long-run. Fiscal policy is more effective than monetary policy. In the short term, the impact of monetary policy through interest rate instrument is greater than fiscal policy variables. Thus, strengthening coordination between monetary authorities and Government and increasing fiscal space would reinforce their respective capacity to converge towards an optimal policy mix oriented to support economic activity and improve the resilience of the Moroccan economy.

Keywords

Fiscal policy - Monetary policy – GDP growth - ARDL

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Introduction

Achieving robust and inclusive output growth is one of the fundamental goals of the macroeconomic-policies. Hence, monetary and fiscal policies are the two main instruments used to accomplish this objective. Through their respective tools, they both affect aggregate demand - investment and consumption - of households and firms and ultimately impact economic growth. In this regard, the appropriate implementation of the two policies is among the prerequisite for achieving macroeconomic stability and strengthening economic performance (Ajayi & Aluko 2017).

Their relative effectiveness has been a renewed controversial debate among academics and policy makers at both the theoretical and empirical fronts. The multiple shocks that hit the economy have challenged the intervention of these policies and highlighted the importance to better understand the impact of their relative interaction on GDP growth. Moreover, it triggered the need for closer coordination in order to facilitate to policymakers making better policy mix formulation.

This coordination is essential as monetary authority has been accorded independence since 2006 and set price stability its primary goal according to central bank law, before being reinforced in 2019. As fiscal policy is concerned, the constitution of 2011 has established the equilibrium of public finances as a constitutional principle. Indeed, according to the article n°77: “The Parliament and the government see to the preservation of the balance of the finances of the State”. Furthermore, in order to better anchor the medium-term budgetary trajectory, the reflection is underway concerning the adoption of a new rule, in addition to the existing “golden rule”.

Recently, the light was shed on the two policies. First, to cope with the effect of the COVID-19 pandemic crisis and second with the comeback of inflation. Interestingly, to mitigate the negative effect of the pandemic, monetary policy has been eased through a reduction of the key rate to a low level of 1.5% to sustain the financing of the economy and reinforce their liquidity injection in favor of banks to boost their credit activity. Concerning fiscal policy, stimulus packages were introduced and allocations have been granted to low income households to relieve the adverse consequences of the crisis and to support the economic recovery. Moreover, ambitious agenda of reforms and sectoral strategies were launched to strengthen the resilience of the economy in facing shocks. As a result of a successful implementation of the macroeconomic policies, the Moroccan gross domestic product recorded a rebound of 8% in 2021 against a contraction of 7.2% in 2020. In the wake of the recent return of inflation, after a more than decade of stable inflation (1.1% in average over the period of 2012-2021), triggered

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by exogenous factors and the decrease of domestic production of food due to severe droughts and hydric stress, the stance of the monetary policy has been tightened, the first time since 2008, through three increase of the key rate by 150 basis points to 3%. On the other hand, the government has adopted countercyclical fiscal measures to preserve households purchasing power and support firms' activities as well as certain sectors such as transport that have been hardly affected by oil prices increase.

In light of this context, this research paper aims to analyze the effect of monetary and fiscal policies interaction on output growth in Morocco to determine their relative role in stimulating economic activity.

The choice of this subject is motivated by the following reasons. First, Morocco is facing several economic and social challenges. Thus, decisions makers need to deeply understand the fiscal and monetary policies interaction impact on economic growth to strengthen the resilience of the Moroccan economy. Second, the importance to determine their relative effectiveness at both the short and long-run in dealing with shocks, to assess the available room of maneuvers and the appropriate timing of policy responses, taking into account the nature of these shocks and their drivers. Third, the necessity to make the right trade-offs in case of the need to mitigate reciprocal negative impact especially during crisis.

For this research, we used Auto Regressive Distributed Lag (ARDL) bounds testing approach to cointegration. This approach is widely mobilized in similar research. Considering Kuma (2018), ARDL model has the advantage to take into account the temporal dynamics in explaining a variable and thus allows to improve the quality of projections and consequently the decisions making. Inversely, the non-dynamic models rely only on instantaneous explanation and the immediate effect. In addition, an hypothetico-deductive approach was mobilized.

The remainder of this research paper is structured as follows. The theoretical and empirical literature review is drawn in the first section. Section 2 introduces the model specification, data sources, estimation method and discusses the empirical findings. Finally, conclusion is presented.

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1. Literature review

1.1. Theoretical framework

1.1.1 Policy mix

The policy mix is widely defined as an economic strategy which consists of optimally combining monetary and fiscal policy measures to achieve stability in economic activity. This combination can be achieved without prior consultation between the fiscal and monetary authorities, but coordination remains important to achieve the objectives set. The policy mix is part of the IS-LM balance analysis framework, and this approach is valid in open economies. Based on a study of the impact of capital mobility on the policy mix, Mundell, R.A, (1968) proposed to allocate monetary policy to external balance and fiscal policy to internal balance, which goes against traditional economic policies. It also recommends assigning an instrument to each objective according to Tinbergen's rule, with the fiscal instrument prioritized for stabilizing economic activity, while the monetary instrument focused on stabilizing the exchange rate. This principle has given rise to two major criticisms: the first was formulated by Mundell when he broadened his perspective to the flexible exchange rate regime by assigning monetary instrument to price stability. The second criticism concerns the mode of formation of agents' expectations where Kydland & Prescott showed the impact of an interaction between the authorities and economic agents on the effectiveness of the policy mix.

Furthermore, various authors would prefer to eliminate the reasoning in terms of policy mix because the latter would bring discretionary economic policies and thus inflation, but the policy mix has survived because the authorities still have doubts about the capacity of the economy to self-stabilize.

Following the model of temporal inconsistency of optimal policies (Kydland and Prescott, 1977), the issue of the policy mix shifts from the problem of allocation to that of coordination between economic policy authorities, and becomes a strategic game analyzed through the tools of game theory.

The increasing internationalization of economies has an impact on the policy mix, leading to a reflection on the institutional mechanisms that are necessary for cooperation. A balanced policy mix assumes that monetary policy controls prices and responds to symmetrical shocks, while fiscal policy generates surpluses during periods of growth to facilitate the task of the central bank. This makes it possible to guarantee a certain level of national savings and respond to asymmetric demand shocks without widening deficits. However, a balanced policy mix is not sufficient to ensure regular, non-inflationary growth.

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1.1.2 Coordination between the Fiscal and monetary policies

The interdependence between fiscal and monetary policies was first highlighted by the seminal works conducted by Sargent & Wallace (1981). Their main conclusion was that the effectiveness of monetary policy depends on the coordination scheme between monetary and fiscal authorities.

The works of Barro & Gordon (1983) highlighted the advantages of the independence of central banks in terms of credibility of anti-inflationary policy, thus leading to the loss of an economic policy instrument. Indeed, the status of the central bank can affect the conduct of fiscal policy in two main ways: the prohibition of the use of "printing money" to finance the public deficit and the specialization of the monetary instrument in fighting against inflation. Furthermore, this independence finds its legitimacy in monetary policy both in its effectiveness in mitigating exogenous shocks, and in its credibility in the face of political pressures in maintaining price stability.

It is commonly known from the economic literature that the independence of central banks takes two main forms. The first form is materialized by the independence of “instruments” to be mobilized to achieve these objectives according to the expectations of economic activity and inflation. As for the second form, it concerns independence in terms of “choice of objectives” in accordance with strategic inflation targeting frameworks.

If the independence of the objectives and instruments granted to the central bank represents undeniable advantages for preserving the sustainability of macroeconomic equilibrium according to Rogoff (1985), the theoretical work of Persson & Tabellini (1993), Walsh (1995) and Svensson (1997) identified several limitations. Among these limitations, the possible disconnection between fiscal and monetary policy caused by the relative autonomy of central banks in terms of the choice of objectives.

Consequently, Alesina and Tabellini (1987) brought to the economic policy coordination framework a new parameter which resides in “fiscal policy” and highlighted “the substitutability Versus the complementarity of fiscal and monetary policies”. In this framework, the central bank would analyze tax policy in order to limit the distorting effects of changes in tax rates on the maintenance of the government’s inter-temporal constraint as well as inflation and growth.

This framework of coordination between the Central Bank and the government inspired by the game theory necessarily implies a loser and a winner, and neglects to take into consideration the institutional capacity to respect these commitments. The inability to achieve the objectives dethrones the central bank from its role as a game maker regarding the public.

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Such a situation rather refers to a Stackelberg-style sequential equilibrium, which the work of Debelle (1996) illustrated by the capacity of an independent Central Bank to impose on the government a rigorous policy of price stability, or fiscal discipline. Thus, forcing it to practice a prudent fiscal policy to avoid the drawbacks of the deterioration of the inter-temporal constraint. Nevertheless, the orientation towards a sequential equilibrium reinforces the constraints which oppose the achievement of an optimal mix between monetary and fiscal policy.

1.1.3 Fiscal theory of the level of prices

This theory was fundamentally developed by Leeper (1991), Sims (1994), Woodford (2001), and Cochrane (2005). This work focused on the interactions between the reaction function of the central bank and that of the government. Overall, three types of situations can exist: A situation of agreement between the fiscal and monetary authorities giving rise to consensual policies. An unbalanced situation where one institution is dominant and the other dominated. Finally, a situation of mutual interaction where the repercussions of the policy followed by the two authorities on the trajectory of macroeconomic balances can be stable or explosive.

Overall, price level adjustments guarantee the sustainability of public debt. The State adopts fiscal dominance where it is the variation in the price level which ensures compliance with its intertemporal budget constraint.

Two forms of this fiscal dominance can be distinguished: a first called “weak” where inflation remains of monetary origin and the central bank would be incapable of controlling the supply of money and therefore inflation. A second term described as “strong” when fiscal policy affects the trajectory of inflation independently of changes in monetary policy and thus pushes prices upward.

In this non-Ricardian regime, the government sets the level of spending and taxes without taking into account its budgetary constraint of intertemporal solvency. The solvency of the State depends on its initial debt and its future primary surpluses. Blanchard (1990) used a method that makes it possible to determine the required primary balance based on the level of debt, the growth rate of real GDP and the real interest rate. This constraint is satisfied by price level adjustments implicitly regulated by the central bank and is done through regulation by interest rates.

For Woodford (1996) and Beetsma and Bovenberg (1999), the only way to limit price volatility is to define fiscal rules and debt ceilings guaranteeing the balance of public finances and the sustainability of public debt.

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1.1.4 Relative effectiveness of fiscal and monetary policies

The Keynesian school supports the idea that fiscal policy is more effective and stronger than monetary policy in stimulating economic activity through increasing aggregate demand. Inversely, the monetarists claim that monetary policy has more potent effect on supporting the economic activity and for this reason they call for increases of money supply by central banks. In the presence of a disequilibrium situation, Mundell (1962) points out that "monetary policy ought to be aimed at external objectives and fiscal policy at internal objectives".

The early seminal paper by Andersen & Jordon (1968) developed empirical discussion on which policy is more effective in boosting output. According to the literature review, there is no conclusive evidence about the relative effectiveness of monetary and fiscal policies on economic activity (Özer & Karagöl, 2018).

1.2. Empirical review

The empirical studies on the interaction between the two policies have mobilized various approaches depending on the complexity of the research questions (OLS, SVAR, GMM, ARDL, DSGE…) to mainly investigate the following issues: (i) the predominance of a monetary or fiscal dominance regime, (ii) the nature of the interaction of the two policies (complementary or substitute) and (iii) the relative effectiveness of fiscal and monetary policies in coping with shocks and in stimulating growth.

Özer & Karagöl (2018) investigated which of the two policies is more potent in stimulating economic growth in Turkey. They found that fiscal policy variables have a long-run significant effect on growth while monetary policy is generating only short-run effects on growth. They conclude that the fiscal policy is more effective than monetary policy over the period 1998 and 2016 using ARDL Bounds testing and structural Granger causality tests.

Praise & Jacob (2018) applied the GMM model to analyze the effect of the two policies on economic growth in a panel data of 47 countries in sub-Sahara-Africa over the period 1996-2016. They found that both fiscal and monetary policies positively affect the promotion of growth while fiscal policy has a greater effect on growth.

Tadesse & Melaku. (2019) examined the relative effectiveness of monetary and fiscal policies in impacting GDP in Ethiopia. They found that both the monetary and fiscal policies have a positive impact on GDP growth. Moreover, in the long-run, fiscal policy is more effective than monetary policy in influencing Real GDP as the elasticity of real output with respect to fiscal policy variable is greater than the money supply. Nevertheless, in the short run, only the fiscal policy that affect output growth.

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Afonso & Balhote (2019) attempted to analyze both the effects of fiscal and monetary policies and their interactions, in the euro area using a SVAR model. Their main findings are that both policies act as complements in more recent years and as strategic substitutes before the Great Recession. Through other approaches such as OLS, OLS-Fixed Effects, and 2SLS, they find evidence that monetary and fiscal policies act as complements only in some European countries. Büyükbasaran, T et al. (2020), using a Bayesian Structural Vector Autoregression (SVAR) model, investigated how both policies variables respond to shocks in Turkey. The results highlighted the importance of the nature of shocks in influencing the interaction between monetary and fiscal policies. In addition, these policies are complementary when it comes to coping with demand and supply shocks.

Okeowo. A, (2022) examined the dynamics of monetary and fiscal policy in Nigeria using ARDL approach. His findings revealed that monetary and fiscal policies are co-integrated explaining about 99 percent variation in economic growth. However, their transmission from short run to long run economic growth was weak (around 2 percent).

More recently, El Husseiny. I, (2023) employed an ARDL for the period 1960-2019 to analyze the effect of the interaction of the policies on growth in Egypt. Its empirical results revealed that both monetary and fiscal policies positively affect economic activity in the long run. However, monetary policy is more effective than fiscal policy in promoting growth as it showed a greater impact on the real economic activity.

Table 1. Empirical evidence from a selected research paper

Article	Country	Method / Period of the study/ Variables	Results
Al Meida, A. (2021)	Euro zone	ARDL 2000Q1- 2020Q4 GDP / M3 / Eonia rate / Assets of ECB / Debt as part of GDP / Cyclically adjusted primary balance as part of potential GDP	- Monetary policy positively affects Euro Area's GDP in both the long and short run. - The impact of fiscal policy is negative.
El Husseiny. I, (2023)	Egypt	ARDL 1960-2019 Government expenditure / Broad money supply / export receipts	- Both monetary and fiscal policies positively affect economic activity in the long run. - Monetary policy is more effective than fiscal policy in promoting growth as it showed a greater impact on the real economic activity.

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Jawaid, S et al. (2010)	Pakistan	ARDL From 1981 to 2009 (GDP/ Money supply / Fiscal balance)	- Both monetary and fiscal policy have significant and positive effect on economic growth. - Monetary policy is more effective in impacting GDP growth.
Lahlou, K. (2015)	Morocco	SVAR et DSGE 1990Q1-013Q4 GDP /Money supply/ inflation/ Interbank rate / Government revenues and expenditures	- The study investigated the nature of the fiscal-monetary policy interactions. - There is neither monetary dominance nor fiscal dominance. Instead, both policies act in the framework of a strategic equilibrium oriented towards growth and macroeconomic stability.
Okeowo. A, (2022)	Nigeria	ARDL 1981-2018 GDP / Government expenditure / M2	- Monetary and fiscal policies are co integrated explaining about 99 percent variation in economic growth. However, their transmission from short run to long run economic growth was weak (around 2 percent only).
Özer, M., & Karagöl, V. (2018).	Turkey	ARDL 1998Q1-2016Q3 GDP / Government expenditures / overnight interest rate	- Fiscal policy variables have long and short -run significant effect on growth while monetary policy is producing only short-run effects on growth. - Fiscal policy is more effective than monetary policy. - Granger causality tests indicate bidirectional causality from fiscal policy variable to growth.
Tadesse, T., & Melaku, T. (2019).	Ethiopia	ARDL 1990Q1-2019Q4 GDP / Government expenditures / CPI / M2 / Trade openness / Real interest rate	- Both the monetary and fiscal policies have a positive impact on GDP growth. - In the long-run, fiscal policy is more effective than monetary policy in influencing Real GDP (the coefficient of real output with respect to fiscal policy variable is greater than the money supply). - In the short run, only the fiscal policy affects output growth.

Source: Table compiled by the authors on the basis of the empirical literature.

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2. Model : Results and interpretation

To the best of our knowledge, most of the empirical studies on our subject related to Moroccan economy focus on studying separately the effects of the monetary policy or the fiscal policy on growth and determining fiscal-monetary policy interaction prevailing nature. Thus, this research paper aims to analyze the effect of the interaction between the two policies on economic growth using an ARDL approach. It attempts to contribute to the discussion about this subject in terms of the research question, the method used and the period chosen.

The choice of this approach is based on the following main reasons. First, it allows analyzing several variables that are integrated of order zero and one or a mix of them. Second, it permits to estimate both the short and long run simultaneously through an error correction model (ECM) derived from the ARDL model (Özer & Karagöl, 2018).

The remainder of this section is organized as follows. First, it provides a description of the data that has been used in our research paper and the model and the hypothesis. Second, it presents the results of the preliminary variables' tests, namely the unit roots tests. Third, it discusses the results.

2.1. Data and model

In order to analyze the effects of the monetary and fiscal policy interactions on GDP, an ARDL model has been used following a version of the 'St. Louis equation', developed by Anderson & Jordan (1968) and revised and expanded later Pesaran et al. (2001). It is specified as follows:

$$GDP = f(MP, FP) \qquad (1)$$

The period of study is from Q1-2000 to Q2-2023 (94 observations) which covers several economic and financial shocks, namely financial crisis, covid-19, drought, high inflation, oil international prices substantial increase due to Ukraine war and the supply chain disturbances. All the data are quarterly and Eviews 12 has been used to empirically implement and interpret the econometric evidence. Our dependent variable is the real Gross Domestic Product (RGDP) measured in millions of dirhams. As the explanatory variables are concerned, the monetary policy stance is proxied by two variables: the rate of the interbank market (Ibankr), as a proxy of the key interest rate, extracted from Bank Al-Maghrib's website and inflation rate (INF) from HCP, both are in percentage. The fiscal policy instruments are proxied by two variables: Government expenditures (GEX) and Government revenues (GR), in millions of dirhams which were extracted from the Ministry of Economy and Finance's website.

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Table 2. Description of the variables

Variables	Description	Unit	Source	Expected sign
RGDP	Real Gross domestic product	In Millions of dirhams	HCP	
GR	Government revenues	In Million dirhams	MEF	+ /-
GEX	Government expenditures	In Million dirhams	MEF	+
IbankR	Weighted Average interbank rate	(In %)	BAM	-
INF	Inflation rate	(In %)	HCP	-

Source : Authors' compilation.

The hypotheses to be tested are as follows:

H1: There is a long run relationship between fiscal and monetary variables in affecting economic growth in Morocco.

H2: The impact of fiscal policy on growth is may be greater than monetary policy.

H3: The relative effect on growth of the two policies is different from the short run to the long run.

To verify these hypotheses, we express GDP as a function of all the variables as follows:

$$\mathbf{GDP_t = a_0 + a_1 GR_t + a_2 GEX_t + a_3 INF_t + a_4 IBANKR_t + \varepsilon_t} \qquad (2)$$

a_0 is the constant, a_1 to a_4 are the coefficients of the model, ε_t is the error term.

We take logs of some of the variables, except inflation rate and interbank market rate and the logarithmic form of Eq. 1 is presented as follows.

$$\mathbf{LGDP_t = a_0 + a_1 LGR_t + a_2 LGEX_t + a_3 LINF_t + a_4 LBANKR_t + \varepsilon_t} \qquad (3)$$

The variables that refer to fiscal policy are expected to have a positive impact on GDP, while interest rates affect GDP in a negative way in case of contractionary monetary policy. Inflation is expected to reduce growth assuming that the increase of prices could cut consumption and diminish investment.

The ARDL approach of Eq.2 of the model is presented as follows:

$$\Delta\mathbf{LGDP_t = a_0 + \sum_{i=0}^{p} a_{1i}\Delta LGDP_{t-1} + \sum_{i=0}^{p} a_{2i}\Delta LGR_{t-1} + \sum_{i=0}^{p} a_{3i}\Delta LGEX_{t-1} + \sum_{i=0}^{p} a_{4i}\Delta LINF_{t-1}}$$

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$$+\sum_{i=0}^{p} a_{5i}\Delta LBANKR_{t-1} + \phi_1 LGDP_{t-1} + \phi_2 LGR_{t-1} + \phi_3 LGEX_{t-1} + \phi_4 LINF_{t-1}$$

$$+\phi_5 LBANKR_{t-1} + \varepsilon_t$$

(4)

Where a_0 : $the\ drift$ / : white nose.

The Error correction model (ECM) is estimated when there is a long relationship between all the variables. It is presented as follows:

$$\Delta LGDP_t = a_0 + \sum_{i=0}^{p} a_1 \Delta LGDP_{t-1} + \sum_{i=0}^{p} a_{2i}\Delta LGR_{t-1} + \sum_{i=0}^{p} a_{3i}\Delta LGEX_{t-1} + \sum_{i=0}^{p} a_{4i}\Delta LINF_{t-1}$$

$$+\sum_{i=0}^{p} a_{5i}\Delta LBANKR_{t-1} + \omega ECT_{t-1} + \varepsilon_t$$

(5)

Where Δ the first difference operator / ECT_{t-1}: the long run relation

2.2. Unit root tests

Before estimating the ARDL model, we first test the stationarity of our variables at their levels, using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. A variable is stationary or I (0) when the null hypothesis is rejected, indicating the absence of a unit root in the variable. In the opposite case, the variable is considered non-stationary, which means that is integrated of an order different from zero, if we fail to reject the null hypothesis. Interestingly, the order of integration of the non-stationary variables is determined through the implementation of the test at the first-difference form of the concerned variables. It is worth mentioning that the perquisite of the ARDL model is that all the variables should be I (0) or I (1) as stated in the econometric literature.

The table 1 below shows that LGR is I (0) while LGDP, LGEX, INF and IbankR are I (1) considering the ADF test.

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Table 3. Unit root test

	ADF		PP	
	Intercept	**Intercept and trend**	**Intercept**	**Intercept and trend**
LGDP	-1,7778	-2,0657	-4.2721 ***	-1.6275***
LGR	-2.7585 *	-4.949 ***	-2,5634	-4.8558 ***
LGEX	-0,9870	-1,2771	-4.1094 *	-11.5296 ***
INF	-0,6994	-0,5795	-2.6988 *	-2,8180
IbankR	-2.8655 *	-2,2070	-2.869 *	-2,4476
Δ LGDP	-12.2785 ***	-11.4306 ***	-12.2785 ***	-23.0647 ***
Δ LGR	-8.4681 ***	-8.4254 ***	-25.9244 ***	-26.6108 ***
Δ LGEX	-17.6067 ***	-17.5553 ***	-60.4695 ***	-61.1432 ***
Δ INF	-8.1142 ***	-8.2568 ***	-10.6485 ***	-10.6738 ***
Δ IbankR	-8.0523 ***	-8.3019 ***	-8.1197 ***	-8.2836 ***

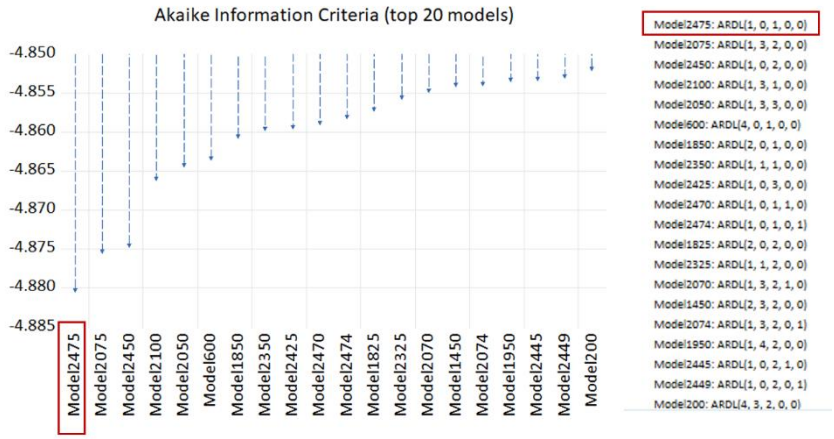
Δ denotes the first difference. *** *p* value < 1%; ** *p* value < 5%; * *p* value < 10%

Source: Table prepared by the Authors' considering the results from Eviews 12

2.3. Discussion

Our ARDL model is (1.0.1.0.0) selected from the Schwarz information criterion as the most optimized among the other 19 models (Figure 1).

Figure 1. Graphical values SIC



Source: Authors' estimation using Eviews 12

The empirical results in the table 4 below show that the two policies have an impact on economic growth and statistically significant except for inflation.

In addition, a 1% increase in Government expenditure will enhance the GDP by 0.017% in the short-run and by 0.019% in the long-run, while the 1% increase in Government revenues improves GDP by 0,017% in both the short-run and the long-run. These results highlight the crucial role of the fiscal policy in stimulating growth and confirm the Keynesian theory. In addition, the positive sign of the impact of government revenues on growth reflects the efforts

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deployed in terms of improving taxes recovery and enlarging tax basis as well as the space provided to canalize resources towards investment to foster growth.

Concerning monetary policy, 1% increase in inflation shrinks GDP only by -0,0012% in the short-run and by -0,0013% in the long run but this impact is very weak and statistically insignificant. Moreover, the increase of the interest rate induces a decrease of GDP by -0.02% in the short-run and by -0.008% in the long-run, indicating the impact of financial conditions tightening on GDP growth. This result is in line with the IMF paper's findings[1] about the impact of the contractionary monetary policy shock on GDP (-0.01) after 10 quarters.

On the other hand, as the elasticity of real GDP growth with respect to fiscal policy variables are greater than the elasticity related to the weighted average rate in the interbank market and inflation, it indicates that the effect of fiscal policy on GDP is greater than the impact of the monetary policy. It could be concluded that fiscal policy is stronger than monetary policy in impacting Real GDP in the long-run.

Table 4. Long-run analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LRGDP (-1)	0.829059	0.039905	20.77575	0.0000
LGR	0.017898	0.008154	2.194987	0.0309
LGEX	0.019393	0.013794	1.405952	0.0333
LGEX (-1)	0.055986	0.013426	4.170058	0.0001
INF	-0.001210	0.001218	-0.993430	0.3233
IBANKR	-0.007760	0.003797	-2.043796	0.0440
C	1.123181	0.262543	4.278078	0.0000

R-squared	0.993612	Mean dependent var	12.29157
Adjusted R-squared	0.993166	S.D. dependent var	0.249462

Table 5. Short run-analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGEX	0.017499	0.013569	1.289618	0.0206
LGR	0.017342	0.008114	2.137231	0.0354
IBANKR	-0.021454	0.010638	-2.016794	0.0468
INF	-0.001250	0.001221	-1.023662	0.3089
CointEq ECM(-1)	-0.173172	0.038111	-4.281539	0.0000

Source: Authors' results from Eviews 12.

[1] Morocco's Monetary Policy Transmission in the Wake of the COVID-19 Pandemic. 2021. WP/21/249.

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In addition, the ECM model coefficient derived from the ARDL model (Table.5) is negative (-0,17) and statistically significant. It suggests that the speed of adjustment of the variables to long-run equilibrium following a short-run shock is 17% per quarter.

On the other hand, the ARDL bound approach is used to test for co integration between variables of fiscal and monetary policy. Following Pesaran et al. (2001), the nul hypothesis of the bound is that there is no co-integration between the variables. It is rejected when the F-statistic is below the upper bound (the fifth column of the table).

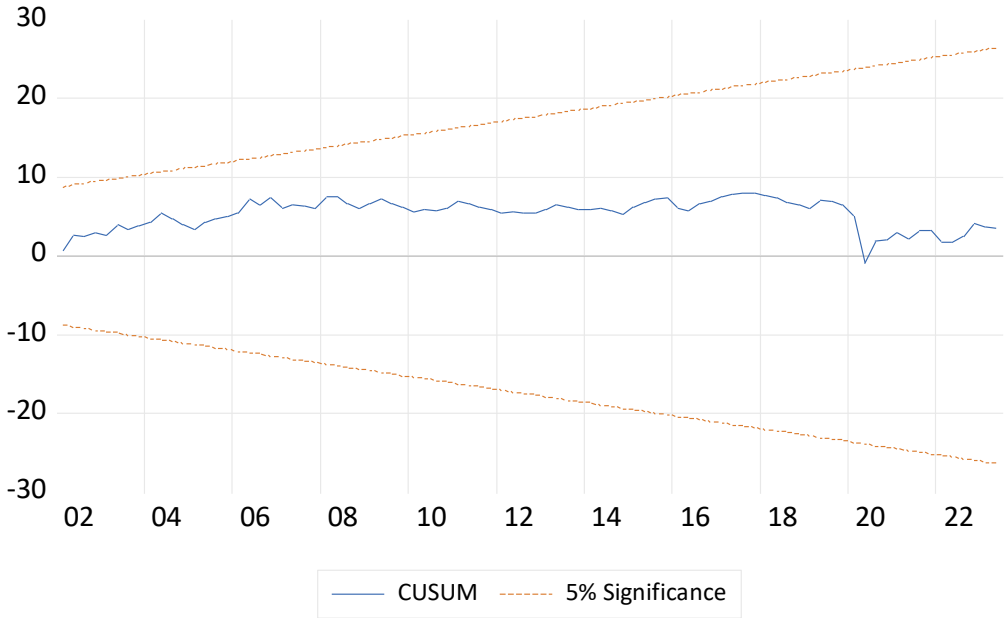
Table 6. Bounds test for cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	6.420325	10%	2.2	3.09
		5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Authors' results from Eviews 12.

Clearly, as shown in the table below, the value of 6.4 is greater than 4.37 which means that there is a co-integration between the fiscal and monetary policies. We can conclude that they have a long-run relationship.

Figure 2. The model's cumulative sum of recursive residuals



Source: Authors' results from Eviews 12.

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Conclusion

This paper has investigated the short and long-run equilibrium relationship between GDP and the interactions of monetary and fiscal policy" from Q1-2000 to Q2-2023. It discusses the relative effectiveness of monetary and fiscal policies in affecting economic growth in Morocco. The study examined through ARDL Bounds testing approach their co-integration assuming that this method is appropriate and widely used by academicians in analyzing this subject.

The relative effectiveness of the two policies has kept great attention over the financial crisis in 2008 and more recently in the wake of multiple crises and shocks that hit the world economy. The theoretical and empirical debates are still not conclusive about which of the policies is more potent and strong in affecting the growth economy. It has been pointed out that their effectiveness depends on the nature of the shocks and the initial economic conditions. The improvement of the coordination of both policies is necessary to converge towards an optimal policy mix oriented to fostering inclusive economic growth.

In this regard, the empirical results indicate that there is a co-integration between fiscal and monetary policies and they both affect GDP growth in Morocco which reflects their key role in promoting growth. In the long-run, Fiscal policy is more effective than monetary policy while in the short-run, the impact of monetary policy through interest rate instrument is greater than fiscal policy variables.

The policy implications obtained from the analysis clearly suggest that monetary and fiscal policy play a crucial role in influencing the level of economic activity in Morocco. Consequently, strengthening coordination and increasing fiscal space would reinforce their response capacity to cope with shocks and enhance the resilience of the Moroccan economy.

From a technical point of view, our result suggests the extension of this research to analyze more precisely the effect of the two policies during the recent shocks by cutting data into two periods prior and post covid-19 and also by mobilizing advanced techniques to take into account the breakpoint experienced in 2020.

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