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Does transparency pay? The impact of EITI on domestic tax revenues in resource-rich developing countries.

Harouna KINDA^{*†}

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Abstract

This paper assesses the “treatment effect” of Extractive Industries Transparency Initiative (EITI) membership on domestic tax revenues mobilization (DRM) in resource-rich developing countries through two main channels. The first consists of a fair tax system and the second by spillovers effects of productive expenditures favor by EITI. With 83 resource-rich developing countries (DCs) (46 EITI and 37 non-EITI) from 2001 to 2017, we use propensity score matching (PSM) to address the self-selection bias associated with EITI-membership. The paper reveals that EITI-members have higher DRM than non-members and that DRM are higher when countries are compliant, even higher with quality of governance, and heterogeneous due to some structural factors. EITI commitment or candidacy impacts DRM significantly and positively compared to non-EITI (1.06 to 1.20 percentage points). EITI compliance generates a considerable surplus of DRM (1.09 to 1.13 percentage points) compared to non-compliant. Besides, the magnitudes of the impacts are more significant if we include governance indicators. The results are robust to non-resource tax (NRTAX) revenues and income tax.

Keywords: *Natural resources; Extractive Industries (EI); Transparency; Domestic revenue mobilization (DRM).* **JEL Classification:** C33; E62; O19; H2; Q32

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1 Introduction

The Addis Ababa conference on financing the Sustainable Development Goals (SDGs), held in mid-2015, placed particular emphasis on domestic tax revenue mobilization (DRM). While most governments in resource-rich developing countries have struggled to mobilize the substantial revenues due to a range of challenges, such as aggressive tax planning by Multinational Enterprises (MNEs), weak enforcement of tax laws, overly generous tax incentives to attract foreign direct investment (FDI), ambiguous fiscal regimes (Knack, 2009), and misuse of public revenues (Robinson et al., 2006).

The pioneering research (Sachs and Warner, 1995, 2001; Van der Ploeg, 2011) suggest that the natural resources dependence hurts the economic performance more resource-rich developing countries than lesser. This statement is generally known as the "resource curse." First, resource revenues hurt the traditional economic sectors by appreciating of exchange rate (often called "Dutch Disease"). The second, power is often centralized, leading regimes to authoritarianism, which hinders the establishment of democratic and transparent institutions. There is also talk of crowding out of NRTAX by resource revenues in several resource-rich developing countries (Bornhorst et al., 2009; Ndikumana and Abderrahim, 2010; Crivelli and Gupta, 2014; Mawejje, 2019). The high natural resource rents allow governments to reduce the burden of taxation on citizens to reduce the demand for democratic accountability (McGuirk, 2013). As a result, disparate literature has focused on natural resources to understand the "resource curse" phenomenon and turn natural resource wealth into a source of economic development. These include definition and rent sharing¹, the macroeconomic effects of abundance and dependence on natural resources², and institutional impacts³.

The Extractive Industries Transparency Initiative (EITI), created in 2003 at the instigation of "Publish What You Pay" NGO aims to promote better governance of natural resources and help address the challenges facing resource-rich developing countries DRM collection. It is an initiative recognized as an international standard of good governance. Since then, 56 countries worldwide have implemented EITI. EITI requires extractive companies to publish all payments made in detail in the government's accounts. Similarly, governments must publish all payments received from extractive companies (oil, gas, and mining). Governments and companies disclose information on the main stages of the value chain: Multi-Stakeholder Group (MSG), Contracts and licenses, Exploration and production, Revenue collection, Social and economic spending, Outcomes, and impact (EITI, 2016). In addition to revenue collection, EITI promotes transparency and accountability in allocating resource revenues to public expenditure. Several international organizations (World Bank, International Monetary Fund, OECD) have endorsed the initiative and provided technical and financial support for implementing EITI. Their objective is to enhance transparency for better DRMn and promote inclusive economic growth and social development in DCs (Liebenthal et al., 2005).

Generally, EITI literature focused on the factors behind a country's joining the initiative (see Pitlik et al., 2010; Cockx and Francken, 2014; Öge, 2016; Kasekende et al., 2016; David-Barrett and Okamura, 2016; Lujala, 2018), the initiative impact on Gouvernance (Namely control of corruption, civil liberty and democracy) (see Ejiogu et al., 2019; Villar and Papyrakis, 2017; Rustad et al., 2017; Magno and Gatmaytan, 2017; Papyrakis et al., 2017; Sovacool et al., 2016; Sovacool and Andrews, 2015; Haufler, 2010), FDI flows (Sovacool and Andrews, 2015), and growth (Corrigan, 2014). A study close to ours is Mawe-

¹(Boadway and Keen, 2010; Charlet et al., 2013; Laporte and Rota-Graziosi, 2014)

²(Gylfason et al., 1999; Tornell and Lane, 1999; Sachs and Warner, 2001; Gylfason and Zoega, 2006)

³(de Medeiros Costa and dos Santos, 2013; Arezki and Brückner, 2011; Kolstad and Wiig, 2009; Saha and Gounder, 2013; Brunnschweiler, 2008; Bulte et al., 2005; Papyrakis et al., 2017; Amiri et al., 2019; Berman et al., 2017; Desai and Jarvis, 2012; Knutsen et al., 2017)

ije (2019) which analyzes the link between natural rents and non-oil revenues using EITI-membership as an interaction variable. This study focused on the linear regression model, therefore not rigorously taking into account the problem of self-selection. Lujala (2018) argues that all impact evaluations of EITI on resource governance and societal development need to correct the selection biases in countries' decisions to commit to and implement EITI. Our paper aims to provide relevant answers to the following questions: Do EITI-membership improve DRM after controlling for self-selection? Does the treatment effect vary with the status of EITI implementation (commitment, candidacy, and compliance)? Is there heterogeneity in the treatment effect of EITI depending on countries' structural characteristics? Therefore, this paper aims to assess EITI' impacts on DRM in resource-rich developing countries by comparing EITI implementation to non-implementation. Our intuition is that EITI implementation would boost the quality of governance in resource-rich developing countries and improve DRM. We consider two main transmission channels. The first is direct, and it works through an optimal and transparent resource tax regime; this could improve the government's share of rents. The second channel is the indirect effect that EITI has on non-resource revenue, as transparency enhances Accountability and resource allocation to productive expenditures; this will have positive spillovers on government NRTAX. This study aligns with work on the effectiveness of EITI in reducing the negative impacts of natural resources on economic development and the quality of governance (Corrigan, 2014, 2017) and in improving DRM (Maweje, 2019).

We contribute to the literature on several points. First, to the best of our knowledge, this paper is the first study taking this self-selection problem rigorously while investigating the impact of implementing EITI on DRM. Secondly, this analysis is more comprehensive because it considers the three main stages of the EITI implementation process. Third, we consider the total DRM as a dependent variable and the NRTAX and income tax for the sensibility analysis. Fourth, we use a control function regression approach to analyze the heterogeneity of treatment effects on DRM related to countries' structural factors. The main results show that EITI implementation positively and significantly impacts on DRM.

In the following steps of the paper, Section 2 discusses the related literature, Section 3 presents data and highlights stylized facts, Section 4 describes the empirical strategy, Section 5 shows the main results, Section 6 explores the sources of heterogeneity in the treatment effects, and Section 7 concludes.

2 Literature review

2.1 What is EITI?

EITI was formally launched in London in June 2003. It is a multi-stakeholder organization dedicated to promoting good management and governance of oil, gas, and mineral resources (EITI, 2016). EITI has been applied in 56 countries. This standard requires extractive companies to publish all payments made in detail in government accounts. Governments must also post all payments received from extractive companies to curb corruption (Papyrakis et al., 2017). In other words, governments and companies disclose information on the main stages of the natural resource value chain, such as exploration activities, licenses and contracts, beneficial owners, production, revenue collection, and revenue use. International organizations such as the World Bank, the IMF, and the OECD have endorsed the initiative with the objective to enhance transparency for better DRM and to promote inclusive growth and social development in DCs (Liebenthal et al., 2005).

EITI implementation process consists of three main steps: *Commitment, Candidacy, and Compliance*.

First, the government commits publicly to implement EITI. Following that, government, companies, and civil society must jointly commit to establishing a national EITI secretariat and a multi-stakeholder group (MSG) to oversee the implementation process. The MSG requires all stakeholders' independent, active, and effective participation. Thus, the MSG adopts a costed work plan to define the country's objectives and priorities for EITI implementation (EITI, 2016). This step takes time and allows the effects of accession to be examined before being accepted as a candidate country (Corrigan, 2014). Second, the country becomes held the candidate status if EITI Board considers that all conditions for membership have been met. Third, EITI Candidate countries must publish a first EITI Report within 18 months to achieve the status of EITI compliant and must submit the final report within two years and a half. Countries that have not met the requirements of the validation process and have not submitted the report on time risk suspension. The same applies to countries experiencing political instability (Anwar and Kannan, 2012).

2.2 *The effects of EITI DRM: transmission channels*

EITI literature focused on the factors behind a country's joining the initiative (see Pitlik et al., 2010; Cockx and Francken, 2014; Öge, 2016; Kasekende et al., 2016; David-Barrett and Okamura, 2016; Lujala, 2018), the initiative impact on Governance (namely, control of corruption, civil liberty and, democracy) (see Ejiogu et al., 2019; Villar and Papyrakis, 2017; Rustad et al., 2017; Magno and Gatmaytan, 2017; Papyrakis et al., 2017; Sovacool et al., 2016; Sovacool and Andrews, 2015; Haufler, 2010), FDI flows (Sovacool and Andrews, 2015), and growth (Corrigan, 2014). A study close to ours is Mawejje (2019), which analyzes the link between natural rents and non-oil revenues using EITI-membership as an interaction variable.

The impacts of EITI on DRM would be reflected in the strengthening of the resource tax regime and linkages with the non-resource economy. The first channel is direct, and it works through an optimal and transparent resource tax regime. EITI improves transparency of the extractive business taxation system, improving the government's share of rents. For example, the identity of the actual owners of companies holding oil, gas and mineral extraction rights has often been unknown. This lack of transparency in the governance of EI fuels corruption, money laundering, tax evasion, and illicit financial flows, as evidenced by the Panamas Papers (Chohan, 2016). EITI requires disclosure of the absolute ownership of extractive companies (the holders of extraction rights), i.e., residence, parent company, and subsidiaries. This demonstrates that EITI leads to more efficient tax collection from companies. The second channel is the indirect effect that EITI has on non-resource revenue once transparency enhances accountability and resource allocation to productive expenditures (for example, infrastructure and human development to promote economic diversification). Allocation of resource revenues to productive expenditures conditions the NRTAX effort. This raises the complementary between resource revenues and NRTAX. In general, citizens' transparency or access to information can reduce bureaucratic corruption.

The impact of EITI on DRM is still little empirically addressed in the existing literature. Only Mawejje (2019) achieves to analyze a direct relationship between EITI and non-oil DRM. The author considers 31 sub-Saharan African countries over the period 2003-2015, and finds a negative relationship between natural resource dependency and non-oil revenue mobilization. The effect becomes weakly positive by using the interaction between EITI-membership and natural resource dependency (*Total rents in % GDP*). Corrigan (2017) shows that EITI-membership positively affects significant economic develop-

ment. An ordinary least squares (OLS) analysis from 2005 to 2009 by Cockx and Francken (2014) finds no evidence for a positive effect of EITI-membership on public health spending.

In terms of challenges, EITI policy focused initially only on revenues from EI. Other aspects of the extractive value chain, such as these revenues allocating, are not considered. Nevertheless, resource-rich developing countries face many corruption problems that are mainly expenditure-based (Öge, 2017). Similarly, Robinson et al. (2006) suggest that responsible allocation of public resources is the way to avoid the "resource curse." As EITI-membership is voluntary, countries and companies can express their intention to join the initiative and whether to proceed. This depends on the opportunity cost of complying with the standards. For example, highly corrupt governments may be interested in not promoting transparency in the EI (Öge, 2017).

3 Dataset and Stylized facts

3.1 Dataset

The analysis is conducted on 83 resource-rich DCs from 1995 to 2017. This large panel is based on the dependence on extractive resources and the availability of tax revenue data. Extractive-dependent countries are defined as countries that depend on minerals for at least 25% of their tangible exports (Haglund, 2011). The sample includes 46 EITI-countries (treatment group) and 37 non-EITI-members (control group). Of these 46 EITI committed countries, all have achieved Candidate status, and only 24 have achieved Compliance status as of the specific dates (see Appendices A12 for the data sources & definitions of the different variables and A13 for the list of countries & their different stages of EITI implementation).

We use Government Revenue Dataset (GRD) developed (Prichard et al., 2014; McNabb, 2017). It is a complete source of cross-country data available and extensively used in the studies surrounding the effects of tax policy. Total DRM (% GDP) is our main dependent variable (*Log Tax_revenue-to-GDP*)⁴. It represents the sum of the sub-components of taxes excluding social security contributions, levied to benefit social welfare institutions. This coverage of DRM data is better because it is specific to taxes and consistent across countries. We use disaggregated measures such as NRTAX and Total income taxes, including taxes on the natural resource sector.

The variable of interest is a dummy of *EITI implementation*, and it is constituted through the information available on the EITI website (EITI, 2016). *EITI dummy* takes the value 1 to start from the year of takes the value 1 for the years that the country is an EITI-member and 0 for the years that the country is not an EITI-member according to the stage of EITI implementation. Indeed, Candidate status is necessarily the first step for an EITI implementing country. For a more comprehensive analysis, in this study, the interest variable is measured in three chronological levels through three main stages, namely *Commitment*, *Candidate*, and *Compliance*. The control group for commitment and candidate status includes non-EITI-countries, and the control group for compliant countries is formed only by EITI commitment or candidate⁵ countries that have not yet obtained compliant status.

The choice of control variables is justified in subsection 4.2. The PSM method suggests that the control factors are simultaneously correlated with treatment and outcome. Otherwise, these factors are

⁴Standard deviations of certain variables in the two groups are pretty disparate (see Table A11 for the descriptive statistics). We, therefore, consider their logarithms

⁵It is essential to note that all EITI Candidate countries are a priori committed, but the reverse is not always the case.

likely to explain both the choice to implement EITI and DRM for a given country. Through the existing literature, we monitor the endogeneity of the following factors: Total rents (oil, gas, mineral), GDP per capita, financial development, Inflation, Commodity prices, Trade openness, Net official development assistance per capita (AID), Foreign direct investment (FDI), Industry value-added, Coal rents, Forest rents, Human development index (HDI), Control of corruption, government effectiveness, Rule of law, Regulatory quality, Voice and accountability. It is impossible to control for unobserved factors that may affect the likelihood of joining EITI. However, the control variables allow us to consider some of the known sources of bias.

3.2 Stylized facts

Governments of resource-rich developing countries receive revenues from taxing extractive companies, royalties, and economic rent-sharing arrangements. The mustache box diagram in fig.1 visualizes the distribution of DRM in EITI-members before and after commitment. For each type of tax revenue, the range is higher for EITI-member periods. The same is true for the median DRM, i.e., the amount that divides the distribution of DRM into two equal shares for EITI-member periods is higher than the non-EITI period. However, we can see from the mustache box diagram in figure 2 that the median of the DRM distribution increases with the stages of EITI implementation (non-EITI, commitment, candidate, and compliance). This reflects the more responsible use of revenues under EITI. We can explain this by creating linkages with the rest of the economy, such as job creation and allocating revenues to productive expenditures that generate other NRTAX. Therefore, EITI implementation helps to mitigate the crowding out of NRTAX. Countries would mobilize more revenue by implementing EITI and achieving compliance status. Before concluding these results, we conduct an econometric verification because the stylized representation of economic variables does not consider specific endogenous factors. Likewise, the periods before and after EITI are not necessarily comparable. We begin an analysis using propensity score matching on two more comparable groups in the following.

Figure 1: Distribution of DRM before and after EITI implementation

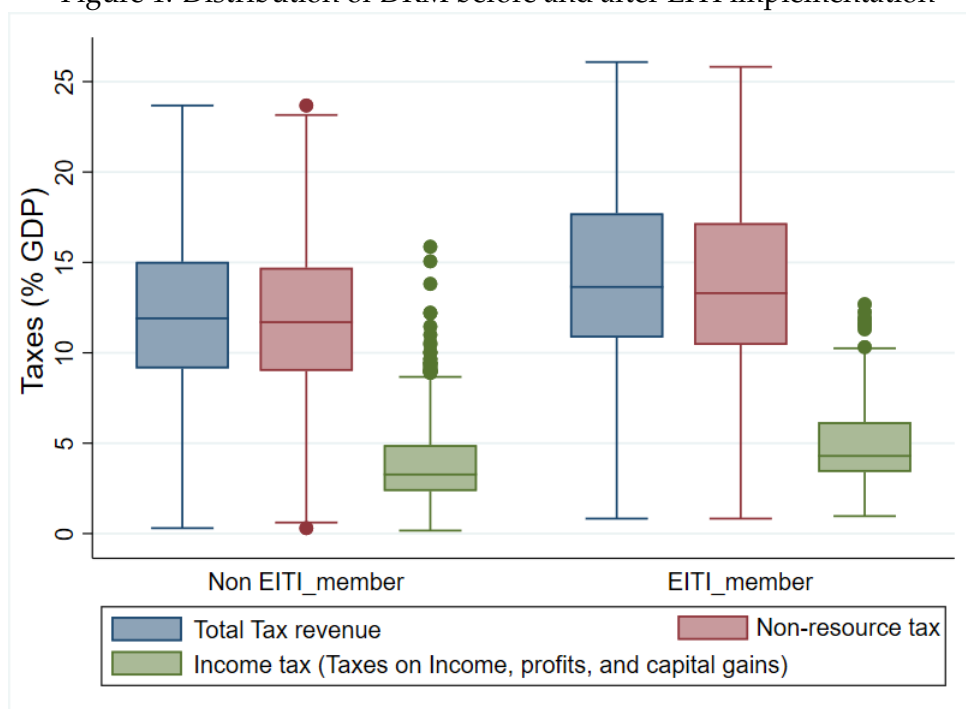
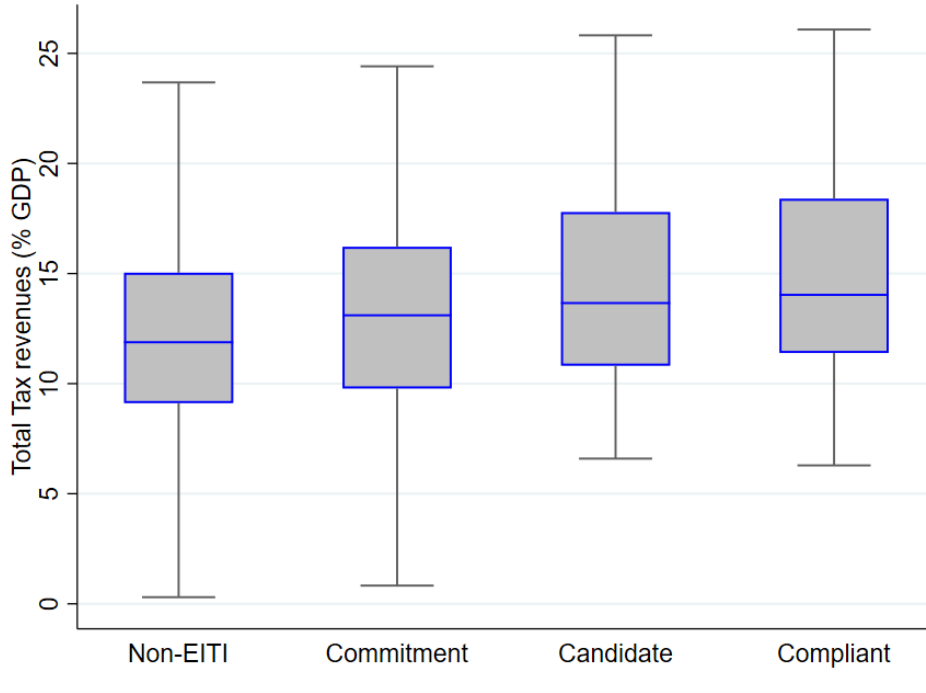


Figure 2: Distribution of total DRM according to EITI implementation stage



4 Empirical strategy

The paper evaluates the impact of EITI implementation on DRM. We refer to EITI-members as the treated group and non-EITI-members as the control group. The equation of the estimated average treatment effect on the treated (ATT) is expressed as follows:

$$ATT = E[(Y_{it}^1 - Y_{it}^0) | EITI_{it} = 1] = E[Y_{it}^1 | EITI_{it} = 1] - E[Y_{it}^0 | EITI_{it} = 1] \quad (1)$$

where $EITI$ is the dummy (independent variable) corresponding to the $EITI$ implementation and Y is the DRMs. $Y_{it}^0 | EITI_{it} = 1$ is the value of DRM at time t that would have been observed if an EITI-member i had not implemented EITI and $Y_{it}^1 | EITI_{it} = 1$ the outcome value observed in the same country. Equation (1) tells us that a simple comparison between DRM observed in the treatment group and the value of DRM observed for the same countries if they had not implemented EITI would give an unbiased estimate of ATT. However, the main difficulty in estimating the ATT is that the second term on the right-hand side ($E[Y_{it}^0 | EITI_{it} = 1]$) is not observable. We cannot observe the value of DRM of an EITI-member if it had not implemented EITI. We face an identification problem, as is often the case with experimental studies.

A simple approach commonly used to address this difficulty and assess the causal effect would consist of comparing DRM of treated (EITI-counties) with those of control group (non-EITI-counties) having similar observed characteristics (Rubin, 1974). This means that the treated group would have had DRM like those in the control group without EITI. The difference in outcome between the two groups can be attributed to the treatment effect. This is possible if and only if the decision of the country to implement EITI is random. Otherwise, It will raise selectivity bias problems. However, the decision to implement EITI may be non-random. This raises a problem of selection, which may lead to an overestimation of the impact of EITI implementation on DRM. In this case, traditional linear regression is unreliable (see Dehejia and Wahba, 2002; Heckman et al., 1998). We use various propensity score

matching (PSM) methods to address the selection problem on observable⁶ (Rosenbaum and Rubin, 1983).

4.1 Matching on propensity scores

The PSM method compares EITI and non-EITI-members having similar observed characteristics so that the difference in DRM values between the two groups of countries can be attributed to the effect of treatment. In other words, it is essential that before the experimental treatment is implemented, the two groups are as comparable as possible.

The *first assumption* needed to apply the PSM method is the "conditional independence" ($Y^0, Y^1 \perp EITI|X$). It requires that conditionally to observable (X) unaffected by the treatment, the outcomes be independent of the *EITI implementation* dummy. Under this assumption, equation (1) can be rewritten as follows:

$$ATT = E[Y_{it}^1|EITI_{it} = 1, X_{it}] - E[Y_{it}^0|EITI_{it} = 0, X_{it}] \quad (2)$$

where we have replaced $E[Y_{it}^0|EITI_{it} = 1]$ with $E[Y_{it}^0|EITI_{it} = 0, X_{it}]$, which is observable. The PSM method would consist of matching processed units to control units with similar values of X . As the number of covariates in X increases, matching on X will be difficult to implement in practice. We follow Rosenbaum and Rubin (1983), which proposes matching the treated units and control units on their PS to overcome this enormous problem. The Propensity Score (PS) is the probability of implementing EITI, conditional on the observable covariates (X), and can be estimated using simple probit or logit models.

$$p(X_{it}) = E[EITI_{it}|X_{it}] = Pr(EITI_{it} = 1|X_{it}) \quad (3)$$

A *second assumption* needed to apply PSM is the "common support," i.e., the existence of some comparable control units for each treated unit. Observations with the same PS have a positive probability of being treated or untreated: $0 < p(X_{it}) < 1$. This implies that the PS distribution is substantially equal in the two groups of countries.

Using PSM, the estimated ATT now can be as:

$$ATT = E[Y_{it}^1|EITI_{it} = 1, p(X_{it})] - E[Y_{it}^0|EITI_{it} = 0, p(X_{it})] \quad (4)$$

We consider here a variety of commonly matching algorithms to assess the effect of treatment because of the difference in matching criterion (see Section 5.2 and 5.3).

4.2 Expected effects of independent variables

Lujala (2018) argues that it is crucial to examine what factors influence a country's decision to join and implement the Standard, to understand whether and how adherence to EITI can affect resource governance and development. We estimate the PS using a probit model with the binary variable EITI as the dependent variable. Our primary selection equation consists of three categories of structural factors influencing both EITI implementation and DRM: internal motivation, internal capacity, and external pressure, such as development agencies and organizations. **Internal motivation.** Öge (2016) argues that acceptance of EITI by leaders of resource-rich developing countries was to consolidate their international prestige as enthusiastic reformers, allowing them to maintain and attract FDI. We expect

⁶The selectivity problem here is neither omitted variables nor a Heckman-type sample selection problem

that extractive-rents will positively affect the likelihood of implementing EITI (see Pitlik et al., 2010; Öge, 2016; Kasekende et al., 2016; David-Barrett and Okamura, 2016; Lujala, 2018). These studies also find that DCs are likely to implement EITI faster than richer countries. In addition to benefiting more from EITI, these countries may face external pressures to receive international assistance. Lujala (2018) using both GDP per capita and the squared of GDP per capita, provide evidence of a curvilinear correlation between the two variables with EITI implementation decision for a given country. We expect a positive impact of the HDI and GDP per capita on the likelihood of implementing EITI. The governments of DCs adopt incentive policies to attract FDI. Following the evidence of David-Barrett and Okamura (2016), and Lujala (2018) we assume that a higher level of *FDI flows* is positively associated with the likelihood of implementing EITI.

Internal capacity. The high level of past Trade openness could negatively influence the likelihood of EITI implementation. In fact, Pitlik et al. (2010) do not find a significant effect. Although, countries with relatively high Industrial value-added will be less interested in implementing EITI because of their level of development. Countries that are more corrupt than others are more likely to start the EITI process (Lujala, 2018). The countries with high corruption and high dependence on extractive-rents are less likely to implement EITI quickly (David-Barrett and Okamura, 2016). Other studies suggest that the corruption in EITI-members may decrease in implementing periods (Papyrakis et al., 2017; Villar and Papyrakis, 2017). However, Regulatory quality and Voice & Accountability, which refer much more to democracy, could motivate countries to join EITI. Governments that respect civil rights may tend to adopt progressive norms. At the same time, the social society can exert more significant pressure on the government to implement EITI (Lujala, 2018). In authoritarian regimes, NGOs will not have some freedom to voice their concerns in this process and act as whistle-blowers (Öge, 2017).

External pressure. Dependence on international organizations can influence a country's likelihood of implementing EITI (Lujala and Rustad, 2012; Sovacool and Andrews, 2015). Countries which receive high levels of aid are likely to implement EITI faster than others (David-Barrett and Okamura, 2016; Lujala, 2018). In terms of macroeconomic fluctuations, we can expect a negative relationship between the high level of the past Inflation rate, financial development index, EITI implementation likelihood, and a positive effect for Commodity prices.

5 Baseline results

5.1 Propensity scores (PS)

Table 1 reports the PS estimates. EITI implementation is a binary variable. It takes the value one during which a given country implements EITI and 0 otherwise. Most of the coefficients are significant and have the expected signs for EITI commitment. Total extractive-rents, GDP per capita, commodity prices, AID, FDI, coal rents, forest rents, HDI, regulatory quality, and voice and accountability influence positively EITI implementation. However, financial development, industry value-added, institutional composite index, control of corruption, government effectiveness, and the rule of law are negatively associated with the likelihood of EITI implementation. The overall significance of the regression is reasonable, with a pseudo R² of about 20%. After estimating the propensity score for the sample, it is essential to ensure that for each EITI-member, there is at least one non-EITI-member with the same propensity score.

Table 1: Probit estimates of the propensity score

	EITI commitment						EITI Candidate						EITI Compliance					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Total extract. rents	0.045** (0.006)	0.048** (0.006)	0.045** (0.006)	0.057** (0.006)	0.047** (0.006)	0.067** (0.007)	0.045** (0.006)	0.048** (0.006)	0.043** (0.007)	0.055** (0.007)	0.047** (0.006)	0.064** (0.007)	0.038** (0.008)	0.039** (0.008)	0.037** (0.008)	0.049** (0.008)	0.040** (0.008)	0.050** (0.008)
LOG.GDP/CAPITA	0.045** (0.016)	0.042** (0.016)	0.050** (0.016)	0.053** (0.017)	0.045** (0.016)	0.079** (0.018)	0.049** (0.017)	0.048** (0.017)	0.053** (0.017)	0.056** (0.017)	0.049** (0.017)	0.080** (0.019)	0.045** (0.022)	0.043** (0.022)	0.047** (0.022)	0.056** (0.023)	0.046** (0.022)	0.077** (0.024)
Financial Dev.	-2.499** (0.591)	-2.764** (0.581)	-2.454** (0.594)	-3.530** (0.574)	-2.649** (0.586)	-4.147** (0.580)	-2.608** (0.625)	-2.929** (0.614)	-2.405** (0.628)	-3.512** (0.608)	-2.764** (0.618)	-4.112** (0.613)	-3.309** (0.838)	-3.355** (0.827)	-3.191** (0.844)	-4.202** (0.842)	-3.488** (0.828)	-4.368** (0.826)
Inflation	-0.015** (0.004)	-0.015** (0.004)	-0.013** (0.004)	-0.012** (0.004)	-0.015** (0.004)	-0.011** (0.004)	-0.026** (0.005)	-0.026** (0.005)	-0.025** (0.005)	-0.023** (0.005)	-0.026** (0.005)	-0.023** (0.005)	-0.036** (0.007)	-0.036** (0.007)	-0.035** (0.007)	-0.034** (0.007)	-0.036** (0.007)	-0.034** (0.007)
Commodity prices	0.048** (0.009)	0.048** (0.009)	0.046** (0.009)	0.043** (0.008)	0.049** (0.009)	0.040** (0.008)	0.056** (0.010)	0.054** (0.010)	0.054** (0.010)	0.050** (0.009)	0.056** (0.010)	0.046** (0.009)	0.025** (0.011)	0.025** (0.011)	0.024** (0.011)	0.021** (0.010)	0.024** (0.011)	0.015 (0.011)
Openess (Trade)	-0.002* (0.001)	-0.003* (0.001)	-0.003* (0.001)	-0.003* (0.001)	-0.002* (0.001)	-0.004** (0.001)	-0.004** (0.002)	-0.005** (0.002)	-0.004** (0.002)	-0.005** (0.002)	-0.004** (0.002)	-0.006** (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)	-0.003 (0.002)	-0.002 (0.002)	-0.004* (0.002)
LOG.AID	0.411** (0.046)	0.400** (0.046)	0.401** (0.045)	0.381** (0.045)	0.418** (0.047)	0.411** (0.046)	0.385** (0.048)	0.375** (0.047)	0.380** (0.047)	0.361** (0.047)	0.390** (0.048)	0.386** (0.048)	0.465** (0.067)	0.466** (0.067)	0.463** (0.067)	0.464** (0.069)	0.463** (0.067)	0.472** (0.070)
FDI	0.025** (0.008)	0.024** (0.008)	0.025** (0.008)	0.022** (0.008)	0.025** (0.008)	0.027** (0.008)	0.031** (0.008)	0.030** (0.008)	0.032** (0.008)	0.029** (0.008)	0.032** (0.008)	0.033** (0.008)	0.003 (0.008)	0.003 (0.007)	0.003 (0.007)	0.001 (0.008)	0.003 (0.007)	0.004 (0.007)
Industry V.A	-0.026** (0.006)	-0.026** (0.006)	-0.026** (0.006)	-0.030** (0.006)	-0.027** (0.006)	-0.035** (0.006)	-0.024** (0.006)	-0.024** (0.006)	-0.023** (0.006)	-0.027** (0.006)	-0.024** (0.006)	-0.031** (0.006)	-0.018** (0.007)	-0.018** (0.007)	-0.018** (0.007)	-0.019** (0.007)	-0.019** (0.007)	-0.023** (0.007)
Coal rents	0.153** (0.061)	0.146** (0.061)	0.149** (0.062)	0.142** (0.060)	0.162** (0.061)	0.087 (0.059)	0.137** (0.057)	0.133** (0.056)	0.133** (0.058)	0.129** (0.056)	0.144** (0.057)	0.082 (0.054)	0.149** (0.044)	0.148** (0.044)	0.146** (0.044)	0.141** (0.044)	0.150** (0.044)	0.107** (0.043)
Forest rents	0.053** (0.012)	0.057** (0.012)	0.051** (0.012)	0.064** (0.013)	0.052** (0.012)	0.059** (0.013)	0.042** (0.013)	0.047** (0.013)	0.039** (0.013)	0.053** (0.013)	0.042** (0.013)	0.049** (0.013)	0.028** (0.016)	0.030** (0.016)	0.025 (0.016)	0.042** (0.017)	0.029** (0.016)	0.033* (0.017)
HDI	4.024** (0.552)	3.897** (0.547)	4.222** (0.556)	3.820** (0.538)	3.890** (0.549)	4.053** (0.546)	4.032** (0.581)	3.907** (0.575)	4.312** (0.591)	3.846** (0.569)	3.906** (0.577)	4.057** (0.576)	3.543** (0.745)	3.493** (0.743)	3.676** (0.756)	3.291** (0.743)	3.488** (0.741)	3.764** (0.752)
Index Governance.(e)	-0.331** (0.071)	-0.428** (0.111)	-0.523** (0.121)	0.202** (0.100)	-0.492** (0.108)	0.545** (0.076)	-0.291** (0.075)	-0.304** (0.116)	-0.578** (0.129)	0.166 (0.106)	-0.410** (0.114)	0.504** (0.079)	-0.129 (0.095)	-0.211 (0.148)	-0.276* (0.163)	0.461** (0.146)	-0.096 (0.145)	0.521** (0.108)
Cntrl of Corruption(e)																		
Gov. Effectiveness(e)																		
Regulatory Quality(e)																		
Rule of Law(e)																		
Voice and Account.(e)																		
Constant	-15.886** (1.447)	-15.376** (1.418)	-15.586** (1.422)	-13.983** (1.364)	-15.964** (1.458)	-14.330** (1.378)	-16.112** (1.559)	-15.486** (1.525)	-16.172** (1.549)	-14.414** (1.486)	-16.074** (1.564)	-14.492** (1.493)	-14.697** (1.957)	-14.716** (1.959)	-14.719** (1.943)	-13.791** (1.901)	-14.425** (1.942)	-13.669** (1.928)
N.Obs.	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221
Pseudo R2	0.208	0.203	0.206	0.196	0.207	0.230	0.207	0.201	0.211	0.197	0.205	0.228	0.177	0.177	0.178	0.188	0.175	0.207

Standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01. Dependent-var: EITI=1 if a country is IIE and 0 otherwise. (e) = Estimate

5.2 Matching results from the basic model

We use four PSM algorithms to match each EITI-member with non-EITI-members given the closeness of their PS ⁷. Table 2 reports the results from matching concerning Total DRM, presented by the ATT (Average Treatment effect Treated). If treatment starts from the country's commitment or candidacy dates, the control group includes only non-EITI-countries. However, if treatment starts from the country's compliance date, the control group is formed only by EITI committed and candidate countries that have not yet obtained compliance status.

The first three columns show the results of n-Nearest neighbors matching (n-NNM), with $n = 1, 2, 3$ (LaLonde, 1986). This technique is subject to the risk of inaccurate matching when the nearest neighbor is numerically distant. The following three columns show the results of r-Radius matching (r-RM), which matches a treated unit to the control units with estimated PS falling within a radius of length r . In other words, each EITI-member is associated only with a non-EITI-member whose propensity score falls within a predefined neighborhood to that of an EITI-member country (Dehejia and Wahba, 2002). We consider Kernel matching (KM), where a treated unit is matched to a weighted average of all control units. All non-EITI-members are used but weighted by their propensity score closeness to EITI-members. Moreover, all control units contribute to the weights, reducing the variance. The control unit's further from the treated unit, the lower the weight (Dehejia and Wahba, 2002). Finally, we consider the last column's regression-adjusted local linear matching (LLRM). This method developed by (Heckman et al., 1998) is like to kernel matching but includes a linear term in the weighting function instead of kernel. Each of these types of methods has advantages and disadvantages. In practice, it is recommended to test the sensitivity of the results according to the method used. We follow Dehejia and Wahba (2002) and compute standard errors by bootstrapping because the matching estimator has no analytical variance.

Table 2 indicates that the estimated ATT remains positive and statistically significant for all the matching algorithms. Regardless of the stage considered or the date of EITI implementation, we can notice a significant improvement in the estimated ATT. Our main results are twofold. First, EITI committed, and candidate countries are more effective than non-EITI-countries in DRM. The estimates show that EITI-members increase total DRM by an average value ranging between $e^{0.0619}$ to $e^{0.178}$ (1.06 to 1.20) percentage points⁸ compared to non-EITI-members. If EITI implementation starts from the commitment date or the candidacy date, it turns out that the treatment effects on total DRM are slightly identical. This could be explained by the fact that the duration is relatively short (two years on average) between the countries' commitment date and their Candidacy date. On the other hand, the improvement of the treatment effect is pronounced between these two stages if we consider them independently, i.e., at their respective periods (see Table A1 and Fig. 3 for fixed effects regression using the function control approach).

Second, compliance to EITI allows for additional DRM compared to non-compliant countries. This is because the ATT estimates using EITI compliance as the treatment variable, included in the control group, only those implementing EITI but are not yet compliant (i.e., committed or candidate countries). According to our estimations, EITI compliance increases total DRM by an average value ranging between $e^{0.0844}$ to $e^{0.122}$ (1.09 to 1.13) percentage points compared to non-compliant members.

⁷While matching EITI-members with non-EITI-members, we limit the analyses to "common support." This is a sine qua non condition to avoid structural confusion bias when estimating treatment effects with the propensity score. (Dehejia and Wahba, 1999; Lucotte, 2012)

⁸Note that the values of DRM are considered in logarithm

Our results support the theoretical arguments presented in Section 2.2 and confirm stylized facts (Section 3.2) that EITI implementation has encouraged the governments of DCs to improve tax revenue collection. We also control for the sensitivity of some governance indicators by adding an index calculated by the principal component analysis, then individually. There is a clear improvement to the estimated ATT for all the governance indicators relating to commitment and EITI candidate status but mixed for compliance status. This could be explained by the fact that almost all non-compliant EITI-countries have made significant and satisfactory progress and have, therefore, good institutions. In other words, the institutional governance of the two groups seems quite similar.

We also check the matching quality through the other three main diagnostic tests. First, the pseudo-R² shows that our control variables significantly explain the probability of implementing EITI, given that its values after matching are 'fairly low' (see for instance Sianesi, 2004; Caliendo and Kopeinig, 2008). Second, the diagnostic test based on the standardized bias evaluates the balancing score (see Sianesi, 2004; Caliendo and Kopeinig, 2008; Lechner, 2001). According to Rosenbaum and Rubin (1985), the p-value associated with the standardized bias should be above the critical value of 10%. The results satisfy the conditional independence assumption. This indicates no significant difference between "EITI" and "non-EITI" observable characteristics within the selected common support. Third, the Rosenbaum bounds sensitivity test shows whether there are unobserved variables that simultaneously affect the treatment (EITI adherence) and the outcome variable (DRM) (Rosenbaum, 2002). The results suggest that there is no hidden bias⁹. Our results are robust to using an alternative measure of DRM (NRTAX and Income tax) and the stages of EITI implementation.

⁹In order not to clutter the tables, we do not display the diagnostic tests of the control of governance indicators, but it should be noted that the results of the diagnostic tests are even better with the introduction of these indicators.

Table 2: Treatment effect on total DRM

<i>Treatment: EITI Commitment date (EITI.1)</i>			<i>Dependent-var: Log Total Tax.revenue (% GDP)</i>					
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI	0.148** (0.0620)	0.0952* (0.0560)	0.0970* (0.0496)	0.0619* (0.0341)	0.0645* (0.0371)	0.106*** (0.0351)	0.104*** (0.0368)	0.0940** (0.0425)
N. Total Obs.	1311	1311	1311	1311	1311	1311	1311	1311
N. Treated/Controls Obs.	330/991	330/991	330/991	330/991	330/991	330/991	330/991	330/991
Pseudo R2	0.009	0.006	0.007	0.005	0.007	0.008	0.007	0.009
Standardized bias (p-value)	0.676	0.882	0.817	0.940	0.862	0.758	0.785	0.676
Rosenbaum sensitivity	1.2	1.2	1.3	1.2	1.2	1.4	1.4	1.4
[2] Index of Governance	0.119* (0.0639)	0.115** (0.0550)	0.102* (0.0552)	0.0559 (0.0389)	0.0759** (0.0383)	0.141*** (0.0391)	0.147*** (0.0380)	0.154*** (0.0444)
[3] Corruption(e)	0.167*** (0.0604)	0.146*** (0.0529)	0.158*** (0.0479)	0.102*** (0.0376)	0.0858** (0.0353)	0.131*** (0.0361)	0.135*** (0.0358)	0.131*** (0.0425)
[4] Gov. Effectiveness(e)	0.142** (0.0714)	0.115* (0.0608)	0.121** (0.0585)	0.0770** (0.0386)	0.0844** (0.0379)	0.155*** (0.0437)	0.166*** (0.0420)	0.157*** (0.0519)
[5] Rule of Law(e)	0.135** (0.0629)	0.136** (0.0578)	0.135*** (0.0511)	0.0922** (0.0385)	0.0915** (0.0362)	0.127*** (0.0365)	0.126*** (0.0372)	0.134*** (0.0439)
<i>Treatment: EITI Candidate date (EITI.2)</i>			<i>Dependent-var: Log Total Tax.revenue (% GDP)</i>					
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.0762 (0.0624)	0.0683 (0.0524)	0.0723 (0.0511)	0.0784** (0.0367)	0.100*** (0.0387)	0.105*** (0.0314)	0.107*** (0.0335)	0.0975*** (0.0372)
N. Total Obs.	1311	1311	1311	1311	1311	1311	1311	1311
N. Treated/Controls Obs.	256/1055	256/1055	256/1055	256/1055	256/1055	256/1055	256/1055	256/1055
Pseudo R2	0.011	0.010	0.009	0.004	0.001	0.006	0.005	0.011
Standardized bias (p-value)	0.694	0.728	0.825	0.991	1.000	0.995	0.964	0.694
Rosenbaum sensitivity	1	1	1.1	1.3	1.5	1.5	1.5	1.4
[2] Index of Governance	0.137** (0.0633)	0.120** (0.0600)	0.123** (0.0510)	0.103** (0.0405)	0.106*** (0.0399)	0.140*** (0.0373)	0.134*** (0.0388)	0.128*** (0.0404)
[3] Corruption(e)	0.162*** (0.0569)	0.127** (0.0528)	0.102** (0.0495)	0.0795** (0.0368)	0.0960*** (0.0365)	0.105*** (0.0361)	0.106*** (0.0344)	0.108*** (0.0372)
[4] Gov. Effectiveness(e)	0.118 (0.0760)	0.126* (0.0664)	0.178*** (0.0643)	0.101** (0.0393)	0.114*** (0.0380)	0.130*** (0.0414)	0.134*** (0.0455)	0.132*** (0.0481)
[5] Rule of Law(e)	0.0673 (0.0613)	0.0704 (0.0538)	0.0727 (0.0461)	0.0688* (0.0376)	0.0751** (0.0361)	0.106*** (0.0359)	0.109*** (0.0352)	0.104*** (0.0361)
<i>Treatment: EITI Compliance date (EITI.3)</i>			<i>Dependent-var: Log Total Tax.revenue (% GDP)</i>					
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.0691 (0.0687)	0.0919 (0.0617)	0.103* (0.0544)	0.0945** (0.0437)	0.121*** (0.0386)	0.114*** (0.0359)	0.110*** (0.0356)	0.116*** (0.0372)
N. Total Obs.	743	743	743	743	743	743	743	743
N. Treated/Controls Obs.	91/652	91/652	91/652	91/652	91/652	91/652	91/652	91/652
Pseudo R2	0.025	0.014	0.011	0.007	0.009	0.008	0.007	0.025
Standardized bias (p-value)	0.808	0.972	0.987	0.999	0.996	0.997	0.998	0.808
Rosenbaum sensitivity	1	1.2	1.4	1.5	1.9	1.7	1.7	1.8
[2] Index of Governance	0.0331 (0.0711)	0.0822 (0.0667)	0.0667 (0.0572)	0.0883* (0.0475)	0.0809* (0.0439)	0.0940** (0.0398)	0.0943*** (0.0355)	0.107*** (0.0381)
[3] Corruption(e)	0.0763 (0.0693)	0.100 (0.0629)	0.107** (0.0508)	0.122*** (0.0462)	0.0906** (0.0430)	0.100*** (0.0350)	0.0971*** (0.0369)	0.107** (0.0416)
[4] Gov. Effectiveness(e)	0.123* (0.0712)	0.107* (0.0596)	0.0909 (0.0572)	0.0844* (0.0466)	0.113*** (0.0418)	0.0850** (0.0365)	0.0846** (0.0379)	0.0980*** (0.0349)
[5] Rule of Law(e)	0.0918 (0.0735)	0.0879 (0.0642)	0.0872 (0.0589)	0.112** (0.0490)	0.110*** (0.0404)	0.0975** (0.0394)	0.0949** (0.0406)	0.105*** (0.0407)

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Bootstrap replications = 500. GI= Governance Index

All the control variables estimating the propensity score are included beforehand, then we use Governance indicators estimate (e) one by one to test their specific influence on the outcome.

5.3 Robustness checks

We analyze the robustness of our empirical results in two ways. First, we check the sensitivity of two essential components of total DRM: the NRTAX-to-GDP ratio and the Income tax-to-GDP ratio. The matching results are presented respectively in Tables 3 and Table 4. The results remain robust to the combination of control variables, treatment variables, matching algorithms, and including governance indicators. We note that the estimated ATT are highly sensitive to governance indicators. Our estimations in Table 3 (*EITI.1 & EITI.2*) demonstrate that compared to non-members, EITI-members increase NRTAX by an average value ranging between $e^{0.0819}$ to $e^{0.222}$ (1.085 to 1.25) percentage points. Table 3 (*EITI.3*) indicates that EITI compliant increases NRTAX by an average value ranging between $e^{0.100}$ to $e^{0.197}$ (1.105 to 1.22) percentage points compared to non-compliant members. Mawejje (2019) found that the coefficient of the interaction term between the EITI-membership dummy and the natural resource dependency is positively and significantly associated with non-oil revenue mobilization. Our results confirm a significant and robust positive impact of EITI on DRM through a better-adapted methodology. This suggests that EITI implementation helps mitigate the crowding out of NRTAX by resource revenues, reducing resource dependence¹⁰.

Likewise, in Table 4 (*EITI.1 and EITI.2*), we notice that EITI-members increase income DRM significantly by an average value ranging between $e^{0.112}$ to $e^{0.447}$ (1.13 to 1.56) percentage points compared to non-members. Table 4 (*EITI.3*) indicates that EITI compliant increase significantly income DRM by an average value ranging between $e^{0.124}$ to $e^{0.234}$ (1.132 to 1.26) percentage points compared to non-compliant members. On the one hand, we note that the estimated ATT coefficients are more significant for income DRM than those for total DRM and NRTAX. This could be explained by the direct impact of EITI on income DRM through more equitable and transparent tax regimes (mining, oil, and gas regimes). The estimated ATT coefficients are smaller for total DRM than for income and NRTAX separately because of the negative relationship between resource dependence and NRTAX despite EITI. This is consistent with Bornhorst et al. (2009), Ndikumana and Abderrahim (2010), Crivelli and Gupta (2014), and Mawejje (2019).

Second, to remove any doubt about whether the treatment effect improves with the main stages of EITI implementation, we undertake a fixed-effects estimation through the control function approach (equation 5), considering only the duration of each stage independently. We then include the estimated propensity score (*_pscore*) obtained after matching, considering all the control variables. The results are presented in Table A1 and graphically represented by Figure 3. The estimated coefficients on the propensity score are statistically significant at the 1% level, which is strong evidence for the presence of self-selection bias. This justifies a posteriori the use of the PSM method in the previous estimations of main results. The results significantly reveal that EITI-members have higher levels of DRM than non-members and the effects are more significant with the stage of EITI implementation. The treatment effect is more critical on income tax revenue than NRTAX revenue, which is also greater than total tax revenue.

¹⁰The degree to which countries do—or do not—have access to alternative sources of income other than resource extraction, at some point in time (Brunnschweiler and Bulte, 2008)

Table 3: Treatment effect on the non_resource_tax_revenues

<i>Treatment: EITI Commitment date (EITI_1)</i>				Dep. var.: Log Non_resource_tax_revenues (% GDP)				
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.0125 (0.0655)	0.0214 (0.0642)	0.0345 (0.0576)	0.0383 (0.0428)	0.0373 (0.0420)	0.0961** (0.0413)	0.0907** (0.0428)	0.0819* (0.0446)
N. Total Obs.	1263	1263	1263	1263	1263	1263	1263	1263
N. Treated/Controls Obs.	277/986	277/986	277/986	277/986	277/986	277/986	277/986	277/986
Pseudo R2	0.013	0.013	0.010	0.003	0.008	0.006	0.006	0.013
Standardized bias (p-value)	0.423	0.436	0.684	0.995	0.851	0.918	0.910	0.423
Rosenbaum sensitivity	1	1.1	1.3	1.1	1.2	1.4	1.4	1.4
[2] Index of Governance	0.222*** (0.0687)	0.192*** (0.0650)	0.191*** (0.0533)	0.131*** (0.0431)	0.131*** (0.0419)	0.203*** (0.0402)	0.203*** (0.0407)	0.200*** (0.0468)
[3] Corruption(e)	0.197*** (0.0619)	0.172*** (0.0542)	0.165*** (0.0529)	0.117*** (0.0410)	0.131*** (0.0372)	0.166*** (0.0372)	0.168*** (0.0368)	0.166*** (0.0403)
[4] Gov. Effectiveness(e)	0.121 (0.0738)	0.131** (0.0627)	0.157** (0.0625)	0.0853** (0.0432)	0.121*** (0.0455)	0.174*** (0.0429)	0.178*** (0.0455)	0.187*** (0.0498)
[5] Rule of Law(e)	0.169** (0.0686)	0.169*** (0.0627)	0.165*** (0.0568)	0.108** (0.0429)	0.124*** (0.0402)	0.185*** (0.0418)	0.187*** (0.0408)	0.179*** (0.0483)
<i>Treatment: EITI Candidate date (EITI_2)</i>				Dep. var.: Log Non_resource_tax_revenues (% GDP)				
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.109 (0.0681)	0.104* (0.0599)	0.113** (0.0560)	0.0757* (0.0438)	0.0820* (0.0423)	0.108** (0.0359)	0.107*** (0.0402)	0.107*** (0.0388)
N. Total Obs.	1263	1263	1263	1263	1263	1263	1263	1263
N. Treated/Controls Obs.	220/1043	220/1043	220/1043	220/1043	220/1043	220/1043	220/1043	220/1043
Pseudo R2	0.012	0.009	0.007	0.005	0.007	0.003	0.003	0.012
Standardized bias (p-value)	0.727	0.867	0.930	0.985	0.948	0.996	0.996	0.727
Rosenbaum sensitivity	1	1.2	1.3	1.2	1.2	1.5	1.5	1.6
[2] Index of Governance	0.147* (0.0756)	0.115* (0.0649)	0.127** (0.0625)	0.0947** (0.0467)	0.123*** (0.0470)	0.182*** (0.0415)	0.185*** (0.0439)	0.196*** (0.0430)
[3] Corruption(e)	0.126** (0.0597)	0.129** (0.0557)	0.145*** (0.0535)	0.101** (0.0413)	0.114*** (0.0388)	0.160*** (0.0368)	0.160*** (0.0358)	0.166*** (0.0368)
[4] Gov. Effectiveness(e)	0.176** (0.0861)	0.170** (0.0717)	0.148** (0.0675)	0.125*** (0.0481)	0.151*** (0.0488)	0.193*** (0.0469)	0.190*** (0.0500)	0.202*** (0.0518)
[5] Rule of Law(e)	0.178** (0.0726)	0.132** (0.0619)	0.158*** (0.0591)	0.125*** (0.0477)	0.150*** (0.0431)	0.179*** (0.0422)	0.173*** (0.0412)	0.169*** (0.0451)
<i>Treatment: EITI Compliance date (EITI_3)</i>				Dep. var.: Log Non_resource_tax_revenues (% GDP)				
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.175* (0.0903)	0.165** (0.0779)	0.144* (0.0741)	0.151*** (0.0554)	0.156*** (0.0548)	0.138*** (0.0478)	0.134*** (0.0464)	0.154*** (0.0497)
N. Total Obs.	664	664	664	664	664	664	664	664
N. Treated/Controls Obs.	68/597	68/597	68/597	68/597	68/597	68/597	68/597	68/597
Pseudo R2	0.043	0.026	0.016	0.006	0.006	0.005	0.005	0.043
Standardized bias (p-value)	0.615	0.899	0.981	1.000	1.000	1.000	1.000	0.615
Rosenbaum sensitivity	1.5	1.7	1.5	1.6	1.7	1.6	1.5	1.8
[2] Index of Governance	0.130 (0.0938)	0.146* (0.0880)	0.141* (0.0773)	0.101* (0.0607)	0.100* (0.0577)	0.155*** (0.0449)	0.155*** (0.0477)	0.162*** (0.0478)
[3] Corruption(e)	0.197** (0.0891)	0.158** (0.0799)	0.183** (0.0775)	0.186*** (0.0569)	0.150*** (0.0528)	0.136*** (0.0439)	0.139*** (0.0449)	0.156*** (0.0466)
[4] Gov. Effectiveness(e)	0.0800 (0.0951)	0.151* (0.0840)	0.131* (0.0758)	0.123* (0.0639)	0.124** (0.0545)	0.159*** (0.0458)	0.157*** (0.0443)	0.162*** (0.0501)
[5] Rule of Law(e)	0.190** (0.0938)	0.137* (0.0748)	0.123* (0.0745)	0.118** (0.0547)	0.140*** (0.0516)	0.130*** (0.0444)	0.133*** (0.0440)	0.154*** (0.0509)

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Bootstrap replications = 500. GI= Governance Indicators

All the control variables estimating the propensity score are included beforehand, then we use Governance Indicators estimate one by one to test their specific influence on the outcome.

Table 4: Treatment effect on the income tax

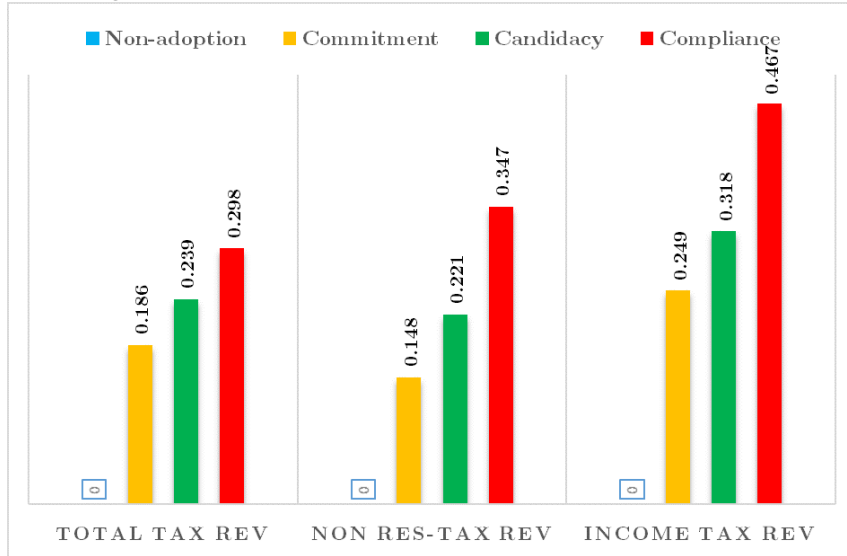
<i>Treatment: EITI Commitment date (EITI.1) Dep. var.: Log Income Tax (income, profits, and capital gains (% GDP))</i>								
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.321*** (0.0996)	0.286*** (0.0888)	0.296*** (0.0822)	0.122** (0.0619)	0.141** (0.0651)	0.242*** (0.0651)	0.260*** (0.0687)	0.267*** (0.0723)
N. Total Obs.	1096	1096	1096	1096	1096	1096	1096	1096
N. Treated/Controls Obs.	229/867	229/867	229/867	229/867	229/867	229/867	229/867	229/867
Pseudo R2	0.047	0.074	0.012	0.007	0.005	0.009	0.012	0.047
Standardized bias (p-value)	0.001	0.000	0.670	0.960	0.989	0.861	0.696	0.001
Rosenbaum sensitivity	1.5	1.7	1.9	1.3	1.5	1.8	1.8	2
[2] Index of Governance	0.447*** (0.108)	0.393*** (0.100)	0.345*** (0.0881)	0.220*** (0.0624)	0.256*** (0.0597)	0.291*** (0.0692)	0.293*** (0.0700)	0.366*** (0.0836)
[3] Corruption(e)	0.373*** (0.104)	0.375*** (0.0906)	0.368*** (0.0819)	0.229*** (0.0632)	0.230*** (0.0593)	0.275*** (0.0631)	0.278*** (0.0631)	0.319*** (0.0765)
[4] Gov. Effectiveness(e)	0.227* (0.117)	0.295*** (0.103)	0.304*** (0.0969)	0.141** (0.0615)	0.182*** (0.0619)	0.324*** (0.0733)	0.329*** (0.0799)	0.393*** (0.0908)
[5] Rule of Law(e)	0.360*** (0.0965)	0.303*** (0.0882)	0.263*** (0.0850)	0.170*** (0.0592)	0.174*** (0.0570)	0.248*** (0.0610)	0.243*** (0.0639)	0.310*** (0.0744)
<i>Treatment: EITI Candidate date (EITI.2) Dep. var.: Log Income Tax (income, profits, and capital gains (% GDP))</i>								
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.234** (0.104)	0.243** (0.0992)	0.229** (0.0906)	0.170** (0.0680)	0.167** (0.0706)	0.183*** (0.0642)	0.189*** (0.0664)	0.258*** (0.0759)
N. Total Obs.	1096	1096	1096	1096	1096	1096	1096	1096
N. Treated/Controls Obs.	177/919	177/919	177/919	177/919	177/919	177/919	177/919	177/919
Pseudo R2	0.023	0.094	0.020	0.008	0.009	0.007	0.007	0.023
Standardized bias (p-value)	0.377	0.000	0.514	0.976	0.958	0.980	0.981	0.377
Rosenbaum sensitivity	1.3	1.4	1.4	1.4	1.5	1.8	1.8	2
[2] Index of Governance	0.262** (0.107)	0.252** (0.100)	0.250*** (0.0890)	0.140** (0.0668)	0.168*** (0.0649)	0.246*** (0.0703)	0.248*** (0.0648)	0.240*** (0.0730)
[3] Corruption(e)	0.252** (0.108)	0.198** (0.0983)	0.188** (0.0910)	0.0642 (0.0658)	0.122* (0.0637)	0.223*** (0.0646)	0.224*** (0.0664)	0.220*** (0.0739)
[4] Gov. Effectiveness(e)	0.225* (0.120)	0.232** (0.107)	0.230** (0.0899)	0.171** (0.0692)	0.200*** (0.0633)	0.308*** (0.0764)	0.305*** (0.0828)	0.284*** (0.0871)
[5] Rule of Law(e)	0.258** (0.105)	0.241*** (0.0890)	0.219** (0.0894)	0.0721 (0.0672)	0.112* (0.0643)	0.228*** (0.0670)	0.227*** (0.0651)	0.226*** (0.0715)
<i>Treatment: EITI Compliance date (EITI.3) Dep. var.: Log Income Tax (income, profits, and capital gains (% GDP))</i>								
	n-Nearest neighbors matching			r-Radius matching			Kernel	local linear
	n=1	n=2	n=3	r=0.005	r=0.01	r=0.05	matching	matching
[1] ATT without GI.	0.211* (0.113)	0.186* (0.100)	0.169* (0.0909)	0.234*** (0.0805)	0.196*** (0.0700)	0.173*** (0.0601)	0.171*** (0.0570)	0.167*** (0.0548)
N. Total Obs.	596	596	596	596	596	596	596	596
N. Treated/Controls Obs.	72/524	72/524	72/524	72/524	72/524	72/524	72/524	72/524
Pseudo R2	0.092	0.170	0.054	0.060	0.027	0.017	0.019	0.092
Standardized bias (p-value)	0.062	0.001	0.419	0.391	0.893	0.973	0.965	0.062
Rosenbaum sensitivity	1.4	1.4	1.3	2.3	2.1	2.3	2.3	2.3
[2] Index of Governance	0.0673 (0.112)	0.165* (0.0963)	0.187** (0.0916)	0.210*** (0.0800)	0.178** (0.0731)	0.132** (0.0598)	0.132* (0.0690)	0.134** (0.0620)
[3] Corruption(e)	0.0958 (0.110)	0.0667 (0.0993)	0.0845 (0.0899)	0.149* (0.0785)	0.111 (0.0753)	0.129** (0.0611)	0.124** (0.0609)	0.136** (0.0612)
[4] Gov. Effectiveness(e)	0.115 (0.117)	0.152 (0.106)	0.157* (0.0912)	0.169** (0.0777)	0.148* (0.0756)	0.144** (0.0575)	0.141** (0.0630)	0.141** (0.0593)
[5] Rule of Law(0-100)	0.277** (0.110)	0.200* (0.103)	0.207** (0.0907)	0.203** (0.0826)	0.168** (0.0749)	0.133** (0.0630)	0.135** (0.0640)	0.138** (0.0574)

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Bootstrap replications = 500. GI= Governance Indicators

All the control variables estimating the propensity score are included beforehand, then we use Governance Indicators estimate one by one to test their specific influence on the outcome.

Figure 3: Impacts of EITI implementation compared to non-EITI.



6 Exploring the heterogeneity in the treatment effects

Developing countries share many common characteristics, but structural factors such as economic and institutional contexts (Easterly, 2002) can magnify or mitigate the impact of EITI implementation on the tax revenues. We have shown through Propensity Scoring Matching that EITI Compliant countries perform better on tax revenues than non-compliant countries. We also examine whether the time elapsed since a country joined the EITI affects tax revenues. Next, we test the influence of economic indicators in the ATT. Finally, we examine the impact of other institutional transparency indicators in the ATT. To assess the presence of potential sources of heterogeneity in the ATT related to structural factors, we use a control function regression approach, following Lin and Ye (2009) and Guerguil et al. (2017). The following OLS specification respecting the common support from matching allows exploring non-linearity in the ATT:

$$TAX_REV_{it} = \alpha + \beta EITI_{it} + \gamma Pscore_{it} + \phi X_{it} + \theta(EITI_{it} * X_{it}) + \mu_i + v_t + \varepsilon_{it} \quad (5)$$

TAX_REV_{it} refers to the tax revenues (or the tax structure); $EITI_{it}$ to the EITI dummy variable; $Pscore_{it}$ which stands for the Estimated Propensity Score through the probit model is included to correct for self-selection. The X_{it} vector includes the set of macroeconomic and institutional factors that could give rise to heterogeneity in the ATT; θ coefficient of the interactive term (between $EITI_{it}$ and X_{it}) characterizes the heterogeneity features of the treatment effect of EITI. μ_i and v_t refer to country fixed effects and time effects, respectively, while ε_{it} refers to stochastic disturbance terms.

Tables A2, A3, and A4 below report the estimated results on total tax revenues using EITI (commitment, Candidate and Compliant, respectively) as the treatment variable. Column (2) shows the results of a simple OLS linking EITI implementation and total tax revenues while accounting for the previously estimated $pscore_{it}$. The estimated β coefficient (including country fixed and random effects) is the average difference in tax revenues between EITI implementing countries and non-EITI countries. This coefficient is positive and significantly different from zero. The magnitudes are close to the ATT from

the matching algorithms in Table 2 above (0.096 for Commitment, 0.088 for Candidate, and 0.057 for Compliant). This shows that tax revenue growth is stronger in EITI members than in other resource-dependent countries. The time elapsed since EITI Commitment or Candidate (column 3) positively and significantly different from zero on tax revenues. We can confirm that the time elapsed since EITI Commitment and Candidate contribute to the heterogeneity of ATT between EITI members. The following columns show the heterogeneity of treatment effects related to a given structural factor.

In EITI Candidate countries, for example, the time elapsed since the country's application date, total rents, GDP per capita, financial development, trade openness, ODA, FDI, coal rents, forest rents, HDI, industrial value-added, governance quality index, influence positively or negatively and significantly the effect of the ATT, depending on the type of tax. Our findings suggest that developing countries could improve their tax revenues by applying EITI standards rigorously and, indeed, strengthening the quality of governance.

Similarly, trade openness improves the effect of treatment on the outcome (column 10). Extractive resources in developing countries are mainly for export. Although trade openness in developing countries is still low compared to developed countries, it influences the impact of EITI membership on tax revenues. High inflation reduces tax revenue mobilization, but its influence on the effect of treatment is insignificant (column 12). This may be explained by the low inflation disparity in developing countries.

7 Conclusion

The objective of this study was to assess the impact of EITI on the tax revenue mobilization from a panel of 83 developing countries over the period 1995-2017. The intuition was that EITI implementation would boost the quality of governance in resource-rich countries and thus improve tax revenue mobilization. Our empirical strategy focuses on the propensity score matching method and the control function approach. We highlight various matching algorithms, which allow us to control the self-selection of choice to implement EITI. We find that the ATT is positive and is robust to various matching methods. In other words, there is a significant difference between EITI members compared to non-EITI members in terms of tax revenue mobilization. Furthermore, matching EITI compliant countries with non-EITI compliant countries suggests that compliance generates a considerable surplus of DRM. The results are robust to non-resource and income tax. The magnitudes of the estimated ATTs are important if we include the quality of governance.

Regarding heterogeneity in EITI Compliant countries, the time elapsed since the country's application date, trade openness, FDI, and forest rents positively and significantly influence the ATT effect of total tax revenues. Financial development, HDI, and governance quality index have a negative and significant influence on the ATT effect. The factors of heterogeneity depend to a greater or lesser extent on the stage of EITI implementation and the type of tax revenue. Stylized evidence shows that EITI membership mitigates the adverse effects of extractive resource dependence.

Most importantly, the implementation of EITI reduces dependence on resources and the "resource curse." Countries already implementing the EITI need to build good institutions. However, it is crucial to remember that simply EITI implementation is not enough to guarantee transparency and better tax revenues. It must be accompanied by a series of other measures, such as compliance and responsible use of revenues. Another suggestion for resource-rich countries beyond this study's scope would be the need to closely monitor international tax treaties and the relationship between EITI policy and fiscal transparency.

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APPENDIX

Common support

According to Heckman et al. (1999), the common support is an area of overlap of treated and untreated individuals on the set of propensity score values. It ensures that there is at least one individual in the control group with simulated observed characteristics (Bryson et al., 2002). The two main techniques for determining common support are the comparison of minima and maxima between the two groups of individuals (Dehejia and Wahba, 1999) and comparison of trimming distributions (Smith and Todd, 2005). The first is to retain all treated and untreated individuals, except those with no counterfactual. The propensity score of the latter is lower than the minimum (respectively higher than the maximum) score of the individuals in the control group. A disadvantage of this method is that observations within limits will be discarded even if they are close to the limits. We use the second method, which estimates the distribution density in the two groups (trimming). We exclude the untreated individuals for whom the proportion of potential counterfactuals is lower, i.e., the treated individuals with a propensity score very close to the propensity score of the untreated individuals under consideration. Figure 4 shows a fictitious situation in which the propensity score distribution supports the treatment group and the control group largely overlap, which is a good case for allowing matches. This indicates common support between EITI-members and non-EITI-members and verifies the second assumption to apply propensity score matching.

Figure 4: Propensity score distributions of treated and controls groups

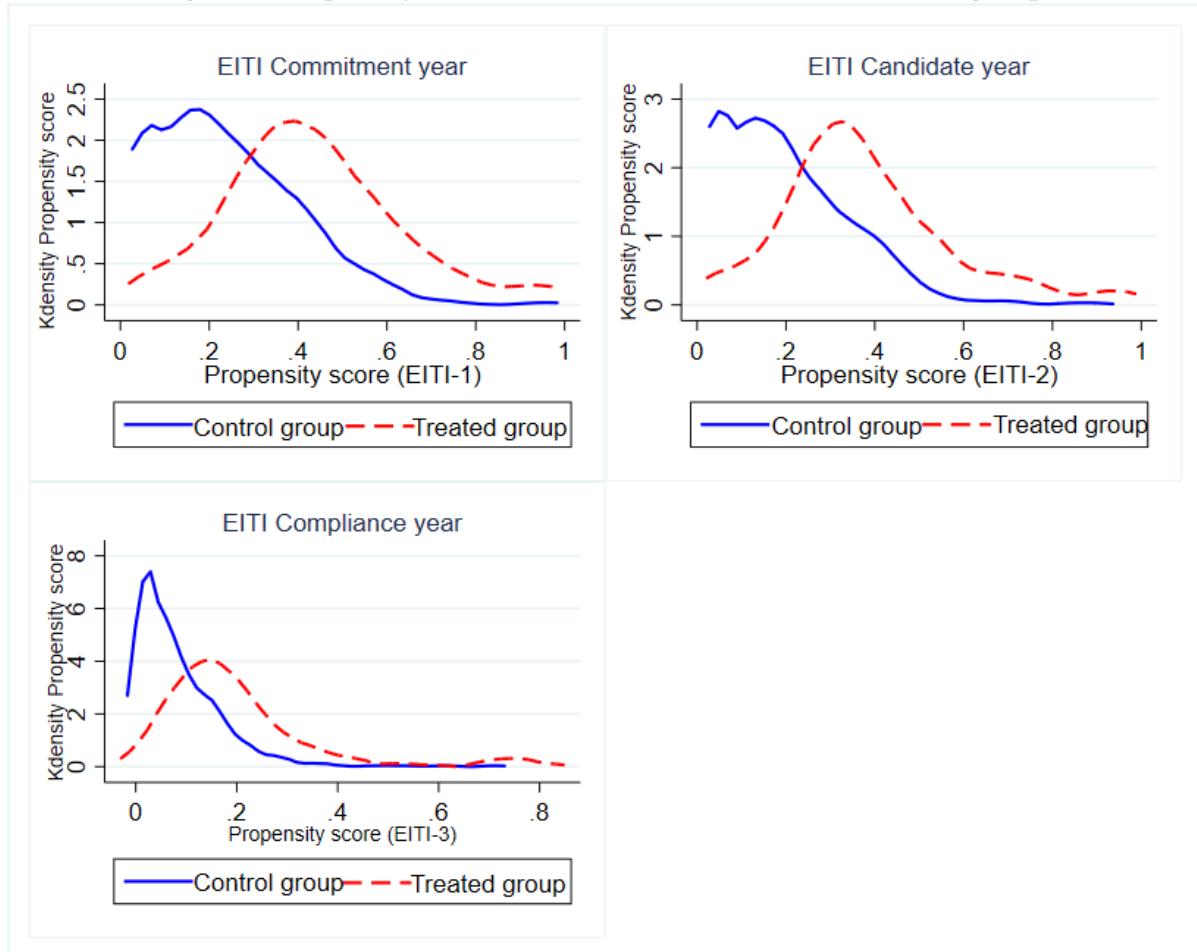


Table A1: Comparing of each EITI implementation step to non-EITI

	[Log.Total Tax rev.] [1]	[Log.NRTAX rev.] [2]	[Log.Income Tax rev.] [3]
.pscore	0.224*** (0.055)	0.180*** (0.059)	0.676*** (0.090)
0.EITI (Non-adoption)	0.000 (.)	0.000 (.)	0.000 (.)
1.EITI (Commitment)	0.186*** (0.029)	0.148*** (0.031)	0.249*** (0.045)
2.EITI (Candidacy)	0.239*** (0.020)	0.221*** (0.021)	0.318*** (0.035)
3.EITI (Compliance)	0.298*** (0.027)	0.347*** (0.032)	0.467*** (0.043)
Constant	2.492*** (0.014)	2.428*** (0.014)	1.193*** (0.021)
N	1311	1210	1085
F	82.532	65.380	90.962
Adjusted R-squared	0.162	0.134	0.212

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Heterogeneity of the treatment effects (EITI.1) on outcome (Log Total tax_revenues (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
EITI.1	0.151*** (0.021)	0.096*** (0.020)	0.058** (0.024)	0.093*** (0.022)	0.182*** (0.068)	0.251*** (0.035)	0.206 (0.370)	0.064* (0.037)	0.328 (0.307)	0.089*** (0.021)	0.084*** (0.021)	0.100*** (0.020)	0.017 (0.023)	0.269*** (0.069)	0.223*** (0.043)	0.024 (0.023)
p_score		0.108** (0.046)	0.086* (0.047)	0.021 (0.048)	0.157*** (0.045)	0.081* (0.047)	0.202** (0.053)	0.100** (0.045)	0.039 (0.051)	0.101** (0.044)	0.060 (0.049)	0.083* (0.048)	0.160*** (0.047)	0.067 (0.047)	0.092** (0.045)	0.136*** (0.047)
Time1			0.011*** (0.004)													
Total.Extract.rents				0.008*** (0.001)												
EITI.1xTotal.Extract.rents				-0.002 (0.002)												
LOG.GDP/CAPITA					0.365*** (0.039)											
EITI.1xLOG.GDP/CAPITA					-0.008 (0.006)											
FINANCIAL DEV.						0.424** (0.188)										
EITI.1xFINANCIAL DEV.						-0.837*** (0.157)										
Commodity prices							-0.005*** (0.001)									
EITI.1xCommodity prices							-0.001 (0.004)									
OPENESS								0.002*** (0.000)								
EITI.1xOPENESS								0.000 (0.000)								
LOG.AID									0.041*** (0.012)							
EITI.1xLOG.AID									-0.011 (0.015)							
Inflation										-0.001*** (0.000)						
EITI.1xInflation										-0.000 (0.001)						
FDI											0.001 (0.002)					
EITI.1xFDI											0.002 (0.002)					
Coal.rents												0.028* (0.017)				
EITI.1xCoal.rents												-0.016 (0.016)				
Forest.rents													-0.030*** (0.003)			
EITI.1xForest.rents													0.014*** (0.003)			
HDI														1.490*** (0.396)		
EITI.1xHDI														-0.300** (0.117)		
Industry.VA															0.010*** (0.001)	
EITI.1xIndustry.VA															-0.005*** (0.001)	
Index Governance																0.114*** (0.019)
EITI.2xIndex Governance																-0.086*** (0.016)
Constant	1.585*** (0.066)	3.256*** (0.052)	3.260*** (0.052)	3.017*** (0.068)	-0.584 (0.411)	3.220*** (0.054)	3.657*** (0.119)	3.037*** (0.057)	2.476*** (0.239)	3.299*** (0.050)	3.258*** (0.052)	3.263*** (0.052)	3.296*** (0.050)	2.630*** (0.174)	2.713*** (0.084)	3.505*** (0.064)
N	1697	1111	1111	1111	1111	1111	1111	1111	1111	1110	1111	1111	1111	1111	1111	1111
F	78.671	75.627	75.002	77.039	81.333	76.291	75.051	80.734	74.855	82.265	74.708	74.275	81.453	75.813	79.310	79.449
Adjusted R-squared	0.826	0.861	0.861	0.866	0.872	0.864	0.862	0.871	0.862	0.873	0.862	0.861	0.872	0.864	0.869	0.869

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table A3: Heterogeneity of the treatment effects (EITL2) on outcome (Tax revenues (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
EITL2	0.134*** (0.022)	0.088*** (0.020)	0.055** (0.025)	0.090*** (0.023)	0.120* (0.068)	0.234*** (0.035)	0.036 (0.432)	0.015 (0.040)	0.467 (0.321)	0.081*** (0.022)	0.078*** (0.021)	0.092*** (0.020)	0.005 (0.023)	0.238*** (0.070)	0.148*** (0.043)	-0.105*** (0.035)
_p.score		0.147*** (0.049)	0.134*** (0.049)	0.068 (0.050)	0.190*** (0.047)	0.129*** (0.049)	0.253*** (0.056)	0.155*** (0.048)	0.087 (0.053)	0.132*** (0.047)	0.089 (0.054)	0.123** (0.051)	0.177*** (0.049)	0.111** (0.049)	0.135*** (0.048)	0.173*** (0.048)
Time2			0.010** (0.005)													
Total.extract.rents				0.008*** (0.001)												
EITL2xTotal.extract.rents				-0.003** (0.002)												
LOG.GDP/CAPITA					0.351*** (0.039)											
EITL2xLOG.GDP/CAPITA					-0.004 (0.006)											
FINANCIAL DEV.						0.384** (0.186)										
EITL2xFINANCIAL DEV.						-0.813*** (0.162)										
Commodity prices							-0.006*** (0.001)									
EITL2xCommodity prices							0.000 (0.004)									
OPENESS								0.002*** (0.000)								
EITL2xOPENESS								0.001* (0.000)								
LOG.AID									0.039*** (0.011)							
EITL2xLOG.AID									-0.018 (0.016)							
Inflation										-0.001*** (0.000)						
EITL2xInflation										0.000 (0.001)						
FDI											0.001 (0.001)					
EITL2xFDI											0.002 (0.002)					
Coal.rents												0.024 (0.016)				
EITL2xCoal.rents												-0.014 (0.015)				
Forest.rents													-0.026*** (0.003)			
EITL2xForest.rents													0.014*** (0.003)			
HDI														1.371*** (0.396)		
EITL2xHDI														-0.267** (0.119)		
Industry_VA															0.009*** (0.001)	
EITL2xIndustry_VA															-0.003** (0.001)	
Index Governance																0.118*** (0.019)
EITL2xIndex Governance																-0.152*** (0.024)
Constant	1.585*** (0.066)	3.256*** (0.052)	3.267*** (0.052)	3.017*** (0.068)	-0.584 (0.411)	3.220*** (0.054)	3.657*** (0.119)	3.037*** (0.057)	2.476*** (0.239)	3.299*** (0.050)	3.258*** (0.052)	3.263*** (0.052)	3.296*** (0.050)	2.630*** (0.174)	2.713*** (0.084)	3.505*** (0.064)
N	1697	1111	1111	1111	1111	1111	1111	1111	1111	1110	1111	1111	1111	1111	1111	1111
F	78.671	75.627	75.475	77.039	81.333	76.291	75.051	80.734	74.855	82.265	74.708	74.275	81.453	75.813	79.310	79.449
Adjusted R-squared	0.826	0.861	0.862	0.866	0.872	0.864	0.862	0.871	0.862	0.873	0.862	0.861	0.872	0.864	0.869	0.869

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A4: Heterogeneity of the treatment effects (EITL3) on outcome (Tax revenues (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
EITL3	0.095***	0.057**	0.031	0.003	0.084	0.205***	-1.223	-0.191***	0.159	0.058**	0.006	0.057**	-0.073**	0.285***	0.005	-0.056
	(0.031)	(0.026)	(0.044)	(0.037)	(0.111)	(0.050)	(0.855)	(0.065)	(0.549)	(0.028)	(0.029)	(0.026)	(0.034)	(0.106)	(0.060)	(0.050)
pscore		0.441***	0.445***	0.287***	0.492***	0.453***	0.528***	0.411***	0.350***	0.386***	0.330***	0.446***	0.467***	0.395***	0.446***	0.493***
		(0.090)	(0.090)	(0.092)	(0.087)	(0.092)	(0.096)	(0.087)	(0.101)	(0.088)	(0.093)	(0.105)	(0.088)	(0.090)	(0.089)	(0.090)
Time3			0.008													
			(0.011)													
Total.extractrentGDP				0.006***												
				(0.001)												
EITL3xTotal.extractrentGDP				0.004												
				(0.003)												
LGDPCAPITA					0.353***											
					(0.039)											
EITL3xLGDPCAPITA					-0.004											
					(0.009)											
FD						0.305										
						(0.188)										
EITL3xFD						-0.933***										
						(0.268)										
xm_gdpf							-0.004***									
							(0.001)									
EITL3xxm_gdpf							0.013									
							(0.008)									
OPENESS_Trade								0.002***								
								(0.000)								
EITL3xOPENESS_Trade								0.003***								
								(0.001)								
LAIID									0.023**							
									(0.011)							
EITL3xLAIID									-0.005							
									(0.027)							
Inflation										-0.001***						
										(0.000)						
EITL3xInflation										-0.000						
										(0.002)						
FDI											0.002*					
											(0.001)					
EITL3xFDI											0.007***					
											(0.002)					
Coal_rents												-0.000				
												(0.011)				
EITL3xCoal_rents												-0.001				
												(0.010)				
Forest_rents													-0.027***			
													(0.003)			
EITL3xForest_rents													0.026***			
													(0.005)			
HDI														1.284***		
														(0.402)		
EITL3xHDI														-0.435**		
														(0.184)		
Industry_VA															0.008***	
															(0.001)	
EITL3xIndustry_VA															0.002	
															(0.002)	
Index Governance																0.109***
																(0.019)
EITL3xIndex Governance																-0.093**
																(0.036)
_cons	1.632***	3.226***	3.226***	3.043***	-0.483	3.196***	3.587***	3.017***	2.779***	3.272***	3.227***	3.226***	3.271***	2.684***	2.817***	3.458***
	(0.067)	(0.052)	(0.052)	(0.060)	(0.411)	(0.054)	(0.113)	(0.056)	(0.222)	(0.050)	(0.051)	(0.052)	(0.050)	(0.177)	(0.077)	(0.064)
N	1697	1111	1111	1111	1111	1111	1111	1111	1111	1110	1111	1111	1111	1111	1111	1111
F	76.162	75.392	74.551	76.755	80.538	74.696	74.945	80.933	74.001	81.799	75.212	73.644	81.264	74.972	78.191	76.901
Adjusted R-squared	0.822	0.860	0.860	0.865	0.871	0.862	0.862	0.871	0.861	0.873	0.863	0.860	0.872	0.862	0.867	0.865

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table A5: Heterogeneity of the treatment effects (EITL1) on outcome (LOG.NRTAX)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITL1	0.104*** (0.023)	0.077*** (0.021)	0.027 (0.025)	0.062*** (0.023)	0.151** (0.072)	0.227*** (0.037)	0.247 (0.348)	0.030 (0.038)	-0.208 (0.311)	0.074*** (0.021)	0.074*** (0.022)	0.079*** (0.021)	-0.004 (0.023)	0.263*** (0.074)	0.045 (0.044)	0.238*** (0.037)	0.274*** (0.035)	0.271*** (0.036)
Pscore		-0.128*** (0.047)	-0.156*** (0.047)	-0.136*** (0.050)	-0.099** (0.046)	-0.179*** (0.048)	0.037 (0.054)	-0.126*** (0.045)	-0.223*** (0.051)	-0.135*** (0.044)	-0.189*** (0.048)	-0.149*** (0.047)	-0.116** (0.048)	-0.173*** (0.048)	-0.125*** (0.047)	-0.122*** (0.047)	-0.178*** (0.048)	-0.145*** (0.046)
Time1			0.014*** (0.004)															
Total_extract_rents				-0.001 (0.001)														
EITL1xTotal_extract_rents				0.002 (0.002)														
LOGGDP/CAPITA					0.215*** (0.039)													
EITL1xLOGGDP/CAPITA					-0.007 (0.006)													
FINANCIAL DEV.						0.050 (0.185)												
EITL1xFINANCIAL DEV.						-0.798*** (0.161)												
Commodity prices.							0.050 (0.185)											
EITL1xCommodity prices.							-0.007*** (0.001)											
OPENESS.								0.002*** (0.000)										
EITL1xOPENESS.								0.001 (0.000)										
LOG_AID									0.041*** (0.012)									
EITL1xLOG_AID									0.015 (0.016)									
Inflation										-0.001*** (0.000)								
EITL1xInflation										-0.001 (0.001)								
FDI											0.006*** (0.001)							
EITL1xFDI											-0.001 (0.002)							
Coal_rents												0.046*** (0.017)						
EITL1xCoal_rents												-0.010 (0.022)						
Forest_rents													-0.024*** (0.003)					
EITL1xForest_rents													0.016*** (0.003)					
HDI														1.501*** (0.391)				
EITL1xHDI														-0.315** (0.123)				
Industry_VA															0.003** (0.001)			
EITL1xIndustry_VA															0.001 (0.002)			
Control of Corruption (0-100)																0.004*** (0.001)		
EITL1xControl of Corruption (0-100)																-0.006*** (0.001)		
Gov. Effectiveness (0-100)																	0.003*** (0.001)	
EITL1xGov. Effectiveness (0-100)																	-0.006*** (0.001)	
Rule of Law (Estimate)																		0.003*** (0.001)
EITL1x Rule of Law (Estimate)																		-0.007** (0.001)
.Constant	1.679*** (0.057)	1.727*** (0.049)	1.738*** (0.049)	1.745*** (0.066)	-0.542 (0.413)	1.726*** (0.052)	2.294*** (0.107)	1.529*** (0.055)	0.943*** (0.238)	1.773*** (0.047)	1.726*** (0.049)	1.736*** (0.049)	1.760*** (0.048)	1.097*** (0.171)	1.589*** (0.083)	1.702*** (0.049)	1.690*** (0.049)	1.706*** (0.049)
N	1621	1069	1069	1069	1069	1069	1069	1069	1069	1068	1069	1069	1069	1069	1069	1069	1069	1069
F	81.016	100.217	100.431	98.109	101.364	100.692	101.899	105.749	99.909	112.926	101.899	98.782	105.976	100.574	98.819	102.641	104.013	103.093
Adjusted R-squared	0.834	0.894	0.895	0.894	0.897	0.897	0.898	0.901	0.896	0.907	0.898	0.895	0.901	0.897	0.895	0.898	0.900	0.899

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A6: Heterogeneity of the treatment effects (EITI_2) on outcome (LOG.NRTAX)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITI_2	0.095*** (0.024)	0.079*** (0.021)	0.024 (0.027)	0.058** (0.024)	0.095 (0.073)	0.245*** (0.037)	0.124 (0.409)	-0.036 (0.042)	0.075 (0.328)	0.075*** (0.022)	0.073*** (0.021)	0.080*** (0.021)	-0.007 (0.024)	0.298*** (0.074)	0.031 (0.043)	0.222*** (0.036)	0.256*** (0.035)	0.261*** (0.036)
Pscore		-0.087* (0.049)	-0.110** (0.050)	-0.083 (0.052)	-0.059 (0.049)	-0.134*** (0.050)	0.100* (0.057)	-0.075 (0.049)	-0.158*** (0.053)	-0.104** (0.047)	-0.189*** (0.053)	-0.108** (0.050)	-0.093* (0.050)	-0.133*** (0.050)	-0.082* (0.050)	-0.071 (0.049)	-0.116** (0.050)	-0.094* (0.049)
Time2			0.016*** (0.005)															
Total_extract_rents				-0.001 (0.001)														
EITI_2xTotal_extract_rents				0.003* (0.002)														
LOGGDP/CAPITA					0.211*** (0.039)													
EITI_2xLOGGDP/CAPITA					-0.002 (0.006)													
FINANCIAL DEV.						0.071 (0.183)												
EITI_2xFINANCIAL DEV.						-0.909*** (0.167)												
Commodity prices.							-0.008*** (0.001)											
EITI_2xCommodity prices.							-0.001 (0.004)											
OPENESS.								0.002*** (0.000)										
EITI_2xOPENESS.								0.001*** (0.000)										
LOG_AID									0.039*** (0.011)									
EITI_2xLOG_AID									0.001 (0.016)									
Inflation										-0.001*** (0.000)								
EITI_2xInflation										-0.000 (0.002)								
FDI											0.006*** (0.001)							
EITI_2xFDI											-0.001 (0.002)							
Coal_rents												0.040** (0.016)						
EITI_2xCoal_rents												0.001 (0.024)						
Forest_rents													-0.022*** (0.003)					
EITI_2xForest_rents													0.017*** (0.003)					
HDI														1.385*** (0.390)				
EITI_2xHDI														-0.381*** (0.124)				
Industry_VA															0.002* (0.001)			
EITI_2xIndustry_VA															0.002 (0.001)			
Control of Corruption (0-100)																0.004*** (0.001)		
EITI_2xControl of Corruption (0-100)																-0.005*** (0.001)		
Gov. Effectiveness (0-100)																	0.003*** (0.001)	
EITI_2xGov. Effectiveness (0-100)																	-0.006*** (0.001)	
Rule of Law (Estimate)																		0.003*** (0.001)
EITI_2x Rule of Law (Estimate)																		-0.007*** (0.001)
.Constant	1.673*** (0.057)	1.719*** (0.049)	1.726*** (0.049)	1.764*** (0.064)	-0.509 (0.414)	1.713*** (0.051)	2.361*** (0.107)	1.528*** (0.055)	0.975*** (0.225)	1.766*** (0.046)	1.716*** (0.048)	1.726*** (0.049)	1.747*** (0.048)	1.135*** (0.171)	1.600*** (0.081)	1.692*** (0.049)	1.677*** (0.049)	1.694*** (0.049)
N	1621	1069	1069	1069	1069	1069	1069	1069	1069	1068	1069	1069	1069	1069	1069	1069	1069	1069
F	80.669	100.020	100.015	98.073	100.931	101.019	102.708	105.371	99.111	112.679	101.709	98.468	105.528	100.438	98.563	102.053	103.236	102.649
Adjusted R-squared	0.834	0.894	0.895	0.894	0.897	0.897	0.899	0.901	0.895	0.907	0.898	0.895	0.901	0.896	0.895	0.898	0.899	0.898

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A7: Heterogeneity of the treatment effects (EITL3) on the outcome (LOG.NRTAX)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITL3	0.056	0.042	0.052	-0.032	-0.275*	0.201***	-0.083	-0.272***	0.059	0.052	-0.052	0.015	-0.108**	0.380***	0.033	0.186***	0.209***	0.249***
	(0.036)	(0.035)	(0.057)	(0.048)	(0.147)	(0.066)	(0.863)	(0.080)	(0.630)	(0.037)	(0.042)	(0.036)	(0.045)	(0.123)	(0.067)	(0.061)	(0.060)	(0.061)
Pscore		-0.037	-0.036	-0.130	-0.031	-0.096	0.279**	-0.047	-0.361***	-0.113	-0.049	-0.051	-0.110	-0.109	-0.094	-0.033	-0.045	-0.037
		(0.104)	(0.104)	(0.119)	(0.097)	(0.104)	(0.110)	(0.098)	(0.122)	(0.094)	(0.101)	(0.103)	(0.099)	(0.103)	(0.101)	(0.102)	(0.103)	(0.101)
Time3			-0.004															
			(0.016)															
Total_extract_rents				0.003*														
				(0.002)														
EITL3xTotal_extract_rents				0.008**														
				(0.003)														
LOGGDP/CAPITA					0.444***													
					(0.053)													
EITL3xLOGGDP/CAPITA					0.025**													
					(0.012)													
FINANCIAL DEV.						-0.447												
						(0.314)												
EITL3xFINANCIAL DEV.						-1.109***												
						(0.391)												
Commodity prices.							-0.013***											
							(0.002)											
EITL3xCommodity prices.							0.001											
							(0.009)											
OPENESS.								0.002***										
								(0.000)										
EITL3xOPENESS.								0.003***										
								(0.001)										
LOG_AID									0.081***									
									(0.016)									
EITL3xLOG_AID									-0.001									
									(0.031)									
Inflation										-0.001***								
										(0.000)								
EITL3xInflation										-0.004								
										(0.004)								
FDI											0.003***							
											(0.001)							
EITL3xFDI											0.011***							
											(0.003)							
Coal_rents												0.002						
												(0.024)						
EITL3xCoal_rents												0.122***						
												(0.044)						
Forest_rents													-0.025**					
													(0.004)					
EITL3xForest_rents													0.029***					
													(0.006)					
HDI														2.362***				
														(0.691)				
EITL3xHDI														-0.689***				
														(0.215)				
Industry_VA															0.009***			
															(0.001)			
EITL3xIndustry_VA															0.000			
															(0.002)			
Control of Corruption (0-100)																0.004***		
																(0.001)		
EITL3xControl of Corruption (0-100)																-0.006***		
																(0.002)		
Gov. Effectiveness (0-100)																	0.003***	
																	(0.001)	
EITL3xGov. Effectiveness (0-100)																	-0.007***	
																	(0.002)	
Rule of Law (Estimate)																		0.005***
																		(0.001)
EITL3x Rule of Law (Estimate)																		-0.008***
																		(0.002)
.Constant	2.552***	2.665***	2.664***	2.692***	-2.908***	2.754***	3.922***	2.525***	1.133***	2.689***	2.654***	2.673***	2.735***	1.156**	2.471***	2.541***	2.580***	2.508***
	(0.055)	(0.057)	(0.057)	(0.057)	(0.670)	(0.073)	(0.183)	(0.058)	(0.314)	(0.051)	(0.055)	(0.057)	(0.054)	(0.457)	(0.062)	(0.066)	(0.075)	(0.074)
N	813	557	557	557	557	557	557	557	557	556	557	557	557	557	557	557	557	557
F	66.282	45.485	44.630	44.782	51.381	45.218	49.288	50.440	46.406	56.335	46.711	44.952	50.506	46.342	48.526	46.241	45.645	46.895
Adjusted R-squared	0.835	0.823	0.822	0.825	0.845	0.827	0.839	0.842	0.831	0.857	0.831	0.826	0.842	0.830	0.837	0.830	0.828	0.832

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A8: Heterogeneity of the treatment effects (EITI_1) on outcome (Log.Income-profits-capital tax (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITI_1	0.189*** (0.035)	0.062** (0.030)	0.007 (0.036)	0.083** (0.035)	0.516*** (0.116)	0.252*** (0.055)	-0.384 (0.627)	0.007 (0.058)	-2.098*** (0.466)	0.046 (0.033)	0.020 (0.032)	0.066** (0.031)	-0.039 (0.035)	0.366*** (0.107)	0.221*** (0.083)	0.188*** (0.060)	0.216*** (0.058)	0.223*** (0.059)
Pscore		0.311*** (0.075)	0.279*** (0.075)	0.254*** (0.085)	0.313*** (0.074)	0.278*** (0.076)	0.366*** (0.083)	0.286*** (0.074)	0.204** (0.080)	0.270*** (0.075)	0.175** (0.081)	0.283*** (0.079)	0.275*** (0.075)	0.224*** (0.076)	0.259*** (0.076)	0.351*** (0.075)	0.278*** (0.078)	0.332*** (0.074)
Time1			0.016*** (0.006)															
Total_extract_rents				0.006** (0.003)														
EITI_1xTotal_extract_rents				-0.005 (0.003)														
LOGGDP/CAPITA					0.223*** (0.068)													
EITI_1xLOGGDP/CAPITA					-0.039*** (0.010)													
FINANCIAL DEV.						0.586** (0.267)												
EITI_1xFINANCIAL DEV.						-0.997*** (0.246)												
Commodity prices.							-0.004* (0.002)											
EITI_1xCommodity prices.							0.004 (0.006)											
OPENESS.								0.003*** (0.000)										
EITI_1xOPENESS.								0.001 (0.001)										
LOG_AID									0.005 (0.019)									
EITI_1xLOG_AID									0.108*** (0.023)									
Inflation										-0.000*** (0.000)								
EITI_1xInflation										0.001 (0.002)								
FDI											-0.002 (0.002)							
EITI_1xFDI											0.009*** (0.003)							
Coal_rents												0.026 (0.025)						
EITI_1xCoal_rents												-0.016 (0.023)						
Forest_rents													-0.021*** (0.006)					
EITI_1xForest_rents													0.021*** (0.004)					
HDI														1.864*** (0.570)				
EITI_1xHDI														-0.519*** (0.179)				
Industry_VA															0.007*** (0.002)			
EITI_1xIndustry_VA															-0.006** (0.003)			
Control of Corruption (0-100)																0.005*** (0.001)		
EITI_1xControl of Corruption (0-100)																-0.004** (0.002)		
Gov. Effectiveness (0-100)																	0.003** (0.001)	
EITI_1xGov. Effectiveness (0-100)																	-0.005** (0.002)	
Rule of Law (Estimate)																		0.004*** (0.001)
EITI_1x Rule of Law (Estimate)																		-0.005*** (0.002)
.Constant	-0.096 (0.100)	0.420*** (0.102)	0.420*** (0.102)	0.195 (0.146)	-1.915*** (0.715)	0.367*** (0.105)	0.712*** (0.198)	0.147 (0.111)	0.333 (0.400)	0.480*** (0.102)	0.439*** (0.102)	0.424*** (0.103)	0.467*** (0.101)	-0.306 (0.245)	0.015 (0.171)	0.373*** (0.102)	0.394*** (0.102)	0.391*** (0.102)
N	1447	910	910	910	910	910	910	910	910	909	910	910	910	910	910	910	910	910
F	42.739	62.129	62.027	61.002	62.707	62.126	60.889	64.079	62.912	62.156	62.628	60.742	63.729	62.452	61.415	62.555	61.780	62.228
Adjusted R-squared	0.743	0.855	0.857	0.856	0.859	0.858	0.856	0.862	0.860	0.858	0.859	0.855	0.861	0.859	0.857	0.859	0.858	0.858

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A9: Heterogeneity of the treatment effects (EITI_2) on outcome (Log.Income-profits-capital tax (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITL2	0.188*** (0.038)	0.077** (0.031)	-0.000 (0.041)	0.105*** (0.037)	0.514*** (0.119)	0.325*** (0.058)	-0.963 (0.812)	-0.031 (0.067)	-1.961*** (0.495)	0.054 (0.036)	0.040 (0.033)	0.084*** (0.032)	-0.033 (0.036)	0.495*** (0.112)	0.222*** (0.083)	0.187*** (0.062)	0.234*** (0.060)	0.242*** (0.061)
Pscore		0.346*** (0.077)	0.325*** (0.085)	0.308*** (0.076)	0.341*** (0.077)	0.301*** (0.086)	0.405*** (0.086)	0.340*** (0.077)	0.259*** (0.081)	0.297*** (0.077)	0.189** (0.089)	0.327*** (0.082)	0.264*** (0.077)	0.248*** (0.078)	0.295*** (0.078)	0.377*** (0.077)	0.311*** (0.079)	0.356*** (0.076)
Time2			0.022*** (0.007)															
Total_extract_rents				0.005** (0.003)														
EITL2xTotal_extract_rents				-0.006* (0.003)														
LOGGDP/CAPITA					0.209*** (0.067)													
EITL2xLOGGDP/CAPITA					-0.038*** (0.010)													
FINANCIAL DEV.						0.645** (0.262)												
EITL2xFINANCIAL DEV.						-1.308*** (0.258)												
Commodity prices.							-0.005* (0.002)											
EITL2xCommodity prices.							0.010 (0.008)											
OPENESS.								0.003*** (0.000)										
EITL2xOPENESS.								0.001 (0.001)										
LOG_AID									0.019 (0.018)									
EITL2xLOG_AID									0.102*** (0.025)									
Inflation										-0.000*** (0.000)								
EITL2xInflation										0.003 (0.002)								
FDI											-0.002 (0.002)							
EITL2xFDI											0.008*** (0.003)							
Coal_rents												0.045* (0.024)						
EITL2xCoal_rents												-0.038* (0.022)						
Forest_rents													-0.017*** (0.006)					
EITL2xForest_rents													0.025*** (0.005)					
HDI														1.710*** (0.563)				
EITL2xHDI														-0.721*** (0.186)				
Industry_VA															0.006*** (0.002)			
EITL2xIndustry_VA															-0.006* (0.003)			
Control of Corruption (0-100)																0.005*** (0.001)		
EITL2xControl of Corruption (0-100)																-0.004** (0.002)		
Gov. Effectiveness (0-100)																	0.003** (0.001)	
EITL2xGov. Effectiveness (0-100)																	-0.005** (0.002)	
Rule of Law (Estimate)																		0.004*** (0.001)
EITL2x Rule of Law (Estimate)																		-0.005*** (0.002)
.Constant	-0.097 (0.100)	0.425*** (0.102)	0.425*** (0.101)	0.236* (0.139)	-1.768** (0.712)	0.361*** (0.104)	0.759*** (0.199)	0.138 (0.109)	0.040 (0.377)	0.483*** (0.102)	0.437*** (0.102)	0.430*** (0.102)	0.460*** (0.101)	-0.246 (0.243)	0.070 (0.166)	0.383*** (0.101)	0.399*** (0.102)	0.397*** (0.101)
N	1447	910	910	910	910	910	910	910	910	909	910	910	910	910	910	910	910	910
F	42.555	62.794	62.772	61.659	63.154	63.595	61.731	65.040	63.222	62.930	62.684	61.558	64.570	63.553	61.970	62.969	62.386	62.801
Adjusted R-squared	0.742	0.857	0.858	0.857	0.860	0.861	0.857	0.864	0.860	0.860	0.859	0.857	0.863	0.861	0.858	0.860	0.859	0.860

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A10: Heterogeneity of the treatment effects (EITI_3) on outcome (Log.Income-profits-capital tax (% GDP))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
EITI_3	0.101*	0.097**	0.150**	0.290***	0.918***	0.514***	-0.547	0.012	-5.414***	0.061	0.024	0.124***	-0.134***	0.966***	0.515***	0.243***	0.323***	0.372***
	(0.052)	(0.044)	(0.067)	(0.064)	(0.161)	(0.075)	(1.440)	(0.098)	(0.739)	(0.050)	(0.049)	(0.045)	(0.051)	(0.148)	(0.112)	(0.081)	(0.082)	(0.083)
Pscore		0.795***	0.784***	1.018***	0.818***	0.711***	0.893***	0.710***	0.435***	0.678***	0.597***	0.793***	0.685***	0.683***	0.716***	0.782***	0.713***	0.795***
		(0.141)	(0.141)	(0.177)	(0.137)	(0.135)	(0.155)	(0.137)	(0.152)	(0.141)	(0.142)	(0.156)	(0.133)	(0.138)	(0.142)	(0.141)	(0.141)	(0.138)
Time3			-0.018															
			(0.017)															
Total_extract_rents				-0.002														
				(0.003)														
EITI_3xTotal_extract_rents				-0.022***														
				(0.005)														
LOGGDP/CAPITA					0.167													
					(0.105)													
EITI_3xLOGGDP/CAPITA					-0.071**													
					(0.013)													
FINANCIAL DEV.						0.968**												
						(0.440)												
EITI_3xFINANCIAL DEV.						-2.564***												
						(0.388)												
Commodity prices.							-0.006*											
							(0.004)											
EITI_3xCommodity prices.							0.006											
							(0.014)											
OPENESS.								0.003***										
								(0.000)										
EITI_3xOPENESS.								0.001										
								(0.001)										
LOG_AID									0.065***									
									(0.022)									
EITI_3xLOG_AID									0.272***									
									(0.036)									
Inflation										-0.000***								
										(0.000)								
EITI_3xInflation										0.005								
										(0.003)								
FDI											0.004**							
											(0.002)							
EITI_3xFDI											0.009***							
											(0.003)							
Coal_rents												0.040**						
												(0.016)						
EITI_3xCoal_rents												-0.049***						
												(0.015)						
Forest_rents													-0.009					
													(0.006)					
EITI_3xForest_rents													0.054***					
													(0.007)					
HDI														1.571*				
														(0.886)				
EITI_3xHDI														-1.572***				
														(0.247)				
Industry_VA															0.007**			
															(0.003)			
EITI_3xIndustry_VA															-0.017***			
															(0.004)			
Control of Corruption (0-100)																0.001		
																(0.001)		
EITI_3xControl of Corruption (0-100)																-0.005**		
																(0.002)		
Gov. Effectiveness (0-100)																	-0.002	
																	(0.002)	
EITI_3xGov. Effectiveness (0-100)																	-0.007***	
																	(0.002)	
Rule of Law (Estimate)																		0.002
																		(0.002)
EITI_3x Rule of Law (Estimate)																		-0.009***
																		(0.002)
.Constant	-0.084	0.737***	0.735***	0.669***	-1.344	0.614***	1.373***	0.546***	-0.415	0.765***	0.747***	0.739***	0.820***	-0.203	0.578***	0.702***	0.872***	0.680***
	(0.094)	(0.074)	(0.074)	(0.077)	(1.314)	(0.099)	(0.376)	(0.078)	(0.432)	(0.073)	(0.073)	(0.075)	(0.072)	(0.583)	(0.097)	(0.089)	(0.105)	(0.101)
N	735	487	487	487	487	487	487	487	487	486	487	487	487	487	487	487	487	487
F	37.682	38.396	37.749	38.781	40.155	41.551	37.248	41.098	43.986	38.746	39.538	38.047	43.365	41.492	38.730	37.437	38.233	38.539
Adjusted R-squared	0.756	0.812	0.812	0.818	0.824	0.829	0.812	0.827	0.837	0.819	0.821	0.816	0.835	0.829	0.818	0.813	0.816	0.818

Standard errors in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The F-test refers to the global significance test (1 %) of the interaction term and the variable X.

Table A11: Descriptive statistics

Variable	Total of Sample					Group of treated					Group of controls				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
Total_tax_revenue	1,697	15.097	7.428	0.301	56.916	913	13.012	4.704	0.301	26.082	784	17.525	9.097	1.193	56.916
non-resource_tax	1,621	13.859	6.957	0.301	56.916	813	12.549	4.804	0.301	25.819	808	15.176	8.395	0.846	56.916
Income tax	1,449	5.044	3.083	0.000	24.074	735	4.298	2.459	0.166	15.867	714	5.811	3.453	0.000	24.074
EITI.1	1,909	0.219	0.414	0.000	1.000	1,012	0.414	0.493	0.000	1.000	897	0.000	0.000	0.000	0.000
Total_rents	1,849	8.516	12.452	0.000	78.623	969	7.377	11.354	0.000	74.033	880	9.771	13.454	0.000	78.623
L.GDPCAPITA	1,872	11.109	2.719	5.453	18.304	989	11.533	2.579	5.453	17.439	883	10.633	2.794	5.899	18.304
Financial Dev.	1,817	0.191	0.123	0.000	0.679	966	0.159	0.091	0.000	0.418	851	0.226	0.143	0.002	0.679
Inflation	1,867	19.873	141.080	-36.565	4800.532	985	15.980	90.314	-36.565	2630.123	882	24.220	181.688	-31.566	4800.532
Commodity prices	1,870	98.001	10.130	44.630	125.776	1,007	99.288	8.649	44.630	122.847	863	96.499	11.446	45.423	125.776
Trade Openness	1,754	75.577	37.119	0.021	311.354	920	74.322	37.210	0.021	311.354	834	76.961	36.991	14.772	220.407
L.ODA	1,817	19.607	1.289	9.903	23.924	992	19.839	1.195	9.903	23.924	825	19.328	1.343	12.346	23.135
FDI	1,821	4.221	8.295	-37.155	161.824	973	4.274	7.790	-37.155	103.337	848	4.160	8.843	-8.589	161.824
Industry_Value Added	1,799	29.115	13.150	2.073	87.797	951	26.997	12.379	3.243	85.659	848	31.490	13.583	2.073	87.797
Coal_rents	1,840	0.232	1.059	0.000	25.316	965	0.257	1.344	0.000	25.316	875	0.205	0.607	0.000	7.850
Forest_rents	1,859	3.337	5.044	0.000	36.068	975	4.515	5.683	0.000	36.068	884	2.038	3.834	0.000	31.963
HDI	1,796	0.572	0.137	0.228	0.832	966	0.537	0.136	0.235	0.832	830	0.612	0.127	0.228	0.822
Governance Index	1,574	-1.106	0.918	-3.312	1.585	833	-1.292	0.730	-3.312	0.181	741	-0.898	1.053	-3.135	1.585
Control of corruption	1,574	-0.630	0.554	-1.826	1.568	833	-0.739	0.409	-1.723	0.478	741	-0.508	0.660	-1.826	1.568
Gov. Effectiveness	1,574	-0.594	0.570	-2.232	1.267	833	-0.708	0.491	-2.232	0.376	741	-0.466	0.623	-1.915	1.267
Regulatory Quality	1,574	-0.608	0.626	-2.344	1.053	833	-0.602	0.544	-2.344	0.615	741	-0.615	0.707	-2.274	1.053
Rule of Law	1,577	-0.692	0.561	-2.255	0.731	836	-0.791	0.468	-2.130	0.292	741	-0.582	0.633	-2.255	0.731
Voice and accountability	1,577	-0.595	0.724	-2.233	0.976	836	-0.467	0.621	-2.233	0.606	741	-0.740	0.801	-2.124	0.976

Table A12: Definitions and Data Sources

Indicateurs	Définitions	Sources
Total rents (% of GDP)	The sum of oil, mining and gas rents, including the EI. They correspond to the difference between the value of gross production at world prices and the total cost of production (specifically for each type of rent).	World Development Indicators. https://databank.worldbank.org/
Coal rents (% of GDP)	Coal rents are the difference between the value of both hard and soft coal production at world prices and their total costs of production.	
Forest rents (% of GDP)	Forest rents are roundwood harvest times the product of average prices and a region-specific rental rate.	
Inflation, GDP deflator (% annual)	It is measured by the annual growth rate of the implicit deflator (ratio of GDP in current local currency to GDP in constant local currency) of GDP and indicates the rate of price change in the economy as a whole.	
Trade openness (% of GDP)	It is the sum of exports and imports of goods and services relative to GDP.	
Net Official Development Assistance (ODA) received per capita (US\$)	It includes loan disbursements with a grant element of at least 25% (calculated using a discount rate of 10%) and grants paid by official bodies (current US \$).	
GDP per capita (\$ US)	GDP per capita is the gross domestic product divided by the population at mid-year. (\$ US constants 2010).	
Foreign Direct Investment (% GDP)	These are the net inflows of investments to acquire a sustainable management interest. It is the difference between new investment inflows and disinvestment divided by GDP.	
Industry value added (% of GDP)	It comprises value added in mining, manufacturing, construction, electricity, water, and gas.	
Voice and Accountability (VA)	capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	Kaufmann et al. (2011). Worldwide Governance Indicators: . Estimate of governance in standard normal units ranging from approximately -2.5 (weak) to 2.5 (strong) governance performance; . Percentile rank among all countries, ranging from 0 (lowest) to 100 (highest) rank. www.govindicators.org
Government Effectiveness (GE)	"capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies."	
Control of Corruption (CC)	"capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests."	
Rule of Law (RL)	"capturing perceptions of the extent to which agents have confidence in and abide by the rules of society and in particular the quality of contract enforcement, property rights, the police , and the courts, as well as the likelihood of crime and violence."	
Regulatory Quality (RQ)	capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	
Financial Development Index	The dataset contains nine indices that summarize how developed financial institutions and financial markets are in terms of their depth, access, and efficiency.	International Monetary Fund https://data.imf.org/
Commodity Terms of Trade	Commodity-price fluctuations on countries that both export and import primary commodities, using a country-specific measure of the commodity terms of trade	Gruss and Kebhaj (2019) International Monetary Fund https://data.imf.org/
Total DRM (% GDP)	It is the sum of the sub-components of DRM, i.e. stamp duties and taxes on the one hand, and upstream profits from extractive resource (oil, gas, and mining), royalties and revenue from rent sharing agreements paid to the consolidated fund on the other hand, and excluding social contributions.	ICTD Government Revenue Dataset www.ictd.ac/dataset/grd
Human Development Index (HDI)	The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living.	UNITED NATIONS DEVELOPMENT PROGRAMME http://hdr.undp.org/en/data

Table A13: List of EITI-members (Group of treated), the original event dates, and status in February 2018, and Non-EITI-members (Group of control)

	EITI-members	Commitment	MSG	Candidate	First Report	Valid. Report	Compliant	Suspended	Status Feb. 2018	Non-EITI-members
1	Afghanistan	march-09	Oct-09	Feb-10	Aug-12	Feb-13		Jan-19 -	Candidate	Algeria
2	Albania	Jan-09	march-09	May-09	march-11	Aug-11	May-13		Compliant	Angola
3	Argentina	Dec-17	Dec-18	march-19					Committed	Azerbaijan
4	Armenia	Jan-17		March-17					Candidate	Belarus
5	Burkina Faso	June-07	Dec-08	May-09	Apr-11	Sept-11	Feb-13		Compliant	Belize
6	Cameroon	Feb-05	May-05	Sept-07	Oct-06	July-10	Oct-13		Compliant	Bhutan
7	Central African Republic	Sept-07	July-08	Nov-08	Feb-09	Nov-10	march-11	April-13 -	Suspended	Bosnia and Herzegovina
8	Chad	Sept-07	Feb-10	Apr-10	Oct-12	May-13	Oct-14		Compliant	Botswana
9	Colombia	May-13	Feb-14	Oct-14					Candidate	Brazil
10	Côte d'Ivoire	May-07	Feb-08	May-08	Jan-10	Nov-10	May-13		Compliant	Bulgaria
11	Ethiopia	July-09	June-09	march-14	May-15				Candidate	Cuba
12	Gabon	May-04	Feb-05	march-07	Apr-07	March-08	Oct-10	Feb-13	Suspended	.
13	Ghana	May-03	Jan-05	Sept-07	Sept-07	June-10	Oct-10		Compliant	Ecuador
14	Guatemala	June-10	May-12	march-11	Apr-13	Nov-13	march-14	Feb - may-15	Compliant	Egypt
15	Guinea	march-05	Apr-05	Sept-07	July-07	Aug-12	July-14	Jan-Nov-11	Compliant	Equatorial Guinea
16	Guyana	May-10	Apr-10	Oct-17					Candidate	.
17	Honduras	Nov-12	Dec-12	May-13	May-15				Candidate	Gambia
18	Indonesia	Dec-08	June-10	Oct-10	May-13	July-13	Oct-14	Feb - Dec-15	Compliant	Georgia
19	Iraq	march-09	Aug-10	Feb-10	Nov-11	Aug-12	Dec-12		Compliant	Guinea-Bissau
20	Kazakhstan	June-05	Apr-05	Sept-07	Nov-07	Aug-10	Oct-13		Compliant	India
21	Kyrgyzstan	Apr-04	June-08	Sept-07	Nov-09	Apr-10	march-11		Compliant	Iran
22	Liberia	May-07	Apr-07	Sept-08	Jan-09	July-09			Candidate	Jordan
23	Madagascar	march-07	Jan-08	Feb-08	May-11	Sept-11		Oct-12 - Jan-14	Candidate	Lao PDR
24	Malawi	June-14	march-15	Oct-15					Candidate	Lesotho
25	Mali	Aug-06	June-07	Sept-07	Nov-09	Sept-10	Aug-11		Compliant	Libya
26	Mauritania	Oct-05	Dec-06	Sept-07	Feb-07	Sept-10	Feb-12	march - may-13	Compliant	Malaysia
27	Mexico	Jan-15	Nov-17	Oct-18	Dec-19				Candidate	Morocco
28	Mongolia	march-06	Jan-06	Sept-07	Dec-07	Feb-10	Oct-10		Compliant	Namibia
29	Mozambique	May-08	Apr-09	May-09	Jan-11	May-11	Oct-12		Compliant	.
30	Myanmar	Dec-12	Jan-14	July-14	Dec-15				Candidate	Russian Federation
31	Niger	march-05	July-05	Aug-07	march-10	June-10	march-11	Oct-17	Suspended	Rwanda
32	Nigeria	Nov-03	Dec-03	Sept-07	Oct-06	June-10	march-11		Compliant	.
33	Papua New Guinea	Apr-13	Nov-13	march-14	Feb-16				Candidate	South Africa
34	Peru	Apr-05	May-06	Sept-07	Oct-09	Sept-10	Feb-12		Compliant	Sudan
35	Philippines	July-12	Jan-13	May-13	Dec-14				Candidate	Syrian Arab Republic
36	Republic of the Congo	June-04	Sept-06	Sept-07	Aug-08	Sept-10	Feb-13		Compliant	Tunisia
37	Sao Tome and Principe	Dec-05	Dec-07	Feb-08	July-14	June-16		Feb - march-10	Candidate	Uzbekistan
38	Senegal	Feb-12	Feb-13	Oct-13	Dec-15				Candidate	Venezuela
39	Sierra Leone	May-06	June-07	Feb-08	Feb-10	July-10	Apr-14		Compliant	Vietnam
40	Suriname	Feb-16	Nov-17	Apr-18				Feb-19 -	Committed	Yemen
41	Tajikistan	Aug-12	Aug-12	Feb-13	Oct-15				Candidate	Zimbabwe
42	Tanzania	Nov-08	Feb-09	Nov-09	Jan-11	May-11	Dec-12	Nov - Dec-15	Compliant	
43	Timor-Leste	Apr-07	Apr-07	Feb-08	Oct-09	march-10	July-10	march - June-17	Compliant	
44	Togo	Dec-09	Apr-10	Oct-10	Feb-12	Apr-13	May-13		Compliant	
45	Ukraine	Oct-09	Oct-12	Oct-13	Nov-15				Candidate	
46	Zambia	July-08	July-08	May-09	Jan-11	May-11	Sept-12		Compliant	

Niger was previously suspended by EITI Board on the basis of inadequate progress in implementing EITI on 26 October 2017, and rejoined EITI in February 2020. Gabon was suspended in February 2013 after failing to submit a Validation report by the agreed deadline, and re-joined EITI on 21 October 2021. EITI Board has decided to temporarily suspend Central African Republic's status as EITI Compliant, effective 10 April 2013, due to political instability.