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► **To cite this version:**

Asbath Alassani. Women's Political Empowerment, Institution and Tax Revenue Mobilization in Developing Countries. 2023. hal-04161235

HAL Id: hal-04161235

<https://hal.science/hal-04161235>

Preprint submitted on 13 Jul 2023

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Women's Political Empowerment, Institution and Tax Revenue Mobilization in Developing Countries

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November 2022

Abstract

This paper complements the literature on the determinants of tax revenue mobilization by providing an important first step on the impact of women's political empowerment on tax revenue mobilization in developing countries. A sample of 66 countries for the period 1995 to 2019 were used to estimate the results using fixed effects techniques and the generalized method of moments (GMM). The results indicate that women's political empowerment has a positive effect on tax collection in developing countries. This effect is attributed to improved governance and institutional quality, as well as the provision of essential goods and services, which enhance tax compliance and expand the tax base. This finding is robust to several robustness tests, specifically changing the definitions of women's empowerment, disaggregating tax revenues, adding additional control variables, and exploring heterogeneity. Furthermore, the analysis of transmission mechanisms provides evidence that better governance and institutional quality on the one hand and increased public spending, especially on education, on the other, are channeled through which women's political empowerment positively affects tax revenues in developing countries. To meet the 2030 Agenda for Sustainable Development, the inclusion and empowerment of women, particularly in the political arena, is a transition to investing in fiscal capacity, promoting governance and thereby improving tax collection in developing countries.

Keywords: Tax revenue; Women's empowerment; Gender equality; Institution; Economic development

JEL Classification: J16; H20; G32; H71; O11

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1 Introduction

The COVID19 pandemic and the current conflicts between the world's largest food producers have exacerbated poverty, inequality and social exclusion. For the Platform for Collaboration on Tax (PCT)¹, as a fallout of the pandemic, decades of progress in closing gender equality gaps may be reversed. Thus, the consequences of recent crises are disrupting progress and jeopardising efforts to achieve the Sustainable Development Goals (SDGs). As such, financing recovery and make it more sustainable will need increased tax collection while implementing inclusive development policies. Since the [Monterrey Consensus](#) (2002), and [Addis Ababa Conference](#) (2015), governments have implemented several strategies to boost tax revenue collection. However, the effort of tax mobilization is still low in developing countries, compared to its potential² ([Mullins et al., 2020](#); [Gaspar et al., 2019](#)). Today, the low level of tax revenues in developing countries is a major structural issue for development ([Besley and Persson, 2014](#); [Mascagni et al., 2014](#)). Therefore, domestic resource mobilisation is going to be an important source of financing, both because of the urgent and significant need for recovery and further because of the uncertainties of obtaining external financing. Conventional drivers of low revenue capacity, including a narrow tax base, high informality, transfer pricing, illicit financial flows, low levels of digitalization, and certain long-term socio-institutional factors. While changing these conventional determinants of tax revenues is difficult in the short run, efforts can be made to alter other unconventional factors that can influence tax revenues in the long run, according to [Ghura \(1998\)](#). [Drummond et al. \(2012\)](#) argue that developing countries cannot achieve desired tax revenue levels in the short term by changing conventional factors alone compared to non-conventional factors such as transparency, governance, and accountability. Therefore, it is relevant to consider a non-conventional approach such as gender political inclusion, given the implication of women's empowerment on economic development.

Women's empowerment is a key measure of social change and institutional instrument relevant to achieving sustainable development goals. [Duflo \(2012\)](#) and [Doepke and Tertilt \(2019\)](#) shows that women's empowerment can be a powerful tool to accelerate development. In general, women's empowerment is defined as improving women's ability to access the building blocks of development, particularly health, education, income, rights and political participation. Although women outnumber men, play a key role in contributing to the economy and shaping future generations, they are still often part of the

¹<https://www.tax-platform.org/news/event/gender-equality-taxation-workshop>

²According to [World Bank,2021](#) the level of tax collection in developing countries in terms of the share of tax in GDP is around 15 to 20% in low- and middle-income countries, compared to over 30% in high-income countries

traditionally marginalized group. Inclusive development policies, such as empowerment and gender inclusion, could be crucial institutional factors for recovery and sustainable development, especially since the pandemic has had a disproportionate impact on women's income, employment, and education. Deploying gender-sensitive policies could help mitigate short-term impacts while addressing the structural drivers of gender inequality to propel development (Tang et al., 2021).

Extensive political economy literature proves that increasing women's empowerment, and more specifically political empowerment is an engine, for economic growth (Cabeza-García et al., 2018; Fernández et al., 2021; Dahlum et al., 2022), poverty reduction (Morrison et al., 2007; Kazembe, 2020), financial development and inclusion (Ekoula et al., 2022; Ghosh, 2022), fostering industrialisation Nchofoung et al. (2021), higher spending on health Mavisakalyan (2015), boosting human development (Desai, 2010; Hornset and de Soysa, 2022), for sustainable development and stronger climate change policies (Mirziyoyeva and Salahodjaev, 2022; Mavisakalyan and Tarverdi, 2019) and for tackling corruption and enhance tax compliance (Alexander and Bågenholm, 2018; Barnes and Beaulieu, 2019; Yimam and Asmare, 2020). It is clear that women's political empowerment represents an untapped potential to drive sustainable and inclusive development. While there is a large literature on women's empowerment and development, the impact of women's empowerment on tax revenue mobilisation has not been addressed.

In developing countries, women's political empowerment is still falling short of global goals. According to the World Economic Forum (2020)³, the global gap in women's political empowerment was 75.3 percent in 2019, compared to 42.2 percent for economic participation. In these countries, women hold an average of 24.7% of parliamentary positions and 20.7% of ministerial positions (UN,2021). This study focuses on the recent measure of women's empowerment called "women's political empowerment", considering politics as the arena for decision-making on public and societal action programs. Those in official positions in government are responsible for managing collective goods and allocating scarce resources, directing resources to certain groups at the expense of others (Bratton and Ray, 2002; Franceschet and Piscopo, 2014), and ultimately enforcing their decisions through force. Furthermore, politicians' decisions influence individual choices by promoting certain behaviors and prohibiting others. Those with formal or informal political power also have power over other social institutions, such as the family or education, and can codify particular practices into law (Martin, 2004). As established in the literature, political leadership plays a crucial role in shaping social and economic outcomes (Jones and Olken, 2005; Yao and Zhang, 2015). Therefore, including women in a

³https://www3.weforum.org/docs/WEF_GGGR_2020.pdf

meaningful way could have unprecedented benefits and appears to be the missing piece for building tax capacity.

The COVID-19 pandemic has exacerbated pre-existing gender disparities, which will have significant macroeconomic implications. In order to address this issue, countries need to implement social and institutional policy reforms that match the severity of the challenge and improve gender equality, with the potential to yield additional benefits. Women's political empowerment is defined as the increased ability of women to influence political decision-making, and can be achieved through multiple channels: (i) political representation in decision-making; (ii) freedom of choice, guaranteed by protected civil liberties; and (iii) the opportunity to organize and effectively express one's voice ([Sundström et al., 2017](#)). Women often constitute the majority of the adult population in many countries, and their inclusion or exclusion as policymakers, as well as their equal participation in public debates, can have significant consequences for the economy. Thus, it is crucial to prioritize women's political empowerment as a means of addressing gender disparities and promoting sustainable growth.

To date, no study has examined women's political empowerment as a determinant of tax capacity building in developing countries. This is surprising, because the inclusion of women is a means to accelerate development. Women's political empowerment may affect tax revenue mobilization, particularly for countries with low quality of institutions, through the following mechanisms: (i) women's political empowerment may improve quality of governance (by tackling corruption, creating a favourable macroeconomic environment, strengthening democracy and high-quality institutions), promotes taxpayer trust in government and consolidates the social contract guaranteeing citizens' compliance with the rules. The obvious consequence is the strengthening of fiscal transparency and accountability, which provides more fiscal space ([Barnes and Beaulieu, 2019](#); [Yimam and Asmare, 2020](#); [Bruce et al., 2022](#)). (ii) The political empowerment of women promotes a great involvement of civil society, which allows for the introduction of a variety of new ideas and the selection of the most efficient policies for an economy ([Dahlum et al., 2022](#)). Therefore, this social paradigm shift promotes innovations that can ensure optimal organisation and better outcomes. Following [Doepke and Tertilt \(2019\)](#) we argue that the political empowerment of women increases human capital. Indeed, political economy literature shows that women are more likely to prefer expenditures in the social, public goods and services. Based on the theoretical argument that taxation is an exchange between citizens and government with taxes the price of public goods and services [Hettich et al. \(1999\)](#), this leads to an improvement in the tax contract and thus tax revenues.

Since we know from previous studies that women's political empowerment is likely

to have an impact on the economy, it is crucial to assess the effect of women's political empowerment on revenue mobilization. This paper aims to quantify the effects of political empowerment and gender inclusion on tax revenue mobilisation. In light of the implications of women's political empowerment on governance and human capital, it is crucial to examine how women's political empowerment can boost tax revenue mobilisation. In order to provide both rational and constructive policy responses to our study, the following main concerns were identified: How does women's political empowerment affect tax revenue mobilization? Does women's empowerment constitute the missing piece of strengthening institutions in developing countries and hence fiscal capacity?

To identify the causal effect of women's empowerment, we rely on panel fixed-effect model and the generalized method of moments (GMM). Using a sample of 66 developing countries over the period 1995 to 2019, our results indicate that empowering women politically improve tax revenue in developing countries. This result is robust to several robustness tests, including , changing the definitions of women's empowerment, tax revenue, adding additional control variables, and using alternative estimation methods. We investigate various potential transmission channels between women's political empowerment and tax revenue. We provide evidence that broadening the tax base through better governance and institutional quality, and increasing of government spending (goods and services) are channels through which women's political empowerment positively affects tax revenue performance in developing countries. Tax policies have a decisive role to play in achieving gender equality, we produce clear and robust evidence that greater gender equality also enhances economic efficiency and improves other development outcomes, including tax revenue mobilization. Our paper adds to a multidisciplinary discussion on the political and institutional determinants of economic development, more specifically on the issue of tax revenue mobilization. Many organizations such as the World Bank, the International Monetary Fund, the French Development Agency, the African Development Bank, and non-governmental organizations, among others, have been advocating for gender-responsive public policies, tax reforms, and budgets as a necessary step to reduce the gender gap exacerbated by the pandemic. In this debate, we propose a crucial argument that highlights women's political empowerment as a vital factor for good governance and generating revenue necessary for development. Thus, for an equitable and sustainable recovery this argument has the potential to push initially reluctant leaders and powerful groups - even if for instrumental reasons - to empower women.

The following section presents a relevant theoretical framework that illustrates the impact of women's political empowerment on development and tax revenue. Section 3 presents some stylised facts. Next, Section 4 describes the methodology and data used, while Section 5 presents the empirical results, and Section 6 analyses the possible heterogeneity of our results. Finally, Section 7 concludes the study and presents the main policy

recommendations derived from the results.

2 Background and transmission channels

The argument that women’s representation is associated with improved development outcomes is well-grounded in existing research (Miller, 2008; Swiss et al., 2012; Branisa et al., 2013; Bruce et al., 2022). In this section, we discuss the potential channels through which women’s political empowerment could impact development overall and tax revenues in particular.

2.1 Effects of women’s political empowerment on development

The extensive literature on women’s political empowerment shows its positive impact on sustainable growth, improving governance, and accelerating development. Studies have established clear consensus relationships between empowering women and increasing productivity, reducing poverty, and promoting social development in the developing world (Mehra, 1997; Duflo, 2012; Elborgh-Woytek et al., 2013; Bhoganadam et al., 2014; Gocio and Kulkarni, 2016; Uzoamaka et al., 2016; Doepke and Tertilt, 2019). Globally, researchers have focused on the relationship between women’s empowerment and development.

Many non-governmental organizations have established Gender Action Plans, explicitly justifying the impact of women’s empowerment on economic development. Studies by Jayasuriya and Burke (2013) and Dahlum et al. (2022) have demonstrated a strong and positive association between women’s inclusion and empowerment in politics and economic growth, adding to the ongoing debate on the benefits of gender inclusion. Several studies examine the effect of women’s labor participation and education access, in enhancing economic growth (Esteve-Volart, 2004; Cuberes and Teignier-Baqué, 2012; Gaddis and Klasen, 2014). Others have found a positive relationship between women’s income share and children’s expenditures, as shown by (Esteve-Volart, 2004; Cuberes and Teignier-Baqué, 2012; Gaddis and Klasen, 2014). Although the empirical literature shows a strong and positive association between political institution and development (North et al., 1990; Rodrik et al., 2004; Shirley, 2005; Acemoglu and Robinson, 2012), less attention has been paid to the economic effects of women’s political inclusion.

The analysis of women’s political inclusion has highlighted its positive effects on sustainable growth, human capital, institution building, the fight against corruption, climate change, and among other things, it is an important step towards achieving the Sustainable Development Goals (Cabeza-García et al., 2018; Fernández et al., 2021; Dahlum et al.,

2022; Ekoula et al., 2022; Ghosh, 2022; Desai, 2010; Hornset and de Soysa, 2022; Asongu et al., 2022). The results of some authors confirm that gender representation and inclusion on related aspects, such as the allocation of public goods Clots-Figueras (2011), employment Ghani et al. (2014), democracy Nchofoung et al. (2022) and broader policy outcomes (Pande and Ford, 2012). Ouedraogo and Ouedraogo (2019) provide evidence that improving the labor force participation rate of women relative to men is correlated with a reduction in the likelihood of electoral violence. As emphasized the participation of women in politics reinforces institutions, while the institutions create a virtuous environment for development policies (Yabré and Semedo, 2021a).

Besides the benefits in terms of economic efficiency, women's inclusion would promote equality and societal well-being. There is evidence that women use their earnings and savings more productively than men, spending much of it on nutrition, clothing, health and education for children (Triki and Faye, 2013; Swamy, 2014). Their inclusion will lead to shared security and prosperity in their families, businesses and communities. Another literature has scrutinized, for decades, to what extent political institutions affect tax revenue. Globally, authors found that the quality of institutions, governance, and strength of the executive branch promote the impartiality of tax systems and more over contribute to the state building (Ricciuti et al., 2019; Touchton et al., 2019; Savoia et al., 2022; Prichard, 2019).

2.2 How does women's political empowerment affect tax revenue mobilization?

The link between women's political empowerment and tax revenue is developed to formalize the testable empirical implications of the relevant theoretical literature. The political economy literature on gender inclusion and corruption, largely supports a direction from gender equality to lower corruption (Alexander and Ravlik, 2015; Dollar et al., 2001; Esarey and Chirillo, 2013). Moreover, Alexander and Bågenholm (2018) find that women's participation in politics enhances awareness and visibility of corruption, which is a necessary precondition for voter accountability and, ultimately, for cleaning up governments. While developing country governments complain about low tax compliance, the literature supports a positive correlation between governance, the provision of public goods and services, and citizen compliance on the one hand. Second, by studying the relationship between gender and tax compliance Yimam and Asmare (2020) through an analysis of firms' tax compliance behavior; the authors conclude that gender influences compliance. Indeed, female-owned firms are more likely to comply with tax rules than male-owned firms. Moreover, this correlation between owner gender and tax compliance also becomes stronger as firm size increases. Other authors have shown that governments

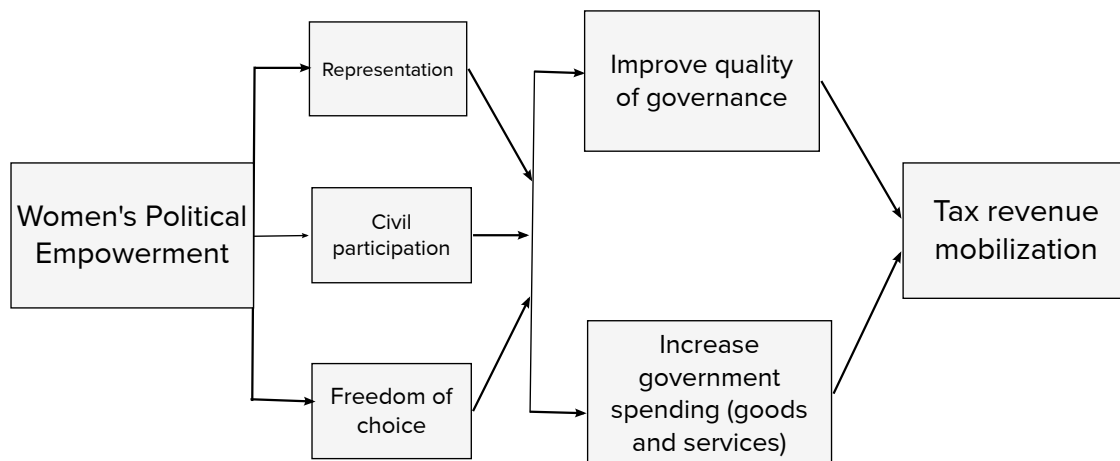
that are less likely to be overthrown and are characterized by higher institutional quality are more likely to achieve fiscal consolidation. [Yabré and Semedo \(2021b\)](#). All of this evidence confirms that female leadership promotes compliance. Thus, a more efficient and responsive government at all levels may result in an increased willingness to contribute and also in an increased demand for public spending and higher voluntary levels of tax effort [Bird et al. \(2006\)](#).

The analyses of [Attila et al. \(2009\)](#) tend to illustrate the importance of tax compliance as a channel for the transmission of corruption on the level of government revenue. In addition, the authors argue that improved performance in terms of the provision of social public goods is the key to reducing non-compliance. Empowering women as economic, political, and social actors can change policy choices and make institutions more representative of a variety of voices. For example, in India, empowering women at the local level has led to better provision of public goods, such as water and sanitation, that matter more to women ([Beaman et al., 2011](#)). Therefore, government can increase willingness to pay either by providing goods and services that taxpayers value or by increasing penalties for not paying taxes ([Timmons, 2005](#)). On this point, taxation is seen as an exchange between citizens and government, with taxes being the price of public goods and services (a key approach to taxation and state governance ([Hettich et al., 1999](#))). Drawing on recent work by [Priyanka \(2022\)](#), female politicians increase the likelihood that urban women will complete upper secondary education. In addition, this exposure leads rural women to spend more on their children's education in later years, especially in households with more daughters, participate more in household decision making, and show a decrease in son preference.

Women's political empowerment can influence tax revenue mobilization through the following mechanisms: first, we assume that women's political empowerment can improve the quality of governance, promote taxpayers' trust in government (through strengthening democracy and the quality of institutions), and strengthen the social contract that ensures citizens' compliance. Women's political empowerment fosters broad civil society involvement, which allows for the introduction of a variety of new ideas and the selection of the most effective policies for a sustainable economy ([Dahlum et al., 2022](#)). We argue that women's political empowerment increases investment in human capital, particularly through a preference for spending on education and health. On this basis, and building on the argument of [Hettich et al. \(1999\)](#) (tax as an exchange between citizens and government, with tax as the price of public goods and services) we argue that gender inclusion could be a factor in broadening the tax base and thus tax revenues. The task of recovering from the pandemic and rebuilding is likely to be difficult, especially as the pandemic has led to an economic downturn that has undermined the strength of already weak fiscal systems. However, it could provide an opportunity for deep socio-economic re-

form. The figure(1) below highlights the implications of women’s political empowerment on tax revenues. In this paper, we bridge these two literatures and address the mentioned research gaps by considering how the political empowerment of women affects tax revenue mobilization and thereby countries’ trajectories of tax capacities building and sustainable development.

Figure 1: Modelling the transmission mechanisms.

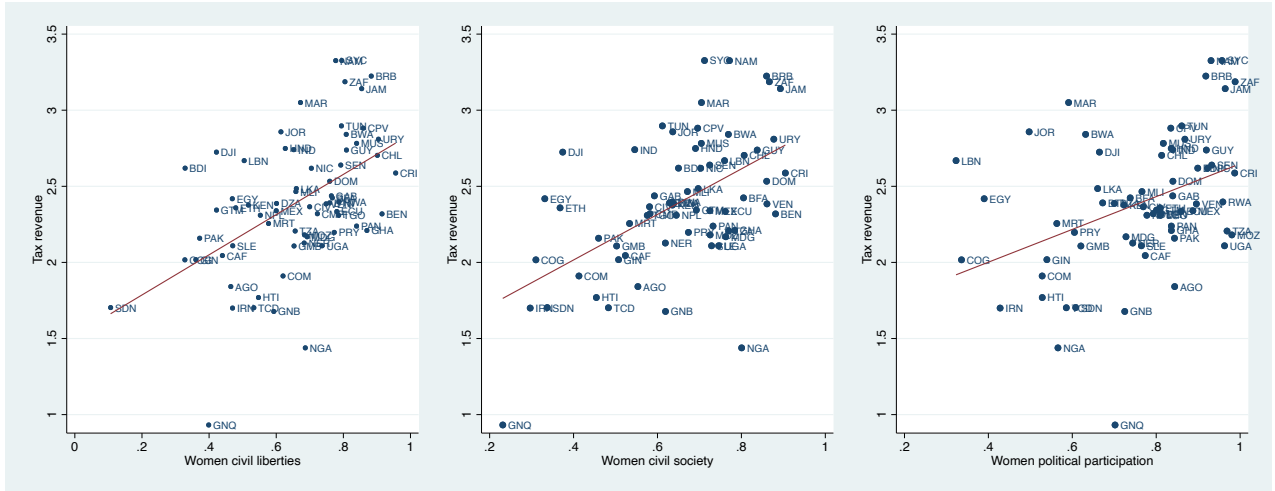


Source: Author’s construction adapted from [Dahlum et al. \(2022\)](#)

3 Stylized facts

We present some stylized facts that characterize tax revenue and women’s political empowerment in developing countries between 1995 and 2019. Figure (2) shows the regional level distribution in terms of women’s political empowerment. Latin America and the Caribbean is the top region with an average performance of 0.832 between 1995 and 2019. It is followed by Sub-Saharan Africa with a score of 0.68, while South Asia is the third and finally the Middle East and North Africa region with an average of 0.64 and 0.54 respectively.

Figure 4: Relation between the components of women’s political empowerment and tax revenue as a percentage of GDP



Concerning the components of the women’s political empowerment index, we also find a strong positive correlation with revenue mobilization. However, the trend line is correlation, not causation, suggesting that the relationship obtained from the graphical analysis may be biased by econometric issues such as the reverse causality of taxes on empowerment and the existence of additional conventional factors that affect the relationship between women’s empowerment and taxes. We therefore conduct an econometric analysis to further explore the impact of gender inclusion.

4 Data and methodology

4.1 Data

The sample includes annual data for the period 1995 to 2019 for 67 developing countries. The choice of this sample of countries is dictated by the availability of data on both dependant and various independent variables. The data used are collected from various sources, mainly from the the World Bank: World Development Indicators (WDI), World Governance Indicators (WGI); set of Varieties of Democracy (V-Dem) Version 10 data, and KOF Swiss Institute. The table in the appendix presents the descriptive statistics of the variables used as well as their sources and definitions and complete list of countries.

4.1.1 Measurement of dependant variable

Following the literature on tax revenue mobilization (Gupta, 2007; Brun et al., 2015; Morrissey et al., 2016; Prichard et al., 2018; Apeti and Edoh, 2023), we use tax revenue in percentage of GDP, for the full sample. Tax revenue excluding resource taxes

and social contributions, is drawn from the UNU-WIDER Government Revenue Dataset (GRD). Unlike the World Revenue Longitudinal Database (WoRLD) or the Organisation for Economic Co-operation and Development (OECD), this database has advantages in distinguishing between resource and non-resource sector revenues based on disaggregated data from IMF Article IV reports (Prichard, 2016).

4.1.2 Measurement of independent variable

There are various indices of women's empowerment in the literature. One known indicator in this regard is the CIRI index provided by Cingranelli and Richards (2010). However, this index is criticized for many reasons, including the fact that it does not explicitly take into account gender differences, and thus becomes an indicator of the government's stance towards women rather than that of women's political empowerment (Liebowitz and Zwingel, 2014). For Sundström et al. (2017), the weak temporal dimension turns out to be an additional limitation of the index. Other authors use indices that include the UNDP Gender Empowerment Measure (GEM), the OECD's Gender and Social Institutions Index (GSI) and the World Economic Forum's Global Gender Gap Index (GGGI). Overall, these data also are limited in terms of time period⁴. Although many efforts have been made to measure women's political inclusion, these data are still limited. To achieve more accurate estimates, we therefore use recently aggregated measures of women's empowerment from the Varieties of Democracy (V-Dem) project. Indeed, the V-Dem project provides a large database for developing countries, allowing studies with larger panels as well as spatial and temporal comparisons (Sundström et al., 2017)⁵. The women's political empowerment index (WPE) is defined as a process of increasing capacity for women, leading to greater choice, agency, and participation in societal decision-making. The advantages of this source over other cross-national data-sets make it a prestigious research tool.

4.1.3 Control variables

Following the literature on the determinants of women's empowerment and tax revenue, we select the following control variables: (i) GDP per capita growth represents the growth in real per capita income of a given country and is an indicator of the country's level of development. We expect higher growth of GDP per capita to positively affect public revenue, as a rise in per capita income would reflect a growing demand for public services and a higher degree of economic and institutional sophistication Crivelli and Gupta (2014); (ii) trade openness represents the country's level of trade openness as a percentage of GDP. We expect a positive effect on revenue based on recent literature about tax Gnanon

⁴GEM, available from 1995-2009, was replaced due to criticism regarding limits to its ability to reflect critical gender disparities. The SIGI was first collected in 2009. The GGGI has been available only since 2006 (UNDP 2015).

⁵see for details <https://www.v-dem.net/data/reference-documents/>

and Brun (2018); (iii) agricultural value added measures value added in the agriculture sector as a share of total value added. A high share of agricultural value added is expected to negatively influence tax revenue. Many studies on the determinants of public revenue mobilization tend to report a negative impact of this variable on public revenue Baunsgaard and Keen (2010), (iv) and domestic credit to the private sector (proxy for financial deepening), we higher financial deepening to positively affect revenue. The table below provides descriptive statistics for the baseline variables.

Table 1: Descriptive statistics

VARIABLES	Obs.	mean	Std. Dev.	min	max
Tax revenue	1577	12.201	5.74	0.846	33.267
Agriculture	1598	18.325	13.176	0.893	61.416
Trade	1577	69.488	36.718	1.219	347.997
Credit to Private Sector	1,497	28.005	25.803	0	142.422
GDP/capita growth	1626	2.218	5.877	-36.778	140.48
WPE	1650	0.684	0.15	0.205	0.956
WCL	1650	0.656	0.182	0.067	0.967
WCS	1650	0.649	0.17	0.207	0.929
WPP	1650	0.759	0.20	0.095	1

4.2 Methodology

The main objective of this study is to empirically examine the effect of women’s political empowerment on tax revenue mobilization as discussed in the theory. The empirical analysis will determine the direction and magnitude of the impact. The methodological focus of this paper is therefore close and inspired by (Dahlum et al., 2022; Ekoula et al., 2022; Brun et al., 2015). Further, it is in line with extensive work on the political economy of taxation which looks at the role of social institutions in domestic revenue mobilization and tax effort (Bird et al., 2006). To test the impact of women political empowerment to tax revenue, our model is formalized as follows:

$$Tax_{i,t} = \alpha + \beta WPE_{i,t} + \rho X_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t} \quad (i = 1; 2; \dots; N; t = 1; 2; \dots; T) \quad (1)$$

Where $Tax_{i,t}$ represents the tax revenue of country i at time t ; α_i is a constant; $WPE_{i,t}$ is the women’s political empowerment; $X_{i,t}$ represents the other explanatory variables, μ_i is the country-specific effect, λ_t is time specific effect and $\epsilon_{i,t}$ is the error term. Furthermore, X identifies a series of variables included in the econometric model to control for several economic factors that may have affected the evolution of women’s political empowerment

during the period under consideration. We apply a number of empirical strategies to estimate the relationship. Following (Dahlum et al., 2022; Ekoula et al., 2022), we use firstly, the fixed effect estimator. The choice of this method was based on its advantages. Indeed, the fixed effects make it possible to control for time-invariant country-specific factors that may affect tax revenue. However, the use of fixed effects may be limited. This is because omitted fixed effects create an endogeneity bias. Theoretically, there is an inverse causal relationship between women's empowerment and tax revenue. To address these endogeneity issues, the traditional solution is to draw upon instrumental variables (IV). However, finding time-varying IV that fulfill the usual econometric restrictions is challenging with macroeconomic series. Hence, to address it and estimate our results efficiently, we formalize the dynamic model below.

$$Tax_{i,t} = \alpha + \sigma Tax_{t-1} + \beta WPE_{i,t} + \rho X_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t} \quad (i = 1; 2; \dots; N; t = 1; 2; \dots; T) \quad (2)$$

Drawing on related study, we choose the generalized method of moments (GMM) improved by (Blundell and Bond, 1998). The GMM avoids problems of simultaneity or reverse causality: women's political empowerment may be endogenous, and thus there is more likely to be a feedback effect of tax revenues on women's political empowerment. Finally, omitted variable bias, notably the existence of important variables that may be omitted from regression models, and measurement error. The GMM estimator combines the difference and level regressions in a system of equations using lagged differential instruments for the level equation, and lagged instrument levels for the difference equation Farhadi et al. (2015). However, a well-known drawback of the system GMM procedure is that it has the "too many instruments problem". This problem of instrument proliferation can readjust endogenous variables and fails to erase their endogenous components. More importantly, this problem weakens Hansen's J-test to detect invalidity of the GMM system instruments Roodman (2009). We apply the two stages GMM estimator of the system. To mitigate instrument proliferation, we follow the literature on fiscal policy (Combes et al., 2021), for a recent contribution, and restricted and collapsed the instrument set to avoid the proliferation of instruments, and corrected standard errors for the finite sample bias (Windmeijer, 2005). Before discussing the main results, observe that usual diagnostic tests support the quality of our fitting: the Hansen J-test does not reject the null hypothesis that our instruments are valid (i.e. uncorrelated with the error term). Similarly, the tests of serial correlation AR(2) reject the hypothesis that the error term is second-order serially correlated, providing additional support to the use of appropriate lags of the explanatory variables as instruments for the estimation.

5 Empirical results

5.1 Main analysis: Women’s political empowerment and tax revenue

We begin by presenting estimates of the results for the effect of women’s political empowerment on tax revenues, using the fixed effects method. The results are presented in table (2) below. This results highlight the effect of women’s political empowerment on tax revenues. As expected, the results confirm that women’s political empowerment is positively associated with tax revenues. However, the results confirm the presence of endogeneity, thus, our preferred estimation method is the GMM-System Two-step estimator. In this subsection, we discuss the results obtained with this estimator.

The results using the GMM method in a two-stage system with robust standard errors are presented in table (3). The results confirm the one obtained by the fixed effects, moreover the associated coefficient is strongly positive and significant at 1% (column 5). Thus, increasing the level of women’s political empowerment through its positive effects on institutions (Alm et al., 1993; Bird et al., 2008) contributes to improving tax revenues. In other words, This means that in the short term, for a one-unit increase in the women’s political empowerment index, the tax revenue increases by an average of 16.4% of its standard deviation ⁶, all other things being equal. The use of standard deviation allows us to interpret the results of our log-linear model to easily compare the relative effects of the independent variable on the dependent variable, regardless of the range of values of the dependent variable. This helps to better communicate our regression results in a clear and concise manner. Our findings suggesting that women’s political empowerment can be the tool to strengthen tax capacity. This result is consistent with previous work on social institutions and tax effort in developing countries. (Bird et al., 2006; Phuong, 2015; Dahlum et al., 2022; Prichard, 2010). As for the control variables, it is observed that increasing in GDP per capita growth has no significant effect on tax revenue in developing countries. This result may seem counter-intuitive, but it is consistent with several other results in the literature. A major reason for this effect is that changes in the tax structure, such as the shift from direct to indirect taxes, can also affect the relationship between economic growth and tax revenue. For example, if indirect taxes represent a larger share of the tax mix, this may lead to a reduction in the responsiveness of tax revenues to economic growth (Baunsgaard and Keen, 2010). For the trade, an increase in the level of trade improves tax revenues. This result is consistent with the previous literature supported by (Gnangnon and Brun, 2019; Baunsgaard and Keen, 2010) and

⁶Given the presence of lagged revenues in the two-stage GMM-System Estimator, the long-run impact is obtained by dividing the coefficient of WPE(0.336) by 1 minus the coefficient of lagged tax revenue (0.336)/(1-0.689).

showing that implementing appropriate tax reform in the context of greater trade openness would generate higher tax revenues. Regarding the impact of value added in the agricultural sector, we observe a reduction in tax revenues. Our results are consistent with the idea that the agricultural sector is largely dominated by unregistered workers and the informal sector that is difficult to tax in developing countries (Drummond et al., 2012). Credit to the private sector significantly and positively affects tax revenues. This result is consistent with recent work of (Drummond et al., 2012; Gnanon, 2022).

Table 2: Women’s political empowerment and tax revenue (Fixed effect)

VARIABLES	Dependant variable: (log) Tax revenue				
	[1]	[2]	[3]	[4]	[5]
WPE	0.499** (0.213)	0.518** (0.212)	0.584*** (0.203)	0.602*** (0.190)	0.600*** (0.188)
Credit to Private Sector		0.00435** (0.00180)	0.00297 (0.00186)	0.00262 (0.00175)	0.00266 (0.00171)
log(Trade)			0.0952*** (0.0313)	0.116*** (0.0331)	0.114*** (0.0325)
Agriculture				-0.00818** (0.00333)	-0.00809** (0.00322)
GDP/capita growth					0.00103 (0.00273)
Constant	1.938*** (0.132)	1.838*** (0.138)	1.397*** (0.190)	1.478*** (0.171)	1.481*** (0.170)
Observations	1577	1411	1351	1332	1331
Year fixed effect	Yes	Yes	Yes	Yes	Yes
R-squared	0.268	0.270	0.370	0.399	0.399
Number of countries	66	66	65	65	65

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Women's political empowerment and tax revenue (Twostep GMM estimates)

VARIABLES	Dependant variable: (log) Tax revenue				
	[1]	[2]	[3]	[4]	[5]
L.(log) Tax revenue	0.749*** (0.0414)	0.522*** (0.135)	0.676*** (0.118)	0.733*** (0.0782)	0.689*** (0.0680)
WPE	0.437*** (0.0986)	0.740*** (0.277)	0.437* (0.226)	0.291** (0.123)	0.336*** (0.108)
log(Trade)		0.150** (0.0620)	0.0683** (0.0273)	0.0457* (0.0229)	0.0583** (0.0223)
Agriculture			-0.00330** (0.00155)	-0.00281** (0.00109)	-0.00283* (0.00143)
GDP/capita growth				0.0139** (0.00606)	0.00774 (0.00730)
Credit to Private Sector					0.00131** (0.000631)
Constant	0.326*** (0.0585)	-0.00117 (0.247)	(0.151) (0.152)	0.295*** (0.0980)	0.316** (0.139)
AR(1)	0.000	0.001	0.000	0.000	0.000
AR(2)	0.356	0.514	0.534	0.629	0.506
Instrument	28	33	38	43	44
Hasen test	0.107	0.863	0.349	0.594	0.241
Year Fixed effect	Yes	Yes	Yes	Yes	Yes
Observations	1507	1438	1419	1418	1259
Number of countries	66	66	66	66	65

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Basically, our results suggest that, women's political empowerment has a positive and statistically significant effect on tax revenues in developing countries. The theoretical discussion has suggested that a substantial time lag may exist before the hypothesized effect of the WPE is transmitted - via public policies and, in turn, their impact on the behavior of firms and other economic agents - and more broadly to governance. However, the exact lag is difficult to determine. We therefore test our basic model by considering the effects of WPE over five years (see Table 11 in appendix). The results remain significant, showing the relevance of women's political empowerment.

5.2 Sensitivity analysis

In this section we analyze the effect of Women’s Political Empowerment on the tax revenue components. Considering that the bases of each tax are different and political inclusion of gender could have different effects depending on the type of tax. The results in (column 1) show that improving women’s political empowerment increases direct tax revenues. Indeed, women’s political representation can lead to greater representation of women and increased tax compliance among corporations, where they may be more likely to pay corporate taxes. Therefore, direct taxes will increase. This argument is in line with the results of (Yimam and Asmare, 2020).

Table 4: Women’s political empowerment and direct and indirect tax revenue

VARIABLES	[1] (log) direct tax	[2] (log) indirect tax
L.(log)direct tax	0.766*** (0.0953)	
L.(log) indirect tax		0.766*** (0.0487)
WPE	0.337** (0.155)	0.359*** (0.0979)
Main controls	Yes	Yes
Constant	-0.233 (0.154)	0.0625 (0.128)
Observations	1128	1185
Number of countries	64	64
AR(1)	0.000	0.004
AR(2)	0.251	0.634
Instrument	48	48
Hansen test	0.278	0.152

Note: Main controls are those of the table in GMM

Robust standard errors in parentheses in brackets.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Considering the output of indirect taxes, we note that gender political inclusion has a positive and significant effect at 1% on tax revenue. Women in politics may push for policies that are more pro-poor and equitable, which can lead to greater indirect tax revenue as the tax base expands to include more people. Further, since women are

sensitive to health and education budgets, increased public spending on education and health can directly stimulate household consumption. As consumption is the tax base for indirect taxes, improving this base mathematically promotes the collection of more tax revenue.

5.3 Robustness checks

To test the robustness of our baseline results, we take into account various considerations: introducing additional control variables, using disaggregation of tax revenues, using an alternative definition of tax revenues, using alternative measures of women's political empowerment, taking into account the time effect of women's political empowerment.

(i) Additional control variable

Table 5: Testing for additional controls on baseline specification

VARIABLES	Dependant variable: (log)Tax revenue			
	(1)	(2)	(3)	(4)
L.(log) Tax revenue	0.694*** (0.0690)	0.605*** (0.0982)	0.768*** (0.0859)	0.803*** (0.0798)
WPE	0.347*** (0.109)	0.330** (0.163)	0.216* (0.115)	0.175** (0.0867)
KOF Globalisation		0.0127** (0.00535)	0.00765** (0.00365)	0.00550*** (0.00204)
Inflation			-0.00129 (0.00231)	-0.00143 (0.00212)
Public Aid				0.00437** (0.00176)
Main controls	Yes	Yes	Yes	Yes
Constant	0.316** (0.139)	-0.189 (0.228)	-0.0758 (0.181)	0.00376 (0.142)
AR(1)	0.000	0.000	0.001	0.001
AR(2)	0.506	0.584	0.882	0.949
Instrument	44	48	53	64
Hasen test	0.241	0.221	0.336	0.419
Observations	1259	1259	1187	1176
Number of countries	65	65	65	65

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Further controls were added in the baseline specification to take into account other variables likely to affect women’s political empowerment. These additional controls are the KOF index, inflation and public aid. The results are presented in Table 5 above.

Globalization has remarkable effects on both tax revenues and women’s political empowerment. The index of globalization can affect gender equality by spreading ideas, norms and values that can reinforce or challenge gender inequalities. Media, information technology, social networks and the media can play an important role in disseminating these ideas. In the same vein as [Keen and Mansour \(2010\)](#) has suggested, globalization affects tax revenues through corporate tax competition and the effects of trade liberalization. Our results in column (2) show that globalization positively and significantly affects revenues. This result is theoretically explained by the idea that it can stimulate the economy by increasing investment and production, improving transparency and fiscal governance in line with international standards. Regarding inflation in column (3), we find no significance even if the sign of inflation is negative. Indeed, the effects of inflation on tax revenues can vary according to several considerations, notably the tax structure and monetary policy. We find a positive and significant effect of aid on tax revenue. This result is consistent with previous literature ([Clist and Morrissey, 2011](#); [Sen Gupta, 2007](#)).

(ii) Testing for an alternative definition of women’s political empowerment

Further, we use alternative definitions of women’s empowerment, notably, women civil liberties, women civil society, and women political participation. Our results are presented in Table 6 below. The results in the columns (1-3) of table 6 show that the different measures of women’s political empowerment have a positive and significant effect on tax revenues with a larger effect of women civil liberties. Evidence that women’s participation in different areas of social life has a positive impact on income mobilization. Indeed, ([Weldon, 2002](#)) , for example, highlights how civil society mobilization shapes political change and can influence formal political institutions.

Table 6: Alternative measures of women's political empowerment

VARIABLES	Dependant variable: (log) Tax revenue		
	[1]	[2]	[3]
L.(log) Tax revenue	0.651*** (0.104)	0.711*** (0.0790)	0.723*** (0.0738)
WCL	0.273** (0.134)		
WCS		0.202* (0.115)	
WPP			0.215*** (0.0732)
GDP/capita growth	0.0125* (0.00721)	0.0152* (0.00865)	0.0129** (0.00621)
(log)Trade	0.0529 (0.0357)	0.0598** (0.0293)	0.0562** (0.0256)
Agriculture	-0.00219 (0.00138)	-0.00212* (0.00121)	-0.00225** (0.00107)
Credit to Private Sector	0.00180 (0.00118)	0.00128 (0.000852)	0.00137** (0.000609)
Constant	0.460* (0.230)	0.347** (0.147)	0.229** (0.108)
AR(1)	0.000	0.000	0.000
AR(2)	0.449	0.451	0.494
Instrument	44	48	48
Hansen test	0.141	0.268	0.457
Observations	1259	1259	1259
Number of countries	65	65	65

Note:WCL:Women civil liberties, WCS: Women society participation, WPP:Women political participation Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

(iii) Testing for an alternative definition of tax revenue

In this subsection, we alter the measure of tax revenue to tax effort and then to total tax revenue including resource revenue. Tax effort measures the ratio of actual tax collection to tax potential, this variable is taken from [McNabb et al. \(2021\)](#). Our results show that there is a significant positive effect regardless of the definition of tax revenue used. The results are presented in Table 7, under (column 1 and 2).

Table 7: Results of alternative definition of tax revenue

VARIABLES	(1) Tax effort	(2) (log) Total revenue
L.Tax effort	0.699*** (0.0719)	
L.(log)Total revenue		0.815*** (0.0889)
WPE	0.106* (0.0538)	0.236** (0.117)
Constant	-0.00918 (0.0649)	0.109 (0.107)
Main controls	Yes	Yes
AR(1)	0.000	0.001
AR(2)	0.152	0.186
Instrument	28	28
Hansen test	0.476	0.243
Observations	1178	1143
Number of countries	64	62

Robust standard errors in parentheses in brackets.*** p<0.01, ** p<0.05, * p<0.1 Note: Main controls are those of the table in GMM twostep system;Tax effort defined as the ratio of actual tax collection to tax potential [McNabb et al. \(2021\)](#) and total revenue represent total tax revenue,including non-resource taxes and social contributions.

(iv) Tests of the transmission channels

In this subsection, we assess the transmission mechanisms in the nexus between women political empowerment and tax revenue mobilization. Our results suggest that women’s political empowerment increases tax revenues in developing countries through quality of governance and expenditure in education. This section aims to shed light on the mechanisms underlying this result. Based on the discussion in the introduction, we test the relevance of our two potential transmission channels, using indicators from the World Governance Indicators ⁷ (WGI) we construct an index on governance quality following [Combes et al. \(2021\)](#). Before testing the relevance of our channels, we assess their impact on tax revenues using a fixed-effects panel regression (OLS). The objective of this approach is to see whether if the two identified channels are each correlated with tax revenues. The results presented in table (11) suggest that the quality of governance and institutions and total education expenditure are highly correlated with tax revenue, representing potentially important transmission channels through which women’s empowerment can have a positive effect on tax revenue in developing countries.

Following ([Ekoula et al., 2022](#); [Mehmetoglu, 2018](#)) We formalize a simultaneous equation model. This approach involves the subsequent estimation of two regression equations, as follows:

⁷Quality of Governance Index (see Kaufmann, Kraay, and Mastruzzi (KKM), 2003)

$$\text{Model 1: } \text{Med}_{i,t} = \alpha + \sigma \text{WPE}_{i,t} + \rho X_{i,t} + V_{i,t}$$

$$\text{Model 2: } \text{Tax}_{i,t} = \alpha + \lambda \text{WPE}_{i,t} + \beta \text{Med}_{i,t} + \rho X_{i,t} + V_{i,t}$$

Where *Medit* represents the mediation variables (Quality of Governance and Education Expenditure). The composition effect is derived from the above two models as follows: In the first step, we estimate model (1), which represents the effect of women’s political empowerment (WPE) on tax revenue; the coefficient on WPE is the parameter describing this effect. In the second step we regress tax revenue on WPE while controlling for mediators. The magnitude of this effect is provided by the WPE coefficient. The indirect effect is thus obtained by the product of σ and β , where β measures the strength of the correlation between WPE and the mediators in model (2). This term also reflects the size of the mediation, which depends critically on the extent to which WPE affects mediators σ and the extent to which mediators influence tax revenue β . The results are presented in Table 8. Columns (1a), (2a), and (3a) present the estimates of model (1) using governance quality control and expenditure on education as mediators, respectively. The estimates of model (2) using mediators as controls are reported in columns (1b), (2b), and (3b) accordingly.

Overall, the results suggest that: (i) WPE affects both mediators, and the effects are statistically significant at the 1% level (columns 1a, 2a, and 3a in Table 8). (ii) Second, the mediators have a significant separate effect on tax revenue (columns 1b, 2b, and 3b in Table 8). (iii) The estimated coefficient of the WPE on tax revenue decreases as soon as a mediator is included in the model (columns 1b, 2b and 3b of tables 8, compared to column 4). Overall, our empirical results confirm the theoretical intuition suggesting that mediation may have occurred when some of the influences of WPE on tax revenue are relayed by the control. We perform a panel of mediation tests to analyze whether the indirect effect of the WPE on tax revenue through the influence of governance quality and education spending is statistically different from zero. When considering the mediation effect of governance quality control, for example, the P-value is less than 5%, suggesting that the null hypothesis of no mediation is rejected. The results are similar when using alternative mediation tests (Delta and Monte Carlo). It should also be noted that the use of bootstrap confidence intervals does not change the results. Indeed, the evidence presented implies that the mediation effect of governance quality is clear with about 42% of the total effect of WPE on tax revenue. Table 8 also shows clear evidence supporting the mediating effect of expenditure on education.

Table 8: Results of transmission mechanisms analysis

VARIABLES	(i) Mediator: Quality of governance			(ii) Mediator: Education expenditures		
	(1a)	(1b)		(2a)	(2b)	
	Quality of governance	log(Tax revenue)		Education expenditures	log(Tax revenue)	
WPE	2.022*** (0.0839)	0.992*** (0.0820)		3.009*** (0.334)	1.070*** (0.0619)	
Quality of governance		0.195*** (0.0236)				
Education expenditures					0.0516*** (0.00589)	
Constant	-2.529*** (0.120)	1.283*** (0.113)		-2.304*** (0.570)	0.957*** (0.102)	
Baseline control variables	Yes	Yes		Yes	Yes	
Bootstrap replications	500	500		500	500	
Observations	1135	1135		906	906	
	Mediating the effect of Quality of governance			Mediating the effect of Education expenditures		
	Coeff	Std.error	P-value	Coeff	Std.error	P-value
(A) Mediation tests						
Delta	0.090	0.015	0.000	0.038	0.009	0.000
Sobel	0.090	0.015	0.000	0.038	0.008	0.000
Monte Carlo	0.091	0.015	0.000	0.038	0.009	0.000
(A) Composition of the effect						
Indirect effect (Sobel)	0.119			0.054		
Direct effect	0.301			0.375		
Total effect	0.420			0.430		

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6 Assessing potential heterogeneity in the result

Empirical literature has found heterogeneity in the macroeconomic structure and political situation in developing countries [Acemoglu et al. \(2019\)](#), in this section, we explore the implications of a possible source of heterogeneity that might be included in our conclusion.

6.1 Historical path, women’s empowerment and tax revenue

Political economy, economic history and fiscal sociology have shown that the level of tax revenue and the building of tax capacity in the present depend on historical roots. We therefore expect that, depending on historical trajectories, the gender empowerment mechanism will have a relative impact on revenues [Mkandawire \(2010\)](#); [Limberg \(2022\)](#). According to this literature, past circumstances have crucially shaped subsequent fiscal development. Moreover, for the World Bank (2022), the low level of tax revenue in the Sub-Saharan African region, for example, can be traced back to the colonial legacy. Governments have adopted a taxation system inherited from the colonizers. We hypothesize that factors inherited institutionally through colonization could affect the relationship between women’s political empowerment and tax revenue mobilization. Based on the classification of [\(Porta et al., 2008\)](#) we estimate the effect of women’s political empowerment on tax revenues according to legal origin. We observe a significant positive effect of women’s political empowerment for both French and English colonial countries. This result reveals that regardless of colonial origin, women’s political inclusion is an effective way to improve revenue mobilization.

Table 9: Testing for women’s political empowerment and tax revenue according to colonial origins

VARIABLES	Dependant variable: (log)Tax revenue	
	English	French
L.(log) Tax revenue	0.797*** (0.0483)	0.716*** (0.117)
WPE	0.256** (0.0944)	0.356** (0.148)
Main controls	Yes	Yes
Constant	0.183* (0.0908)	0.267 (0.191)
AR(1)	0.013	0.006
AR(2)	0.864	0.473
Instrument	15	44
Hansen test	0.543	0.424
Observations	353	877
Number of countries	17	46

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6.2 Level of Development, women’s political empowerment and tax revenue

First, we distinguish countries in our sample according to their development level using IMF classifications ⁸. Despite sharing some common characteristics, developing countries show significant heterogeneity. To take this heterogeneity into account, we place our sample countries into two groups: developing countries (low-income countries) and emerging countries. Results presented in columns [1]-[2] of Table 10 show that in both low-income developing countries and emerging markets, women’s political empowerment still has a positive and significant coefficient.

⁸A classification based on such factors as high per capita income, exports of diversified goods and services, and greater integration into the global financial system

Table 10: The effect of women’s political empowerment on tax revenues disaggregated by type of economic group

VARIABLES	(1)	(2)
	Emerging Market Economies	Low-Income Economies
L.log (Tax revenue)	0.900*** (0.0620)	0.575*** (0.167)
WPE	0.126* (0.0715)	0.431** (0.177)
Main controls	Yes	Yes
Constant	0.127* (0.0710)	0.469* (0.267)
AR(1)	0.030	0.016
AR(2)	0.370	0.673
Instrument	25	21
Hansen test	0.517	0.147
Observations	561	677
Number of contries	32	33

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

7 Conclusion and policy implications

In this paper, we estimate the effect of women’s political empowerment on tax revenue mobilization. A sample of 66 countries for the period 1995-2019 was used to estimate the results using fixed-effects techniques and the generalized method of moments (GMM). We found that, women’s political empowerment increases tax collection through better governance and institutional quality, as well as the provision of basic goods and services that lead to tax compliance and an increasing tax base. When these results are subjected to sensitivity tests, the positive link is robust to examination of the premises of development level and colonial origin. This result is robust to several robustness tests, including changing the definitions of women’s political empowerment and tax revenue, adding additional control variables, and using alternative estimation methods. We provide empirical evidence that broadening the tax base through better governance and institutional quality, and increasing public spending (goods and services) are channels through which women’s political empowerment positively affects tax revenues in developing countries.

It is widely recognised that the Sustainable Development Goals cannot be achieved without the elimination of gender inequalities and the inclusion of women in all aspects of political, economic and social policy. In light of the volatile nature of the economic recovery and multiple challenges, from the impact of COVID-19 on poverty to income inequality, gender inequality, and social exclusion, the need to close the gender gap and improve revenue needed for financing has never been greater. As part of the Platform for Collaboration on Tax—a joint initiative with the Organisation for Economic Co-operation and Development, United Nations, and World Bank—the IMF is also considering the role of taxation in achieving gender equality. It is therefore essential to pursue inclusive development policies to improve gender equality, through tools such as gender-responsive budgeting and a gender-equitable tax policy. Since women’s political inclusion and empowerment is a prerequisite for good governance, it would be easier for people to improve their institutions of governance than to reorganize nature’s bounty for tax revenue mobilization purposes. All of these factors reinforce the argument of [Bird et al. \(2008\)](#), that asking a country, which wishes to increase its level of tax revenue, to focus only on conventional factors may not be sound political economy advice. Overall, it is clear that in order to implement inclusive development policies that boost tax revenue collection, governments must promote gender equality in education, which can help empower women and reduce the political divide; promote equal access to economic opportunities and resources, including credit, land and property rights, and paid employment ; helping to increase women’s representation in decision-making bodies; implementing laws and policies that promote gender equality, including measures to eliminate discrimination and violence against women; encouraging women’s political participation through quotas; and changing social norms that perpetuate gender inequality. In this process, international organizations can provide technical and financial support to programs and policies aimed at closing the gap in women’s political empowerment. In order to meet the 2030 Agenda for Sustainable Development, the inclusion and empowerment of women, particularly in the political arena, is a transition to investing in fiscal capacity, promoting governance and thereby improving tax collection in developing countries.

Acknowledgments

We are grateful to Gervasio Semedo and Bertrand Laporte for their comments and suggestions. Any errors or omissions are our own.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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8 Appendix

Figure 5: Relation between women’s political empowerment and tax revenue by region

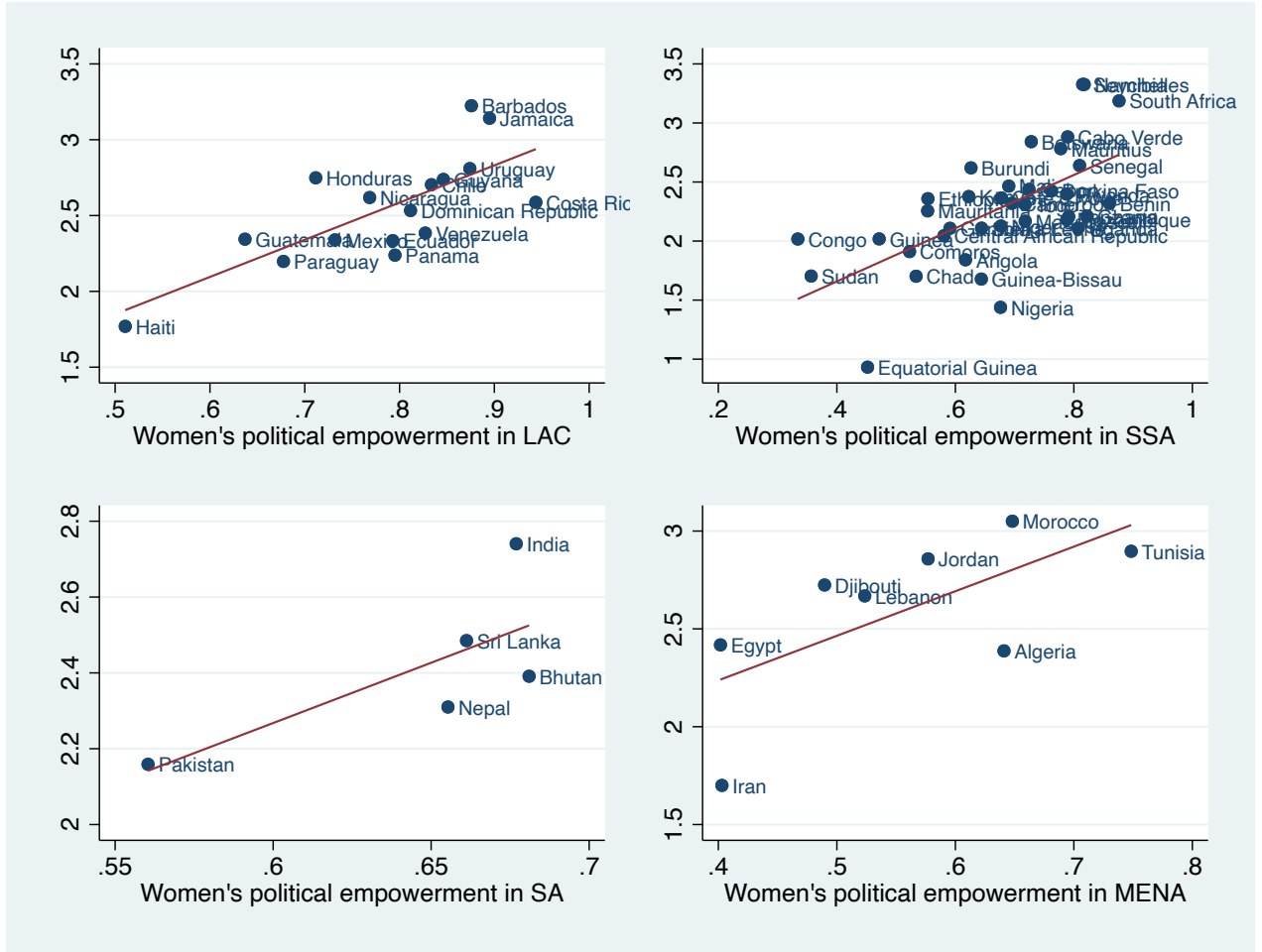


Table 11: The effects of WPE over five years

VARIABLES	Dependant variable: (log)Tax revenue					
	[1]	[2]	[3]	[4]	[5]	[6]
WPE(T0)	0.600*** (0.101)					
WPE(T+1)		0.518*** (0.104)				
WPE(T+2)			0.426*** (0.109)			
WPE(T+3)				0.399*** (0.108)		
WPE(T+4)					0.252** (0.107)	
WPE(T+5)						0.240** (0.108)
Constant	1.481*** (0.102)	1.599*** (0.106)	1.752*** (0.111)	1.922*** (0.113)	2.213*** (0.114)	2.259*** (0.120)
Main controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1331	1272	1211	1149	1086	1024
R-squared	0.399	0.376	0.358	0.352	0.365	0.373
Number of countries	65	65	65	65	64	62

Note: Main controls are those of the table in fixed effect regression and Columns[2]-[6] consider only observations for 1,2,3,4 and 5 years of the effect of WPE,respectively. Standard errors in parentheses.***p <0.01, **p <0.05, *p <0.1.

Table 12: Correlation between Women’s political empowerment and main channels

VARIABLES	log(Tax revenue)	
	(1)	(2)
Quality of governance	0.361*** (0.0245)	
Education Expenditure		0.0808*** (0.00653)
GDP/capita growth	0.00370 (0.00481)	0.000154 (0.00291)
log(Trade)	0.0815*** (0.0220)	0.116*** (0.0319)
Agriculture	-0.000683 (0.00130)	-0.00621*** (0.00104)
Credit to Private Sector	0.00533*** (0.000485)	0.00485*** (0.000412)
Constant	2.082*** (0.0857)	1.642*** (0.131)
Observations	1135	906
R-squared	0.527	0.520

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Potential omitted covariates or additional control (OLS)

VARIABLES	Dependant variable: (log)Tax revenue											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
WPE	1.690*** (0.0787)	1.589*** (0.0831)	1.461*** (0.0839)	1.359*** (0.0733)	1.359*** (0.0733)	1.370*** (0.0729)	1.360*** (0.0735)	1.115*** (0.0551)	1.031*** (0.0525)	0.990*** (0.0551)	0.990*** (0.0551)	0.956*** (0.0568)
log(Trade)		0.244*** (0.0240)	0.139*** (0.0195)	0.127*** (0.0202)	0.127*** (0.0202)	0.0994*** (0.0205)	0.0982*** (0.0208)	0.0956*** (0.0163)	0.117*** (0.0175)	0.0790*** (0.0193)	0.0790*** (0.0193)	0.0740*** (0.0188)
Agriculture			-0.0106*** (0.000851)	-0.00507*** (0.00103)	-0.00507*** (0.00103)	-0.00511*** (0.00101)	-0.00519*** (0.00102)	-0.00599*** (0.000895)	-0.00577*** (0.000856)	-0.00598*** (0.000876)	-0.00598*** (0.000876)	-0.00746*** (0.000905)
Credit to Private Sector				0.00672*** (0.000462)	0.00672*** (0.000462)	0.00670*** (0.000458)	0.00666*** (0.000459)	0.00699*** (0.000319)	0.00642*** (0.000351)	0.00638*** (0.000354)	0.00638*** (0.000354)	0.00635*** (0.000351)
FDI						0.00853*** (0.00234)	0.00827*** (0.00239)	0.00590*** (0.00189)	0.00627*** (0.00186)	0.00790*** (0.00198)	0.00790*** (0.00198)	0.00757*** (0.00195)
GDP/capita growth							0.00410 (0.00391)	0.00189 (0.00344)	0.00136 (0.00325)	0.00259 (0.00403)	0.00259 (0.00403)	0.00255 (0.00425)
Public debt								0.00773** (0.00350)	0.00956*** (0.00337)	0.0126*** (0.00377)	0.0126*** (0.00377)	0.0126*** (0.00374)
Natural Rent									-0.00500*** (0.00102)	-0.00511*** (0.00103)	-0.00511*** (0.00103)	-0.00575*** (0.000970)
Inflation										-0.00572*** (0.00169)	-0.00572*** (0.00169)	-0.00566*** (0.00178)
Aid												0.00475 (0.00296)
Constant	1.215*** (0.0796)	0.273** (0.110)	1.010*** (0.105)	0.847*** (0.107)	0.847*** (0.107)	0.940*** (0.102)	0.943*** (0.103)	1.075*** (0.0959)	1.091*** (0.0941)	1.376*** (0.108)	1.376*** (0.108)	1.410*** (0.109)
Year Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1577	1509	1490	1332	1332	1329	1328	1192	1192	1133	1133	1133
R-squared	0.294	0.370	0.436	0.567	0.567	0.572	0.573	0.640	0.650	0.653	0.653	0.656

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 6: Table of variable sources

Variables	Descriptions	Sources
Tax revenue	The variable representing the share of a country's total non-resource tax revenue in \% Gdp), which is the difference between the total tax revenue excluding grants and social contributions (\% Gdp) and the resource tax revenue (\% Gdp), the latter being the tax revenue collected on natural resources	ICTD Government revenue dataset (see: http://www.ictd.ac/index.php/dataset#core-dataset)
Women's Political Empowerment	Women's political empowerment index, scaled 0 to 1. Higher values indicate better empowerment	V-Dem (https://www.v-dem.net/data/the-v-dem-dataset/)
GDP/Capita Growth	Gross Domestic Product per capita Growth	World Development Indicators
Trade openness	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	
FDI _Net inflows	(new investment inflows less disinvestment) in a given economy from foreign investors, divided by GDP	
Credit to Private Sector	Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations,	
Public Debt	Central government debt, total (% of GDP) is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date	
Aid	Net official development assistance and official aid received	
Agriculture	Agriculture, forestry, and fishing, value added (% of GDP)	
Natural Rent	Total natural resources rents (% of GDP)	
Education Expenditure	Government expenditure on education, total (% of GDP)	
Inflation	Inflation, consumer prices (annual %)	
KOFGI	Overall globalization index.	KOF Swiss Institute (https://kof.ethz.ch/fr/donnees.html)
Legals Origins	institutional origins linked to colonization.	La Porta et al. (1999)
Quality of governance	variable of WGI. The quality of institution, computed as the simple average of government effectiveness, control of corruption, Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law	WGI database

Table 14: List of countries

List of countries		
Angola	Gambia. The	Namibia
Burundi	Guinea-bissau	Niger
Benin	Equatorial Guinea	Nigeria
Burkina Faso	Guatemala	Nicaragua
Barbados	Guyana	Nepal
Bhutan	Honduras	Pakistan
Botswana	Haiti	Panama
Congo	India	Paraguay
Central African Republic	Iran	Rwanda
Cote d'Ivoire	Jamaica	Sudan
Cameroon	Jordan	Senegal
Comorro Island	Kenya	Sierra Leone
Cape Verde	Lebanon	Seychelles
Costa Rica	Sri Lanka	Chad
Djibouti	Morocco	Togo
Dominican Republic	Madagascar	Tunisia
Egypt. Arab Republic	Mexico	Tanzania
Ethiopia	Mali	Uganda
Gabon	Mozambique	Uruguay
Ghana	Mauritania	Venezuela
Guinea	Mauritius	South Africa