Original Paper

The Tax Burden and Economic Growth in Morocco:

Empirical Analysis

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Abstract

The tax burden in Morocco has an important place, both in the political arena and in the media. These debates are often based on the identification of the tax burden in the economy. Moreover, taxation plays a key role in achieving the objectives of the State's social and economic policy. Because its main role is to collect resources to supply the state budget to meet multiple obligations, taxes have an economic role (correcting market inefficiencies in resource allocation) and a social role (reducing inequalities through income redistribution, social equity...). The paper uses to identify the Laffer growth curve and determine the optimal tax rate maximizing economic growth for the Moroccan economy we used econometric techniques. This empirical study covered the period from 1990 to 2018. However, a high tax rate can influence the macroeconomic performance of the state as in the case of Morocco, since Morocco ranks among the developing countries with a high tax burden, the latter defines the relative importance of taxes and duties (or compulsory levies, such as social insurance contributions on wages) in the national economy based on the tax rate which is considered the most relevant economic indicator. The challenge is to find an optimal tax rate that stimulates economic growth while at the same time achieving fairness and equity in our tax system.

Keywords

tax burden, economic growth, optimal tax rate, laffer curve

1. Introduction

Taxation is today a central element of the Moroccan economic policies; it has first of all a financial dimension which consists in organizing as well as possible the levy in order to provide the State with the resources essential to its operation. It also has an economic dimension insofar as the structure of the

levy has significant consequences on the behavior of the agents, it favours consumption, savings or investment, and influences the modes of financing of companies.

In a world where competition is fierce, the tax rate levy will be the only tool for the governments of the countries. The latter are forced to change their tax rates in order to save their resources first, and then to fight against the adequacy of companies with low-tax jurisdictions. As a result, the tax rate chosen affects government income and the inflow and outflow of capital of multinational companies. This has an impact on the rate of economic growth through two main channels: a supply channel and a demand channel.

Supply effects are transmitted via incentive mechanisms: following a tax cut, agents may be encouraged to work more, invest or hire. With this supply channel, a tax change will only have an impact if it changes the behavior of agents.

Demand effects are based on agents' disposable income. A tax cut, because it generates an increase in disposable income, which will lead to an increase in consumption, which in turn will generate additional income for sellers, and therefore additional hiring, investment and tax revenues. This is the tax multiplier mechanism.

In Morocco, tax revenues represent more than 80 percent of total revenues. Since 1980, Morocco has implemented a series of tax reforms. These reforms explicitly focus on broadening the tax base and changing the tax structure in the direction of increased resource mobilization and with the only purpose of developing a modern, coherent, and efficient tax system.

The question that arises at this level is as follows: What is the optimal tax rate and what are the effects of the tax burden on economic growth in Morocco?

2. Literature Review

The OECD defines the tax burden as "the relative importance of a tax or group of taxes in an economy, i.e., the tax burden measures the state's grip on economic agents, i.e., taxpayers". This notion of tax burden concerns macroeconomic magnitudes, i.e., there is a relationship between "tax burden" and "economic growth", by mobilising numerous economic variables such as public expenditure, investment, savings, public deficit, etc.

The issue of the impact of the tax burden on economic growth is a concern that has drawn the attention of several authors. A number of economists have addressed this issue extensively, such as Laffer (1974), Romer (1986), Sato (1967), Scully (2006), Krzyzaniak (1967), Feldstein (1974), Easterly and Rebelo (1993)... A high tax rate influences tax revenues, capital inflows and outflows of multinational companies, investment... This influences economic growth. Indeed, most economists try to consider that high taxation penalizes economic growth:

For A. Smith: "Taxes, like restraints, when they are too high, destroy activity, creating despair; and before they reach this extreme level, they increase the wages of workers and raise the price of all goods" (Note 1), Thus he sees that the tax can hinder the people's industry and divert it from certain branches

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of trade or work that would provide occupation and livelihood for many people.

P. Romer (1986), Lucas (1988), and Aghion and Howitt (1992) see that high taxation influences not only the transitory growth rate, but also the rate of long-term growth. Hall and Rabushka (1988) see that the tax burden acts on capital income, comparable to a reduction in the net interest rate, which can alter the distribution of resources between present and future consumption.

Mirrless (1971) found it necessary to find tax rates that take into account the objectives of equity and efficiency, while keeping the state's public finances in good shape. However, the rates were not solved in a synthetic way. The fact remains that this rate is below the rate that would maximise government revenue.

Levine and Renelt (1992) assessed the impact of taxes on trade, i.e., corporate and personal taxes, as well as on social levies. These variables significantly reduce the growth rate if the effects of the investment rate are taken into account. Newbery and Stern (1987), Chambas (1994), and Arthus (1997) found that tax rates have adverse effects on production activity. These authors argue that tax rates in Africa create disincentives to investment.

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Koester and Kormendi (1989) concluded, based on an analysis of 63 countries over the period of 1970 to 1979, that average tax rates do not affect growth, taking into account their endogenous nature and their link to per capita output. However, marginal tax rates reduce economic activity when their effects are controlled by average rates.

Savadogo (2001) has argued that one of the causes of the decline in the multiplication of production activities in Burkina Faso is related to the way in which the amount owed by patentees is determined. According to Savadogo, the taxation procedure is likely to lead investors to limit their action, and thus profoundly affect the economic fabric to direct taxpayers to carry out their production activities.

For Laffer (1974), taxes play an important role in his economic analysis, which is reflected in the Laffer curve by illustrating the relationship between the size of the tax and tax revenue. Thus, the junction between taxes and economic growth reveals a new type of Laffer curve, which still follows the same reasoning as the initial one, called the Laffer growth curve. Its principle reveals that any increase in taxation above a certain threshold could be detrimental to economic growth as previously estimated for our country.

The purpose of this paper is to identify the Laffer growth curve and to make an evaluation of the threshold of the optimal tax burden in Morocco.
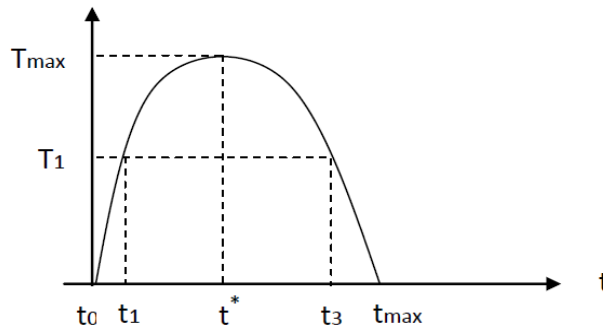
Figure 1. Laffer Curve of Economic Growth

Where t on the X-axis denotes tax rates. In particular, $t*$ is the optimal tax rate and T, on the Y-axis, denotes the tax revenues collected. This curve, which takes the form of an inverted U (bell-shaped), indicates that above a certain threshold of tax pressure, an increase in taxes will have a negative impact on economic growth.

Scully (2006) highlighted the existence of an inverted U-shaped relationship between taxes and economic growth in the case of New Zealand. He used his model, which is based on the assumption of a balanced budget. Using this model, the author found that the optimal tax burden maximizing the growth rate is 20%.

According to the OECD report, the average total tax rate in Morocco is around 49.3%, which is the 38th position out of 53 African countries. This rate is also high compared to the world rate which is around 40%. It should also be noted that the level of taxation is very high in Morocco. The tax/GDP ratio is 26.4% in Morocco in 2016, the third highest rate in Africa, after Tunisia (29.4%) and South Africa (28.5%). Although the public authorities report a drop in the tax burden to 22%, a decrease of 4 points, it seems that this rate is calculated in gross terms by including the agricultural sector, which is almost exempt from taxes. The following table elaborated by us compares Morocco's tax pressure to that of other countries (including social contributions).
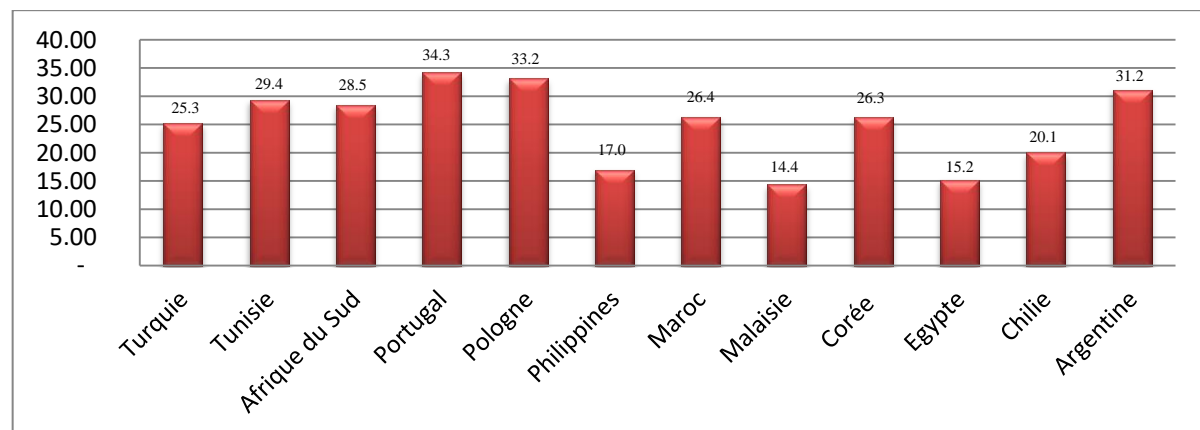

Figure 2. Overall Tax Burden % of GDP Including Social Contribution

Source: OECD (2016).

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Moreover, our estimation of the relationship between the tax burden during 46 years in Morocco shows that when the overall tax burden increases by 1 point the economic growth rate falls by 0.12 point. A priori, this reveals that our economy is on the decreasing part of the Laffer curve. Decomposed by type of tax, it appears that if the direct tax increases by 1 point, economic growth falls by 0.06 point. Similarly, if indirect taxes increase by 1 point, economic growth also falls by 0.06 point. We can therefore ask ourselves about the sustainable tax threshold, with an unchanged tax mix, which could maximise economic growth without harming the well-being of individuals, and how changes in the budget deficit would influence the behaviour of the tax burden.

3. Empirical Analysis Methodology

To identify the Laffer growth curve and determine the optimal tax rate maximizing economic growth for the Moroccan economy we used econometric techniques. This empirical study covered the period from 1990 to 2018.

For this purpose, the econometric evaluation will be divided into two parts. The first consists in calculating the overall tax rate. While the second focuses on the decomposition of the latter into the three main taxes (IR, IS and VAT) and to determine the sustainable tax rate for each tax.

In order to address the issue of tax rate optimality, we considered it appropriate to introduce in the second model the budget deficit as an indicator variable that serves to better make the behavior of the tax rate realistic on the economic growth rate.

As indicated in the models above, the set of variables used to carry out this modeling can be summarized in the following table:

Table 1. Selected Variables and Calculation Method

Variables	calculation method
Real growth rate: TCR	$\dfrac{(pib_t - pib_{t-1})}{pib_{t-1}}$
Tax burden (tax rate): τ	Tax revenue / GDP
Tax pressure squared: τ^2	(Tax revenue / GDP)²
Tax burden indexed by the budget deficit rate	Tax revenues / GDP* F(U, Ū) (Note 2)
Square tax burden indexed by the budget deficit rate	(Tax revenue / nominal GDP)² * F(U,Ū)
Effective tax burden for income tax (IR): $\tau *$	Tax revenue from income tax (IR)/ GDP
Effective tax burden for corporate income tax (IS): $\tau **$	Corporate tax revenue (IS) / GDP
Effective tax burden in respect of value added tax (TVA): $\tau ***$	Tax revenue from value added tax (VAT)/ GDP

Source: Made by myself.

While being based on the whole of the studies prepared to be able to determine the optimal tax pressure, the choice is related to the straightening out of a quadratic model and the execution of a model of regime change.

After the estimate of our models, the results can be presented in what follows where the values between brackets are the T-statistics:

Total model:

The equation hereafter expresses the quadratic total model connecting the GDP and the total tax rate and that raised at square without taking account of the rate of the budget deficit (i.e., without change of the mode).

Quadratic model:

$$\log(GDP)_t = 0{,}65 + 2{,}73\tau_t + 0{,}06\tau_t^2 + 0{,}17\log(GDP)_{t-1} + \varepsilon_t$$
$$(2{,}86)(-2{,}09)(2{,}09)(-3{,}55)$$

The following model integrates, in addition to the tax rates as explanatory variables, the mathematical function collecting the budget deficit. It is called model of regime change with a threshold of budget deficit of 3%.

$$\log(GDP)_t = 0.014 - 0.08\tau_t + 0.002\tau_t^2 + 0.37\tau_t F_1(U,\overline{U}) - 0.0034\tau_t^2 F_1(U,\overline{U}) + 0.35\log(GDP)_{t-1} + \varepsilon_t$$
$$(3.05)(-3.94)(3.98)(2.03)(-1.94)(2.85)$$

Model of regime change with a threshold of budget deficit of 4%:

$$\log(GDP)_t = 0.03 - 0.04\tau_t + 0.001\tau_t^2 + 0.56\tau_t F_2(U,\overline{U}) - 0.01\tau_t^2 F_2(U,\overline{U}) + 2.25\log(GDP)_{t-1} + \varepsilon_t$$
$$(7.44)(-2.20)(2.22)(3.56)(-3.56)(-2.57)$$

As for the model of IR, it is also quadratic and connects the income tax of the natural persons to the tax rates.

Model relating to IR:

$$TCR_t = 3{,}94 + 16{,}2\tau_t^{**} - 2.0\tau_t^{2**} + \varepsilon_t$$
$$(2{,}94)(2{,}60)(-2{,}62)$$

Concerning the model of the IS, it always connects the income tax of the companies to the tax rates corresponding according to a quadratic relation.

Model relating to the IS:

$$\log(GDP)_t = 0{,}04 + 3{,}86\tau_t^* - 30{,}86\tau_t^{2*} - 0{,}86\log(GDP)_{t-1} + \varepsilon_t$$
$$(6{,}47)(2{,}64)(-2{,}12)(-5{,}82)$$

In connection with the VAT, the specified model always connects the VAT including the TIC to the related effective tax rates according to a quadratic relation.

Model relating to the VAT:

$$TCR_t = 3{,}82 + 16{,}27\tau_t^{***} - 1{,}35\tau_t^{2***} + \varepsilon_t$$
$$(4{,}74)(3{,}39)\quad(-2{,}78)$$

Table 2. Various Results of the Bearable Tax Rate

Models	Methodology	First derivative	Second derivative	Optimal tax rate	Effective rates 2009-2018
Global	Quadratic	$2.73 - 0.12\tau = 0$	- 0.12	22.75%	21,80%
	Change of regime (3%)	$0.057 - 0.0028\tau = 0$	- 0.0028	20.35%	
	Change of regime (4%)	$0.52 - 0.018\tau = 0$	- 0.018	28.8%	
IR	Quadratic	$16.24 - 4\tau^{**} = 0$	- 4.00	4.06%	3.70%
IS	Quadratic	$8.86 - 61.72\tau^{*} = 0$	- 61.72	6.25%	4.60%
TVA	Quadratic	$16.27 - 2.70\tau^{*} = 0$	- 2.70	6.03%	5.60%

Source: Made by myself.

4. Discussion of Results

We can notice that the estimates of all the models emphasize a bell-shaped curve between the tax pressure and growth rate since the tax pressure coefficient is positive and that of the tax pressure high squared are negative. For the TIC, the estimates do not show a bell-shaped curve.

Let us start first of all with the total model. Through the quadratic form of this model we obtained an optimal threshold of tax pressure total of 22.75%. This last determines the optimal proportion of imposition compatible with growth rate. This rate shows that the tax pressure in Morocco is completely correct and that Morocco is not for this reason champion. The average effective rate of the tax pressure over the period 2009-2018 is lower than the optimal rate resulting from the curve of Laffer of growth (see Table 2).

It should be stressed that not taken it into account of the defiscalized agricultural GDP and defrauds it and tax avoidance would worsen the tax pressure ratio relatively into force.

On the level of the second model, the optimal tax pressure changed after having taken account of the variable "budget deficit" like indicating variable. It makes it possible to collect the possible influence of the budget deficit on the existing relation between the economic growth and the tax pressure and considering which it represents a data which explains the behavior of imposition.

The optimal tax pressure maximizing the growth became of 20.35%. On the other hand, when one increased the threshold of the ratio of the budget deficit of 1 point, the curve of Laffer moved to the bottom on the right. This is known as that a rise of the average of the ratio of the deficit increases the value of the optimal tax pressure and at the same time lowers the rate of the economic growth. Through these scenarios, we can understand that an increase in the deficit causes an increase in the threshold because of the increase in debt that is spent on unproductive activities. At this level, the government is obliged to increase the fiscal pressure in order to get revenues that will cover public expenditure, which will negatively impact economic growth in the long term.

For IR, the IS and the VAT the estimates show that the average effective rates of the tax pressure over

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period 2009-2018 are lower than the optimal rate resulting from the curves of Laffer of growth relative to each type of tax in particular for the IS.

In connection with the weight of abstract, our analysis of the relation between the tax pressure ratios compared to the weight of the abstract activity and the GDP per capita show that the companies which resist this constraint are generally the companies having abstract activities (partially or completely). Indeed, only the companies having partially or completely abstract activities manage to develop their activities (Figure 3).

Certain activities exerting in sectors with tax incentives or whose activity is very lucrative are able to develop in spite of the very high tax rates. They are the companies of the building or constructions. This leads to an allowance under optimal of the investments in, diverting them of sectors which are more creator of growth and employment.
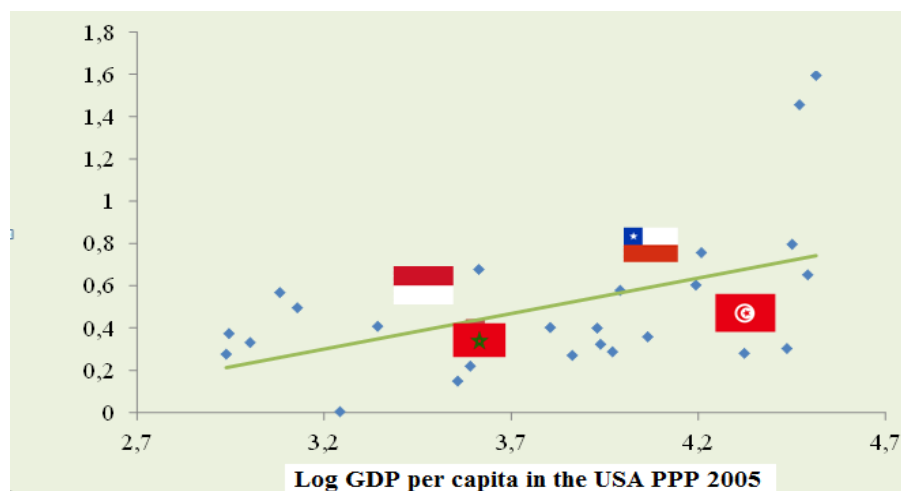

Figure3. Ratio of the Tax Burden to the Weight of the Informal Sector

Source: Prepared by the authors (world bank data).

5. Conclusion

All in all, the lesson drawn from the various econometric tests and the international comparisons, suggests that tax proportioning between income taxes of the factors and consumption taxes must be done in favor of the excise duties. The fiscal policy for the 10 years to come must obviously aim at a better tax justice by tax, taxpayer and sector through the total suppression of the exemptions and the revision of the rates of the taxes while making them progressive and not regressive as it is the case with the current mode in particular on the level of IR. For the VAT, the studies on the VAT in the developing countries are still rare, but it is increasingly clear that the VAT is not a particularly regressive tax.

In a more general way, little of taxes are well adapted to the continuation of objectives of equity. They are known as regressive. The policies of expenditure are often a much better means of achieving these goals, although the capacity of targeting of the expenditure is very limited. Today, in spite of impressive successes of the VAT, its potential fully was not exploited yet, nor perhaps fully

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included/understood in our country.

References

Arnold, J. M., Brys, B., Heady, C., Johansson, A., Schwellnus, C., & Vartia, L. (2011). Tax Policy for Economic Recovery and Growth. *The Economic Journal*, *121*, F59-F80. https://doi.org/10.1111/j.1468-0297.2010.02415.x

Chambas, G. (1994). *Fiscalité et développement en Afrique Subsaharienne*. Paris, Economica.

Chamley, C. (1986). Optimal Taxation of Capital Income in General Equilibrium with Infinite Lives. *Econometrica*, *54*. https://doi.org/10.2307/1911310

Easterly, W., & Rebelo, S. (1993). Fiscal policy and Economic Growth: An Empirical Investigation. *Journal of Monetary Economics*, *32*. https://doi.org/10.1016/0304-3932(93)90025-B

Koester, J., Reinhard, B., & Kormendi, R. C. (1989). Taxation, Aggregate Activity and Economic Growth: Cross-Country Evidence. *Journal of Public Economics*, *80*. https://doi.org/10.1111/j.1465-7295.1989.tb02011.x

Levine, R., & Renelt, D. (1992). A Sensitivity Analysis of Cross-Country Growth Regression. *American Economic Review*, *82*(4).

Lucas, R.E., & Rapping, L. A. (1969). Real Wages, Employment, and Inflation. *Journal of Political Economy*, *77*, 721-754. https://doi.org/10.1086/259559

Mirrlees, J. A. (1971). Une exploration de la théorie de la taxation optimal de revenus. *Review of Economic Studies*, *38*. https://doi.org/10.2307/2296779

NewberY, D. M., & Stern, N. H. (1987). *The Theory of Taxation for Developing Countries*. New York and Oxford University Press for the World Bank.

Ramsey, F. (1928). A Mathematical Theory of Saving. *Economic Journal*, *38*. https://doi.org/10.2307/2224098

Rapport du HCP. (2007-2008-2009-2010-2011-2012). *Comptes nationaux: Base 2007*.

Rapport du Ministère d'Economie et des Finances (République du Sénégal). (2012). *L'effort fiscal et l'équité fiscal*.

Rapport OCDE. (février 2018). *Examen des Statistiques D'investissements Directs Internationaux au Maroc*.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, *94*. https://doi.org/10.1086/261420

Sato, K. (1967). In capital theory Theorem and Switching of Techniques. *Revue d 'Économie Politique*.

Savadogo, S. (2001). *Décentralisation au Burkina-Faso: Une approche en économie institutionnelle*. Université de Fribourg, Suisse, 2010.

Smith, A. (1881). *Recherche sur la nature et les causes de la Richesse des Nations*. Edition française Guillau- min et Compagnie.

Notes

Note 1. Cited by Laurent, A., & Reichman, C. (2000). Théories contre l'impôt, Paris, Les belles lettres, p. 6.

Note 2. By way of explanation, the transition function emanates from the deficit ratio, which is indexed by binary variables. These are obtained in this way: When $\bar{U} > U \rightarrow F = 1$; $\bar{U} < U \rightarrow F = 0$.