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INFLATION, EXTERNAL DEBT, AND FISCAL MOBILIZATION IN MOROCCO: THE TRANSMISSION CHANNELS OF DEVALUATION AND THE INFLATIONARY PAST

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ABSTRACT

This work seeks to empirically assess the effects of inflation and external debt on Morocco's tax revenue mobilization. The study also discusses the moderating effect of devaluation and the inflationary past in the relationship between debt and tax mobilization. The study covers the period from1985- to 2019. The results of the modeling, using the generalized method of moments (GMM), show that inflation has a negative impact on the tax structure. This impact is due to low inflation, which hampers economic activity and leads to a loss of revenue for the government. Similarly, external debt has been shown to negatively impact domestic tax revenues and has a positive impact on trade taxes. Also, the estimation results assert that external indebtedness in interaction with inflation reduces the amount of tax revenue. The low level of inflation does not allow for debt repayment and the generation of tax revenues from it. Finally, the study reveals that external debt, in interaction with devaluation periods, positively impacts tax revenues. The study concludes that good inflation and productive debt allow for a revival of economic activity, and consequently, increased mobilization of tax revenues. The fight against devaluation periods is also an important transmission channel in the relationship between external debt and tax collection.

Contribution/Originality: This study is one of the very few studies that have examined the effects of inflation and external debt on tax revenue mobilization in Morocco. Compared to previous studies that addressed the determinants of tax revenues, our study also addresses the interaction effects of devaluation and inflationary past.

1. INTRODUCTION

Every government has fundamental economic and social objectives to achieve. In this study, we look at improving citizens' well-being as a government priority. Achieving this objective requires the sustainability of public spending to maintain a sufficient level of investment, stimulate infrastructure, promote the education and health sectors, reduce the budget deficit, and sustain economic growth. Taxation is the main source of revenue available to developing countries that will help to achieve these expectations (Aizenman & Jinjarak, 2008).

Tax revenue mobilization depends mainly on an economy's ability to raise more taxes without creating wealth in the sense of Laffer (1981), who stated that "too much tax kills tax". On the other hand, Musgrave (1959) argues that taxation does not only seek to mobilize revenue but to fulfill the three functions of allocation, distribution, and stabilization.

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Several researchers have debated the determinants of tax mobilization in their work. The latter opens the research axis to various factors. Initially, the main factor identified as a cause of variation in the tax burden was the level of development. This is generally represented by GDP per capita (Bahl, 1971; Lotz & Morss, 1970) and productive specialization, which can be explored through the sectoral composition of GDP (Stotsky & WoldeMariam, 1997). Tanzi (1992) argues that the large fluctuations in tax coefficients observed in several countries cannot be satisfactorily explained by variations in the traditional determinant of tax revenues. Rather, they can be better explained by the changes in the macroeconomic policy environment (monetary and fiscal policy) that have played important roles.

Morocco is an economy classified by the World Bank as "lower-middle-class income" where public debt continues to grow. Indeed, the outstanding debt of the Treasury alone was estimated at MAD 723.8 billion in 2019, representing 88.7%[1] of GDP against MAD 533.9 billion in 2016. Morocco's public external debt, follows the same logic. Its outstanding debt rose from 44.63 billion dollars in 2016 to 62.45 billion dollars in 2019. Moreover, the low growth rates recorded by the Moroccan economy during the study period are volatile and are linked to the weakness of the Moroccan economic fabric and the very low level of inflation. The latter does not allow the revival of economic activity since it recorded an average growth of 0.42%[2] from 2009 to 2019. In this regard, the financing of the Moroccan economy and, particularly, the revival of certain economic sectors has become a necessity to meet the needs of a consistently growing population.

Since 1980, the government authority has implemented a series of tax reforms, which were intensified in the period between 1989 and 2000. Currently, Morocco's economy is predominantly tax-based, contributing 80% of tax revenues. However, the tax rate remains very high in Morocco (26% of GDP) compared to other countries. This is because Morocco limits the room for maneuver of businesses and penalizes personal income more optimally, which hinders tax collection from taxpayers. Thus, given the limits and complexity of procedures for obtaining external funds, the tax revenues generated from the economic policies employed have proved to be a major factor in achieving the government's objectives. It is, therefore, appropriate to consider the effect of macroeconomic policies, particularly monetary and fiscal policy, on Morocco's tax revenues.

Given the foregoing and the importance of taxation as a bend in Morocco's new development model, two main questions arise: To what extent do inflation and external debt affect Morocco's tax revenue mobilization? What are the roles of the transmission channels of devaluation and the inflationary past?

Regardless of the studies that have been carried out on taxation, to our knowledge these research questions have received virtually no empirical attention on the structure of Moroccan tax revenues. In contrast to previous national studies, which have been limited to the tax potential, the added value of our work is to address the transmission channels (currency devaluation and inflationary past) through which these economic magnitudes influence the Moroccan tax structure.

The main objective of this study is to assess the effects of inflation and external debt on Moroccan tax mobilization while taking into account the channels mentioned above. Our work is based on four research hypotheses that are as follows:

H1: High inflation has a negative impact on tax revenues.

H2: External debt leads to higher tax revenues.

H3: Low inflation leads to debt repayment difficulties, and therefore to fiscal demobilization.

H4: The devaluation of the national currency also leads to debt repayment difficulties, and therefore to a drop in tax revenues.

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[1] Data published by the Ministry of Economy and Finance of Morocco: https://www.finances.gov.ma/fr/Pages/statistiques-economiques-financieres.aspx.

[2] Data published by the Moroccan Central Bank: https://www.bkam.ma/Publications-statistiques-et-recherche/Documents-d-information-et-de-statistiques/Statistiques-monetaires.

Our study is divided into four parts. The first deals with a review of the literature on the determinants of tax revenue, including the effect of inflation and external debt. The second part is devoted to the presentation of the main Moroccan stylized facts. The methodology of the work and the source of the data are presented in the third part, and the results of the study and discussion are covered in the final part.

2. LITERATURE REVIEW

Several researchers have examined the determinants of fiscal performance and have revealed that there are a variety of sources from which the government can mobilize tax revenues. Lotz & Morss (1970) are the pioneers who pointed out that the level of development, as measured by GDP per capita, is the most frequent factor used to explain tax revenues. Chelliah (1971) argues that the level of economic development has a positive impact on government revenues. Chelliah (1971) shows that countries with high per capita income tend to collect more tax revenue. According to Wagner's law, since there is an increasing demand for public services in terms of income, the share of goods and services provided by the state should increase tax revenues.

Existing literature shows that the sectoral composition of an economy influences fiscal performance (Stotsky & WoldeMariam, 1997). The authors argue that countries with a very high share of agriculture in national production can have a fiscal demobilization. They added that in developing countries, agriculture characterized by small farmers is notoriously difficult to tax because of subsistence farming. Hence, for political reasons, some governments exempt a large part of agricultural activities from taxation (Bird, Martinez-Vazquez, & Torgler, 2008). The authors reveal that a higher share of agriculture reduces tax revenues.

The literature also identifies foreign trade as one of the most important structural determinants for governments to raise revenue. In a study of sub-Saharan African countries, Agbeyegbe, Stotsky, & WoldeMariam (2006) investigated the relationship between trade openness, the exchange rate, and tax revenues. They analyzed a panel of 22 countries using the generalized method of moments (GMM) over the period 1980-1996. The results of the study show that trade openness has no effect on total tax revenues and has a positively small effect on trade taxes. They also found that the exchange rate does not affect tax revenues. Gnangnon (2017) studied the relationship between multilateral trade liberalization and government revenues in a panel of 169 countries from 1995 to 2013. Using the system generalized method of moments (S-GMM), the results indicate that multilateral trade policy has a positive impact on government revenues. The author also reveals that this impact depends on the level of development of countries and their level of domestic trade policy liberalization.

Piancastelli (2001) points out that education is an important factor in tax revenue mobilization. Indeed, people in a more educated society are more likely to know why they pay taxes than those with less education, which has a positive effect on tax compliance. In other words, the level of fiscal citizenship increases with education. However, Pessino & Fenochietto (2010) argue that the effect of education on tax compliance remains ambiguous. Generally, however, it can be argued that the more educated people are, the more they understand the relationship between the supply of public goods and the importance of paying taxes to finance them.

Demographic factors can also affect tax mobilization. Bahal (2003) points out that rapid population growth leads to losses in tax revenue because such growth prevents governments from detecting new taxpayers. Consequently, a rise in population negatively affects tax revenues. On the other hand, a high population growth rate could lead to higher domestic consumption, possibly higher per capita income, and thus a higher tax revenue ratio.

Further studies show that it is not only supply factors that are important, but that demand factors such as control of corruption, bureaucracy, democracy, and political stability also have a significant impact on tax revenues (Bird et al., 2008). Demand factors are related to institutional and governance quality. Tanzi & Davoodi (2000) argue that a one-point increase in corruption reduces the direct tax-to-GDP ratio by more than the indirect tax-to-GDP ratio. Similarly, Gupta, Davoodi, & Alonso-Terme (2002) argue that corruption has a negative impact on direct and indirect tax revenues. However, the effect on direct tax revenue is more intense. In a study based on a

panel of 53 MENA economies, Thornton (2008) found that the effect of corruption on tax collection is greater in the case of taxes on goods and services and international business transactions.

The above literature review shows that there is substantial evidence in the literature on the determinants of tax revenues. Given this and the fact that more attention is given to tax determinants, macroeconomic policies in turn can have an impact on the level of taxation.

Tanzi (1977) and Ghura (1998) argue that the (expansive or restrictive) nature of fiscal and monetary policy can influence the rate of tax collection. According to the authors, a stable macroeconomic environment indicates less investment risk, which favors the development and higher tax mobilization. It also implies that the worse the macroeconomic situation, the lower the revenue from different taxes.

According to Tanzi (1977) in an inflationary environment, where real tax payments lag behind the transactions to be taxed, tax obligations are lower in real terms at the time of tax payment. Similarly, excise taxes on certain products such as tobacco, alcohol, and gasoline may be levied at specific rates that cannot necessarily be adjusted for inflation (Tanzi, 1988). The author reveals that the monetary policy implemented in the past directly influences the determination of contemporary tax revenue. Indeed, expansionary monetary policy tends to increase the rate of inflation. This effect is a constraint on the mobilization of fiscal resources because there is a time lag between the date of taxation and the date of collection of taxes by the state; the real value of tax revenue collected is eroded by inflation (Keynes-Olivera-Tanzi effect). Inflation can affect the real value of tax revenue if there is a significant time lag between tax assessment and tax collection. In many countries, taxes are assessed in one year but not collected until the following year or even later. As a result, any increase in inflation would reduce tax revenues. This phenomenon is what economists call the " Olivera-Tanzi effect " (Tanzi, 1968; Tanzi, 1977).

Ghura (1998) also argues that high rates of inflation can reduce the tax base to the extent that individuals tend to protect their wealth from the negative effects of inflation by substituting assets that are less likely to be taxed and/or postponing investment plans. In general, the share of tax revenue may decline with inflation. However, although the literature on the impact of inflation on tax revenue performance is considerable, it may be difficult to describe this phenomenon. While governments rarely index higher tax thresholds to inflation, personal income tax revenues and national insurance contributions increase in line with wage increases. This means that inflation pushes more people into higher tax brackets. Also, provided that inflation is low enough and does not change too quickly, corporate profits increase in line with inflation in the economy, and this, therefore, suggests that corporate tax revenues increase with inflation.

Immervoll (2002) assessed the effects of inflation on tax revenues in Europe using a micro-simulation model of tax revenues. The study argues that inflation changes the characteristics of tax systems. Real tax revenues increase and employee social insurance revenues decrease when taxes are not adjusted for inflation. The effects on tax revenues are significant even at low rates of inflation. They depend on the progressivity of tax schedules and the extent to which tax rules rely on lump-sum deductions, thresholds, allowances, and credits. The results also suggest that the inflation adjustment regimes used in one European country were successful in neutralizing distortions in periods of inflation, while in other countries the adjustment factors generally overestimated real inflation and thus led to a slight decrease in real tax revenues.

Heer & Süssmuth (2007) studied the effects of inflation on the distribution of wealth while examining the role of capital taxation. The authors mobilize the computable general equilibrium model of the US economy. The results show that the poor accumulate their savings mainly in the form of money, while the rich participate in the stock market and accumulate equity. Thus, the study indicates that higher inflation leads to higher nominal interest rates and higher real tax revenue on interest income. Finally, the authors argue that higher inflation leads to a lower rate of stock market participation; consequently, savings decline and the distribution of wealth becomes even more unequal.

Levy, Nogueira, Siqueira, Immervoll, & O'Donoghue (2010) simulate the impact of inflation on personal income tax progressivity in Brazil. The authors used a micro-simulation model to simulate the potential income and distributional effects of inflation on income taxes. The results suggest that if the income tax is not adjusted for inflation, progressivity would decrease. On the other hand, redistribution would increase due to a higher tax burden; however, but income inequality would not change substantially. They confirmed the hypothesis that in the absence of adjustment of tax revenues to inflation, the level and distribution of income tax revenue is substantially affected.

The expensive nature of fiscal policy plays an important role in tax revenue mobilization. Indeed, the growth of public spending generates large budget deficits, which also leads to an increase in the share of public debt in GDP. This debt pushes the government to collect more revenue to service it. To this end, debt is an important determinant of tax capacity.

Tanzi (1988) reveals that the fiscal policies implemented in the past directly affect the level of contemporary taxation. The author explains that past budget deficits will be transformed into debt servicing, which will force the government to increase the tax burden to maintain public expenditure levels. Similarly, a major primary deficit incurred in the previous year means that a future increase in the debt burden can be expected, prompting the government to relaunch its efforts to increase tax collection.

However, Tanzi (1992) suggests that high debt can also create macroeconomic imbalances that can reduce the level of taxation. The author shows that countries facing an increase in their trade deficit may try to restrict imports instead of making an exchange rate adjustment. This, consequently, reduces revenues from imports and, by implication, foreign trade revenues. Thus, if deficits persist, the country's external position could eventually become unsustainable due to increasing indebtedness. This could undermine the country's ability to mobilize revenues and affect the tax base. As a result, a strongly negative current account balance may also have adverse effects on consumption and investment, reducing domestic tax revenues.

Heller (1997) relates the tax-to-GDP ratio to various combinations of explanatory variables associated with economic policy. Using the GMM regression, his findings confirm that debt servicing negatively impacts the tax rate. Inflation itself is a negative indicator of domestic resources.

Ghura (1998) analyzed the relationship between the determinants representing macroeconomic policies and tax revenues. His study covers a panel of 39 sub-Saharan African countries from 1985 to 1996. Estimation by the method of ordinary double least squares with instrumental variables indicates that an increase in public debt reduces tax revenues. The author explains that when debt is not directed to productive investment sectors, tax revenues are negatively impacted.

Cassimon & Van Campenhout (2007) studied the fiscal response to debt relief in 28 heavily indebted poor countries (HIPCs) between 1991 and 2004. Using a VAR panel model, the authors found that public debt relief increased government revenues and encouraged growth in public spending with a one-year lag. This, according to the authors, was proof of the over-indebtedness hypothesis. Thus, public expenditure increased mainly due to the increase in revenue resulting from debt relief. Contrary to this relief, the researchers showed that the increase in government spending could be due to wasteful spending.

Augustin (2007) assessed external debt service in 35 sub-Saharan African countries, including Kenya, Madagascar, and Senegal, from 1975 to 1994. Using a regression-based random-effects model, the author found that servicing displaced external debt in social sectors, including education and health, and reduces the overall budget by about one-third. This study; shows that an increase in public debt, especially external debt, would increase debt service charges and affect social sectors. This would imply high expenditures since taxation is generally considered a source of revenue.

Elisa, Albert, Rigas, & Andrew (2012) analyzed the impact of debt levels and debt maturity on inflation in OECD countries from 1990 to 2010. The results conclude that the volatility of inflation depends on the sign of the

debt share. Higher debt leads to higher inflation, and longer debt maturity leads to more persistent inflation. Thus, the study also indicates that higher inflation plays an important role in achieving fiscal sustainability, and hence high taxation.

Assibey-Yeboah, Mallick, & Mohsin (2016) examined the real effects of inflation on external debt in developing economies during the period 1970-2004. The research methodology used in the study consists of applying a panel structural vector autoregressive (SVAR) model with restrictions that interact with the variables of the model. The results of the study show that a positive inflationary shock, due either to money supply growth or the depreciation of the national currency, leads to a decrease in real production and consumption. This is because inflation creates a fiscal wedge between consumption and leisure, leading to a decrease in the stock of real debt in national currency. The estimate also indicates a decrease in the level of tax revenue in proportion to the decrease in other economic variables. Additionally, the authors support the trade-off between inflation and key variables, including the position of external debt. Given the ambiguity in the empirical literature as to whether governments can escape the debt crisis through higher inflation, they considered this a significant result.

Kumar, Bhutto, Mangrio, & Kalhoro (2019) investigated the impact of external debt and exchange rate volatility on consumption in Pakistan on annual data from 1980 to 2014 using the ARDL time series model. The results of this study showed that in the long run exchange rate volatility and external debt positively influenced the level of domestic consumption, and consequently, increased the mobilization of domestic tax revenues. However, trade taxes decreased as a result of lower consumption of imported products. The study also indicates that in the short term exchange rate volatility and external debt remain positively related to domestic consumption, and therefore, more tax revenue collected. Nevertheless, the two economic magnitudes do not affect external demand, reflecting a shortfall in trade revenues.

3. STYLIZED FACTS

This part of the study examines the evolution of the inflation rate, external debt, and Moroccan tax revenues. Such an exercise should enhance understanding of the transmission channels through which the two economic magnitudes influence Moroccan tax revenues.

3.1. Analysis of the Evolution of the Inflation Rate in Morocco

The monetary policy primarily aims to ensure the stability of the general price level and fight against large fluctuations in imported inflation. We use two indicators to assess the evolution of national and international prices, namely the underlying inflation rate and the growth rate of import prices. Figure 1 illustrates the evolution of the inflation rate in Morocco.
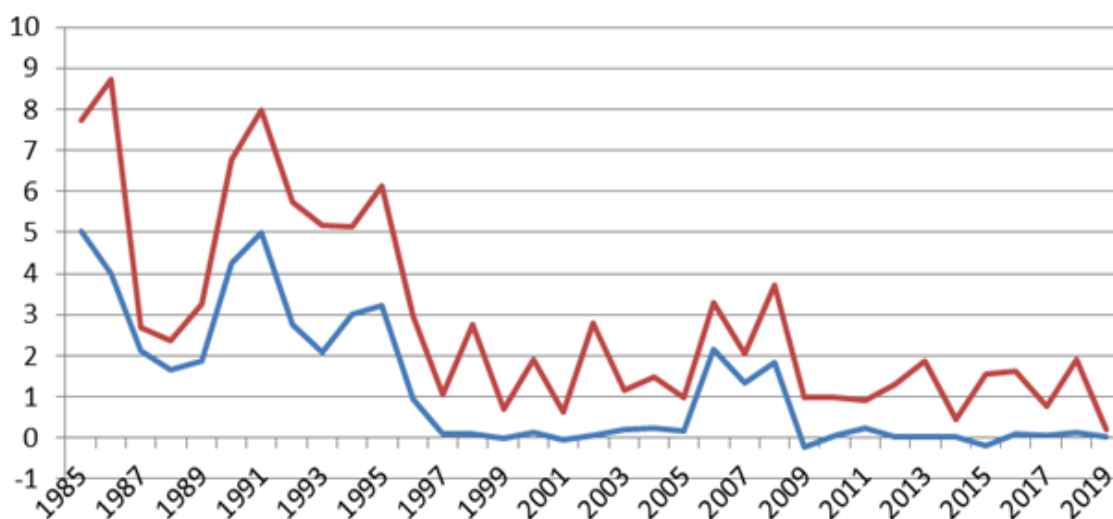

Figure 1. Evolution of the inflation rate (red line) and the growth of import prices (blue line).

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Given the sensitivity of inflation and its important place in economic policies, Morocco, as a transition economy, experienced high inflation during the 1980s and 1990s and has been able to control its inflation rate over the last 20 years. During the period 1980-1990, the inflation rate averaged a high of 7.1%. This period was characterized by the absence of macroeconomic rebalancing mechanisms, which is what prompted the government to adopt structural adjustment program. Starting in the 1990s, an important transition period in this process, the inflation rate fell by two percentage points as the measures taken under the structural adjustment program (SAP) bore some fruit. However, the failure of SAP and changes in the national and international economic environments led to macroeconomic instability. However, during the 2000s and following the consolidation of the central bank's status and its institutional reforms, the efforts of the monetary authorities achieved the objective of price stability. During the 2000-2010 period, the inflation rate fell below 2% except for the peaks of the international crisis in 2008. Thus, the last phase of monetary macroeconomic adjustment was able to bring the inflation rate down to an average of 0.87%. In terms of inflation, this performance has contributed to Morocco's macroeconomic stability and the improvement of its economic competitiveness by maintaining the stability of the dirham's parity.

Moreover, given Morocco's international trade structure, the evolution of its inflation level is essentially linked to its relations with its trading partners. Also, given the growing importance of imports, imported inflation can influence domestic macroeconomic stability. To assess this, we use the growth rate of import prices as a proxy variable for imported inflation. The graph above shows that the growth rate of import prices fluctuated by around 4.03% during the period 1985-1996, implying that the Moroccan economy is vulnerable to rising international prices. However, this rate has been declining since the 2000s, except for the 2008 break. This decrease is explained by certain factors, amongst which are the fixed exchange rate regime where there is central bank intervention, the low band of fluctuations (-0.3%; +0.3%), and the measures taken by the compensation fund to mitigate the volatility of prices of goods, which was considered very unstable on the international market.

3.2. Review of External Debt Developments in Morocco

Since high external debt is a country risk factor, an economy's external debt is an important element in assessing the health of public finances. Figure 2 illustrates the evolution of external debt as a percentage of GDP during the 1985-2019 period.
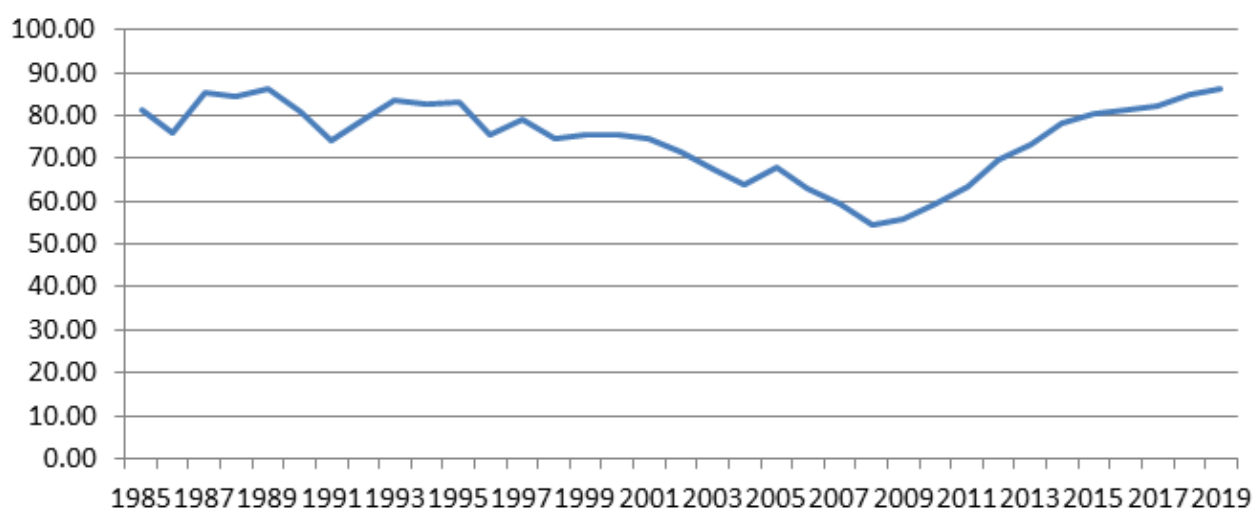

Figure 2. Evolution of external debt as a percentage of GDP.

During the two decades of the 1980s and 1990s, the ratio of foreign debt to GDP repayable in foreign currency reached its highest level. The latter averaged 83.1% of GDP over the two decades. During this period, the state of public finances was a cause for concern. Macroeconomic imbalances were indicative of the deterioration of the

Moroccan economy, and this pushed the government toward external indebtedness under the Structural Adjustment Program (SAP).

On the other hand, starting in 2000, the external debt ratio deteriorated steadily until 2007, rising from 75.64 percent of GDP in 2000 to 59.60 percent of GDP in 2007. This remarkable decline is attributed to state intervention in various economic sectors, mainly through national initiatives aimed at diversifying activities in secondary and tertiary industries and maintaining stable monetary and fiscal policies, thereby; encouraging and securing investment. Structural reforms have also contributed to improving the macroeconomic environment and accelerating the country's economic and social development.

Since 2008, given the international financial crisis and slowdown in economic growth, and due to non-debt generating external capital flows (particularly FDI and grants), they have contributed only 36% of external financing needs. The public and private debts took up the remaining 64% of the debt. To this end, the level of debt has been rising steadily from 54.60% of GDP in 2008 to 86.12% of GDP in 2019. This increase is mainly due to the rise in raw material prices, the high cost of food and fuel subsidies, and the rise in interest and commission charges as a result of the increase in outstanding external debt. Thus, an increase in foreign debt puts pressure on the state's foreign exchange reserves. Figure 3 below shows the evolution of foreign exchange reserves in Morocco during the period from 1985 to 2019.
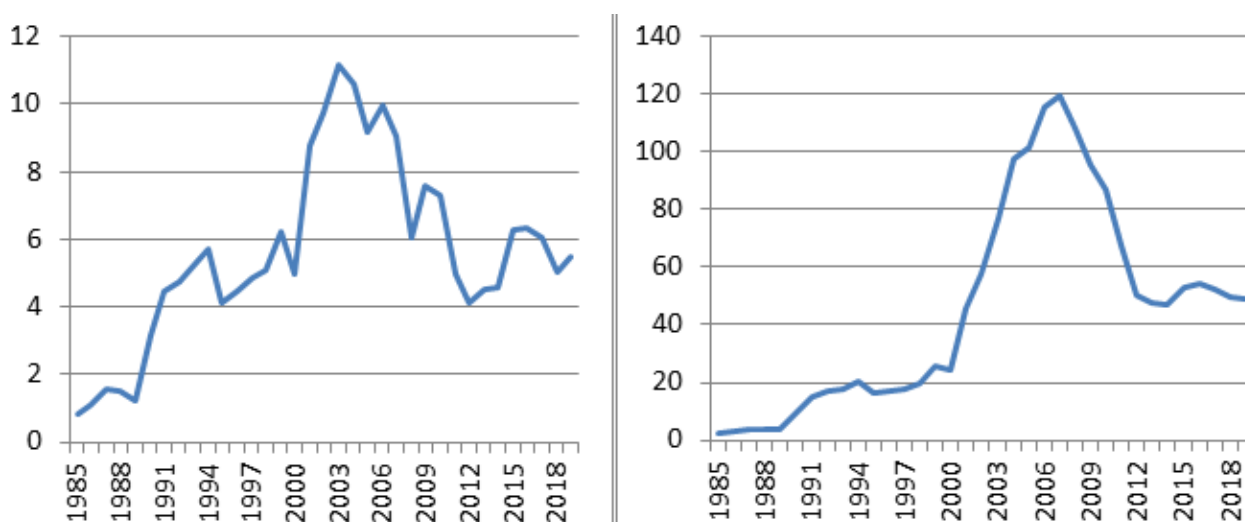

Figure 3. Evolution of foreign exchange reserves (left: expressed in months of exports: right: expressed as a % of total external debt).

We note that a significant portion of foreign exchange reserves is paid for foreign debt. Both ratios (total reserves as a percentage of external debt and total reserves in months of imports) were low during the period between 1985 and 1996. This weakness is associated with the poor contribution of the Moroccan economy to the generation of foreign exchange reserves. During the SAP period, Morocco's foreign exchange reserves were insufficient for one month of imports. However, starting in 2000 and following government intervention in many sectors, foreign exchange reserves increased significantly (the emergence of certain value added sectors: such as global businesses, telecommunications, and insurance).

This upward trend in foreign exchange reserves did not last, the financial shock of 2008 led to a remarkable drop in foreign exchange in the face of the increasing needs of the local market in terms of consumption and investment. Thus, the large share of incomprehensible imports and the weakness of Morocco's exportable supply worsened the situation of foreign exchange reserves in Morocco. Also, external debt is subject to exchange rate fluctuations, which has altered its value. Repeated policies of currency devaluation have depleted the foreign exchange reserves of the Moroccan economy and have led to difficulties in repaying and servicing debt.

3.3. Analysis of Moroccan Tax Revenue Trends

Morocco has undergone numerous tax reforms in recent years that have contributed to increased tax revenues. The evolution of taxes as a percentage of GDP between 1985 and 2019 shows a significant increase in the tax burden on taxpayers.

Figure 4 shows that the evolution of different taxes in Morocco remains concentrated on income tax, VAT, and corporate income tax. VAT fell during the 1985-1990 period: this is due to the drought that affected consumer goods, and consequently, the decline in household purchasing power. This represents an average contribution of 3.98% to GDP. As of 2003, we note that the value added tax shows a significant upward trend compared to other taxes. This situation is explained by the performance of VAT on imported products and the improvement in gross national income per capita, which represents an average contribution of 8.75% to GDP.

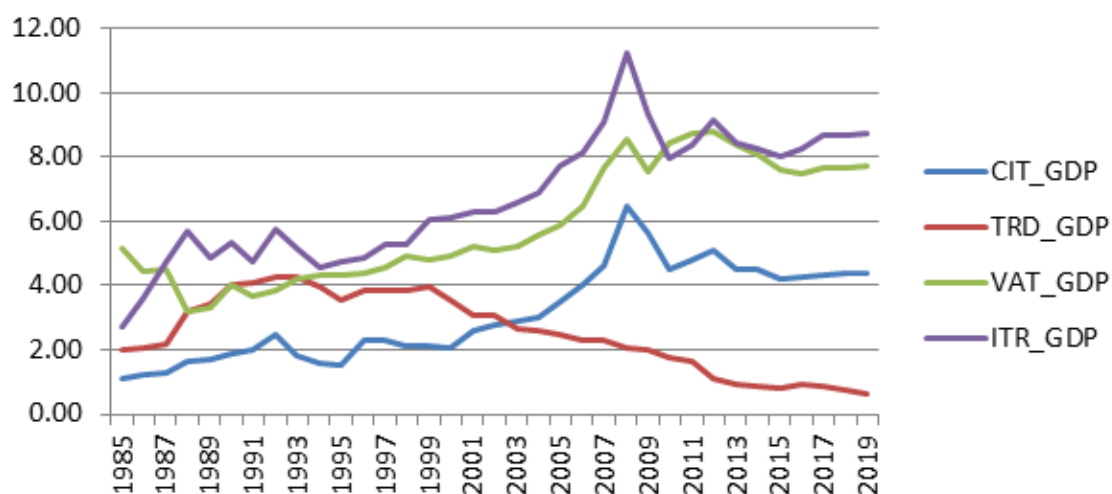Figure 4 shows the evolution of tax revenues as a percentage of GDP

Figure 4. Evolution of tax revenues as a percentage of GDP.

Concerning income tax, we note the superiority of the latter with corporate income tax. Admittedly, during the period from 1985 to 1990, income tax was dominated by the presence of certain taxes (PTS, TPI, PSN, ect.) with a share of 6.56% in GDP. On the other hand, the corporate tax that was introduced in 1987 remains concentrated on PPT (Profits and Profits Tax) profits and profiles with a share of 1.39% in GDP. In 1990, the public authorities carried out a reform while introducing the general income tax, and the final income tax reform in 2006. These tax reforms allowed for increased mobilization of income tax revenues. The spike in 2008 is explained by the intervention of the tax administration. The latter reinforces these efforts in terms of tax control and the declaration process. An important finding for our study is related to the trend in foreign trade revenues, which we can see were high from 1985 to 1999 with an average of 3.64% in GDP. This can be attributed to the policy of tariff protection. From 2000 onwards, the evolution of trade revenues shows a downward trend: that is a contribution of 0.73% in the GDP in 2019. The signing of free trade agreements and customs restrictions are at the root of the decline in the trade tax base.

4. METHODOLOGICAL FRAMEWORK

The literature review allowed us to look at the explanatory variables that could explain the level of tax revenues. In this part of the study, we present the econometric specification of the various models to be estimated, the data sources, and the estimation method.

4.1. Model Specification and Data Sources

The econometric specification of our basic model is as follows:

$$TR_t = \alpha_0 + \alpha_1 X_t + \alpha_2 Infl_{t-1} + \alpha_3 Det\_PIB_t + \varepsilon_t$$

TR: Main tax revenues as a % of GDP.

X: The vector of explanatory variables. These are the control variables and reflect the level of the tax base generated by the tax capacity of the Moroccan economy in terms of production and economic development.

Infl$_{t-1}$: The inflation rate lagged to capture the effect of the inflationary past.

Det_GDP: External debt as a percentage of GDP.

ε: The specification error.

As mentioned at the beginning of the study, the added value of this work is that it also models the impact of external debt in interaction with lagged inflation and devaluation on Moroccan tax revenues. Thus, we integrate the following two variables as transmission channels: Det_GDP*LagInfl and Det_GDP*Dummy. In comparison with other works that are limited to total tax revenues, we decided to study the tax structure. In other words, we assess the effect of inflation and external debt on Morocco's main tax revenues, including corporate income tax (CIT), income tax (IT), value added tax (VAT), and trade tax revenue. This makes it possible to address the effect on each type of tax; and to ensure a robust econometric specification of the results obtained.

The econometric specifications to be estimated are as follows:

$$TR_t = \alpha_0 + \alpha_1 TR_{t-1} + \alpha_2 LogGDP_t + \alpha_3 Agr\_GDP_t + \alpha_4 Ind\_GDP_t + \alpha_5 Open_t + \alpha_6 ESE_t + \alpha_7 POP_t + \alpha_8 INST_t + \alpha_9 \boldsymbol{LagInfl_t} + \varepsilon_t$$

$$TR_t = \alpha_0 + \alpha_1 TR_{t-1} + \alpha_2 LogGDP_t + \alpha_3 Agr\_GDP_t + \alpha_4 Ind\_GDP_t + \alpha_5 Open_t + \alpha_6 ESE_t + \alpha_7 POP_t + \alpha_8 INST_t + \alpha_9 \boldsymbol{Det\_GDP_t} + \alpha_{10} \boldsymbol{TB\_GDP_t} + \varepsilon_t$$

$$TR_t = \alpha_0 + \alpha_1 TR_{t-1} + \alpha_2 LogGDP_t + \alpha_3 Agr\_GDP_t + \alpha_4 Ind\_GDP_t + \alpha_5 Open_t + \alpha_6 ESE_t + \alpha_7 POP_t + \alpha_8 INST_t + \alpha_9 \boldsymbol{Det\_GDP_t * LagInfl} + \alpha_{10} \boldsymbol{Det\_GDP_t * Dummy} + \varepsilon_t$$

Our study covers the period from1985 to 2019 and we estimate the above specifications using the generalized method of moments (GMM).

The data used in this modeling come from three data sources. The macroeconomic control variables come from the World Bank databases, tax revenue data are taken from the International Monetary Fund (IMF) database, and the variable that measures institutional quality comes from the International Country Risk Guide (ICRG) database. Table 1 presents the title of each variable chosen and its expected sign.

4.2. Estimation method

When modeling economic phenomena, a natural question to ask is whether a variable presumed to be endogenous in previously adapted models could instead be treated as exogenous. The two variables of external debt and institutional quality are endogenous we remedy this problem by an estimation technique using instrumental variables.

Admittedly, in the case of endogenous explanatory variables, the OLS estimator is no longer efficient insofar as the regressors are correlated with the error term. Thus, this estimation method remains inappropriate in the presence of lagged explanatory variables. To remedy this problem of hypothesis violation, we use the GMM which entails identifying the endogenous variable while associating it with a set of robust instruments.

The problem of the endogeneity of external debt has been studied in the literature. Khattry & Rao (2002) explained the existence of a simultaneity link between debt and tax revenues. The authors reveal that the decline in tax revenues pushes the government into debt to mitigate the upward trend of the budget deficit. On the other hand, indebtedness helps to boost economic activity and generate tax revenues.

We are also careful not to capture an inverse causal relationship between the institutional quality index variable and tax revenues. According to Bird et al. (2008) a good institution helps strengthen tax collection. In other words, tax mobilization contributes to institutional improvement.

We use the following empirical instruments:

- Population growth.
- The ratio imports/GDP.
- The degree of openness of the economy.

The method of estimation by instrumental variables consists of estimating the models by GMM, testing the endogeneity via the Wu-Hausman test, and testing the validity of the instruments via the Sargan test.

Table 1. List of variables.

Variables	Title	The expected sign of the variable
Independent variable		
GDP	GDP per capita	(+)
Agr_GDP	The added value of the agricultural sector/GDP	(-)
Ind_GDP	The added value of the industrial sector/GDP	(+)
Open	Trade openness, percentage of GDP	(+)
ESE	The enrolment rate in secondary education	(+)
POP	The growth rate of the employed labor force	(-)
INST	The ICRG Institutional Quality Index	(+)
LagInfl	The lagged inflation rate	(-)
Det_PIB	External debt as a percentage of GDP	(+)
TB_GDP	The trade balance as a percentage of GDP	(-)
Dummy	Dummy variables that reflect periods of currency devaluation	(-)
Det_GDP*LagInfl	The interaction term of the external debt with the inflation rate	(-)
Det_GDP*Dummy	The term of the interaction of external debt with periods of currency devaluation	(-)
Dependent variables		
TTR_GDP	Total tax revenues, percentage of GDP	
ITR_GDP	Income tax revenue, percentage of GDP	
CIT_GDP	Corporate income tax revenue, percentage of GDP	
VAT_GDP	Value added tax revenue, percentage of GDP	
TRD_GDP	Trade tax revenue, percentage of GDP	

5. RESULTS AND DISCUSSION

This part of the study presents the results of estimating the effect of inflation and external debt on Morocco's main tax revenues. The aggregation of all tax resources hides the real effect of inflation and debt, which should be examined by analyzing the different types of taxes. These are five specifications whose dependent variables are total tax revenue, corporate tax, income tax, value added tax, and trade tax.

The results of the estimation of the impact of inflation on tax revenues are presented in Table 2.

The results of estimating the effect of inflation on tax revenues are statistically significant. A 1% increase in inflation leads to a decrease of 0.845% in total tax revenue, 0.786% in IT, 0.914% in CIT, 0.707% in VAT and 0.046% in foreign trade revenue.

Using the inflation rate indicator, the results indicate that the annual change in the CPI has a negative impact on Morocco's tax structure. This negative relationship is not associated with the Olivera -Tanzi effect (Tanzi, 1968; Tanzi, 1977) and the work of Ghura (1998), in which macroeconomic instability (hyperinflation) was shown to reduce the tax base. Admittedly, the Moroccan economy is characterized by low inflation. This is due to the deceleration of the rate of increase in the prices of volatile goods and the underlying component of inflation. Generally, this can be caused by the monetary authorities' efforts in inflation targeting. Theoretically, we know that this situation generates adverse effects on economic agents, and by implication, a loss of revenue for the state.

Table 2. Results of the effect of inflation on the Moroccan tax structure.

Estimator: Generalized Method of Moments (GMM)					
Period of study: 1985-2019					
Specification	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Variable	TTR_GDP	ITR_GDP	CIT_GDP	VAT_GDP	TRD_GDP
TR_{t-1}	0.367***	0.597***	0.553***	0.877***	0.448
	(0.00012)	(0.00091)	(0.00020)	(0.01034)**	(3.05413)
LogGDP	9.733***	5.112***	4.043**	5.956***	1.036
	(0.00091)	(0.00074)	(0.02105)	(0.00170)	(0.71209)
Agr_GDP	-0.772***	-0.934**	-0.060	-0.130***	-0.058***
	(0.00105)	(0.00318)	(0.73106)	(0.00041)	(0.00502)
Ind_GDP	-0.498***	-0.252	-0.305*	-0.228***	-0.095**
	(0.00601)	(0.98543)	(0.05010)	(0.00903)	(0.07103)
Open	0.163**	0.133**	0.237**	0.180*	-0.073*
	(0.00941)	(0.00612)	(0.04081)	(0.06803)	(0.08305)
ESE	-0.790***	-0.991***	-0.902***	-0.645***	-0.644
	(0.00907)	(0.00207)	(0.00116)	(0.00271)	(1.51403)
POP	-5.473***	-3.702***	-4.016***	-3.483***	-1.041
	(0.00016)	(0.00053)	(0.01007)	(0.01046)	(2.93012)
INST	-0.790	-0.824*	-0.746	-0.838	-0.073
	(0.612023)	(0.08209)	(1.53073)	(2.10481)	(5.67012)
LagInfl	-0.845***	-0.786***	-0.914***	-0.707***	-0.046*
	(0.00250)	(0.00380)	(0.01015)	(0.00095)	(0.07228)
C(Intercept)	5.732***	7.028	7.406**	2.690**	4.705***
	(0.02056)	(2.70681)	(0.30088)	(0.20819)	(0.00290)
R^2	0.8836	0.8216	0.7392	0.7904	0.7253
Wu_Hausman	0.0014	0.0416	0.0280	0.0019	0.0843
Sargan	0.2309	0.1927	0.5430	0.3620	0.2109

Notes:
a. Dependent variables: (1) Ratio of total tax revenue to GDP; (2) Ratio of income tax revenue to GDP; (3) Ratio of corporate tax revenue to GDP; (4) Ratio of value added tax revenue to GDP; (5) Ratio of trade tax revenue to GDP.
b. Endogenous explanatory variable: INST (a measure of institutional quality).
c. (.) Standard deviations of the estimators.
d. Significance: *** 1% ; ** 5% ; *10%

For companies, low inflation reduces prices; and profit margins, and pushes entrepreneurs to reduce their investments. As a result, firms are forced to freeze wages, stop working, and face layoffs. The effect is more penalizing on indebted firms, especially when the inflation rate is lower than the interest rate. However, firms with declining revenues and loans to repay still have debt repayment schedules, so they find it increasingly difficult to repay their loans, which further hinders their investments. In the end, government revenues, mainly corporate income tax and VAT, decrease due to the effect of the slowdown in corporate turnover.

As far as households are concerned, the decline in inflation rates could appear favorable for purchasing power. In the short term, households can consume, and the state can collect a certain percentage of taxes. However, this situation is not sustainable in the long term. Indeed, in the long term, and when inflation rates are close to 0%, households consume too little; and with low wage increases and rising unemployment, households' real income decreases, and subsequently, their purchasing power. Thus, this leads to lower income tax and value added tax. Like firms, the fall in inflation penalizes indebted households as they are unable to repay their loans. This situation further reduces household incomes and minimizes government revenues, particularly income tax and VAT.

Foreign trade revenues are negatively affected by the rate of inflation. Rising prices of incompressible imports increase costs, which is reflected in the prices of tradable goods. Thus, Morocco has experienced periods when import prices were very high due to the effect of devaluation. Consequently, the level of consumption of foreign products falls and, of course, trade taxes. However, the magnitude of the negative effect of inflation is small; it is estimated at -0.046% on trade taxes.

Table 3 presents the results of the effect of external debt on tax revenue. The coefficients of the share of external debt in GDP are negatively related to tax revenues. In terms of significance, a 1% increase in the external debt/GDP ratio leads to a decrease of 0.970% in total revenue, 0.568% in IT, 0.609% in CIT, and 0.851% in VAT. Conversely, this ratio has a positive impact on trade revenues since a 1% increase in the debt share leads to a 0.013% increase in trade taxes.

The results, however, are consistent with an earlier study by Tanzi (1992) which found a negative relationship between external debt and tax collection. This negative relationship is attributed to the macroeconomic imbalance that reduces tax revenues. The modeling of the impact of the trade balance on government revenue confirms that the high level of debt reduces foreign exchange reserves; and, consequently, a less proportional decline in imports. As a result, due to unsustainable debt and a rising trade deficit, the current account deficit balance will have negative repercussions on consumption and investment, and thus; on domestic tax revenues.

On the other hand, the degree of external indebtedness has a positive impact on trade revenues. This indicates that part of the foreign exchange stock had a positive impact on the import-to-GDP ratio. Consequently, these dynamic increases in import duties or other trade taxes to generate a budget surplus for debt service could lead to an increase in trade tax revenues.

Table 3. Results of the effect of the external debt on the Moroccan tax structure.

Estimator: Generalized Method of Moments (GMM)					
Period of study: 1985_2019					
Specification	(1)	(2)	(3)	(4)	(5)
Variable	TTR_GDP	ITR_GDP	CIT_GDP	VAT_GDP	TRD_GDP
TR_{t-1}	0.614***	0.537***	0.590***	0.843***	-0.157*
	(0.00150)	(0.00790)	(0.02713)	(0.00017)	(0.08391)
LogGDP	9.850***	5.628***	5.149**	6.462***	1.742
	(0.01017)	(0.01038)	(0.08717)	(0.02546)	(2.23083)
Agr_GDP	-0.640***	-0.846*	-0.148*	-0.353***	-0.106***
	(0.00712)	(0.09348)	(0.09324)	(0.04015)	(0.01609)
Ind_GDP	-0.498***	-0.316**	-0.152*	-0.207**	-0.081***
	(0.00630)	(0.05207)	(0.76039)	(0.07103)	(0.02007)
Open	0.190***	0.160***	0.212**	0.176*	-0.088**
	(0.00908)	(0.00120)	(0.03719)	(0.09144)	(0.06154)
ESE	-0.708**	-0.953***	-0.734***	-0.633	-0.671
	(0.53037)	(0.00839)	(0.03012)	(3.50371)	(3.07608)
POP	-5.432***	-3.710***	-3.941***	-3.470**	-1.448*
	(0.00173)	(0.04197)	(0.00260)	(0.25086)	(0.80722)
INST	-0.790*	-0.809	-0.783	-0.873*	-0.096*
	(0.08107)	(3.22048)	(2.80490)	(0.90614)	(0.70302)
Det_GDP	-0.970***	-0.568***	-0.609**	-0.851***	0.013**
	(0.01530)	(0.03074)	(0.06905)	(0.00160)	(0.04136)
TB_GDP	-1.018***	-0.703***	-0.927***	-0.941***	0.002
	(0.00946)	(0.04109)	(0.01573)	(0.01016)	(2.73116)
C(Intercept)	2.649**	9.358*	3.405***	5.954*	4.932***
	(0.01105)	(0.08941)	(0.00922)	(0.50671)	(0.00027)
R^2	0.8614	0.8034	0.8318	0.9051	0.8640
Wu_Hausman	0.0064	0.0004	0.0583	0.0170	0.0630
Sargan	0.7207	0.1850	0.2750	0.1380	0.1071

Notes:
a. Dependent variables: (1) Ratio of total tax revenue to GDP; (2) Ratio of income tax revenue to GDP; (3) Ratio of corporate tax revenue to GDP; (4) Ratio of value added tax revenue to GDP; (5) Ratio of trade tax revenue to GDP.
b. Explanatory variables of an endogenous nature: INST and external debt
c. (.)Standard deviations of the estimators.
d. Significance: *** 1% ; ** 5% ; *10%

Table 4 represents the results of the roles of devaluation and inflationary past in the impact of external debt on fiscal revenues. The negative effect of the external debt on tax revenues is partly explained by the effect of the low

inflation rate. Bondholders are concerned about Morocco's economy, which is experiencing low inflation and weak economic growth. Although real value bonds may rise with optimal inflation, bondholders may fear that the economy will stagnate and that the government will have difficulty repaying its debts. Low inflation also leads to lower prices for goods and services, and consequently, lower government taxes. This also works for indebted and low-wage households, which reduces income tax and value added tax. As a result, the low level of inflation does not allow for the repayment of debt or the generation of tax revenues from it.

The impact of external debt, in interaction with the dummy variables (the periods of devaluation), is significantly positive on tax revenues. Admittedly, the devaluation of the national currency leads to difficulties in repaying the debt, which pushes the state to increase the level of taxation to generate the revenues needed to service it.

The estimated models have corroborated our theoretical findings (Chelliah, 1971; Lotz & Morss, 1970). GDP per capita, an indicator of development, and a proxy for the contributive capacity of citizens in terms of taxation have a significantly positive impact on domestic tax revenues. However, it is insignificant on foreign trade revenues, which can be explained by the rise in the prices of tradable goods, and hence, a fall in trade taxes.

Table 4. Results of the effect of external debt on Morocco's tax structure: The transmission channels of devaluation and the inflationary past.

Estimator: Generalized Method of Moments (GMM)					
Period of study: 1985--2019					
Specification	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Variable	TTR_GDP	ITR_GDP	CIT_GDP	VAT_GDP	TRD_GDP
TR$_{t-1}$	0.609***	0.552***	0.572***	0.877***	0.140
	(0.10400)	(0.03655)	(0.00495)	(0.10488)	(2.61720)
LogGDP	9.844***	5.607***	5.572**	6.555***	1.737
	(0.03341)	(0.10682)	(0.09529)	(0.00962)	(3.09214)
Agr_GDP	-0.833***	-0.853*	-0.138**	-0.337***	-0.093***
	(0.03094)	(0.08815)	(0.04052)	(0.00090)	(0.04077)
Ind_GDP	-0.473***	-0.341**	-0.163**	-0.221**	-0.079***
	(0.02082)	(0.10733)	(0.09151)	(0.10148)	(0.00544)
Open	0.186***	0.161***	0.228**	0.170*	-0.082**
	(0.02283)	(0.10409)	(0.09163)	(0.28041)	(0.08390)
ESE	-0.715	-0.807***	-0.772***	-0.627	-0.633
	(2.50967)	(0.01403)	(0.06641)	(3.99037)	(2.09152)
POP	-5.201***	-3.012***	-3.751***	-3.766***	-1.112
	(0.03041)	(0.02061)	(0.02309)	(0.00027)	(2.47603)
INST	-0.774*	-0.811	-0.772	-0.805	-0.090*
	(0.06607)	(4.03461)	(3.60712)	(1.10809)	(0.81005)
Det_GDP*LagInfl	-0.983***	-0.735***	-0.701***	-0.884***	0.067
	(0.00120)	(0.01000)	(0.00343)	(0.02730)	(3.50491)
The effects of devaluation:					
Det_GDP*D86	0.529***	0.751*	0.208***	0.643***	0.307**
Det_GDP*D88	0.696**	0.775***	0.252**	0.660**	0.331*
Det_GDP*D90	0.854***	0.905***	0.507*	0.721***	0.519***
Det_GDP*D95	0.874***	0.925**	0.831	0.837***	0.643
Det_GDP*D2001	0.901***	0.944***	0.841**	0.924***	0.903
C(Intercept)	5.019**	2.381***	5.672***	4.746***	1.370*
	(0.17033)	(0.04116)	(0.00391)	(0.03804)	(0.50319)
R^2	0.9571	0.9607	0.9628	0.9430	0.9655
Wu_Hausman	0.0103	0.0417	0.0105	0.0611	0.0047
Sargan	0.3077	0.3510	0.1391	0.7207	0.4073

Notes:
a. Dependent variables: (1) Ratio of total tax revenue to GDP; (2) Ratio of income tax revenue to GDP; (3) Ratio of corporate tax revenue to GDP; (4) Ratio of value added tax revenue to GDP; (5) Ratio of trade tax revenue to GDP.
b. Explanatory variables of an endogenous nature: INST and external debt
c. (.) Standard deviations of the estimators.
d. Significance: *** 1% ; ** 5% ; *10%

The share of agriculture in GDP has a negative and significant relationship with tax revenues. This is a shortfall throughout Morocco's tax structure. This negative effect is due to several reasons. First, the presence of a large agricultural sector is considered administratively difficult to tax (Mkandawire, 2010). Second, the weight of exemptions limits the number of taxpayers paying income or profit taxes. Third, the predominance of substantial consumed and non-commercialized activities. These factors led to a decline in domestic revenue. Similarly, agricultural products do not contribute to international trade revenues (significant and negative relationship). This fiscal demobilization is due to the low exportable supply of Moroccan agricultural products (uncompetitive products) and relations with EU countries that reflect a political as well as an economic aspect.

The share of industry in GDP is negatively related to tax revenues. This result is correlated with the national context regarding corporate tax exemptions for various industries. Let us add that 1% of firms that pay corporate tax. At the level of foreign trade revenues, the industry is not affected. This finding is explained by the weakness of Morocco's global trades since they remain concentrated in small segments, mainly wiring (automotive; aeronautics).

Trade openness indicates a positive and significant impact on domestic revenues. Nevertheless, the estimated elasticities of the openness rate for tax revenues remain very low. This fiscal underperformance related to foreign trade is explained by the dismantling of tariffs and the signing of free trade agreements, which have led to a downward trend in customs duties. This result is confirmed by the negative impact of trade openness on revenues from international trade.

Population growth has a significant and negative effect on tax revenues. National demographics are characterized by rapid growth, which puts pressure on the Moroccan tax system to register and monitor new taxpayers. As a result, the pace of tax mobilization will be very slow.

The secondary school enrollment rate is a proxy variable for the level of education, the quality of public provision in the education sector, and the informal economy. The estimation results show a significant negative sign on the Moroccan tax structure. This result can be explained by the fact that individuals do not meet their tax obligations, which is mainly due to a lack of fiscal knowledge; and the quality of public goods and services offered by the government in the education sector. Also, the secondary school enrollment rate variable suggests that these people turn to informal activities to express their needs, resulting in fiscal demobilization.

The results of the estimate contradict the findings of Bird et al. (2008) that institutional quality enhances tax revenue mobilization. The negative sign of the impact of institutional quality on Moroccan tax revenues is explained by the presence of the scourge of corruption, poor bureaucratic quality, and the low level of democracy. These findings also show that the weakness of Moroccan institutions increases the level of fiscal incivility among taxpayers.

5.1. Statistical Interpretation

The models are globally significant and have a good fit since the coefficients of determination are important.
The probabilities for the Wu-Hausman test are less than 5% in all specifications. Therefore, we reject the hypothesis H0 (the variable is exogenous) and we accept H1 (the variable is endogenous). The test confirms the endogeneity status of the two variables of external debt and institutional quality.

The Sargan test verifies the over-identification restrictions. It tests the hypothesis that the instrumental variables are not correlated with a set of residuals and are, therefore, acceptable instruments. We note that the probabilities associated with the Sargan test are greater than 5% and, accordingly, weaccept H0 (the instruments are valid).

6. CONCLUSION

Tax revenues play a major role in the economic and social development of countries. These revenues enable governments to finance their sectoral strategies, invest in basic infrastructure, and, in general, improve the quality of life of their citizens. However, unfavorable macroeconomic conditions can hamper tax mobilization. The main objective of this study was to empirically assess the effects of inflation and external debt on Moroccan tax revenue mobilization during the period from 1985 to 2019.

Using the generalized method of moments (GMM), the results show that inflation negatively impacts the structure of Moroccan tax revenues. This negative impact can be explained by the low level of inflation, which does not allow economic activity to be revived, and, therefore, does not generate tax revenues for the government budget. Lower inflation rates have reduced firms' profit margins, which, in turn, reduces their investments. As a result, income from corporate income tax and VAT declines due to the effect of the slowdown in entrepreneurs' revenues. Thus, with stable wages and rising unemployment rates, tax revenues, especially IT and VAT, are declining. Low inflation also penalizes indebted households causing a further reduction of VAT on consumer credit. The extent of the negative impact of inflation on foreign trade taxes remains small.

The results of the study also reveal that external debt has a negative effect on domestic revenues. This effect is attributed to the macroeconomic imbalance, mainly the trade and current account deficit balance, which reduces domestic tax revenues. This finding confirms the work of Tanzi (1992). On the other hand, external debt has a positive impact on foreign trade revenues. This is due to the performance of the share of the foreign currency stock that has had a favorable impact on imports, which increases trade taxes. Estimates also show that in Morocco the low level of inflation does not allow debt repayment, and hence causes fiscal demobilization. In contrast, in interaction with periods of devaluation, external debt is positively related to tax revenues. The devaluation of the national currency with other foreign currencies creates difficulties in repaying the debt, which pushes the state to increase the level of taxation to generate the income necessary for its services.

Concerning the control variables, the estimate was able to show that GDP per capita is positively related to domestic revenue. However, it is insignificant on foreign trade revenue. The shortfall in tax revenues in industry and agriculture is explained by tax exemptions and waivers, substantial activity, the preponderance of the informal sector, and the weakness of the Moroccan industry. The degree of openness does not generate high tax revenues, which, in turn, results from tariff dismantling and free trade agreements. Population growth reduces the amount of tax revenue collected; this is related to the emergence of new taxpayers who evade taxation. The negative sign of the secondary school enrollment rate is an indication of fiscal incivility, the low quality of public provision in the education sector, and taxpayers' recourse to informal activities. Finally, the institutional quality index indicates that Moroccan institutions do not play an important role in tax mobilization. This can be explained by the presence of corruption, weak administration, and a deteriorating level of democracy.

Considering the importance of these results, we can conclude that there are still efforts to be made by the Moroccan government. First, the inflation rate must be increased. In other words, we must seek the right inflation (optimal inflation) that allows the revival of economic activity without harming it. This allows firms to anchor their expectations of price increases in the medium and long terms. The predictability of these expectations is conducive to investment decisions because it reduces uncertainty regarding future revenues generated by investment. Second, debt should be directed much more toward investment than consumption. Debt is profitable only if it is directed toward productive sectors capable of creating value added with rational tax exemptions. Third, it also appears that the devaluation policy has far more negative effects than opportunities for the Moroccan economy. Morocco is not an industrial country; and any policy on exchange rate flexibility or devaluation will result in losses to the Moroccan economy in the event of an external shock. The fixed exchange rate regime remains the most appropriate regime against exchange rate risks, including depletion of foreign exchange reserves. Thus, our work suggests other implications that can improve tax revenue mobilization, including improving institutional quality, combating the informal sector, evaluating tax expenditures, and developing the productive capacity of the Moroccan economy.

To enrich our work in the future, other avenues of research can be pursued and further exploration of the role of public aid in tax mobilization is highly recommended. The economic literature suggests that donor funding is an important source of fiscal mobilization.

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