Impact of tax policy in sub-Saharan territories on Moroccan FDI:
An econometric cointegrating panel modelling experiment,

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Summary:

Since the 2000s, inflows of FDI into sub-Saharan countries from Morocco have increased significantly in the context of south-south cooperation and the economic integration of Morocco in its African continent. However, the volume of Moroccan FDI flows to sub-Saharan territories differs from one country to another, and this is explained by the heterogeneity of the factors of localization of FDI, including the fiscal policy of these countries, which constitutive an important determinant of the attractiveness of FDI alongside socio-political-economic conditions.

Therefore, This work raises the question on the contribution of the fiscal policy of the countries of sub-Saharan Africa on the attractiveness of Moroccan foreign direct investment (FDI) using the econometric methodology to study this impact and particularly the co-integration approach with dynamic panel data for the period 2004-2017.

The result confirms the evidence of the co-integration of the panel between FDI and the variables of fiscal policy. As a result, we found that Moroccan inward FDI is influenced positively by the tax payment score and negatively by the tax rate on profits. However, the effects of the tax burden and the total tax rate are not identified.

Key words: Foreign direct investment, territorial attractiveness, tax incentive, panel co-integration.
Impact de la politique fiscale dans les territoires subsahariens sur les IDE marocains : une modélisation économétrique de cointégration de panel

Résumé :

Depuis les années 2000, les flux des IDE entrants dans les pays subsahariens provenant du Maroc monteraient significativement dans le cadre de la coopération sud-sud et l'intégration économique du Maroc dans son continent africain.

Néanmoins, le volume de flux des IDE marocains vers les territoires subsahariens se différent d'un pays à l'autre, et ce, s'explique par l'hétérogénéité des facteurs de localisation des IDE, y compris la politique fiscale desdits pays, qui constitue un déterminant important de l'attractivité des IDE à côté des conditions socio-politico-économiques. De ce fait, Ce travail pose la question sur l'apport la politique fiscale des pays de l'Afrique subsaharienne sur l'attractivité de l'investissement direct étranger (IDE) marocain en utilisant la méthodologie économétrique pour étudier cet impact et particulièrement l'approche de co-intégration avec des données de panel dynamiques sur la période 2004-2017.

Le résultat confirme la preuve de la co-intégration du panel entre l'IDE et les variables de la politique fiscale. En conséquence, nous avons constaté que les IDE marocains entrants sont influencés positivement par le score de paiement des impôts et négativement par le taux d'imposition sur les bénéfices. Cependant, les effets de la pression fiscale et du taux d'imposition total ne sont pas identifiés.

Mots-clés: Investissement direct étranger, attractivité territoriale, incitation fiscale, co-intégration des panels.
Introduction

The competition has been intensified on the European markets since a decade ago, pushing Moroccan firms to reoriented themselves into the African territories, which additionally becomes an area of entrepreneurial development for any sort of companies. Furthermore, the 2007 financial crisis, that hit the world economy, had a negative impact on the trade balance of Moroccan economy, especially the one with the members of European Union. Eventually, this vulnerability encouraged Morocco to shift their interest center from the north to the south by diversifying its sub-Saharan partners.

In this context, the average annual flows of Moroccan FDI toward sub-Saharan territories are estimated at 100 million US dollar in 2010, which making it 92% of the total flow of Moroccan direct investments abroad. In 2015, these average annual flows are estimated had been tripled to 300 US dollar.

On the other hand, stimulating private investment in the sub-Sahara African territories has become an urgent to put in place well elaborated fiscal policy in order to encourage foreign firms to make investment decisions and to commit capital in the acquisition of means of production. A foreign-friendly fiscal policy is able to adjust its tools to the requirements of the investment community. The most common measure is the tax incentives for investment wildly used by sub-Saharan decision makers in order to become elements of the economic landscape. Hence, The African fiscal policy is multiplying the incentives to boost the foreign investment through their code of investments.

Considering that the other determinants of foreign direct investment have been largely and sufficiently treated by a multitude of theoretical as well as empirical literature, the present research focus only on fiscal policy and taxation as an important determinant of FDI investment in sub-Saharan Africa, in particular Moroccan capital, in trying to answer the question next major question: to what extent does fiscal policy impact the inflow of Moroccan FDI into sub-Saharan Africa?
The objective of this article is to empirically analyze the impact of the weight of the fiscal policy in sub-Saharan Africa on the attractiveness of Moroccan foreign direct investment (FDI) in sub-Saharan African countries, using the dynamic panel cointegration approach.

Our article is organized as follows: Section 1 presents the literature review on the relationship between FDI and the host country tax system, while Section 2 empirically analyzes the impact of fiscal policy on attractiveness of Moroccan FDI.

1. literature review

1.1. Importance of FDI and taxation in the host economy

Almost all policymakers are keen to attract foreign direct investments by using different measures. Those foreign capital flows can increase a significant level of unemployment, enhance domestic technologies, bring new knowledge and, more generally, boost economic growth. In addition, the increasing GDP and domestic income is shared by the government through the taxation of foreign-controlled firms and its workers, which increase also the public investment in infrastructure and social programs (Diamond et Mirrlees, 1971). All these potential advantages given by FDI, decision makers are systematically reviewing their tax laws to ensure that their economy is enough attractive for foreign corporations (Benassy-Quere et al., 2003).

Fiscal policies can also attract foreign firms, as long as their investment can be effective in securing access to other markets and achieving economies of scale, which results an increasing in gross domestic production. However, governments are struggling to find an equilibrium in in the same time between the objective of attracting FDI with a competitive fiscal environment and the objective of ensuring a fairly distributed tax burden on multinationals.

In other hand, while it is recognized that taxation system and fiscal policy is an important determinant of investment decision, FDI is also attracted to another factors as market access and profit prospects; fair judiciary system that is a predictable and non-discriminatory; macroeconomic stability; a skilled and responsive workforce; an open economy and developed infrastructures. However, in the second section, we use an innovative empirical tool to identify the relationship between taxation and FDI without interfering the other determinant and resulting in the same time robust non biased estimators.
1.2. Taxation is a determinant of FDI

The reaction of foreign direct investment to which optimal level of corporate tax in a host economy is the main debate in the literature. In order to attract FDI, tackling this problematic is essential and crucial to determine how to deal with the stakes for a competitive fiscal system. Furthermore, it is important to analyse the costs and benefits of tax holidays for these investments and to estimate the impact of potential tax policy reforms on tax revenues.

Studies on international flows show that FDI decreases by 3.7%, in average, following a 1% increase in the tax rate applicable to it (Ohno, 2010). Generally, the decreases are estimated between 0% and 5% which is explained by the differences between the countries the sectors studied, or the study periods concerned. For instance, recent analysis find that foreign direct investment is becoming more fiscal sensitive, which is explained by the increased mobility of capital flows as non-tax obstacles to FDI are removed and permit to study and estimate the long-run impact of corporate tax on FDI attractiveness.

In measuring FDI responses to fiscal reforms, one of the reservations is the question of what is the impact of fiscal policy on FDI decisions and what are the tax rates taken in account by investors? Comparisons may emphasis on the "posted" statutory rates of business income tax. It is also possible that effective tax rates or marginal effective tax rates may be more significant than posted rates, in that they include provisions determining the fraction of profits that are taxable.

The average effective tax rates predict the average tax burden valid to investment ventures while the marginal effective tax rates predict the marginal tax burden (on the last unit of capital invested in a given venture, after the collapse of profits) (An, 2003). Statutory tax rates may differ expressively from actual rates, as taxable profits differ from real (economic) profits. The question also ascends of what is the role of tax planning.

Another struggle arises from the fact that FDI responses to fiscal reforms may differ from one country to another (contrary to the assumption adopted by heterogenous analysis frameworks) and that one can assume that they depend on a number of issues that are hard to measure and take into account. Recent studies confirm the sight that the response of FDI to fiscal policy
depends on the host country and the mobility of the industries on which the tax base is based (Kemsley, 2003). In particular, when corporations benefit from the site of their production in large markets in order to cut the costs of trade, such as logistic costs, a certain grade of inertia in the choice of location of firm can be predicted. Due to host economy benefits and a certain capital flow fixity, profits can be taxed to a certain level without discouraging foreign investment (Barthel et al., 2009).

This view is consistent with the finding that a number of OECD countries with huge markets and large inflows of FDI have relatively high corporate tax rates. Other empirical models also advocate that the optimal tax rate for business inclines to decline as trade costs decrease and capital flow becomes more mobile (Gordon, 1990). This point is steady with the finding that a number of economies apply a lower tax burden to more mobile industrial or commercial sectors such as shipping, head office activities and film production.

2. Analysis model

2.1. Specification of the empirical model

As mentioned in the first section, literature has pointed many determinants of investment decision making as the size of the market; good institutional quality; skilled and/or skilled workforce and macroeconomic policy. However, our research interest keens to identify the impact of fiscal policy on FDI by using cointegration approach. Due to the availability of data, we only use four indicators that give us an image about the weight of the fiscal policy on FDI inflows. Thus, the study will consider a model as follows:

\[
FDI_{it} = \alpha + b_1 TB_{it} + b_2 TPS_{it} + b_3 TR_{it} + b_4 TRP_{it} + \mu_{it}
\]

Where:

- FDI : Net flows of Moroccan FDI in country i in year t;
- TB : The tax burden of a country i in year t;
- TPS : The tax payment score of a country i in year t;
- TR: The total tax rate of a country i in year t;
- TRP: The tax rate on the profits of a country i in the year t;
- \(\mu_{it}\) : The error term.
2.2. Explanatory variables

In order to conduct our empirical analysis, it is important to present and explain the exogenous variables, their importance in the analysis and their indication as fellows:

- **Doing Business Score of Payment of Taxes**: It is elaborated as the average of scores grading the number of payments per year, the total taxes and contribution rate as percentage of profits, the classification index between 0 and 100 and the time in hours.

- **Tax burden**: it is the sum of cash flow collected from taxes, social security contributions and other forms of income such as fees, fines, rents and income from goods or sales.

- **Total tax rate**: it measures the amount of taxes and mandatory contributions owed by businesses after the declaration of allowable deductions and exemptions as a share of commercial profits. Taxes withheld (such as personal income taxes) or collected and remitted to the tax authorities (such as value-added taxes, turnover taxes, or goods and services taxes) are not accounted for.

- **Tax rate on the profits**: is the amount of taxes on profits paid by companies.

2.3. Methodology

According to the literature review discussed above, the taxation system impacts FDI attractiveness. Indeed, the cointegration panel analysis does not aim to isolate the effects of fiscal policy on the FDI, by working on specific transmission channels, but on the contrary, its objective is to capture the effects overall. This provides a major argument in favor of the bivariate, and / or bidirectional approach, while also avoiding serious estimation problems such as autocorrelation, heteroskedasticity and multi-collinearity and endogeneity.

According to current practice of this approach, it has been used to avoid complications resulting from the indirect causality of the so-called auxiliary variables which have been taken into account in a multivariate framework.
2.4. Research hypotheses

To study the impact of taxation in the sub-Saharan territories on the attractiveness of Moroccan FDI, we must examine the following hypotheses:

- **H1:** Tax payment score impacts positively the inflow of Moroccan FDI in sub-Saharan territories.
- **H2:** Tax pressure impacts negatively the inflow of Moroccan FDI in sub-Saharan territories.
- **H3:** Total tax rate impacts negatively the inflow of Moroccan FDI in sub-Saharan territories.
- **H4:** Tax rate on profits impacts negatively the inflow of Moroccan FDI in sub-Saharan territories.

2.5. Data sources

Our research aims to study the impact of tax policy and fiscal policy weight on Moroccan foreign direct investment in African territories. In order to do so, our empirical analysis is based on panel data of seventeen (17) sub-Saharan countries across 14 years. For the Moroccan net flows of FDI in these countries, the only source of the data is the Office des Changes using its Balance of Payments.

The countries taken into account are seventeen: The other sub-Saharan countries are not included in the empirical study because of the lack of data on one and the non-significance of Moroccan FDI for another. Regarding the temporal data, we took only the data between 2004 and 2017 according to the documents published by the Exchange Office concerning the Balance of Payments and the Global Financial Position. For the Tax policy data, we took those extracted from the databases provided by the World Bank.
3. Results and discussion

Step 1: Testing Unit root

Table 2: Summary of unit root tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Common unit root</th>
<th>Individual unit root</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LLC</td>
<td>Breitung</td>
</tr>
<tr>
<td>FDI</td>
<td>I(0)</td>
<td>I(2)</td>
</tr>
<tr>
<td>TB</td>
<td>I(0)</td>
<td>I(2)</td>
</tr>
<tr>
<td>TPS</td>
<td>I(0)</td>
<td>I(2)</td>
</tr>
<tr>
<td>TR</td>
<td>I(0)</td>
<td>I(2)</td>
</tr>
<tr>
<td>TRP</td>
<td>I(0)</td>
<td>I(2)</td>
</tr>
</tbody>
</table>

Source: Author's estimates

We begin with common unit root tests that assume the existence of homogeneity between African countries. First of all, according to the LLC and Hadri tests, the time series of the variables are significantly stationary in level at the 1% significance: we can reject the null hypothesis that these series have a common unit root.

Therefore, both tests confirm that our variables are integrated at level I(0). However, the Breitung test cannot reject the null hypothesis of unit root at level and at first difference, the series only become stationary after the second difference (the variable integrated in the second order I(2)). Generally, the majority of tests conclude that the series of variables are stationary at the level: Variables are integrated at level I(0).

Now, we reject the hypothesis of the homogeneity of the variables and we accept the hypothesis of heterogeneity, namely that the results are different from one country to another. Moreover, the IPS, ADF and PP tests, assuming heterogeneity, do not confirm the existence of an individual unitary root at the level: one can reject the null hypothesis that the individual series having a unit root at the threshold of 1% and 5%. However, only the IPS test cannot reject the null hypothesis of the existence of an individual unit root in the time series of the TC variable. Generally, according to the majority of individual unit root tests, the time series of the two variables are stationary at the level: they are integrated at the first order level I(0).
Generally, the majority of unit and common unit root tests confirm the stationarity of the time series at the level of variables, which means that the series follow an integration process at level I (0). Following the results of the panel unit root tests, and the confirmation of an integration of the variables at the I (0) level, the next step is to test the cointegration of the panel between the variables.

**Step 2: Testing panel cointegration**

<table>
<thead>
<tr>
<th>Pedroni Specification</th>
<th>Within Dimension</th>
<th>Between Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Panel rho</td>
<td>Panel PP</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.57244</td>
<td>-0.95434</td>
</tr>
<tr>
<td>None</td>
<td>-0.4494</td>
<td>-0.26695</td>
</tr>
<tr>
<td>Kao</td>
<td>-1.309211 (0.0952)***</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Author’s estimates

Note: *, **, *** indicate significance at the level of 1%, 5% and 10% respectively. The delay maximum selection is automatic by the software using the CIS as a benchmark.

Assuming the existence and absence of an intercepts in the test equation, the null hypothesis of no cointegration between the FDI on the one hand and TB, TPS, TR and TRP cannot be rejected. On the other hand, at the intra-dimensional or inter-dimensional level. Only the Group PP test that can reject the non-cointegration hypothesis at the 1% threshold.

On the other hand, the Kao test, using the ADF statistic, can reject the null hypothesis of non-cointegration between the FDI and the variables concerned and accepts the alternative hypothesis of a long-term dynamic relationship. at the threshold of 10%.

In conclusion, we could say that the variables are cointegrated in the long term; which means that they are positively associated with each other.
Step 3 : Testing long-run impact

Table 4: Results of estimates of long-term impact on FDI.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>T statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td>53,05089 (0.1758)</td>
<td>1.363141</td>
</tr>
<tr>
<td>TPS</td>
<td>84.81807 (0.0000)*</td>
<td>5.218442</td>
</tr>
<tr>
<td>TR</td>
<td>-16.50942 (0.4976)</td>
<td>-0.680767</td>
</tr>
<tr>
<td>TRP</td>
<td>-450.9112 (0.0001)*</td>
<td>-4.153516</td>
</tr>
</tbody>
</table>

Note: the numbers are the p-values. The null hypothesis: the estimators have no meaning; *, **, *** indicate a significance respectively at the level of 1%; 5% and 10%. For the PDOLS, the selection of delays (lags) and offsets in future (leads) is automatic by the logic using the CIS as a benchmark.

With the assertion that the variables are cointegrated, the long-term relationship is estimated using the PDOLS cointegration regression technique proposed by Pedroni (2001). These estimators have the advantage that they produce unbiased estimates even with endogenous regressors and allow the coefficients to differ between countries.

Based on the results, cannot reject the null hypothesis that the TB variable does not impact FDI because the p-value exceeds the 10% threshold and the absolute value of t-calculated is less than 5%. This result indicates that Moroccan investors do not take into account the weight of tax revenues in the sub-Saharan economy, this can be explained by the fact that this indicator includes not only corporate taxes but also the added-value tax, customs, and various sources of tax. As a result, the change in the tax burden does not necessarily reflect the tax burden borne by the company.

On the other hand, it turns out that the TPS variable is significantly positive at the 1% threshold. This result is easy to explain since this variable is one of the Doing Business indicators developed by the World Bank to measure the parameters that influence the decision of multinational firms to relocate in a given territory. As a result, the ease of payment of taxes and tax procedures has a positive impact on FDI inflows. However, the TR variable is also insignificant, which is explained by its overall composition which includes not only the direct tax on society but all indirect taxes and social contributions. And finally, the TRP variable is significantly positive at the 1% level, since the company is interested in the direct tax paid on its commercial profits.
Conclusion and prospects

Our article establishes an empirical analysis of the impact of fiscal policy in Sub-Saharan economies on Moroccan FDI inflows attractiveness. Empirical results claim that Moroccan investors take into account the delay and ease of payment procedure for taxes as an important factor of investment. Also, the tax rate on commercial profits is a negative determinant of Moroccan FDI in Africa. However, no significance is proven for the tax burden variables and the total tax rate.

Finally, as part of the research hypotheses formulated above, the results lead us to:

- Confirm H1: The tax payment score positively impacts the inflow of Moroccan FDI.
- Infirm H2: The tax burden does not impact the inflow of Moroccan FDI.
- Infirm H3: The total tax rate does not negatively impact the inflow of Moroccan FDI.
- Confirm H4: The tax rate on profits negatively impacts the inflow of Moroccan FDI.
Bibliography


