



Tackling tax base erosion in developing countries: Does information exchange initiative make a difference?

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Abstract

This study investigates how multilateral cooperation on tax information exchange affects tax revenue mobilization in developing countries. In response to global efforts to curb tax evasion, the OECD launched the Global Forum on Transparency and Exchange of Information for Tax Purposes. Focusing on its core objective of enhancing tax transparency, we analyze the impact of Forum membership on non-resource direct tax revenues in 60 developing countries from 2000 to 2020. Using a semi-parametric difference-in-differences approach, we find that membership significantly boosts tax revenues. These results are robust to alternative estimation techniques and remain consistent across disaggregated tax data. Our findings highlight the critical role of cross-border information exchange in improving transparency and strengthening domestic revenue systems, particularly where enforcement capacity is limited. By showing that cooperation enhances tax collection without compromising investment attractiveness, this study contributes to debates on international tax reform and the Base Erosion and Profit Shifting (BEPS) agenda, emphasizing the value of information sharing and capacity building for equitable tax governance.

Keywords Tax cooperation · Tax information exchange · Tax evasion · Transparency · Tax revenue · Developing countries

JEL Classification F42 · H26 · H73 · H77 · H87

1 Introduction

Tax abuse—through evasion, avoidance, and other strategies to minimize obligations—remains one of the most pressing issues affecting both developed and developing countries (Spicer 1986; Allingham and Sandmo 1972; Marrelli 1984; Cowell 1985). These practices undermine the integrity of global financial systems and

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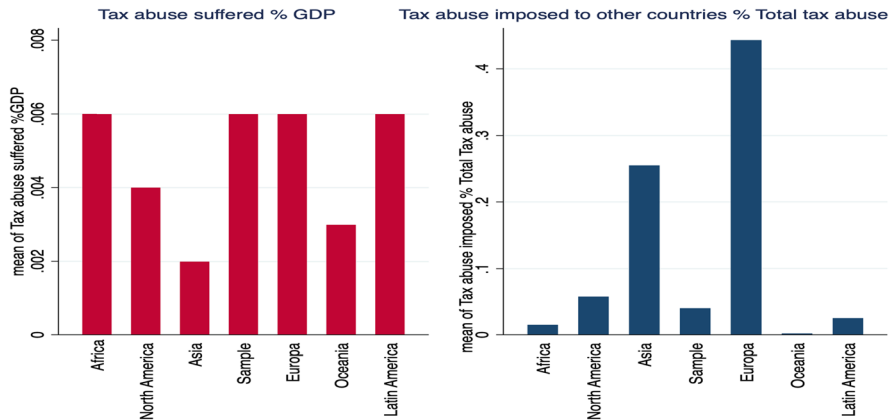


Fig. 1 Tax abuse level by continent. *Source:* Author's construction

erode public trust in tax institutions. Recent tax scandals have revealed that tax abuse persists as a significant and ongoing problem in the current international tax system. High-profile leaks such as Lux Leaks (2014), Swiss Leaks (2015), Panama Papers (2016), Paradise Papers (2017), Mauritius Leaks (2019), Luanda Leaks et Fincen files (2020), and Lux Letters (2021) have exposed how wealthy individuals and multinational companies use offshore structures and secret financial arrangements to avoid taxes. In 2012, the Tax Justice Network, alongside economist James S. Henry,¹ estimated global tax evasion at approximately \$30 trillion, with half of this wealth concentrated in the hands of just 0.0015% of the global population. Despite the development of repressive measures, the Tax Justice Network (2021) estimates in its “State of Tax Justice” report that approximately \$483 billion in tax revenue is lost annually due to tax abuses by multinationals and high-net-worth individuals, with 57% of the revenue losses for developing countries. Figure 1 illustrates that, although Africa and Latin America are the regions most affected by tax abuse, they contribute the least to such practices. In contrast, Europe, despite being heavily impacted by tax avoidance, also plays a significant role in enabling it through jurisdictions that facilitate aggressive tax planning.

Abusive tax manipulation can pose a threat to state sovereignty. On the one hand, the problem of tax evasion and fraud, in addition to causing revenue losses, puts states in a weak position (Drummond et al. 2012), deteriorates the social environment, and encourages tax incivism (Kisters 2022). Keen and Ligthart (2006) also stressed that tax evasion affects the fairness of the tax system and facilitates the proliferation of harmful activities such as money laundering, terrorist financing, bribery, and corruption. In the case of developing countries, the phenomenon is more significant and constitutes an obstacle to the achievement of the commitments made

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to prioritize the mobilization of domestic resources as the primary source of financing for development in Addis Ababa² in July 2015.

On the other hand, developing countries face a greater risk of abusive tax manipulation.

Characterized by limited tax administrations (Chang et al. 2020) and tax control systems, many countries have experienced a rise in tax evasion and avoidance, driven in part by recent growth in foreign direct investment (FDI), the promotion of free trade, and increasing globalization. These global developments have facilitated the expansion of cross-border activities, making it more difficult for domestic tax systems, often still governed by national laws, to effectively manage taxation. Several studies have highlighted the mismatch between traditional tax governance and the evolving structure of the global economy.

In addition, the pioneering work of the Organization for Economic Cooperation and Development (OECD) in 1998 drew attention to the existence of harmful tax competition. Neumann et al. (2009) and Avi-Yonah (2009) have underscored the risks of tax arrangements and revenue losses stemming from the lack of harmonization among national tax systems. In response to these challenges, the OECD proposed the creation of the Global Forum on Transparency and Exchange of Information for Tax Purposes in 2000—an initiative that, at first, received limited international support. The 2008 financial crisis, along with revelations of large-scale tax avoidance by multinational corporations, served as a catalyst for accelerating the institutionalization of the Forum and the adoption of international tax transparency standards in 2009. The main objective of the Forum is to promote tax transparency by establishing a framework for the exchange of tax-related information between domestic financial institutions, national tax authorities, and foreign tax administrations concerning cross-border taxpayer activities. Although often associated with recent reforms, the concept of exchanging tax information dates back several decades. Its formal origins can be traced to 1927, when the League of Nations' Committee on Double Taxation and Tax Evasion introduced the first international framework.

This laid the foundation for further developments, particularly with the OECD's involvement starting in 1963 and culminating in the Multilateral Convention on Mutual Administrative Assistance in Tax Matters, proposed in 1979 and ratified in 1987. In the U.S., high-profile tax evasion cases involving Liechtenstein's LGT and Switzerland's UBS spurred efforts to enhance cross-border transparency, ultimately leading to the introduction of FATCA,³ specific to the US states.

Unlike FATCA, the Global Forum is more ambitious and includes developing countries.

While existing studies have shown that information exchange has contributed to resource mobilization for developed countries, evidenced by the modification of bank deposits and the reduction of illicit financial flows (Zucman 2013; Johannesen

² Through negotiations, the States participating in the Conference on Financing for Development in Addis.

Ababa, Ethiopia reached a historic agreement on a series of bold measures to reform the global practice of financing for sustainable development.

³ Foreign Account Tax Compliance Act.

and Zucman 2014; Cobham and Janský 2018), the impact on developing countries remains less clear. This paper aims to address that gap by analyzing how tax information exchange affects tax revenue mobilization in developing countries. This focus is particularly relevant given the distinct institutional, economic, and fiscal environments that characterize these countries.

First, the technological deficiency and the outdated organization of tax administrations create a different context for these countries. Such constraints can hinder the effective implementation of the standards set by the Global Forum. Moreover, in the absence of favorable economic conditions, tax incentives and the assurance of confidentiality for foreign taxpayers have long contributed to making these countries attractive for investment, as demonstrated by Schjelderup (2016), Sharman (2010), and Gordon (2009). Secondly, several studies (Ajayi and Ndikumana 2014) have shown that developing countries are the most exposed to capital flight and illicit financial flows, and advocate for the exchange of information between national tax authorities as a key policy tool to mitigate this issue (Fuest and Riedel 2010). Finally, the stagnation of official development assistance, combined with fiscal pressures arising from the COVID-19 crisis and growing development needs, underscores the urgency of finding sustainable domestic financing solutions (United Nations 2020; IMF 2020). The critical question in this context is whether participation in the Global Forum for transparency and exchange of information for tax purposes improves resource mobilization in developing countries.

This paper attempts to answer this question by comparing members and non-members developing countries using information available in the Forum's annual reports applying impact analysis methods. The potential impact of the Forum is twofold: it may enhance revenue generation by reducing illicit financial flows and increasing tax transparency, but it may also be influenced by FDI⁴ flow reduction. To better understand this dual impact, the work of Bacchetta and Espinosa (1995) provides a useful theoretical framework, suggesting that the exchange of information between countries, while beneficial in many ways, can also generate unintended consequences. According to their game theory model, the choice to share tax information can be strategic, with both positive and negative effects.

While some argue, like Dagan (2000), that tax transparency could deter FDI—especially if capital-exporting countries are trying to avoid taxes—others, such as Johannesen and Zucman (2014) and Cobham and Janský (2018) highlight the potential benefits of tax transparency for FDI-receiving countries, suggesting that it can reduce illicit financial flows, attract stable investments, and boost investor confidence.

This study aims to examine the net impact of tax information exchange on tax revenues in developing countries, considering the potential adverse effects on FDI. It is one of the first empirical investigations to focus exclusively on developing countries. Given the complex institutional diversity and data constraints in

⁴ FDI can contribute to growth, create employment, and, above all, facilitate significant technology transfer to the recipient country. They can also stimulate economic activity and create greater potential for government revenues.

developing countries, our primary goal is to provide rigorous empirical evidence on the effects of Global Forum membership on tax revenue mobilization. These findings serve as a foundation for future theory-building, helping to shape more context-sensitive models that can better capture the diverse mechanisms at play.

We apply the semi-parametric difference in difference method of Abadie (2005) adapted for panel data structure and non-randomized studies, which allows for relaxation of the parallel trend hypotheses. Using a reweighting technique, this method estimates the effects based on observable characteristics after controlling for the country and time-specific factors without imposing restrictions on functional forms compared to standard regression methods. It adjusts for differences between groups on observable characteristics correlated with the propensity score and enables evaluation of the treatment effect linked to membership in the Forum. In our case, where the treatment start date corresponding to membership of the global information exchange forum is not the same for all countries, it also tries to reduce unobserved and time-varying differences between early and late member countries that can confound our results.

In robustness checks, we employ the difference-in-differences with multiple time periods proposed by Callaway and Sant'Anna (2021) which has the advantage of better handling dynamic contexts. Additionally, we apply alternative matching methods and Inverse Probability Weighting to address potential selection bias and verify the consistency of our findings across various specifications. To further validate the results, we conduct a sensitivity analysis, testing the stability of the outcomes under various assumptions and model specifications.

This study also considers the impact analysis of the application of each of the two primary standards of the Global Forum and evaluates the effect on disaggregated revenues. The main finding in this paper indicates that Global Forum membership significantly improves non-resource direct tax revenue mobilization by about 2.68 percentage points on average. We also remark a significant effect on corporate income tax revenues of 2.49 percentage points and personal income tax of 0.94 percentage points on average.

We demonstrate that our finding is particularly robust to different specifications and the use of additional identification strategies. Moreover, we find that countries implementing Global Forum's Exchange Of Information on Request (EOIR) Standard also experience improvements in tax revenue mobilization. The analysis of main transmission channels supports our hypothesis and present expected effects. Our results are in line with the theoretical model of Bacchetta and Espinosa (1995) which indicates that the choice of sharing tax information can generate negative effects but can also provide positive effects that counterbalance the negative effects. The rest of the paper is organized as follows: after a review of the existing literature on the issue in Sects. 2 and 3 presents the data and stylized facts, Sect. 4 outlines the methodology used, Sect. 5 discusses the results obtained, Sect. 6 explores the effects through the primary transmission channels, Sect. 7 presents robustness checks, and the last section concludes.

2 Literature review

2.1 Overview of the literature on information exchange for tax purposes

When we examine the literature on information exchange for tax purposes, we find diverse literature mainly oriented around three axes.

The first wave of literature explores the factors motivating countries to enter into tax information exchange agreements. Early foundational work includes Bacchetta and Espinosa (1995) and Huizinga and Nielsen (2003), who developed game-theoretical models to explain the strategic incentives behind cooperation. Bacchetta and Espinosa (1995) argue that governments weigh the temporary benefits of withholding information against the long-term costs of potential retaliatory tax policies. Similarly, Huizinga and Nielsen (2003), further emphasize that cooperation is driven by the desire to monitor taxpayers' cross-border activities. Key factors encouraging cooperation include bank secrecy, reciprocity, tax rates, and the interaction dynamics between governments. Real-world case studies provide empirical support for these theoretical insights. Voget (2009), using a Heckman Tobit model on information sharing between the Netherlands and 81 partners (1992–2005), finds that high tax rates, significant capital abroad, and public fund costs incentivize countries to sign such agreements. Ligthart et al (2011), analyzing double taxation treaties among 189 countries, identify personal tax rates, withholding tax rates, and direct investment stocks as positive determinants of treaty formation. Bilicka and Fuest (2014) examine 565 Tax Information Exchange Agreements (TIEAs) signed by tax havens and find that bilateral economic ties (portfolio investment, FDI, and trade) significantly increase the likelihood of agreement. Finally, Lesage et al. (2020) highlight that BRICs⁵ countries are motivated by their exposure to illicit financial flows, but sovereignty concerns make them wary of external enforcement.

The second wave focuses on how information exchange affects investment, producing mixed but insightful results. Hanlon et al. (2015), using Difference-in-Differences (DiD) on a sample of 59 countries (1984–2008), show that U.S. tax information exchange agreements reduce portfolio investments in tax havens. De Simone et al. (2020) reach similar conclusions regarding U.S. foreign portfolio investments in tax havens following the implementation of FATCA (2006–2015). However, other studies highlight more complex relationships. Blonigen & Davies (2004), use a conditional multinomial logit model on 88 countries (1980–1999) and find adverse effects of tax treaties on FDI flows, attributing this to increased investment uncertainty. They argue that while tax agreements may facilitate FDI, they can also deter it due to enhanced information exchange between tax authorities, which limits opportunities for tax avoidance.

An alternative explanation is provided by Kinda and Tagem (2024), who investigate the role of treaty network centrality in resource-rich developing countries. Using a network analysis approach, they show that countries highly embedded in

⁵ Brazil, Russia, India, China, South Africa.

treaty networks, often acting as conduits for treaty shopping, experience lower revenue mobilization from natural resources. Their findings suggest that the negative effects of tax treaties on investment or revenues may stem not only from uncertainty but also from structural exposure to treaty abuse, which can erode the domestic tax base.

Further empirical analyses show more nuanced results: Davies et al. (2009) report both positive and negative effects of double taxation treaties on FDI stocks; Blonigen and Piger (2014) confirm that information exchange provisions influence investment outcomes; Braun and Weichenrieder (2015) find a 46% reduction in German affiliate investments in tax havens following bilateral tax information agreements.

The third wave investigates the relationship between tax information exchange and cross-border bank deposits, a key channel for tax evasion. Huizinga and Nicodème (2004), using OECD panel data, find no significant impact of information exchange on deposit behavior. Grilli (1989) reports a positive effect of banking secrecy on European deposits, while Hemmelgarn and Nicodème (2009) observe no robust effects from the European Savings Directive. In contrast, Johannesen (2010) finds that the Directive caused shifts of deposits from Switzerland to jurisdictions without information exchange. Johannesen and Zucman (2014) reveal that TIEAs led tax evaders to non-cooperating jurisdictions. Beer et al. (2019) estimate that such frameworks have reduced offshore deposits by 25% in developed countries. Spengel et al. (2018) report that the Automatic Exchange of Information (AEOI) caused an 11.5% decline in tax haven deposits, but warn about possible fund redirection.

To contribute to this broad literature, this study assesses the overall impact of tax information exchange within the institutional framework of the Global Forum⁶ on tax revenue mobilization in developing countries. While previous literature has primarily focused on developed economies and tax havens, this paper fills a gap by providing one of the first empirical analyses centered exclusively on developing countries. Employing a semi-parametric approach, it captures the non-linear and heterogeneous effects of international tax cooperation, overcoming limitations of traditional Difference-in-Differences (DiD) models that assume uniform treatment effects. Drawing on Abadie (2005), the methodology offers flexibility in modeling varying country-specific impacts over time. Moreover, this study also contributes to current debates on international tax reforms. By shedding light on how membership in international tax forums like the Global Forum on Transparency and Exchange of Information can enhance tax revenue mobilization, it underscores the importance of information exchange for achieving global tax reform objectives. As the international community pushes for measures like beneficial ownership disclosure and a global minimum tax, the study highlights the role of data collection and sharing in achieving these goals. This empirical evidence supports the notion that strengthening international tax cooperation can play a critical role in curbing tax avoidance and base erosion, aligning with ongoing efforts to reform global tax rules.

⁶ Global Forum on Transparency and Exchange of Information for Tax Purposes.

2.2 Analytic framework

This study is grounded in a framework that connects international tax cooperation, particularly through participation in the Global Forum, to domestic resource mobilization in developing countries. The central hypothesis is that information exchange agreements, by increasing transparency and curbing illicit financial flows, can strengthen tax compliance and enhance tax revenue. The framework draws on existing theoretical and empirical insights to identify the channels through which Global Forum membership can influence domestic tax revenue.

As illustrated in Fig. 2, we identify three primary causal mechanisms linking Global Forum participation to improved tax mobilization.

2.2.1 Reducing illicit financial flows

The Global Forum fosters a standardized framework that encourages tax information exchange among member countries, thereby promoting transparency, accountability, and regulatory compliance. This institutional environment is expected to reduce illicit financial flows Combes et al.(2019) by curbing corruption, opacity, profit shifting and opportunities for tax evasion. Reuter (2017) underscores that improving transparency and governance is essential to addressing the complex drivers of illicit financial activity.

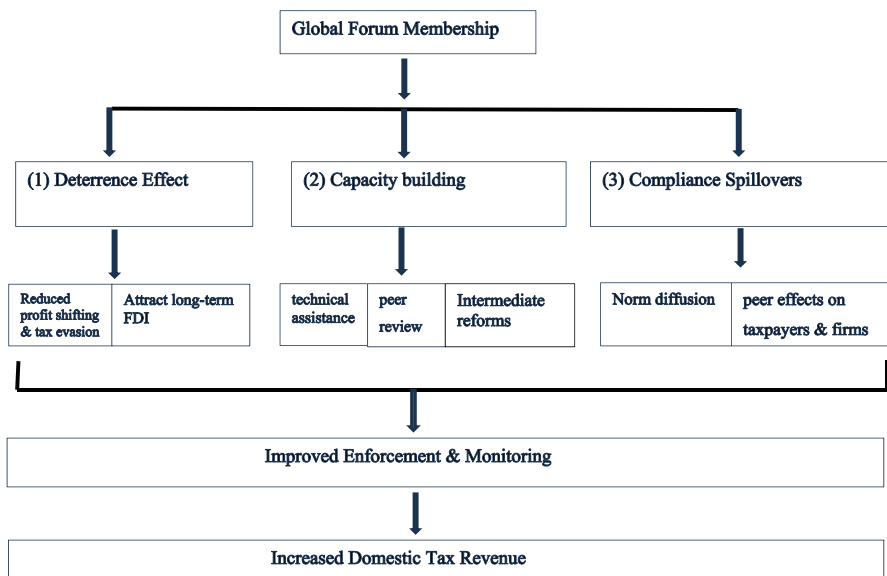


Fig. 2 Conceptual framework: channels through which global forum membership affects domestic tax revenue

2.2.2 Capacity-building and institutional strengthening

Participation in the Global Forum is often associated with peer reviews, legal reforms, and technical support (OECD 2011). These processes contribute to strengthening tax administrations by improving audit capabilities, enforcement mechanisms, and overall institutional capacity, which in turn enhance domestic revenue mobilization (Mascagni 2018).

2.2.3 Compliance spillovers and reputational effects

Information exchange can influence FDI patterns in opposing ways. On one hand, as Davies et al. (2009) argue, it may deter tax-motivated investment by constraining tax arbitrage opportunities and increasing disclosure risks. On the other hand, improved transparency and institutional credibility can enhance investor confidence and attract more stable, long-term capital. Countries may also benefit from reputational gains at the international level, further improving their attractiveness. Prior research, including Gropp and Kostial (2001), has shown that FDI, particularly when accompanied by strong governance, can contribute significantly to tax revenue mobilization.

To test these mechanisms, we employ a semi-parametric Difference-in-Differences method to estimate the effect of Global Forum participation on both total and disaggregated direct tax revenues, while controlling for country-specific characteristics, timing of implementation, and potential selection bias. This approach allows us to capture the heterogeneity in responses across countries and over time, providing a nuanced understanding of the effectiveness of tax information exchange in the developing world.

3 Data and stylized facts

3.1 Data

The analysis is based on a panel of 60 countries covering the period from 2000 to 2020. The selection of these countries was based on their level of development and constrained by data availability. This sample contains 42 developing countries that joined the Global Transparency Forum on different dates and 18 that are not members until 2020. Among these countries participating in the Forum, 26 are willing to apply standard 1 of the Forum, which corresponds to the exchange of request information, and 10 for standard 2, which corresponds to the automatic exchange of information. We use the direct tax revenue as a percentage of GDP from the Government Revenue Dataset (GRD) developed by UNU-WIDER as the dependent variable in our analysis (McNabb et al. 2021). This database offers the advantage of distinguishing between these different tax components. In this study, we focus specifically on non-resource direct tax revenues, excluding social contributions. This choice is guided by several considerations. First, the Global Forum's initiatives have primarily targeted direct rather than indirect taxation. Second, existing assessments and empirical evidence indicate that the most significant losses from tax evasion

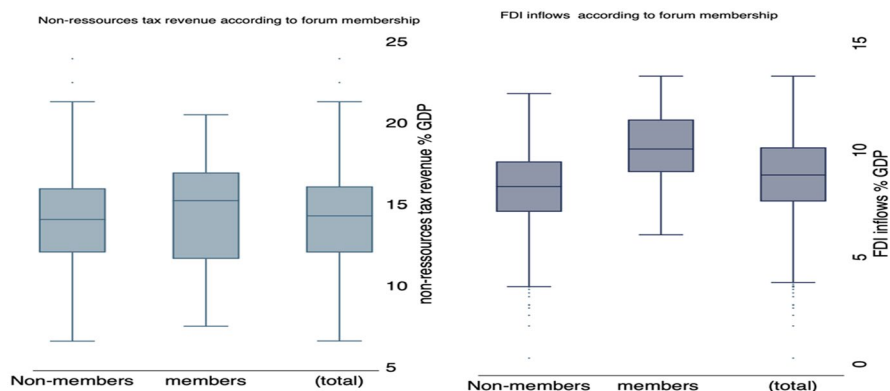


Fig. 3 Tax revenue and FDI level according to forum membership. *Source:* Author's construction

stem from direct tax revenues, as illustrated in Fig. 2. Finally, revenues derived from natural resources are subject to high price volatility and can mask the actual performance of tax systems in mobilizing stable, broad-based revenues. As highlighted by Baunsgaard and Keen (2010), non-resource tax revenues are more sensitive to policy changes and administrative improvements, making them a more relevant indicator for assessing the impact of tax information exchange frameworks.

Our primary variable of interest is a dummy taking the value 1 from the year in which a country joins the Global Forum and 0 otherwise (data available on the OECD's Global Forum on Transparency and Exchange of Information for Tax Purposes website).⁷ To refine our analysis, we examine the impact of the implementation of Forum's two primary information exchange standards. Thus, the variable of interest will take the value 1 if the country implements the EOIR and 0 otherwise. Similarly, it will take the value 1 if the country adopts the AEOI and 0 otherwise. The data on the control variables used in this study come from various sources (Table 13), including the World Development Indicators, the World Bank's World Governance Index, the ICTD (International Center for Tax and Development), the Heritage Foundation database, the International Tax Institutions (ITI) Database and the UNCTAD database of the United Nations Conference on Trade and Development.

3.2 Stylized facts

First, we compare the level of revenue and FDI between countries that are members of the transparency and information exchange forum and those that are not. Looking at Fig. 3, we observe that Forum members tend to have a higher average level of non-resource tax revenue compared to non-members. The same trend is evident for net FDI flows. When comparing the median revenue and FDI of the sample, we

⁷ <https://www.oecd.org/fr/fiscalite/transparence/>

also find that Forum members exhibit higher median levels than the overall sample. A two-sample t-test confirms the findings, showing that the difference is statistically significant. This test presents a mean difference of 2.07 percentage points for tax revenue. However, no significant difference was found for FDI, suggesting that Forum membership does not have a clear or consistent impact on FDI flows between member and non-member countries.

4 Empirical approach

This study aims to assess the causal impact of international cooperation for tax purposes on tax revenue mobilization in developing countries. Specifically, we focus on the case of the Global Forum for Transparency and Exchange of Information for Tax Purposes as an example of such international cooperation. The primary challenge of this analysis is establishing a causal link between a country's membership in this forum and its subsequent tax revenue mobilization. In this context, we treat a country's membership in the Global Forum as the treatment, where membership is defined at a given date.

To conduct the analysis, we divide our sample into two subgroups, the treatment group, and the control group. The treatment group corresponds to countries that are members of the Forum, and the control group to the non-member countries of the Forum.

In the literature, various impact assessment methods are used, each with its own strengths, weaknesses, and underlying assumptions. Like many studies on international cooperation for tax information exchange, our study faces challenges related to endogeneity and the difficulty of constructing a perfect counterfactual.

Previous studies have addressed these issues using various methods, such as the Heckman (1979) two-step estimator or the Prais–Winsten method for panel data (Hanlon et al. 2015). Other studies also use conventional matching methodologies like the difference in difference method (Lesage et al. 2020; Braun and Weichenrieder 2015; Beer et al. 2019). Following this approach, in our study, we apply the difference-in-differences estimator to assess the impact of membership in the Global Forum by comparing the changes in tax revenue over time between the treated group (member countries) and the control group (non-member countries). This method allows us to account for systematic differences between the two groups, control for biases due to omitted variables (Wan et al. 2019), and effectively address endogeneity concerns (Meyer 1995).

In its classic form, the difference-in-differences model involves two periods and two groups. The first period is the pre-treatment period, when no country is a member of the Forum, and the second period represents the post-treatment period, when some countries have become members (treated group) and others have not (control group). To estimate the treatment effect of Forum membership, we rely on the parallel trends assumption, which posits that, in the absence of treatment, the treated and control countries would have followed parallel trends over time.

However, in the case of our study, we cannot ensure the validity of this hypothesis, as illustrated in Fig. 3. This limitation could compromise the reliability of the

traditional difference-in-differences estimator in accurately capturing the causal effect of Forum membership on tax revenue mobilization. Fortunately, more recent methodological developments have addressed these challenges. One of the most notable contributions is the semi-parametric difference-in-difference method proposed by Abadie (2005).

The semi-parametric difference in difference method offers key advantages over traditional DiD approaches. It employs a reweighting technique that adjusts for imbalances in observable baseline characteristics between treated and untreated groups. By relying on the propensity score to balance covariates, this method accounts for systematic differences that could bias treatment effect estimates. This method is well-suited for studies like ours, where membership in the Global Forum is not randomly assigned. This identification strategy corrects for non-random selection by considering differences between member and non-member countries that may affect results. Notably, this approach does not rely on the strong assumption of conditional independence or require strict parallel trends, making it more robust in contexts where these assumptions are questionable. It is also more adapted to the panel data structure and helps mitigate unobserved, time-varying heterogeneity between early and late adopters, which is an important feature in our context, where countries joined the Global Forum at different points in time. Another key benefit of this method is its flexibility, as it does not require repeated observations for the same unit in every period and allows for parsimonious parametric estimation of the average treatment effect on the treated (ATT) as a function of selected covariates.

According to this method, the ATT is estimated in three steps:

- First, it calculates the evolution of outcomes over time for each unit.
- Second, it estimates the probability of being treated for each unit, which it uses to weigh the units.
- Finally, it compares the weighted evolution over time between treated and untreated groups.

The Absid command developed by Hounbedji (2016) makes it possible to execute all these steps at once.

Following recent studies using this methodology (Wu et al. 2023; Muganyi et al. 2021; Nenavath 2022; Beuchert et al. 2018), we then assess the effect of the global forum for transparency and exchange of information for tax purposes membership on tax revenue's mobilization in developing countries.

The average treatment effect (ATT) of participating in the Forum can then be expressed through the following equation:

$$ATT\{Y\} = E(Y_{1t}|GFA = 1) - E(Y_{0t}|GFA = 1) \quad (1)$$

Under key assumptions

$$E(Y_{0t} - Y_{0b}|GFA_t = 1, x_b) = E(Y_{0t} - Y_{0b}|GFA_t = 0, x_b) \quad (2)$$

$$P(GFA_t = 1) > 0 \quad \text{and} \quad \pi(x_b) < 1 \quad (3)$$

According to Eq. 1, each unit (country) has two potential outcomes: Y_{1t} and Y_{0t} . Y_{1t} represents the tax revenue outcome if the country receives the treatment (i.e., becomes a member of the Forum) by time t and Y_{0t} is the country does not received the treatment (i.e., remains a non-member) at time t . The variable GFA_t is a dummy indicating membership in the Global Forum, taking the value of 1 if the country is treated by time t and 0 otherwise. At baseline b , no country is treated.

We acknowledge that other factors may also affect tax revenues for both the treated and control groups, potentially influencing their trends. To mitigate this, the vector x_b includes a range of control variables associated with both the likelihood of Global Forum membership and the evolution of tax revenue mobilization. These covariates account for time-varying confounders, allowing for a more accurate comparison between treated countries and their most similar counterparts. They include GDP per capita, tax burden, financial development, macroeconomic indicators (such as inflation), various anti-avoidance reforms (including Transfer Pricing legislation, the General Anti-Avoidance Rule, and the Thin Capitalization Rule), tax administration reforms (such as the High Net-Worth Individuals Program, the Large Taxpayer Office program, the Simplified Income Tax Regime, online tax payment services, the Cooperative Compliance Approach, and the Administrative Investigation Service), as well as institutional quality indicators (including Political Stability, Rule of Law, Regulatory Quality, Voice and Accountability, Control of Corruption, and Government Effectiveness).

The selection of these variables is essentially based on the literature. Bacchetta and Espinosa (2000) highlight that GDP per capita, income tax rates, and tax authority control encourage countries to sign information exchange agreements, which likely influence their decision to join the Global Forum for Transparency and Exchange of Information for Tax Purposes and their capacity for tax revenue mobilization. Similarly, Davoodi and Grigorian (2007) find that institutional quality enhances transparency, suggesting that countries with institutional improvements are more likely to join the Forum and improve tax collection. Voget (2009) argue that higher tax burdens and income tax rates increase the risk of tax evasion, which can implicitly motivate countries to engage in information exchange agreements and strengthen tax revenues.

Capasso and Jappelli (2013) show that financial development contributes to reducing tax evasion by improving access to taxpayer information, thereby supporting the implementation of EOIR and AEOI standards and enhancing revenue performance. Internal tax administration reforms, such as the modernization of systems, adoption of risk-based compliance approaches, and digitalization of tax services, can also influence a country's decision to join the Global Forum. They reflect a government's broader commitment to transparency and cooperation. Minea and Villieu (2009) add that effective inflation targeting fosters improved governance, which may also increase the likelihood of Forum membership and support better fiscal outcomes. We mitigate selection bias by comparing treated and control countries with the most similar observed characteristics. To estimate the ATT, we construct the propensity score $\pi(x_b)$ summarizing all relevant information from the covariates. This score is obtained via a first-stage

regression of the dummy variable "GFA" on the vector $X=x$. Countries with higher propensity scores, indicating a higher likelihood of treatment, are given greater weight in the analysis. To respect the hypothesis given by Eq. 3, We discard any propensity scores lower than 0 and higher than 1.

The semiparametric difference-in-difference estimator can finally be rewritten as

$$ATT = \left(E \frac{Y_t - Y_b}{P(GFA_t = 1)} \cdot \frac{GFA_t - \pi(x_b)}{1 - \pi(x_b)} \right) \quad (4)$$

$$ATT\{Y\} \equiv E\{Y_{1t} - Y_{0t} | X = x, GFA\} \quad (5)$$

To verify the robustness of our results, we apply alternative methods of Difference-in-Differences with multiple time periods as proposed by Callaway and Sant'Anna (2021).

This approach is well-suited for analysis with staggered treatment adoption and varying treatment timings. It allows for more flexible identification in setting with staggered treatment adoption, accounting for treatment effect heterogeneity and enabling the evaluation of dynamic treatment impacts over time. In addition, to test the stability and consistency of our findings, we also apply several matching methods including Inverse Probability Weighting (IPW), Inverse Probability Weighting Regression Adjustment (IPWRA), Augmented Inverse Probability Weighting (AIPW), and Propensity Score Matching (PSM) which also reduce selection bias and strengthening causal inference. Unlike our semi-parametric approach that computes the ATT directly on Stata, these matching methods enable us to observe the main factors determining a country's likelihood to join the Global Forum. As detailed in table 12 in the "Appendix", most factors are positively associated with Forum membership, while inflation and political stability appear to reduce the likelihood of joining. The counterintuitive result for political stability may reflect weaker reform incentives in stable regimes, where governments face less pressure to enhance credibility or attract international support. Alternatively, it may suggest institutional resistance to external scrutiny in politically entrenched systems (Cazdow et al. 2023). These reforms signal a commitment to transparency and improved governance, making forum membership a natural complement to domestic efforts. As noted by IMF (2023), countries that enhance their administrative capacities are better positioned to engage in international tax cooperation frameworks. We further conduct a placebo test to ensure that the observed effects are not driven by random fluctuations but truly reflect the impact of Forum membership. Moreover, extensive sensitivity analyses and heterogeneity analyses are performed to check the stability of our results across different model specifications and sub-samples, which reinforces the credibility of our conclusions.

5 Estimation results

5.1 Results of treatment effects on direct tax revenues excluding resource revenues

We estimate the treatment effect of Global Forum membership by comparing member countries to non-member countries. Tables 1 through 5 present the results across various model specifications. Column (1) reports the baseline specification, which includes country and year fixed effects but excludes control variables. Column (2) adds key control variables—Tax Burden, Transfer Pricing legislation, Thin Capitalization rules, and GDP per capita—without including fixed effects. Column (3) retains these variables while incorporating country-year fixed effects. Columns (4), (5), and (6) build on the specification in column (3) by sequentially adding the General Anti-Avoidance Rule, the Financial Development Index, and inflation, respectively.

Table 1 presents the ATT associated with membership in the Global Forum. The estimated ATT remains positive and statistically significant across all specifications, indicating that member countries can mobilize more tax revenue than non-member countries. The estimated gains range from 1.89 to 3.06 percentage points of tax revenue as a share of GDP. These findings support theoretical expectations and align with evidence from Global Forum progress reports and broader stylized facts. For example, African countries have identified substantial additional revenue since 2009 through improved tax compliance enabled by information exchange mechanisms. In Latin America, a significant amount of additional tax revenues has been reported from 2014 to 2020. These results underscore the tangible revenue gains achieved through commitment to international tax cooperation and further reinforce the credibility of our estimated treatment effects.

Table 1 Effect of global forum membership on non-resource direct tax revenues

Treatment variable: GFA	Outcome: non-resource direct tax revenues in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	2.3951*** (0.2253)	1.8960*** (0.2476)	2.6819*** (0.2864)	3.0232*** (0.2180)	2.9913*** (0.2370)	3.0602*** (0.2415)
Observations	660	814	566	456	454	433
Country FE	Yes	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes

This table analyzes the effect of Global Forum membership on non-resource direct tax revenues. Each column presents estimates from a different specification. Column (1) presents the baseline model without control variables. Column (2) adds controls for Tax Burden, GDP per capita, Transfer Pricing Legislation, and Thin Capitalization Rule. Column (3) adds country and year fixed effects to the specification used in Column (2). Columns (4) to (6) sequentially add the General Anti-Avoidance Rule, Financial Development Index, and Inflation respectively

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2 Effect of global forum membership on non-resource corporate income tax revenues

Treatment variable: GFA	Outcome: corporate income tax revenues in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	2.2087*** (0.2498)	1.9887*** (0.3126)	2.5548*** (0.2516)	2.7072*** (0.2740)	2.7051*** (0.2763)	2.8276*** (0.2715)
Observations	504	641	432	342	342	342
Country FE	Yes	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes

This table analyzes the effect of the global forum for transparency and exchange of information for tax purposes membership on non-resource corporate income tax revenues. Each column presents estimates from a different specification. Column (1) presents the baseline model without control variables. Column (2) adds controls for Tax Burden, GDP per capita, Transfer Pricing Legislation, and Thin Capitalization Rule. Column (3) adds country and year fixed effects to the specification used in Column (2). Columns (4) to (6) sequentially add the General Anti-Avoidance Rule, Financial Development Index, and Inflation respectively

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Several factors may explain the observed effect. Membership in the Forum enhances transparency through commitments to implement standards and participate in the peer review process, which may improve domestic legislative frameworks. Additionally, it strengthens the negotiating capacity of developing countries, enabling them to secure more favorable information exchange agreements. Membership also provides a platform for participation in the Forum's decision-making processes, which are based on the consensus principle, and fosters a collaborative environment that allows the sharing of best practices and experiences among member countries. This, in turn, enhances their efficiency, enabling them to anticipate challenges and adopt solutions based on the experiences of others. Furthermore, membership offers support and guidance from the Forum's Secretariat and its partners, including training and tailored assistance.

Moreover, membership increases a country's international visibility and reputation, making it a more attractive jurisdiction for business and investment. This increased visibility can positively influence the economic environment, leading to further tax revenue mobilization. Another possible explanation is the deterrent effect of membership. By joining the Forum, countries signal their commitment to combating tax evasion and avoidance, which can discourage firms from engaging in such behaviors, due to the increased likelihood of scrutiny through information exchange agreements. It is also essential to note that the commitment to cross-border transparency and related reforms may also strengthen tax compliance at the national level, thereby contributing to explain the observed results.

5.2 Treatment effect of forum membership on disaggregated direct tax revenues

As highlighted in the stylized facts, a substantial portion of revenue losses in developing countries stems from income taxes. We therefore disaggregate direct tax revenues and estimate the ATT of Global Forum membership on corporate and

personal income tax revenues as a share of GDP. As reported in Table 2, Forum membership is associated with an average increase of 2.49 percentage points in corporate income tax revenues and 0.94 percentage points in personal income tax revenues. The stronger effect on corporate taxes compared to personal income taxes can be attributed to several factors. Multinational corporations engage in complex tax avoidance strategies like profit-shifting and transfer pricing, which often span multiple jurisdictions, making them more susceptible to international information exchange efforts. These agreements provide transparency, helping tax authorities detect and combat tax avoidance. Personal income tax evasion, in contrast, tends to be more localized. Underreporting of income or over-claiming deductions being primarily addressed through internal audits, which are less influenced by international cooperation. Additionally, international frameworks, such as the BEPS project and the Global Forum on Transparency, have focused more on corporate tax compliance by introducing mechanisms like Country-by-Country Reporting that specifically target corporate tax evasion. Corporations are also more exposed to reputational risks and regulatory scrutiny, further incentivizing compliance with international tax standards. Voluntary disclosure programs have been particularly effective for corporations, as they often involve complex offshore operations that benefit from information exchange. Moreover, corporations are subject to audits by multiple tax authorities across different jurisdictions, making it easier for authorities to track financial activities and identify discrepancies. Personal income tax evasion, however is harder to detect through such international mechanisms (Table 3).

5.3 Analysis of the effects according to the application of the main standards of the forum

Two primary standards govern the Global Forum for Transparency and the Exchange of Information for Tax Purposes: the EOIR and the AEOL. The Forum's

Table 3 Effect of global forum membership on non-resource personal income tax revenues

Treatment variable: GFA	Outcome: personal income tax revenues in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.8957*** (0.1517)	0.4699** (0.1884)	1.0611*** (0.1561)	1.0596*** (0.1678)	1.0629*** (0.1677)	1.0890*** (0.1772)
Observations	516	558	447	359	359	335
Country FE	Yes	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes

This table analyzes the effect of the global forum for transparency and exchange of information for tax purposes membership on non-resource personal income tax revenues. Each column presents estimates from a different specification. Column (1) presents the baseline model without control variables. Column (2) adds controls for Tax Burden, GDP per capita, Transfer Pricing Legislation, and Thin Capitalization Rule. Column (3) adds country and year fixed effects to the specification used in Column (2). Columns (4) to (6) sequentially add the General Anti-Avoidance Rule, Financial Development Index, and Inflation respectively

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4 Effect of exchange of information on request on non-resource direct tax revenues

Treatment variable: EOIR	Outcome: direct tax revenues in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	5.1657*** (0.4438)	0.1722 (0.3576)	5.7973*** (0.3643)	5.6624*** (0.3877)	5.5919*** (0.3858)	5.6185*** (0.4372)
Observations	108	256	117	106	103	99
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

This table analyzes the effect of exchange of information on request application on non-resource direct tax revenues. Each column presents estimates from a different specification. Column (1) presents the baseline model without control variables. Column (2) adds controls for Tax Burden, GDP per capita, Transfer Pricing Legislation, and Thin Capitalization Rule. Column (3) adds country and year fixed effects to the specification used in Column (2). Columns (4) to (6) sequentially add the General Anti-Avoidance Rule, Financial Development Index, and Inflation respectively

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5 Effect of automatic exchange of information on non-resource direct tax revenues

Treatment variable: AEOI	Outcome: direct tax revenues in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	-0.3741 (0.9600)	4.8027*** (0.9962)	-0.3833 (0.9359)	-0.1886 (0.9528)	-0.2421 (0.9907)	-0.3295 (1.0816)
Observations	264	187	334	274	278	253
Country FE	Yes	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes

This table analyzes the effect of Automatic exchange of information application on non-resource direct tax revenues. Each column presents estimates from a different specification. Column (1) presents the baseline model without control variables. Column (2) adds controls for Tax Burden, GDP per capita, Transfer Pricing Legislation, and Thin Capitalization Rule. Column (3) adds country and year fixed effects to the specification used in Column (2). Columns (4) to (6) sequentially add the General Anti-Avoidance Rule, Financial Development Index, and Inflation respectively

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

global objective is to promote the widespread adoption of AEOI among all members. However, significant disparities exist across countries in the implementation of these standards. To assess the distinct impact of each standard, we evaluate them separately. Table 4 reports the effect of EOIR implementation, revealing a positive and statistically significant average impact of approximately 5.5 percentage points on tax revenue as a share of GDP. In contrast, Table 5 presents more limited findings for AEOI, primarily due to the relatively small number of observations. This limitation stems from the early stage of AEOI implementation in many developing countries, which restricts the robustness of the empirical analysis for this standard. According to Global Forum statistics, from its establishment through

Table 6 Sensitivity analysis: effect of global forum membership on non-resource direct tax revenues

Treatment variable:		Outcome: non-resource direct tax revenues in % of GDP											
GFA	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
ATT	3.0602 ^{***} (0.2476)	3.1049 ^{***} (0.2467)	3.0582 ^{***} (0.247)	3.0998 ^{***} (0.2467)	3.1316 ^{***} (0.2446)	3.0844 ^{***} (0.2479)	3.0580 ^{***} (0.2465)	3.0480 ^{***} (0.2442)	2.9953 ^{***} (0.2442)	3.0635 ^{***} (0.2381)	3.0147 ^{***} (0.2460)	3.0453 ^{***} (0.2497)	3.0563 ^{***} (0.2479)
Observations	433	425	421	423	424	424	424	244	244	242	245	243	239
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

We analyze the effect of Global Forum for Transparency and Exchange of Information for Tax Purposes membership on non-resource direct tax revenues. All specifications include controls for: Tax Burden, GDP per capita, natural resource rents, Financial Development Index, Inflation, and key anti-avoidance measures (Transfer Pricing Legislation, General Anti-Avoidance Rule, and Thin Capitalization Rule). To account for governance and institutional quality, Eqs. (2)–(7) sequentially add the following indicators: Political Stability, Rule of Law, Regulatory Quality, Voice and Accountability, Control of Corruption, and Government Effectiveness. To capture the role of tax administration structures and modernization tools, Eqs. (8) to (13) sequentially introduce binary indicators for: existence of a High Net Wealth Program, a Simplified Income Tax Regime, a Large Taxpayer Office, a Cooperative Compliance Approach, Online Payment systems, and Investigation Services in the Tax Administration

Robust standard errors in parentheses: ^{***} $p < 0.01$, ^{**} $p < 0.05$, ^{*} $p < 0.1$

2020, a total of 5606 information requests were received by African and Latin American countries, 58% of which benefited African countries and 42% Latin American countries. During the same period, 5411 requests were initiated by these regions, with 27% originating from African countries and 73% from Latin American countries.

5.4 Analysis of sensitivity

To further assess the robustness of our baseline findings, Table 6 conducts a comprehensive sensitivity analysis by incorporating additional institutional and administrative controls. Each column introduces a distinct set of variables to test whether the positive association between Global Forum membership and non-resource direct tax revenues persists under alternative specifications. Columns (1)–(6) progressively include governance indicators, such as Political Stability, Rule of Law, Regulatory Quality, Voice and Accountability, Control of Corruption, and Government Effectiveness. These variables help to evaluate whether improvements in institutional quality, rather than Global Forum participation, might be driving the observed revenue gains. Columns (7)–(12) shift focus to tax administration reforms by sequentially introducing indicators capturing the presence of modernization tools and structural features within the tax system. These include the existence of a Large Taxpayer Office, a High Net Wealth Program, a Simplified Income Tax Regime, a Cooperative Compliance Framework, Online Payment systems, and specialized Investigation services. This allows us to test whether Forum membership effects are confounded by broader administrative reforms implemented concurrently. In all specifications, the estimated coefficient on Global Forum membership remains positive, statistically significant, and comparable in magnitude to the baseline results presented in Table 1. This consistency reinforces our interpretation that Forum membership contributes independently to stronger domestic revenue mobilization, beyond what can be attributed to institutional improvements or internal tax administration upgrades alone. These findings highlight the Forum's added value not only as a platform for international cooperation but also as a catalyst for broader reform and capacity-building in developing countries. They underscore the credibility of the main results and support the policy message that engagement with the Forum yields tangible fiscal benefits, even when accounting for underlying differences in institutional and administrative environments.

5.5 Control of heterogeneity

While developing countries may share certain structural characteristics, institutional and socio-political differences can introduce important sources of heterogeneity in our analysis (Lin and Ye 2009; Easterly 2002; Guerguil et al. 2017). To address this, we investigate whether the impact of Global Forum membership on tax revenue mobilization varies across different country contexts. In Table 10, we investigate several potential sources of heterogeneity to determine whether countries that meet the preconditions for tax cooperation, perform better in terms of

revenue mobilization. To this end, we split the sample based on the mean value of selected variables. For each dimension, we categorize the countries into two subgroups: those above the sample mean and those below it. We begin by analyzing macroeconomic factors. Columns (1) and (2) of Table 10 show that countries with higher GDP per capita experience a more substantial and statistically significant positive effect from Forum membership compared to those with lower income levels.

Next, we explore the heterogeneous effect of Global Forum membership between countries with high and low levels of inward FDI. Columns (3) and (4) indicate that the impact is significantly stronger for low-FDI countries. These countries have fewer alternative revenue sources making them more motivated to improve domestic tax collection. Their domestic businesses also tend to use less sophisticated cross-border tax avoidance strategies, which makes international transparency measures more immediately effective. Moreover, They may be more committed to international norms and reforms, viewing information exchange as a way to enhance governance and attract external support. In contrast, high FDI countries may prioritize maintaining favorable tax regimes to attract foreign investment. This can lead to a cautious or selective application of transparency reforms. Financial development is another source of heterogeneity. As shown in columns (7) and (8), countries with higher levels of financial development experience stronger positive effects on non-resource direct tax revenues. This suggests that financial system maturity may facilitate more effective implementation of transparency and exchange of information standards. Finally, we examine how the degree of corruption control moderates the treatment effect. Results indicate that member countries with stronger control of corruption show significantly greater improvements in tax revenue mobilization than those with weaker institutions. This may reflect their greater institutional capacity to enforce Global Forum standards. These findings are consistent with previous research by Davoodi and Grigorian (2007), who found that improvements in institutional quality enhance tax revenue performance (Table 7).

6 Impact on our main transmission channels

We hypothesize that membership in the Global Forum affects tax revenues through several key transmission channels. While our results confirm that participation in information exchange initiatives positively impacts tax revenues, we also examine its influence on these underlying channels. Our analysis indicates that Forum membership has a favorable effect on transparency. In terms of FDI flows, our findings contrast with those of Blonigen and Davies, as we observe a relatively positive and statistically significant effect. This suggests that Global Forum membership helps reduce tax evasion without deterring FDI, thereby contributing to the development of recipient countries. These results are consistent with earlier studies by Lim (1983), Root and Ahmed (1979), and Wheeler and Mody (1992), which argue that taxation is a relatively weak determinant of foreign investment decisions. Furthermore, increased transparency may attract more compliant and long-term investors while

Table 7 Heterogeneity analysis: global forum membership and non-resource direct tax revenues

	Outcome: non-resource direct tax revenues in % of GDP							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment variable: GFA	High GDP	Low GDP	High FDI	Low FDI	High corruption control	Low corruption control	High Financial Development	Low Financial Development
ATT	4.0160 ^{***} (0.3759)	2.1761 ^{***} (0.3153)	2.5583 ^{***} (0.5359)	3.5235 ^{***} (0.2885)	4.0309 ^{***} (0.3598)	2.0621 ^{***} (0.2393)	4.8034 ^{***} (0.3733)	1.8660 ^{***} (0.3064)
Observations	195	207	120	286	219	173	193	224
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

High GDP represents countries with a GDP per capita above the sample average and low GDP denotes those below the average. High rents represent countries with rents above the sample average and low rents denote those below the average. High corruption control represents countries with control of corruption above the sample average and low corruption control denotes those below the average. High FD represents countries with Financial development above the sample average and FD denotes those below the average

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8 Effect of global forum membership on inward FDI

Treatment variable: GFA	Outcome: Inward FDI in % of GDP					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	1.5893*** (0.5128)	2.0271*** (0.5934)	2.1772*** (0.6002)	2.6715*** (0.6469)	2.6715*** (0.6469)	2.5151*** (0.6644)
Observations	877	769	759	628	629	584
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9 Effect of global forum membership on transparency

Treatment variable: GFA	Outcome: transparency index					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.8182*** (0.0661)	- 0.0217 (0.1341)	0.9407*** (0.1295)	1.1486*** (0.1296)	1.1479*** (0.1301)	1.1833*** (0.0661)
Observations	440	475	369	317	318	299
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10 Placebo test: assessing the effect of global forum membership through false treatment assignment

	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.1407 (0.0925)	- 0.0248 (0.1815)	0.0685 (0.1114)	0.1300 (0.1373)	0.1137 (0.1373)	0.1246 (0.1631)
Observations	1110	814	806	637	637	606
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

This table reports placebo estimates based on the false assignment of Global Forum membership to countries

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

discouraging those primarily motivated by tax avoidance. This rebalancing could lead to a net positive or neutral effect on FDI inflows. Participation in international tax cooperation frameworks may also strengthen a country's institutional reputation by signaling a stronger regulatory environment and lowering perceived investment

risks. This, in turn, could improve the overall investment climate, particularly in countries with initially weaker governance. As highlighted through our administrative variables, many countries that implement EOI standards also undertake broader reforms, such as the digitization of tax systems and the simplification of procedures. These reforms not only support tax administration but also contribute to a more business-friendly environment, further increasing investment attractiveness (Tables 8, 9).

7 Robustness checks

As a robustness check, we analyze the impact of membership in the Global Forum for Transparency and Exchange of Information for Tax Purposes on tax revenue using several alternative methods (see Table 10). We employ several matching methods to address potential concerns about the endogeneity of Global Forum membership, potentially influenced by political or economic pressures. First, we apply the inverse probability method, which does not require strong parametric assumptions and is robust to sample size and missing data bias. The propensity score-based weights generated by Inverse Probability Weighting form a pseudo-population in which treatment assignment is independent of observed covariates, addressing potential selection biases. Next, we use the inverse probability weighted regression adjustment, which is similarly robust to sample size variations and misspecification bias (Wooldridge 2007). Third, we apply Augmented Inverse Probability Weighting, which combines the strengths of Inverse Probability Weighting and regression fitting, making it doubly robust (Robins 1994). We also implement Propensity Score Matching, which matches treated and untreated units based on similar propensity scores, thereby improving the comparability of the groups and reducing selection bias (Rosenbaum and Rubin 1983). Finally, we employ the staggered difference-in-differences method proposed by Callaway and Sant'Anna (2021), which is well-suited for estimating dynamic treatment effects and addressing endogeneity concerns. This approach accounts for variation in treatment timing and allows for conditioning on covariates, thereby strengthening causal identification in the presence of treatment effect heterogeneity. Across all methods, the estimated effect remains positive and statistically significant.

To further validate the robustness of our findings, we conduct a placebo test by randomly assigning false treatments to the control groups. The absence of significant results reinforces the credibility of our findings (Table 11).

Table 11 Robustness checks using alternative estimation methods

	Inverse probability weighting	Inverse probability weighted regression adjustment	Augmented inverse probability weighting	Propensity score matching	Difference in difference
ATT	0.4822 ^{***} (0.2403)	0.7273 ^{***} (0.1790)	0.7694 ^{***} (0.1851)	1.2236 ^{***} (0.3353)	0.9083 [*] (0.4869)
Observations	614	612	612	612	791
Treated	231	231	231	231	
Controls	383	381	381	381	

This table reports the estimated effects of Global Forum membership on non-resource direct tax revenues using alternative estimation methods. These robustness checks complement the main results by assessing the consistency of treatment effects across different modeling approaches

Robust standard errors in parentheses: ^{***} $p < 0.01$, ^{**} $p < 0.05$, ^{*} $p < 0.1$

8 Conclusion

The establishment of the Global Forum on Transparency and Exchange of Information marks a significant step in the fight against tax evasion and illicit financial flows. However, its implementation is still in the early stages, with disparities in its application across countries. Not all members fully adhere to the Forum's standards, highlighting the need for further enforcement. This study examines the impact of Global Forum membership on domestic tax revenue mobilization in developing countries and finds a positive, significant effect using the semi-parametric difference-in-differences method. The largest impact is observed on corporate income tax revenues, with member countries outperforming non-members. These findings are robust across several alternative methods, including propensity score matching, inverse probability weighting, and difference-in-differences. Moreover, countries that fully comply with exchange-of-information-on-request standards achieve higher revenues than those that fall short. Countries that effectively implement exchange of information on request standards collect higher revenues than those that fall short. This research contributes to the ongoing debate on global tax reform, particularly the OECD's BEPS initiatives and discussions surrounding minimum taxation for multinationals. Exchange of information is central to key international tax reforms, such as achieving a Minimum Global Tax and establishing beneficial ownership transparency. These reforms require reliable data collection and sharing to ensure effective implementation and compliance. Our results suggest that international cooperation through initiatives like the Global Forum is essential in limiting tax base erosion, particularly in developing countries. The policy implications are clear: developing countries can enhance revenue mobilization by adhering to and effectively implementing the Global Forum's standards. Membership also facilitates crucial reforms in tax administrations through peer review and mutual assistance. Countries should not delay participation until all administrative capacities are fully developed to join the Forum. To maximize the benefits, countries must establish strong domestic institutions, enforce compliance, and ensure the effective exchange of information. Furthermore, it is essential for the Forum to implement dissuasive measures against non-compliance with tax declaration obligations or opacity from member countries, ensuring a high-quality exchange of information.

Appendix

See Figs. 4, 5, 6, 7 and 8 and Tables 12, 13, 14 and 15.

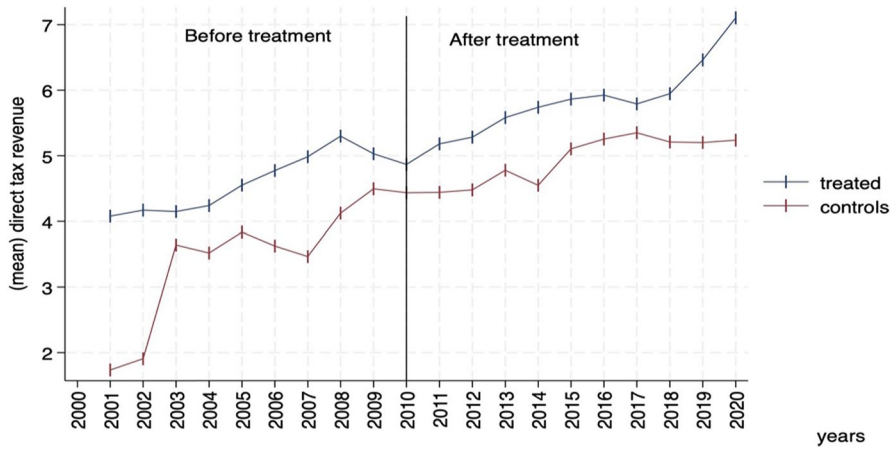


Fig. 4 Non-resource direct tax revenues evolution over time. *Source:* Author's construction

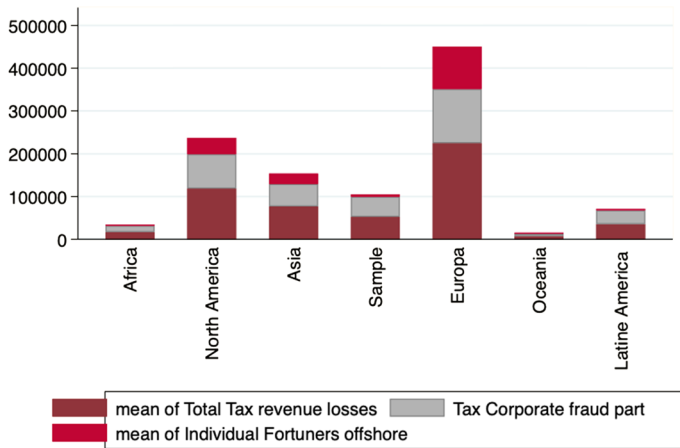


Fig. 5 Tax revenue losses in millions USD

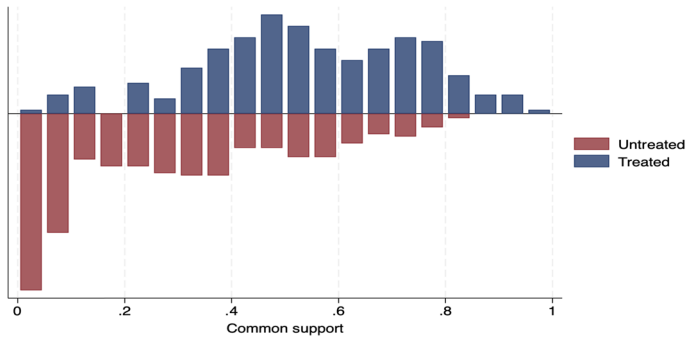


Fig. 6 Common support for propensity score matching

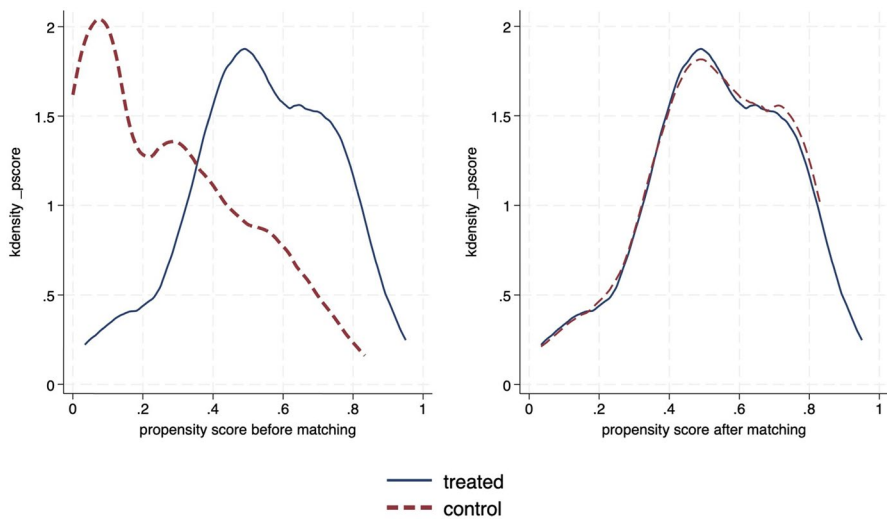


Fig. 7 Common support before and after matching

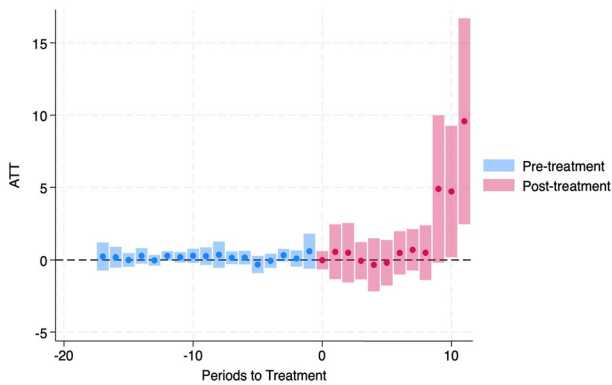


Fig. 8 Difference in difference with multiple time periods event study plot

Table 12 Factors influencing the probability of global forum membership

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Tax burden	0.016*** (0.006)	0.016*** (0.006)	0.015*** (0.006)	0.009 (0.006)	0.011* (0.006)	0.016*** (0.006)	0.014*** (0.006)	0.015*** (0.008)	0.013 (0.008)	0.016*** (0.008)	0.016*** (0.008)	0.016*** (0.008)	0.018*** (0.008)
Transfer pricing legislation	0.763*** (0.125)	0.711*** (0.127)	0.818*** (0.129)	0.864*** (0.130)	0.732*** (0.126)	0.763*** (0.127)	0.770*** (0.127)	0.278* (0.156)	0.211 (0.157)	0.111 (0.164)	0.150 (0.161)	0.219 (0.158)	0.228 (0.158)
Thin capitalization rule	-0.002 (0.103)	-0.002 (0.104)	-0.064 (0.105)	-0.066 (0.105)	-0.002 (0.104)	-0.014 (0.104)	-0.032 (0.104)	0.448*** (0.137)	0.412*** (0.139)	0.422*** (0.141)	0.417*** (0.141)	0.424*** (0.139)	0.478*** (0.138)
Log GDP per capita	0.332*** (0.072)	0.368*** (0.075)	0.294*** (0.074)	0.312*** (0.075)	0.343*** (0.074)	0.318*** (0.073)	0.279*** (0.075)	0.089 (0.092)	0.120 (0.090)	0.149* (0.090)	0.161* (0.091)	0.154* (0.088)	0.154* (0.088)
General anti-avoidance	0.979*** (0.114)	1.004*** (0.117)	0.934*** (0.116)	1.009*** (0.118)	0.914*** (0.117)	0.964*** (0.116)	0.953*** (0.116)	1.197*** (0.146)	1.166*** (0.147)	1.108*** (0.150)	1.188*** (0.148)	1.185*** (0.147)	1.127*** (0.148)
Financial Development Index	1.443*** (0.446)	1.650*** (0.455)	0.650 (0.509)	-0.348 (0.564)	0.651 (0.536)	1.162*** (0.498)	0.823 (0.536)	3.332*** (0.629)	3.200*** (0.625)	3.426*** (0.628)	3.347*** (0.622)	3.237*** (0.612)	3.106*** (0.611)
Inflation	-0.063*** (0.011)	-0.068*** (0.012)	-0.069*** (0.012)	-0.059*** (0.012)	-0.065*** (0.012)	-0.063*** (0.012)	-0.066*** (0.012)	-0.071*** (0.015)	-0.069*** (0.015)	-0.066*** (0.015)	-0.068*** (0.015)	-0.063*** (0.015)	-0.063*** (0.015)
Political stability	-0.136* (0.073)												
Rule of law			0.400*** (0.106)										
Regulatory quality				0.641*** (0.118)									

Table 12 (continued)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Voice and account-ability					0.272***								
Corruption of control					(0.087)	0.165*							
Government effective-ness						(0.091)	0.295***						
High net wealth program existence							(0.120)	0.511***					
Simplified income tax regime								(0.180)	0.652***				

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 13 Descriptive statistics

Variable	Obs	Mean	Std. dev	Min	Max
GFA	1260	.2555556	.4363462	0	1
EOIR	1260	.1761905	.3811334	0	1
AEOI	1260	.0206349	.1422152	0	1
Tax_Burden	1177	74.89856	10.41945	32.3	97.6
Transfer Pricing legislation	1200	.55	.4977011	0	1
Thin capitalization rule	1089	.4288338	.4951368	0	1
GDP per capita	1237	6254.168	6479.002	420.2722	33,261.87
General-anti-avoidance	938	.6140725	.4870733	0	1
Financial Development Index	1260	.1657495	.1219422	.0262936	.6622255
Inflation	1172	7.861413	22.77383	−9.797647	513.9068
Political Stability	1200	−.4621352	.8229468	−2.699193	1.283142
Rule of Law	1200	−.6327941	.5898575	−1.88087	1.023956
Regulatory Quality	1200	−.5644717	.6108267	−2.282205	1.196947
Voice and Accountability	1200	−.4266028	.7386659	−2.226054	1.311339
Control of Corruption	1200	−.4266028	.7386659	−2.226054	1.311339
Government Effectiveness	1200	−.5670531	.6143284	−1.627693	1.420243
direct tax revenue	1199	−.6501205	.5981503	−1.887359	1.16092
PIT revenue	998	4.493622	2.995084	.1678167	32.08401
CIT revenue	793	4.38764	2.999562	.128866	31.25838
FDI	1249	2.122959	1.920864	0	11.55367
Transparency	608	4.254787	7.42218	−18.91777	103.3374
High Net Wealth program existence	819	2.802632	.6031436	1.5	4.5
Simplified income tax regime	819	.0952381	.2937229	0	1
Large Tax Payer Office existence	819	.1379731	.3450825	0	1
Cooperative compliance approach	819	.2307692	.4215825	0	1
Online payment	819	.1868132	.6488824	0	11
Investigation in Tax administration	819	.1159951	.3204147	0	1

Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14 Data description and sources

Variables	Description	Sources
GFA	Dummy taking 1 if a country join Global forum and 0 otherwise	OECD
EOIR	Dummy taking 1 if country apply Exchange of Information on Request and 0 otherwise	OECD
AEOI	Dummy taking 1 if country apply Automatic Exchange of Information and 0 otherwise	OECD
Tax_Burden	Tax burden index	Heritage foundation
Transfer Pricing legislation	Dummy taking 1 if country adopt Transfer Pricing legislation and 0 otherwise	ITI Database
Thin capitalization rule	Dummy taking 1 if country apply Transfer Pricing legislation and 0 otherwise	ITI Database
General-anti-avoidance	Dummy taking 1 if country adopt General Anti-avoidance rule and 0 otherwise	ITI Database
FD	Financial Development index	IMF
CorruptionControl	Control of corruption index	WGI
Gov-effectiveness	Government effectiveness index	WGI
PoliticalStability	Political stability and absence of violence index	WGI
RuleofLaw	Rule of law index	WGI
RegulatoryQuality	Regulatory quality index	WGI
Voice and Accountability	Voice-and-Accountability index	WGI
direct tax revenue	Direct taxes excluding social contributions and resource revenue % GDP	UNU WIDER
PIT revenue	Non-resource component of taxes on income(individuals)	UNU WIDER
CIT revenue	Non-resource component of taxes on income, profits, and capital gains	UNU WIDER
FDI	Foreign direct investment, net inflows (% of GDP)	WDI
GDP per capita	GDP per capita (current international \$)	WDI
Inflation	Inflation, consumer prices (annual %)	WDI
Transparency	CPIA Transparency Accountability Corruption in Public Sector rating	WDI
High Net Wealth program existence	Dummy variable indicating whether a country has a dedicated tax program for high net wealth individuals	TADAT
Simplified income tax regime	Dummy variable capturing the existence of simplified income tax schemes	TADAT
Large Tax Payer Office existence	Dummy variable reflecting whether the tax administration has a specialized unit for managing large taxpayers	TADAT

Table 14 (continued)

Variables	Description	Sources
Cooperative compliance approach	Numbers of cooperative compliance models launched to enhance voluntary tax compliance	TADAT
Online payment	Dummy variable showing whether taxpayers can make income tax payments through online platforms	TADAT
Investigation in Tax administration	Dummy variable representing the existence of dedicated investigative units within the tax authority to detect and address tax evasion or fraud	TADAT

Table 15 List of countries in the sample

Countries	Commitment	Countries	Commitment
Angola	No member	Dominican Republic	2013
Argentina	2009	Ecuador	No member
Benin	2017	Egypt	2016
Bolivia	No member	El Salvador	2011
Botswana	2011	Ghana	2011
Brazil	2009	Guatemala	2009
Burkina-Faso	2012	Guinea	No member
Burundi	No member	Guinea Bissau	No member
Cabo Verde	2018	Honduras	No member
Central African Republic	No member	Kenya	2010
Chad	2016	Lesotho	2013
Comoros	No member	Liberia	2009
Congo	No member	Libya	No member
Cote d'Ivoire	2016	Madagascar	2018
Democratic Republic of Congo	No member	Malawi	No member
Djibouti	2017	Mali	2020
Ecuador	No member	Mauritania	2012
Egypt	2016	Mauritius	2009
Equatorial Guinea	No member	Morocco	2011
Eritrea	No member	Mozambique	No member
Ethiopia	No member	Namibia	2019
Gabon	2012	Niger	2015
Nigeria	2011	Paraguay	2016
Panama	2009	Peru	2014
Rwanda	2017	Tunisia	2012
Sao Tome and Principe	No member	Uganda	2012
Senegal	2012	Uruguay	2009
Seychelles	2009	Zambia	No member
South Africa	2009	Sierra Leone	No member
Tanzania	2015	Sudan	No member
Togo	2016	Cameroon	2012

Author contribution Nourat Al Hayat GUIGMA.

Data availability Data are available on request.

Declarations

Competing interests The authors declare no competing interests.

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