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THE EFFECT OF FOREIGN DIRECT INVESTMENT ON TAX REVENUE IN DEVELOPING COUNTRIES

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Abstract:

Internal resource mobilisation remains a big challenge for developing countries. While many studies have attempted to highlight several strategies to increase tax revenues, the contribution of FDI flows in this process has received little attention. When discussing the link between FDI and tax revenues, two opposing mechanisms may be at play: (1) FDI inflows could boost tax revenues by broadening the corporate income tax base with a new entry (new investment); (2) to attract FDI, many developing countries grant large tax exemptions to new investors who can sometimes lead to unfair competition, FDI inflows may not result in a significant increase in tax revenues. This paper tries to provide an empirical answer to FDI inflows' crucial role in tax revenue mobilisation. Using a System GMM system estimator for 90 developing countries over the period 1990 – 2017, our results strongly suggest that FDI inflows lead, to a significant tax revenue increase. Nevertheless, this effect is not observed in resource-exporting countries where tax revenues seem statistically insensitive to FDI inflows.

Keywords: Foreign direct investment, tax revenue, System GMM, resource exporting countries.

JEL Codes: F21 - H20 – E62

INTRODUCTION

Considerable financing gap threatens the achievement of the SDGs included in the 2030 agenda especially in developing countries. According to UNCTAD (2014), developing countries should mobilise an average of \$5 trillion per year to cover their financing needs, but only about half of this amount, i.e., \$2.5 trillion per year, can be mobilized. Consequently, the mobilisation of all sources of financing becomes imperative.

In this context, since the United Nations conference in Addis Ababa in 2015, much hope has been placed in tax revenues. According to the World Bank (2017), tax revenues should represent between 50% and 80% of the resources needed to finance sustainable development goals (SDGs). However, the tax revenues mobilised by most of these countries are below the standard proposed by the IMF for this purpose, i.e., 20% of GDP. For example, in 2018, out of a sample of 92 developing countries, the share of revenue in GDP of 74 developing countries was less than 20%. Besides, 65 countries in the sample had a ratio of less than 17%. This lack of internal resources has led several academics and institutions to address the issues through key determinants of internal revenue mobilisation (Baunsgaard and Keen, 2010; Brun et al., 2005; Chambas, 2005). Alongside this, it would be relevant to analyse the correlation between external sources of finance and internal revenue mobilisation, particularly that of FDI and tax revenues.

FDI is the primary source of external financing for developing countries, ahead of migrant remittances and official development assistance (ODA). In 2018, developing countries had mobilised \$699.3 billion in FDI (UNCTAD, 2020), \$529 billion in remittances and \$160.4 billion in ODA (World Bank). The importance of FDI has thus given rise to significant academic and practical debates on its effects on the host country's economy through careful testing of its main determinants. Its effects on growth, knowledge transfer and poverty have received considerable attention in the literature, but its contribution to tax revenues remains little explored to date.

In principle, by contributing to the host country's productivity, FDI could directly increase tax revenues through corporate taxes (CITs), personal income taxes, income taxes, royalties, and indirectly through VATs.

From a direct point of view, companies benefiting from FDI will increase their productivity. This could increase its industrial and commercial profit (ICP). Thus, the increase in the ICP of

these companies will widen the taxable base of the corporation tax and thus increase tax revenues. Besides, when FDI flows go to labour-intensive sectors, this is done to increase the job supply and thus the wage bill. This medium could increase the personal income tax base. According to Zhang, (2001), FDI increases tax revenues through job creation. The diffusion of technology and knowledge transfer resulting from FDI could increase productivity in the host country and thus generate income (Danielova and Sarkar, 2011; Gajigo et al., 2012; Nguyen et al., 2014). This will allow the EMN to benefit from dividends and the public administration to increase its tax revenues through income taxes.

Indirectly, FDI could result with consumption in two ways, on the supply and demand side. When FDI contributes to the increase in the production of goods and services offered on the domestic market, it could increase VAT revenues. On the other hand, the increase in demand for goods and services because of increased employment could increase VAT receipts. This would lead to an increase in tax revenues.

Notwithstanding these likely benefits, they may be neutralised and even more than neutralised under certain conditions. Indeed, MNEs can implement tax optimisation policies through transfer pricing practices favourable to the reduction of MNE revenues. This medium reduces the tax potential of this activity and reduces corporate tax (Fuest and Riedel, 2009; Gropp and Kostial, 2001; UNCTAD, 2012). Moreover, competition between countries to attract FDI leads them to implement tax incentive policies through tax exemptions and or reductions in tax rates could offset the expected positive effects ((Fuest and Riedel, 2009; International Monetary Fund Staff, 2011; Zee et al., 2002). Also, the practice of bribery between tax administrators and foreign companies in specific industries could lead to lower tax revenues (Bornhorst et al., 2009; Ehrhart, 2011).

Because of the above, we cannot predict the effects of FDI on tax revenue mobilisation. Thus, this effect will be positive if the advantages outweigh the disadvantages, neutral if the two outweigh each other, and negative if the disadvantages outweigh the disadvantages. Therefore, to analyse the effect of FDI on tax revenues, an empirical study will have to be carried out to determine this relationship.

The paper's contribution is twofold: firstly, it expands the literature on both the effect of FDI inflows and the drivers of tax revenues in developing countries. Some studies (Becker et al., 2012; Bénassy-Quéré et al., 2005; Rochananonda, 2006) have examined the correlation between tax revenues and FDI, but they have focused only on the impact of tax and fiscal

policies on attracting FDI, without exploring the opposite direction. Most studies on the determining factors of tax revenues have not considered the impacts of FDI.

Secondly, it contributes to the literature on the topic by estimating the impact of FDI on tax revenue mobilisation for developing countries in general and resource exporting economies more particularly. To our knowledge, this is the first study that analyses the effect of FDI on tax mobilisation for resource exporting economies from developing countries.

The remainder of the paper is structured as follow. Section 2 presents theoretical and empirical literature on the relationship between FDI and tax revenue mobilisation. Section 3 presents the empirical methodology used to estimate the impact of FDI inflows on tax revenue. Section 4 describes the data used and provides some stylised facts for this study. Section 5 discusses the empirical results and runs some robustness checks, while section 6 concludes the study.

THEORETICAL AND EMPIRICAL LITERATURE ON THE IMPACT OF FDI ON TAX REVENUE

This subsection reviews the theoretical studies on the relationship between FDI inflows and tax revenue collection. The theoretical framework section analyses the transmission channels through which FDI nets inflows' variations may affect tax revenue. The empirical reviews section reviews the literature on the effect of FDI nets inflows on tax revenue.

Review of theoretical literature

The literature on FDI partly indicates that FDI can have a positive impact on tax revenues. However, for other studies, the positive impacts of FDI on tax revenues do not automatically materialise. FDI can hurt tax revenues in several ways. The direction of the effects of FDI depends on the political and economic structure prevailing in the host country.

The positive effect of FDI on tax revenue

This positive impact can either be direct (through productivity, technology transfer, job creation) or indirect (consumption, trade, employment). By providing financial resources for establishing activities in the formal sector, FDI inflows are likely to generate additional value-added tax (UNCTAD, 2012). Besides, by contributing to new jobs, FDI inflows might generate tax revenue on labour income (Fuest and Riedel, 2009; UNCTAD, 2012). By improving exports and facilitating access to markets or supplies, FDI is likely to increase customs duties revenue (Anwar and Nguyen, 2011). Knowledge transfer and technology dissemination are

ways in which FDI can also fund the exploitation of natural resources and generate income. Capital gains and profits generated by FDI contribute to corporate tax revenues in the said host country (Danielova and Sarkar, 2011; UNCTAD, 2012). As highlighted by Fuest and Riedel (2009), most poor populations in developing countries are not subject to taxation. Therefore, by supporting investment and employment opportunities, FDI inflows can contribute to revenue mobilisation by broadening the taxpayer base and generating more tax revenue. For countries with important natural resources, FDI inflows directed toward those sectors are likely to generate royalty which might be large enough.

Ehrhart (2011) illustrated that in resource-rich countries, democratic institutions are vital because of their higher levels of transparency, leading to the positive effects of the initial natural resource rent on domestic tax revenues. Given that most FDI is directed to natural resource exploitation activities in developing countries, it can be inferred that higher levels of transparency can have a positive impact on the income that foreign direct investment can generate. An excellent institutional environment will attract more foreign investors and ensure their effective participation in tax revenues.

The negative effect of FDI on tax revenue

Many studies explain how FDI can shrink the tax base through several mechanisms and factors. Revenue mobilisation could be affected by the "negative consequences" of tax incentives, tax evasion and tax fraud and avoidance by multinational companies, overly competitive conditions that can crowd out domestic and local companies, and the pursuit by tax authorities and multinational companies of income from rent-seeking activities.

UNCTAD (2012) shows that foreign direct investment can generate financial resource outflows in the repatriation of income or costs. According to Gropp and Kostial (2001), multinational groups can transfer taxable income to countries with a less restrictive tax system, through "transfer pricing" and other tax mechanisms such as debt financing. Gropp and Kostial (2001) take the following example: a multinational in a high-tax country that produces a good with a branch's inputs in a low-tax country. For B2B trade, the multinational has an incentive to overestimate the price of inputs, increasing profits in the low-tax country and reducing profits in the high-tax country, thereby minimising global tax obligations. Fuest and Riedel (2009) explain that profit displacement by multinationals acts by distorting trade prices. For these authors, the prices of goods exported to developing countries suffer an upward distortion. On

the other hand, the prices of goods imported from developing countries remain artificially low, so that income generated in developing countries accrues to developed economies.

Zee et al. (2002) point out that the widespread use of tax incentives to attract foreign direct investment has several negative consequences (in terms of lost revenue). For Zee et al. (2002) and Fuest and Riedel (2009), FDI can produce tax revenue losses through the existence of tax incentives such as Free Economic Zones, where goods are generally exempt from duties and taxes, corporate taxes are low or zero. Zee et al. (2002) explain it: First, these incentives reduce the tax base. Second, tax incentives distort the allocation of resources for activities that benefit from tax advantages to others' detriment. Finally, tax exemptions create opportunities for corruption and rent-seeking. Therefore, the lack of visibility in the treatment of exemptions may have an impact on revenue. On this line, the International Monetary Fund staff (2011) show that the revenue effects of FDI could substantially reduce when large tax cuts accompany FDI.

For UNCTAD (2012), FDI can, in some situations, crowd out domestic corporations, particularly Small and Medium-Sized Enterprises. In the same vein, FDI can reduce the proportion of taxpayers and limit these national units' taxation.

For Zee et al. (2002), tax incentives to attract FDI create corruption and business opportunities that generate socially unsuccessful profits and have an enormous impact on income. The pursuit of rents is likely linked to natural resource exploitation activities (Bornhorst, et al. 2009). Most foreign companies are involved in this sector, particularly in African countries. Corrupt practices between tax officials and foreign companies in this sector can lead to lower tax revenues. Because of this analysis, it is difficult to determine the net impacts of FDI on tax revenues a priori.

Review of empirical literature

The economic literature has much focused on the effect of taxation on FDI attraction and revealed that taxations are a crucial determinant of FDI inflows and there was a negative relationship between tax rates and FDI inflows (Bénassy-Quéré et al., 2005; Devereux and Freeman, 1995; Loretz, 2008; Tabasam, 2014). Nevertheless, there are a few studies which analysed the effect of FDI on tax revenue. Furthermore, the rare studies on these issues found an ambiguous result (Gropp and Kostial, 2000; kimm Gnanon, 2017; Mahmood and Chaudhary, 2013; Tabasam, 2014).

The earlier literature typically found a positive relation between FDI and government revenue.

Dunning, (1993) and Raff and

Srinivasan, (1998) focus their investigation of FDI effect through the determinants of tax revenues. Dunning (1993) argued that welfare effects of FDI in host country depend on the bargaining power of host country with foreign investors, including either by offering the tax rebates on energy or labour costs to attract foreign investment or by imposing the tax. Whereas Raff and Srinivasan (1998) have claimed that FDI could create employment, local labour's training transferred technology and better management skills; the government should lose some tax revenue to attract foreign investment inflow.

In one of the early empirical studies, Gropp and Kostial (2000) analysed the correlation between FDI, Taxation, and revenues of corporate tax in 19 OECD countries over the period 1987-1997, using panel data analysis and found that FDI inflows affected the corporate tax revenues positively. Mahmood and Chaudhary (2013) analysed the effect of FDI on the total tax revenue in Pakistan during 1972-2010 and revealed that FDI inflows affected the total tax revenues positively. However, the results may not be generalised to other countries in the MENA's regions.

Okey, (2013) also studied the effect of FDI inflows on tax revenue mobilisation in West Africa over 1989-2009. Using a panel regression, he concluded that FDI inflows have a positive effect on tax revenues. However, the findings may not be generalised to other countries of the South Saharan Africa because the investigation is limited to only French-speaking members of ECOWAS (Economic Community West African States) and these countries are political and economic characteristic different with English speaking countries in the West African Region.

In another study, Bunescu and Comaniciu, (2014) studied the economic and non-economic factors that affect tax revenues in 27 EU countries over 1995-2011. Using correlation analysis, they revealed that FDI inflows had a weak positive effect on the tax revenues. On the other side, Tabasam (2014) investigated the interaction among tax revenues and the foreign capital inflows (FCI) in Pakistan during 1975-2012. Using time series analysis, he concluded that FDI inflows hurt tax revenues. Besides, Aslam (2015) examined the long-run relationship between FDI inflows and tax revenues in Sri Lanka over 1990-2013 and discovered that FDI inflows significantly positively contributed to the tax revenues.

Bal and Fazl, (2016) also studied the impact of FDI inflows on firms' tax payments at different levels of technology in Turkey over the period 2004-2012 and found that FDI inflows increased the tax payments of firms and that the effect was more extensive in high-technology firms.

Kimm Gngangnon (2017) analysed the effect of FDI on government revenue. Using panel data over the period 1980-2013, he found that the effect of FDI on government revenue depends on FDI inflows' level. However, the transformation of FDI in logarithm by Kimm Gngangnon (2017) can suffer from the error of measure, given that FDI contains negative values. Finally, Bayar and Ozturk (2018) investigated the impact of foreign direct investment inflows on tax revenues in OECD countries with a panel cointegration and causality analysis during the 1995-2014 period. They found that there was one-way causality from foreign direct investment inflows to total revenues.

SPECIFICATION OF THE MODEL AND ECONOMETRIC METHODS

This section focuses on the specification of the empirical model for estimating the impact of FDI flows on total tax revenues and the estimation method used to estimate this empirical model.

Empirical Model specification

Because of the inertial tax structure of developing countries and the fact that a country's current fiscal capacity depends on its inherited fiscal capacity from the past (Besley and Persson, 2013) 2013), previous studies on tax effort estimate that the level of current tax revenue in each country is affected by its past values (Gngangnon and Brun, 2017; Gupta, 2007; Leuthold, 1991; Yogo and Ngo Njib, 2018). We consider and specify a dynamic panel data model to estimate the impact of income inequality on non-resource-related tax revenues. Precisely, the estimated model is specified as follows:

$$\log (Tax)_{it} = \alpha + \delta \log (tax)_{it-1} + \beta \log (FDI)_{it} + \theta X_{it} + \vartheta_i + \mu_t + \varepsilon_{it} \quad (1)$$

where $(Tax)_{it}$ is the total tax revenues in the proportion of GDP for country i in year t while $(tax)_{it-1}$ is its value in years $t-1$. $(FDI)_{it}$ represents Foreign Direct Investment net inflows for the host country i at the period t . X_{it} stands for other tax revenue determinants identified by previous studies on tax revenue mobilisation in developing countries. These determinants include agriculture value added, manufacturing value added, trade openness, and corruption (Brun and al., Gupta, 2007). Temporal effects (μ_t) are included to control the common shocks affecting developing countries, ϑ_i represents a country-specific effect and ε_{it} is the error term.

Agriculture value-added and manufacturing value-added are included to control the sectoral composition of the economy, while trade openness controls the effect of exposure to international trade on tax ratio. We also include control of corruption among the explanatory as a proxy of the institutional policy.

In equation (1), ϑ_i is included among the right-hand side variables to control for unobserved time-invariant country-specific characteristics that are potentially correlated with tax revenues and μ_t to control for time-varying shocks and economic fluctuations that affect all developing countries.

Identification strategy

We have to fix some econometric issues that may arise when estimating the baseline specification (equation 1). FDI is likely to be endogenous, due to the inverse causality between fiscal policy and the decision to invest. Indeed, governments may choose to reduce their tax burden to attract foreign investors. Consequently, FDI could be correlated to the error term. Besides, a lagged dependent variable among the right-hand variables creates a dynamic panel bias (Nickell, 1981) due to the correlation between the lagged dependent variable and the error term. This bias is particularly significant for panel data with a short time dimension ($T = 6$ for our panel). In this case, applying a panel fixed effects estimator would not be appropriate (Roodman, 2009b).

To solve these endogeneity problems, following the literature on the estimation of dynamic panel data, we use the system-GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). kimm Gnanon, (2017) adopts the same approach using the GMM system estimator to estimate the impact of FDI on tax revenues for 10-year panel data for 21 OECD countries over the period 1870-2011.

In the system GMM estimator of the system, the level and difference equation are combined as a system, and their lagged differences are used as instruments the level variables, and the lagged level variables instrument the different variables. This increases the efficiency of the system GMM estimator relative to the difference GMM estimator because the system GMM simultaneously exploits the time-series dimension and the variations in the cross-section of the data. The difference-GMM estimator (Arellano and Bond, 1991) uses the first differences to remove unobserved country fixed effects in equation (1). This solves the problem of potential correlation between unobserved country fixed effects and the explanatory variables. Then, the first differentiated variables are instrumented by the lagged values of the variables in level. However, the difference GMM estimator's problem is that lagged levels of variables may be imperfect instruments (weak instrument problem) if those variables follow a random walk

process as lagged values of the variables in level provide less information about future changes (Blundell Bond, 1998). Therefore, in this study, our preferred estimator is system-GMM (Arellano and Bover, 1995; Blundell and Bond, 1998). The validity of the instruments in system GMM estimation is checked with the Hansen test of over-identifying restrictions, which tests the validity of the instrumental variables used in the regressions and the Arellano and Bond's autocorrelation tests. Furthermore, with the system GMM estimator, we must ensure that the total number of instruments does not exceed the number of countries to avoid the problem of "instrument proliferation" in the estimations (Roodman, 2009a).

DATA

To achieve our objectives, we construct an unbalanced panel dataset of 90 developing countries from 1990-2017. The availability of data dictates the choice of the sample and the period covered. Since the beginning of the 1990s, "globalisation" has meant a new phase in the global integration of economic, financial, ecological, and cultural phenomena. We, therefore, retain the period from 1990 to 2017 as the analysis period of this study.

Dependent variable: Tax revenue (TAX)

Tax revenue includes national government revenue collected from tax sources aggregated at the central and local level, receipts from taxes and social contributions taxes. It is expressed in percentage of GDP. . The variable total tax revenue in % of GDP is extracted from the ICTD-GRD database (UNU-WIDER Government Revenue Dataset, 2020).

The primary explanatory variable: Foreign direct investment net inflows (FDI)

FDI means the acquisition of 10% of a foreign company's share capital in a foreign country different from that of the investors. It comprises the sum of equity, reinvested earnings, other long-or short-term capital as they appear in the balance of payments. The expected effect is positive¹.

As in the empirical literature on economic growth and according to Islam et al., (2018), we divide the panel data period into five-year intervals without overlap to obtain panel data for seven periods, except for the last sub-period, which is three years: 1990-1994; 1995-1999;

¹ UNCTADstat - Documentation, available at <https://unctadstat.unctad.org/wds/TableViewer/summary.aspx?ReportId=96740>

2000-2004; 2005-2009; 2010-2014; 2015-2017. This transformation eliminates cyclical fluctuations in the data (Pickering and Rajput, 2018; Yogo and Ngo Njib, 2018) and mitigates the problem of measurement errors (Yogo and Njib, 2018), thus allowing a focus on long-term relationships. This transformation is in line with the frequencies of FDI data for developing countries, where the most recent years' FDI data are still preliminary and subject to revision by national authorities at the time of publication.

Control variables

As already mentioned in the paragraph following the empirical model, the control variables include the agriculture value-added as the share of GDP, manufacturing value-added as the share of GDP, the trade openness measured by the sum of exports and imports the share of GDP, the control of corruption. These variables obtained from the World Development Indicators database (WDI) and World governance indicators (WGI), the World Bank and WGI. Let now us discuss the expected effect of control variables on tax revenue.

Agriculture value added.

Agriculture value added as a proportion of GDP is employed as a proxy of the economy's structure or sectoral composition. In developing countries, the agriculture sector in the developing sector is dominated by many smallholder farmers who produce for self-consumption or sell their output in informal markets or exchange their output for other goods. Besides, most of the farmers in African countries do not keep modern accountings for managing their farms. All these factors aforementioned contribute to making it hard for taxation of the agriculture sector in Africa (Fox and Gurley, 2005; Gupta, 2007; Janet Gale Stotsky and Asegedech WoldeMariam, 1997). We, therefore, expected a negative effect of Agriculture value-added on tax revenues in our estimations.

Manufacturing value added.

Manufacturing value added as a proportion of GDP is employed to capture economic development. In developing countries, more extensive manufacturing is more comfortable to monitor, tax. Besides, tax performance is lower, the smaller the share of manufacturing in the host country. We, therefore, expected a positive effect of manufacturing value-added on tax revenues in our estimations.

Trade openness

Trade openness expressed as the sum of exports and imports as a percentage of GDP is expected to increase tax mobilisation as trade openness stimulates trade volume and therefore trade taxes. However, in developing countries, trade liberalisation policies have been implemented through cuts in tariffs. These measures have resulted in a loss in tax revenue for some countries (Baunsgaard and Keen, 2010) while some others have compensated losses in tariffs by an increase in domestic tax revenue (Bird and Gendron, 2007; Cnossen, 2015). Within this background, the impact of trade openness on tax revenue is a priori difficult to predict. This study, the expected effect of trade openness on my revenue variables remains a priori unknown.

Control of corruption

The level of corruption in the country may affect its tax collection performances. Some taxpayers may erode their tax bases in complicity with a tax administration official. We control for the impact of corruption in tax revenue. To do so, we include the indicator "control of corruption index from World Government Indicators (WGI) (Kraay et al., 2010). The index measures corruption's perception, and it ranges from -2.5 to 2.5 with higher values indicating a better control of corruption in the host country.

Table 1 provides descriptive statistics on averaged five non-overlapping years' data of all the variables from the sample used to estimate this study. The average non-resource tax revenue is equal to 13.92% of GDP, while total tax revenue for the sample of countries under investigation accounts for 15.04% of GDP (table 1). The average FDI inflows are 3.60 % of GDP with the lower FDI inflows negative at -7.76) and the highest at 42.19%. The next section is devoted to analysing results obtained from estimating the impact of FDI on tax revenue.

FDI net inflow and tax revenue trends

We get a first look at the nature of the relationship between non-resource taxes and income inequality through graphical analysis. Figure 2 depicts the relationship between FDI net inflows and tax revenues in a sample of developing countries over the period 1990–2017.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Total Tax Revenue	484	15.03699	7.600041	.7399876	52.64481
FDI net inflow	540	3.596755	4.537396	-7.760731	42.19277
Agriculture added value	540	283.8621	2606.556	.0183323	33454.94
Manufacturing added value	540	179.9569	1836.964	1.127323	29984.75
Trade openness	540	1766.594	21215.93	14.32069	401593.6
Control of Corruption	449	-.4419992	.6985144	-1.739455	1.565322
Non-Resource Tax Revenue	474	13.92533	7.393021	.1717362	56.80965
Exchange rate	536	3136513	7.26e+07	.0000125	1.68e+09
Financial Development	528	.2057108	.1384162	0	.7300614
income Tax	462	4.677829	3.107457	0	22.3225
Tax on goods and services	413	4.364437	2.867236	0	15.25281
Corporate Tax	379	2.2774	1.703682	0	16.38664
Direct Tax	497	4.357102	2.995895	.0561856	19.13312
Political Stability	449	-.3904369	.8480311	-2.763284	1.303999

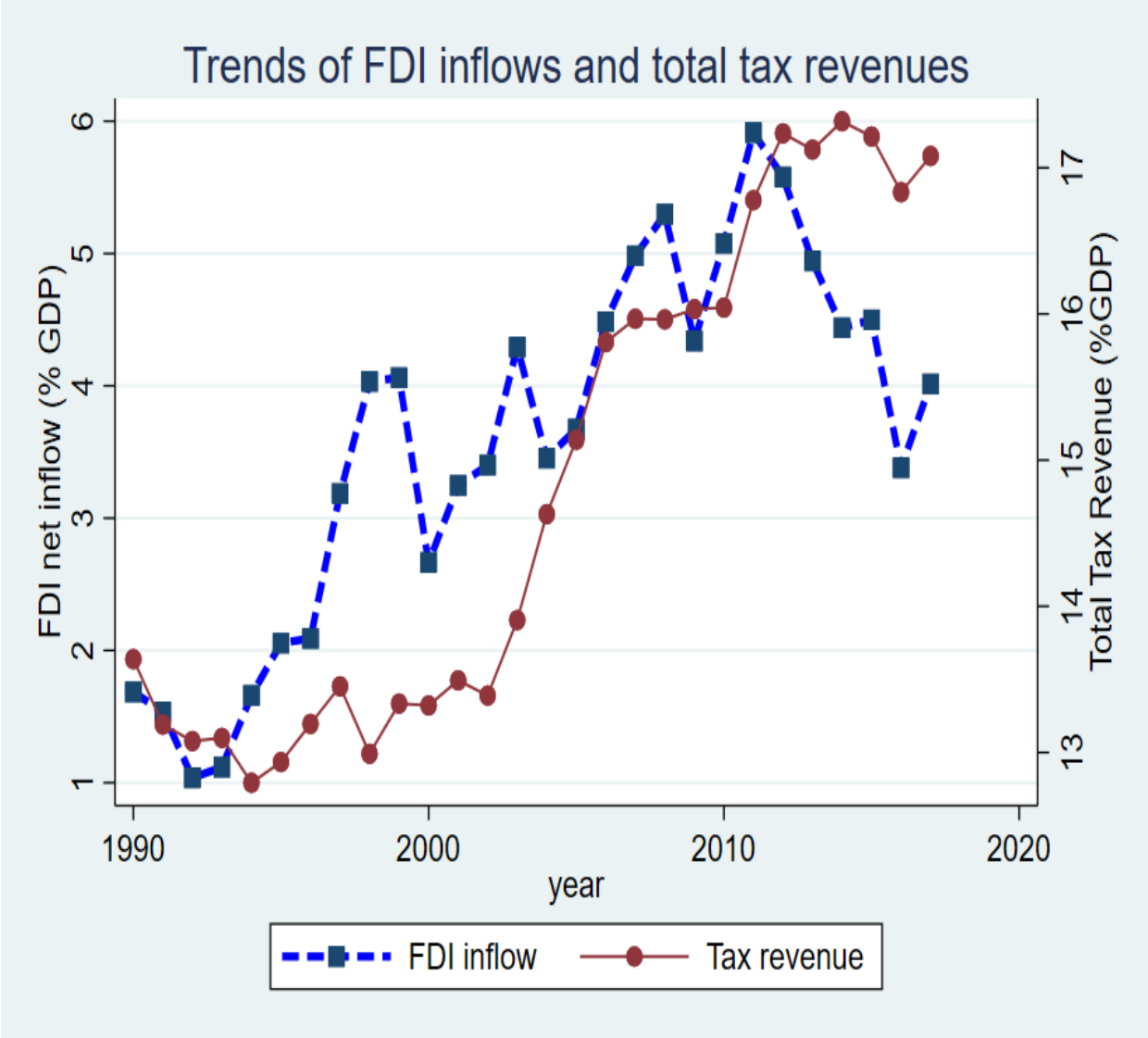
Source: Author's calculation using data from UNU-WIDER, WDI, UNCTADsta and WGI(Kraay et al.,2010)

FDI flows have increased significantly since the early 1990s (Figure 1). They accounted for only 1.74% of GDP in 1990, peaking at 6% of GDP in 2011, before falling back to 3.7% of GDP in 2010. Nevertheless, only on closer inspection, it is clear that this growth has not been stable over time. Indeed, since the 1990s, following economic liberalisation through the vast privatisation movements under structural adjustment programmes, developing countries, and more precisely those in our sample, have experienced a sustained increase in the share of FDI in their economies. Moreover, between the late 1990s and the early 2000s, this was followed by a decline in the FDI ratio associated with, among other things, weak economic growth in most parts of the world and falling stock markets that reduced capital flows (UNCTAD, 2003). In other words, the reduction in global growth led to a decline in demand and production. Moreover, the fall in stock markets reduces investor confidence in the short-term prospects for recovery. This situation is a natural consequence of the decline in investment. On the other hand, the downturn of FDI flows since 2008 partly reflects the consequences of the financial crisis of the subprime crisis of 2007/2008 and secondly the difficulties encountered by

globalisation since the early 2010s when a sharp decline in almost all aspects of globalisation (FDI, migration, foreign trade) occurred.

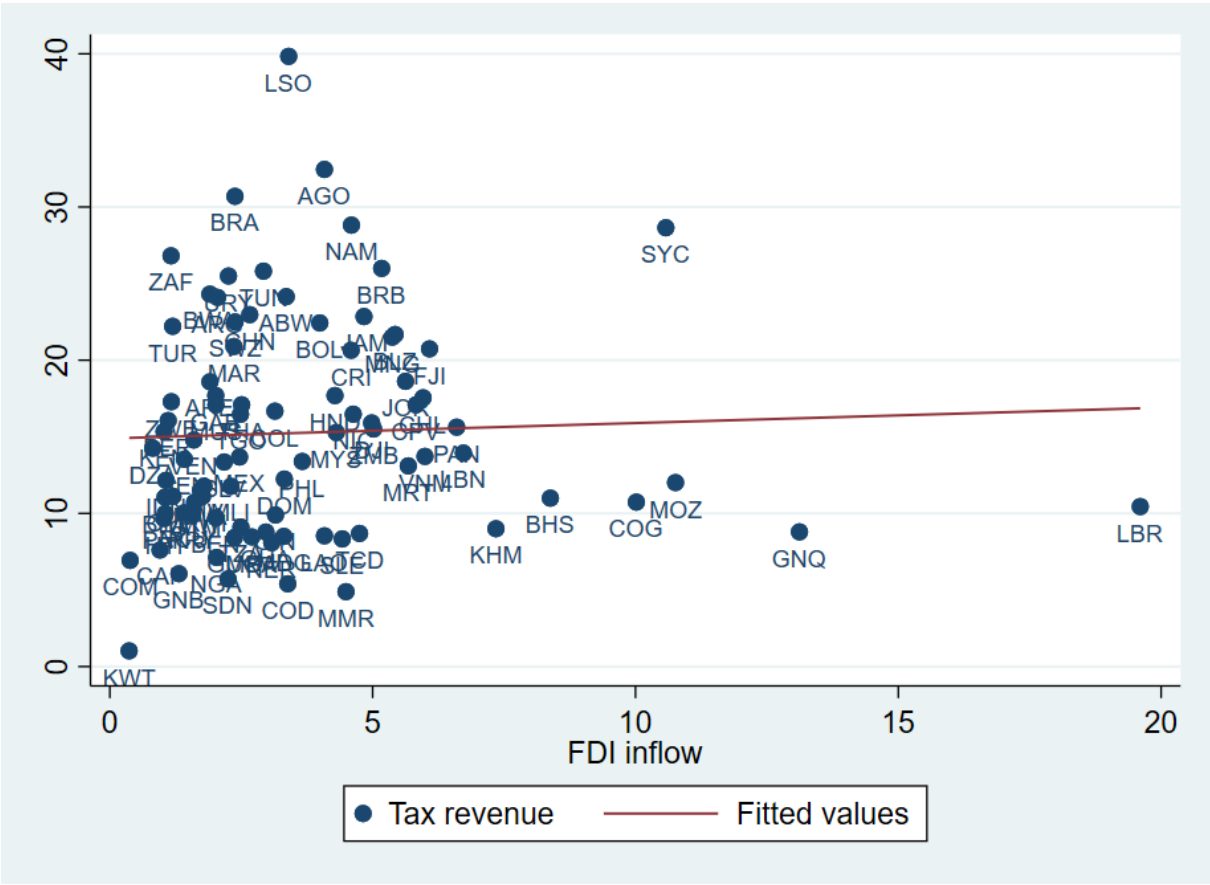
Long-term trends show a positive relationship between FDI flows and tax revenues (Figure 1), although, at times, we can observe negative correlations no correlation at all. From the mid-1990s to the early 2000s, while FDI flows peaked at around 5% of GDP, tax revenues stagnated. This reflects on the one hand incentives and trade liberalisation and the adoption of trade agreements relating to FDI. In other words, since the early 1990s, developing countries have introduced incentives through tax exemptions and reductions in tax rates in order to attract foreign investors. Also, to alleviate double taxation problems, governments have established non-double taxation treaties with individual partner states. These measures have increased the share of FDI in the economy, but tax revenues do not follow these FDI growths.

Figure 1 Trends of FDI and tax revenue



Source: Author’s calculation using data from UNU-WIDER, UNCTADst

Figure 2: Correlation between FDI and tax revenue



Source: Author’s calculation using data from UNU-WIDER, UNCTADsta

As a highlight in figure 2, most countries have the lowest average FDI as GDP over 1990-2017. Figure 2 shows that resource-rich countries tend to have a higher level of FDI as GDP while their performance in collecting tax revenue is relatively small than the non-resource rich countries in the continent. This is not to say resource dependence is attracting FDI inflows, but we have here indications that resource dependence may reduce the effort to collect taxes from tax bases. The trend line in figure 2 below shows a positive correlation between FDI inflow and tax revenue, whereas countries like Liberia, Equatorian Guinea, Mozambique, Congo have higher FDI inflow as GDP, but their tax performances are on average less than 10% of GDP. The trend line is, in fact, a correlation, not causality, suggesting that the relationship obtained from the graphical analysis could be biased by econometric problems like reverse causality from taxes to FDI inflow attraction and the existence of other factors that affect the FDI inflow-taxes nexus. Therefore, we undertake an econometric analysis to explore further the impact of FDI net inflow on tax revenue collection.

MAINS RESULTS

We present the main results obtained from estimating the base equation and those obtained from the various robustness analyses we perform to check whether the main results are robust under certain circumstances.

Baseline results

Before analysing and commenting on our results, it is essential to point out that the GMM system estimator's regressions pass all standard diagnostic tests. There is no evidence of second-order residual autocorrelation, and Hansen's test confirms that all instrumental variables are exogenous. Besides, for each system GMM regression performed, the number of instruments does not exceed the number of countries (see the last rows of Tables 2, 3 and 4). Table 2 presents the results from the estimation of the basic specification (equation 1). The results show that the impact of FDI on total tax revenue is positive and statistically significant at 5%. The estimates indicate that a one percentage point increase in FDI flows will lead to a 0.16 percentage point increase in the total tax revenue ratio in developing countries (column 1 of Table 2). This result suggests that FDI flows are a non-negligible source of tax revenue mobilisation and that policymakers can consider reasonable measures to make FDI flows more attractive to improve tax revenue collection in their countries.

As regards the classical determinants of tax revenues, in line with the literature on the subject, our estimation results indicate that the coefficient of the lagged dependent variable is statistically significant at 5 per cent in all specifications (columns 1, 2,3 and 4 of Table 2), which supports the prediction of inertia in tax collection in developing countries.

As expected, we find that manufacturing value added has a positive correlation with total tax revenue in developing countries (column 1, Table 2). This results may explain that the GDP manufacturing industry's importance illustrates the importance of sectoral share indicators regularly. Tax collection is likely to be based on a range of relevant elements - reflecting a more concentrated, complex, and formalised economic activity is more amenable to tax collection.

In contrast to the expectations, the impact of trade on total tax revenue is negative and statistically significant in the results reported in table 3. This result seems mainly via exports since an insignificant impact of imports appears when this variable is tested separately (Appendix Table 5 column 3).

Table 2:Effect of FDI on total tax revenue

VARIABLES	(1) Baseline	(2) Exchange rate	(3) Pol Sta	(4) Fin Dev
L.Log(Total tax revenue)	0.9139*** (0.0752)	0.5924*** (0.1456)	0.6411*** (0.1168)	0.7466*** (0.1525)
Log(FDI Flow)	0.1607*** (0.0394)	0.0917** (0.0404)	0.1784*** (0.0448)	0.1260*** (0.0449)
Log(Agriculture)	-0.0349 (0.0358)	-0.1319** (0.0509)	-0.0964** (0.0453)	-0.0107 (0.0263)
Log(Manufacturing)	0.2237** (0.1036)	0.1488** (0.0689)	0.1523*** (0.0445)	0.0576* (0.0309)
Log(Trade openness)	-0.1546** (0.0738)	-0.0645 (0.0681)	-0.0530 (0.0418)	-0.0525* (0.0295)
Control of corruption	0.0035 (0.1083)	-0.0249 (0.0989)	-0.2572*** (0.0962)	-0.1392** (0.0610)
Log(Exchange rate)		0.0819*** (0.0290)		
Political Stability			-0.0034 (0.0446)	
Financial Development				0.4168* (0.2432)
Constant	0.2420 (0.2635)	0.8295** (0.3465)	0.6946*** (0.2618)	0.4939 (0.3412)
Observations	359	341	359	354
Number of id	72	70	72	71
Number of instrument	25	26	22	19
AR1	0.000171	0.00617	0.00478	0.00899
AR2	0.587	0.485	0.546	0.516
Hansen	0.328	0.677	0.764	0.578

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: author.dta

One possible explanation could be reducing customs duties' rate (Gupta, 2007; Keen and Simone, 2004). Gupta (2007) concluded that lower tariff rates lead to lower tax revenues. Besides, Keen and Simone (2004) suggested that in parallel with reducing tariff rates, revenues could increase if trade liberalisation occurs through quota pricing, removal of exemptions, reduced tariff peaks and improved customs procedures. It follows that policies aimed at further trade liberalisation in developing countries may be detrimental to revenue generation. This could be addressed by revising trade agreements, discouraging corruption in customs divisions through better service and prosecution conditions. Given the positive impact of FDI inflows on tax revenue mobilisation, we subject this result to various robustness tests.

Robustness check

We perform various robustness analyses to check whether the positive impact of FDI inflows on tax revenues found by the empirical analysis holds when specific considerations are considered.

Analysis of transmission channels of FDI inflows to total tax revenue

This subsection discusses how FDI may affect tax collection, highlighting that political stability, exchange rate, and Financial development are potential transmission channels of FDI inflows to tax revenue. Thus, adding each of these variables as a control in the baseline specification may only lead to weak FDI inflows. This is the background approach we follow to test the transmission channels of FDI inflows to total tax revenue in developing countries.

Political stability

In discussing how net FDI inflows affect tax revenue mobilisation, we have suggested that increasing net FDI inflows can favour government stability and significantly promote tax collection. Therefore, we need to control government stability to effectively capture the effect of net FDI inflows on the tax revenue ratio. We use government stability index from the World Government Indicators (WGI) (Kraay et al., 2010). This index captures perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism, and it ranges from -2.5 to 2.5 with higher values indicating the most stability. While this article's main findings remain qualitatively stable when control of government stability index is included in the equation, we find that political stability does not have a statistically significant impact on total tax revenue mobilisation. (table 2 column 3)

Exchange rate

We control the exchange rate because the volume of FDI is a function of the exchange rate's stability (Udomkerdmongkol et al., 2009), but this stability also reflects a better economic policy, therefore favorable to a better tax potentially likely to attract FDI. Moreover, developing countries' economic policies are most observed with the existence of an often-negative relationship between a country's tax revenues and the real level of its official exchange rate. An appreciation of the real official exchange rate - that is, a decline in national currency units per unit of foreign currency - leads, all other things being equal to a decline in the ratio of tax revenue to GDP. A significantly overvalued exchange rate implies a much lower tax ratio than would otherwise have existed. The exchange rate data is taken from World Development Indicators (WDI), of the World Bank.

The main results of the paper remain unchanged when the impact of the exchange is controlled. The effect of the FDI inflows on tax revenue is positive and significant. Furthermore, as expected, the exchange rate's overvalued significantly reduce tax revenue collection at 1% (table2, column2).

Financial Development

In discussing how net FDI inflows affect tax revenue mobilisation, we have suggested that increasing net FDI inflows can favour financial development and significantly enhance tax collection. Therefore, we need to control the impact of financial development to effectively capture the effect of net FDI inflows on the tax revenue ratio. We use a new composite index introduced by the IMF's Policy and Strategy Review Department, constructed from various financial systems indicators using Principal Component Analysis (PCA). Relating to Svirydzenka, (2016), the index captures financial development in a multidimensional way, involving banking and non-banking institutions and stock market development. Three dimensions of these systems are considered in calculating the index: their depth, access, and efficiency.

The main results of the paper remain unchanged when the impact of the exchange is controlled. The effect of the FDI inflows on tax revenue is positive and significant. Furthermore, as expected, the suppression of financial constraints and the improvement of the financial system would increase the total tax revenue. (table2, column4).

Table 3: FDI effect on disaggregated tax revenue

VARIABLES	(1) Non-Resource tax	(2) Direct Tax	(3) Goods and service tax
Log(FDI inflow)	0.1083*** (0.0378)	0.1136 (0.0850)	0.2943*** (0.0900)
Log(Agriculture)	0.0306 (0.0381)	-0.1810** (0.0763)	0.0103 (0.0656)
Log(Manufacturing)	0.2025* (0.1077)	0.1314*** (0.0423)	0.1674*** (0.0604)
Log(Trade openness)	-0.2046** (0.0816)	0.0490 (0.0649)	-0.1961*** (0.0537)
Control of corruption	-0.0652 (0.0577)	-0.4009** (0.1907)	0.0843 (0.1417)
L.Log(non-resource tax)	1.0447*** (0.1053)		
L.Log(direct tax)		0.6386*** (0.0773)	
L.Log(tax on goods and service)			0.6396*** (0.0999)
Constant	0.0399 (0.2495)	0.1447 (0.1076)	0.6757*** (0.1618)
Observations	327	405	324
Number of id	70	88	81
N_instr	31	18	18
AR1	0.00337	0.0203	0.00942
AR2	0.585	0.113	0.562
Hansen	0.337	0.826	0.236

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: author.dta

Disaggregated of tax revenue.

Moreover, these overall results could mask considerable contrasts depending on the types of tax revenues from which this capital could benefit. A series of studies document the relationship between FDI inflows and tax policies but analyse this relationship at an aggregate level of tax revenues, and do not identify which particular tax policy is likely to benefit most from FDI inflows. We seek to fill this gap by analysing FDI inflows' effect on taxation on disaggregated tax revenue.

FDI effect on non-resource tax

As tax revenues do not wholly exclude natural resource revenues (they contain the tax on mining/oil companies), we replace the chosen indicator with an indicator of tax revenues excluding natural resources. Our results show that FDI inflow increases non-resource tax mobilisation (Table3, Column 1). The estimated elasticity is close to 0.11, which suggests that a 1% increase in FDI inflows may cause non-resource tax increase by 0.11%. This means that policymakers could implement FDI attracting policies which improve non-resource activities.

FDI effect on direct tax

Given the role of FDI on growth, business productivity and employment, we estimate the relation of FDI on direct tax. The results show that FDI inflow's impact on direct tax mobilisation is positive but non statistically significant (Table3, Column 2). We can offer two possible explanations for this non-significant correlation. The first possibility is that because of competition between domestic and foreign companies, FDI flow could lead to crowd out certain domestic companies. This may offset positive effect of FDI on direct tax revenue. We believe that this is unlikely because the less competitive domestic companies would crowd out and this crowding out will be compensated. The second possibility is that many developing countries provide tax incentives to foreign investors to encourage investment. However, this distorts resource allocation and is detrimental to long-term growth. This appears to be more plausible because the tax practices of multinational companies via tax evasion put the financing of sustainable development at risk. In fact, this interpretation would be consistent with the evidence of Glencore². Glencore's head office is located in Switzerland in the canton of Zug. The group is present in more than 50 countries and has a turnover of more than \$170 billion. The Glencore group is the subject of severe accusations by NGOs relating to its abusive transfer

² (Telerama, 2011)

pricing practices in Africa, particularly in Zambia and the Democratic Republic of Congo. In the DRC, Glencore has been in production since 2008 with a turnover of \$210 million. This medium will increase to \$808 million in 2013. However, it has been systematically posting negative results since 2008. Due to accumulated losses, the company has lost its entire capital of US\$100 million. It has therefore paid no corporate tax for at least five years (Peyer and Maillard, 2011).

FDI effect tax on goods and services

FDI contributes to increasing the production of goods and services offered on the domestic market, therefore increasing VAT revenues. On the other hand, an increase in demand for goods and services resulting from increased employment could lead to an increase in VAT receipts. This would lead to an increase in tax revenues. For this reason, we estimate the relationship between FDI flows and the mobilisation of tax on goods and services. The results show that FDI inflows significantly affect tax on goods and service. This suggests that governments could put in place policies to curb FDI aimed at increasing the production of domestic goods and services and thereby increase domestic demand.

What is the effect of FDI on resource exporting countries?

The phenomenon known as the natural resource curse in the literature could influence FDI inflows' effect on tax revenues. Therefore, it will be essential to analyse the effect of FDI net inflows at the level of countries' net exporters of natural resources by comparing to other countries³. Table 4 presents the findings with the countries who are resource exporting countries (column 1) and other countries (column2). Like general results, when countries are resource exporting, FDI inflows positively affect government tax revenue. However, the tax revenues of these countries are not statistically sensitive to an increase in FDI. These findings could be explained by the excessive tax incentive and holidays tax accessible to multinational enterprises operating in the national economy. Another explanation could be that the leaders of resource-rich countries tend to neglect the sectors of activity and what could increase their level of fiscal effort. Besides, the extractive resources sector, which needs more capital, is dominated by foreign companies. Therefore, excessive tax exemption can significantly reduce the involvement of FDI in tax revenues. Also, companies operating in the extractive resources sector often advance corrupt relationships with tax officials to take advantage of substantial tax

³ We consider a country a natural resource exporter if its exports of natural resources represent more than 60% of its total exports for more than ten years.

and royalty exemptions and thus reduce their liability in host countries. In addition, the company operating in this sector practises the price transfer method to avoid corporate tax, thereby reducing its corporate tax liability in host countries.

Whereas, when countries are non-resource exporters, the magnitude of the effect of FDI on tax mobilization is consistent with the results of this study and most of the literature on the relationship between FDI and government revenues.

CONCLUSION

Usually seen as a significant factor of economic growth in developing countries, FDI allows transfer from home countries to host countries. It stimulates local investment, improves human capital as well as the quality of institutions in developing countries. Through these channels, FDI can improve tax mobilisations in developing countries. However, on the other hand, tax incentive and tax complexity and natural resources often lead FDI to negatively affect tax mobilisation in developing countries. A few studies about the relationship between government tax mobilisation and FDI inflows in developing countries are inconclusive.

This paper contributes to empirically investigate in a large sample of developing countries by finding out how FDI affect government tax mobilisation, using a System GMM approach. And we find that FDI affect government tax mobilisation positively. Given the resource curses in developing countries due to tax incentives, we analyse this question for countries that are resource exporters. The results suggest that for resource exporting countries, FDI inflows do not affect government tax mobilisations.

From a policy perspective, this papers shows that FDI's promotion through tax incentive should take into count the role of tax evasion. The results also suggest it is necessary to substitute or combine these policies with non-tax measures such as subsidies to foreign investors, institutional environment improvement and infrastructure development, attracting FDI without much loss in tax revenue. Besides, Countries must also consider the crucial role of natural resources, agriculture, and trade openness in tax revenue mobilisation.

Table 4: FDI and Tax revenue relationship by resource country types

VARIABLES	(1) Resource exporters	(2) Non-Resource exporters
L.log(total tax revenue)	0.7246*** (0.2288)	0.7963*** (0.2934)
Log(FDI inflow)	0.0663 (0.0812)	0.0971* (0.0491)
Log(Agriculture)	-0.0818 (0.0645)	-0.0663 (0.1012)
Log(Trade openness)	0.0875* (0.0513)	0.0513 (0.0719)
Log(Trade openness)	0.1234 (0.1139)	-0.0018 (0.0658)
Control of corruption	-0.3311** (0.1590)	-0.1848* (0.1017)
Constant	-0.1042 (0.8321)	0.4716 (0.6793)
Observations	156	238
Number of id	35	51
N_instr	18	19
AR1	0.0551	0.0643
AR2	0.695	0.768
Hansen	0.689	0.196

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: author.dta

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Appendix

List of countries

Aruba, Angola, United Arab Emirates, Argentina, Burundi, Benin, Burkina Faso, Bahamas, Belize, Bolivia, Brazil, Barbados, Botswana, Central African Republic, Chile, China, Cote d'Ivoire, Cameroon, Congo Democratic Republic, Congo Republic, Colombia, Comoros, Cabo Verde, Costa Rica, Djibouti, Dominican Republic, Algeria, Egypt, Ecuador, Ethiopia, Fiji, Gabon, Ghana, Guinea, Gambia, Guinea-Bissau, Equatorial Guinea, Guatemala, Honduras, Haiti, Indonesia, Jamaica, Jordan Kenya, Cambodia, Kuwait, Lao PDR, Lebanon, Liberia, Lesotho, Morocco, Madagascar, Mexico, Mali, Myanmar, Mongolia, Mozambique, Mauritania, Mauritius, Malawi, Malaysia, Namibia, Niger, Nigeria, Nicaragua, Pakistan, Panama, Peru, Philippines, Paraguay, Rwanda, Sudan, Senegal, Sierra leone, El Salvador, Chad, Togo, Thailand, Tunisia, Turkey, Tanzania, Uganda, Uruguay, Venezuela, Vietnam, South Africa, Zambia, Zimbabwe.

Table 5: Result with openness disaggregated.

VARIABLES	(1) Export	(2) Import	(3) Import+Export
L.Log(Total tax revenue)	0.9263*** (0.0652)	0.9038*** (0.0886)	0.8694*** (0.0644)
Log(FDI Flow)	0.1321*** (0.0343)	0.1988*** (0.0515)	0.1147*** (0.0241)
Log(Agriculture)	-0.0269 (0.0310)	-0.0415 (0.0403)	-0.0547** (0.0241)
Log(Manufacturing)	0.1601* (0.0929)	0.2850** (0.1132)	0.1000*** (0.0229)
Control of corruption	-0.0074 (0.1002)	0.0212 (0.1193)	-0.1174* (0.0699)
Log(export)	-0.1152** (0.0511)		-0.1263* (0.0678)
Log(import)		-0.1934* (0.0983)	0.0836 (0.0721)
Constant	0.1247 (0.1884)	0.1347 (0.3199)	0.2008 (0.1809)
Observations	359	359	359
Number of id	72	72	72
N_instr	25	25	22
AR1	0.000192	0.000243	0.000200
AR2	0.515	0.667	0.493
Hansen	0.250	0.446	0.262

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: author.dta