Ecole Doctorale des Sciences Economiques, Juridiques, Politiques et de Gestion

Centre d'Etudes et de Recherches sur le Développement International (CERDI)

Université Clermont Auvergne, CNRS, IRD, CERDI, F-63000 Clermont-Ferrand, France

DOMESTIC REVENUE MOBILIZATION IN DEVELOPING COUNTRIES: FIVE ESSAYS ON THE CONTRIBUTION OF PROPERTY TAXATION

Thèse présentée et soutenue publiquement le **13 Décembre 2024**
pour l'obtention du titre de Docteur ès Sciences Économiques

par

Tiemele Aristide AFFROUMOU

sous la direction de

Professeure Mary-Françoise RENARD

Membres du Jury

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Mary-Françoise Renard	Professeure émérite, Université Clermont Auvergne, Cerdi, France	Directrice

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Dédicace

Toute la gloire revient à Dieu.

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Summary

Domestic revenue mobilization is currently considered one of the most potent tools for financing development in developing countries. Moreover, it is recognized that domestic revenues can contribute significantly to achieving the 2030 Agenda Sustainable Development Goals (SDGs). The question then is which national fiscal instruments governments can rely on to finance their economies. From this perspective, many practitioners and researchers have argued that property taxation, long neglected, can play an essential role in increasing domestic revenues.

The aim of this thesis is twofold. First, it seeks to revisit the main determinants of property taxation identified in the literature and explore the mechanisms through which these factors can influence the collection of property tax revenues. Second, it provides insight into specific institutional factors affecting property tax collection in Sub-Saharan Africa. On the whole, the thesis assesses how property taxation can contribute to the overall mobilization of tax revenues.

The thesis findings thereby contribute to a deeper understanding of property taxation policies in developing countries. The thesis is divided into two parts, comprising a total of six chapters, including an introductory chapter. The first part, which includes Chapters 2, 3, and 4, provides an in-depth immersion in the literature on the main determinants of property tax revenues. The second part, encompassing Chapters 5 and 6, focuses on Sub-Saharan Africa and examines specific institutional factors influencing property tax revenue mobilization in these countries.

Chapter 2 investigates the causal relationship between property tax revenue, income inequality, and urbanization in a panel of 115 developing and developed countries from 2000 to 2018. The results reveal a mixed picture across developing and developed countries. In both groups, the findings indicate that urbanization Granger-causes an increase in property tax revenue, with a unidirectional relationship observed in developing countries. In developed countries, however, there is a positive bidirectional causality between urbanization and property tax revenues. Additionally, the chapter finds that urbanization reduces income inequality in

both developed and developing countries, with unidirectional causality. When examining the full sample, the findings demonstrate bidirectional causality between property tax revenue and income inequality, as well as positive unidirectional effects of urbanization on property tax revenues. More specifically, the findings highlight a negative effect of income inequality on property tax revenues. Conversely, we find that property taxation increases income inequality. Finally, the analysis of impulse responses reveals distinct dynamics between developing and developed countries while confirming previous findings.

Chapter 3 examines the relationship between urbanization and property tax revenues among 71 developing countries over the period 1996-2019. The results show that urbanization positively and significantly impacts property tax revenue mobilization. This positive association can be attributed to urban expansion, which creates new land opportunities and increases the taxable base for property tax revenue collection. The findings survive after a battery of tests, reflecting a clear positive impact of urbanization on property tax revenue mobilization. Furthermore, we provide some evidence that digitization and financial development are effective transmission channels through which urbanization may influence property tax revenue mobilization in developing countries.

Chapter 4 reevaluates the impact of Fiscal Decentralization (FD) on property tax revenues in a sample of 42 developed and developing countries for the period 2005-2019. Our findings reveal a robust positive effect of fiscal decentralization on property tax revenues. Additionally, we found that a higher level of democracy enhances this positive relationship. However, our analysis indicates that a higher level of corruption can undermine the beneficial impact of fiscal decentralization on property tax revenues. The chapter also demonstrates that lower levels of ethnic fragmentation positively influence the relationship between fiscal decentralization and property tax revenues. Finally, using quantile regression, the chapter reveals that countries with below-median property tax revenue are less likely to benefit from fiscal decentralization than countries with above-median property tax revenue levels.

Chapter 5 investigates the implications of internal conflicts for property tax revenues and highlights the moderating role of property rights in Sub-Saharan African countries from 1996 to 2019. Estimates indicate that internal conflicts reduce property tax revenues, and property rights play a moderating role in the influence of internal conflicts on property tax revenues. Specifically, when property rights are clearly defined, the effect of internal conflicts is quantita-

tively weaker compared to situations where property rights are ambiguous or poorly enforced. Moreover, in addition to the positive impact of protecting property rights on property tax revenues, the estimates also provide evidence of government effectiveness, further reinforcing the interconnected relationship among internal stability, property rights protection, and property tax revenues.

Chapter 6 investigates how colonial legacies have a long-term influence on property taxation in sub-Saharan Africa over the period 1996-2019. Specifically, we examine how legal origins interact with institutional quality in determining property tax revenues. The results show that former French colonies tend to collect less property tax revenue than former British colonies. Additionally, our findings indicate that even with high institutional quality, ex-French colonies experience lower property tax revenue than ex-British colonies. These results remain robust when accounting for a set of controls and various alternative institutional variables and when employing an alternative estimation method.

Keywords: Property taxation; Africa; Developing countries; Developed countries; Urbanization; Fiscal Decentralization; Institution; Inequality; Conflicts; Property rights; Digitalization; Financial Development.

Classification JEL: H71; R38; Q24; K11; K25; R14; P51; H72; D31; H20; H77; H56; H11; P14.

Résumé

La mobilisation des recettes domestiques est considérée de nos jours comme un outil crucial pour le financement du développement dans les pays en développement. Dans le même ordre d'idées, il est également admis que les recettes fiscales domestiques jouent un rôle important dans la réalisation des Objectifs de développement durable de l'Agenda 2030. La question est donc de savoir sur quels instruments fiscaux les gouvernements peuvent encore s'appuyer pour financer leurs économies. Dans cette perspective, de nombreux praticiens et chercheurs ont fait valoir que la fiscalité foncière, longtemps négligée, peut jouer un rôle primordial dans l'augmentation des recettes fiscales nationales.

L'objectif de cette thèse est double. Premièrement, elle vise à revisiter les principaux déterminants de la fiscalité foncière identifiés dans la littérature et à explorer les mécanismes par lesquels ces facteurs peuvent influencer la collecte des recettes de l'impôt foncier. Deuxièmement, elle apporte un éclairage sur certains facteurs institutionnels spécifiques qui affectent la collecte de l'impôt foncier en Afrique subsaharienne. Dans l'ensemble, la thèse évalue comment les gouvernements peuvent utiliser la taxation foncière pour accroître la mobilisation des recettes fiscales totales.

Les résultats de la thèse contribuent ainsi à une meilleure compréhension des politiques d'imposition foncière dans les pays en développement. La thèse est subdivisée en deux parties, incluant au total six chapitres dont un chapitre introductif. La première partie comprend les chapitres 2, 3 et 4 et fait une immersion dans la littérature sur les principaux déterminants des recettes foncières. La deuxième partie de la thèse, qui comprend les chapitre 5 et 6 se concentre sur les pays d'Afrique sub-saharienne et examine certains des facteurs institutionnels influençant la mobilisation des recettes de l'impôt foncier dans ces pays.

Le chapitre 2 examine la relation causale entre les recettes de la taxe foncière, l'inégalité des revenus et l'urbanisation dans un panel de pays en développement et développés sur la péri-

ode 2000-2018. Les résultats ne sont pas toujours très probants mais permettent de conclure à un rôle positif de l'urbanisation sur la perception de la taxe foncière, aussi bien dans les pays en développement que dans les pays développés, avec une relation unidirectionnelle dans le cas des pays en développement. De plus, une relation bidirectionnelle positive entre l'urbanisation et les recettes de la taxe foncières est observée dans les pays développés. En outre, les résultats révèlent que l'urbanisation réduit les inégalités de revenus dans les deux groupes de pays, avec une causalité unidirectionnelle. Lorsque l'on considère l'ensemble de l'échantillon, les résultats indiquent une causalité bidirectionnelle entre les recettes de la taxe foncière et l'inégalité des revenus, tout en mettant en évidence des effets positifs unidirectionnels de l'urbanisation sur les recettes de la taxe foncière. Plus spécifiquement, les résultats mettent en exergue un effet négatif des inégalités de revenus sur les recettes de l'impôt foncier. Inversement, nous trouvons que la taxation foncière augmente les inégalités de revenus. Enfin, l'analyse des réponses impulsionnelles révèle des dynamiques distinctes entre les pays en développement et les pays développés, tout en confirmant les résultats précédents.

Le chapitre 3 examine la relation entre l'urbanisation et les recettes de l'impôt foncier dans un échantillon de 71 pays en développement sur la période 1996-2019. Les résultats montrent que le processus d'urbanisation a un impact positif et significatif sur la mobilisation des recettes foncières dans les pays en développement. Cette association positive peut être attribuée au fait que l'expansion urbaine crée de nouvelles opportunités foncières et augmente la base taxable pour la collecte des recettes foncières. Les résultats survivent après une batterie de tests, confirmant ainsi l' impact positif de l'urbanisation sur la mobilisation des recettes foncières. De plus, nous apportons des preuves que la digitalisation et le développement financier sont des canaux efficaces par lesquels l'urbanisation pourrait influencer la mobilisation des recettes foncières.

Le chapitre 4 réévalue l'impact de la décentralisation fiscale sur les recettes de la taxation foncière dans un échantillon de pays développés et en développement sur la période 2005-2019. Les résultats révèlent un effet positif et robuste de la décentralisation fiscale sur les recettes de l'impôt foncier. En outre, nous trouvons qu'un niveau élevé de démocratie renforce cette relation positive. Cependant, notre analyse montre qu'un niveau élevé du niveau de corruption peut miner l'effet positif de la décentralisation fiscale sur les recettes de l'impôt foncier. Le chapitre démontre également que des niveaux plus faibles de fragmentation ethnique influencent positivement la relation entre la décentralisation fiscale et les revenus de l'impôt foncier. Enfin,

les résultats de ce chapitre démontrent que les pays dont les recettes foncières sont inférieures à la médiane sont moins susceptibles de bénéficier de la décentralisation fiscale que ceux dont les recettes de l'impôt foncier sont supérieurs à la médiane.

Le chapitre 5 analyse les implications des conflits internes sur les recettes foncières et met en évidence le rôle modérateur de la définition des droits de propriété dans les pays d'Afrique subsaharienne sur la période 1996-2019. Les estimations indiquent que les conflits internes réduisent les recettes foncières, et que les droits de propriété jouent un rôle modérateur dans l'influence des conflits internes sur les recettes foncières. Plus précisément, lorsque les droits de propriété sont clairement définis, l'effet des conflits internes est quantitativement plus faible que dans les situations où les droits de propriété sont ambigus ou mal appliqués. De plus, en plus de l'impact positif de la protection des droits de propriété sur les recettes foncières, les estimations fournissent également des preuves que l'efficacité du gouvernement renforce la relation entre la stabilité interne, la protection des droits de propriété et les recettes foncières.

Le chapitre 6 étudie l'influence à long terme des héritages coloniaux sur la taxation foncière en Afrique subsaharienne sur la période 1996-2019. Plus précisément, nous examinons comment les origines légales interagissent avec la qualité institutionnelle pour influencer le niveau de collecte des recettes foncières. Les résultats montrent que les anciennes colonies Françaises ont tendance à collecter moins de recettes foncières que les anciennes colonies Britanniques. En outre, nos résultats indiquent que même avec une qualité institutionnelle élevée, les ex-colonies françaises enregistrent des niveaux de recettes foncières inférieurs à ceux des ex-colonies britanniques. Ces résultats demeurent valides lors de la prise en compte d'un ensemble de diverses variables institutionnelles alternatives, ainsi que lors de l'utilisation d'une méthode d'estimation alternative.

Mots clés : Impôt foncier ; Pays en Développement ; Afrique ; Pays développés ; Développement financier ; Urbanisation ; Décentralisation fiscale ; Institution ; Inégalités ; Conflits ; Droits de propriétés ; Digitalisation.

Classification JEL : H71 ; R38 ; Q24 ; K11 ; K25 ; R14 ; P51 ; H72 ; D31 ; H20 ; H77 ; H56; H11; P14.

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CHAPTER 1

General introduction

Developing countries aim to achieve concrete and significant development results in terms of poverty reduction and inclusive prosperity for decades to come.

– The 2030 Agenda for Sustainable Development

1.1 Origin of property taxation: a little history

The property tax originated in the feudal system, where the lords and the Church levied rights and royalties on the peasantry in exchange for the protection and exploitation of the land. The annual taxation of agricultural land (the initial name for land tax) represents one of the most critical links in constructing European States. It should also be noted that the tax on urban land appeared in the second phase, but its product gradually exceeded the first as wealth creation moved from the countryside to the cities.[1] What is more, these annual levies encourage the development of land. Anyone who does not cultivate his land and has to pay an annual tax to keep it will eventually sell or rent it to someone who can make it productive. Over the years, property tax has become a local tax everywhere, or at least all researchers and practitioners are unanimous that property tax is a local tax.

Evidence of property taxation in Africa dates back to around 5,000 B.C. in ancient Egypt, where it applied explicitly to agricultural land. This annual tax was efficiently administered thanks to a highly literate society. Scribes meticulously recorded land ownership and field sizes, likely acting as intermediaries between landowners and tax collection.

Ancient Greece also had property taxation long before B.C. Indeed, under the reign of Aristides (530 B.C.-468 B.C.), land tax reforms were introduced. During this period, the property tax was collected according to the value and the productivity of the land.

In France, the first land taxes appeared in 1790-1791, with the land contribution (taxing land) and the movable contribution (taxing rent and profit). In addition, in 1798, a tax on doors and windows was introduced (taxing homes according to the number of doors and windows). This new tax boosted the royal finances, which were in great difficulty after the revolutionaries (mainly the physiocrats) had toppled the king, who sought to consolidate all powers at the expense of promoting the general interest. Indeed, they advocated turning to other types of revenue, including land tax.

Property taxation in England has a long history, dating back to the seventeenth century. The Land Tax Act of 1692 established a land tax and marked a significant development in the evolution of property taxation. Over time, the tax structure has evolved, becoming a key mechanism for financing various government expenditures.

[1] https://www.agter.org/bdf/fr/corpus_chemin/fiche-chemin-49.html

In some countries, such as the United States of America, Canada, and Australia, property tax is always based on market values (the price at which the land can be sold). Conversely, due to their historical origins, European countries mainly have a property tax based on the rental value (the rent at which the land can be rented).

The 19th century was marked by an explosion in property taxation in the United States and Europe. Property values rose due to the Industrial Revolution and urbanization, increasing the importance of property taxes as a source of revenue for local governments.

1.2 Motivation and context

Securing sustainable financing for economies, particularly in developing countries, is a significant challenge in contemporary discourse. One approach to overcome this challenge, proposed by researchers and practitioners, is domestic tax revenue mobilization. By improving domestic tax collection efficiency and broadening the tax base, developing countries can lessen their dependence on international assistance and natural resources. Moreover, domestic tax revenue serves as a powerful mechanism to combat poverty and reduce income inequality by funding redistributive policies and inclusive development programs.

The importance of domestic tax revenue mobilisation is highlighted in various international policy frameworks, such as the Addis Ababa Action Agenda, adopted at the Third International Conference on Financing for Development in 2015, and the African Union's Agenda 2063. Both emphasize its pivotal role in financing critical infrastructure projects and delivering essential public services, which are fundamental to achieving sustainable development goals. The principle is straightforward: achieving a structural transformation that combines autonomy, resilience, development, and the emergence of active citizenship cannot be accomplished without efforts to build wealth based on national resources (Jacquemot and Raffinot, 2018; Chambas, 2005b). In this context, the first-generation fiscal transition primarily aimed to reduce the share of tax revenues derived from customs duties by promoting indirect taxation, particularly VAT. Despite numerous reforms aimed at improving the efficiency of VAT and achieving encouraging results, significant challenges remain. These include issues with managing VAT refunds, the proliferation of exemptions, and the presence of multiple, often high rates, which complicate its application. Given these limitations, future fiscal transitions could explore alternative tax mechanisms. One

such proposal is the concept of a third-generation fiscal transition, which emphasizes the integration of environmental taxation. This approach remains largely untapped in developing countries, despite its potential to generate revenue while addressing pressing environmental challenges.

The recent global financial crisis, along with ongoing challenges like COVID-19, the Russia-Ukraine conflict, and the decline of globalization, has shown the need for reliable internal financing sources. These challenges highlight the importance of developing countries building strong domestic tax systems to better handle external shocks and invest in long-term growth. The key question is: what new tax instruments can governments adopt to increase revenue while simultaneously reducing inequalities?

Based on the preceding discussion, this thesis explores a solution underutilized by many countries: namely ***property taxation***. Relevant researchers and practitioners have identified this tax as an effective tool for governments to increase their overall tax revenue, thereby advancing their fiscal transition objectives (Awasthi, 2020; Norregaard, 2013; Franzsen and McCluskey, 2017; Chambas et al., 2010, 2007).

Why property taxation and not other taxes?

This thesis focuses on property taxation, an under-exploited area in developing countries with the potential to diversify tax revenue collection in developing countries significantly. Unlike some mobile assets, the property offers a relatively stable and identifiable tax base, although challenges like unregistered properties exist. Notably, property taxation is a local tax directly contributing to the financing of local economies. Furthermore, the visibility and political sensitivity of the property tax base can incentivize local governments to be more responsive, efficient, and accountable in delivering public services. This close link between local taxes and the provision of local public goods fosters a sense of ownership and encourages responsible governance.

Soaring land values in today's rapidly urbanizing world offer a unique opportunity to improve property tax revenues. This is the perfect time for countries to modernize their property tax policies and also fight against urban sprawl. Likewise, this tax is considered by many practitioners to be less distortive and the primary source of revenue for local government (Chambas, 2005a; Chambas et al., 2007; Presbitero et al., 2014; Caldeira et al., 2023). In practice, one of the difficulties raised by several countries regarding the challenges associated with property tax is linked to the technical difficulties of keeping the cadastral system up to date. However, compared to the efforts required for determining wealth income or evaluating the tax accounts

of multinational corporations, determining property tax presents fewer difficulties.

In most countries, governments prioritize taxes with the potential for higher immediate revenue, often overlooking the steady contributions of property taxation. According to the World Bank, property tax contributes to 1.1 percent of GDP in developed countries compared to just 0.3 and 0.6 percent of GDP in developing countries. Therefore, there is a significant shortfall in terms of this tax. Based on the UNU-WIDER Government Revenue Dataset, Figure 1.1 compares the level of property tax revenue by development level. The figure indicates a significant gap in property tax revenue collection between developing and developed countries, consistent with the World Bank's previous statistics.

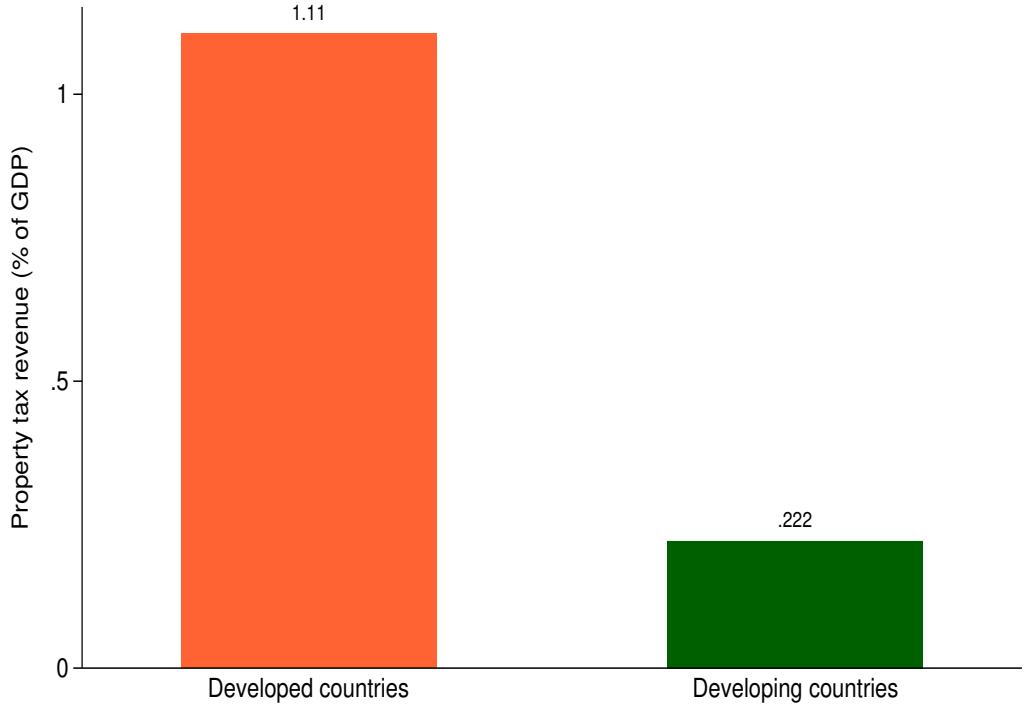

Figure 1.1: Comparing Property tax revenue by development level

Moreover, when we consider the evolution of property tax revenue by income level over the period 1980-2020, Figure 1.2 reveals that, on average, the level of property tax revenue is correlated with the income level. In the same order of idea, the figure shows that high-income countries have experienced more property tax revenue collection prosperity. Likewise, during this period, the data confirm that the level of property tax revenue in terms of GDP percentage remains low, regardless of income level. Nonetheless, since 2020, we remark a slight increase in property tax revenue in the different income categories. This significant gap in property

tax revenue between developed countries and others can partly be attributed to differences in state capacity, as highlighted by Besley and Persson (2009), Rogers and Weller (2014), and Nistotskaya and D'Arcy (2023). According to these authors, limited state capacity is a major obstacle to development and, consequently, to the effective implementation of fiscal policies. Furthermore, they show that developed countries tend to build greater fiscal capacity, enabling them to generate higher revenue. Similarly, one explanation for these differences lies in the level of legal capacity, as discussed by (Besley and Persson, 2009).

On a regional level, Figure 1.3 shows that Europe and Central Asia are the regions with the higher level of property tax revenue. In comparison, South Asia and sub-Saharan Africa have the lowest property tax revenues.

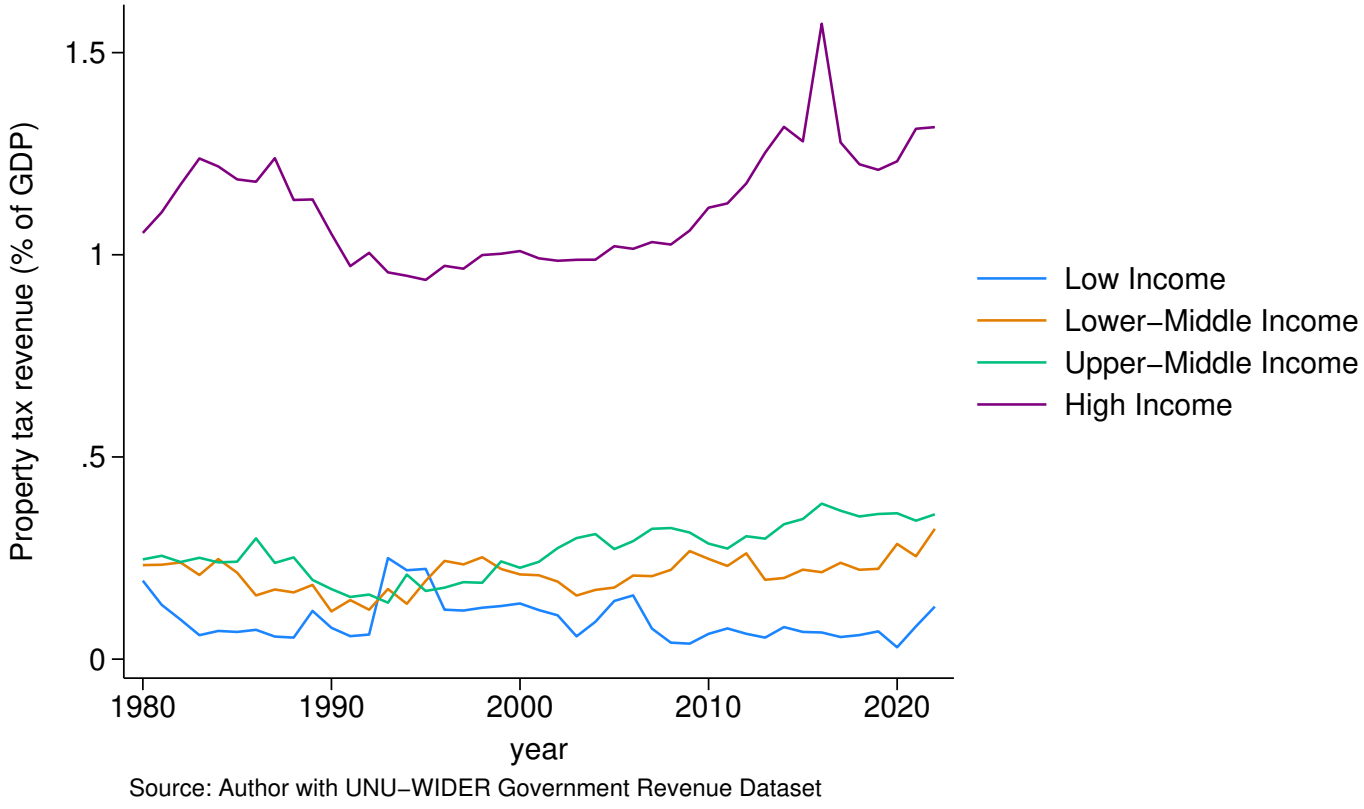

Figure 1.2: Property tax revenue evolution

In practice, countries prefer to focus on categories of taxes that clearly contribute to their economies. Thus, we compare the share of property tax revenue to the main categories of taxes. Figure 1.4 shows that, on average, the level of property tax revenue is weaker in all the regions compared to the other categories of tax revenues.

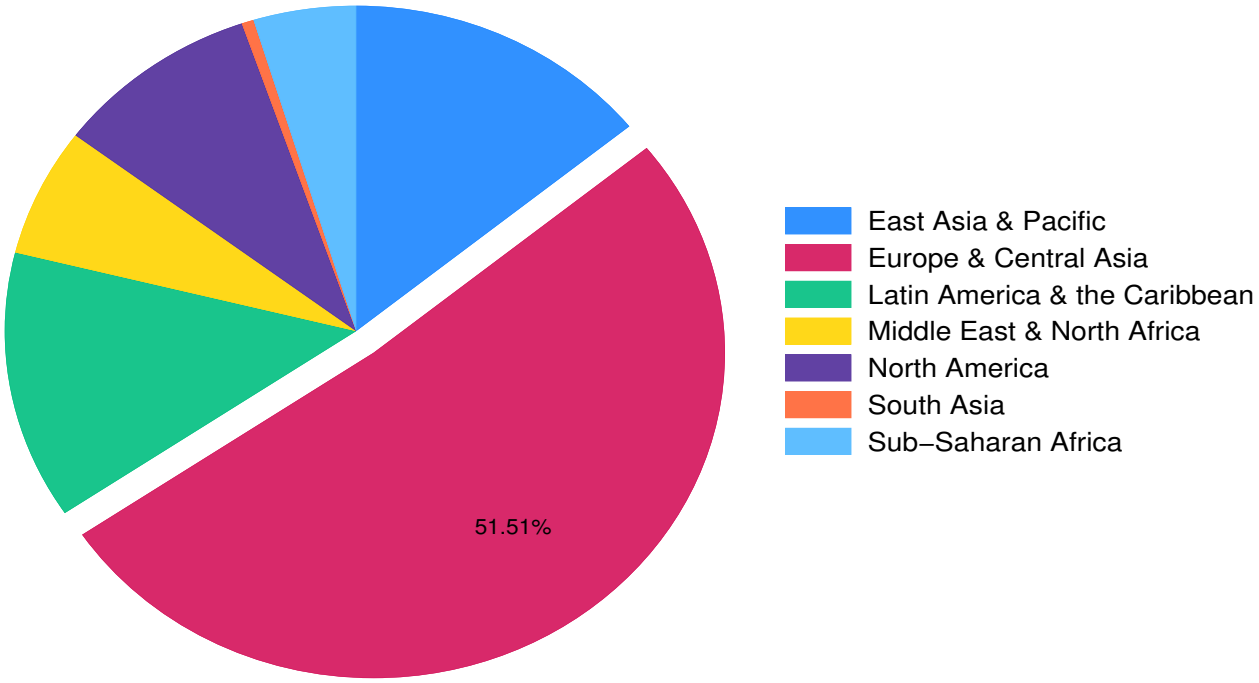

Figure 1.3: Property tax revenue by region

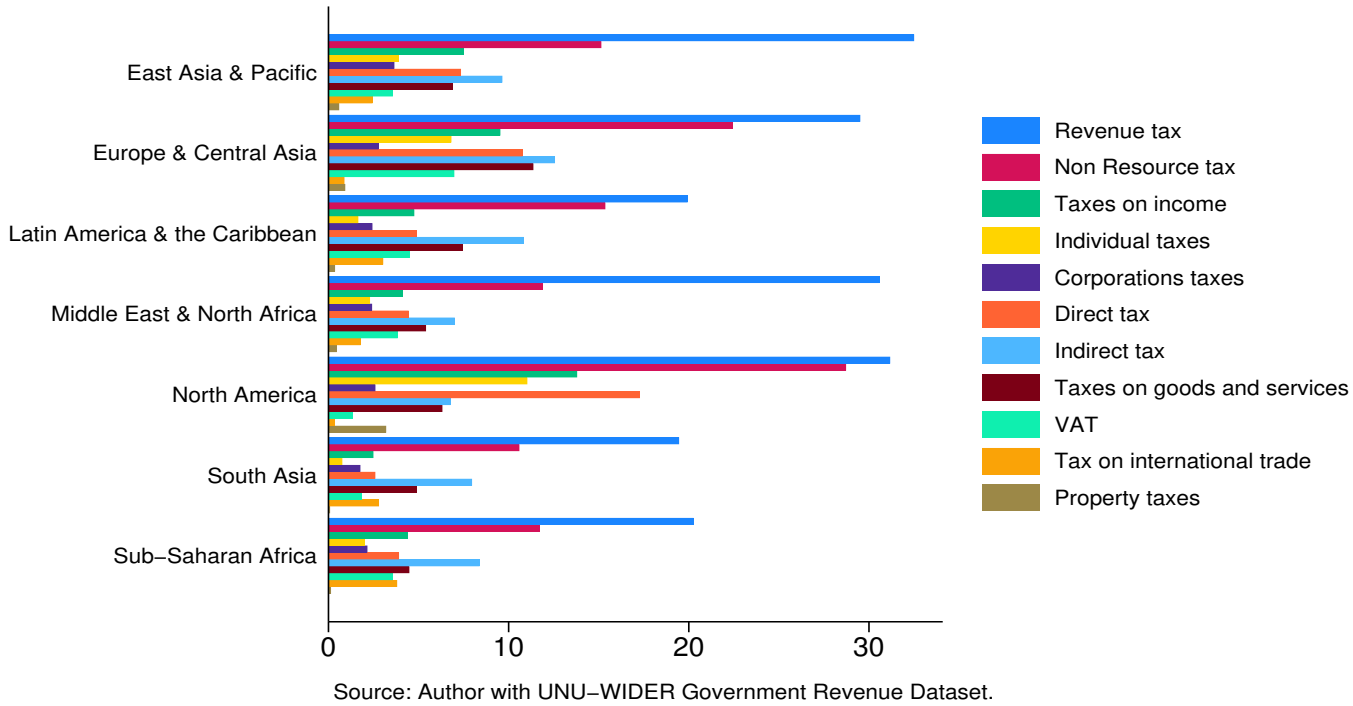

Figure 1.4: Structure of tax revenue by region

Finally, the limited research on property taxes compared to other taxes offers a significant opportunity to enrich the literature. So, this thesis would like to enhance the understanding of property taxation by utilizing a recent dataset not previously explored in scholarly investigations. Doing so will enhance the current body of literature and advance comprehension of the intricate dynamics of property taxation, particularly its implications for sustainable economic development and local governance.

Property Taxation and Development: Balancing Expectations with the Burden of Taxation

A well-established property tax system can catalyze local economic development. Efficient land management can promote optimal land utilization by incentivizing landowners to utilize their land effectively. For instance, targeted tax incentives can facilitate the transformation of unused land into commercial or residential areas, consequently enhancing local economic activity. For local governments, property taxation represents the primary avenue to finance local development and thereby meet the needs of their citizens in terms of public service delivery. Indeed, the challenge lies not only in collecting more taxes but also in ensuring the efficient utilization of the revenue collected. The provision of public services is crucial for fostering taxpayer compliance. When individuals perceive the services provided as valuable, they are more willing to fulfill their property tax obligations.

The importance of utilizing property tax revenue is underscored by its impact on urbanization. Urbanization, as a mechanism for wealth creation, leads to the appreciation of land and property values. When effectively leveraged through property taxation, this appreciation can provide funding for the ongoing demands of urban development. However, excessive property tax rates can impede the economic development process, as they may deter investment. Furthermore, small businesses and homeowners of modest means are disproportionately burdened by property taxes, which constitute a significant portion of their income.

Some impediments to property taxation

Property taxation presents numerous advantages, yet its effective implementation encounters several obstacles. One of the foremost concerns is ensuring robust protection of property rights, necessitating clear legal frameworks and enforcement mechanisms to forestall disputes and ensure equitable treatment for all landowners. Weak property rights can foment internal conflicts and erode trust in the system, impeding the effective collection of property taxes.

In developing countries, additional challenges complicate matters. Limited awareness among

specific households can be mitigated through public education campaigns elucidating the tax system and its benefits. Moreover, bridging communication gaps between tax authorities and residents is imperative and achievable through streamlined procedures, accessible information channels, and enhanced transparency. Addressing taxpayer resistance from perceived inequities and heightened costs requires establishing fair tax structures and efficient service delivery justifying the tax burden. Addressing concerns regarding corruption in land management is also paramount. Finally, political considerations may impede property tax reforms in some governments.

A further challenge specific to African countries is the issue of outdated or ill-suited tax legislation. Tax systems inherited from colonial eras may fail to reflect current economic realities, leading African states to prioritize alternative forms of taxation. Finally, addressing these challenges is vital to unlocking the full potential of property taxation as a catalyst for sustainable development in developing countries, particularly in Africa.

1.3 Theoretical foundations

The writing of this thesis mobilized some theoretical arguments. Those are presented below:

Rent theory

This thesis draws its initial theoretical foundations from rent theory. Here, we briefly present the theories of Adam Smith and David Ricardo regarding the issue of rent.

- **Rent according to Adam Smith (The Wealth of Nations, 1776):** According to Adam Smith, rent is the income that landowners derive from their land under their ownership. However, he indirectly criticizes these landowners by suggesting that they benefit from this income without actually contributing to production. Thus, Smith considers rent as passive income, detached from any active contribution to the production of wealth by landowners.

- **Rent according to David Ricardo (Principles of Political Economy and Taxation, 1817):** David Ricardo expanded the concept of rent by incorporating it into his theory of income distribution. In Principles of Political Economy and Taxation (1817), he argues that rent arises from differences in land fertility and productivity. As the population grows and the demand for food increases, it becomes necessary to cultivate increasingly

less fertile land, which leads to diminishing marginal returns. Rent, therefore, emerges as a surplus generated by the most fertile land and paid to landowners. Ricardo views rent as a transfer of wealth, rather than a cost of production. He also identifies a conflict of interests between landowners, capitalists, and workers, with the latter facing stagnating wages.

Fiscal federalism theory

The theory of fiscal federalism examines how power and budgetary resources are shared between different levels of government within a country. In essence, it proposes dividing fiscal responsibilities between the central government and local entities. A key tenet of this theory is to promote local government autonomy, particularly in terms of tax revenue and expenditure decisions (Lockwood et al., 2015; Oates, 2008; Musgrave, 1961; Tiebout, 1956).

According to the theory of fiscal federalism, subnational governments can tailor the production of public goods to local preferences. However, this theory also suggests that decentralizing taxation (devolving the power to raise taxes) is most effective for specific revenue streams like property taxes and user charges. Furthermore, this theory promotes reducing regional inequality through redistribution mechanisms like national solidarity. This theoretical framework, which emphasizes the link between local taxation and development, has inspired numerous studies. Building on this foundation, we use fiscal federalism principles to examine the relationship between property taxation and fiscal decentralization.

Development model with unlimited labor supply: Lewis theory

The thesis also mobilizes some arguments based on the Arthur Lewis theory. Arthur Lewis (1915-1991) is considered as the pioneer of development economics. Specifically, the thesis uses some of his arguments to explain the high level of urbanization faced by developing countries nowadays. Indeed, the dynamism of cities can partly be explained by the transfer of surplus labor from the traditional sector (agricultural sector) to a modern capitalist sector with unlimited labor.

Optimal taxation/ The Laffer curve

Mankiw et al. (2009) argue that taxation must be optimal. However, according to the authors, it must make it possible to mobilize resources without harming the productive machine of the economy. In real life, some countries do not explore the potential of their tax revenue.

Indeed, they focus on some categories of taxes to the detriment of other categories of taxation. This limits the global potential of their tax revenue mobilization capacity. Likewise, according to the Laffer curve, a certain tax rate level exists that maximizes tax revenue without deteriorating economic activity. This suggests that there is an optimal level of taxation beyond which taxpayers respond by changing their economic behavior, which ultimately reduces tax revenue (see Figure 1.5).

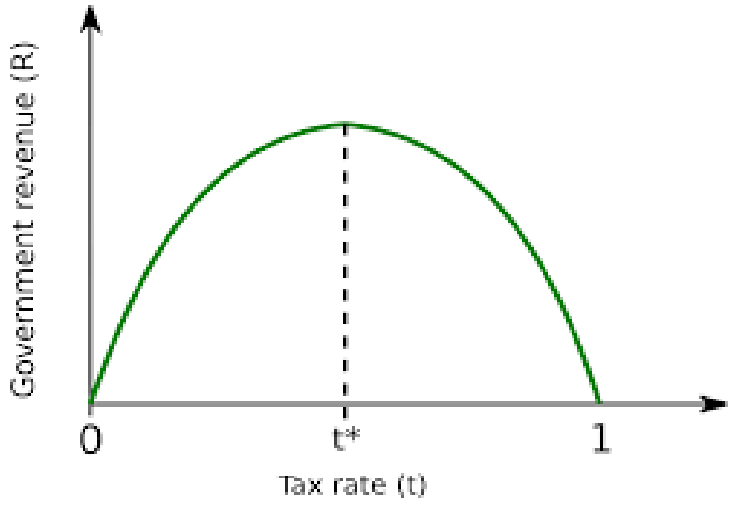

Figure 1.5: Laffer curve

Tax compliance theory

The thesis also focuses on tax compliance theory to explain taxpayers' payment of property taxes. Tax compliance theory examines the factors that influence taxpayers' behavior in declaring and paying taxes. It seeks to understand why some individuals or companies meet their tax obligations while others attempt to evade them. Taxpayers consider various factors when deciding whether to comply, including the risk of being caught, the potential penalties for non-compliance, their sense of civic duty, personal beliefs, trust in institutions, the perceived fairness of the tax system, and the quality of public services. Overall, this reflects voluntary adherence to tax rules establishing social norms regarding tax compliance. It suggests that taxpayers make conscious decisions about whether or not to comply with their tax obligations.

Conflicts and state building: Charles Tilly theory

The Tilly theory highlighted the implication of conflict and other forms of protestation on state building (Tilly, 2017). More specifically, Tilly's theory suggests that war played a crucial role in forming European states. According to this theory, the pressures of armed conflict

between different political entities drove states to centralize power and establish institutions capable of collecting taxes and managing armies. This process ultimately led to the consolidation of state authority. Moreover, Besley and Persson (2009) argue that war serves as a catalyst for taxation, motivating governments to invest in institutions that uphold property rights. This theory is employed in this thesis to investigate the relationship between property taxation and internal conflicts, as previously used by Rasler and Thompson (1985).

1.4 Main findings and value added

This thesis contributes to the debate on tax revenue mobilization and development, focusing on an area that remains underexplored in the literature: property taxation. Indeed, most studies on tax revenue mobilization have paid less attention to property tax, as they tend to focus on other tax categories perceived to generate higher revenue. This thesis seeks to reestablish the importance of property taxation as a tool for enhancing tax revenue mobilization. It specifically examines the key determinants that can drive property tax mobilization and identifies obstacles hindering its effectiveness. The thesis is structured in two parts, with the first part comprising three chapters and the second part two chapters.

1.4.1 Part 1: Revisiting the main determinants of property tax revenue investigated in the literature

The first part delves into the literature on the key determinants of property tax, focusing on the factors that form the tax base and are most frequently cited by practitioners and researchers. Specifically, these include urbanization and fiscal decentralization. We explore these topics through Chapters 2, 3, and 4.

Chapter 2: Exploring the causal relationship between Property tax revenue, income inequality, and urbanization: A GMM Panel VAR Evidence

This chapter tests the existence of causality between property taxation, inequality, and urbanization. The literature expects to assess whether there exists a relationship between these variables. Thus, we aim to verify the existence of this causality. Using data from 115 developing and developed countries covering the period from 2000 to 2018, our study is the first to investigate

the causal relationship between property tax revenue, income inequality, and urbanization. The regression is estimated using the generalized method of moment panel vector autoregressive method developed by Abrigo and Love (2016).

Our findings show that a causal relationship exists between the three variables. Specifically, when we considered the full sample (developing and developed countries), the results indicate a bidirectional relationship between income inequality and property tax revenue, with urbanization having a positive and significant impact on property tax revenue (unidirectional causality). More precisely, the findings show a negative effect of income inequality on property tax revenues. Conversely, we find that property taxation increases income inequality. Also, the results indicate that urbanization reduces income inequality (unidirectional causality). Regarding the case of developing countries, the results reveal that urbanization negatively affects income inequality while it improves property tax revenues.

Finally, when we consider the case of developed countries, our findings prove that there is a bidirectional positive Granger causality between urbanization and property tax revenues. At the same time, we note the negative impact of urbanization on income inequality (unidirectional causality). Overall, the chapter highlights that urbanization not only enhances property tax revenue but also reduces income inequality. Although this study provides instructive results, it is very empirical. It would therefore be interesting for future studies to theoretically discuss the link between the triplet income inequality, urbanization, and property tax revenue.

Chapter 3: New Evidence of the Impact of Urbanization Process on Property Tax Revenue Mobilization in Developing Countries: Do Financial Development and Digitalization Matter?

This chapter assesses the effect of the urbanization process on property tax revenue mobilization in 71 developing countries from 1996 to 2019. Based on panel-fixed effects regressions, our empirical results show urbanization's positive and significant effect on property tax revenue mobilization. To address the endogeneity issue, we re-estimated our model using instrumental variables, the system GMM method, and a series of robustness checks. These estimates consistently show urbanization's positive and significant effect on property tax revenues. The chapter also explores two transmission channels, digitalization and financial development, through which urbanization might influence property tax revenues. The results indicate that both channels are

relevant to explain the effect of urbanization on the mobilization of property tax revenues. Governments should thus pay greater attention to their rapid urbanization by implementing policies that could facilitate the recovery of property tax revenues. For instance, improving their financial development and digitalization efforts is required. Likewise, given this high level of urbanization, a modernization of the cadastral system (e.g., use of digital technology) is necessary for better identification of all properties requiring taxation. For better compliance with the property tax, governments also need to bring the provision of public services closer to their populations.

Chapter 4: (Re)understanding the relationship between Fiscal Decentralization and property tax revenue: Insights from developing and developed countries

This chapter examines the impact of local autonomy measured by fiscal decentralization on property tax revenue collection in 42 developed and developing countries over the period 2005-2019. The study aims to demonstrate that granting more autonomy to local governments can enhance property tax revenue collection. Additionally, the study investigates the significance of democracy, corruption, and ethnic fragmentation in strengthening the relationship between fiscal decentralization and property tax revenues. Empirically, our research shows that fiscal decentralization positively impacts property tax revenue collection and that a higher degree of democracy strengthens this relationship. Our results also indicate that a higher level of corruption can negate the positive influence of fiscal decentralization on property tax revenue. The chapter also demonstrates that lower levels of ethnic fragmentation positively influence the relationship between fiscal decentralization and property tax revenues. In addition, using quantile regression, the chapter shows that countries below the median of property tax revenue are less susceptible to benefit from fiscal decentralization compared to countries above the median levels of property tax revenue. Finally, the study suggests that improving Fiscal Decentralization can promote property tax revenue collection, which is relevant for developed and developing countries. The success of policies surrounding the relationship between property tax revenue and Fiscal Decentralization is contingent upon implementing attendant policies tailored differently across countries with varying initial levels of property tax revenue. Specifically, these policies are unlikely to be effective unless considering each country's initial levels of property tax revenue.

1.4.2 Part 2: Institutions and property taxation in Africa

The second part of the thesis focuses on Africa, a continent where property taxation remains largely under-exploited or weak. According to some scholars, Africa inherited its property tax systems from former colonizers, systems that are often poorly suited to the African context. As a result, tax legislation in Africa does not support the effective implementation of property taxation policies. Additionally, Africa is known for its numerous land disputes related to property rights significantly hindering property tax revenue collection. We, therefore, investigate these issues in chapters 5 and 6.

Chapter 5: Internal Conflicts and the Moderating Role of Property Rights in Sub-Saharan Africa: Implications for Property Taxation

Analyzing and understanding the interaction of the factors that explain the low collection of property taxes in Africa is a nameless essential. This understanding prompts us to rethink political and institutional systems for protecting property rights, often sources of internal instability undermining favorable conditions for higher tax revenues. To achieve this, we utilize a sample comprising sub-Saharan African countries spanning the period from 1996 to 2019. The regressions employ the fixed effects estimator. The results remain robust when employing alternative estimators based on the Driscoll and Kraay method to generate estimates consistent with autocorrelation, heteroskedasticity, and endogeneity issues. Furthermore, they remain stable within the framework of reverse causality analysis, which addresses potential endogeneity between internal conflicts and property tax revenues.

Our empirical findings indicate that internal conflicts diminish property tax revenues, whereas more robust protection of property rights and higher government quality are associated with more significant property tax revenues. Specifically, in countries with strong property rights protection, the negative effect of internal instabilities on property tax revenues is less pronounced. Likewise, when governments excel in law enforcement, anti-corruption efforts, and bureaucratic quality, they are better equipped to safeguard property rights, mitigating the adverse effects of internal conflicts in property tax revenues. Furthermore, systems that effectively protect property rights and demonstrate efficiency in public actions can significantly attenuate the impact of internal conflicts on property tax revenues, resulting in minimal adverse effects in

these countries.

To address the challenges of increasing property taxes, African states must take urgent steps to reduce internal conflicts by adopting a comprehensive and multidimensional approach while addressing the underlying causes of conflict, aiming to consolidate peace and strengthen governance and institutions. Specifically, promoting inclusive governance structures that give all groups a voice in decision-making can help mitigate grievances and reduce the likelihood of conflict. In this regard, administrative decentralization can serve as a tool to promote power-sharing and inclusive political processes. States also need to strengthen the rule of law, promote accountable governance, and build effective and impartial institutions, which are essential. Additionally, initiatives favoring regional cooperation and integration can help resolve cross-border conflicts and promote peace and stability on the African continent. For instance, regional organizations such as the African Union (AU) for conflicts like the ongoing crisis between Rwanda and the Democratic Republic of Congo, as well as sub-regional bodies such as ECOWAS for countries like Mali, Niger, Burkina Faso, or Sierra Leone, must play a key role in conflict prevention, mediation, and peacekeeping efforts. Nevertheless, we acknowledge that governments must play a key role, particularly in establishing stronger protection of property rights on land and ensuring greater effectiveness in public action to moderate the consequences of internal conflicts for greater collection of property taxes.

Our analysis complements existing studies by highlighting the importance of institutional political systems in the link between property tax revenues and internal conflicts. However, it may be criticized for focusing extensively on the macro impacts of internal conflicts. Nevertheless, several insights can be gained by examining the micro dimension of conflicts. In this regard, by studying the impact of internal conflicts on property tax, it is possible to identify various types of conflicts (tribal, civil wars, ethnic, etc.), as well as their intensity and duration. Similarly, some countries have undertaken significant tax reforms that could influence the relationship between conflicts and property tax.

Chapter 6: Post Decolonization, Institutional Settings and property tax revenue mobilization in Sub-Saharan Africa (SSA): Lessons from former French colonies

In this study, we evaluate the persistent effect of colonial legacies, their impact on the current African institution indicators, and how their persistent effect impacts property tax revenue

mobilization in ex-French colonies compared to former British colonies over the period 1996-2019. Our findings reveal the persistent effect of colonial legacies in African property tax revenue mobilization through institutional variables. Moreover, the results highlight that, on average, former French colonies collect less property tax revenue than former British colonies. However, these results are contrary to those found by Young (2004) and Maseland (2018), who find the end of the impact of the colonial system effect in Africa. Indeed, their assertion could be true for other outcomes but not for property taxation. Thus, the main contribution of this chapter is to refresh the debate about the impact of colonial legacies in African tax revenue collection, with a specific focus on property taxation policies.

These results have significant implications concerning property tax management and warrant particular attention in African countries. Hence, we urge former African French colonies to review their tax legislation and adapt it to their current economic environmental context, in order to boost the level of their property tax revenue mobilization. In brief, these countries urgently need to modernize their property tax management systems.

Part I

Revisiting the main determinants of property tax revenues investigated in the literature

CHAPTER 2

Exploring the causal relationship between Property tax revenues, income inequality, and urbanization: A GMM Panel VAR Evidence

This chapter is a joint work with André Gbato, PhD (Laboratoire d'Economie de Poitiers, Poitiers)

2.1 Introduction

The relationship between property taxation, income inequality, and urbanization is a significant concern for both developed and developing countries. However, it is important to note that developing countries are most characterized by high-income inequality, poor property tax revenue, and a dynamic urbanization rate (Chambas et al., 2007; Awasthi, 2020; Sulemana et al., 2019).

As societies evolve and urbanize, with populations increasingly concentrated in cities, property taxation can serve as an additional source of funding for economies while playing an important role in reducing income inequality by financing public services. Similarly, property taxation can be used to address urban sprawl, which may result from the urbanization process.

In the current economic environment, domestic revenue mobilization, such as property taxation, is at the heart of many policy debates. Achieving the objective of boosting property tax revenue mobilization involves considering the impact of income inequality and urbanization. Conversely, property tax revenue could play an important role in income inequality and urbanization dynamics. Therefore, a strong interrelation exists between income inequality, urbanization, and property tax revenue. Specifically, a shock in one of these variables can substantially alter the patterns observed in the others.

Regarding the existing literature, some scholars argue that tax policy can be a potential instrument for achieving a government's redistributive goals and, therefore, reducing income inequality (Cabrera et al., 2015; Piketty and Saez, 2014; Chancel and Piketty, 2021; Doyle and Stiglitz, 2014). On the other hand, Norregaard (2013) highlights that tax policy, particularly property taxation, can be a source for answering the need for urbanization and *vice versa*. Likewise, in the literature, there is a controversial debate on the relationship between urbanization and income inequality (Sulemana et al., 2019; Liddle and Messinis, 2015; Robinson, 1976). In fact, while some studies investigate the influence of urbanization on income inequality, other studies examine the impact of income inequality on urbanization. However, the sense of causality has not been explicitly explored in all these studies.

Based on the discussion above, we assume a causal relationship between the triplet urbanization, income inequality, and property tax revenue. The concern is to know *which* variable causes *which* variable first. Specifically, we assume that a higher level of urbanization could

create a suitable environment for property tax collection and, therefore, contribute to putting in place some policies able to reduce income inequality. However, this idea could vary depending on the country's level of development. Indeed, the level of urbanization is highly correlated with the level of development (Liddle and Messinis, 2015). The more the country is developed, the more it becomes urbanized. In a nutshell, no order of causality between these three parameters is pre-established.

Another central question concerns the role of local governments in reducing inequalities and determining their effects on urbanization processes. In this context, adopting a strategy focused on strengthening local public resources and implementing an income-redistributive fiscal policy, based on a more efficient provision of public goods, has become crucial for reducing inequalities and achieving a stable path to development. However, local fiscal policies vary considerably between countries. Indeed, when in some countries, local governments have no fiscal autonomy, others have low tax rates, and others have progressive local taxes. In the same vein, in most developed countries, local governments play an important role in local taxes, including property taxes, and are responsible for funding essential public services. The choice of different local tax policies may result from the economic and political interests of different social groups. In this context, income inequality may be a determining factor in the choice of local tax policy. Moreover, local tax policies may influence the joint evolution of urbanization levels and inequalities.

In view of the aforementioned, political economy models that link income distribution and urbanization through fiscal policy need to be explored conjointly. These models suggest that political processes reflect the influence of citizens' preferences on fiscal policy decisions, while economic structures determine these policies' efficiency and equity effects. Despite the relevance of these models, no empirical studies have yet attempted to analyze the potential for a mutually influential causal relationship between the triplet income inequality, urbanization, and local taxation, mainly through the property taxation channel, as proposed in this chapter. Specifically, most existing empirical studies are based on separately estimated regressions.

This chapter aims to determine the dynamic link between property tax revenue, income inequality, and urbanization. To this end, it first analyzes the Granger-causality between income inequality, urbanization, and property tax revenue. Then, it assesses each variable's responses to the shocks encountered by the others. To this end, we use the Panel VAR approach based on

the generalized method of moments estimation (GMM) and impulse response function in 115 developing and developed countries from 2000 to 2018.

This chapter's contribution is, therefore, twofold. First, it identifies the effects of a variation in each of the variables on the others. The existing literature only examines the unidirectional relationship between these variables. Second, it enables us to target the policy to be implemented to help decision-makers construct effective policies by considering the interrelation between these variables.

The estimate based on Granger causality gives mixed results across developing and developed countries. When considering the total sample, the findings show a bidirectional causality between property tax revenue and income inequality. Specifically, income inequality has a negative effect on property tax revenues. Conversely, the results show that property tax revenues increase inequality. While they reveal a positive (unidirectional) effect of urbanization on property tax revenue. The study also highlights different causality depending on whether the country is developed or developing. Indeed, the findings show that there is a unidirectional positive causality between urbanization and property tax revenues when considering the sample of developing countries, whereas the bidirectional positive relationship between the two variables is found in the case of developed countries. We also find that there is a unidirectional negative causality between urbanization and income inequality, regardless of the country's level of development.

Finally, the impulse-response function gives instructive results. Specifically, on average, a 1% shock in urbanization leads to a peak of approximately 0.05 unit decrease in income inequality, while it leads to a peak of 0.04% increase in property tax revenue. Regarding the shock in income inequality, the findings indicate that, on average, a 1% shock in income inequality leads to a negative effect on urbanization over time. Likewise, the response of property tax revenue to a 1% shock in income inequality is negative and becomes flat after the third period. Also, the response of urbanization to a 1% shock of property tax revenue is positive and decreasing over time. Moreover, a 1% shock in property tax revenue leads to a peak increase of -0.02 in income inequality, with the effect stabilizing after approximately two years. However, the dynamic responses between these variables have some heterogeneities for developing and developed countries.

The rest of the chapter is structured as follows. Section 2.2 provides a brief overview of the background literature. The data and some stylized facts are presented in Section 2.3. Section 2.4

presents the methodology used. Section 2.5 reports and discusses the main results. Sections 2.6 and 2.7 investigate respectively the study case of developing and developed countries. Section 2.8 concludes the chapter.

2.2 Background literature

2.2.1 Urbanization and property taxation

The impact of urban property taxation on urbanization and development is a complex issue with mixed results. For instance, in the city of Pittsburgh, a significant increase in property tax rates led to a spectacular rise in construction activity during the 1980s, suggesting that property taxation can support urban development (Oates and Schwab, 1997). However, critics argue that property taxation can drive up land prices and offer only limited incentives for construction, raising doubts about its effectiveness in reducing housing costs and addressing wealth inequality. (Wyatt, 2013).

However, the relationship is not unidirectional. The effectiveness of property taxation is closely tied to the institutional capacity to collect taxes, which can be strengthened by urban development. In developed countries, where tax administrations are more robust, urbanization is often linked to an increase in property tax revenues due to more rigorous property assessments and a stable legal framework (Bird and Slack, 2004a; Awasthi, 2020).

Urbanization can also be seen as a phenomenon of population concentration in urban areas. From this perspective, urbanization can be associated with increased demand for public infrastructure, housing, and collective services. These needs create opportunities for governments to mobilize revenue through property taxation (Slack, 2011; Chambas et al., 2007). In developing countries, where tax systems are often weak, urbanization can encourage better management of property tax bases, particularly through the assessment and taxation of real estate (Bahl and Vazquez, 2008).

2.2.2 Urbanization and income inequality

Theoretical and empirical studies show that urbanization has complex effects on income inequality. Some studies argue that urbanization increases income inequality, while others argue that it has the opposite effect. Furthermore, some researchers highlight that the relationship

between urbanization and inequality is actually non-linear, evolving differently depending on the stages of the process. Kuznets (1955) suggests a bell-shaped curve, whereby initial urbanization tends to increase inequalities due to income differences between rural and urban sectors. However, as the urbanization process progresses, inequalities may decrease through the expansion of economic opportunities and improved redistribution mechanisms (Kanbur and Zhuang, 2013; Wang et al., 2023). Nonetheless, this effect can vary according to the level of development, the economic structure and local public policies.

In addition, urbanization can reduce inequalities by enhancing access to public services such as education, healthcare, and infrastructure. These redistributive effects, however, are contingent on the ability of local governments to finance these services through effective taxation, particularly property taxes (Sepulveda and Martinez-Vazquez, 2012).

Research on urbanization and income inequality reveals mitigate relationships. While some studies conclude that urbanization can reduce income inequality in the long term (Ha et al., 2019; Wan et al., 2022), others indicate a more nuanced impact. For example, He et al. (2016) observed an immediate mitigating effect of urbanization on income inequality in China, but also noted a delayed aggravating effect. Similarly, Kolomak (2020) identified a bell-shaped relationship between urbanization and income inequality indicators in Russia. The disparity between urban and rural areas is a significant factor in explaining inequality in less developed countries Wan et al. (2022). Factors such as secondary school enrolment rates and the share of agriculture in the economy can help reduce income inequality (Ha et al., 2019). These findings emphasize the need for comprehensive social reforms and well-managed urbanization to effectively address income inequality (Wan et al., 2022; He et al., 2016).

2.2.3 Property taxation and income inequality

Property taxation is considered progressive when land values are strongly linked to taxpayers income levels (Bahl and Vazquez, 2008). A well-designed property tax can thus contribute to reducing inequalities by mobilizing resources from wealthier landowners to finance public services that benefit the broader population (Akgun et al., 2017). In the case of China, Kang et al. (2024) show that the property tax pilot program has played a role in reducing housing wealth inequality. Their findings underscore the redistributive potential of property taxes when effectively implemented.

However, the reality is often more complex. In many contexts, property assessments are biased or undervalued for the wealthiest landowners, limiting the redistributive potential of this tax (Norregaard, 2013). Furthermore, in certain cases, property taxes can exacerbate inequalities if applied uniformly in contexts where income levels vary significantly across social groups.

2.3 Data and stylized facts

2.3.1 Data sources

Income inequality (gini) is captured by the Gini index from UNU-WIDER, 2021, namely WIID (World Income Inequality Database). The Gini index is the most widely used measure of income inequality in a country and can, therefore, be used to compare income inequality between countries. Moreover, the WIID data are mainly used in several relevant literature to capture income inequality (Sulemana et al., 2019; Jenkins, 2015; David et al., 2023). Urbanization (urb) is from World Development Indicators (WDI) and reflects the percentage of people living in urban cities (Oyvat, 2016; Qiao et al., 2019).

Property tax revenue (hereafter Ptax) represents the aggregate value of property tax revenue by year in one country derived from the International Monetary Fund (IMF) database. For the analysis, annual data on 70 developing and 45 developed countries were collected from 2000 to 2018,[1] and the natural logarithms of these variables used to linearize the data. Recall that the idea behind this chapter is that there may be a mutual causality between income inequality, urbanization, and property tax revenues. Table 2.1 below presents the descriptive statistics of these variables.

Table 2.1: Dataset summary statistics

Variables	N	Mean	Std.Dev	Min	Max
Income inequality	1,981	0.386	0.0938	0.223	0.659
Urbanization	1,981	61.47	20.91	13.40	100
Property tax revenue	1,886	0.942	1.074	5.35e-07	17.22

[1]The complete list of countries in the sample used in this chapter is available in Table A3 in the appendix.

2.3.2 Stylized facts

This subsection provides an initial overview of the data distribution. Figure 2.1 illustrates distinct patterns across income categories. For instance, High-income countries exhibit lower levels of income inequality compared to other income groups. At the same time, they are marked by the highest levels of property tax revenue and urbanization rates (see Figure 2.2 and 2.3). In contrast, the figures reveal that low-income countries experience greater income inequality while having the lowest levels of property tax revenue and urbanization rates, as shown in the Figures 2.1, 2.2 and 2.3.

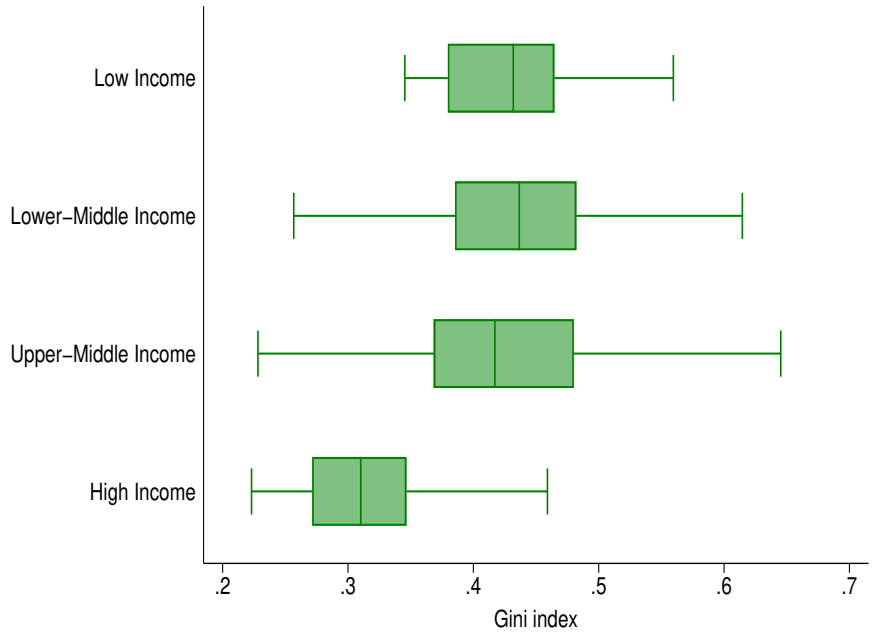

Figure 2.1: Gini distribution

Next, to examine the relationships between these variables, we present scatter plots in Figure 2.4. The plots reveal a positive correlation between property tax revenue and urbanization, a negative correlation between income inequality and property tax revenue, and a negative correlation between urbanization and income inequality. We find the same correlations when we divide our sample into developed and developing countries (see Figures A1 and A2 in the appendix).

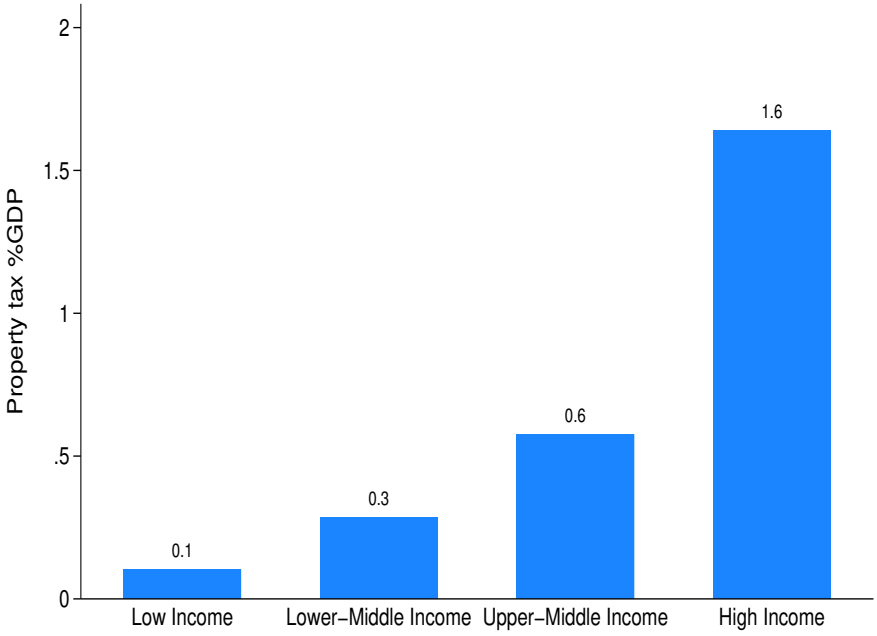

Figure 2.2: Property tax revenue distribution by income level

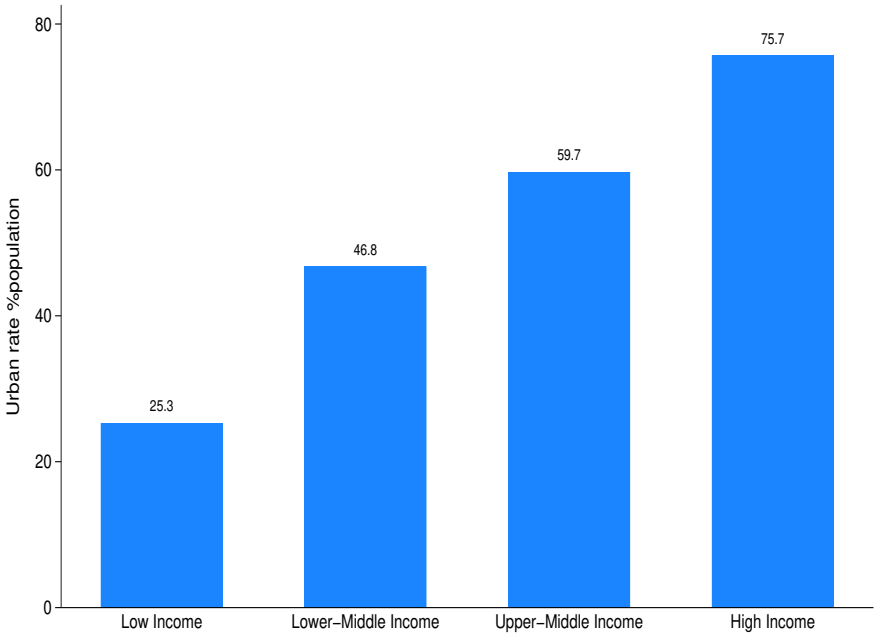

Figure 2.3: Urbanization distribution by income level

2.4 Methodology

Studying the interconnection between property tax revenues, income inequality, and urbanization raises questions about the endogeneity process within these variables. To address this

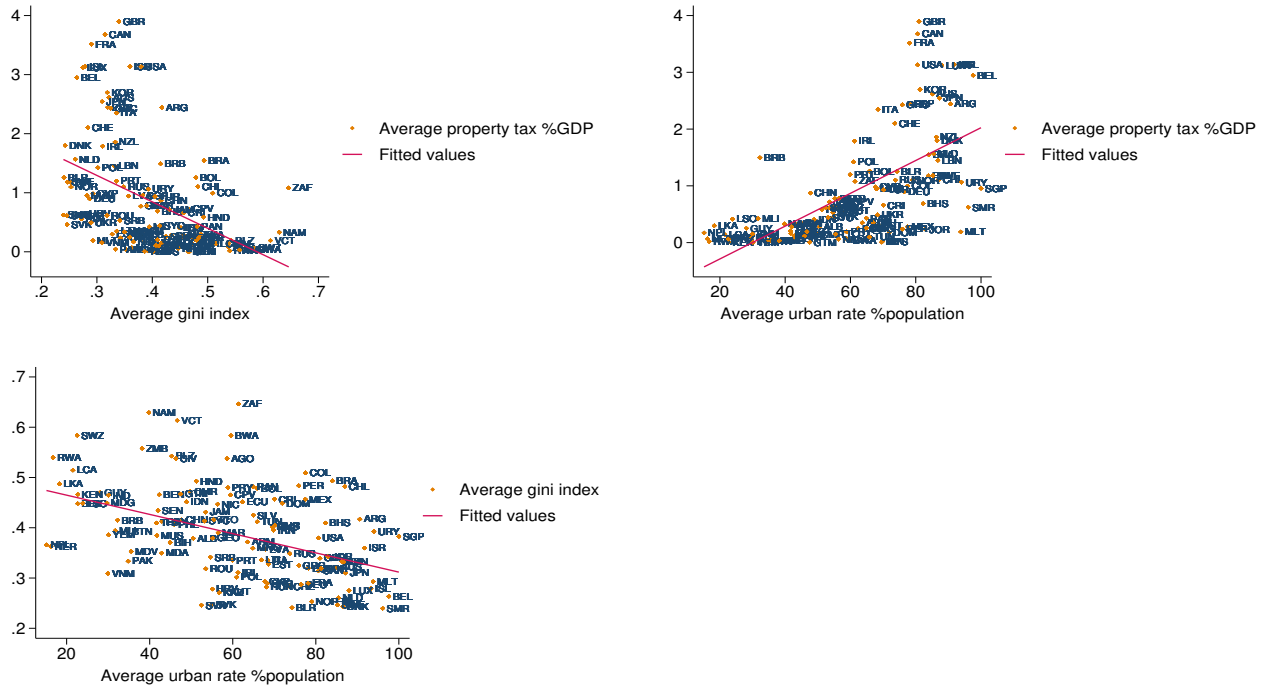

Figure 2.4: Correlation between urbanization, property tax revenue, and income inequality

issue, several econometric methodologies have been proposed. In particular, the econometric literature suggests using a panel VAR approach, introduced first by Sims (1980), to account for potential reverse causality between these variables.

In this study, the bivariate PVAR model based on GMM/IV is estimated following Abrigo and Love (2016) and Head et al. (2014). A Panel Vector Autoregressive Model (PVAR) is used intensively as an alternative to multivariate simultaneous equation models. This model allows us to determine the causal relationship between several variables. Indeed, it helps to identify any bidirectional/unidirectional causality between the variables of interest. Moreover, this particular model discloses both the direct and indirect impacts, if any, that property tax revenues might have on income inequality and urbanization. Also, the sense of causality between income inequality and urbanization can be analyzed through the PVAR model.

Specifically, to conduct this methodology, we followed the model developed by Abrigo and Love (2016), which proposed an interesting *stata* model to overcome the deficiencies encountered by previous studies limited to determining Granger causality sense only. Indeed, their model facilitates the investigation of unidirectional/bidirectional causality between several variables and gives an idea of the sign of the different coefficients. Moreover, the PVAR model is based

on the GMM estimator, which allows us to control for unobserved individual heterogeneity and deal with the variables' endogeneity by computing lagged regressors as instruments. Similarly, this model is appropriate because it does not make a priori restrictions on the exogeneity and endogeneity of the variables.

To determine whether a long-term relationship exists between property tax revenue, income inequality, and urbanization, the first step consists of studying the stationarity of the variables. In fact, the GMM estimator suffers from weak instrument problems when the variables contain unit roots. We overcome this problem by addressing the unit root test to avoid fallacious results. Then, we perform the cointegration test to ensure the existence of long run relationship between the variables. After this step, we perform the lag order selection test to determine the optimal number of lags to include in the dynamic system. Afterward, we execute the Granger causality test and the robustness of the GMM PVAR estimates by examining the eigenvalue stability condition. Finally, if the model is stable, we realize the impulse-response function (IRFs) to explore the dynamic response of an exogenous shock on the variables (Abrigo and Love, 2016). The reduced form of the dynamic PVAR model can be expressed as follows based on a model developed by Abrigo and Love (2016) and used by Gaies and Jahmane (2022):

$$Y_{ct} = Y_{c_{t-1}}A_1 + Y_{c_{t-2}}A_2 + ... + Y_{c_{t-p+1}}A_{p_{-1}} + Y_{c_{t-p}}A_p + X_{it}B + \mu_c + \epsilon_{ct} \tag{2.1}$$

$c \in \{1, 2, ..., N\}, t \in \{1, 2, ..., T\}$.

Y_{ct} is a $(1 \times k)$ vector of dependent variables, and X_{ct} is $(1 \times l)$ vector of exogenous covariates. μ_c is $(1 \times k)$ vectors of dependent variable-specific panel fixed-effects, and ϵ_{ct} is $(1 \times k)$ idiosyncratic errors. The parameters computed by the equation-by-equation GMM estimation are included in the $(k \times k)$ matrices $(A_1, A_2, ..., A_{p_{-1}}, A_p)$ and the $(l \times k)$ matrix B. In this model, the term of error has the following characteristics: $E[\epsilon_{ct}] = 0$, $E[\epsilon'_{ct}\epsilon_{ct}] = \Sigma$, and $E[\epsilon_{ct}\epsilon_{cs}] = 0$ when $t > s$.

2.5 Discussion of the results

2.5.1 Unit root testing

The first step of this analysis is to determine the order of integration of the variables. To do so, unit root tests on each variable were performed to explore their stationarity.[2] Table 2.2 indicates that all the variables are stationary at level I(0). In fact, the null hypothesis of the presence of unit roots is rejected for the different variables.

Table 2.2: Test of Stationarity (Fisher-Type Unit Root/Phillips–Perron Tests)

Unit-root test for ln_Ptax	Statistic	P-value
Inverse chi-squared(218) P	560.8364	0.0000
Inverse normal Z	-13.4873	0.0000
Inverse logit t(549) L*	-13.6349	0.0000
Modified inv. chi-squared Pm	16.4189	0.0000
Unit-root test for ln_gini	Statistic	P-value
Inverse chi-squared(222) P	534.7495	0.0000
Inverse normal Z	-12.0392	0.0000
Inverse logit t(559) L*	-12.2058	0.0000
Modified inv. chi-squared Pm	14.8424	0.0000
Unit-root test for ln_urb	Statistic	P-Value
Inverse chi-squared(220) P	525.1162	0.0000
Inverse normal Z	-8.6052	0.0000
Inverse logit t(554) L*	-9.3067	0.0000
Modified inv. chi-squared Pm	14.5458	0.0000

Note: H0: All panels contain unit roots; HA: panel is stationary

2.5.2 Cointegration tests

Table 2.3 presents the results of the cointegration analysis between property tax revenue, income inequality, and urbanization, using the Kao, Pedroni, and Westerlund cointegration tests. The findings confirm the presence of cointegration among the variables. This allows us to estimate the long-run relationships while simultaneously examining the short-term dynamics of the variables under study.

[2]Note that by taking a series in its raw form; we have very little chance of it being stationary. We, therefore, use the logarithmic transformation of our variables to avoid the problem of a series having a dispersion that varies over time.

Table 2.3: Cointegration test

	t-Statistic	P-value
Kao Cointegration test		
Dickey–Fuller t	-6,94	0.0000
Augmented Dickey–Fuller t	-4,58	0.0000
Pedroni Cointegration test		
Phillips–Perron t	-9,77	0.0000
Augmented Dickey–Fuller t	-1,13E+15	0.0000
westerlund Cointegration test		
Variance ratio	-6,61	0.0000

H0: No cointegration
Ha: All panels are cointegrated

2.5.3 Determination of the number of lags

We selected the number of lags based on the lag value with the smallest value of MBIC, MAIC, and MQIC (see Table 2.4). Based on this principle, we retain the first-order lag. However, it is good to highlight that the best criteria among the three is the MBIC (Gaies and Jahmane, 2022; Saidane and Abdallah, 2021). Likewise, another way to select the number of lags is to look at the Hansen statistic (J-statistic). Regarding the different values of this statistic, we find that the first lag has a greater value than other associated values. Therefore, these results confirm that the first-order panel VAR model is more stable using the GMM estimations.

Table 2.4: Number of lag determination

Lag	CD	J	J pvalue	MBIC	MAIC	MQIC
1	.9999999	38.02728	.0774318	-155.6903	-15.97272	-68.3832
2	1	23.66789	.1662121	-105.4771	-12.33211	-47.27243
3	.9999988	3.302376	.9930065	-82.79432	-20.69762	-43.99117
4	.9999983	.8167491	.991617	-42.2316	-11.18325	-22.83002

Note: MBIC=Moments of Bayesian Information Criteria;
MAIC=Moements of Akaike Information Criteria;
MQIC=Moments of Hannan-Quin Information Criteria.

2.5.4 PVAR Coefficients estimation

Table 2.5 presents the results of the PVAR coefficients using GMM estimations. The results indicate that income inequality negatively influences property tax revenues. This result implies that one percent increase in income inequality reduces property tax revenue to around 2,1%. This finding can be explained by the fact that countries characterized by lower income inequality

are more likely to recover more property tax revenue than those characterized by a high level of income inequality (Doyle and Stiglitz, 2014). Similarly, we find paradoxically a positive impact of property tax revenues on income inequality. These findings indicate that property tax revenue increases income inequality. One explanation for this could be that property taxes add to the tax burden borne by the poorest households. Indeed, an increase in property tax rates can significantly impact housing costs, making it more difficult for low-income households to access housing. Likewise, higher costs can exacerbate inequalities by driving low-income individuals towards precarious neighborhoods with few public services. To this end, some countries have undertaken initiatives to remove some of the components of this tax, as is the case in France with the deletion of the *habitation tax*. In a nutshell, the results show a bidirectional association between income inequality and property tax revenues.

On the other hand, the results indicate a positive impact of urbanization on property tax revenues. These results confirm the idea that urbanization constitutes a good determinant to explain property tax revenue mobilization (Chambas et al., 2007; Awasthi, 2020). Conversely, the results highlight a positive and insignificant impact of property tax revenue on urbanization, implying the unidirectional causality from urbanization to property tax revenues.

Regarding the relationship between urbanization and income inequality, we find a unidirectional association. The results reveal that urbanization reduces income inequality by offering more opportunities in terms of access to work and relatively high salaries, consistent with Wu and Rao (2017).

Table 2.5: pVAR coefficients.

Variables	ln_Ptax	ln_gini	ln_urb
ln_Ptax (t-1)	-0.126	0.001*	0.000
	(0.092)	(0.000)	(0.000)
ln_gini (t-1)	-2.109**	0.049*	-0.000
	(0.891)	(0.029)	(0.003)
ln_urb (t-1)	2.635**	-0.370***	0.962***
	(1.028)	(0.038)	(0.006)
Observations	1,652	1,652	1,652

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Instruments : L(1/2).(ln_tax ln_gini ln_u)

2.5.5 Granger causality result

To validate the results obtained with the PVAR coefficients, we analyze in Table 2.6 the Granger causality estimation. The results indicate that urbanization contributes significantly to property tax revenues mobilization and *not vice versa* (unidirectional relationship), confirming the results obtained previously that urbanization positively affects property tax revenues. We also find a bidirectional association between property tax revenue and income inequality, as in the case of the PVAR coefficient estimation. Finally, the results show that there is a unidirectional relationship between income inequality and urbanization (Urbanization ⇒ income inequality). On the whole, the findings are consistent with those obtained in Table 2.5.

Table 2.6: Granger causality

Equation	Excluded	Chi-square	df	prob
ln_Ptax				
	ln_gini	5.609	1	0.018
	ln_urb	6.565	1	0.010
	ALL	21.989	2	0.000
ln_gini				
	ln_Ptax	3.771	1	0.052
	ln_urb	96.481	1	0.000
	ALL	99.809	2	0.000
ln_urb				
	ln_Ptax	0.580	1	0.446
	ln_gini	0.002	1	0.967
	ALL	0.585	2	0.747

Ho: Excluded variable does not Granger-cause Equation variable;
Ha: Excluded variable Granger-causes Equation variable

2.5.6 Validity of the model

To verify the stability of our findings, Abrigo and Love (2016) proposed to analyze the eigenvalues stability conditions and the roots of the companion matrix. In this regard, Table 2.7 presents the different results of modulus statistics that should be lower than 1 to validate the stability of PVAR coefficients and Granger causality results.

The results reveal that all modulus values are lower than 1, reflecting the validity of the stability conditions of eigenvalues. Moreover, Figure 2.5 shows that all the eigenvalues are inside the unit

Table 2.7: Eigenvalue Stability Condition Table

Eigenvalue		
Real	Imaginary	Modulus
.9623493	0.0000	.9623493
-.1128781	0.0000	.1128781
.0357628	0.0000	.0357628

Note: ALL the eigenvalues lie inside the unit circle
PVAR satisfies the stability condition.

circle, which also satisfies the stability conditions through panel VAR for the selected variables (Kilian, 2006; Hamilton, 1994; Abrigo and Love, 2016; Akbar et al., 2021). Stability implies that the panel VAR is invertible and has a vector moving average (VMA) representation of infinite order. Therefore, it will be possible to assess the impulse response functions (IRFs).

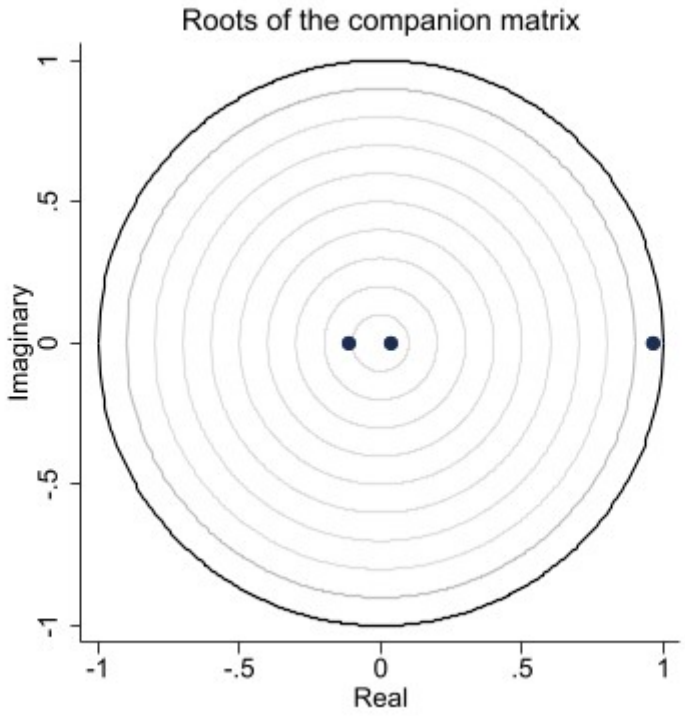

Figure 2.5: Roots of the companion matrix

2.5.7 Impulse-response functions

Because the PVAR model is stable, we can now estimate the impulse-response functions (IRFs). The impulse-response function shows that by adding a standard deviation to a variable,

the IRF estimates generate an impressive effect on the other variables (Mora and Logan, 2012). IRF confidence intervals are calculated using 200 Monte Carlo draws based on the estimated model. Figure 2.6 below presents the results of IRFs estimation.

We find that income inequality's response to a 1% shock in urbanization is negative and leads to a peak of approximately -0.05. Meanwhile, a 1% shock in urbanization leads to a peak of 0.04% increase in property tax revenue and remains positive over time.

Regarding the shock to income inequality, the findings indicate that, on average, a 1% shock in income inequality has a negative effect on urbanization over time. Likewise, property tax revenue's response to a 1% shock in income inequality is negative and becomes flat after the third year and near 0.

The response of urbanization to a 1% shock of property tax revenue is positive and decreasing over time. Moreover, a 1% shock in property tax revenue leads to a peak of approximately -0.02 unit increase in income inequality and becomes flat near 0 after approximately three years.

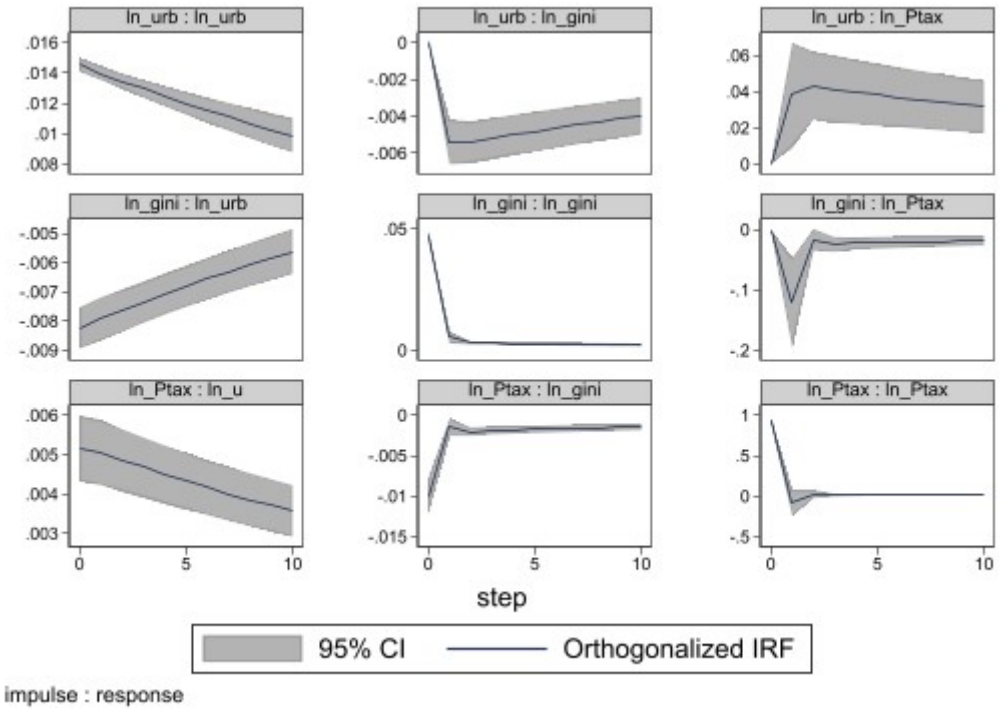

Figure 2.6: Impulse-Response: All sample

2.6 The case of developing countries

2.6.1 Determination of the number of lags

Table 2.8 below shows that the optimal lag number for the GMM PVAR estimates is *1*.

Table 2.8: Lag selection criteria for the developing countries

Lag	CD	J	J pvalue	MBIC	MAIC	MQIC
1	.9999999	35.10835	.1361425	-142.6437	-18.89165	-66.6575
2	.9999998	27.68603	.0669967	-90.81534	-8.313974	-40.15787
3	.9999985	18.54703	.1000621	-60.45388	-5.452968	-26.68223
4	.9999977	.0904922	.9999851	-39.40996	-11.90951	-22.52414

Note: MBIC=Moments of Bayesian Information Criteria;
MAIC=Moements of Akaike Information Criteria;
MQIC=Moments of Hannan-Quin Information Criteria.

2.6.2 PVAR Coefficients estimation: developing countries

Table 2.9 indicates the results of PVAR coefficients in the case of developing countries. The findings show that urbanization affects positively property tax revenue and negatively income inequality as in the case of the full sample. In recent years, developing countries have experienced significant urban growth and an increase in building construction, which has expanded the taxable property base. This expansion could explain the observed positive relationship between urbanization and property tax revenues. Likewise, with urbanization, certain populations (including those living in poverty) can see their income increase, thereby reducing income inequalities ceteris paribus (Jones and Koné, 1996; Adams and Klobodu, 2019). However, contrary to the previous case, we find an insignificant effect of property tax revenue on income inequality and an insignificant effect of income inequality on property tax revenues.

2.6.3 Granger causality result

Table 2.10 presents the Granger causality result and confirms the result obtained with PVAR coefficients estimation. In a nutshell, urbanization Granger causes property tax revenue and income inequality (unilateral causality).

Table 2.9: PVAR coefficients for the developing countries

Variables	ln_Ptax	ln_gini	ln_urb
ln_Ptax (t-1)	-0.279***	0.001	-0.000
	(0.096)	(0.001)	(0.000)
ln_gini (t-1)	0.407	0.103***	-0.001
	(1.637)	(0.037)	(0.005)
ln_urb (t-1)	3.014*	-0.303***	0.951***
	(1.797)	(0.055)	(0.009)
Observations	936	936	936

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Instruments : l(1/2).(ln_Ptax ln_gini ln_urb)

Table 2.10: Granger causality for the Developing countries

Equation	Excluded	Chi-square	df	prob
ln_Ptax				
	ln_gini	0.062	1	0.804
	ln_urb	2.814	1	0.093
	ALL	3.258	2	0.196
ln_gini				
	ln_Ptax	1.115	1	0.291
	ln_urb	30.243	1	0.000
	ALL	31.119	2	0.000
ln_urb				
	ln_Ptax	0.570	1	0.450
	ln_gini	0.026	1	0.871
	ALL	0.585	2	0.746

Ho: Excluded variable does not Granger-causes Equation variable;
Ha: Excluded variable Granger-causes Equation variable

2.6.4 Validity of the model

The PVAR model in the case of developing countries is stable because all the modulus are smaller than one (see Table 2.11). Moreover, Figure 2.7 shows that the model is stable as the roots of the companion matrix are all inside the unit circle.

Table 2.11: Eigenvalue Stability Condition Table for the Developing countries

Eigenvalue		
Real	Imaginary	Modulus
.9507332	0.0000	.9507332
-.2796755	0.0000	.2796755
.1032905	0.0000	.1032905

Note: ALL the eigenvalues lie inside the unit circle
PVAR satisfies the stability condition.

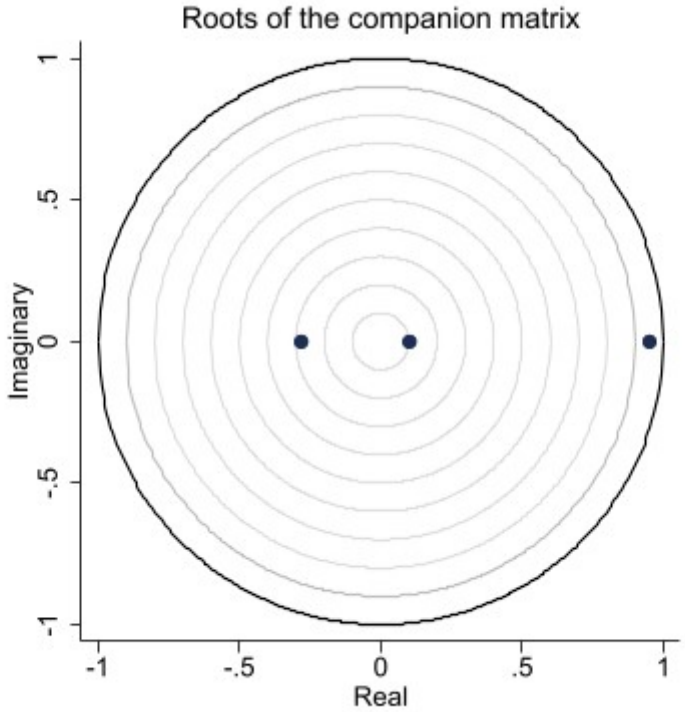

Figure 2.7: Unit circle stability test for the Developing countries.

2.6.5 Impulse-response functions

The impulse response function indicates that a 1% shock in urbanization results in a maximum decrease of 0.04 units in income inequality. This negative effect persists over five years, although a gradual increase begins from the third year onwards (see Figure 2.8). However, it has a positive impact on property tax revenue and leads to a peak of approximately 0.05%. Moreover, a 1% shock in income inequality leads to a negative effect on urbanization and a relatively non-effect on property tax revenues.

A 1% shock in property tax revenue leads to a positive effect on urbanization but this effect

decreases over time. Finally, a 1% shock in property tax revenue leads to a peak of -0.004 unit increase in income inequality, which remains flat near 0 after approximately three years.

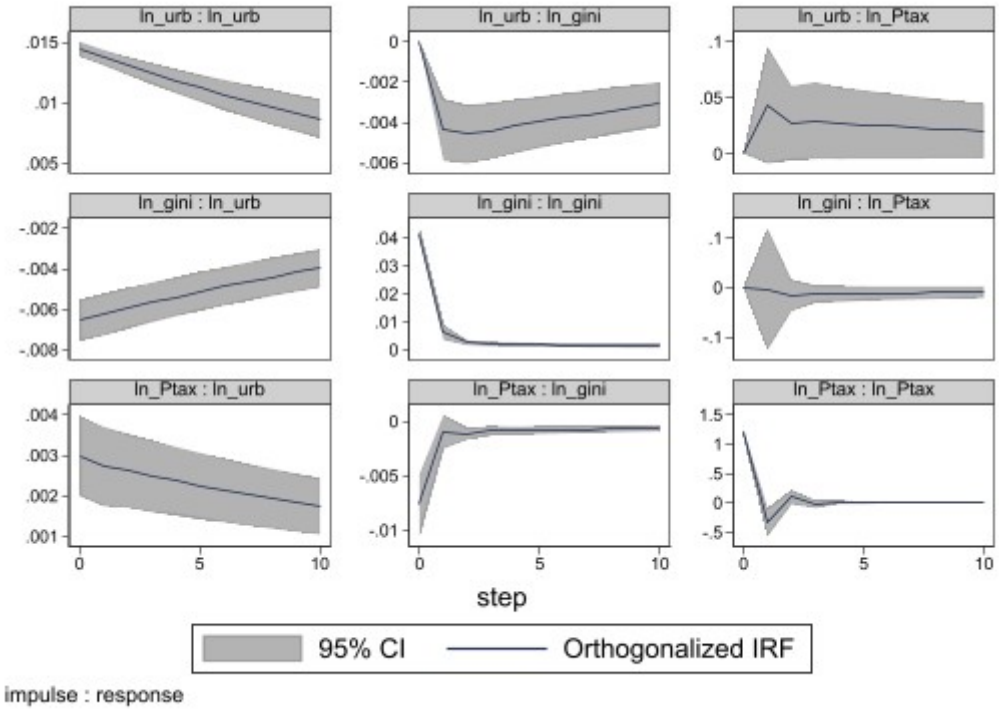

Figure 2.8: Impulse-Response: Developing countries

2.7 The case of developed countries

2.7.1 Determination of the number of lags

Here, we note a non-convergence between the different criteria (MBIC, MAIC, MQIC). In this vein, we selected the number of lags based on the MBIC criteria, as explained previously. Thus, we retain the first lag for to estimate GMM PVAR coefficients (see Table 2.12).

2.7.2 PVAR Coefficients estimation

Table 2.13 reveals that in the case of developed countries, urbanization reduces income inequality and promotes property tax revenue. Likewise, we find that, contrarily to developing countries, property tax revenue promotes urbanization. This positive impact of property tax revenue on urbanization is explained by the fact that developed countries have a better structure

Table 2.12: Lag selection criteria: Developed countries

Lag	CD	J	J pvalue	MBIC	MAIC	MQIC
1	1	60.03503	.000261	-111.906	6.035027	-39.93597
2	1	30.13776	.0361285	-84.4896	-5.862235	-36.50957
3	.9999997	.0059882	1	-76.41226	-23.99401	-44.42557
4	.9999722	.0012196	1	- 38.2079	-11.99878	-22.21456

Note: MBIC=Moments of Bayesian Information Criteria;
MAIC=Moements of Akaike Information Criteria;
MQIC=Moments of Hannan-Quin Information Criteria.

of property tax management. Moreover, this tax helps local authorities in the funding of their urbanization policies in these countries.

Table 2.13: pVAR coefficients: developed countries

Variables	ln_Ptax	ln_gini	ln_urb
ln_Ptax (t-1)	-0.156	-0.001	0.001***
	(0.102)	(0.002)	(0.000)
ln_gini (t-1)	-0.011	-0.009	-0.001
	(0.388)	(0.042)	(0.005)
ln_urb (t-1)	3.561***	-0.451***	0.972***
	(0.536)	(0.048)	(0.003)
Observations	716	716	716

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Instruments : l(1/2).(ln_Ptax ln_gini ln_urb)

2.7.3 Granger causality result

Regarding the Granger-causality result in Table 2.14 below, the results confirm a bidirectional relationship between urbanization and property tax revenues, where urbanization Granger-causes property tax revenues and vice versa. In addition, the results indicate that urbanization Granger-causes income inequality.

2.7.4 Validity of the model

The PVAR model is stable because all the modulus are smaller than one (see Table 2.15). Moreover, the roots of the companion matrix are all inside the unit circle (see Figure 2.9), confirming the stability of the model.

Table 2.14: Granger causality: Developed countries

Equation	Excluded	Chi-square	df	prob
ln_Ptax				
	ln_gini	0.001	1	0.978
	ln_urb	44.101	1	0.000
	ALL	147.359	2	0.000
ln_gini				
	ln_Ptax	0.481	1	0.488
	ln_urb	89.884	1	0.000
	ALL	90.209	2	0.000
ln_urb				
	ln_Ptax	6.812	1	0.009
	ln_gini	0.054	1	0.816
	ALL	7.156	2	0.028

Ho: Excluded variable does not Granger-cause Equation variable;
Ha: Excluded variable Granger-causes Equation variable

Table 2.15: Eigenvalue Stability Condition Table: Developed countries

Eigenvalue		
Real	Imaginary	Modulus
.974714	0.0000	.974714
-.1578801	0.0000	.1578801
-.0092353	0.0000	.0092353

Note: ALL the eigenvalues lie inside the unit circle
PVAR satisfies the stability condition.

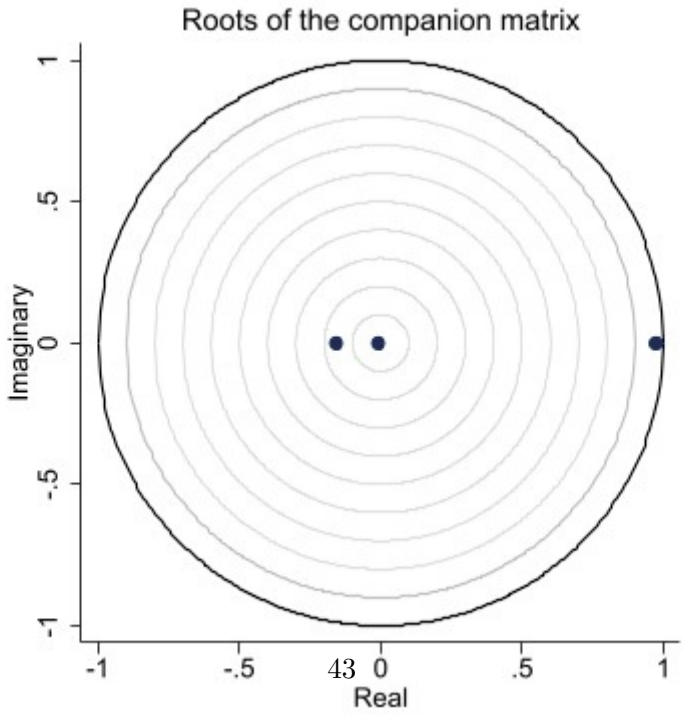

Figure 2.9: Unit circle stability test: Developed countries

2.7.5 Impulse-response functions

The impulse response function (IRFs) suggests that, on average, urbanization positively impacts property tax revenues (see Figure 2.10). Specifically, a 1% shock in urbanization leads to a peak increase of 0.08% in property tax revenues, which then decreases and stabilizes around 0.05% after approximately the third period. While it harms income inequality and reaches its peak at 0.06. In addition, a 1% shock in property tax revenue leads to a peak of approximately 0.01% increase in urbanization. Nevertheless, this positive impact decreased slowly after the second year.

Likewise, we note that 1% shock in property tax revenue leads to a peak of -0.05 increase in income inequality and becomes flat near 0 after the third year. Finally, a 1% shock in income inequality leads to a peak 0.066% decrease in urbanization and increases over time after this peak. Moreover, a 1% shock in income inequality leads to a peak 1% increase in property tax revenue. However, it's useful to mention that this effect on property tax revenues diminishes after reaching the peak and stabilizes near 0 after the third period.

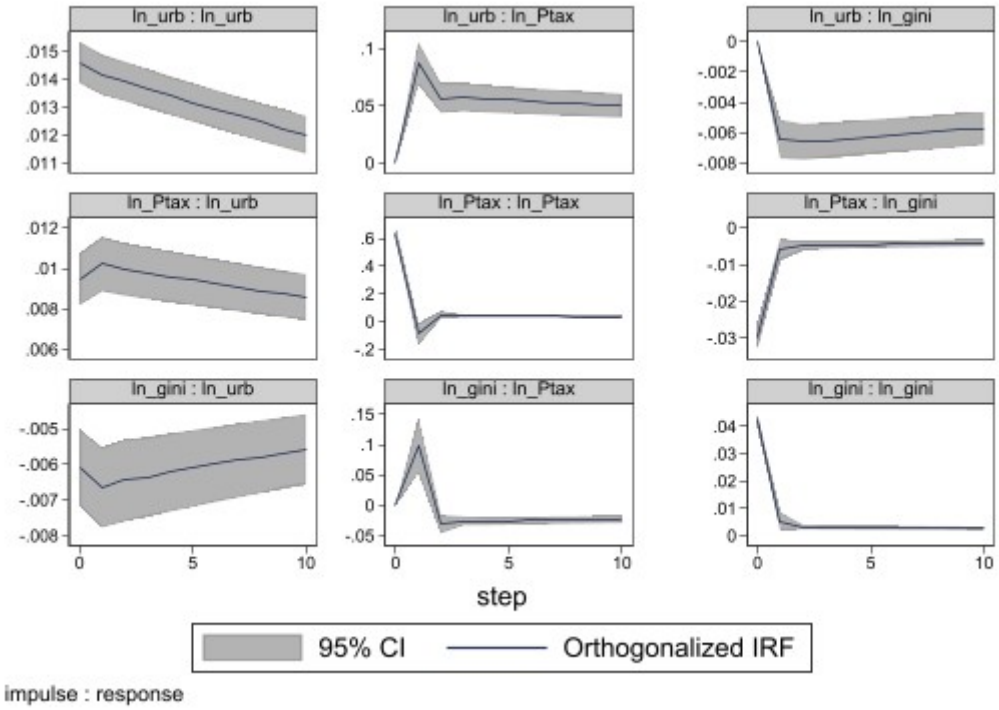

Figure 2.10: Impulse-Response: Developed countries

2.8 Conclusion

Using data from 115 developing and developed countries covering the period from 2000 to 2018, our study investigated the causal relationship between triplet property tax revenues, income inequality, and urbanization. The regression is estimated using the generalized method of the moment panel vector autoregressive method developed by Abrigo and Love (2016).

Our findings show that a causal relationship exists between these three variables. Specifically, when we consider the full sample (developing and developed countries), the results indicate a bidirectional relationship between income inequality and property tax revenue and urbanization's positive and significant impact on property tax revenue (unidirectional causality). In more detail, these findings show that income inequality reduces property tax revenues while property taxation, in turn, worsens income inequality. In addition, the results indicate that urbanization reduces income inequality (unidirectional causality). In the case of developing countries, urbanization not only reduces income inequality but also increases property tax revenues.

Finally, when we consider the case of developed countries, our findings prove that there is a bidirectional positive Granger causality between urbanization and property tax revenue. Simultaneously, we note the negative impact of urbanization on income inequality (unidirectional causality).

Table A1 in the appendix summarizes the different results. In conclusion, this chapter highlights that urbanization not only promotes property tax revenue mobilization but also reduces income inequality. Regarding economic policy implications, governments can modernize property tax assessments to accurately reflect the rise in real estate values associated with increasing urbanization. Additionally, policymakers should focus on effectively managing urban expansion so that the economic benefits of urbanization are shared broadly across all citizens and not just concentrated in wealthy urban areas. Lastly, property taxes could be more progressive, meaning that higher-value properties in urban centers would contribute proportionally more to tax revenues. This final measure can help to reduce income inequality. Although this study provides instructive results, it is essentially very empirical. Therefore, it would be interesting for future studies to theoretically discuss the link between the triplet income inequality, urbanization, and property tax revenues.

Appendix

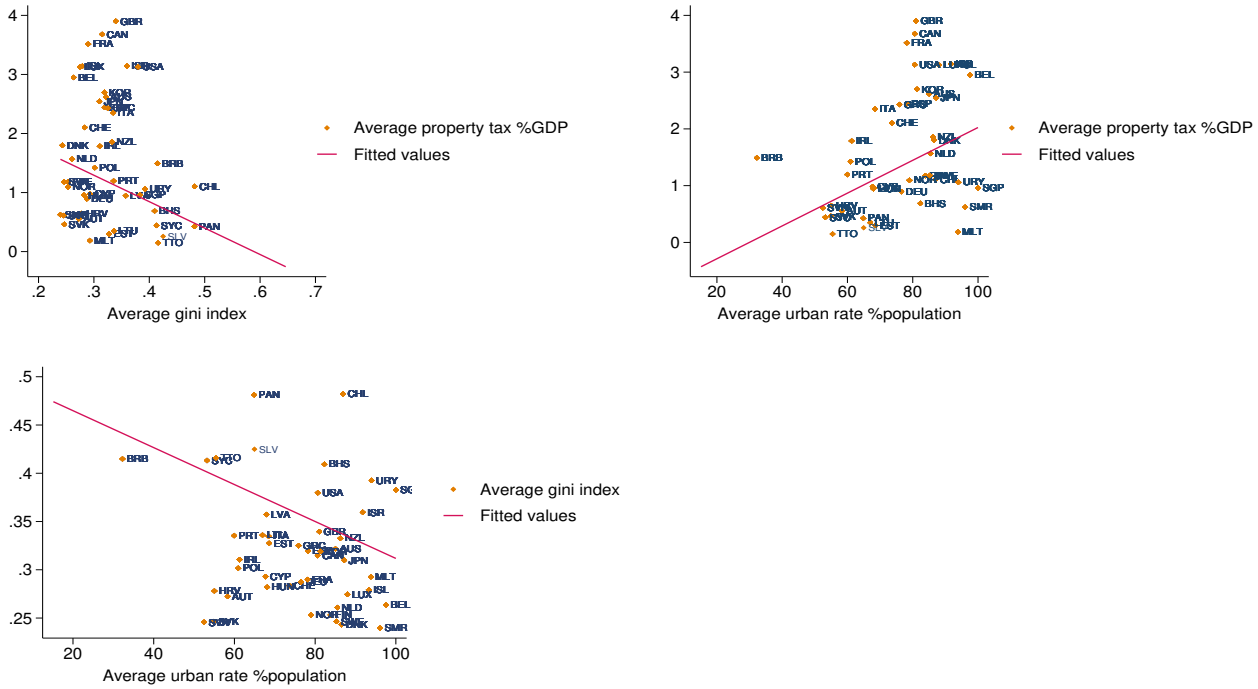

Figure A1: Correlation between urbanization, property tax revenue, and income inequality (Developed countries)

Table A1: Summary of the Granger causality results

	Full sample	Developing countries	Developed countries
Model 1			
Income inequality Granger-causes property tax revenue	Yes [-]	No	No
Urbanization Granger-causes property tax revenue	Yes [+]	Yes [+]	Yes [+]
Model 2			
Property tax revenue Granger-causes income inequality	Yes [+]	No	No
Urbanization Granger-causes income inequality	Yes [-]	Yes [-]	Yes [-]
Model 3			
Property tax revenue Granger-causes urbanization	No	No	Yes [+]
Income inequality Granger-causes urbanization	No	No	No

Note: In hooks [.], we give the sign of the PVAR GMM coefficients estimation.

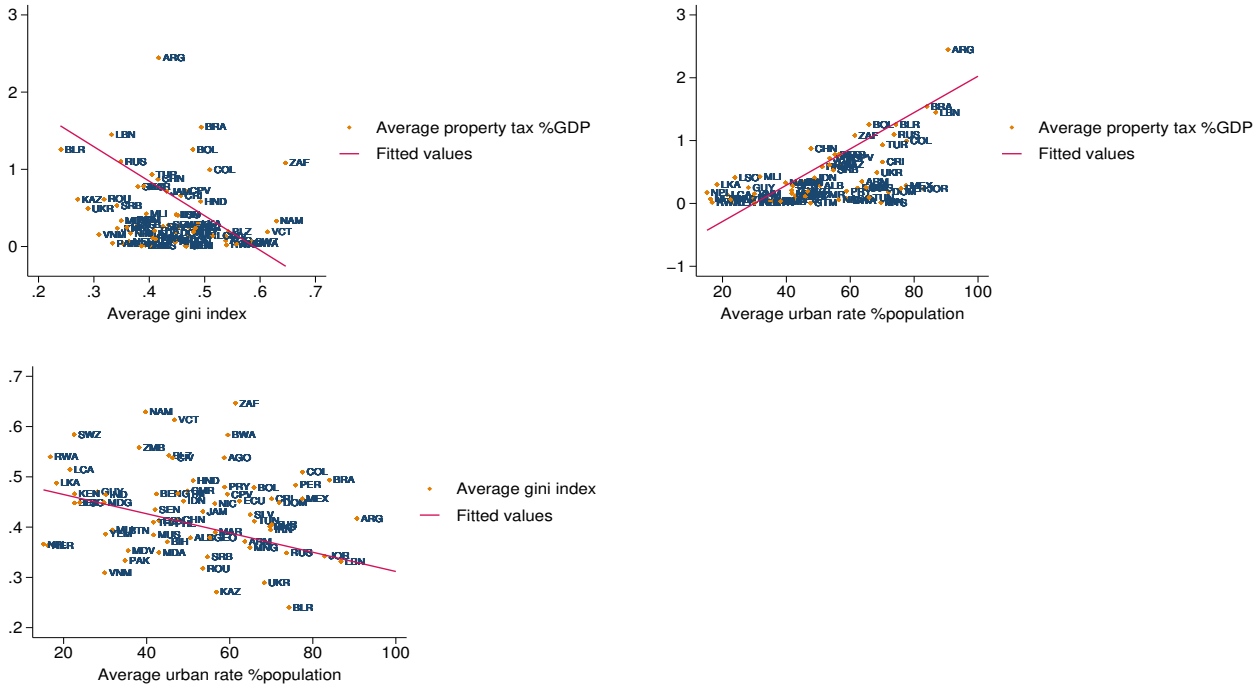

Figure A2: Correlation between urbanization, property tax revenue, and income inequality (Developing countries)

Table A2: Description of variables, and sources.

Variables	Description	Sources
Income inequality	Income inequality is approximated by GINI idex.	World Income Inequality Database (WIID)
Urbanization	Urban population refers to people living in urban areas as defined by national statistical offices. Percentages urban are the numbers of persons residing in an area defined as "urban" per 100 total population.	World development Indicators (WDI)
Property tax revenues	Total property tax revenues.	International Monetary Fund (IMF)

Table A3: List of countries

Armenia	Colombia	Iceland	Maldives	Poland	Trinidad and Tobago
Australia	Costa Rica	India	Mali	Portugal	Tunisia
Austria	Cote d'Ivoire	Indonesia	Malta	Romania	Turkey
Bahamas	Croatia	Iran	Mauritius	Russia	Ukraine
Barbados	Cyprus	Ireland	Mexico	Rwanda	United Kingdom
Belarus	Denmark	Israel	Moldova	San Marino	United States
Belgium	Dominican Republic	Italy	Mongolia	Senegal	Uruguay
Belize	Ecuador	Jamaica	Morocco	Serbia	Vietnam
Benin	Egypt	Japan	Namibia	Seychelles	Vincent and Grenadines
Bhutan	El Salvador	Jordan	Nepal	Singapore	Yemen
Bolivia	Estonia	Kazakhstan	Netherlands	Slovakia	Zambia
Bosnia and Herzegovina	Finland	Kenya	New Zealand	Slovenia	
Botswana	France	Korea	Nicaragua	South Africa	
Brazil	Georgia	Latvia	Niger	Spain	
Burkina Faso	Germany	Lebanon	Norway	Sri Lanka	
Cameroon	Greece	Lesotho	Pakistan	St. Lucia	
Canada	Guatemala	Lithuania	Panama	Swaziland	
Cape Verde	Guyana	Luxembourg	Paraguay	Sweden	
Chile	Honduras	Madagascar	Peru	Switzerland	
China	Hungary	Malaysia	Philippines	Thailand	

CHAPTER 3

New Evidence of the Impact of Urbanization process on Property Tax Revenue in Developing Countries: Do Financial Development and Digitalization matter?

This chapter was presented at the 71st annual conference of the Association Française d'économie (AFSE) at Sciences Po, Paris.

3.1 Introduction

Developing countries have been characterized in recent years by a high level of urban population rate. This urbanization is associated with the modernization and industrialization of cities as well as the socioeconomic development of cities (Cobbinah et al., 2015a; Un-Habitat and Programme, 2011; Poku-Boansi, 2021; Cobbinah et al., 2015b,c). In 2016, the United Nations estimated that two-thirds of humanity would live in cities by 2050. According to the World Bank, 2022, over 50% of the population lives in urban areas today. By 2045, the world's urban population will increase by 1.5 times to 6 billion. City leaders must move quickly to plan for growth and provide the basic services, infrastructure, and affordable housing their expanding populations need.

According to UN-Habitat, 40% of the African population lived in urban areas in 2011. The same report indicates that by 2025, this percentage should be close to 50% of the total population. In a context where these countries are already struggling to provide sufficient public services and collect their potential tax revenue, this rapid rate of urbanization will require public services to be expanded and improved to meet the population's needs. This is a significant challenge, given the poor performance of tax mobilization in developing countries. One way for countries to respond to this problem is to exploit urbanization's opportunities to increase their tax resource mobilization. Among these possibilities, we could mention the improvement of property tax management. Indeed, this rapid urbanization is not always accompanied by a significant increase in property tax revenue mobilization[1] and the establishment of new infrastructure in most developing countries. In addition, several obstacles to this urbanization include land management, which is an essential component of urban development. For instance, in developing countries, there are many situations of land insecurity due to frequent disputes over property rights. However, urban development, also defined as physical improvements to the city area over time, could be a potential opportunity for developing property tax revenue through an effective collection policy appropriate to the development of cities. Indeed, the modernization of cities marked by the emergence of multiple investments (public or private) and new buildings and other infrastructures could represent a favorable factor for raising the property tax base.

[1]For instance, according to the ICTD, property tax revenue collected by African countries is less than 0.5% of GDP.

Given this fact, urbanization creates several opportunities for developing countries to collect more property tax revenue.

The results of the Third International Conference on Financing for Development, the Addis Ababa Action Agenda, and the Addis Tax Initiative are precisely in this direction. In addition, the 2030 Agenda recognizes domestic revenues as a key resource for achieving Sustainable Development Goals. Thus, property tax is crucial in enhancing domestic tax revenue collection, which remains underutilized in most developing countries but presents significant potential. In addition, urban innovation driven by rapid urbanization expands the property tax base, offering a valuable opportunity for governments to improve property tax mobilization, provided they implement policies that account for this progress at the city level.

According to Chambas et al. (2007), urban expansion creates new land assets, driving the evolution of local collective needs for infrastructure, security, education, and health while broadening the property tax base. This raises the question: How does urbanization contribute to property tax revenue mobilization in developing countries? A possible answer lies in the expansion of the tax base. Moreover, we have identified two main channels through which urbanization may impact property tax revenue mobilization: the digitization process and financial development.

As urbanization progresses, the financial needs of individuals and businesses grow, driving financial institutions to expand their range of products and services. This expansion contributes to the overall development of the financial sector. Similarly, urbanization promotes the adoption of digital services as the demand for accessible and efficient financial solutions rises in increasingly urbanized areas. The strong relationship between urbanization and financial sector growth fosters technology integration, supporting the transition to more digitalized economies. On the other hand, some scholars have shown the positive effect of digitization on tax revenue (Wandaogo, 2022; Chambas et al., 2007; Jacobs, 2017; Knebelmann, 2022). For them, digitalization through geolocalization and digital cartography offers an efficient method for locating properties, rendering property information available to the public, reducing corruption, and consequently increasing taxpayers' compliance. Concerning financial development, it is good to note that it contributes to acquiring more information on taxpayers and improves access to credit, which serves as a channel to enhance investment and, consequently, the establishment of new companies. Since businesses pay most property tax revenues in developing countries, this can boost the overall collection of property tax revenue. Additionally, financial development helps modernize

payment systems, which facilitates the recovery of tax revenues (Aizenman and Jinjarak, 2009; Lompo, 2024; Gnangnon, 2019).

To the best of our knowledge, few studies have empirically examined the relationship between urbanization and property tax revenue. Nonetheless, this chapter is the first to investigate this economic relationship, specifically in the context of developing countries, by analyzing the mechanisms through which urbanization may affect property tax revenues. Precisely, it will first assess the impact of urban development on property tax revenue collection in developing countries. Second, it will examine the role of financial development and digitalization in this relationship. In doing so, we assume that the modernization of cities, along with the growth of digitalization and financial development, will positively influence property tax revenues. In the same sense, although we accept that urban and regional development caused by urbanization can be a challenge for the future development of human and environmental society, especially in developing countries subject to heavy urbanization (Chaolin, 2020), it is clear that this modernization of cities also presents a significant opportunity to increase property tax revenues for governments.

To carry out this chapter, we empirically revisit the relationship between urbanization and property tax revenues using fixed effects estimations. We also address the potential endogeneity issue, which may arise due to reverse causality between urbanization and property tax revenues. Specifically, property tax revenues can influence urbanization, as governments might use these funds to finance their urbanization policies. Therefore, to resolve the endogeneity problem, we explore several alternative approaches, such as reverse causality investigation, instrumental variables (IV), and the system GMM approach. Overall, this chapter finds its place in academic circles because it contributes to the literature related to tax revenue mobilization on the one hand and to the literature on urbanization.

Moreover, studying this relationship in the context of developing countries presents significant challenges and could provide valuable insights into property tax revenue collection. Finally, this research is justified by the contrast between the high level of urbanization and the relatively low property tax revenues in developing countries. Consequently, this chapter contributes to revisiting the debate around the impact of urbanization on property tax revenue mobilization in the case of developing countries.

On average, the findings show that urbanization increases property tax revenues, confirming

the results obtained in previous literature on this topic. In addition, this chapter shows that financial development and digitalization are effective transmission channels through which urbanization can influence the mobilization of property tax revenues. Overall, the results remain stable after a series of robustness investigations, including [1] the endogeneity issue, [2] adding additional control variables, [3] exploring some heterogeneities, [4] using a system GMM estimator, [5] Sub-period analysis, and [6] by using an alternative measure of urbanization. In terms of policy recommendations, this chapter encourages governments in developing countries to profit from their high level of urbanization to boost their property tax revenue collection. More specifically, they can focus on updating the land register and implementing a comprehensive digitalization policy to address streets and buildings and better identify properties. Additionally, a well-developed financial sector improves the efficiency of tax administration, allowing taxpayers to pay their property taxes more quickly and easily, thereby increasing tax compliance.

The remainder of the chapter is structured as follows. Section (3.2) presents a global view of urbanization in developing countries. Section (3.3) describes the data. Section (3.4) presents the empirical strategy. Section (3.5) reports the results, and Section 3.6 provides further investigation. Finally, section (3.7) concludes the chapter with some policy recommendations.

3.2 Urbanization: An overview

3.2.1 Concept and dynamics of urbanization in developing countries

Urbanization is happening everywhere. It is inevitable nowadays, as it is closely linked to the various development processes. Urbanization refers to the increasing number of people who live in urban areas (Chaolin, 2020). Also, it indicates the movement of people from rural to urban areas and the progressive expansion of people living in urban areas. Although this high level of urbanization has some adverse effects, for example, the destructive effects of urban expansion on the growth of agriculture, land tensions, environment pollution, traffic congestion, and inadequate public services delivery (Zhao et al., 2022; Fan and Zhou, 2019; Chen et al., 2019), it is important to note that the process of urbanization also has many positive and beneficial effects (Zhao et al., 2022; Bertinelli and Black, 2004). For instance, urbanization helps to boost the economic dynamic by creating numerous job opportunities and easier access to basic public services such as education and health services. Similarly, urbanization increases tax revenues by

increasing the tax base (Norregaard, 2013).

Since urbanization refers to the proportion of the population living in urban areas, it is important to mention that the definition of what constitutes an urban area can differ between countries. Indeed, what is considered urban in one country may be classified as rural in another, leading to variations in how urbanization is measured across different regions. For instance, in Angola, Argentina, and Ethiopia, all settlements with a population of 2,000 or more are classified as urban. In Benin, however, only towns with 10,000 or more inhabitants are defined as urban (Cohen, 2006). Table 3.1 below shows some statistics about the population size in the world.

Table 3.1: Urban population size and distribution by major geographic region area, 1950–2030

Region	1950	1975	2000	2030*
Total Population (millions)				
World	2,519	4,068	6,071	8,130
More Developed Regions	813	1,047	1,194	1,242
Less Developed Regions	1,706	3,021	4,877	6,888
Rural Population (millions of inhabitants)				
Wold	1,786	2,552	3,214	3,185
More Developed Regions	386	344	311	228
Less Developed Regions	1,400	2,208	2,902	2,958
Urban Population (millions of inhabitants)				
World	733	1,516	2,857	4,945
More Developed Regions	427	703	882	1,015
Less Developed Regions	306	813	1,974	3,930
Percentage of the Population Living in Urban Areas				
World	29.1	37.3	47.1	60.8
More Developed Regions	52.5	67.2	73.9	81.7
Less Developed Regions	17.9	26.9	40.5	57.1
Distribution of the World's Urban Population				
World	100	100	100	100
More Developed Regions	58.3	46.4	30.9	20.5
Less Developed Regions	41.7	53.6	69.1	79.5

Source: Cohen Data
Note: The data for the year 2030 are projected data.

We can observe that the world population grew rapidly from around 2.5 billion in 1950 to more than 8 billion in 2030. In this vein, it is essential to emphasize that a dynamic increase in infrastructure in developed countries accompanies this demographic growth. Similarly, we observe that the highest population growth is from less developed regions. In developing countries, we observe that in 1950, most of the population lived in rural areas (1,400 billion), while only 306 million lived in urban areas. Over time, this trend has been considerably reversed in

the early 2000s, with an urbanization rate approaching 40.5 in these countries. Today, about 50% of the population in developing countries lives in urban areas. Thus, developing countries, which have long been on the bangs of urban development, are today characterized by a great wave of modernization of their cities.

Although the reasons for this high level of urbanization may differ from one country to another, we can cite the following factors, among others: the effect of globalization, internal and external migration, the progress of technology in the domains of transportation and telecommunications, and the redrawing of cities and villages.

Looking at the population structure by continent, it appears that all continents have a substantial share of the urban population, as indicated by Table 3.2. We note that Africa has the second highest level of urban population, just behind Asia. When we look at the percentage of the urban population in the total population of each continent, we can notice that this percentage is becoming more and more important in comparison with the beginning of the 1950s, reaching 80% in some continents, including Europe, Latin American and the Caribbean, Northern America. Moreover, maps (3.1) and (3.2) show us a visual evolution of urbanization in 2000 and 2019. We can note that several countries have experienced a remarkable degree of urbanization between those times. Both maps show countries that are not considered in our sample in white.

3.2.2 Focus on urbanization and property tax revenues

Property tax revenues represent a significant part of tax collection in developed countries, accounting for around 3% of GDP (Awasthi, 2020). However, it is weaker in developing countries, contributing less than 0.5% of GDP and occupying a marginal proportion of overall tax revenues (ICTD). Indeed, these countries are still struggling to raise sufficient property tax revenues, or they make a lot of exemptions (including government property and agricultural land). At the same time, these countries are marked by accelerated urbanization, which leads to an additional need for public services. However, the effect of urbanization on property taxation remains less explored in the literature. This subsection briefly reviews the existing research on this subject.

Some scholars argue that rapid urbanization creates a need for public services and, therefore, a need for additional public resources while improving the property tax base (Spence et al., 2008; Chambas et al., 2007; Awasthi, 2020; Kresse and van der Krabben, 2022). For the authors,

Table 3.2: Urban population size and distribution by continent, 1950–2030

Region	1950	1975	2000	2030*
Urban population (millions of inhabitants)				
Africa	33	103	295	748
Asia	232	575	1367	2664
Europe	280	446	529	545
Latin America and the caribbean	70	197	393	602
Northern America	110	180	250	354
Oceania				
Percentage of population living in urban areas				
Africa	14.9	25.3	37.1	53.5
Asia	16.6	24.0	37.1	54.5
Europe	51.2	66.0	72.7	79.6
Latin American and the caribbean	41.9	61.2	75.5	84.6
Northern America	63.9	73.8	79.1	86.9
Oceania	60.6	71.7	72.7	74.9
Distribution of the world's urban population				
Africa	4.5	6.8	10.3	15.1
Asia	31.7	37.9	47.8	53.9
Europe	38.2	29.4	18.5	11.0
Latin America and the caribbean	9.5	13.0	13.8	12.2
Northern America	15.0	11.9	8.8	7.2
Oceania	1.1	1.0	0.8	0.6

Source: Cohen Data

Note: The data for the year 2030 are projected data.

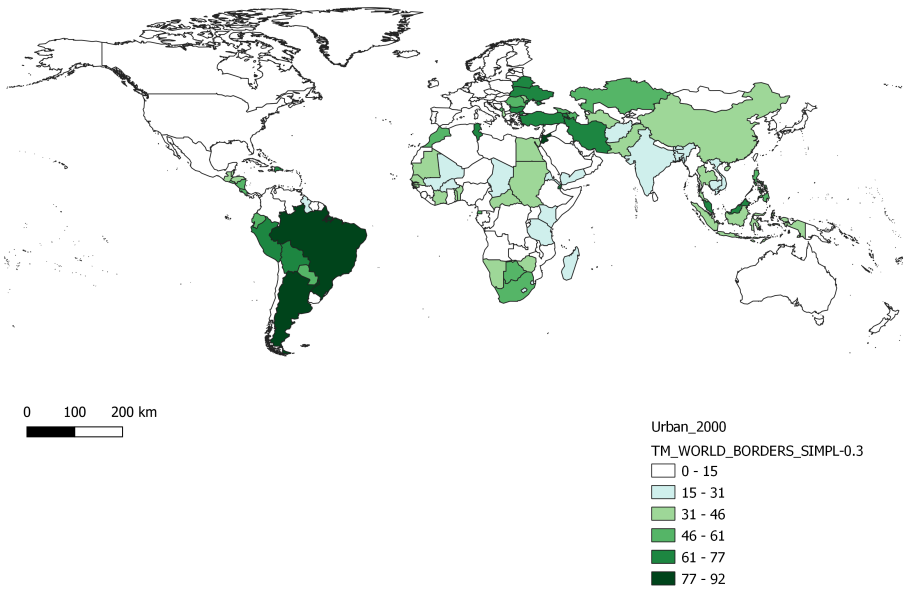

Figure 3.1: Degree of urbanization in 2000

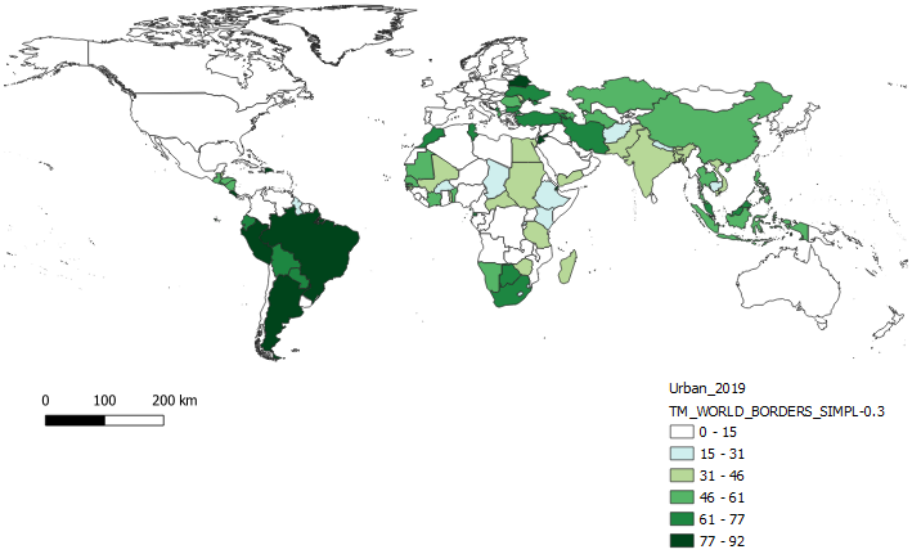

Figure 3.2: Degree of urbanization in 2019

property tax is one of the few taxes whose potential revenue rises with the challenge of the rapid development of cities. For example, economic growth around urban areas and ongoing urban sprawl mean that the value of urban buildings increases rapidly and should generate more property tax revenues. Moreover, the urban expansion results in the creation of new land

assets, which certainly determine the evolution of local collective needs in terms of infrastructure, security, education, health, etc.., but also, at the same time, a widening of the taxable base for property taxes. Similarly, property tax is, and will continue to be, the principal source of local government revenue because properties are immobile and easily identifiable, and their tax base cannot relocate (Wallis, 2001).

From these observations, this rapid urbanization could be a springboard or an ideal opportunity to recover more property tax revenues. In the case of Portugal, Almeida et al. (2013) demonstrate that the Municipal Urbanization Tax (MUT), which is levied on land subdivisions or individual buildings, is intended to promote urban rehabilitation through the construction, maintenance, and enhancement of urban infrastructure. The authors proposed a new formula to evaluate the real cost of land use and the better assessment of properties. In line with this argument, Awasthi (2020) shows that property tax has the most outstanding efficiency and incorporates several other qualities of a tax tool: transparency, equitable treatment, and a direct link to benefits. Thus, the author used the following variables as determinants of property tax revenues: GDP per capita, population, Federal transfer, governance quality, household size, and property tax rate. In his paper, the author finds that every 1 percent increase in GDP and population will increase property tax revenues by around 0.13% and 0.76% on average, respectively. One limitation of his study is that he does not investigate the endogeneity issue and limits his work to developed countries. In the same vein, Sepulveda and Martinez-Vazquez (2012) estimate the determinants of property tax mobilization for nine Latin American countries from 1990-2007. They are used as control variables for urbanization, municipal cadaster, government size, income per capita, competition for public positions, fiscal decentralization, transfer dependency, and democracy index. When they used the random effects model in their econometric investigation, they found that urbanization, municipal cadaster, and government size are statistically significant, but the non-significant effect of these variables when using the fixed effects approach.

In a study based on 64 countries between 1990 and 2010, Norregaard (2013) used urbanization, the openness of the economy, and legal heritage as determinants of immovable property revenue. In his study, the author estimates a fixed effect model and finds that these factors positively affect countries' development. This development can also increase property tax revenues. In addition, for Bahl and Martinez-Vazquez (2007), higher levels of urbanization have

increased the use of taxation in countries over time. Indeed, according to them, land values tend to increase significantly in urban centers, leading to increased property taxation attractiveness. More clearly, compliance with property taxes may be higher across countries and over time with a higher degree of urbanization.

Although urbanization can indeed boost property tax revenues, it is also good to note that property tax can constitute an excellent tool for reducing urban sprawl when the rules surrounding property taxation are well-defined. (Taranu and Verbeeck, 2022; Brandt, 2014; Song and Zenou, 2006). Conversely, Wassmer (2016), based on a fixed effects estimator, shows that property taxation can serve as a vector in favor of urban sprawl by increasing the land consumption of a United States urbanized area for a given population.

There are, however, some limitations to the previous studies. Thus, this chapter contributes to extending the knowledge about the literature on the relationship between property taxation and urbanization. Indeed, contrary to previous studies, this chapter covers a panel of developing countries and is not limited to a short panel dataset of a specific country, allowing for a specific comparison across different regions. Likewise, only a few studies have used empirical models. Moreover, the results of some of the previous studies may be biased because the question of endogeneity is not investigated, as we do here. Specifically, we look at the reverse causality between urbanization and property tax revenues. In fact, urbanization may affect property taxation, as property taxation can also allow local governments to finance their urbanization policies.

Finally, none of the previous studies investigated the potential main transmission channels through which urbanization can enhance property tax revenues. Indeed, as urbanization increases, the financial needs of individuals and businesses grow, pushing financial institutions to expand their services. This drives the development of the financial sector while fostering the adoption of digital services due to rising demand for accessible and efficient solutions. The close link between urbanization and financial sector growth promotes technology integration, leading to more digitalized economies. Also, it is important to note that with urbanization, the world is experiencing increasing technological revolutions that break down many barriers, making access to various services easier (Zhao et al., 2023). To fill this gap, the chapter postulates that digitalization and financial development are potential channels through which urbanization can increase property tax revenues. Indeed, these two channels can help to facilitate the recovery

of property tax revenues. For instance, Lompo (2024), using a panel of 46 developing countries and based on system GMM estimation, reveals that higher financial development contributes positively to the capacity of the government to raise tax revenues. On the other hand, for Uyar et al. (2021), digitalization can improve the quality of tax revenue collection by improving the efficiency and quality of tax management. Similarly, Knebelmann (2022) shows that digitalization through satellite imagery tools and geolocated data systems can offer distinct advantages to property tax systems by aiding in the detection, registration, characterization, and valuation of properties.

Hence, based on this recent literature and in line with many fiscal practitioners, urbanization trends can constitute a source of extending property values, and this evolution boosts property tax revenues. It should be emphasized that even if the literature agrees that urbanization leads to an increase in property tax revenues, this additional revenue will not be achieved with a magic wand. In fact, it is the responsibility of governments to put in place policies that can help them to take advantage of this rapid urbanization.

Figure 3.3 presents briefly how urbanization could affect property tax revenues. Although some taxpayers indeed pay property tax voluntarily, the diagram illustrates a strong link between the provision of public goods and property tax revenues (Timmons, 2005). Thus, governments that deliver public services closer to their populations increase the latter's compliance with property tax payments. In addition, it is necessary to improve property tax revenue collection to address the financing of local public services resulting from urban growth, as demonstrated in the literature.

3.3 Data

The panel dataset used in this chapter covers 71 developing countries from 1996-2019. The choice of the period and sample depends mainly on data availability. The variables employed come from various sources and are based on the existing literature on this subject (Awasthi, 2020; Sepulveda and Martinez-Vazquez, 2012; Norregaard, 2013). The dependent variable used is property tax revenue, defined as the ratio of the total property tax revenue to GDP, derived from the International Centre for Tax and Development (ICTD) database.[2] The variable of

[2]In this chapter, we do not explore the different components of property taxes. We recognize that there are some heterogeneities in countries concerning the definition of property taxes. Nevertheless, here we focus our

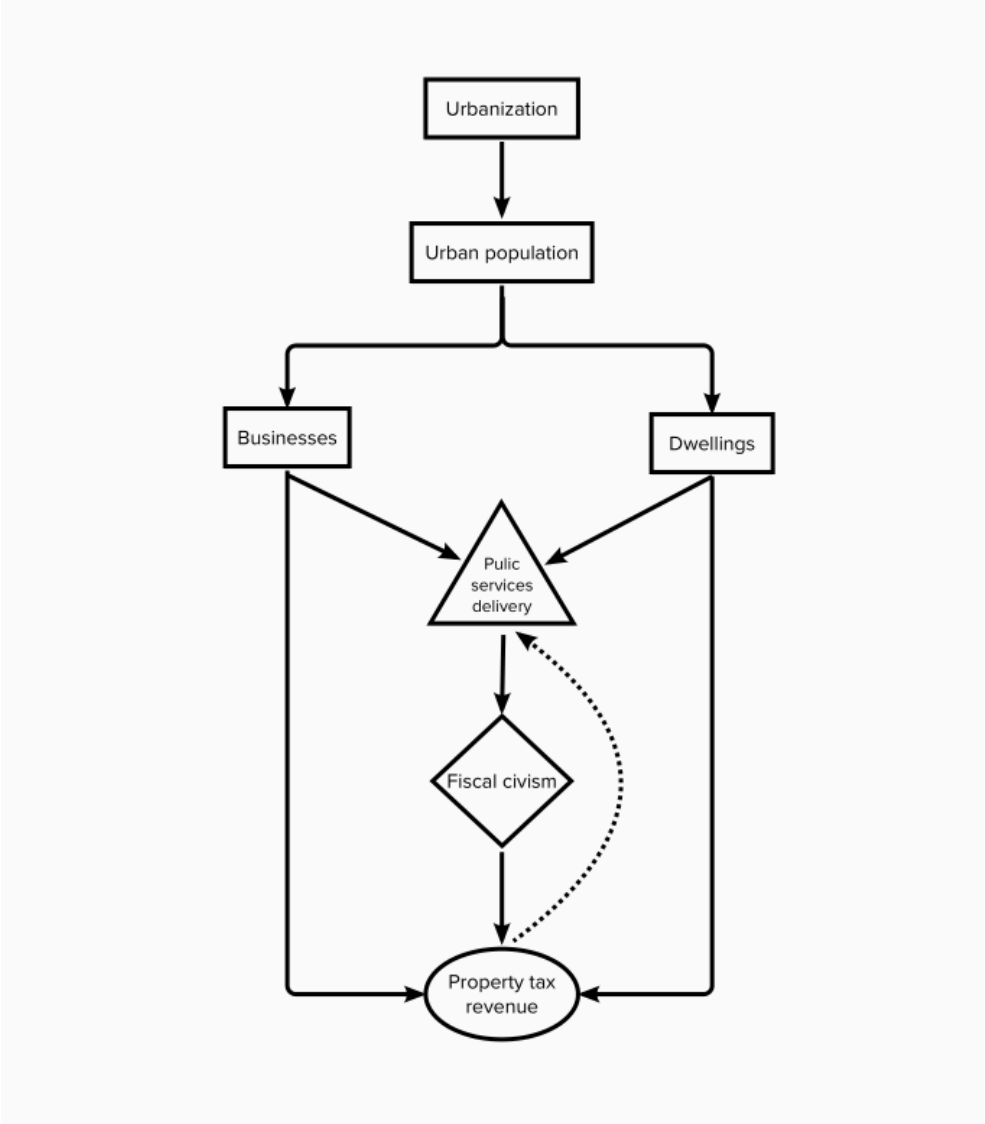

Figure 3.3: Simplified representation of basic transmission channels

interest is urbanization from World Development Indicators (WDI), which is proxied by the percentage of a country's population living in urban areas defined by national statistical offices. This measure of urbanization is the traditional one commonly used in the literature (Andersson, 2018; Brueckner, 2019a; Wang et al., 2022; Ali, 2021; Qiao et al., 2019; Oyvat, 2016). The following equation shows how this variable is calculated.

$$URBAN_t = \frac{PURB_t}{PURB_t + PRURAL_t} \tag{3.1}$$

attention on data available and delivered by ICTD. In fact, it is possible to measure property tax revenue on land only, buildings, or a combination of both. In Africa, property tax revenue is generally the fact of business property. A future study will attempt to explore the different components of property taxes across countries

$PURB_t$ and $PRURAL_t$ represent urban and rural populations, respectively. To conduct our investigation, some determinants based on previous studies about property tax revenue are chosen in the list of various determinants. These variables are described below.

3.3.1 Description of control variables

Based on previous determinants of property tax revenue used in the literature, the main control variables used in this chapter are presented below:

- **Economic dynamic**: GDP per capita growth indicates the overall prosperity of an economic system and is likely to have a favorable effect on property tax revenue collection. The level of taxation in a country strongly depends on its level of prosperity. Indeed, the more dynamic the country, the higher the potential for property tax revenue. Therefore, this variable is assumed to positively affect property tax revenues (Norregaard, 2013; Sepulveda and Martinez-Vazquez, 2012).

- **Trade openness**: Generally, when a country is more open to the world, trade openness can positively affect tax revenues. Indeed, it can create investment opportunities and establish new businesses. Thus, an important volume increase in the establishment of new businesses is susceptible to an increase in one country's property tax base. Therefore, to have a positive impact on property tax revenue, the latter condition must be met. On this basis, trade openness is a good determinant of property tax revenue (Norregaard, 2013; Sepulveda and Martinez-Vazquez, 2012; Alfirman, 2003). However, governments often propose exempting companies from property taxes to attract investment, which can negatively impact property tax revenues.

- **Natural resource rents**: According to various studies, the effect of natural resources on tax revenues is ambiguous. Pioneering studies conclude that natural resources positively affect tax revenue (Tanzi, 1992). Recent studies highlight that natural resources reduce the incentive to collect more and can lead to problems in managing fiscal and macroeconomic policies (Arezki and Nabli, 2012; Thomas and Trevino, 2013; Bornhorst et al., 2009a; Crivelli and Gupta, 2014; James, 2015). Similarly, for Martinez-Vazquez et al. (2001) natural resources can undermine the willingness of governments in resource-rich countries to prioritize property tax collection. Also, property tax revenue that is already poor in

developing countries could be abandoned in favor of natural resources. However, it is good to mention that resource-rich countries can generate large budget surpluses by turning to alternative sources of revenue, such as property tax revenue. For this purpose, this variable can also be used as a determinant of property tax revenue. Hence, his effect on property tax revenues remains to be seen.

- **Government size** : As property taxes are an accountability tax, the more the government spends on improving access to health and education facilities, for example, the more the population will feel the need to support government action by committing to the property tax payment (Sepulveda and Martinez-Vazquez, 2012). Indeed, investments in these sectors are highly visible to the public, which can incentivize citizens to support government initiatives by paying property taxes.

- **Political stability and Absence of violence/Terrorism**: This variable is used to consider the fact that property tax collection can be influenced by political stability. Indeed, some scholars conclude that political stability plays a significant role in tax revenues, including property tax revenues (Timmons, 2005; Elbahnasawy, 2020). For the authors, a stable political environment encourages investment and boosts taxpayer confidence and the efficiency of tax collection. Inversely, political instability, other studies highlight the negative association between political stability and tax revenues. For instance, Besley and Persson (2011) argue that higher instability can limit investments and consequently limit fiscal capacity. Indeed, conflicts and other forms of violence are sources of instability and, therefore, favorable to the disorganization of government action. This could implicitly harm property tax collection.

Table B10 in the Appendix defines and sources these variables, and Table B3 in the appendix provides descriptive statistics of the main variables used in this chapter.

3.3.2 Some descriptive statistics

Figure 3.4 below shows the evolution of property tax revenue in each developing country region from 1996 to 2019. This figure shows a trend marked by solid instabilities and significant disparities between the regions covered by our study. The absence of adequate policies to

promote a good definition of property rights could also explain this low level of property tax revenue mobilization in developing countries.

In most of these countries, given the marginal contribution of this tax to overall tax revenues and GDP, it is often left on the shelf. However, some regions have made remarkable progress since 2015. Note that the significant drop in property revenues in East Asia from 2007 can be explained by the high level of speculation in the real estate market in these countries, particularly in China. Indeed, these countries have been strongly marked by a significant decline in their real estate markets due to an overabundance of housing supply, leading to decreased housing prices (Cao et al., 2018). Similarly, Figure 3.5, shows that, the mean of property tax revenue is less than 1% of GDP in all the regions considered, reflecting this tax's marginal contribution.

Beyond the average rates presented above, it is good to note that some developing countries are making remarkable progress in property tax revenue collection. One example is South Africa. Indeed, this country has one of the most dynamic local property tax administrations in Africa, thanks to its policy of decentralizing property taxes.

In contrast to the trends in property tax revenues, the urban population is growing rapidly across all regions, as shown in Figure 3.6, based on World Bank data.

Before diving into the econometric analysis, it is helpful to explore the potential relationship between property tax revenue and urbanization through graphical representation. Thus, Figure 3.7 shows a positive correlation between these two variables, suggesting that higher levels of urbanization are associated with more significant property tax revenues. Similarly, Table B4 in the appendix shows the unconditional correlation between the two variables, confirming that urbanization is positively and significantly correlated with property tax revenue at the 1% confidence level. Additionally, all Variance Inflation Factors (VIF) presented in Table B1 are below 10, indicating that multicollinearity is unlikely to be a concern. However, it is essential to note that the positively found effect here is not absolutely true because correlation does not immediately imply causality. Hence, the econometric analysis that will be carried out later will provide a clearer understanding of the causal relationship between these variables.

In addition, to account for disparities between countries, an additional analysis by a group of regions attracted our attention. Figure B1 in the appendix provides insights into the relationship between property tax revenue and urbanization in the different regions in our sample. The Figure reveals the exact positive correlation observed earlier. In our econometric analysis, we

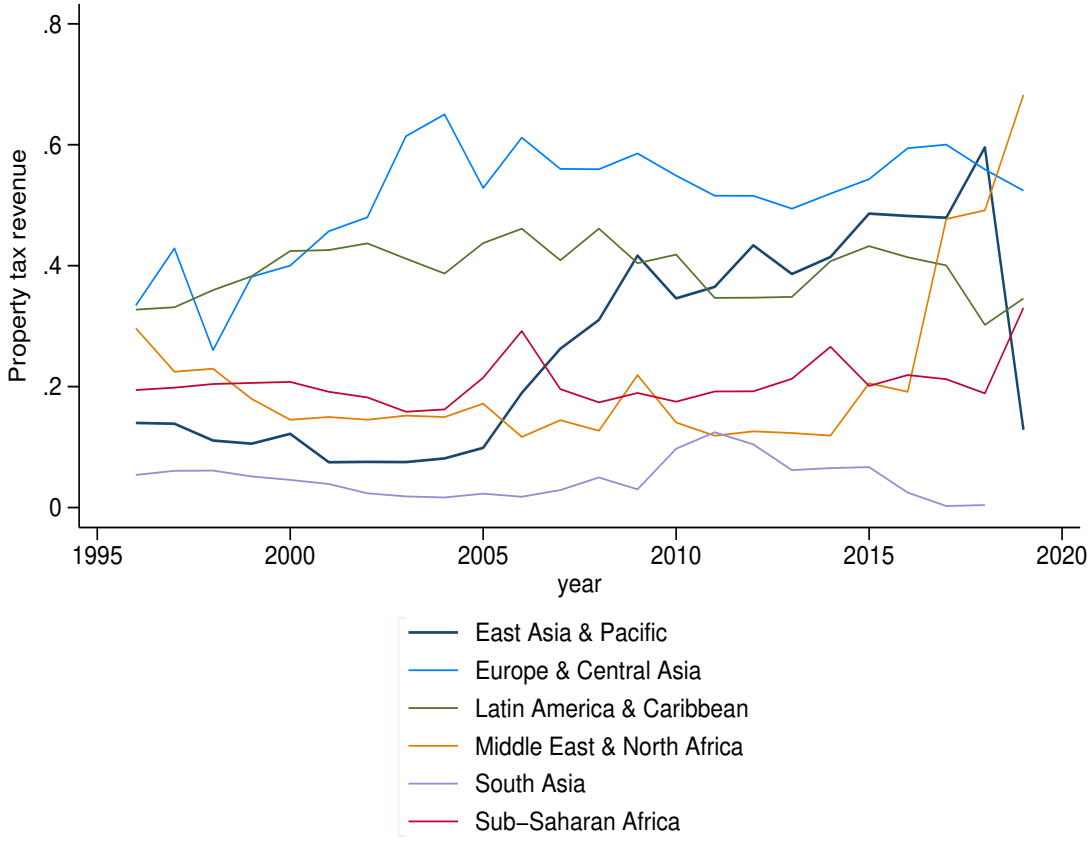

Figure 3.4: Property tax revenue evolution by region

will explore regional heterogeneities to verify or challenge this positive relationship.

3.4 Empirical Approach

To evaluate the impact of urbanization on property tax revenues, we start our empirical methodology by using simple OLS estimation. Although this approach has several flaws with panel data, we include this estimation to compare them with the results obtained when OLS considers fixed effects (country and time fixed effects) and the endogeneity investigation. In fact, we suspect an endogeneity between urbanization and property tax revenues. More explicitly, a high level of urbanization can affect property tax revenue mobilization. However, at the same time, local governments, in their development strategies, could place more importance on property tax revenue to finance their urbanization policies. Likewise, the endogeneity investigation can consider some omitted variables correlated with urbanization and property tax revenue

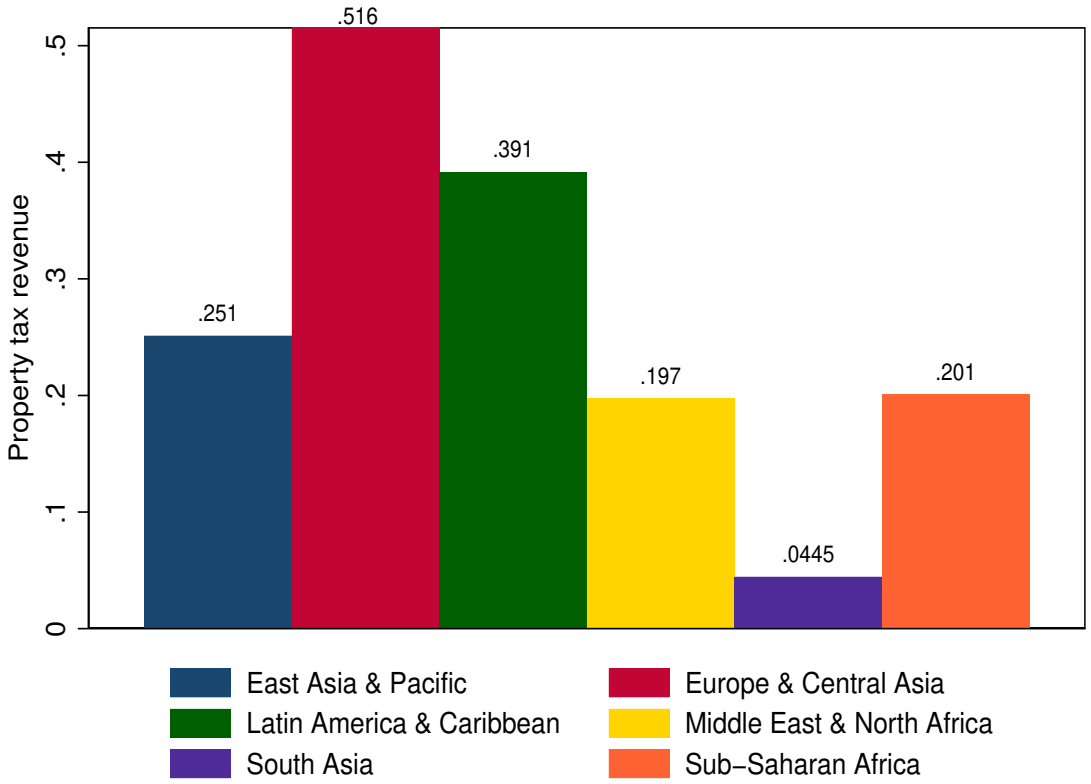

Figure 3.5: Property tax revenue by region

captured in the error term. The baseline model we estimate is:

$$logPT_{ct} = \beta_0 + \beta_1 logURBAN_{ct} + \sum_{k=2} \beta_k X_{ct} + \theta_c + \gamma_t + u_{ct} \tag{3.2}$$

Where $logPT_{ct}$ represents the log of property tax revenue from country c at the period t, logURBAN represents the log of urbanization. X_{ct} is the set of control variables[3] used in this chapter. θ_c is the time-invariant and country-specific effects of country c. γ_t represents time-varying factors or standard shocks that could potentially affect property tax revenue in all developing countries. u_{c_t} represents an idiosyncratic disruption. The coefficient of interest is β_1, which captures the effect of our interest variable on property tax revenues.

To address the endogeneity issue, we proceed with different approaches. First, we resolve the reverse causality by estimating the model lagging in Urbanization following (Datta and Agarwal, 2004; Wandaogo, 2022). Second, we do the same exercise by taking the lagging of all our control

[3]Details of control variables are presented in section 3.3.1.

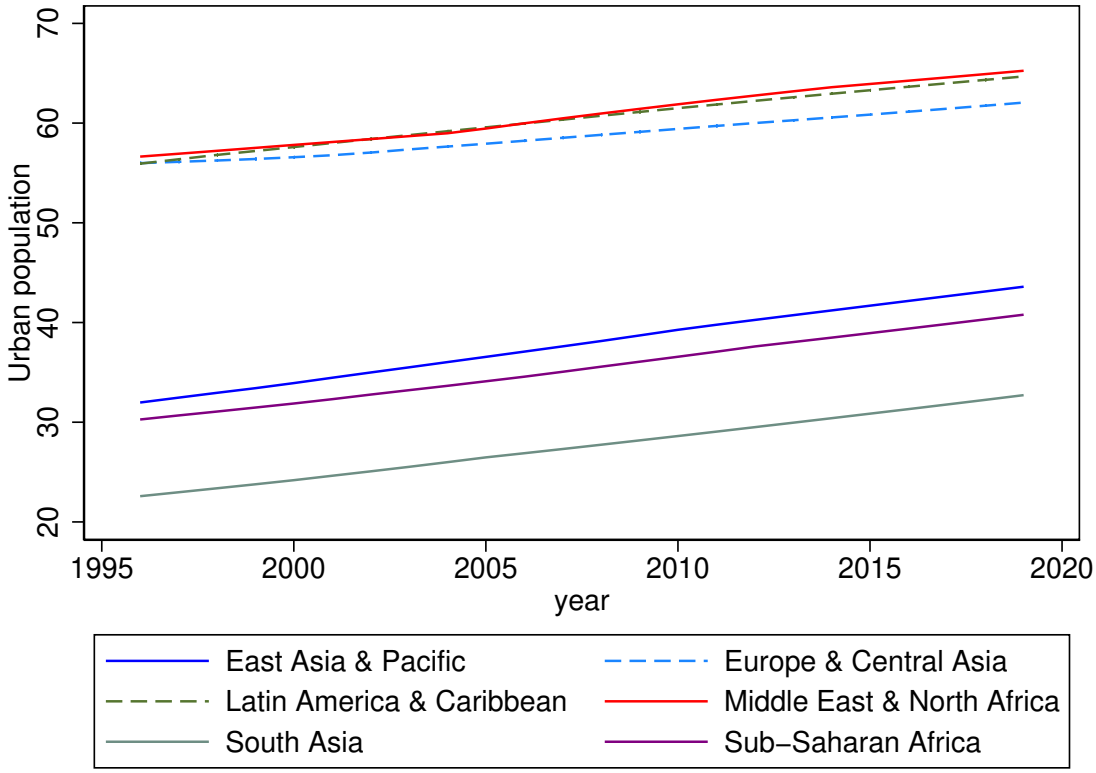

Figure 3.6: Urban population Evolution by region

variables (Qiao et al., 2019; Arezki and Nabli, 2012). Finally, we resolve the endogeneity problem by using two instrumental variables and exploring the system GMM method (also to consider the potential inertia of property tax revenue). The estimation of the impact of urbanization on property tax revenue using the instrumental variables approach is done in two stages. In the first stage, the suspected endogenous variable (urbanization) is regressed on all the explanatory variables and the instrumental variables to "clean up" its correlated component with the error term in the model.

$$logURBAN_{ct} = \alpha_0 + \alpha_1 X_{ct} + \alpha_2 Z_{ct} + \theta_c + \gamma_t + \epsilon_{ct} \tag{3.3}$$

Z_{ct} represents the instrumental variables (Access to electricity and interpersonal globalization).[4] In the second step, we extract the predicted variable from this variable. Then, we replace

[4]We will give more information about these variables in the next sections. Also, conducting estimation by the instrumental variables method makes sense when two or more instruments are in the model. In these circumstances, the model is said to be over-identified. However, it is also possible to have a model that is just identified with a single instrument (not very recommended).

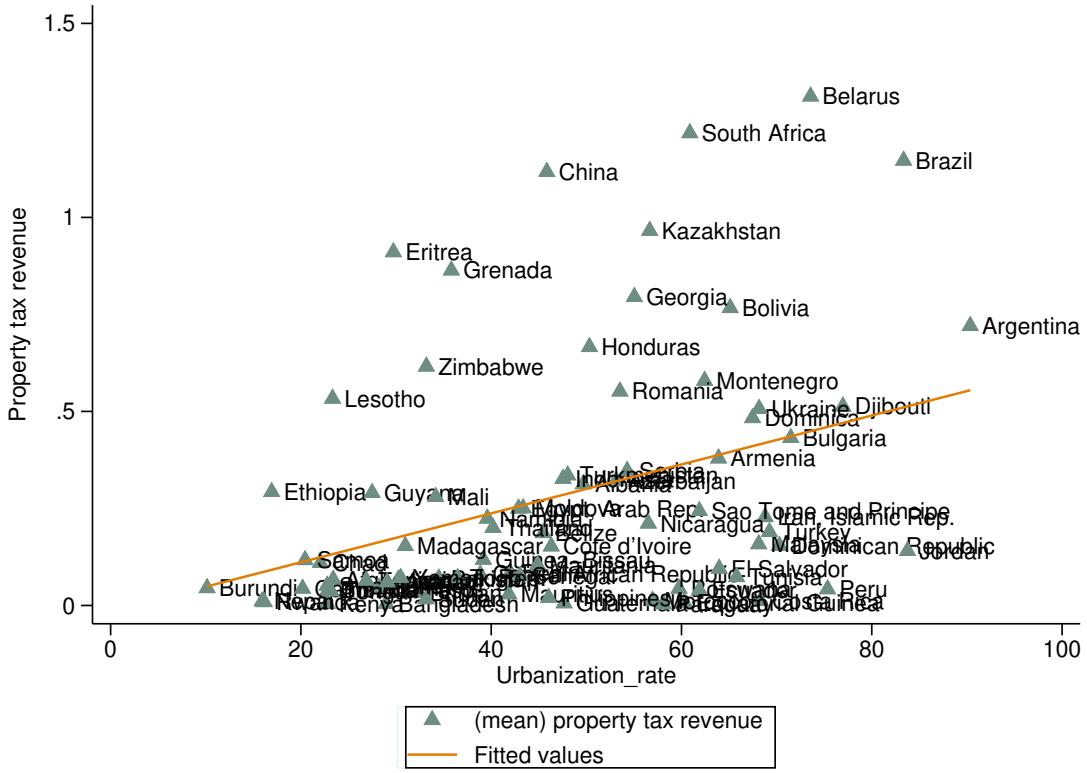

Figure 3.7: Scatter plot between urbanization and property tax revenue

urbanization with its predicted variable in the original model, which will be evaluated by fixed effects.

$$logPT_{ct} = \varphi_0 + \xi log\widehat{URBAN}_{ct} + \psi X_{ct} + \theta_c + \gamma_t + u_{ct} \tag{3.4}$$

$log\widehat{URBAN}_{ct}$ is the predicted value of urbanization from the first stage equation. The rest of the variables are the same as described previously. The coefficient of interest is ξ.

3.5 Core results and discussion

3.5.1 Baseline results

Table B2 in the appendix presents the OLS estimation results. This estimation does not consider the fixed effects.[5] First, the regression was done without controls (column 1). Then, starting from column (2), we gradually add the different control variables. This procedure provides a fascinating picture of the impact of urbanization on property tax revenue before adding

[5]The table can be dispensable, but we considered it worthwhile to look at our results behavior throughout our different analyses.

any additional variables. Nonetheless, our baseline specification is reported in column (6). The results indicate urbanization's positive and significant impact on property tax revenues. Indeed, the findings show that a one percent increase in urbanization is expected to increase property tax revenue by approximately 1.6% (column 6). As noted above, this table is presented for comparison with fixed effects and the endogeneity issue approach results. Pooled estimates are likely biased because they do not capture the dynamics of individual behavior and its potential heterogeneity. In fact, there are several differences between countries, and ignoring them could bias the results.

In this vein, we do the same exercise but now consider the dynamics of individual behaviors and their possible heterogeneity. To do so, we make the same regression by controlling the estimation with the fixed effects (country and year fixed effects). The results are presented in Table 3.3, which also shows that urbanization positively impacts property tax revenues. However, the magnitude of the coefficients derived here (column 6) differs slightly from those obtained with the pooled method. Although the estimation in Table B2 does not consider the dynamics of individual behavior, the results derived from this estimation are consistent with those obtained when we control the estimation with fixed effects. These results join those obtained previously by Norregaard (2013) and Sepulveda and Martinez-Vazquez (2012).

Regarding the control variables, we find a positive and significant effect of natural resource rents, government size, and political stability on property tax revenue, and an insignificant effect on GDP per capita growth. To reinforce and consider the potential limits of these results, we discuss the endogeneity issue and some robustness checks further.

3.5.2 The impact of urbanization on property tax revenue at the regional level

Before turning to reverse causality, we thought it worthwhile to examine what happens when we apply the same reasoning at the level of each region. Indeed, our stylized facts indicate a positive relationship between urbanization and property tax revenue when the different regions are considered separately (see Figure B1 in the appendix). Since correlation does not mean causality, we were interested in empirically testing this relationship. Likewise, property tax revenue mobilization could react differently to urban processes according to the region considered.

The results of this investigation are presented in Table 3.4. Columns 2, 3, 4, and 6 of this

Table 3.3: Estimation of the impact of urbanization on property tax revenue (Fixed effects)

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log)	0.945***	0.897***	1.283***	1.603***	1.624***	1.469***
	(0.172)	(0.172)	(0.180)	(0.199)	(0.198)	(0.243)
GDP per capita growth		-0.009	-0.012	0.030*	0.029*	0.029
		(0.010)	(0.010)	(0.016)	(0.016)	(0.018)
Natural resources rents (log)			0.107***	0.210***	0.215***	0.207***
			(0.038)	(0.040)	(0.039)	(0.044)
Government size				0.090***	0.087***	0.087***
				(0.011)	(0.011)	(0.013)
Trade					0.001	-0.000
					(0.002)	(0.002)
Political Stability						0.334***
						(0.103)
Constant	-5.823***	-5.859***	-4.973***	-5.381***	-5.423***	-5.253***
	(0.361)	(0.359)	(0.412)	(0.426)	(0.440)	(0.475)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,175	1,163	1,138	1,057	1,057	896
R-squared	0.179	0.181	0.202	0.269	0.270	0.296

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

table show urbanization's significant and positive impact on property tax revenue in Europe & Central Asia, Latin America & Caribbean, Middle East & NA, and Sub-Saharan Africa. Also, a negative and insignificant effect is found in East Asia and the Pacific. In contrast, urbanization has a positive and insignificant impact on property tax revenue in South Asia. In total, it is safe to say that the positive effect is stronger. Moreover, we note that Sub-Saharan African countries and Latin America & Caribbean have the highest magnitudes (2.2 and 2.3, respectively) of the impact of urbanization on property tax revenues. The fair variation in the amplitude of the coefficients between the different estimations corroborates our intuition.

Table 3.4: Estimation of the impact of urbanization on property tax revenue by region

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & NA	South Asia	SSA
Urbanization (log)	-0.382	1.748***	2.306*	1.883**	1.794	2.200***
	(0.641)	(0.524)	(1.379)	(0.748)	(2.262)	(0.250)
GDP per capita growth	-0.064	0.069**	-0.051	-0.065	0.371**	0.031
	(0.053)	(0.030)	(0.073)	(0.052)	(0.166)	(0.027)
Natural resources rents (log)	1.179***	0.170***	-0.751***	0.072	4.573***	0.193***
	(0.211)	(0.058)	(0.213)	(0.186)	(1.501)	(0.058)
Government size	0.373***	-0.029	0.370***	-0.190	-0.255	0.083***
	(0.049)	(0.028)	(0.063)	(0.151)	(0.279)	(0.013)
Trade	-0.017***	0.005	0.011	-0.009	0.013	-0.002
	(0.004)	(0.004)	(0.008)	(0.015)	(0.074)	(0.004)
Political stability	0.233	0.244**	0.620	-0.539	-0.967	0.008
	(0.198)	(0.108)	(0.654)	(0.561)	(1.355)	(0.137)
Constant	-5.044***	-5.169***	-14.008***	-2.286	13.976	-4.876***
	(1.243)	(0.910)	(1.917)	(1.809)	(8.571)	(0.574)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69	218	218	76	48	267
R-squared	0.810	0.379	0.326	0.550	0.745	0.400

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

3.5.3 Addressing reverse causality

As previously discussed, a high degree of urbanization could affect property tax revenue, while governments could use property tax revenue to finance their urbanization policies. The treatment of reverse causality is one of the limitations of previous literature. To address this reverse causality issue, we follow the same approach used by (Wandaogo, 2022; Datta and Agarwal, 2004). This methodological approach uses the lags of our supposedly endogenous variable in our initial specification. Thus, we replace the urbanization variable with its first, second, and third-order lags in our baseline specification. We find that the impact of urbanization on property tax revenue remains significant and positive (see Table 3.5). Furthermore, in all of our specifications, the magnitudes of the coefficients do not differ significantly from those obtained previously.

Table 3.5: Estimation of the impact of urbanization on property tax revenue (URBAN lag model)

Dependent variable: Property tax revenue (log)				
	(1)	(2)	(3)	(4)
Urbanization (log)	1.469***			
	(0.243)			
Urbanization (log), t-1		1.554***		
		(0.255)		
Urbanization (log), t-2			1.537***	
			(0.256)	
Urbanization (log), t-3				1.606***
				(0.268)
GDP per capita growth	0.029	0.022	0.022	0.007
	(0.018)	(0.019)	(0.021)	(0.023)
Natural resources rents (log)	0.207***	0.193***	0.194***	0.180***
	(0.044)	(0.045)	(0.053)	(0.055)
Government size	0.087***	0.087***	0.088***	0.094***
	(0.013)	(0.014)	(0.016)	(0.018)
Trade	-0.000	0.000	0.000	-0.000
	(0.002)	(0.002)	(0.003)	(0.003)
Political Stability	0.334***	0.322***	0.325***	0.351***
	(0.103)	(0.106)	(0.124)	(0.130)
Constant	-5.253***	-5.222***	-5.203***	-5.224***
	(0.475)	(0.521)	(0.568)	(0.599)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	896	842	842	789
R-squared	0.296	0.309	0.309	0.330

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

Next, we conduct an analysis comparable to the previous one, taking the lag of our inde-

pendent variables to eventually correct any possibility of reverse causality between our different explanatory variables and our dependent variable (Qiao et al., 2019; Iimi, 2005). Overall, the results in Table 3.6 are consistent with previous estimates, confirming the positive impact of urbanization on property tax revenues.

Table 3.6: Estimation of the impact of urbanization on property tax revenue (lag model)

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log), t-1	0.984***	0.938***	1.314***	1.583***	1.617***	1.552***
	(0.179)	(0.179)	(0.187)	(0.202)	(0.201)	(0.250)
GDP per capita growth, t-1		-0.011	-0.014*	0.017	0.017	0.008
		(0.008)	(0.009)	(0.016)	(0.016)	(0.020)
Natural resource rents (log), t-1			0.098**	0.195***	0.203***	0.199***
			(0.040)	(0.042)	(0.041)	(0.047)
Government size, t-1				0.095***	0.091***	0.093***
				(0.010)	(0.011)	(0.012)
Trade, t-1					0.002	0.001
					(0.002)	(0.002)
Political Stability, t-1						0.329***
						(0.108)
Constant	-5.787***	-5.816***	-4.966***	-5.529***	-5.587***	-5.327***
	(0.360)	(0.365)	(0.425)	(0.432)	(0.443)	(0.458)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,116	1,104	1,081	1,004	1,004	843
R-squared	0.189	0.187	0.208	0.280	0.280	0.311

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

3.5.4 Treatment of endogeneity through instrumental variables approach

This section uses two instrumental variables to explore the abovementioned endogeneity problem. Recognizing the complexity of identifying good instruments, this chapter proposes two instruments, interpersonal globalization and access to electricity, which satisfy to our view the conditions of pertinence and exogeneity. The idea is to show that the link between the two instruments and property tax revenue is not direct. However, they can affect property tax revenue mobilization through the urbanization process.

- ***Interpersonal globalization***: refers to policies and resources that enable direct interactions between people living in separate countries. Therefore, this global interconnectedness may be a key determinant in the urbanization process of developing countries. Indeed, the movement of people from developing to developed countries, for example, engenders

similar development and modernization intentions among the latter. These preconceived ideas are, in most cases, materialized by investments (migrant remittances, for example), thus participating in the development process. Moreover, thanks to these numerous cross-border movements, we are witnessing the birth of several partnerships between cities, which contribute significantly to their overall objective of building a better future. From the above, we can argue that there exists a link between interpersonal globalization and the urbanization process.

- ***Access to electricity***: is one of the reasons why people move to urban cities. Indeed, people are usually drawn to towns and cities where they have easy access to electricity (Liddle and Lung, 2014). Moreover, access to electricity is favorable for urbanization because it can promote the implementation of more buildings/infrastructures to face this high level of urban population. On the other hand, even if the size of the urban population does not change, better access to electricity can lead to the development of new businesses, which in turn can lead to the construction of sites to support these businesses and ultimately increase the property tax base.

Table 3.7 presents the results of the IV approach. Regarding the results of the first step (column 2), both instruments are positive and significant, as expected. In addition, the Cragg-Donald Wald statistic is 49.97. Based on Stock and Yogo's rule, this statistic is above the critical value of the F-test at the 10% significance level, allowing us to reject the claim that the instruments are weak (Sanderson and Windmeijer, 2016; Stock and Yogo, 2005; Canavire-Bacarreza et al., 2020). Moreover, the Kleibergen-Paap rk Wald F statistic (KP) for weak identification is also higher than the Stock-Yogo critical value of 19.93 at 10% maximal IV size. The KP suggests that our instruments are strong. Finally, the Hansen statistic is insignificant at 5%, supposing that at least the instruments are exogenous.

In the second stage, our results once again confirm that urbanization generates more property tax revenue. However, the coefficient obtained here is relatively higher than those obtained with fixed effects.

Table 3.7: Estimation of the impact of urbanization on property tax revenue (IV)

Dependent variable : Property tax revenue (log)			
	(1)	(2)	(3)
		IV 2ls	
Variables	Fixed effect	first stage	2nd stage
Urbanization (log)	1.469***		1.805***
	(0.243)		(0.638)
Access to electricity		0.008***	
		(0.001)	
interpersonal globalization		0.003***	
		(0.001)	
GDP per capita growth	0.029	-0.003	0.027
	(0.018)	(0.003)	(0.020)
Natural resources rents (log)	0.207***	-0.008	0.247***
	(0.044)	(0.007)	(0.054)
Government size	0.087***	0.005*	0.086***
	(0.013)	(0.002)	(0.015)
Trade	-0.000	-0.003***	0.001
	(0.002)	(0.004)	(0.002)
Political stability	0.334***	0.104***	0.316**
	(0.103)	(0.022)	(0.128)
Constant	-5.253***	-1.56***	-4.819***
	(0.475)	(0.124)	(0.784)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Kleibergen-Paap rk Wald F statistic			32.9
Cragg-Donald Wald F statistic			49.97
Hansen (P-value)			0.11
Kleibergen-Paap rk LM statistic			53.132
Chi-sq(2) P-val			0.000
Observations	896	823	823

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

3.6 Further analysis

3.6.1 Testing for additional variables

In this subsection, we add additional variables to the baseline specification that can affect property tax revenues. These additional variables are presented below:

Inflation: Unlike other types of taxes, high inflation rates tend to reduce the tax base, as individuals adjust their portfolios toward assets that generally avoid taxation in order to preserve the real value of their wealth (Ghura, 1998; Tanzi, 1992). However, we argue that

property tax revenue is expected to rise in the presence of inflation. This is because inflation drives up rental values, which in turn raises property tax rates. The resulting higher property tax rates could lead to increased property tax revenue. On the other hand, higher property tax rates driven by inflation could discourage taxpayers from paying their property taxes.

Financial Development index: The various financial development processes currently underway in most countries with the adoption of mobile money services, for instance, could contribute to facilitating the payment of taxes (Lompo, 2024; Compaoré, 2022). In addition, financial development contributes significantly to acquiring information on taxpayers via financial institutions. Thus, it facilitates the payment and the collection of taxes in general and could enhance property tax revenue mobilization by improving financial institutions. In this chapter, we use the financial development index derived from the IMF database, which evaluates the level of financial development measured by five banking sector performance indicators and size.[6]

Agriculture: The agriculture sector is likely to harm property tax revenue in developing countries because this sector is difficult to tax (Baunsgaard and Keen, 2010; Bird and Slack, 2004b). Moreover, taxpayers in developing countries generally do not pay property taxes on their agricultural land or are exempted from the payment of property taxes. Thus, this variable's negative impact is expected on property tax revenues. Nevertheless, it is safe to precise that some countries have decided to impose agricultural land to improve the efficiency of agricultural land use (this has been the case in Namibia since 2002).

Digitalization: We use the proxy of Internet consumption (see, for instance, Gnangnon and Brun (2018)) to capture digital improvements (hereafter digitalization). Digitalization enables online declarations and payments, automates tax procedures to avoid mistakes in manual registration, and offers tax authorities better information on property declarations, facilitating the land registry's work. Thus, digitalization simplifies the tasks of the tax administration's IT services by efficiently identifying people's properties and reducing administration collection costs. Today, many countries are implementing policies to improve their digitalization process (esyntax Burkina Faso, ITAS in Uganda are some examples). Therefore, this variable will significantly and positively affect property tax revenue collection (Uyar et al., 2021).

Foreign direct investment: is used to capture the role of foreign investment in property tax revenue mobilization. Most of the investment in developing countries comes from foreign

[6]It combines depth, access, and efficiency.

countries, mainly developed countries. Foreign direct investment contributes to increasing land speculation, especially in constructing new infrastructure projects, thereby expanding the tax base. Consequently, a positive effect of FDI on property tax revenues is expected (Camara, 2023).

We also include additional institutional variables, such as **corruption**, **regulatory quality**, **voice and accountability**, the **rule of law**, and **government effectiveness**, to see their effect on property tax revenues because these variables can have different impacts.

The results of all these investigations are reported in Table 3.8 (see columns [2]-[11]), and we observe that the effect of urbanization on property tax revenues remains positive and significant, whatever the specification. Moreover, the magnitudes do not deviate significantly from previous results (baseline result in column [1]). In columns [2]-[3], we control respectively by Agriculture and inflation. We do not find a significant effect of these variables on property tax revenues. In columns [4]-[6]), we include, respectively, Digitalization, financial development, and foreign direct investment. Our results show these variables' significant positive effects on property tax revenues. When we observed the columns [7]-11], we only found a significant and positive impact of the variable Rule of law on property tax revenue. This variable is important because it serves as a proxy for the legal confusion around property rights protection in many developing countries. It demonstrates that good property tax rules are necessary for a better return on property tax revenues. In sum, the results from additional control variables join the baseline results.

Table 3.8: Adding More variables

Dependent variable : Property tax (log)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Urbanization (log)	1.469***	1.508***	1.445***	1.434***	0.881***	1.469***	1.373***	1.710***	1.592***	1.541***	1.546***
	(0.243)	(0.254)	(0.248)	(0.239)	(0.240)	(0.244)	(0.270)	(0.218)	(0.225)	(0.230)	(0.238)
GDP per capita growth	0.029	0.028	0.030*	0.040**	0.025	0.025	0.019	0.035**	0.037**	0.034*	0.034*
	(0.018)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
Natural resources rents (log)	0.207***	0.218***	0.202***	0.247***	0.262***	0.200***	0.244***	0.153**	0.204***	0.234***	0.209***
	(0.044)	(0.053)	(0.045)	(0.046)	(0.048)	(0.044)	(0.065)	(0.063)	(0.048)	(0.054)	(0.051)
Government size	0.087***	0.090***	0.087***	0.078***	0.060***	0.088***	0.143***	0.093***	0.089***	0.082***	0.086***
	(0.013)	(0.016)	(0.013)	(0.014)	(0.015)	(0.013)	(0.022)	(0.014)	(0.013)	(0.014)	(0.014)
Trade	-0.000	0.000	-0.000	0.000	0.002	-0.002	-0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Political Stability	0.334***	0.339***	0.345***	0.320***	0.387***	0.317***					
	(0.103)	(0.107)	(0.105)	(0.110)	(0.104)	(0.102)					
Agriculture		0.003									
		(0.012)									
Inflation			0.005								
			(0.005)								
Digitalization				0.021***							
				(0.007)							
Financial development index					3.356***						
					(0.542)						
Foreign direct investment						0.042***					
						(0.014)					
Corruption							0.085				
							(0.130)				
Regulatory Quality								-0.169			
								(0.186)			
Voice and Accountability									0.119		
									(0.095)		
Rule of Law										0.328*	
										(0.182)	
Government Effectiveness											0.208
											(0.167)
Constant	-5.253***	-5.270***	-5.353***	-5.207***	-6.847***	-5.220***	-6.100***	-5.654***	-5.470***	-5.305***	-5.531***
	(0.475)	(0.558)	(0.486)	(0.492)	(0.489)	(0.479)	(0.668)	(0.514)	(0.480)	(0.508)	(0.476)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	896	883	896	854	881	892	799	898	899	899	898
R-squared	0.296	0.294	0.296	0.307	0.311	0.300	0.233	0.290	0.290	0.292	0.290

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

3.6.2 Transmission channels

We previously hypothesized that urbanization can significantly impact property tax revenues, particularly in countries with higher levels of financial development and digitalization. To explore this, we use financial development and digitalization as key channels through which urbanization may influence property tax revenue mobilization. To test the validity of these mechanisms, we perform a two-step statistical analysis. First, we examine the direct impact of these channels on property tax revenues. Second, we analyze the effect of the main variable of interest, urbanization, on the selected channels to assess their influence.[7] The Figure 3.8 synthesized the mediator mechanism.

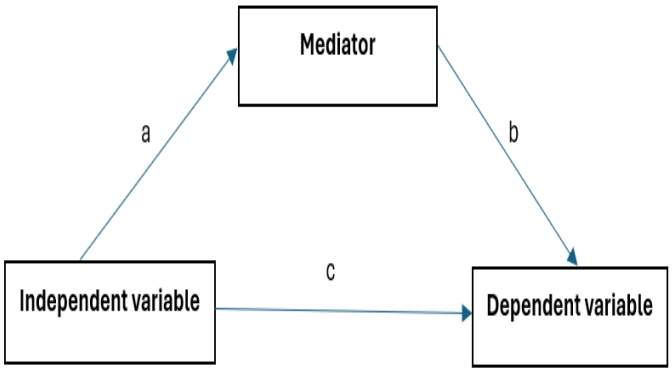

Figure 3.8: Mediator model

Note:: (a) means that the independent variable affects the mediator. (b) indicates the influence of the mediator on the dependent variable. (c) indicates the effect of the independent variable on the dependent variable.

The results in Table 3.9 indicate that property tax revenue are positively impacted by Financial development and digitalization. Likewise, Table 3.10 reveals that urbanization is associated with a significant improvement in Financial development and digitalization. Based on the two results, we can conclude that financial development and digitalization represent the valid transmission channels through which urbanization affects property tax revenues. Another way to test the transmission channels is to follow the approach developed by Baron and Kenny (1986). Their method is realized in three steps : (i)- Analyze the significant effect of the interest variable on the presumed mediator; (ii)-Analyze the significant impact of the interest variable on the dependent variable; (iii)- When the interest variable and the mediator are controlled in the regression, the previously significant relation between the independent and dependent variables is no longer significant or reduce the amplitude of the independent variable. The following Ta-

[7]The goal is to explore whether the two channels selected here correlate with property tax revenue.

Table 3.9: Correlation between channels and property tax revenue.

	[1]	[2]
	Property tax revenue (log)	Property tax revenue (log)
Financial development	3.967***	
	(0.422)	
Digitalization		0.038***
		(0.006)
Constant	-8.295***	-6.846***
	(0.316)	(0.291)
Country FE	Yes	Yes
Time FE	Yes	Yes
Observations	1,142	1,121
R-squared	0.192	0.184

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

Table 3.10: Transmission channels

	[1]	[2]
	Financial Development	Digitalization
Urbanization (log)	0.149***	8.268***
	(0.008)	(0.805)
Constant	0.486***	12.796***
	(0.016)	(1.708)
Country FE	Yes	Yes
Time FE	Yes	Yes
Observations	1,840	1,784
R-squared	0.378	0.718

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

bles 3.11 and 3.12 show that the two mediator variables respect the different conditions of the validity of the mediator. Overall, these results validate the idea that financial development and digitalization are good channels through which urbanization can improve property tax revenues.

3.6.3 Robustness check using access to electricity and interpersonal globalization as instrumental variables separately

In this subsection, we examine the validity and the force of each of our instruments separately. Access to electricity and interpersonal globalization jointly determine urbanization in the first stage and should be used together as instruments. Similarly, when we use them separately, both

Table 3.11: Financial Development as Mediator

	(1)	(2)	(3)
	Financial Development	Property tax revenue (log))	Property tax revenue (log))
Urbanization (log)	0.149***	0.945***	0.346**
	(0.008)	(0.172)	(0.175)
Financial development			3.537***
			(0.457)
	(0.016)	(0.361)	(0.431)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	1,840	1,175	1,142
R-squared	0.378	0.179	0.195

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

Table 3.12: Digitalization as mediator

	(1)	(2)	(3)
	Digitalization	Property tax revenue (log)	Property tax revenue (log)
Urbanization (log)	8.268***	0.945***	0.864***
	(0.805)	(0.172)	(0.168)
Digitalization			0.032***
			(0.006)
Constant	12.796***	-5.823***	-5.858***
	(1.708)	(0.361)	(0.358)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	1,784	1,175	1,121
R-squared	0.718	0.179	0.198

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

instruments are significant in the first stage (see Table 3.13). Moreover, the Kleibergen-Paap rk Wald F statistic and the Cragg-Donald Wald F statistic confirm that the instruments are strong.

However, when we look at the results of the second stage, we find that only the second stage using access to electricity as an instrument of urbanization gives us a significant value of urbanization on property tax revenue. Based on these findings, it is tempting to argue that

access to electricity captures a more important dimension by which the effect of urbanization on property tax revenues is identified.

Table 3.13: Robustness check using access to electricity and interpersonal globalization as instrumental variables separately

Dependent variable: Property tax revenue (log)					
	(1)	(2)	(3)	(4)	(5)
		access to electricity		***interpersonal globalization***	
		IV 2SLS		IV 2SLS	
VARIABLES	Fixed effect	first stage	2nd stage	first stage	2nd stage
Urbanization (log)	1.469***		2.247***		-1.159
	(0.243)		(0.652)		(1.276)
GDP per capita growth	0.029	-0.004***	0.033*	-0.004	0.011
	(0.018)	(0.003)	(0.020)	(0.002)	(0.022)
Natural resource rents (log)	0.207***	-0.017	0.239***	-0.020***	0.127*
	(0.044)	(0.006)	(0.053)	(0.006)	(0.070)
Government size	0.087***	0.006	0.078***	0.006***	0.109***
	(0.013)	(0.002)	(0.015)	(0.002)	(0.018)
Trade	-0.000	-0.002**	0.002	-0.003***	-0.007**
	(0.002)	(0.000)	(0.003)	(0.000)	(0.003)
Political Stability	0.334***	0.117***	0.232*	0.106***	0.703***
	(0.103)	(0.021)	(0.134)	(0.022)	(0.191)
Access to electricity		0.008***			
		(0.001)			
interpersonal globalization				0.006***	
				(0.001)	
Constant	-5.253***	-1.509***	-4.538***	-0.963***	-7.590***
	(0.475)	(0.081)	(0.789)	(0.059)	(1.288)
Country FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap rk Wald F statistic			48.074		28.590
Cragg-Donald Wald F statistic			94.77		26.106
Kleibergen-Paap rk LM statistic			45.596		26.725
Chi-sq(1) P-val			0.0000		0.0000
Observations	896	854	854	865	865

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

3.6.4 Alternative estimation methods: GMM exploring

In the quest for the validity of our results, we estimate an alternative method to overcome the endogeneity[8] issue and to take into account the dynamic aspect of property tax revenue, namely system-GMM proposed by Blundell and Bond (1998) and Blundell et al. (2001). We overcome instrument explosion by collapsing the instruments matrix to have fewer instruments than countries (Roodman, 2009). The results in Table 3.14 confirm urbanization's positive and significant effect on property tax revenue mobilization. Also, the findings indicate that the second-order autocorrelation test (AR2), the first-order autocorrelation test (AR1), and the

[8]GMM is an excellent alternative to resolve endogeneity issue because it is not easy to find credible instruments

Hansen test are valid for GMM estimation. Moreover, the coefficient associated with the lag of the explained variable is positively significant with a good magnitude, which also confirms the validity of the GMM estimator. It reflects the persistent effect of property tax revenues. An additional element of the validity of the GMM system is the fact that the number of instruments is less than the number of countries. Overall, using system GMM does not affect the positive effect of urbanization on property tax revenues.

Table 3.14: Robustness check using system GMM

Dependent variable: Property tax revenue (log)	
	(1)
VARIABLES	GMM
L.Property tax	0.755***
	(0.015)
Urbanization (log)	0.750***
	(0.086)
GDP per capita growth	-0.027***
	(0.003)
Natural resource rents (log)	0.057***
	(0.012)
Government size	0.015***
	(0.004)
Trade	0.001**
	(0.001)
Political Stability	0.069***
	(0.024)
Constant	-1.059***
	(0.173)
Observations	788
Number of countries	68
Number of instrument	56
AR1	0.016
AR2	0.187
Hansen	0.375

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

3.6.5 The impact of urbanization on property tax revenue by income level

An important observation concerning the abovementioned findings is that these results could be heterogeneous across countries. Thus, after exploring what happens at the regional level in

the previous section, another way to investigate this heterogeneity is to regard the sensitivity of our results at the income level. When we do so, the findings in Table 3.15 show a positive and significant effect of urbanization in Low-income and upper-middle-income and a positive and insignificant effect of urbanization on property tax revenue in lower-middle-income. Although the results depend on each country's income level, urbanization's positive effect on property tax revenue remains. Moreover, the magnitude of the interest variable is higher in upper-middle income than in low-income, reflecting that the more the countries are developed, the more they collect property taxes.

Table 3.15: Effect of urbanization on property tax revenue by income group

Dependent variable: Property tax revenue (log)			
	(1)	(2)	(3)
	Low income	Lower Middle income	Upper Middle income
Urbanization (log)	1.909***	0.060	2.452***
	(0.541)	(0.441)	(0.814)
GDP per capita growth	0.033	0.011	-0.018
	(0.040)	(0.040)	(0.014)
Natural resource rents (log)	0.008	0.510***	0.078
	(0.402)	(0.155)	(0.076)
Government size	0.035**	0.008	0.002
	(0.016)	(0.041)	(0.022)
Trade	0.013	0.004	-0.020***
	(0.008)	(0.007)	(0.004)
Political Stability	-0.019	0.236	-0.235
	(0.299)	(0.173)	(0.213)
Constant	-7.934***	-5.894***	-2.639***
	(2.806)	(1.019)	(0.978)
County FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	137	294	465
R-squared	0.553	0.264	0.802

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

3.6.6 Sub-period analysis

Here, we perform our analysis by subdividing our sample into two sub-periods (see Tables B5 and B6 in the appendix) to account for the effects of the 2007 crisis.[9] The idea is to see

[9]The choice of this period is justified by the consequences of the 2008 global financial crisis. The investors have reoriented their investments to developing countries, such as African countries, which were not really affected by the crisis. In addition, this period saw an increase in investment in the real estate sector in many developing countries, broadening the property tax base.

if our results remain stable, whatever the sub-period. Moreover, it helps to reduce the size of the period and explore if the results are non-conducted by time horizon. Despite including the two sub-periods in our analysis, urbanization stays positive and significant at 1%. These results reinforce our previous results even if, in the second sub-period, some of our explanatory variables are not significant.

3.6.7 Estimation by considering three-year averages of the data

To address the possible variations of the variables over time, we review the data by using the three-year average of our data. This approach smooths any disparities in the data. The results of this estimation are given in Table 3.16. Overall, the results confirm that urbanization positively impacts property tax revenue mobilization.

Table 3.16: Estimation of the impact of urbanization on property tax revenue (three-year averages)

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log)	0.972***	0.937***	1.264***	1.590***	1.606***	1.395***
	(0.282)	(0.282)	(0.294)	(0.330)	(0.327)	(0.355)
GDP per capita growth		-0.024	-0.029	0.043	0.042	0.027
		(0.019)	(0.020)	(0.039)	(0.040)	(0.041)
Natural resource rents (log)			0.093	0.216***	0.219***	0.241***
			(0.061)	(0.063)	(0.061)	(0.066)
Government size				0.096***	0.093***	0.089***
				(0.015)	(0.017)	(0.016)
Trade					0.001	-0.001
					(0.003)	(0.003)
Political stability						0.352**
						(0.153)
Constant	-5.847***	-5.816***	-4.997***	-5.518***	-5.562***	-5.239***
	(0.467)	(0.476)	(0.596)	(0.596)	(0.630)	(0.636)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	437	433	425	392	392	389
R-squared	0.220	0.223	0.241	0.304	0.304	0.311

I use three-year averages of the data to explore the sensitivity of the results to the time horizon.
*** p<0.01, ** p<0.05, * p<0.1. Robust Standard errors in parentheses

3.6.8 Estimation without East Asia & Pacific and South Asia

As previously observed in Table 3.4, the impact of urbanization on property tax revenue is insignificant for East Asia & Pacific and South Asia. Thus, in this part, we perform the exercise without these regions (see Table 3.17). In columns[1]-[3], we observe that the impact

of urbanization on property tax revenue remains positive and significantly stable in the three cases.

Table 3.17: Robustness check: Results without East Asia Pacific and South Asia, and both

Dependent variable: Property tax revenue (log)			
	(1)	(2)	(3)
Urbanization (log)	1.513***	1.335***	1.379***
	(0.260)	(0.239)	(0.258)
GDP per capita growth	0.020	0.020	0.011
	(0.020)	(0.018)	(0.020)
Natural resource rents (log)	0.193***	0.176***	0.160***
	(0.045)	(0.042)	(0.043)
Government size	0.080***	0.080***	0.072***
	(0.014)	(0.013)	(0.014)
Trade	0.001	0.000	0.001
	(0.002)	(0.002)	(0.002)
Political Stability	0.302***	0.326***	0.282**
	(0.115)	(0.100)	(0.112)
Constant	-4.994***	-5.565***	-5.295***
	(0.457)	(0.469)	(0.455)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	827	848	779
R-squared	0.291	0.238	0.231

*** p<0.01, ** p<0.05, * p<0.1. Robust Standard errors in parentheses
[1] Estimation without East Asia & Pacific;
[2] Estimation without South Asia;
[3] Estimation without both

3.6.9 The case of Sub-Saharan Africa countries without South Africa

In this subsection, we examine the context of the Sub-Saharan Africa region. Figure B1 in the appendix indicates that South Africa differs from other African countries. Therefore, we analyze the case of this region without South Africa to determine whether our results remain consistent after removing this country. Notably, South Africa leads in property tax revenues, due to its highly decentralized property tax management system. Once again, the results of this investigation presented in Table 3.18 validate our main results. Thus, we can conclude that our results are not influenced by outliers.

Table 3.18: Robustness check: The case of Sub-Saharan Africa countries without South Africa

Dependent variable: Property tax revenue (log)	
VARIABLES	(1)
Urbanization (log)	1.455***
	(0.273)
GDP per capita growth	0.025
	(0.025)
Natural resource rents (log)	0.175***
	(0.056)
Government size	0.062***
	(0.014)
Trade	0.002
	(0.004)
Political Stability	0.105
	(0.134)
Constant	-5.870***
	(0.588)
Country FE	Yes
Time FE	Yes
Observations	246
R-squared	0.288

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

3.6.10 Urban agglomeration versus rural population

In this sub-section, we explore the quality of our results by using an alternative measure of urbanization following (Andersson, 2018). As the property tax base is substantially more represented in large urban areas, we use the variable represented by population in urban agglomerations of more than 1 million (% of the total population) from WDI to analyze the relationship between the urbanization process and property tax revenue (Norregaard, 2013). The critical question is how large urban areas affect property tax revenue. To answer this question, it is good to note that the major infrastructures, buildings, businesses, etc. are generally more represented in larger cities. For this reason, this variable can be an excellent one for evaluating urbanization's effects on property tax revenues.

The results of this estimation are presented in Table B7 in the appendix, which confirms the baseline results. On the other hand, we also explore the relationship between rural population derived from WDI and property tax revenue. According to the World Bank database, rural

population refers to people living in rural areas as defined by national statistical offices. The idea is to verify the general point of view that property tax revenue is generally collected in urban cities only. Indeed, the idea is that the rural population does not pay property tax or that this tax is unknown to them. Table B8 in the appendix shows the rural population's negative and significant effect on property tax revenue, confirming the negative link between the rural population and the mobilization of property tax revenue.

3.7 Conclusion

Developing countries are part of the world where domestic resources remain poorly collected. Consequently, the literature on property tax revenue collection is gaining increasing attention from researchers and practitioners. One instrument governments in these countries could leverage to improve their property tax revenue mobilization is better exploiting their urbanization process. In this context, this chapter assessed the effect of urbanization on property tax revenue mobilization in 71 developing countries over the period 1996-2019.

Based on panel-fixed effects regressions, our empirical results show urbanization's positive and significant effect on property tax revenue mobilization. To deal with the endogeneity issue, we estimate our model using instrumental variables, the system GMM method, and a battery of robustness checks. The findings from these estimates also reveal a positive and significant effect of urbanization on property tax revenues. We can thereby argue that urbanization represents a good opportunity for developing country governments to enhance their property tax revenue collection.

The chapter also investigated two main transmission channels: digitalization and financial development, through which urbanization can affect property tax revenues. When we do so, our results indicate that both are suitable transmission channels through which urbanization can enhance property tax revenue mobilization. Governments should thus pay greater attention to their rapid urbanization by implementing policies that facilitate the recovery of property tax revenues. For instance, improving their financial development and digitalization efforts is required. Likewise, given this high level of urbanization, a modernization of the cadastral system (e.g., use of digital technology) is necessary for better identification of all properties requiring taxation. In addition, governments are responsible for adequately redefining property rights to

avoid disputes around property rights protection.

Finally, for better compliance with the property tax, governments need to bring the provision of public services closer to their populations. South Africa's experience in granting the collection of this tax to local authorities remains an example to follow in Africa.

Appendix chapter 3

Table B1: Variance inflation factor

Variables	VIF	1/VIF
Political stability	1.25	0.798577
Government size	1.25	0.801915
Trade	1.23	0.811384
Natural rents (log)	1.16	0.862436
URBAN (log)	1.11	0.903347
GDP per capita growth	1.04	0.960042
Mean VIF	1.17	

Table B2: Estimation of the impact of urbanization on property tax revenue (Pooled)

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (Log)	1.360***	1.336***	1.453***	1.544***	1.535***	1.572***
	(0.149)	(0.151)	(0.168)	(0.173)	(0.174)	(0.201)
GDP per capita growth		-0.000	-0.000	0.055***	0.050***	0.058***
		(0.011)	(0.012)	(0.014)	(0.014)	(0.016)
Natural resource rents (Log)			0.080**	0.135***	0.156***	0.153***
			(0.039)	(0.043)	(0.043)	(0.050)
Government size				0.103***	0.091***	0.091***
				(0.012)	(0.011)	(0.014)
Trade					0.006***	0.006***
					(0.002)	(0.002)
Political Stability						0.307***
						(0.109)
Constant	-5.884***	-5.912***	-5.552***	-7.001***	-7.155***	-7.102***
	(0.141)	(0.147)	(0.276)	(0.362)	(0.378)	(0.442)
Country FE	No	No	No	No	No	No
Time FE	No	No	No	No	No	No
Observations	1,175	1,163	1,138	1,057	1,057	896
R-squared	0.079	0.076	0.086	0.161	0.167	0.182

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

Table B3: Descriptive statistics

Variables	N	Mean	Std,Dev	Min	Max
Property tax revenue	1,175	0.310	0.379	1.30e-07	1.928
urban population	1,912	46.44	19.08	7.412	91.99
Total natural resources rents	1,889	6.317	9.245	0	87.46
Government size	1,688	14.30	5.788	2.047	62.13
Government Effectiveness	1,673	-0.450	0.604	-2.279	1.267
Political Stability	1,669	-0.420	0.839	-3.006	1.342
Regulatory Quality	1,673	-0.424	0.634	-2.275	1.127
Rule of Law	1,679	-0.512	0.607	-1.897	1.079
Voice and Accountability	1,679	-0.415	0.770	-2.259	1.152
Corruption	1,268	2.246	0.749	0	5
Financial development index	1,848	0.211	0.140	0	0.739
Agriculture	1,836	16.51	11.12	0.893	61.42
IndividualsusingtheInternet	1,790	16.87	20.80	0	84.19
InflationGDPdeflatorannual	1,875	9.568	35.49	-31.57	1,014
Trade	1,762	75.88	37.60	15.64	348.0
GDP per capita growth	1,878	2.832	5.810	-36.56	140.4
Access to electricity	1,741	85.01	21.30	7.740	100
Interpersonal globalization	1,840	43.29	19.01	7.730	87.17

Table B4: Table of Correlation

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
[1]Property tax revenue	1																
[2] urban population	0.392***	1															
[3] GDP per capita growth	0.0547	-0.0597	1														
[4] Total natural resource rents	-0.0892*	-0.110**	0.0528	1													
[5]Government size	0.323***	0.257***	-0.0983*	-0.173***	1												
[6]Trade	0.0180	0.00806	0.0696	-0.109**	0.288***	1											
[7] Political stability	0.210***	0.200***	0.0916*	-0.185***	0.401***	0.195***	1										
[8] Agriculture	-0.359***	-0.743***	0.0116	0.186***	-0.322***	-0.0860*	-0.192***	1									
[9] Inflation	0.166***	0.143***	-0.0365	0.0962*	-0.00706	0.0948*	-0.00286	-0.0403	1								
[10]Internet	0.334***	0.517***	-0.0399	-0.175***	0.157***	0.0381	0.0474	-0.446***	-0.0585	1							
[11]Corruption	0.00582	0.118**	-0.0780	-0.0741	0.243***	-0.0945*	0.265***	-0.0442	0.0511	-0.144***	1						
[12]Regulatory Quality	0.0319	0.118**	0.0136	-0.479***	0.339***	0.0949*	0.350***	-0.333***	-0.336***	0.156***	0.228***	1					
[13] Voice and Accountability	-0.00478	0.135***	-0.109**	-0.380***	0.266***	-0.153***	0.341***	-0.201***	-0.136***	0.0599	0.300***	0.577***	1				
[14]Rule of Law	0.0208	0.0581	0.0217	-0.258***	0.427***	0.0301	0.386***	-0.299***	-0.196***	0.138***	0.340***	0.679***	0.483***	1			
[15] Government Effectiveness	0.169***	0.274***	0.0458	-0.272***	0.377***	0.00933	0.267***	-0.506***	-0.169***	0.246***	0.279***	0.679***	0.373***	0.763***	1		
[16] Access to electricity	0.240***	0.582***	0.113**	-0.114**	-0.114**	0.207***	-0.139***	-0.580***	0.102*	0.427***	-0.161***	0.00186	-0.132**	-0.0996*	0.127**	1	
[17]Interpersonal globalization	0.0350	0.417***	0.0262	-0.306***	0.319***	0.512***	0.357***	-0.451***	-0.0139	0.460***	-0.0528	0.314***	0.148***	0.162***	0.164***	0.340***	1

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

Table B5: Robustness check using the period 1996-2007

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log)	0.736***	0.653***	1.120***	1.506***	1.510***	1.126***
	(0.193)	(0.192)	(0.223)	(0.236)	(0.229)	(0.319)
GDP per capita growth		-0.003	-0.008	0.060***	0.060***	0.065***
		(0.013)	(0.013)	(0.018)	(0.019)	(0.023)
Natural resource rents (log)			0.204***	0.306***	0.307***	0.299***
			(0.055)	(0.054)	(0.053)	(0.066)
Government size				0.080***	0.079***	0.072***
				(0.014)	(0.013)	(0.018)
Trade					0.000	-0.001
					(0.002)	(0.003)
Political Stability						0.518***
						(0.148)
Constant	-6.382***	-6.478***	-5.183***	-5.277***	-5.288***	-5.345***
	(0.381)	(0.376)	(0.499)	(0.515)	(0.553)	(0.657)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	658	646	633	591	591	430
R-squared	0.150	0.156	0.181	0.249	0.249	0.279

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

Table B6: Robustness check using the period 2008-2019

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log)	1.441***	1.425***	1.961***	2.073***	2.070***	1.974***
	(0.318)	(0.320)	(0.304)	(0.350)	(0.353)	(0.372)
GDP per capita growth		-0.030	-0.029	0.009	0.009	0.006
		(0.027)	(0.027)	(0.030)	(0.030)	(0.030)
Natural resource rents (log)			-0.056	0.043	0.042	0.064
			(0.057)	(0.056)	(0.056)	(0.054)
Government size				0.120***	0.120***	0.116***
				(0.015)	(0.018)	(0.018)
Trade					-0.000	-0.001
					(0.003)	(0.003)
Political Stability						0.193
						(0.147)
Constant	-4.758***	-4.619***	-4.312***	-5.927***	-5.924***	-5.601***
	(0.449)	(0.467)	(0.508)	(0.499)	(0.506)	(0.534)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	517	517	505	466	466	466
R-squared	0.230	0.231	0.267	0.349	0.349	0.351

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

Table B7: Property tax and urban agglomeration

Dependent variable: Property tax revenue (log)						
	Urban agglomeration					
	(1)	(2)	(3)	(4)	(5)	(6)
Urbanization (log)	0.830***	0.833***	0.930***	1.066***	1.192***	1.250***
	(0.173)	(0.174)	(0.187)	(0.182)	(0.184)	(0.203)
GDP per capita growth		0.010	0.010	0.016	0.017	0.010
		(0.019)	(0.019)	(0.018)	(0.017)	(0.021)
Natural resource rents (log)			0.190***	0.219***	0.235***	0.224***
			(0.068)	(0.071)	(0.071)	(0.078)
Government size				0.168***	0.160***	0.133***
				(0.020)	(0.021)	(0.024)
Trade					0.006**	0.004
					(0.003)	(0.003)
Political Stability						0.648***
						(0.128)
Constant	-8.861***	-8.912***	-8.494***	-10.478***	-11.252***	-10.509***
	(0.535)	(0.552)	(0.508)	(0.525)	(0.600)	(0.676)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	837	837	837	805	805	690
R-squared	0.226	0.226	0.233	0.297	0.301	0.328

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

Table B8: Effect of rural population on property tax revenue

Dependent variable: Property tax revenue (log)						
	(1)	(2)	(3)	(4)	(5)	(6)
Rural (log)	-1.058***	-0.996***	-1.382***	-1.393***	-1.504***	-1.251***
	(0.161)	(0.163)	(0.161)	(0.172)	(0.175)	(0.198)
GDP per capita growth		-0.009	-0.011	0.028*	0.028*	0.027
		(0.010)	(0.010)	(0.016)	(0.016)	(0.018)
Natural resource rents (log)			0.071*	0.161***	0.178***	0.182***
			(0.037)	(0.038)	(0.038)	(0.044)
Government size				0.083***	0.074***	0.075***
				(0.011)	(0.011)	(0.014)
Trade					0.004**	0.002
					(0.002)	(0.002)
Political Stability						0.369***
						(0.108)
Constant	-2.411***	-2.652***	-0.733	-1.344	-1.077	-1.633*
	(0.733)	(0.735)	(0.770)	(0.823)	(0.815)	(0.878)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,127	1,115	1,090	1,009	1,009	854
R-squared	0.179	0.180	0.203	0.257	0.259	0.282

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

Table B9: Sample of countries by income groups and regions.

Sample of countries by income groups and regions.

Country	Region (World Bank)	Income group (World Bank/OECD)
Afghanistan	South Asia	Low income
Albania	Europe & Central Asia	Upper middle income
Azerbaijan	Europe & Central Asia	Upper middle income
Argentina	Latin America & Caribbean	Upper middle income
Bangladesh	South Asia	Lower middle income
Armenia	Europe & Central Asia	Upper middle income
Bhutan	South Asia	Lower middle income
Bolivia	Latin America & Caribbean	Lower middle income
Botswana	Sub-Saharan Africa	Upper middle income
Brazil	Latin America & Caribbean	Upper middle income
Belize	Latin America & Caribbean	Upper middle income
Bulgaria	Europe & Central Asia	Upper middle income
Burundi	Sub-Saharan Africa	Low income
Belarus	Europe & Central Asia	Upper middle income
Cambodia	East Asia & Pacific	Lower middle income
Central African Republic	Sub-Saharan Africa	Low income
Chad	Sub-Saharan Africa	Low income
China	East Asia & Pacific	Upper middle income
Comoros	Sub-Saharan Africa	Lower middle income
Costa Rica	Latin America & Caribbean	Upper middle income
Benin	Sub-Saharan Africa	Low income
Dominica	Latin America & Caribbean	Upper middle income
Dominican Republic	Latin America & Caribbean	Upper middle income
Ecuador	Latin America & Caribbean	Upper middle income
El Salvador	Latin America & Caribbean	Lower middle income
Equatorial Guinea	Sub-Saharan Africa	Upper middle income
Ethiopia	Sub-Saharan Africa	Low income
Eritrea	Sub-Saharan Africa	Low income
Djibouti	Middle East & North Africa	Lower middle income
Georgia	Europe & Central Asia	Upper middle income
Grenada	Latin America & Caribbean	Upper middle income
Guatemala	Latin America & Caribbean	Upper middle income
Guyana	Latin America & Caribbean	Upper middle income
Honduras	Latin America & Caribbean	Lower middle income
India	South Asia	Lower middle income
Indonesia	East Asia & Pacific	Lower middle income
Iran, Islamic Rep.	Middle East & North Africa	Upper middle income
Cote d'Ivoire	Sub-Saharan Africa	Lower middle income
Kazakhstan	Europe & Central Asia	Upper middle income
Jordan	Middle East & North Africa	Upper middle income
Kenya	Sub-Saharan Africa	Lower middle income
Lesotho	Sub-Saharan Africa	Lower middle income
Madagascar	Sub-Saharan Africa	Low income
Malaysia	East Asia & Pacific	Upper middle income
Mauritania	Sub-Saharan Africa	Lower middle income
Mauritius	Sub-Saharan Africa	Upper middle income
Moldova	Europe & Central Asia	Lower middle income
Montenegro	Europe & Central Asia	Upper middle income
Morocco	Middle East & North Africa	Lower middle income
Namibia	Sub-Saharan Africa	Upper middle income
Nepal	South Asia	Low income
Nicaragua	Latin America & Caribbean	Lower middle income
Pakistan	South Asia	Lower middle income
Paraguay	Latin America & Caribbean	Upper middle income
Peru	Latin America & Caribbean	Upper middle income
Philippines	East Asia & Pacific	Lower middle income
Guinea-Bissau	Sub-Saharan Africa	Low income

Country	Region (World Bank)	Income group (World Bank/OECD)
Romania	Europe & Central Asia	Upper middle income
Rwanda	Sub-Saharan Africa	Low income
Sao Tome and Principe	Sub-Saharan Africa	Lower middle income
Senegal	Sub-Saharan Africa	Lower middle income
Vietnam	East Asia & Pacific	Lower middle income
South Africa	Sub-Saharan Africa	Upper middle income
Zimbabwe	Sub-Saharan Africa	Lower middle income
Sudan	Sub-Saharan Africa	Lower middle income
Swaziland	Sub-Saharan Africa	Lower middle income
Thailand	East Asia & Pacific	Upper middle income
Togo	Sub-Saharan Africa	Low income
Tonga	East Asia & Pacific	Upper middle income
Tunisia	Middle East & North Africa	Lower middle income
Turkey	Europe & Central Asia	Upper middle income
Turkmenistan	Europe & Central Asia	Upper middle income
Ukraine	Europe & Central Asia	Lower middle income
Egypt, Arab Rep.	Middle East & North Africa	Lower middle income
Tanzania	Sub-Saharan Africa	Low income
Burkina Faso	Sub-Saharan Africa	Low income
Samoa	East Asia & Pacific	Upper middle income
Yemen, Rep.	Middle East & North Africa	Low income
Serbia	Europe & Central Asia	Upper middle income

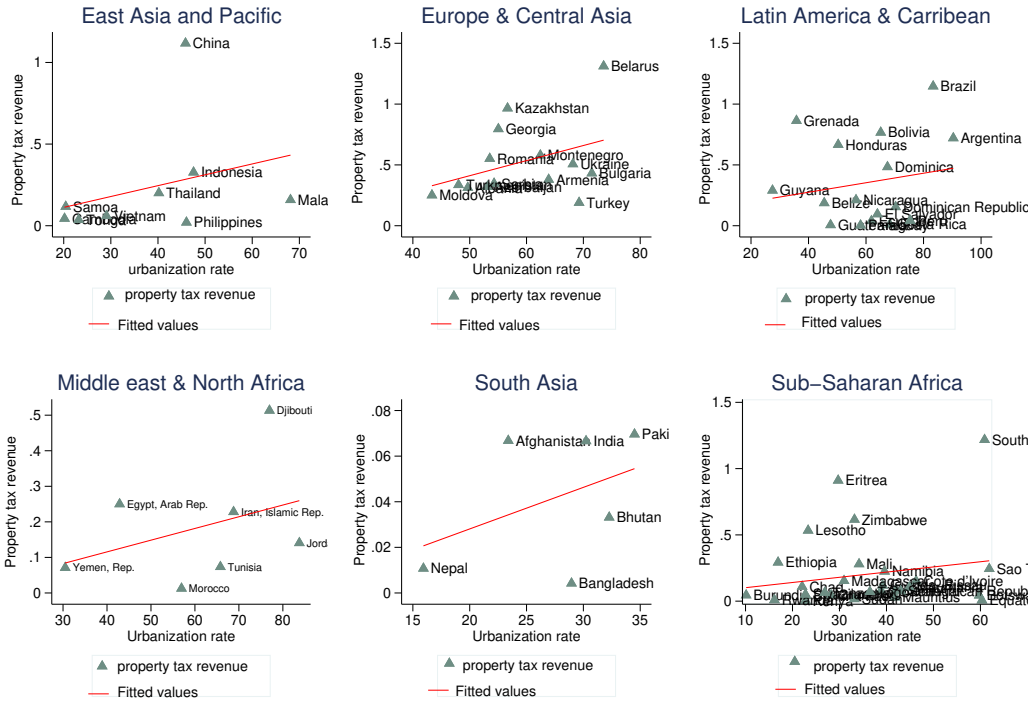

Figure B1: Scatter plot between urbanization and property tax revenue by region

Table B10: Definitions and Data sources

Variables	Description	Sources
Urban population (URBAN)	Urban population refers to people living in urban areas as defined by national statistical offices. Percentages urban are the numbers of persons residing in an area defined as "urban" per 100 total population.	WDI
GDP per capita growth	Annual percentage growth rate of GDP per capita based on constant local currency.	
Government Size	They include all current expenditures by the general government on purchasing goods and services and compensation of employees.	
Inflation, GDP deflator (annual %)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.	
Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	
Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	
Agriculture, forestry, and fishing, value added (% of GDP)	Agriculture, forestry, and fishing corresponds to ISIC divisions 1-3 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production.	
Individuals using the Internet (% of population)	Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.	
Access to electricity	Access to electricity, urban is the percentage of urban population with access to electricity.	
Population in urban agglomerations	Population in urban agglomerations of more than one million is the percentage of a country's population living in metropolitan areas that in 2018 had a population of more than one million people.	
Financial Development Index	Index for overall financial development	IMF/ FSED
Political stability and absence of violence	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.	WGI
Government Effectiveness	capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	
Voice and Accountability	capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	
Rule of law	capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	
Corruption	This is an assement of corruption within the political system	ICRG
Property tax revenue (% GDP)	Total property tax revenues	ICTD
Interpersonal globalization	Interpersonal Globalization, de facto	KOF

CHAPTER 4

(Re)understanding the relationship between Fiscal Decentralization and property tax revenue: Insights from developing and developed countries

This chapter was presented at the 22nd edition of the EUDN workshop at the Paris School of Economics and the 26th INFER annual conference in Chania, Greece. A slightly different version of this chapter is currently under review at Economic Change and Restructuring.

4.1 Introduction

The 1990s saw a wave of decentralization in many countries, but the trend accelerated in the 2000s in developing countries with local elections in many African countries. That is mainly due to inefficiencies in the central government's provision of public goods and the desire to bring services closer to the population.

Decentralization led to the transfer of competencies to the local level, which has been extensively studied (Ebel and Yilmaz, 2002; Sanogo, 2019; Prud'Homme, 1995; Oates et al., 1972; Banzhaf et al., 2021). It takes many forms, but we are more interested in one of its components, namely fiscal decentralization. In essence, fiscal decentralization refers to the allocation of taxation and expenditure responsibilities to subnational authorities.

Fiscal decentralization promotes local democracy and improves public sector efficiency by increasing citizens' participation and holding decision-makers accountable (Kwabena Obeng, 2021; Qiao et al., 2019). Additionally, the population is more sensitive to proximity policies, which directly impact their standard of living (Faguet, 2014). Likewise, the COVID-19 crisis has underscored the importance of local government autonomy in managing local needs.

Thus, if fiscal decentralization policies are implemented, it is incumbent upon local governments to exhibit greater efficiency in the delivery of public goods and services. Therefore, decentralization is expected to have a beneficial effect on the allocative efficiency of local governments. However, to effectively mobilize local tax revenues, local governments must have adequate resources capable of providing appropriate public services. Indeed, the ineffectiveness of the administrative capacity of local authorities can compromise the expected positive effects of decentralization. Moreover, in most developing countries, decentralization policies have not been accompanied by genuine strategies for mobilizing their resources. This weakens local authorities's development level; consequently, most of them remain dependent on government transfers.

The proximity that results from decentralization can be a source of corruption, as evidenced by (Tanzi, 1994; Blanchard and Shleifer, 2001; Ali et al., 2020). Indeed, it will create personal relationships that can encourage corruption. This constitutes one of the main arguments why some countries are reluctant to accord total fiscal autonomy to their local governments. Nevertheless, at the same time, they remain indifferent or less motivated in terms of promoting

local tax reform and delivering more public services closer to the citizens. Conversely, some studies argue that decentralization can also limit opportunities for corruption. For instance, fiscal decentralization could limit corruption risks by favoring competition among local governments and making closer information between citizens and local government (Ivanyna and Shah, 2010; Weingast, 1995; Changwony and Paterson, 2019). In the same vein, this closer proximity could be an excellent alternative to increase local taxation, including property taxation (Caldeira et al., 2023; Liberati and Sacchi, 2013; Norregaard, 2013; Chambas, 2005a), which is a local tax by definition.[1] On the other hand, it is important to note that fiscal decentralization can lead to demands for autonomy from regions characterized by a high degree of ethnic fragmentation (Tranchant, 2010). Moreover, high levels of ethnic fragmentation can influence the implementation of fiscal policies, particularly local taxation (Easterly and Levine, 1997).

The literature on the effects of fiscal decentralization is fairly abundant. Nevertheless, few of them have investigated its impact on property tax revenues. The scant number of empirical studies on this subject is largely attributable to the researcher's limited access to property tax revenue data in the last decades. Therefore, this study seeks to empirically revisit the effect fiscal decentralization can have on property tax revenues, focusing on a panel of developed and developing countries, and using data on property tax revenue from the UNU-WIDER Government Revenue Dataset. The question that arises is how local autonomy can influence property tax revenue collection. However, it is important to note that the numerous transfers that local governments receive do not encourage them to be financially autonomous. The choice is, therefore, between more decentralization and elimination of subsidies or more subsidies and centralized management of property taxes. In all cases, the non-participation or lower implication of local authorities in the efforts of property tax collection may be an explanation for the current low participation of this tax in the mobilization of tax revenues.[2]

In developed countries, property taxes represent an important source of revenue for local authorities.[3] However, in most developing countries, particularly those in Africa, the potential for

[1] Property tax management is decentralized in most developed countries. That is not the case in most developing countries (Chambas, 2005a).

[2] For instance, the difficulty in uncovering the numerous illegal occupations of properties and the arbitrary attribution of property titles are some difficulties. Yet, local government can play an important role in the identification of the property tax base.

[3] Property tax contributes significantly to the annual budget of local authorities. This is not the case in many developing countries which remain largely dependent on government transfers (Pomeranz and Vila-Belda, 2019; Brockmeyer et al., 2021).

property tax revenue remains under-exploited. In francophone African countries, for instance, the collection of property taxes is centralized, which raises concerns about its insufficient contribution to overall tax revenue generation (Monkam et al., 2010).

Undoubtedly, it is important to consider the notion of economies of scale and, therefore, to make a good trade-off between economies of scale and property tax management at the local level. Thus, if the mobilization of property taxes is more effective at the central rather than local level, it would be important to maintain this management at the central level. Nonetheless, property tax is the type of tax in which the tax base cannot be moved outside the jurisdiction concerned. Indeed, the buildings or land are located in a very specific locality. Consequently, better identification of these assets would result in the locality being able to identify them more easily.

Against this backdrop, the present study revisits the connection between fiscal decentralization and property tax revenue collection in a blend of developing and developed countries. Contrary to previous research focused solely on developed or developing countries, this chapter examines both simultaneously. Understanding the relationship between fiscal decentralization and property tax revenue is of utmost importance for policymakers and practitioners, as property tax revenue constitutes an important source of funding for local governments. This chapter extends the existing literature on this issue, particularly the scarce empirical examination. By examining the effects of fiscal decentralization on property tax revenue, we can gain valuable insights into the implications for local governance, fiscal sustainability, and local economic development. Unlike previous research, the chapter also investigates the initial distribution of property tax revenue before presenting policy suggestions. Further, although previous studies have found that fiscal decentralization positively affects property tax revenue, they have not specifically examined the channels through which fiscal decentralization influences property tax revenue. Therefore, we aim to investigate the transmission channels of these effects. This chapter proposes thus the level of democracy, corruption, and ethnic fragmentation as potential mechanisms through which fiscal decentralization can influence property tax revenues. Based on the above discussion, the study tests the assumption that higher local autonomy can foster property tax revenue collection.

In an econometric analysis utilizing a panel approach with fixed effects, including country and year fixed effects, we have deduced a positive and statistically significant impact of fiscal

decentralization on property tax revenues. Furthermore, our research has uncovered that the influence of fiscal decentralization is more pronounced in developed than in developing countries. The robustness of our findings was confirmed through multiple checks, rendering them thus reliable. Moreover, considering the effect of democracy on the relationship between fiscal decentralization and property tax revenue collection, it is observed that a higher degree of democracy tends to reinforce the positive relationship between these two variables. On the other hand, we find that a higher level of corruption can cancel the positive effect of fiscal decentralization on property tax revenue and turn this relationship into a negative one. We also demonstrate that lower levels of ethnic fragmentation positively influence the relationship between fiscal decentralization and property tax revenues. Finally, the results show that lower levels of ethnic fragmentation reinforce the positive relationship between fiscal decentralization and property tax revenues. The study suggests that policymakers consider the initial conditional distribution of property tax revenue when implementing different property tax policies.

The rest of the chapter is structured as follows. Section 4.2 provides a brief overview of fiscal decentralization. Section 4.3 describes the empirical strategy. Section 4.4 presents the data and some descriptive statistics. Section 4.5 discusses the main empirical results. Section 4.6 presents some further investigations, and section 4.7 concludes the chapter.

4.2 Fiscal decentralization: A brief review

4.2.1 Theoretical underpinnings on fiscal decentralization

Fiscal decentralization policy implementation plays an important role in improving public spending efficiency, generating additional resources (Chambas et al., 2010; Sepulveda and Martinez-Vazquez, 2012). It can also favor intergovernmental competition (Weingast, 1995; Brennan and Buchanan, 1980; Tiebout, 1956). In this vein, this subsection presents the model of Laffer curves and shows how it can influence fiscal decentralization, as presented by Crowley and Sobel (2011). Recall that the Laffer curve illustrates the inverted U-shaped relation between a government's tax rate and the tax revenue it collects.

For local government c at time t, total tax revenue, R_{c_t}, is given by the product of the tax rate (τ_{c_t}) and the level of the tax base, B_{c_t}.[4] Also, the tax base is a function of the tax rate.

[4]Note that, generally the differences in property tax revenue across countries is relative to the definition of the

Thus, we can employ a functional form of $B_{c_t}(\tau_{c_t})$ to demonstrate that the tax base depends on the tax rate, as higher rates could lead to a reduction in the tax base, further limiting tax revenues. Based on these elements, the authors of the Laffer model developed the following model:

$$R_{c_t} = \tau_{c_t} B_{c_t}(\tau_{c_t}) \tag{4.1}$$

A first-order linear approximation [5] of the impact of the tax rate on the tax base can be expressed as:

$$B_{c_t}(\tau_{c_t}) = \alpha + \beta\tau_{c_t} \tag{4.2}$$

In equation (4.2), $\beta<0$ as higher rates shrink the tax base and $\alpha>0$. When we combine equation (4.1) and (4.2), we obtain:

$$R_{c_t} = \tau_{c_t}(\alpha + \beta\tau_{c_t}) \tag{4.3}$$

$$R_{c_t} = \alpha\tau_{c_t} + \beta\tau_{c_t}^2 \tag{4.4}$$

$$\frac{\partial R_{c_t}}{\partial \tau_{c_t}} = \alpha + 2\beta\tau_{c_t} = 0 \tag{4.5}$$

The tax rate that maximizes tax revenue is given by $\tau_{c_t}^{opt}$ in the following equation (4.6):

$$\tau_{c_t}^{opt} = \frac{-\alpha}{2\beta} \tag{4.6}$$

In theory, the degree to which a government can achieve this optimal rate is materialized by the Leviathan ratio:

$$Leviathan_{ratio} = \frac{\tau_{c_t}}{\tau_{c_t}^{opt}} \tag{4.7}$$

Where τ_{c_t} is the current tax rate. At the local level, this ratio can permit each local govern-

property tax base. While some countries tax buildings or land only, others include machinery and equipment in their tax base (Canada, United States).

[5] In mathematical analysis, an affine function is a function obtained by adding and multiplying the variable by constants. It is written in the form: $f(x) = ax + b$.

ment to adjust it, thus creating some competitiveness between localities.[6]

Note that this ratio can have three situations:

- $Leviathan_{ratio} > 1$, the ratio is less optimal and detrimental
- $Leviathan_{ratio} < 1$, the ratio is not optimal but not detrimental
- $Leviathan_{ratio} = 1$, the ratio is optimal

Generally, this ratio should be between zero and one for local governments because they cannot have a tax rate above $\tau_{c_t}^{opt}$. However, in some specific circumstances, local governments are permitted to surpass this rate, as demonstrated in Namibia, subject to the written approval of the relevant minister (Franzsen and McCluskey, 2017). Higher values indicate less competitive behavior. Competition among local governments could enhance local tax revenue collection and make taxpayers' votes more sensitive to any change in the property tax rate (Presbitero et al., 2014; Cabral and Hoxby, 2012). Nevertheless, it is important to highlight that competition between subnational governments could produce low and inefficient tax rates (Li, 2016). Indeed, some governments, to attract foreign capital or local investors, could offer generous tax incentives. However, we assume that, in the long run, tax incentives can generate more revenue than losses. Moreover, tax incentives are not the main reason why foreign people or businesses might be attracted to a locality. Overall, the influence of Fiscal decentralization on property tax revenue collection depends on the structure of central and local government, as well as the collaborative relationship between them.

4.2.2 The potential of fiscal decentralization as a panacea for property taxation

Property tax, by definition, is a local tax (Chambas et al., 2007; Chambas, 2005a; Presbitero et al., 2014; Home, 2021). Nevertheless, in practice, this is not always the case in all countries, particularly in most developing countries. Indeed, many of them have a central management of this tax. More importantly, property tax is unpopular in developing countries. Bahl and Vazquez (2008) reveal that developed countries realized more property tax revenue than developing countries because of their enforcement and valuation systems and because they have

[6] This is currently the case in Norway, but it does not use this power veritably.

embarked on a great wave of fiscal decentralization. According to the authors, property valuation is one of the reasons why all countries should entrust the management of property taxes to local governments. They are more familiar with citizens' preferences and local land use patterns. Thus, local governments are more able to identify property tax bases and are in a better position to show the taxpayers how property taxes they pay are employed to finance public services. That can enhance citizens' compliance. To investigate the impact of fiscal decentralization on property tax revenue, Bahl and Vazquez (2008) used the subnational government expenditures as a percent of total government expenditures derived from the GFS database of the International Monetary Fund (IMF). Their estimation is based only on developing countries, and they revealed that fiscal decentralization positively impacts property tax revenues.

Similarly, Liberati and Sacchi (2013) highlight that expenditure decentralization positively impacts property tax revenue in OECD countries. Likewise, in a study on Latin American countries, Sepulveda and Martinez-Vazquez (2012) show that the lower level of local autonomy explains the poor level of property tax revenue collection in this region due to their lower administrative capacity. Thus, for Lockwood (2008), the advantage of fiscal decentralization for tax revenue is only possible with a benevolent government.

Caldeira et al. (2023) recently found that fiscal decentralization has increased tax on rural land property in Brazil. For them, property tax would be better allocated to subnational entities because local governments are better informed about the taxed assets.

At the national level, some countries, such as Canada, Denmark, France, and the United States, place particular emphasis on the role of local governments in managing taxes, including property taxes. As for African countries, Kenya enacted a new constitution in 2010 to grant greater fiscal autonomy to subnational governments, including local property tax management responsibility. Similarly, South Africa also entrusts its local governments with significant responsibilities in the administration of property taxes.

On the contrary, some governments are reluctant to give more power to local governments because they do not always take advantage of this opportunity to promote tax collection and improve public service delivery, leading to a deterioration of public services.[7] Nonetheless, an important response to this situation is that decentralization gives the power to citizens to throw the rascals out at the next election. That can explain why, in most developing countries,

[7]The infamous "race to the bottom."

property tax revenue management remains at the central level. However, the fiscal federalism theory points out that decentralization of taxation is only desirable for limited tax revenues, such as property taxes. In all cases, whether property taxation is managed locally or centrally, each has its advantages and disadvantages.

Our chapter reviews the existing literature by reevaluating the connection between fiscal decentralization and property tax revenue. In addition, we employ a novel dataset on property tax revenue from the UNU-WIDER Government Revenue Dataset, which has not been utilized in previous research, to investigate the effect of fiscal decentralization on property tax revenues. When employing this dataset, the idea is to determine whether our findings align with previous results. Importantly, although previous studies argue that fiscal decentralization positively affects property tax revenue, they do not look specifically at the channels through which fiscal decentralization affects property tax revenues. Furthermore, prior studies have not examined the initial distribution of property tax revenue across countries before giving policy recommendations, which we also explore here. Most importantly, our study jointly analyzes both developed and developing countries, comparing the two groups.

4.3 Empirical strategy

In this chapter, our goal is to investigate the influence of fiscal decentralization on the mobilization of property tax revenue in 42 developing and developed countries. To achieve this, we first employ fixed effects regression analysis. We estimate thus the following specification:

$$ln(PT)_{i_t} = \beta_0 + \alpha FD_{i_t} + \theta X_{i_t} + \mu_i + \phi_t + u_{i_t} \tag{4.8}$$

Where $ln(PT)_{it}$ represents the log of property tax revenues from country i at the period t. The log transformation helps minimize the effects of outliers and smooth the data. Property tax revenue is the total property tax revenue paid in the country. FD represents the Fiscal Decentralization indicator, and $X_{i,t}$ is the set of control variables used in this study. μ_i and ϕ_t represent the country and time-fixed effects, respectively. Country and year-fixed effects account for any country or year-specific effects. u_{it} is the error term, which includes the effects of variables not considered in the estimation. Fiscal decentralization promotes local autonomy and accountability owing to the connection between many of the services provided at the local

level. We expect a positive impact of Fiscal Decentralization on property tax revenue collection (the coefficient of interest is α). The control variables include the most general determinants of property tax revenue derived from the literature. We include thus the urban population (in log form), GDP per capita (in log form), natural resources rent (in log form), general government expenditure (in log form), trade openness (in log form), democracy, and government quality.

We now describe briefly the control variables included in the regressions. First, it is good to mention that property tax revenue collection is generally conducted by the level of economic development (Brun et al., 2015; Norregaard, 2013), which is captured by **GDP per capita**. Likewise, the increase in **urban population** can increase the property tax base by implementing new constructions (Chambas et al., 2007; Bahl and Vazquez, 2008). **Natural resources rent** can have a mitigating impact on property tax revenues. On the one hand, resource-rich countries can contribute to generating more property tax revenues. Indeed, extracting natural resources generally leads to establishing new infrastructure, thus improving the taxable land base. On the other hand, the dependence on natural resources could reduce the willingness of governments in resource-rich countries to focus on property tax collection (Martinez-Vazquez et al., 2001). The level of **government expenditure** can also positively or negatively influence property tax revenue collection (Martinez-Vazquez and Sepulveda, 2011). Indeed, the more the government invests in the delivery of public services, the more citizens will be motivated to comply with their property tax payments. The opening to the world, generally measured by **trade openness**, represents an opportunity for new investments (businesses) to settle in a country. Since businesses typically pay property tax, this can influence the level of property tax revenue collection (Norregaard, 2013). However, it is worth noting that in order to attract investment, governments often propose exempting businesses from property taxes. Therefore, this can hurt property tax revenue collection. We also include the variable polity 2 from the Freedom House database as a **democracy** index. This variable reflects the degree of political rights and civil liberties across countries. It is used to account for the ability of taxpayers to express their preferences.

Finally, as a measure of the **quality of government**, we used the ICRG quality of government index. This synthetic index variable includes corruption, bureaucracy quality, and law and order. To give a greater value to our results, we introduce other control variables likely to affect the relationship between fiscal decentralization and property tax revenue collection

in further investigation. We also carry out a battery of robustness checks to investigate the sensitivity of our results, including the use of alternative estimators and alternative measures of fiscal decentralization.

The definitions of these variables are presented in Table C8 in the appendix.

4.4 Data and descriptive statistics

4.4.1 Data

There is no universally agreed-upon variable for quantifying all aspects of decentralization. This is because decentralization occurs across multiple dimensions, including political, administrative, and fiscal, which present challenges in consolidating them into a solitary metric (Stegarescu, 2005; Martínez-Vázquez et al., 2017; Qiao et al., 2019).

Literature about fiscal decentralization used largely local revenues as a ratio of national revenues or local expenditures as a ratio of national expenditures derived from the IMF, World Bank, or OECD statistics. Data on decentralization in African countries is limited due to a lack of up-to-date local government accounts and difficulties in collecting and processing the data. Local governments also face capacity constraints, which can hinder their ability to build accurate statistics.

In the study conducted by Bahl and Smoke (2003), the authors focused on another variable, namely the decentralization effort, which was measured by evaluating the difference between the level of local revenue observed and that of revenue determined by structural factors. Their econometric analysis shows that the ratio between actual and predicted decentralization assessed decentralization effort. According to Sanogo (2019), the central transfer-to-local government ratio can also be used to evaluate fiscal decentralization. A high ratio indicates low autonomous financing for local governments.

In this chapter, we used local government expenditure from the International Monetary Fund database (IMF-GFS)[8] as our main variable to measure fiscal decentralization. This variable is widely used in the literature to capture fiscal decentralization (Qiao et al., 2019; De Mello Jr, 2000; Wang et al., 2021; Ivanyna and Shah, 2010). Additionally, this variable reflects the degree of local authorities' expenditure responsibilities in the public sector. It captures the own

[8]The OECD database on fiscal decentralization covers only advanced countries and emerging markets.

spending as a ratio of general government spending, indicating who controls spending. It is the main fiscal decentralization variable used in the literature to capture local authorities' autonomy. In the robustness check of our results, we will also look at local revenue as a share of total government revenue, as used by Sepulveda and Martinez-Vazquez (2012). However, it is important to note that this variable is not available for most African countries. Our property tax revenue data are sourced from the UNU-WIDER Government Revenue Dataset .[9] It measures a country's total property tax revenue.[10] It is the comprehensive data on property tax revenue that is available.

The variables above, including GDP per capita, urbanization, total natural resources, government expenditures, and trade openness, are sourced from the World Development Indicators (WDI).[11] Democracy is from the Freedom House database. The panel dataset used covers 27 Developing and 15 Developed Countries from 2005 to 2019.[12] The choice of this period is justified by the large availability of data on fiscal decentralization during this period.

4.4.2 Some descriptive statistics

This part introduces a quick overview of important data features. Specifically, it gives us a first idea of the correlation between fiscal decentralization and property tax revenues and their different trends over the period considered in this study.

To begin with, Figure 4.1 shows the evolution of the average fiscal decentralization by income level over the analysis period. We observe that, on average, fiscal decentralization is higher in developed countries than in developing countries. However, we note an important evolution of fiscal decentralization in the last few years in developing countries, certainly due to the numerous efforts made by these countries to improve their fiscal decentralization policies.

[9]Property taxes manifest in various forms, however, it is predominantly imposed as an annual levy on the value of the real property, such as land and buildings.
[10]Note that we lack information on the various components of tax in the different countries.
[11]The definitions of the variables are presented in the annex.
[12]See the appendix for the list of countries and the data sources and the definitions of the different variables.

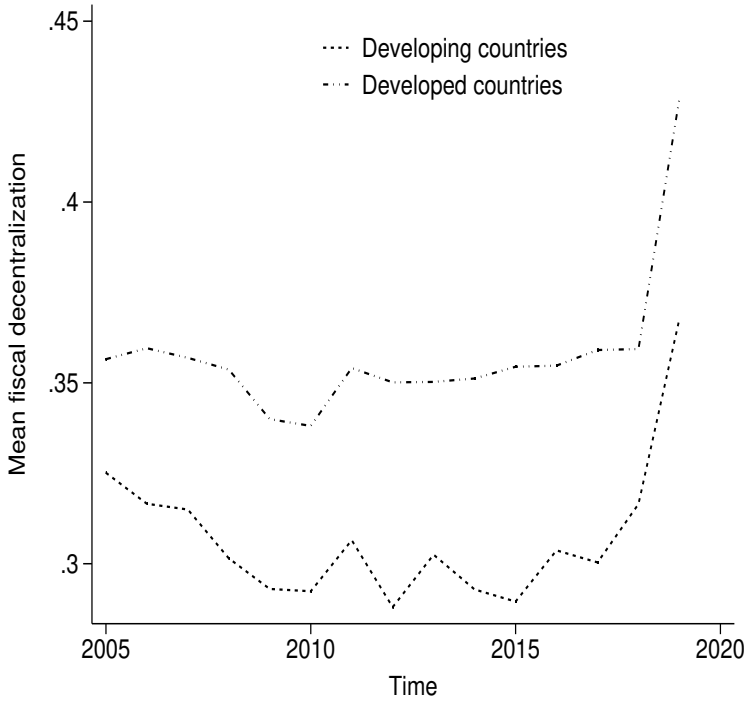

Figure 4.1: Fiscal decentralization evolution by income level

When we look at the average level of fiscal decentralization by its main measurement, Figure 4.2 also illustrates that developed countries tend to have higher levels of local autonomy, regardless of the measure of fiscal decentralization used. As for the evolution of property tax revenue under the period from 2005 to 2020, Figure 4.3 indicates that, on average, property tax revenue evolution is more pronounced in developed countries. However, we note an important evolution in both groups since 2018. In addition, based on the median of fiscal decentralization, Figure 4.4 shows that countries with higher fiscal decentralization collect more property tax revenues.

Figures 4.5, 4.6, and 4.7 present the first look at the correlation between fiscal decentralization and property tax revenues. We observe a positive correlation between these two variables, regardless of the sample considered. In addition, the correlation graph indicates some outliers that should be considered in our estimations. We now focus on the unconditional correlation between the interest and the dependent variable. As presented in line [2] of Table C6 in the appendix, the results demonstrate a positive and statistically significant correlation between fiscal decentralization and property tax revenue at the 1% confidence level.

Finally, in line with Table C6 and Figure 4.5, we can globally assume a positive relationship between fiscal decentralization and property tax revenues. However, since correlation does not

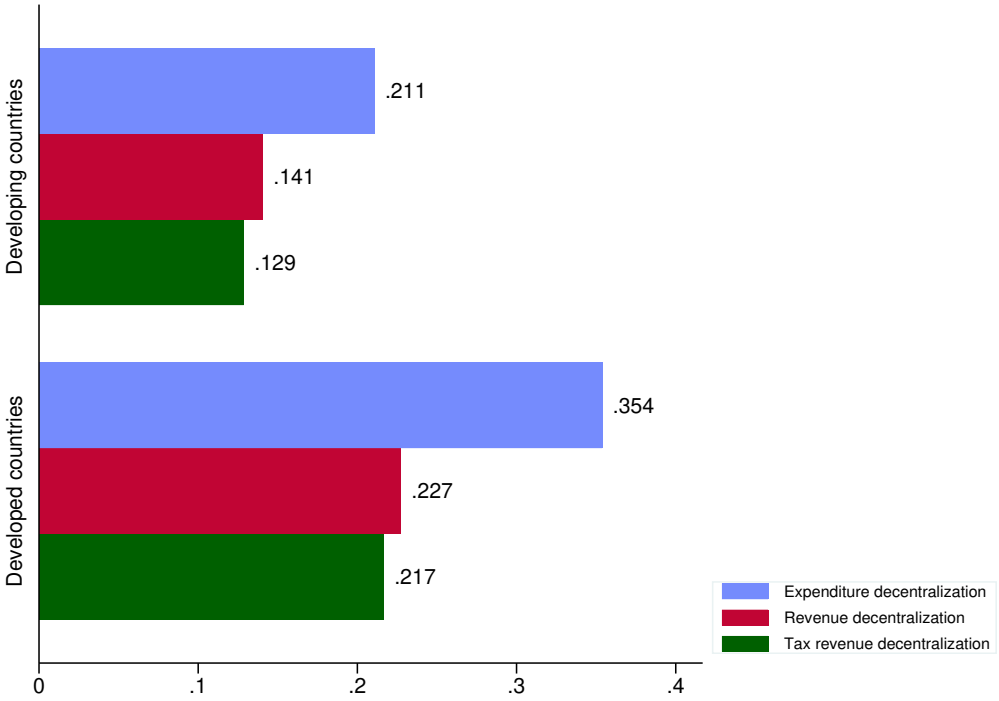

Figure 4.2: Fiscal decentralization component by income level

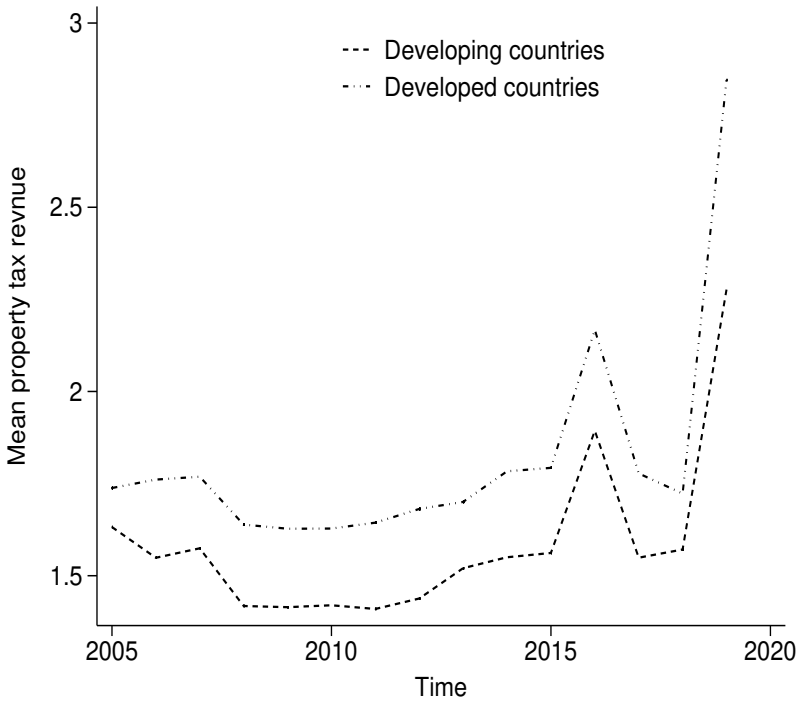

Figure 4.3: Property tax revenue evolution by income level

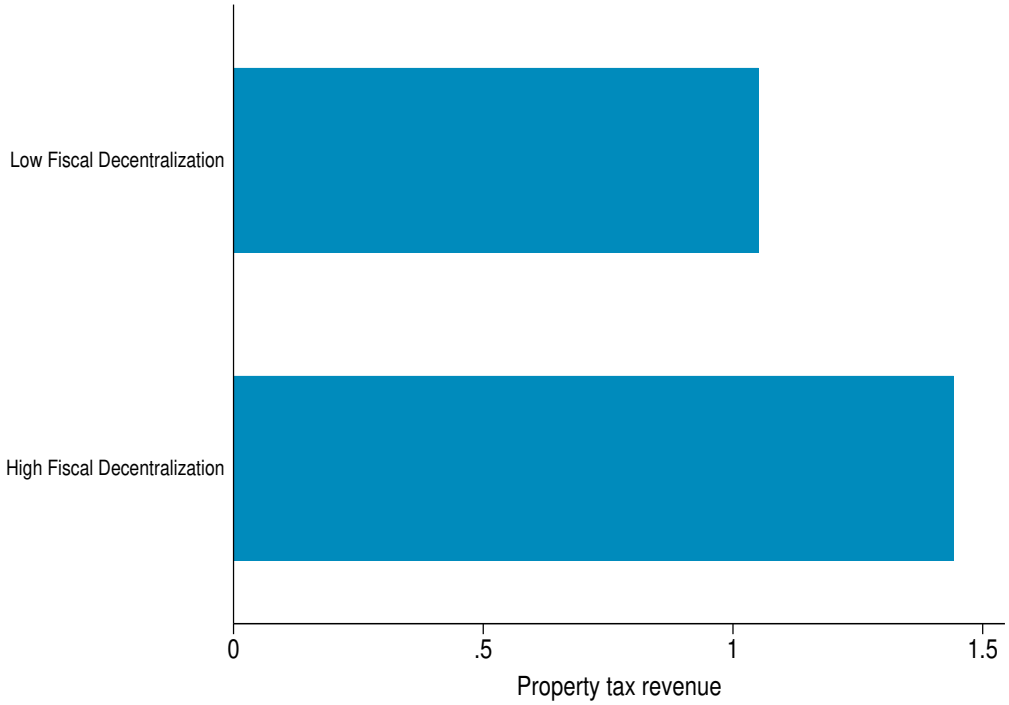

Figure 4.4: Property tax revenues in countries with low and high levels of local autonomy

necessarily imply causality, the econometric approach will give us an idea of the existing causality.

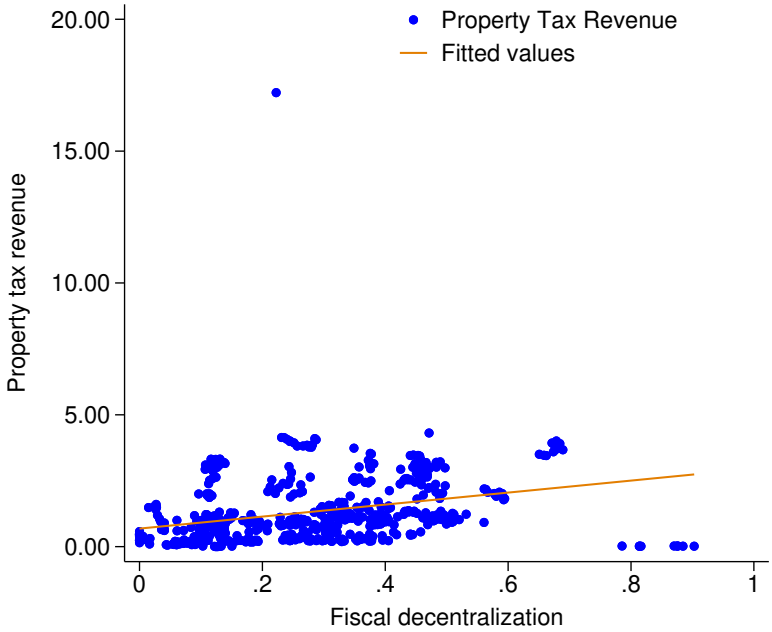

Figure 4.5: Correlation between expenditure decentralization and property tax revenue (full sample)

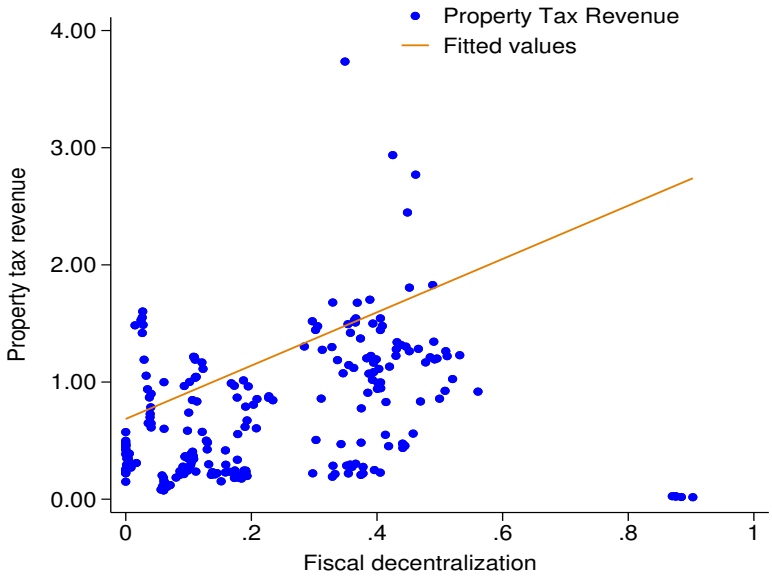

Figure 4.6: Correlation between expenditure decentralization and property tax revenue (Developed countries)

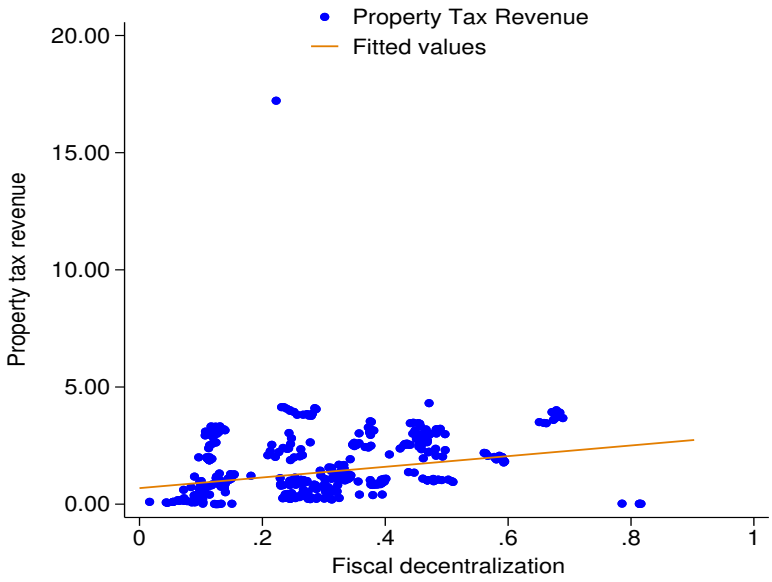

Figure 4.7: Correlation between expenditure decentralization and property tax revenue (Developing countries)

4.5 Discussion of estimation results

4.5.1 Baseline results

We first estimate the full sample of countries, including developed and developing countries. Table 4.1 presents the baseline results. The analysis starts by examining the relationship

between fiscal decentralization (measured as own expenditures over general government expenditures) and property tax revenues, without considering other variables and without country- and time-fixed effects (column 1). The findings indicate that higher decentralization of spending responsibilities to local governments increases property tax revenue in the selected countries. In column 2, we add only country-fixed effects; in column 3, we include only time-fixed effects. The results remain consistent with the previous findings. Furthermore, column 4 considers both country- and time-fixed effects. When we do, the results confirm that fiscal decentralization positively impacts property tax revenues.

In columns [5] and [6], we consider potential property tax revenue collection determinants such as urban population, Natural resources rent, Trade openness, and Government expenditure. The findings of these estimations show again that fiscal decentralization increases property tax revenues. Finally, in columns [7] and [8], we take into account the institutional variables captured by the ICRG quality of government index, and we also include the level of democracy (polity2). Our results confirm that fiscal decentralization continues to impact on property tax revenue positively. However, our preferred specification is the one with both country and time-fixed effects (column 8). So, the rest of our investigation will be based on this specification.

Regarding the control variables, we find that urban population, natural resources rent, GDP per capita, and government expenditure positively impact property tax revenues. A surprising result is the fact that we found a negative effect of government quality on property tax revenue collection. This contradicts our expectations, as government quality is expected to be positively associated with property tax revenue mobilization. However, this negative impact could be due to some difficulties related to property rights protection/confusion in many countries or due to the complexity of administrative formalities relating to properties. Also, as this variable is composed of corruption, law and order, and bureaucracy quality, to further elaborate on these arguments, in subsequent sections, we will utilize the various components of this variable, along with other institutional variables, to assess the sensitivity of our results.

The increase in urban population leads to an increase in the demand for housing and its value, increasing thus the property tax base. This explains the positive effect of the urban population on property tax revenues. The positive association between natural resource rent and property tax revenues seems to indicate that resource rent contributes to larger property tax revenue collection. We also find that public spending positively impacts property tax revenues,

showing that the greater the efforts in terms of public service delivery, the more citizens comply with their property tax payments. Likewise, the results show that a higher development level is positively associated with property tax revenues. This implies that the more developed the country, the more potential it has to collect property tax revenues.

Table 4.1: Fiscal decentralization and property tax revenues (full sample)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Dependent: Property tax revenue (log)								
Fiscal decentralization	1.790***	1.269**	1.807***	1.334***	1.272***	1.147***	1.256***	1.201***
	(0.462)	(0.496)	(0.461)	(0.470)	(0.457)	(0.428)	(0.450)	(0.443)
Urban population (log)					1.804**	2.335***	1.558**	2.188***
					(0.772)	(0.790)	(0.663)	(0.697)
Natural resources rents (log)					0.000	0.038	0.029	0.064***
					(0.031)	(0.031)	(0.023)	(0.022)
GDP per capita (log)					0.332**	0.763***	0.499***	0.809***
					(0.162)	(0.215)	(0.179)	(0.253)
Trade (log)					0.125	0.352***	-0.002	0.250*
					(0.120)	(0.112)	(0.140)	(0.139)
Government expenditure (log)					0.371**	0.491***	0.294	0.413**
					(0.150)	(0.154)	(0.189)	(0.190)
Democracy							-0.002	0.004
							(0.008)	(0.008)
Quality of Government							-0.999*	-0.987*
							(0.560)	(0.551)
Constant	-0.723***	-1.423***	-0.776***	-1.508***	-12.896***	-19.669***	-12.127***	-18.485***
	(0.124)	(0.137)	(0.218)	(0.151)	(2.674)	(3.560)	(2.681)	(3.893)
Country FE	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	Yes	No	Yes	No	Yes
Countries	51	51	51	51	51	51	42	42
Observations	613	613	613	613	607	607	495	495
R-squared	0.071	0.950	0.075	0.952	0.954	0.957	0.964	0.966

Notes: *** p<0.01, ** p<0.05, * p<0.1. All standard errors (in parentheses) are heteroscedasticity robust

4.5.2 Heterogeneity investigation in the sample

Because our baseline results included developed and developing countries, we could think that the results were conducted by one group. Consequently, we split our sample into developed and developing countries. In both cases, the findings reveal also that fiscal decentralization positively impacts property tax revenues (see Table 4.2). Nevertheless, the amplitude of the effect of fiscal decentralization is more pronounced in developed countries. That joins the arguments indicating that more decentralized countries are more susceptible to collecting more property taxes (Bahl and Vazquez, 2008; Liberati and Sacchi, 2013; Caldeira et al., 2023; Norregaard, 2013). Indeed, developed countries are more decentralized compared to developing countries (Liberati and Sacchi, 2013; Qiao et al., 2019). For instance, in France and Canada, local governments possess

discretionary authority and are capable of making decisions independently. This is not always the case in developing countries, where the central government exercises significant control over property tax management. The outcome concerning developing countries aligns with those obtained previously by (Bahl and Vazquez, 2008; Sepulveda and Martinez-Vazquez, 2012).

Table 4.2: Fiscal decentralization and property tax revenues in developed and developing countries

	[1]	[2]
Dependent variable:	**Property tax revenue (log)**	
	Developed countries	Developing countries
Fiscal decentralization	2.315*	1.261***
	(1.284)	(0.461)
Democracy	0.016	-0.023
	(0.011)	(0.021)
Urban population (log)	2.602***	1.393
	(0.913)	(1.290)
Natural resources rents (log)	0.080**	0.084**
	(0.033)	(0.041)
GDP per capita (log)	0.851**	0.991***
	(0.365)	(0.329)
Trade (log)	0.064	0.469***
	(0.266)	(0.181)
Government expenditure (log)	0.993***	0.047
	(0.276)	(0.273)
Quality of Government	-2.782***	-1.375*
	(0.990)	(0.764)
Constant	-20.559***	-17.015**
	(5.971)	(6.846)
Country FE	Yes	Yes
Time FE	Yes	Yes
Countries	15	27
Observations	168	327
R-squared	0.951	0.971

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

4.6 Further investigation

4.6.1 Endogeneity concerns

One important thing to consider when estimating our baseline specification is treating the endogeneity issue. Generally, the reasons for endogeneity issues are omitted variable bias, mea-

surement errors, and reverse causality. For Slack and Bird (2015) and Bahl and Vazquez (2008), property tax is a vector in favor of decentralization. Indeed, property taxation could impact the extent of decentralization. Moreover, property tax is the primary source of local revenue. Through the recourse to property taxes, local governments can lessen their reliance on central government subsidies, thereby fostering fiscal independence and decentralization. This explains a reverse causality between fiscal decentralization and property tax revenues.

Moreover, property tax revenue and fiscal decentralization can both be influenced by unobservable structural, institutional, and historical characteristics. In this context, it is crucial to analyze the endogeneity issue to overcome it. Because of the difficulties of finding good instrumental variables, we used the lag in Fiscal decentralization as an alternative approach to reduce the endogeneity bias, particularly the reverse causality (Datta and Agarwal, 2004; Wandaogo, 2022). Similarly, the introduction in the regression of country and year fixed effects minimizes the potential omitted variable bias. Table 4.3 below reports the results of this estimation. Once again, the findings confirm the results obtained previously. Fiscal decentralization continues to have a positive impact on property tax revenues. Concerning the control variables, their impact on property tax revenue remains consistent with previous findings, except for columns (2) and (3), where the quality of government variables becomes insignificant. Likewise, in Table 4.4, we explore the possible reverse causality between the explanatory and the dependent variables using the control variables lag. This investigation also helps to minimize the potential endogeneity due to reverse causality. This estimation also highlights that fiscal decentralization positively impacts property tax revenues.

4.6.2 Sensitivity to additional covariates

It is important to note that we can not include all the determinants of property tax revenues in the same blanket. For this reason, in this subsection, we explore the sensitivity of our results by considering additional variables that could potentially influence the relationship between fiscal decentralization and property tax revenues. We thus expand the baseline specification by including more macroeconomic variables that capture other economic, political, and institutional variables likely to affect property tax revenue collection. We include Agriculture, Inflation, Foreign direct investment, Industrialization, and Internet use to capture digitalization. Similarly, we test the sensitivity of the results by replacing the government quality index with other

Table 4.3: Effect of fiscal decentralization on property tax revenue with lag in Fiscal decentralization

	(1)	(2)	(3)
Dependent variable: Property tax revenue (log)			
Fiscal decentralization, t-1	1.077**		
	(0.457)		
Fiscal decentralization, t-2		1.456***	
		(0.479)	
Fiscal decentralization, t-3			1.279**
			(0.536)
Democracy	0.002	0.009	0.021**
	(0.008)	(0.009)	(0.009)
Urban population (log)	1.808***	2.152**	2.438**
	(0.632)	(0.844)	(1.017)
Natural resources rents (log)	0.076***	0.074**	0.061
	(0.025)	(0.029)	(0.046)
GDP per capita (log)	0.683***	0.629**	0.672**
	(0.216)	(0.249)	(0.284)
Trade(log)	0.203	0.234	0.259*
	(0.142)	(0.151)	(0.145)
Government expenditure (log)	0.483**	0.484**	0.659***
	(0.192)	(0.213)	(0.231)
Quality of Government	-0.956*	-0.645	-0.463
	(0.552)	(0.593)	(0.608)
Constant	-15.938***	-17.351***	-19.483***
	(2.763)	(3.477)	(4.215)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Countries	42	42	42
Observations	457	419	380
R-squared	0.968	0.968	0.968

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

institutional measures such as corruption, rule of law, Government effectiveness, Regulatory quality, political stability, law and order, and bureaucracy quality. We do that because each institutional variable could react differently to property tax revenue and because there is a higher correlation between them. This robustness check also helps to minimize the omitted variable bias. The definitions of these variables are presented in Table C8 in the appendix.

Table C2 in the appendix presents all these specifications results. The findings reveal that Fiscal Decentralization continues to impact property tax revenues positively in all the specifications considered. Moreover, the results are in similar ranges with the baseline specification; the

Table 4.4: Estimation of fiscal decentralization on property tax revenue (lag model)

	(1)	(2)
Dependent variable: Property tax revenue (log)		
Fiscal decentralization, t-1	1.139**	1.159**
	(0.463)	(0.454)
Democracy, t-1	0.011	0.016*
	(0.008)	(0.008)
Urban population (log), t-1	1.407**	1.922***
	(0.623)	(0.632)
Natural resources rents (log), t-1	0.022	0.069**
	(0.026)	(0.028)
GDP per capita (log), t-1	0.486***	0.595***
	(0.168)	(0.193)
Trade (log), t-1	-0.028	0.068
	(0.132)	(0.141)
Government expenditure (log), t-1	0.335*	0.409**
	(0.177)	(0.187)
Quality of Government , t-1	-0.212	-0.078
	(0.533)	(0.535)
Constant	-11.762***	-15.345***
	(2.181)	(2.749)
Country FE	Yes	Yes
Time FE	No	Yes
Countries	42	42
Observations	461	461
R-squared	0.965	0.967

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

coefficients range from [1.1-1.3]. Regarding additional control variables, we find that Agriculture, Inflation, Foreign direct investment, corruption, and regulatory quality negatively impact property tax revenues. The negative influence of agriculture is explained in the literature by the fact that the agricultural sector benefits from some exemptions or preferential treatment, including lower tax rates on agricultural properties, and this can consequently harm the level of tax collection base (Tanzi and Shome, 1992; Stotsky and WoldeMariam, 1997).

Moreover, assessing the taxable value of agricultural land is sometimes complicated. Corruption could also deteriorate the identification of the property tax base by manipulating property assessment and thus reduce the overall taxable value of properties. That can consequently negatively impact property tax revenue collection. Concerning the negative impact of regulatory quality, one explanation could be that better identification of property tax base needs good

regulation to avoid confusion around land proprieties assessment. Many countries in the world have this problem, specifically developing countries. Consequently, this poor regulation of land properties can harm property tax revenue collection.

We also observe that industrialization has a positive influence on property tax revenue. Indeed, industrialization results in new business implementation, which could increase the property tax base. In the presence of inflation, governments could increase the property tax rate. This can consequently discourage taxpayers from complying with property tax payments, which could explain the negative effect of inflation on property tax revenue found in Table C2 in the appendix. Finally, the other control variables have the same effect as the baseline results.

4.6.3 Alternative estimation: using fixed effects by Driscoll and Kraay

In researching the validity of our results, we estimate the fixed effects developed by Driscoll and Kraay (DK) corrected standard errors. This method is robust to heteroscedasticity, cross-sectional dependence (cross-sectional dependence refers to the phenomenon whereby shocks or disruptions in one country can spread to other countries), missing values, and autocorrelation (Driscoll and Kraay, 1998; Presbitero et al., 2014; Joshi et al., 2021; Hoechle, 2007). Ignoring cross-sectional dependence in estimating panel data could result in severely biased statistical results (Hoechle, 2007). In fact, in panel data, the question of cross-sectional dependence could affect the panel unit from shock on unobserved factors. Note that the lag used in the Driscoll and Kraay estimator specifies the maximum lag to be considered in the autocorrelation structure. By default, the lag length calculated by *stata* is obtained as follows:

$$m(T) = floor[4(T/100)^{2/9}] \tag{4.9}$$

Here, we vary the lag value between [1-6]. We find that the results do not differ from other lag values. On average, the results show that the effect of Fiscal Decentralization on property tax revenue remains positive (see Table 4.5). The other control variables are consistent with the previous results.

Table 4.5: Robustness checks: Driscoll and Kraay corrected standard errors

	(1)	(2)	(3)	(4)	(5)	(6)
	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5	Lag 6
Dependent variable: Property tax revenue (log)						
Fiscal decentralization	1.201***	1.201***	1.201***	1.201***	1.201***	1.201***
	(0.388)	(0.325)	(0.277)	(0.276)	(0.260)	(0.254)
Democracy	0.004	0.004	0.004	0.004	0.004	0.004
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Urban population (log)	2.188***	2.188***	2.188***	2.188***	2.188***	2.188***
	(0.317)	(0.274)	(0.241)	(0.225)	(0.193)	(0.199)
Natural resources rents (log)	0.064**	0.064**	0.064***	0.064***	0.064***	0.064***
	(0.024)	(0.022)	(0.020)	(0.020)	(0.019)	(0.015)
GDP per capita (log)	0.809***	0.809***	0.809***	0.809***	0.809***	0.809***
	(0.233)	(0.213)	(0.212)	(0.208)	(0.202)	(0.192)
Trade (log)	0.250	0.250	0.250	0.250	0.250	0.250
	(0.145)	(0.153)	(0.158)	(0.160)	(0.160)	(0.159)
Government expenditure (log)	0.413**	0.413**	0.413**	0.413**	0.413**	0.413**
	(0.169)	(0.175)	(0.189)	(0.191)	(0.181)	(0.171)
Quality of Government	-0.987*	-0.987*	-0.987*	-0.987*	-0.987	-0.987*
	(0.486)	(0.500)	(0.528)	(0.558)	(0.561)	(0.554)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	495	495	495	495	495	495
R-squared	0.966	0.966	0.966	0.966	0.966	0.966
Number of groups	42	42	42	42	42	42

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Unreported constant.
Note: lag(.) specifies the maximum lag to be considered in the autocorrelation structure.

4.6.4 Sensitivity using quantile regressions

This part allows us to explore heterogeneity in the sample. It is good to recall that the estimation approaches used previously estimate the mean value of the conditional distribution of the dependent variable (Bui et al., 2021; Hao and Naiman, 2007). Here, we explored the initial conditional distribution of property tax revenue, such as countries with low, intermediate, and high initial levels of property tax revenues, which include the 25th, 50th, and 75th quantiles distribution of property tax revenue, as presented in Figure 4.8. Indeed, this initial distribution of property tax revenue could respond differently across Fiscal Decentralization levels. We employ quantile regressions to examine this issue.

Moreover, the quantile regression is robust to outliers and heteroscedasticity (Koenker, 2005; Hao and Naiman, 2007). Likewise, it does not require the variables to follow a normal distribution (Liu et al., 2021). The results of this investigation are presented in Table 4.6 and reveal instructive results. The results have uncovered a negative relationship between Fiscal Decentralization and property tax revenue in countries with low levels of property tax revenue. Conversely, in countries with the highest levels of property tax revenue, the results show a positive and significant relationship between Fiscal Decentralization and property tax revenue, and

the median distribution indicates a positive albeit non-significant correlation. On a global scale, it can be inferred that as one moves from low to high quantiles, the negative effect of Fiscal Decentralization transforms into a positive effect, which may explain the previously observed positive linkage. This implies that countries with property tax revenues above the median are more likely to benefit from fiscal decentralization reforms than those below the median.

Table 4.6: Fiscal decentralization and property tax revenue (Quantile model)

Dependent variable: Property tax revenue (log)			
	Q.25	Q.50	Q.75
Fiscal decentralization	-1.829***	0.228	0.884***
	(0.352)	(0.237)	(0.175)
Democracy	-0.030**	-0.037***	-0.036***
	(0.013)	(0.009)	(0.006)
Urban population (log)	2.417***	2.457***	1.408***
	(0.352)	(0.237)	(0.175)
Natural resources rents (log)	-0.110***	-0.098***	-0.107***
	(0.033)	(0.023)	(0.017)
GDP per capita (log)	0.686***	0.475***	0.088
	(0.157)	(0.106)	(0.078)
Trade (log)	-0.405***	-0.448***	-0.500***
	(0.124)	(0.083)	(0.062)
Government expenditure (log)	0.659**	0.438**	0.806***
	(0.272)	(0.183)	(0.135)
Quality of government	-1.377*	-0.797	0.624*
	(0.761)	(0.513)	(0.378)
Constant	-15.948***	-13.704***	-7.091***
	(1.791)	(1.207)	(0.890)
Pseudo R2	0.475	0.440	0.439
Observations	495	495	495

*** p<0.01, ** p<0.05, * p<0.1. Robust Standard errors in parenthesis. Q.25 means countries where property tax revenue is the least. Q.75 means countries where property tax revenue is the highest.

4.6.5 Alternative measure of Fiscal Decentralization

Following the literature on the measurement of Fiscal Decentralization, we used here an alternative measure of Fiscal decentralization, namely revenue autonomy (ratio of own revenues to general government revenues), to check the robustness of our results. Indeed, this variable is also used in the literature to measure Fiscal Decentralization (Sepulveda and Martinez-Vazquez, 2012). The results of this investigation are presented in Table C3 and indicate that revenue

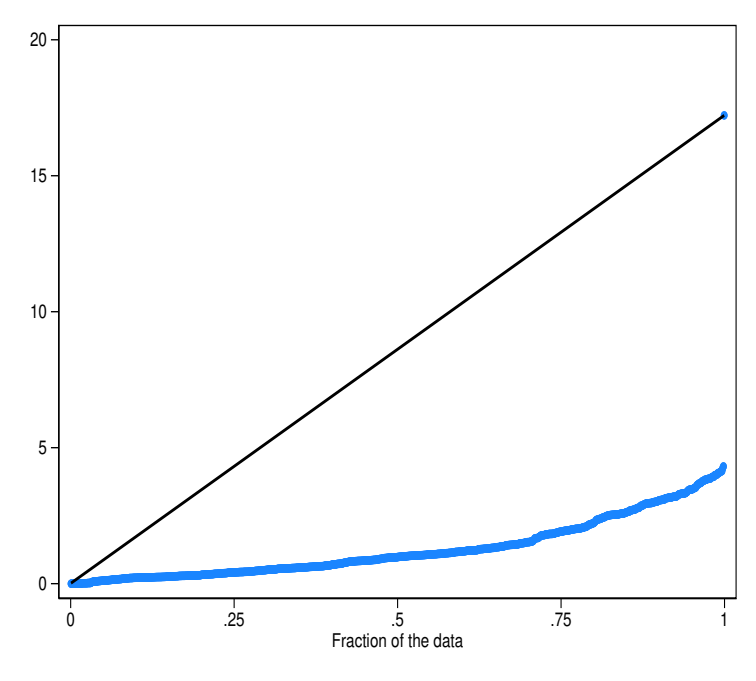

Figure 4.8: Quantiles of Property Tax Revenue as a % of GDP

autonomy enhances property tax revenues. These results are consistent with those obtained by Sepulveda and Martinez-Vazquez (2012), who found a positive effect of revenue autonomy on property tax revenue mobilization in Latin American countries.

However, it is important to interpret these results with caution because of the existing reverse causality between revenue decentralization and property tax revenues. For this reason, we use the lag in revenue decentralization to mitigate the endogeneity issue in the estimation. The results of this investigation are presented in Table C4 in the appendix and highlight the positive influence of Fiscal decentralization on property tax revenues. These results are also confirmed in Table C5 when we consider the potential reverse causality between our explanatory variables and the dependent variable.

4.6.6 Fiscal decentralization and democracy nexus

Fiscal decentralization promotes the proximity between the delivery of public services and the population's needs, which could have two effects on the mobilization of property tax revenues. On the one hand, the closer relationship between public administration and the citizens can promote local democracy because the local population will be able to judge the actions of the local government. This right of scrutiny leads local authorities to carry out local development actions

and thus promote local public services (Golem, 2010; Qiao et al., 2019). In this perspective, people will be more inclined to pay local taxes, including property taxes.

On the other hand, for the sake of electoral ambitions, the local government may be lured by a climate of political pressure from local elites. Thus, it may be less likely to focus its policies on local tax collection, providing no policy incentive to collect property tax revenues. It can be inferred that a positive and statistically significant relationship exists between the two variables, which supports the initial argument (see the line [2] of Table C6 in the appendix). Several arguments can be made to support this point of view. Nevertheless, the approach proposed here is only a subjective illustration of several ideas. We assume, therefore, that one of the main mechanisms that can explain the positive effect of Fiscal Decentralization on property tax revenues is that it promotes democracy. Thus, in this subsection, we provide indirect evidence that the positive effect of fiscal decentralization increases when local democracy increases, too.

To substantiate our argument, we introduce an interaction effect between Fiscal Decentralization and democracy to evaluate the role played by varying degrees of democracy in the Fiscal Decentralization process on property tax revenues. We re-estimate thus the following equation:

$$ln(PT)_{it} = \alpha_0 + \alpha_1 FD_{it} + \alpha_2 Democ_{it} + \alpha_3 FD_{it} * Democ_{it} + \psi X_{it} + \mu_i + \phi_t + u_{it} \quad (4.10)$$

The coefficient of interest is α_3. If $\alpha_3 > 0$, this implies that the effect of Fiscal Decentralization on property tax revenues increases with a high level of democracy (hereafter Democ). The results of this estimation are presented in Table C9. The findings reveal that the coefficient of the interaction is positive but not significantly different from zero. That suggests there is no substitution effect between fiscal decentralization and democracy. However, this does not necessarily imply that the effect of Fiscal Decentralization is insignificant for each level of democracy. Thus we analyze the interaction term graphically to understand this non-linearity better. This manner of proceeding provides insight into the behavior of the interaction term on property tax revenues. When we do so, we observe that the effect of Fiscal Decentralization on property tax revenues is insignificant for the low level of democracy. Nevertheless, it increases with a higher level of democracy and becomes significant. This implies that a greater level of democracy contributes significantly to the positive nexus between Fiscal Decentralization and property tax revenue in the selected countries (see Figure 4.9). In other words, the results suggest

that fiscal decentralization's effect on property tax revenue disappears when it is associated with a lower level of democracy.

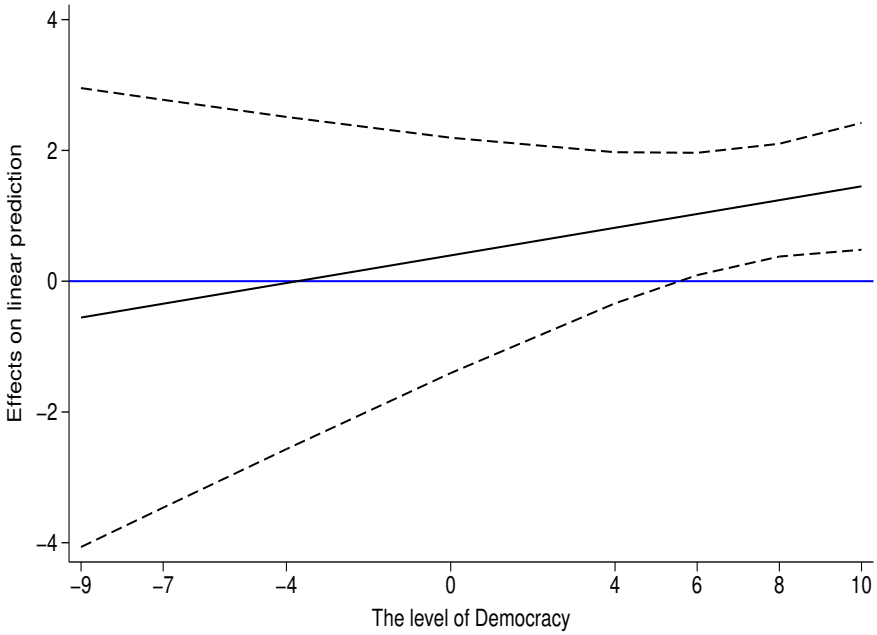

Figure 4.9: Average marginal effects of Fiscal Decentralization with 95% CIs (democracy)

4.6.7 Fiscal Decentralization and corruption nexus

In checking the explanation of the relationship between fiscal decentralization and property tax revenues, we also assumed that the level of corruption (hereafter Corr in equation 10) is an important point to consider. For this reason, in this part, we analyze corruption as a moderator of the relationship between Fiscal Decentralization and property tax revenues. Our idea is that a lower level of corruption could reinforce the positive effect of Fiscal Decentralization on property tax revenues (Caldeira et al., 2023; Liberati and Sacchi, 2013; Norregaard, 2013). Thus, our model introduces an interaction term between Fiscal Decentralization and corruption. Here, corruption is measured by control of corruption from the World Bank Government Indicator. The higher value of this variable indicates high control of corruption. The analysis is based on the following equation:

$$ln(PT)_{i_t} = \beta_0 + \beta_1 FD_{i_t} + \beta_2 Democ_{i_t} + \beta_3 Corr_{i_t} + \beta_4 FD_{i_t} * Corr_{i_t} + \lambda X_{i_t} + \mu_i + \phi_t + \epsilon_{i_t} \quad (4.11)$$

The results of this investigation are presented in Table C10 in the appendix. Contrary to our expectations, we find that the interaction term is negative and statistically significant. However, the negative sign of the interaction term could suggest that rigorous efforts to control corruption may hinder the process of fiscal decentralization and, therefore, reduce the level of property tax revenue collection. Indeed, central authorities can prioritize efforts to fight corruption to the detriment of encouraging local autonomy reforms. This can disincentive affect the collection of property tax revenue in the short term. In other words, the prevalence of corruption can cause citizens to be less inclined to fulfill their property tax obligations. A lack of trust in the transparency of local authorities' management of funds can lead to decreased compliance, which can impact property tax revenues. As a result, governments will prioritize addressing this issue, potentially diminishing the emphasis on an expanded Fiscal Decentralization policy through anti-corruption measures. This, in turn, may reduce the impact of Fiscal Decentralization on the collection of property tax revenues. Nevertheless, in the long term, anti-corruption efforts could yield favorable results in mobilizing property tax revenues.

To gain a deeper comprehension of these findings, we have examined the margin plot graph, which illustrates the impact of different values control of corruption in the interplay between Fiscal Decentralization and property tax revenues. Figure 4.10 shows the average marginal effects of fiscal decentralization, which leads to instructive results. On average, the figure shows that lower values of control of corruption exert a positive effect on the nexus between Fiscal Decentralization and property tax revenue. However, this effect decreases for high values of control of corruption until a certain threshold where it becomes insignificant. As explained previously, one possible explanation of these results is that, in a context where the level of control of corruption is high, taxpayers may perceive local authorities as corrupt or untrustworthy in managing public resources. This can lead to a general distrust of local government and, therefore, motivate taxpayers to minimize their tax payments, including property taxes.

4.6.8 The triplet interaction between fiscal decentralization, democracy, and corruption

To better understand the impact of Fiscal Decentralization on property tax revenues. We now investigate the triplet interaction between fiscal decentralization, control of corruption, and the level of democracy. The idea is that some governments can conjointly focus their policies

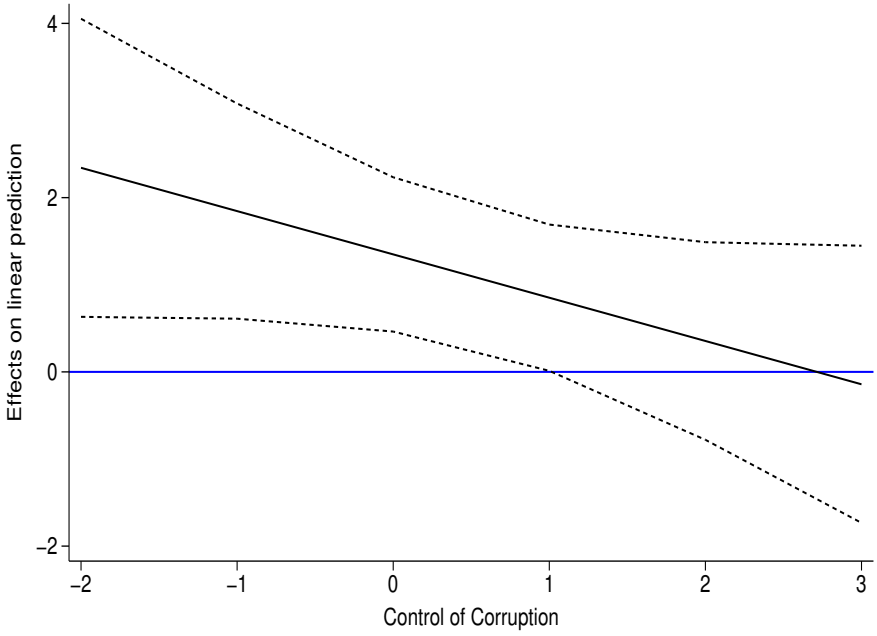

Figure 4.10: Average marginal effects of Fiscal Decentralization with 95% CIs (corruption)

on the control of corruption and the promotion of democracy in local communities in order to enhance citizens' compliance with the payment of property taxes. However, this can have an ambiguous outcome in property taxation. Indeed, this can create a crowding-out effect on the provision of public services and, therefore, reduce willingness to pay property taxes.

On the other hand, the government's efforts to promote democracy and fight corruption can create a climate of public confidence in the government and, in turn, improve the tax morale of taxpayers. Based on this discussion, we introduce a triplet interaction between fiscal decentralization, democracy, and control of corruption in our estimation. The results of this investigation are presented in Table C11 in the appendix.

The findings show that the interaction term between the three variables is negative and statistically significant. Note that explaining this type of result is very complex. However, this negative association can be explained by the fact that in certain democratic nations, local governments may be subject to the influence of the central government or specific interest groups. As a result, biased decisions may occur, leading to higher levels of corruption in local government actions. Consequently, this can adversely affect property tax revenue collection. Similarly, in an environment characterized by high levels of corruption and unstable democracy, democratic institutions may be insufficient to counteract or reduce corruption effects (Lessmann

and Markwardt, 2010). Accordingly, the potential positive effects of fiscal decentralization could be diminished, which could negatively impact property tax collection. Therefore, it may imply that governments must prioritize policies proceeding through a step-by-step approach rather than adopting a joint policy that simultaneously includes anti-corruption and democracy promotion policies.

4.6.9 Fiscal decentralization and ethnic fragmentation nexus

In analyzing the relationship between fiscal decentralization and property tax revenues, it is also important to investigate the moderating role of ethnic fragmentation. Some scholars have examined the relationship between fiscal decentralization and ethnic fragmentation (Choudhury and Sahu, 2022; Tranchant, 2010). Indeed, decentralization presents a risk of increased demands for autonomy in contexts of ethnic fragmentation, which can implicitly affect the collection of property taxes. To consider this aspect, we perform an additional regression by incorporating the interaction term between fiscal decentralization and ethnic fragmentation. Here, the ethnic fragmentation index (hereafter EFI) is derived from the ICRG dataset and serves as a proxy for ethnic fragmentation. Lower values of this index are assigned to countries with high levels of ethnic fragmentation, while higher values correspond to countries with minimal ethnic fragmentation. For better comprehension, we rescaled this variable so that higher values indicate greater ethnic fragmentation. We, therefore, estimate the following equation.

$$ln(PT)_{i_t} = \gamma_0 + \gamma_1 FD_{i_t} + \gamma_2 Democ_{i_t} + \gamma_3 EFI_{i_t} + \gamma_4 FD_{i_t} * EFI_{i_t} + \theta X_{i_t} + \mu_i + \phi_t + \epsilon_{i_t} \quad (4.12)$$

Figure 4.11 presents the average marginal effects of fiscal decentralization. It reveals that lower levels of ethnic fragmentation positively affect the relationship between fiscal decentralization and property tax revenues until a certain threshold, after which the effect becomes negative and insignificant. A low level of ethnic fragmentation reflects good social cohesion, which can translate into more effective local governments. In addition, low ethnic fragmentation reduces the risk of inter-ethnic tension, which can be conducive to implementing fiscal policies, such as land policy (Alesina and La Ferrara, 2005; Easterly and Levine, 1997). Indeed, taxpayers have more confidence in the government's actions. Therefore, this stability at the local level can lead to a positive effect of fiscal decentralization on property tax revenues.

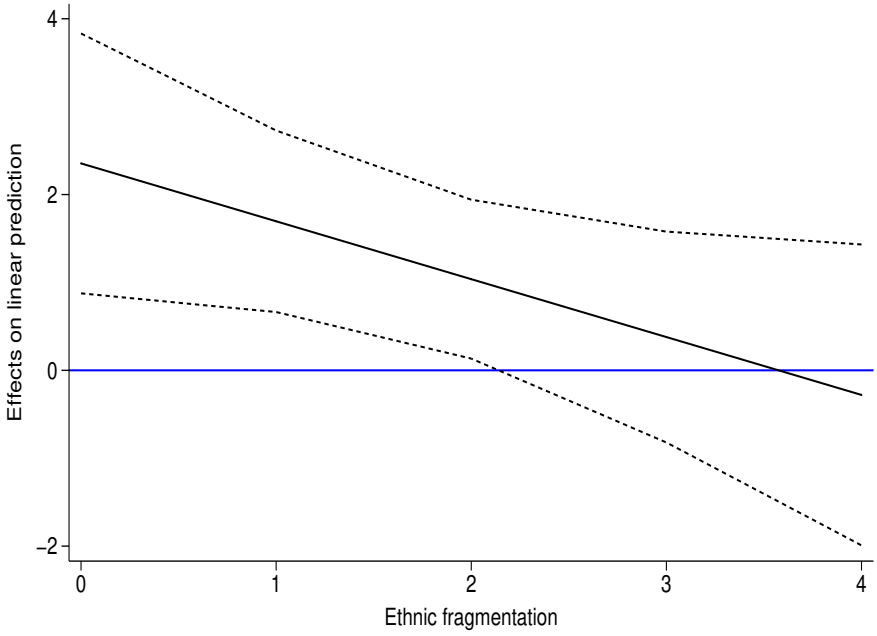

Figure 4.11: Average marginal effects of Fiscal Decentralization with 95% CIs (Ethnic fragmentation)

4.7 Conclusion

This study revisited the impact of local autonomy, measured by Fiscal Decentralization, on property tax revenue collection in a selected group of developed and developing countries over the period 2005-2019. The primary goal was to demonstrate that granting greater autonomy to local governments can enhance property tax revenue collection. Additionally, the study explored the significance of democracy, corruption, and ethnic fragmentation in reinforcing the relationship between fiscal decentralization and property tax revenues. To do so, the econometric investigation is based on panel fixed effect regressions. Moreover, the results remain robust to alternative robustness checks, including, among other things, the Driscoll and Kraay method estimator, endogeneity investigation, and quantile regressions.

Empirically, our research indicates that fiscal decentralization positively impacts property tax revenue collection and that a higher degree of democracy strengthens this relationship. Furthermore, our results also indicate that a higher level of corruption can negate the positive influence of fiscal decentralization on property tax revenues. The chapter also demonstrates that lower levels of ethnic fragmentation positively influence the relationship between fiscal decentral-

ization and property tax revenues. Moreover, we observe that the effect of fiscal decentralization on property tax revenue is more pronounced in developed countries than in developing countries. Finally, the results highlight a negative association between Fiscal Decentralization and property tax revenue in countries with low levels of property tax revenues, and a positive relationship in countries with the highest levels of property tax revenue. This implies that countries with property tax revenues above the median are more likely to benefit from fiscal decentralization reforms than those below the median. The study suggests thus that policymakers may consider the initial conditional distribution of property tax revenue in the implementation of their different fiscal decentralization policies around property taxation management.

Appendix chapter 4

Table C1: Descriptive statistics

Variables	N	mean	sd	min	max	skewness	kurtosis
Expenditure decentralization	626	0.276	0.184	0	0.903	0.669	3.308
Revenue decentralization	676	0.182	0.183	0	0.922	2.143	8.253
Property tax revenue	880	1.301	1.199	0.000243	17.22	3.320	37.21
Polity2	783	7.236	4.967	-9	10	-2.149	6.373
Agriculture	914	5.844	6.491	0.214	34.06	2.059	6.928
Foreign direct investment	923	6.333	18.97	-57.61	280.1	8.780	105.3
GDP per capita	923	22,307	22,350	353.7	112,373	1.414	4.977
Government expenditure	911	17.75	5.616	6.585	70.17	4.050	36.77
Industrialization	914	26.18	7.790	9.985	65.71	1.217	5.908
Inflation	923	4.522	6.856	-18.84	85.35	4.934	46.92
Trade	911	91.77	47.98	11.86	360.1	1.853	9.304
Total natural resources rents	923	3.435	6.352	0.000190	42.26	3.026	12.98
Internet	899	56.99	26.74	1.742	99.01	-0.425	2.023
Urban population	923	67.51	17.17	16.96	98.00	-0.718	3.186
Control of Corruption	923	0.480	1.085	-1.638	2.470	0.149	1.803
Government Effectiveness	923	0.608	0.934	-1.498	2.354	-0.175	1.859
Political Stability	923	0.231	0.858	-2.801	1.596	-0.832	3.247
Regulatory Quality	923	0.673	0.864	-1.835	2.092	-0.546	2.639
Rule of Law	923	0.525	1.016	-1.897	2.130	-0.151	1.801
Quality of Government	802	0.645	0.214	0.250	1	0.122	1.618
Law and order	842	4.311	1.244	1	6	-0.512	2.420
Bureaucracy quality	842	2.791	1.023	1	4	-0.229	1.865

Table C2: Additional macroeconomic covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Dependent variable: Property tax revenue (log)													
Fiscal decentralization	1.201***	1.121**	1.203***	1.210***	1.131***	1.135**	1.303***	1.183***	1.199***	1.262***	1.319***	1.301***	1.267***
	(0.443)	(0.435)	(0.444)	(0.433)	(0.423)	(0.445)	(0.446)	(0.432)	(0.434)	(0.459)	(0.430)	(0.447)	(0.445)
Democracy	0.004	0.003	0.007	0.003	0.006	0.005	0.006	0.002	0.002	0.005	-0.001	0.004	0.003
	(0.008)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.009)	(0.009)
Urban population (log)	2.188***	2.185***	2.285***	2.246***	2.238***	2.051***	2.322***	2.188***	2.273***	1.984***	2.306***	2.365***	2.417***
	(0.697)	(0.696)	(0.699)	(0.697)	(0.710)	(0.689)	(0.718)	(0.713)	(0.719)	(0.674)	(0.718)	(0.740)	(0.727)
Natural resources rents (log)	0.064***	0.065***	0.011	0.068***	0.013	0.051*	0.068***	0.065***	0.066***	0.065***	0.060***	0.067***	0.063***
	(0.022)	(0.022)	(0.035)	(0.022)	(0.037)	(0.028)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.023)	(0.023)
GDP per capita (log)	0.809***	0.822***	0.667**	0.809***	0.761***	0.858***	0.963***	0.906***	0.884***	1.004***	0.779***	0.774***	0.805***
	(0.253)	(0.253)	(0.276)	(0.250)	(0.276)	(0.267)	(0.222)	(0.230)	(0.219)	(0.233)	(0.219)	(0.250)	(0.254)
Trade (log)	0.250*	0.240*	0.286*	0.323**	0.208	0.274**	0.248**	0.231*	0.232*	0.254**	0.254**	0.266*	0.249*
	(0.139)	(0.139)	(0.153)	(0.134)	(0.149)	(0.138)	(0.122)	(0.121)	(0.122)	(0.119)	(0.122)	(0.143)	(0.142)
Government expenditure (log)	0.413**	0.413**	0.364*	0.252	0.449**	0.297	0.359**	0.385**	0.388**	0.389**	0.382**	0.403**	0.420**
	(0.190)	(0.186)	(0.199)	(0.192)	(0.207)	(0.205)	(0.167)	(0.166)	(0.167)	(0.163)	(0.167)	(0.188)	(0.189)
Quality of Government	-0.987*	-0.996*	-0.973*	-1.089**	-0.870	-0.823							
	(0.551)	(0.548)	(0.565)	(0.549)	(0.576)	(0.559)							
Foreign direct investment		-0.003**											
		(0.001)											
Agriculture (log)			-0.228*										
			(0.120)										
Inflation				-0.007***									
				(0.002)									
Industrialization					0.013*								
					(0.008)								
Internet (log)						0.051							
						(0.054)							
Control of Corruption							-0.198***						
							(0.071)						
Rule of Law								-0.102					
								(0.111)					
Government Effectiveness									-0.062				
									(0.083)				
Regulatory Quality										-0.223**			
										(0.094)			
Political Stability											0.082		
											(0.065)		
Law and Order												-0.074	
												(0.094)	
Bureaucracy Quality													0.264
													(0.216)
Constant	-18.485***	-18.484***	-17.063***	-18.582***	-18.531***	-18.407***	-20.718***	-19.608***	-19.723***	-19.652***	-19.088***	-19.200***	-20.329***
	(3.893)	(3.881)	(3.869)	(3.896)	(3.902)	(3.961)	(3.717)	(3.605)	(3.692)	(3.486)	(3.630)	(4.071)	(3.857)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	42	42	42	42	42	42	44	44	44	44	44	42	42
Observations	495	495	488	495	488	490	522	522	522	522	522	487	487
R-squared	0.966	0.967	0.967	0.967	0.967	0.967	0.965	0.965	0.965	0.965	0.965	0.966	0.966

Notes: *** p<0.01, ** p<0.05, * p<0.1. All standard errors (in parentheses) are heteroscedasticity robust

Table C3: Robustness checks: Alternative measurement of fiscal decentralization.

	(1)	(2)	(3)
Dependent variable: Property tax revenue (log)	Full sample	Developed countries	Developing countries
Revenue decentralization	3.717***	7.523***	2.678**
	(1.051)	(1.574)	(1.308)
Democracy	0.002	0.005	-0.019
	(0.008)	(0.009)	(0.022)
Urban population (log)	2.068***	2.034**	1.218
	(0.658)	(0.801)	(1.294)
Natural resources rents (log)	0.030	-0.046	0.080**
	(0.036)	(0.085)	(0.039)
GDP per capita (log)	0.653**	0.939**	0.851**
	(0.261)	(0.433)	(0.329)
Trade (log)	0.261*	0.150	0.467**
	(0.154)	(0.237)	(0.193)
Government expenditure (log)	0.228	1.063***	-0.111
	(0.194)	(0.275)	(0.301)
Quality of Government	-0.549	-0.917	-1.279*
	(0.546)	(1.007)	(0.739)
Constant	-16.485***	-20.063***	-14.577**
	(3.746)	(5.703)	(7.012)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Countries	44	15	29
Observations	500	161	339
R-squared	0.967	0.960	0.970

*** p<0.01, ** p<0.05, * p<0.1. Standard errors (in parentheses) are heteroscedasticity robust

Table C4: Effect of revenue decentralization on property tax revenue with lag in revenue decentralization

	(1)	(2)	(3)
Dependent variable: Property tax revenue (log)			
Revenue decentralization, t-1	3.043***		
	(0.927)		
Revenue decentralization, t-2		3.554***	
		(1.017)	
Revenue decentralization, t-3			2.549**
			(0.991)
Democracy	0.000	0.006	0.019**
	(0.008)	(0.009)	(0.009)
Urban population (log)	1.675***	1.942**	2.293**
	(0.618)	(0.806)	(1.023)
Natural resources rents (log)	0.062	0.065	0.071
	(0.040)	(0.046)	(0.051)
GDP per capita (log)	0.580**	0.539**	0.604**
	(0.241)	(0.265)	(0.301)
Trade (log)	0.209	0.209	0.274*
	(0.167)	(0.178)	(0.166)
Government expenditure (log)	0.304	0.320	0.520**
	(0.201)	(0.217)	(0.230)
Quality of government	-0.685	-0.522	-0.530
	(0.565)	(0.599)	(0.597)
Constant	-14.231***	-15.229***	-17.962***
	(2.770)	(3.444)	(4.373)
Country FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Countries	44	44	44
Observations	461	421	381
R-squared	0.968	0.968	0.968

*** p<0.01, ** p<0.05, * p<0.1. Standard errors (in parentheses) are heteroscedasticity robust

Table C5: Estimation of revenue decentralization on property tax revenue (lag model)

	(1)	(2)
Dependent variable: Property tax revenue (log)		
Revenue decentralization,t-1	2.619***	2.869***
	(0.888)	(0.952)
Democracy, t-1	0.011	0.013
	(0.008)	(0.008)
Urban population (log), t-1	1.649***	1.822***
	(0.624)	(0.619)
Natural resources rents (log), t-1	-0.018	0.042
	(0.027)	(0.037)
GDP per capita (log), t-1	0.352*	0.451**
	(0.202)	(0.222)
Trade (log), t-1	0.060	0.101
	(0.136)	(0.153)
Government expenditure (log), t-1	0.199	0.354*
	(0.183)	(0.193)
Quality of Government, t-1	0.069	0.225
	(0.518)	(0.531)
Constant	-11.702***	-13.835***
	(2.138)	(2.787)
Country FE	Yes	Yes
Time FE	No	Yes
Countries	44	44
Observations	465	465
R-squared	0.966	0.967

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

Table C6: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
[1]Property tax revenue	1																					
[2]Expenditure decentralization	0.385***	1																				
[3]Polity2	0.274***	0.141**	1																			
[4]Urban population	0.651***	0.392***	0.322***	1																		
[5]Total natural resources rents	-0.352***	-0.000260	-0.366***	-0.161***	1																	
[6]GDP per capita	0.585***	0.472***	0.372***	0.493***	-0.234***	1																
[7]Trade	-0.256***	-0.0679	-0.107*	-0.113*	-0.0499	-0.00752	1															
[8]Government expenditure	0.479***	0.166***	0.295***	0.452***	-0.411***	0.358***	0.189***	1														
[9]Quality of Government	0.637***	0.392***	0.433***	0.608***	-0.238***	0.874***	0.0125	0.546***	1													
[10]Revenue decentralization	0.338***	0.420***	-0.281***	0.115*	-0.0670	0.300***	-0.164***	-0.0117	0.219***	1												
[11]Industrialization	-0.464***	-0.148**	-0.675***	-0.392***	0.681***	-0.311***	0.0324	-0.524***	-0.373***	0.171***	1											
[12]Foreign direct investment	-0.0433	-0.0630	0.0842	0.0710	0.0867	0.0262	0.271***	0.121*	0.0911	-0.103*	-0.0641	1										
[13]Internet	0.540***	0.335***	0.257***	0.570***	-0.287***	0.750***	0.0693	0.474***	0.772***	0.222***	-0.328***	0.0234	1									
[14]Inflation	-0.272***	-0.0324	-0.333***	-0.147**	0.289***	-0.339***	0.122*	-0.220***	-0.374***	-0.0874	0.239***	0.0186	-0.360***	1								
[15]Agriculture	-0.591***	-0.490***	-0.246***	-0.671***	0.184***	-0.671***	0.0137	-0.509***	-0.720***	-0.223***	0.236***	-0.0203	-0.656***	0.271***	1							
[16]Control of Corruption	0.603***	0.409***	0.494***	0.613***	-0.305***	0.867***	0.0112	0.502***	0.953***	0.194***	-0.410***	0.0885	0.774***	-0.386***	-0.748***	1						
[17]Rule of Law	0.602***	0.361***	0.529***	0.558***	-0.309***	0.860***	0.0213	0.518***	0.955***	0.169***	-0.437***	0.0873	0.798***	-0.415***	-0.737***	0.975***	1					
[18]Government Effectiveness	0.621***	0.373***	0.452***	0.554***	-0.328***	0.862***	0.0146	0.515***	0.946***	0.241***	-0.400***	0.0684	0.794***	-0.460***	-0.750***	0.962***	0.975***	1				
[19]Regulatory Quality	0.565***	0.270***	0.604***	0.543***	-0.348***	0.785***	0.0113	0.474***	0.888***	0.0946*	-0.471***	0.107*	0.759***	-0.497***	-0.699***	0.929***	0.949***	0.942***	1			
[20]Political Stability	0.296***	0.308***	0.432***	0.387***	-0.136**	0.648***	0.205***	0.319***	0.699***	0.183***	-0.252***	0.130**	0.576***	-0.236***	-0.492***	0.739***	0.725***	0.669***	0.651***	1		
[21]Law and Order	0.521***	0.310***	0.229***	0.517***	-0.0819	0.760***	0.0731	0.484***	0.911***	0.224***	-0.187***	0.111*	0.683***	-0.192***	-0.612***	0.815***	0.830***	0.803***	0.709***	0.631***	1	
[22]Bureaucracy Quality	0.684***	0.381***	0.498***	0.592***	-0.316***	0.861***	-0.0274	0.549***	0.959***	0.205***	-0.458***	0.0734	0.731***	-0.461***	-0.712***	0.923***	0.932***	0.943***	0.896***	0.638***	0.786***	1

*p<0.05, ** p<0.01, *** p<0.001

Table C7: List of Countries

Albania	Chile	Iran	Netherlands	Tunisia
Armenia	China	Israel	New Zealand	Turkey
Australia	Colombia	Japan	Norway	Ukraine
Austria	Costa Rica	Kazakhstan	Paraguay	United Arab Emirates
Azerbaijan	El Salvador	Kenya	Peru	United Kingdom
Belarus	Estonia	Korea	Russian Federation	United States
Belgium	Georgia	Kyrgyz Republic	South Africa	Uzbekistan
Bosnia and Herzegovina	Germany	Latvia	Spain	
Brazil	Honduras	Mauritius	Sweden	
Burma	Hungary	Moldova	Switzerland	
Canada	Iceland	Mongolia	Thailand	

Table C8: Description of the variables

Variable	Definition	Sources
Property tax revenue (% GDP)	Total property tax revenues.	UNU-WIDER
Fiscal decentralization	The ratio of own expenditures/revenues to general government expenditures/revenues.	IMF
Quality of government	Corresponds to the combine of "corruption", "bureaucracy quality", and "law and order".	ICRG
Democracy	The polity score capture the regime's authority (polity 2). Ranges between -10 and +10, where +10 implies a very democratic case.	Polity IV dataset
Rule of law	capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	
Political stability and absence of violence	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	
Control of corruption	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	WGI
Government Effectiveness	capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	
Regulatory quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	
Real GDP per capita	GDP per capita (constant 2015 US$).	
Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	
Total natural resources rents (% of GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	
urban population	Urban population refers to people living in urban areas as defined by national statistical offices.	
Government expenditure	They include all current expenditures by the general government on purchasing goods and services and compensation of employees.	WDI
Agriculture, forestry, and fishing, value added (% of GDP)	Agriculture, forestry, and fishing correspond to ISIC divisions 1-3 and include forestry, hunting, and fishing, as well as cultivation of crops and livestock production.	
Internet	Internet users are individuals who have used the Internet (from any location) in the last 3 months.	
Inflation, GDP deflator (annual %)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.	
Foreign direct investment	Foreign direct investment, net inflows (% of GDP).	
Industrialization	Industry (including construction), value added (% of GDP)	
Law and order	To assess the "Law" element, the strength and impartiality of the legal system are considered, while the "Order" element is an assessment of popular observance of the law.	ICRG
Bureaucracy Quality	The institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change.	
Ethnic fragmentation	This index is an assessment of the degree of tension within a country attributable to racial, nationality, or language divisions	

Table C9: Effect of fiscal decentralization on property tax revenue depending on democracy

	(1)
Dependent variable: Property tax revenue (log)	
Fiscal decentralization	0.395
	(0.915)
Democracy	-0.012
	(0.018)
Fiscal decentralization*Democracy	0.106
	(0.103)
Urban population (log)	2.227***
	(0.702)
Natural resources rents (log)	0.064***
	(0.022)
GDP per capita (log)	0.768***
	(0.276)
Trade (log)	0.244*
	(0.139)
Government expenditure (log)	0.373*
	(0.190)
Quality of Government	-0.940*
	(0.557)
Constant	-18.086***
	(4.223)
Country FE	Yes
Time FE	Yes
Countries	42
Observations	495
R-squared	0.967

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

Table C10: Effect of fiscal decentralization on property tax revenue depending on corruption

	(1)
Dependent variable: Property tax revenue (log)	
Fiscal decentralization	1.349***
	(0.451)
Democracy	0.004
	(0.009)
Corruption	-0.051
	(0.123)
Fiscal decentralization*corruption	-0.497*
	(0.293)
Urban population (log)	2.254***
	(0.711)
Natural resources rents (log)	0.069***
	(0.022)
GDP per capita (log)	0.913***
	(0.224)
Trade(log)	0.207*
	(0.123)
Government expenditure (log)	0.342**
	(0.165)
Constant	-19.769***
	(3.730)
Country FE	Yes
Time FE	Yes
Countries	44
Observations	522
R-squared	0.965

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

Table C11: Estimation of the interaction between fiscal decentralization, democracy and corruption

	(1)	(2)
Dependent variable: Property tax revenue (log)		
Fiscal decentralization	1.602***	1.423***
	(0.490)	(0.453)
Democracy	-0.009	0.002
	(0.006)	(0.009)
Control of Corruption	0.145	-0.088
	(0.106)	(0.101)
Fiscal decentralization*democracy*corruption	-0.083***	-0.053**
	(0.028)	(0.027)
Urban population (log)		2.261***
		(0.717)
Natural resources rents (log)		0.067***
		(0.022)
GDP per capita (log)		0.919***
		(0.223)
Trade (log)		0.203
		(0.125)
Government expenditure (log)		0.383**
		(0.170)
Constant	-1.478***	-19.932***
	(0.169)	(3.762)
Country FE	Yes	Yes
Time FE	Yes	Yes
Countries	44	44
Observations	522	522
R-squared	0.960	0.966

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

Part II

Institutions and property tax revenue in Africa

CHAPTER 5

Internal Conflicts and the Moderating Role of Property Rights in Sub-Saharan Africa: Implications for Property Taxation

This chapter is a joint work with Isaac Amedanou, PhD (GATE, Université Jean Monnet, Saint-Etienne). A slightly different version of this chapter is published at Journal of African economies, OXFORD. It was aslo presented at GATE Research Seminar.

5.1 Introduction

In contemporary times, the primary objective for African countries is to mobilize internal resources, aiming to strengthen their overall tax revenue, reduce their dependence on foreign aid, and consequently amplify the provision of public goods and services. According to the Third International Conference on Financing for Development, the Addis Ababa Action Agenda, increasing domestic resource mobilization is essential to financing the Sustainable Development Goals. However, several factors are likely to hinder tax revenue collection. Among them, the most recurrent are corruption (Cerqueti and Coppier, 2009; Jahnke and Weisser, 2019), the quality of institutions (Gnangnon, 2022) as well as the various conflicts prevailing in the countries concerned (Van Den Boogaard et al., 2018; Ndoricimpa, 2021).

In addition, it should be noted that African countries are often confronted with multiple conflicts (civil wars, military coups, inter-ethnic conflicts),[1] which threaten their development process (Ray and Esteban, 2017; Sunjo and Page, 2022; Hugon, 2003) and, therefore, their tax mobilization policies (Ndoricimpa, 2021; Adhvaryu et al., 2021). In this respect, many studies have investigated the link between internal conflicts and several macroeconomic variables (see, e.g., Mwesigye and Matsumoto, 2016; Mihalache-O'Keef, 2018; Farzanegan et al., 2018; Ndoricimpa, 2021). Moreover, protecting property rights can play a pivotal role in analyzing the impact of internal conflict. Firstly, solid and well-defined property rights can help reduce conflict by giving individuals and groups a sense of security and ownership over their property. Secondly, in areas where land rights are ambiguous, disputes over ownership, use, and access to land can escalate into violent conflicts between individuals, communities, and even between nations. However, while several scholars have examined the individual effects of conflict and property rights on tax revenue (Besley and Persson, 2009; Ch et al., 2018) and on property tax revenue (Jibao and Prichard, 2016), it seems appropriate to focus on the key role of protecting property rights in the collection of property tax through the internal conflict channel.

According to Gupta et al. (2004), conflicts could constitute one of the principal explanations for property tax revenue inefficiency in African countries. This situation is characterized by political and socio-economic instability (displacement/reduction in human capital), the control of some parts of the country by armed groups, and damage to public and private infrastructure, hindering the smooth running of the economy. Internal conflicts can also discourage investors from implementing new businesses in conflict countries. Moreover, conflict can promote the relocation of some companies to those countries where internal stability is ensured. As a result, the property tax base has shrunk, leading to lower property tax revenue.

There is extensive literature concerning the relationship between conflicts and tax revenue (see, e.g.,

[1] Some examples include the recent case of military coups in Burkina-Faso, Mali, and Niger. But also the several conflicts that took place in Cote d'Ivoire, Tchad, Soudan, Sierra Leonne, Namibia, Dem. Rep. of Congo, and Rwanda.

Sanogo, 2019; Besley and Persson, 2010; Ebeke and Ehrhart, 2012), but to the best of our knowledge, none of them has investigated the relationship between internal conflicts and the specific case of property tax revenue in the context of African countries. It is precisely this gap that the present analysis seeks to fill by highlighting the implications of internal conflicts on property tax revenue and the moderating role played by property rights in Sub-Saharan African countries. In doing so, the chapter falls between two streams of literature, one on internal conflicts and the other on the mobilization of tax revenues.

Regarding the existing literature, scholars associate conflicts with the period where the government is incapable to collect/raise tax revenue (Besley and Persson, 2010). Also, the impact of conflicts on tax revenue varies according to the region. For example, in Europe, the government enhances the level of tax collection during crises/conflicts to answer the need for financing to deal with the crisis (Feldman and Slemrod, 2009). The authors explain this positive relationship by the fact that war contributes to putting in place tax reform and improving citizens' compliance. In one way, citizens do not really have the choice to contest government reforms during wars. In another way, citizens comply to show their patriotism. However, in the case of African countries, this positive interconnection is less evident. In fact, given that institutional quality is already weaker in African countries, conflicts can further exacerbate this situation, negatively impacting institutional quality and, therefore, governance. According to Ndoricimpa (2021), African countries in a period of conflict are generally unable to apply their taxation policies. Similarly, since institutional quality is already poor in African countries, they suffer more from the deterioration of the tax base. In this vein, conflicts can negatively affect tax revenue mobilization (Van Den Boogaard et al., 2018). In a context where conflicts reduce the tax base, governments prefer to focus on the principal taxes, which can generate more revenues. Therefore, they could abandon some taxes, such as property taxes, which are already weakly collected. Likewise, all the tax reforms [2] undertaken by the government to promote the collection of internal resources could be abandoned in times of conflict.

Moreover, concerning property tax revenue, it is essential to mention that internal conflicts could also deteriorate the definition of property rights and the deregulation of tax procedures. In the sense of Baker and Booth (2012), property rights are commonly defined as a right to own or possess something, such as land or an automobile, and to be able to dispose of it as one chooses. However, internal conflicts often lead to the collapse of the rule of law and the erosion of institutions, increasing the risk of expropriation. Thus, when conflicts arise, law enforcement agencies can become ineffective or corrupt, making it difficult to enforce property rights. Also, when the legal system becomes inoperative, individuals and businesses may lose confidence in protecting their assets. Lastly, institutions can be weakened or destroyed during periods of instability, leaving property owners vulnerable to violation or seizure by opportunistic individuals or

[2] In 2018, Togo introduced a land registry reform to improve property tax collection. The Togolese government implemented the *Guichet Foncier Unique (GFU)* under the clauses of article 220 of law no. 2018-005 of 14 June 2018 on the land and property code. This structure is attached to the Togolese Revenue Office, which aims to facilitate the formalities and procedures relating to land and property.

groups.

Historically, Africa has experienced successive conflicts that have negatively impacted macroeconomic variables such as tax revenue mobilization. For instance, the crisis in Cote d'Ivoire started in 1999 after the *coup d'etat* against President Henry Konan Bedie. This crisis was followed in 2002 by a civil war originating in inter-ethnic conflicts around land management. This period was characterized by the fragility of the macroeconomic environment and then tax revenue mobilization (see Figure D1). Similarly, Tax administration was also reduced and closed in the region occupied by the rebels. Burundi has also experienced many episodes of conflicts since its independence in 1962. For example, the civil war that started in 1993 in Burundi affected the country's economic structure and tax policies (Ndoricimpa, 2021). Thus, we argue that internal conflicts negatively affect tax administration capacity and erode the tax base by destroying firms (Gupta et al., 2004), which harms tax compliance. Globally, conflicts affect public finances by influencing real economic activity and changing government spending composition.

The chapter investigates the following question: How do conflicts affect property tax revenue? To answer this question, we should remember that internal conflicts affect property tax revenue through several factors. Indeed, it is clear that there are several macroeconomic variables through which internal conflicts could affect property tax revenue, but our purpose is not to explore each of them. In this research, we assumed that internal conflicts could affect property tax revenue via property rights,[3] and the quality of the government. In Africa, it is difficult to identify all the properties, and the efforts made by governments to enhance the level of property rights protection are mostly outdated. Thus, if a country faces an internal conflict, this could deteriorate the protection of property rights. In periods of conflict, countries with relatively higher property rights protection suffer less than countries with lower policies to manage property (Platteau, 2000). In this context, we assume that good protection of property rights could mitigate the negative effect of internal conflicts on property tax revenue collection. Specifically, we used an interaction term between property rights and internal conflicts to see their combined effect on property tax revenues. Likewise, we look at the moderator effect of the quality of government in the relationship between property rights protection and internal conflicts on property tax revenue. Overall, our question of interest is whether property rights and the quality of government could mitigate the impact of internal conflicts on property tax revenue mobilization. To the best of our knowledge, no literature directly assesses the combined effect of such variables on property tax revenue. We intend also to fill this lacuna in the case of African countries.

The contribution of the chapter is twofold. First, it investigates a new determinant of property tax revenue that has not yet been investigated in previous studies about property tax revenue, including urbanization, government expenditure, and the level of development, among others. Second, we highlight the moderating role of property rights on the relationship between internal conflicts and property tax

[3]It measures property rights' security separately from other aspects of the rule of law.

revenue and the role that could play government quality in the relationship between property rights and internal conflicts while assessing their combined effect on property tax revenue mobilization.

To achieve this aim, we use panel data covering sub-Saharan African countries from 1996-2019 using the fixed-effects regressions. The selected countries largely depend on data availability. Then, we combined data on internal conflicts from the International Country Risk Guide (ICRG) with property tax revenue from the International Centre for Tax and Development (ICTD) and other variables from World Development Indicators (WDI). The estimation results are pretty instructive. Indeed, our empirical findings indicate that countries exhibiting internal conflict tend to collect less property tax revenue. In light of the negative relationship between internal conflicts and property tax revenue, the study suggests property rights protection and the quality of the government are good moderators to mitigate this negative relationship. When we do so, we observe that this pattern of low property tax collection is more prominent in countries where property rights are ill-defined, and the quality of government is weak. In more detail, among the components of the quality of government notably the quality of the bureaucracy, rule of law, and corruption, only the latter has been seen to be relevant in explaining the magnitude of property tax revenues. Finally, among other factors tested, some, such as the level of development, the share of natural resources, and the urban population, are also relevant in determining property tax revenues.

The remainder of the chapter is organized as follows. Section 5.2 introduces a brief view of property tax management in Africa. Section 5.3 provides some arguments about the nexus between property tax and relevant channels. Section 5.4 describes the data and the empirical methodology. Section 5.5 discusses the empirical findings. Section 5.6 concludes and derives some policy implications while discussing the limits and prospects for future research.

5.2 Brief view of property tax management in Sub-Saharan Africa

This section provides some history of property tax revenue management in Africa. This is organized into two categories: local management and the other central property tax management. Central property tax management is often practiced in *Francophone* and *Lusophone* countries. In contrast, local management (provincial/state) is the case in Anglophone countries, both inherited from their former colonizer. Local governments are responsible for property tax legislation in some countries, such as Nigeria, South Africa, Kenya, Namibia, and Tanzania.

Conversely, in other countries such as Cote d'Ivoire, Mali, Burkina Faso, Niger, Cameroon, and Togo, the tax legislation is managed by the central government, which holds all the decision-making power. Central property tax management is often justified by the existence of a high level of corruption within local authorities and the fact that the latter does not have sufficient resources to manage property tax.

Even though they manage property tax differently, one of the common features of all these countries is the low revenue generated by this tax (Franzsen and McCluskey, 2017). It is also important to be precise that some Anglophone countries (Rwanda, Tanzania, and the Gambia) have recently recentralized some key aspects of property taxation in the ambition to collect more (Goodfellow, 2017). Thus, Central *versus* Local property tax management needs to be explored more in the context of African countries.

However, the implementation of land policies faces enormous challenges. On the one hand, the implementation of these policies is hampered by internal conflicts in certain countries. In contrast, in other countries, the failure to implement policies did not lead to civil war, and this fragility can be attributed to weak institutions. Property tax revenue collection needs good and stable fiscal laws. According to Daud et al. (2013), property tax bases are three broad categories, including a per-unit tax, an area-based tax, and a value-based tax. The definition of these tax bases is often confronted with multiple debates that can lead to conflicts between communities or a group of taxpayers.

In Africa, one explanation for the poor collection of property tax revenue is probably the protection of property rights. In most cases, the land is rural. In fact, all the discussion around this tax is linked to "*who*" defines the property rights of the land or "*who*" pays the tax. Traditional or customary chiefs play a significant role in land management in some countries, such as Botswana, Cote d'Ivoire, Uganda, and Niger. This strong presence of customary authorities in managing and allocating land is often at the root of several internal conflicts (for instance, the region of Kayes in Mali). These conflicts can be at the community level,[4] leading to land expropriation. In Ghana and South Africa, customary chiefs do not have any power to raise revenue through property taxes (Franzsen and McCluskey, 2017). The problem is that when traditional authorities play a significant role in land tenure, they often oppose the formalization of land ownership. In fact, they are, in some cases, at the origin of the inefficiency of the cadastre initiative to better define the maps around the different properties. On the other hand, there can exist good collaboration between the local community and central government in the management of land, as is the case in Benin (Yelome, 2022).

Yet, several other countries are granting property tax management to some autonomous institutions. This is the case, amongst others, of countries such as Togo and Burundi that established Semi-autonomous revenue authorities (SARAs) for better tax revenue collection (Monkam and Moore, 2015; Gallagher, 2005). Private management of tax revenue could be an excellent alternative to put the spotlight on other taxes, such as property tax, which has been forgotten for a long time by centralized administration.

Beyond such reform, for some countries, the cooperation between local government, cadastral surveyors, and water and electricity companies is essential to facilitate the identification of the land and the buildings susceptible to taxation (the case of Niger in the early 2000s). In Rwanda, the management of land information has made significant progress with their process in digitally the individually owned

[4]The conflict is generally between the citizens, traditional chief, local government, and central government.

parcels [5] and the establishment of two types of certificates, notably the certificate of registration of full title and the certificate of registration of emphyteutic lease that is leasehold. Moreover, the Constitution of the Republic of Rwanda recognizes state and private property and grants every citizen a right of ownership over the property they own.[6] The case of Namibia is also fascinating, with the particularity of defining a maximum tax rate for land. However, as in South Africa, local authorities play a key role in tax management. This ceiling rate is introduced and defined by the Urban Land Tax Act.[7] Nonetheless, local authorities can exceed this rate with the prior written approval of the relevant minister (Franzsen and McCluskey, 2017).

5.3 The nexus between property tax and relevant channels

5.3.1 Is land a source of conflicts?

This section briefly discusses the relationship between the land arena and internal conflicts. We then expose explicitly how land constitutes a source of conflicts, giving some examples of African countries' land conflicts. For example, in RDC, particularly in Kalehe communities during the 1980s-1990s, Claessens et al. (2012) noted that land control had been one of the main reasons for the conflicts between autochthonous communities and rwandophones. Indeed, access to land in Kalehe on a customary basis did not distinguish between applicants who were foreigners or native tribesmen. These land conflicts led to the birth of several armed groups brandishing the discrimination of the Tutsi people by other tribal communities as the reason for their struggle. Land claims in this locality are due to a controversial demarcation of territories resulting from incessant and poorly organized mutations. Beyond these examples, land has been a source of conflict in several countries in Africa, such as Burkina Faso, Cote d'Ivoire, Cameroon, and Botswana, where access to land remains problematic, and its management is generally a source of conflict (Bob, 2010; Kalabamu, 2019; Bambio and Agha, 2018).

In Cote d'Ivoire, we can take the example of land conflicts between the *Baoulé* and the *kroumen* communities. Several *Baoulé* acquired land after working for a long time on *kroumen* plantations, and they were supported at that time by the PDCI-RDA regime.[8] This practice was often based on agreements between landowners and *allogènes* or arrangements made with certain indigenous traditional chiefs to obtain a parcel of land officially. Likewise, the conflicts between Baoulé/Guéré in 1997, Kroumen/Burkinabé

[5] The transferring of property in Rwanda takes only one month, contrary to the past, where the same procedure took more than one year. Moreover, the Organic Law on Land recognizes that the rights to land obtained through customary ownership are equivalent to those obtained under formal law and mandates land registration. Under this law, all rural land previously held under customary law is now registered and subject to an emphyteutic lease.

[6] https://www.rema.gov.rw/our-work/link/land

[7] See Local Authorities Act No. 23 of 1992, Land Reform Act No. 6 of 1995, Communal Land Reform Act No. 5 of 2002.

[8] This political regime was in power during this period (party of Félix Houphouet Boigny).

(Dagari, Lobi, and Mossi), and Bété/Burkinabé in 1999 are some other examples. Moreover, the beginning of all the conflicts in Cote d'Ivoire also derives from land conflicts. Indeed, all these cumulative crises led to a coup d'état in 1999, which overthrew the power of President Henri Konan Bédié. Over the years, this practice gradually became a source of confrontation between non-natives and natives, sometimes leading to armed conflicts and rebellion, as in the civil war in 2002.

In the case of Mali, the same example could be taken in the region of Kayes between the descendants of formerly enslaved people and those of their former superiors, often characterized by intra-community conflicts. These land conflicts in this region resulted in the forced expropriation of enslaved people's descendants' land and the deaths of many people. Land conflicts in this area are still present. Burkina Faso has also registered land conflicts between *Mossi* and *Peuhls*.[9] Any land allocated to non-natives (*Peuhls*) was subject to oral conditions that the latter would have to observe. When these obligations were not respected, the offending non-natives were subject to penalties, which could lead to exclusion from the village. The conflicts between the two groups started because the *Peuhls*, long-settled immigrant peoples, refused to recognize the rights of the natives to the land that had been ceded to them for farming purposes, claiming that the land was now theirs. Finally, all these situations do not create an ideal framework for establishing strong policies around property tax since governments are more likely to adopt peacemaking policies. Moreover, despite all the reforms initiated by these countries, this tax remains unknown to many African citizens today.

5.3.2 Property rights and internal conflicts

According to Skaperdas (1992), in a context where African countries struggle to define good property rights protection, conflicts could drastically push the definition of these property rights. Indeed, conflicts are a source of instability and, therefore, amplify the difficulties in controlling property rights protection by the government. Also, it is good to mention that debates around property tax improvement in developing countries are generally due to property rights protection (Cai et al., 2018). In the same way, poor enforcement of property rights protection could exacerbate the effects of conflicts (Gonzalez, 2007) by deteriorating social welfare. Moreover, conflicts could lead to the closure of public administrations, undermining the functioning of the tax administration and limiting tax revenue collection to the big cities. A dysfunction or absence of public administration can also lead to an absence or non-application of property rights. Thus, internal conflicts contribute to the deterioration of tax compliance (Gupta et al., 2004; Ndoricimpa, 2021).

From another point of view, property rights could help to prevent internal conflicts. Indeed, when the laws around land ownership are clearly defined, property rights protection could reduce the likelihood

[9] Another well-known land crisis in Burkina Faso is the land crisis between farmers and herders.

of disputes over land use or occupation. Consequently, property rights protection can mitigate conflicts' harmful effects on property tax revenue. Finally, since the failure to protect property rights leads to conflict, it can justify the government's responsibility in terms of preventing conflicts.

5.3.3 The balancing role of quality of government

We now briefly discuss the role that could play quality of government in the relationship between property rights and internal conflicts. The idea is to explore the role that the quality of the government can play in the relationship between property rights protection and internal conflicts. It is good to keep in mind that the quality of government indicators used in this research is composed of corruption, law and order, and the quality of bureaucracy from the ICRG database. The higher value of this variable reflects a higher quality of government. An efficient government will do its best to implement suitable policies for protecting property rights by increasing political decision transparency, respecting the rule of law, and improving bureaucracy quality while reducing corruption. This achievement will not happen by some magical wand. Of course, it will undoubtedly take time, but governments are responsible for ensuring the security of property rights. For instance, good protection of property rights by reducing the level of corruption could consequently minimize the risk of conflicts. Also, lower conflict risk could enhance property tax revenue mobilization.

5.4 Methods and data

5.4.1 Empirical methodology

We now explain the econometric approach guiding the empirical investigation of the effect of internal conflicts on property tax revenue mobilization in Sub-Saharan African countries. Specifically, we estimate the following model :

$$PTax_{it} = \beta_0 + \beta_1 IConflict_{it} + \beta_2 PRight_{it} + \beta_3 IConflict_{it} * PRight_{it} + \beta_k X_{it} + \theta_i + \gamma_t + \mu_{it} \quad (5.1)$$

Where $PTax_{it}$ is the total of property tax revenue expressed in percentage of GDP for the country i in year t. $IConflict_{it}$ represents internal conflicts, and $PRight_{it}$ denotes property rights. μ_{it} represents the error term capturing the omitted factors and noise. β_0 reflects the constant term. θ_i is the time-invariant and country-specific effects of the country.[10] γ_t represents time-varying factors or standard shocks that could potentially affect property tax revenue in all African countries. The estimation of the parameters β_1 and β_2 reflects the individual effects of internal conflicts and property rights on the

[10]The inclusion of country-fixed effects is particularly useful in accounting for the potential unobserved heterogeneity among countries. By including country-fixed effects, we also control for time-invariant country-specific factors that could lead to differences in property tax revenue across countries.

dependent variable. The coefficient β_3 captures the marginal impact of the interaction between internal conflicts and country-specific property rights protection, varying in time over the sample period. The interaction between internal conflicts and property rights is used because the protection of property rights in one country could affect the magnitude of the internal conflicts' effect on property tax revenue. While X_{it} represents the vector of control variables reflecting the main time-varying determinants of property tax revenues, frequently used in the relative literature to minimize the omitted variable bias. The total effect of internal conflict on property tax revenues is given by:

$$\frac{\partial PTax}{\partial IConflict_{i_t}} = \beta_1 + \beta_3 PRight$$

It is important to notice that in our preliminary analysis, we execute our estimation without the interaction term to explore the direct effect of internal conflicts solely. To conduct our econometric investigation, we employ panel fixed-effects regressions. The error terms have been automatically adjusted for heteroscedasticity using the *robust* option. We also carry out a series of supplementary estimations to test the robustness of the main findings. More specifically, we employ the Driscoll and Kraay estimator to address cross-sectional dependence, autocorrelation, and missing values in the data (Driscoll and Kraay, 1998). Additionally, the chapter further examines the potential bias of endogeneity that may arise from the reverse causality between internal conflicts and property tax revenue. In this vein, owing to the challenge of finding suitable instruments, this study uses reverse causality analysis to mitigate endogeneity bias. Nonetheless, the fact that we include annual and country-fixed effects reduce also the bias of omitted variables and consequently reduces the endogeneity issue.

5.4.2 Data

This chapter analyzes the empirical effect of internal conflicts on property tax revenue in Sub-Saharan African countries (Table D2 gives the list of countries in the appendix). The data covers the period from 1996-2019, and the selected countries depend largely on data availability. The dependent variable is the property tax revenue derived from the ICTD database, and the interest variable is internal conflicts from the ICRG database following Gupta et al. (2004). The highest score of the internal conflicts variable is given to countries with greater internal stability, and the lowest score is given to a country faced with internal instabilities. Consequently, an increase (decrease) in this indicator represents a reduction (increase) in the level of internal conflicts. The ICRG internal conflicts index has been used widely in the related literature (see, e.g., Farzanegan and Witthuhn, 2017, Bjorvatn and Farzanegan, 2013). The main reason to use this variable is that it considers many dimensions of internal conflicts. Moreover, it is not a binary variable, as in some studies using the UCPD/PRIO armed conflict dataset. It is constituted of three subcomponents including civil war, terrorism, and civil disorder. In the case of this chapter, we

use it as a proxy to capture the political instability, the existing conflicts in a country, and the different conflicts inherited from property rights protection.

As internal conflicts are recognized as detrimental to the mobilization of property tax revenues, the individual effect is presumed to be positive. Indeed, this positive link indicates the fact that the reduction of conflicts (internal stability) is positively associated with property tax revenue mobilization. In other words, the positive sign implies that an increase in internal conflicts reduces property tax revenue collection.

To look at the role played by the quality of government in the relationship between internal conflicts and property tax revenue, we used the ICRG quality of institutions index, including corruption, bureaucracy quality, and law and order. This variable reflects the mean value of the three variables scaled from 0 to 1. We used this index of quality of government as a moderator through which internal conflicts can impact property tax revenue. The higher values of this variable indicate a higher quality of government.

Property rights are proxied by the protection of property rights, as defined by the Heritage Foundation database and QoG data. This measure evaluates the security of property rights independently of other components of the rule of law. It combines all publicly available information on the perception of the security of property rights (18 singular indicators of property rights)[11] and combines all publicly available information on the perception of the security of property rights.

As for the control variables, we selected them following the determinants of property tax revenue existing in the literature. Thus, the main variables used include urban population, GDP per capita, total natural resources rents, government expenditure, and foreign direct investment (FDI). All of them are taken in natural logarithm form. The definition of all these variables are presented in Table D4 in the appendix.

The **urban population** is used to control urbanization. It is the main variable used in the literature to capture urbanization variables (Oyvat, 2016; Brueckner, 2019b). The increase in urban population is generally associated with the implementation of new buildings or businesses. Thus, it could boost the property tax base and, therefore, the enhancement of property tax revenue mobilization.[12] So, we expect a positive relationship between this variable and property tax revenue. **GDP per capita** measures a country's development level. We also expect a positive relationship between the level of development and property tax revenue. Indeed, the more the country is developed, the more the country offers a good environment to collect additional tax revenue and, in turn, more property tax revenues. The **total natural resources rent** can have a mitigating impact on property tax revenues. In fact, from one point of view, property tax could help a resource-rich country to generate more tax revenues (Franzsen and McCluskey, 2017). From another point of view, natural resources could reduce the willingness of

[11] see QoG and Ouattara and Standaert (2020) for more information about this variable
[12] It is important to note that land value increases urban population (Cai et al., 2018).

governments in resource-rich countries to focus on property tax collection (Martinez-Vazquez et al., 2001). **Government expenditure** controls the effort made by the government to establish the infrastructure to improve the living conditions of their citizens. Public service delivery, such as expenditure on education, health, and roads, is one element that could enhance citizens' volunteering to pay their property tax. The effect of this variable on property tax revenue is expected to be positive. Nevertheless, if citizens do not receive the basic infrastructure, that could harm their voluntary to compliance with the property tax payment. **Foreign direct investment (FDI)** is used to capture the implementation of new businesses in one country by foreign firms. Foreign investment is in line with the construction of new buildings or companies. Consequently, it can contribute to increasing the property tax base. Moreover, in Africa, most of the property tax revenues are paid by businesses. Thus, we expect a positive relationship between FDI and property tax revenues.

5.4.3 Descriptive statistics

This section provides a first view of the relationship between our main variables. Regarding Table D3 in the appendix, which presents the unconditional correlation, we note a positive and significant correlation between internal conflict and property tax revenue. Based on the definition of internal conflicts, this positive link implies that greater internal stability is positively associated with higher property tax revenues. Likewise, graphically, we make a comparison based on the median of internal conflicts. We assumed that countries above the value of the median are confronted by fewer conflicts than countries under the median value. When we do that, Figure 5.1 shows that on average, countries with low levels of internal conflicts tend to collect more property tax revenue compared to countries faced with high levels of internal conflicts.

The table D3 also indicates a positive and significant relationship between property rights and internal conflicts. Indeed, the stronger protection of property rights is associated with an increase in internal stability and *vice versa*. Finally, we also observe a positive and significant correlation between the quality of government and property rights, reflecting that an effective government can put in place a good mechanism to protect property rights.

We then provide a visual overview of these relationships. When we do so, Figure 5.2 below indicates a positive correlation between internal stability and property tax revenue, which reflects that greater internal stability is positively associated with property tax revenue mobilization. Also, Figure 5.3 confirms the positive relationship between property rights protection and internal stability, as previously obtained with the unconditional correlation. Finally, Figure 5.4 also indicates that the quality of the government is positively associated with property rights protection.

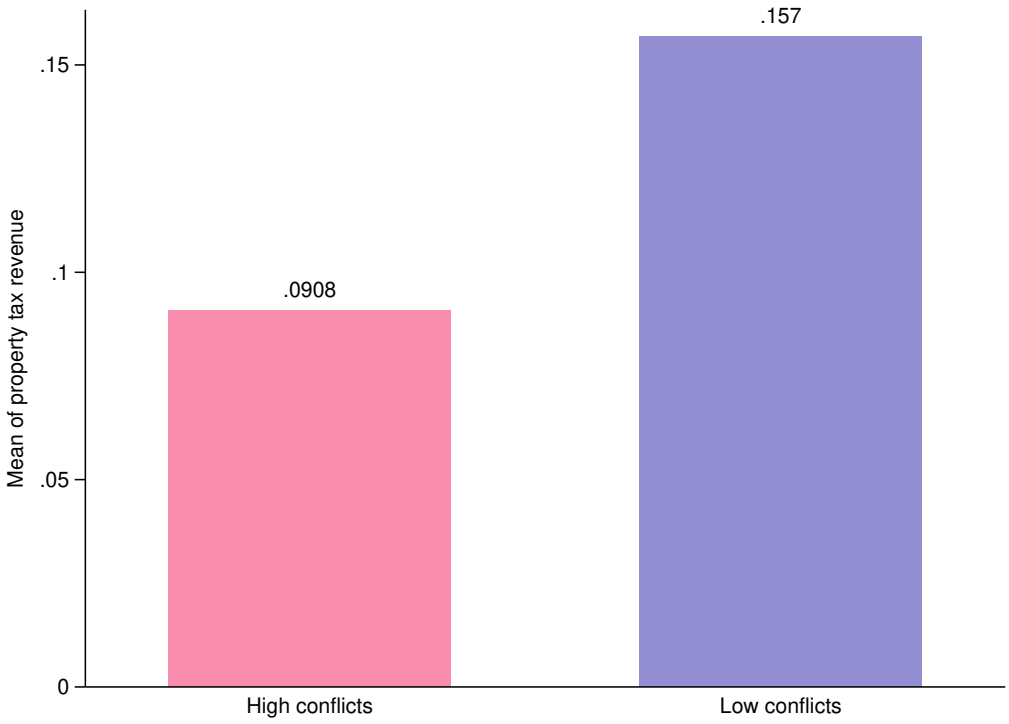

Figure 5.1: Property tax revenue in low and high conflict levels

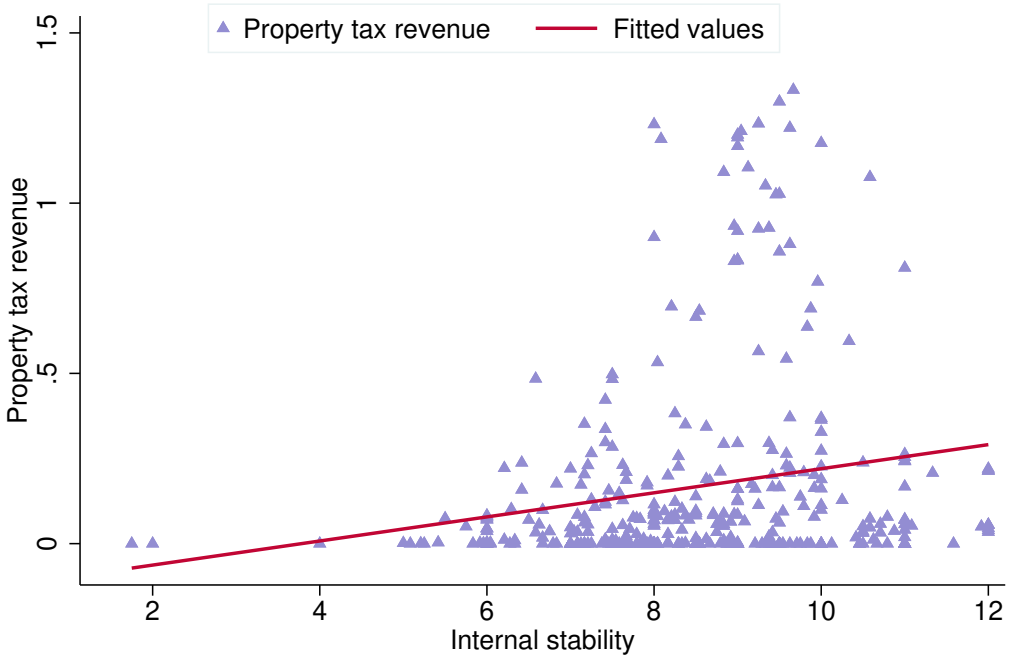

Figure 5.2: Correlation between internal stability and property tax revenue

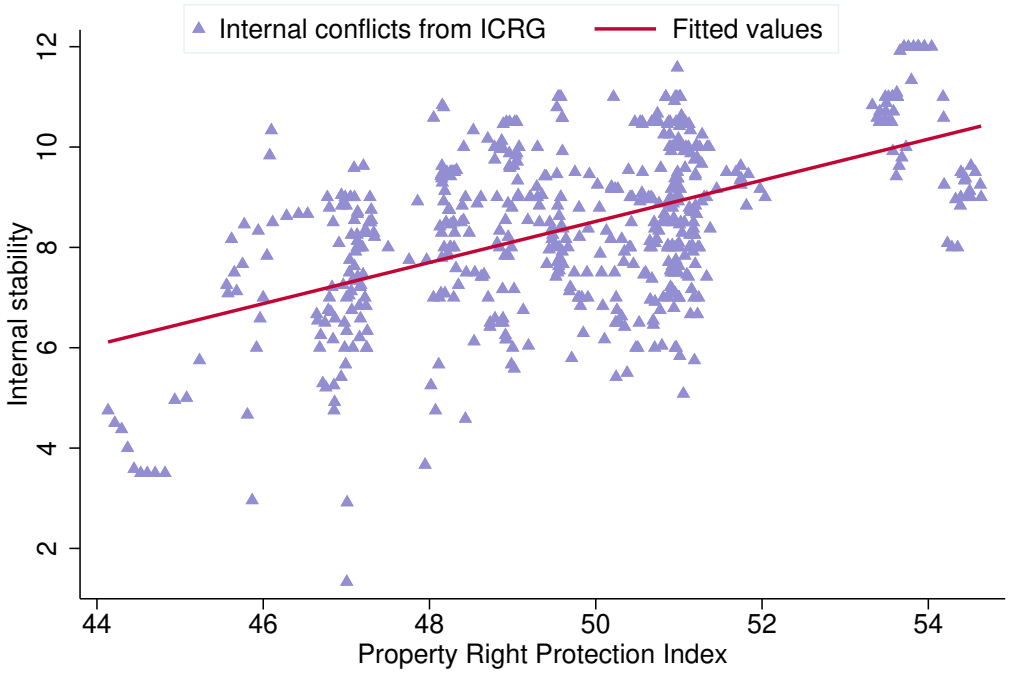

Figure 5.3: Correlation between property rights protection and internal stability

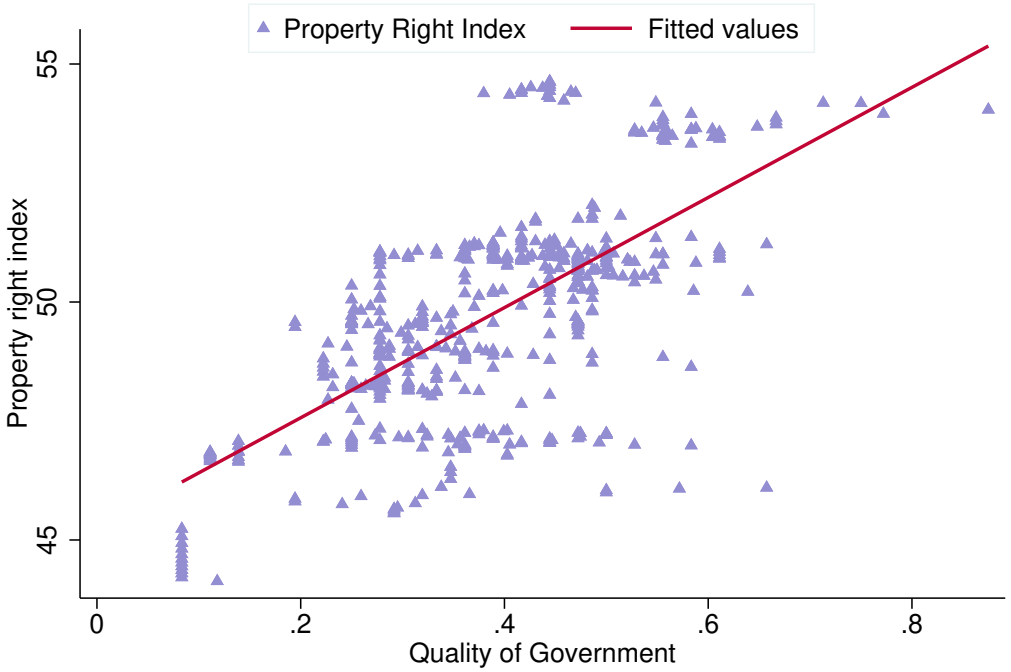

Figure 5.4: Correlation between quality of government and property right protection

5.5 Discussion of the results

5.5.1 Main results

Table 5.1 summarizes the results of our estimates regarding the potential link between internal conflict phenomena and property tax revenue within a country. Column 1 presents the specification that does not include country and year-fixed effects as control variables. Based on the estimate in column 1, there is a positive association between internal conflict and property tax revenues. The estimated coefficient of the internal conflict is 0.035, which is statistically significant at the 1% level. Considering that a higher internal conflict score from The PRS Group (2021) indicates lower internal conflict, the point estimate in column 1 implies that a 1-point increase in internal conflict reduces property tax revenues by 0.035 percentage points.

In column 2, we demonstrate that the negative relationship between internal conflicts and property taxes remains statistically significant even when controlling for country-fixed effects only, which remains consistent when adding the time-fixed effects (column 3). However, our preferred regression results start with column 5, which shows that the individual effect estimates of internal conflicts on property tax revenue, while quantitatively larger than the previous estimates, continue to be significant at the 1% level when controlling for property rights and the interaction between the two variables. The interaction term involves the multiplication of internal conflicts and the property rights index. Furthermore, the individual effect estimated for property rights indicates that a stronger definition of property rights leads to a statistically significant increase in the level of property tax revenues. Indeed, when property rights protection is well defined individuals are more willing to declare their properties, which in turn could lead to higher property tax collection. Given their larger magnitudes, the results suggest that the relationship between internal conflicts and property tax revenues may depend on country-specific protection of property rights. As observed, the estimate for the interaction term is significantly negative and quantitatively substantial. So, in countries with stronger property rights, the negative impact of internal conflict on property tax revenue may be relatively smaller. In comparison, the marginal impact may be more significant in countries with weaker property rights. Finally, column 6, in which we add control variables, shows that the implications of internal conflicts and the cushioning role of the protection of property rights in terms of property tax revenues remain consistent, whether or not control variables are present. However, our empirical evidence suggests that the pathways through which internal conflicts affect property tax revenues cannot be isolated from the protective mechanisms associated with property rights.

From these results, we are now looking at what might underpin good protection of property rights. We anticipate that this can come from good governance. Thus, it can be argued that strong institutions

can lead to favorable conditions for protecting property rights in an environment where transparency and accountability prevail. Obviously, these institutional factors are key conditions for improving tax revenues according to the relative literature such as Touchton et al. (2021); Timmons and Garfias (2015) and Flatters and MacLeod (1995), among others.

These results indicate that the negative impact of internal conflicts on property tax revenues is not uniform (homogeneous), given the specific characteristics of each country in terms of the definition of property rights. Figure 5.5 illustrates this assertion. It represents the marginal effects of internal conflicts for different values of property rights with a confidence interval of 95%. For low values of property rights, the marginal impact of internal conflicts on property tax revenues is positive and statistically significant up to a threshold where it becomes negative and statistically significant for high values of property rights (for instance, it is the case of South Africa, Mauritius, and Namibia). The average effect of internal conflict in each Sub-Saharan African country is presented in Figure 5.6.

Table 5.1: Property rights in linking internal conflicts and property tax revenues

	[1]	[2]	[3]	[4]	[5]	[6]
Internal conflicts	0.035***	0.018**	0.019***	0.017**	0.945***	1.034***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.224)	(0.212)
Property right				0.085***	0.248***	0.247***
				(0.020)	(0.045)	(0.044)
Internal conflicts x Property right					-0.019***	-0.020***
					(0.004)	(0.004)
Urban population (log)						0.291**
						(0.124)
GDP per capita (log)						0.068
						(0.088)
Natural resources rents (log)						-0.089***
						(0.030)
Government expenditure (log)						0.009
						(0.037)
Foreign direct investment (log)						0.005
						(0.010)
Constant	-0.134***	-0.160*	-0.197**	-4.715***	-12.708***	-14.254***
	(0.052)	(0.082)	(0.085)	(1.111)	(2.298)	(2.126)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	Yes	Yes	Yes	Yes
Observations	366	366	366	303	303	256
Countries	27	27	27	26	26	21
R-squared	0.036	0.857	0.863	0.870	0.884	0.897

The dependent variable is property tax revenue in percentage of GDP.
Robust standard errors are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

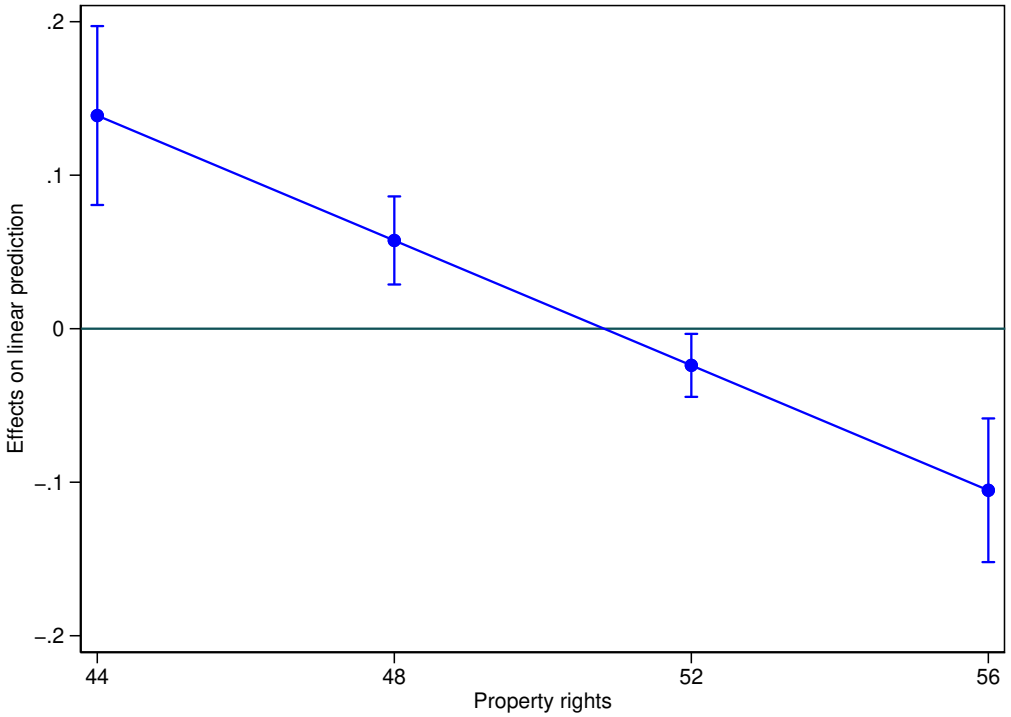

Figure 5.5: Average marginal effects of internal conflicts

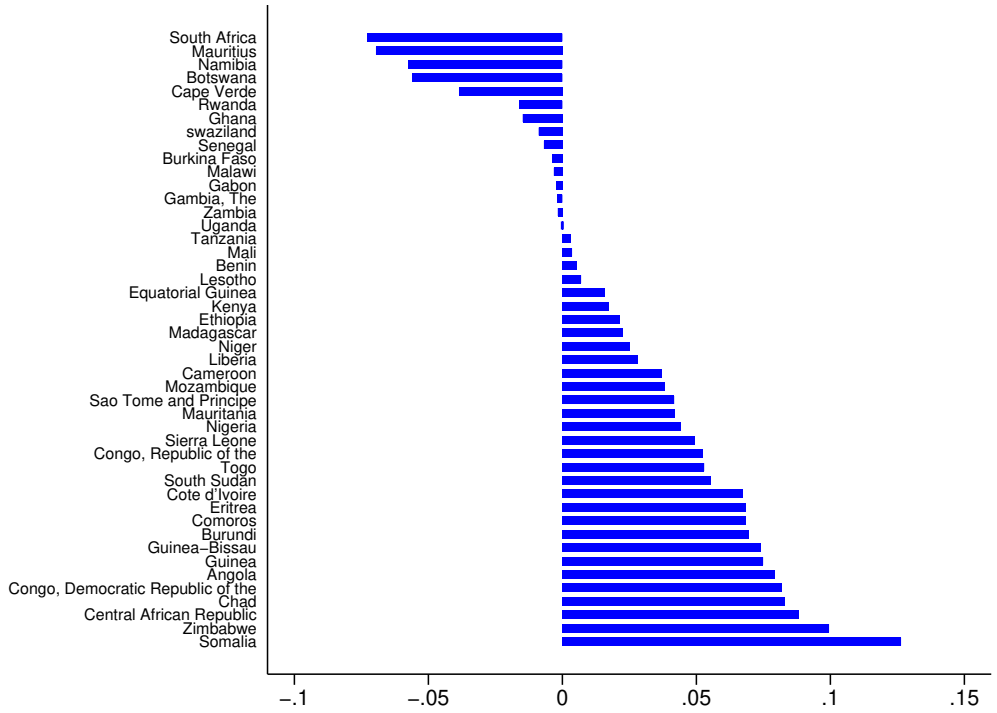

Figure 5.6: Cross-country average total effects of internal conflicts

However, to better understand the effect of the interaction between internal conflict and property rights protection on property tax revenue, it is useful to examine whether the quality of government impacts property tax revenue through the protection of property rights. We explore this question in Table 5.2 by examining how the quality of government and its interaction with property rights affect property tax mobilization. To measure the quality of government, we use an assessment of the effectiveness of public action from the The PRS Group (2023). A higher score indicates a higher level of effectiveness in public action.

In column 1, we estimate the individual effect of property rights on property tax revenue. We find that protecting property rights leads to a statistically significant increase in property tax collection without any control variables, neither by country nor time-fixed effects. When we introduce control variables for country effects only (column 2) and then for both time and country fixed effects (column 3), the coefficient on property rights is no longer statistically significant at the conventional level. However, when we introduce control variables for government quality, country-fixed effects, and time-fixed effects, the coefficient on property rights becomes quantitatively larger and statistically significant at the 1% level. Furthermore, the coefficient on property rights becomes even more substantial, indicating that a 1-point increase in property rights protection is associated with a 0.06 percentage-point increase in property tax collection.

The results in column 5 are particularly interesting as they include an additional variable, the interaction between property rights and the quality of government. The coefficient of this interaction term is negative and statistically significant. Note that the individual effects suggest that in countries where the quality of government is high and property rights are well protected, there may be more efficient processes for administering and collecting property taxes. This efficiency could result in improved compliance and increased property tax revenues.

However, it is important to note that the negative sign of the interaction term suggests that the quality of government partially counteracts the positive effect of property rights on property tax revenues. In other words, the negative sign implies that the relation between property rights protection and property tax is affected by the quality of government. In clear, their combined effect is less than the sum of their individual effects. One explanation could be due to the variations in countries and tax policy management. Indeed, in a country where there are relatively high levels of government quality and good property rights protection, the government could attempt to put in place low property tax rates that could result in less property tax revenue compared to a country where the quality of government is bad (see Figure 5.7). Indeed this kind of situation could reflect the Leviathan government's ability to practice higher property tax rates even if in the absence of good property rights protection.

Figure 5.7 supports these results by plotting the marginal effects of property rights on property tax revenue for various range values of government quality, with a 95% confidence interval. The estimated

marginal effects are positive and statistically significant up to a certain threshold, beyond which they become significantly negative.

Table 5.2: Quality of government in linking the protection of property rights and property tax revenue

	[1]	[2]	[3]	[4]	[5]	[6]
Property right	0.028***	0.012	0.017	0.066***	0.118***	0.108***
	(0.007)	(0.012)	(0.013)	(0.021)	(0.027)	(0.028)
Quality of government				0.517**	8.101***	9.468***
				(0.207)	(2.333)	(2.091)
Property right x Quality of government					-0.151***	-0.178***
					(0.046)	(0.041)
Urban population (log)						0.315***
						(0.118)
GDP per capita (log)						0.052
						(0.075)
Natural resources rents (log)						-0.093***
						(0.028)
Government expenditure (log)						0.026
						(0.037)
Foreign direct investment (log)						-0.006
						(0.010)
Constant	-1.287***	-0.586	-0.892	-3.855***	-6.320***	-7.435***
	(0.368)	(0.631)	(0.721)	(1.083)	(1.353)	(1.308)
Country fixed effects	No	Yes	Yes	Yes	Yes	Yes
Time fixed effects	No	No	Yes	Yes	Yes	Yes
Observations	458	458	458	303	303	256
Countries	39	39	39	26	26	21
R-squared	0.060	0.807	0.819	0.874	0.882	0.895

The dependent variable is property tax revenue in percentage of GDP.
Robust standard errors are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

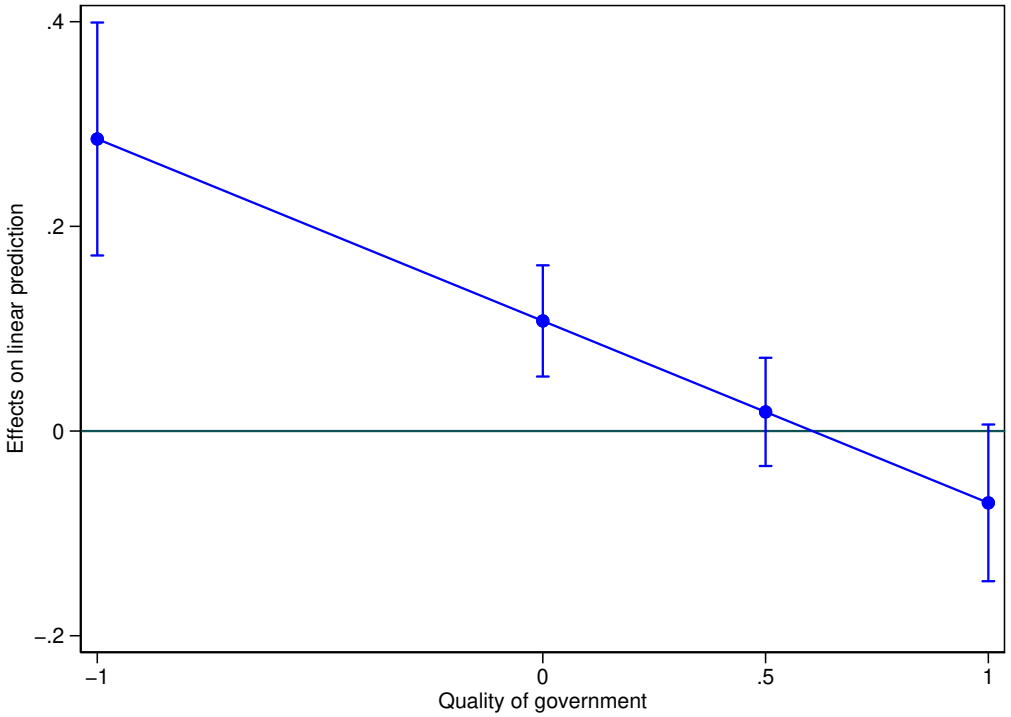

Figure 5.7: Average marginal effects of property rights

Again to deeper insights into the subject, we examined the consistency of the estimated individual effects of internal conflicts, property rights, and government quality on property tax revenue. This analysis was done by simultaneously including them in an additional regression, and the findings are presented in Table 5.3. The results from this estimation validate the inverse relationship between internal conflict and property tax revenue, as well as the positive impact of property rights and government quality on property tax revenue, as observed in column 1. Subsequently, when considering the results of column 2, which introduces an interaction among these three variables, the estimated coefficient is statistically significant and negative, thereby confirming our previous findings. Consequently, the negative impact of internal conflicts on property tax revenue is diminished in countries with robust protection of property rights and a government that demonstrates high efficiency in public action.

Table 5.3: Property rights and quality of government in linking internal conflicts and property tax revenues

	[1]	[2]	[3]
Internal conflicts	0.015**	0.050**	0.055**
	(0.007)	(0.021)	(0.025)
Quality of government	0.482***	1.259***	1.475***
	(0.144)	(0.461)	(0.510)
Property right	0.068***	0.077***	0.056**
	(0.026)	(0.022)	(0.027)
Internal conflicts x Quality of government x Property right		-0.002*	-0.002**
		(0.001)	(0.001)
Urban population (log)			0.276**
			(0.137)
GDP per capita (log)			0.128
			(0.093)
Natural resources rents (log)			-0.088***
			(0.030)
Government expenditure (log)			0.026
			(0.041)
Foreign direct investment (log)			-0.001
			(0.011)
Constant	-4.135***	-4.819***	-5.921***
	(1.398)	(1.215)	(1.324)
Country fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Observations	303	303	256
Countries	26	26	21
R-squared	0.876	0.878	0.890

The dependent variable is property tax revenue in percentage of GDP.
Robust standard errors are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Regarding the control variables used, most of them are not statistically significant at the conventional level, regardless of the estimates (refer to the last columns of tables 5.1, 5.2, and 5.3), even when introduced into the regressions in an alternative manner. However, only the estimates with all the control variables introduced simultaneously are presented, as the results do not differ. Therefore, two variables, namely the share of the urban population (in the total population) and the share of natural resource rents are found to be statistically significant. Consequently, the share of the urban population and the share of natural resources have explanatory power in determining property tax revenues.

More specifically, we have observed a positive association between the share of the urban population and property tax revenues. This is consistent with the results found by Awasthi (2020). Our understanding of this relationship suggests that it operates through two channels, including expanding the tax base and increasing property values. Firstly, as the share of the urban population grows, the property tax

base expands. This is due to a greater number of residential, commercial, and industrial properties that can be taxed in urban areas. The broader tax base results in a larger pool of properties contributing to property tax revenues. Secondly, urban areas typically experience higher property values compared to rural areas. The process of urbanization drives the demand for housing and commercial property in cities, leading to increased property values and generating higher property tax revenue.

Furthermore, we have discovered that the estimated coefficient on the natural resource variable is negative, indicating that an increase in resource exploitation leads to decreased property tax revenue. This negative relationship can be attributed to a country's dependency on natural resources. For instance, in countries heavily dependent on resources such as oil, gas, or minerals, the government often derives a significant portion of its revenue from resource-related taxes and royalties. Consequently, there may be less emphasis on property taxes as a source of revenue. This dependency on natural resources can reduce the reliance on property taxes, resulting in a negative association between the share of natural resources and property tax revenues.

5.5.2 Decomposition effect of quality of government

The following is a decomposition of government quality into its main components in order to understand further how it can influence the moderating effect of property rights in the impact of internal conflicts on property tax revenues. The quality of government is the average value of the ICRG variables, including corruption, law and order, and the quality of the bureaucracy. Several studies have examined the influence of governance quality on tax revenue collection. It is widely acknowledged that corruption among public officials and poor governance can considerably reduce tax revenues and seriously undermine economic growth and development (Ajaz and Ahmad, 2010; Antonakas et al., 2013; Yaru and Raji, 2022). Table 5.4 presents the results of our previous regressions, decomposing the quality of government into its three components used alternatively and then adding the interaction between property rights and country-specific levels of corruption, law and order, and bureaucratic quality (columns 1-3). Then, in columns [4]-[6], we add alternately the triple interactions between property rights, internal conflicts, and the components of government quality. Each specification also includes control variables.

From a comparative viewpoint, the signs of the coefficients of corruption, law and order, and bureaucracy quality are virtually the same as the previous specification using government quality. This suggests that government quality improves property tax revenue collection and moderates the relationship between the protection of property rights and internal conflicts in determining property tax revenue, which is also predictable when using the factors driving government quality. Thus, the complex relationships (direct or indirect) between the quality of government, property rights, and conflicts and their implications in terms of property tax revenues are not driven by one or more factors determining the quality of govern-

ment. These predictions also remain valid in specifications incorporating triple interactions, even if some coefficients have become insignificant. As for the control variables, GDP per capita becomes statistically significant in columns 1 and 6, in addition to the shares of natural resources and urban population, which were previously significant. Accordingly, the level of development is also relevant in determining property tax revenues, as in Awasthi (2020).

Table 5.4: Robustness checks of the quality of government

	[1]	[2]	[3]	[4]	[5]	[6]
Property right	0.048	0.099***	0.096***	0.058**	0.073***	0.012
	(0.030)	(0.030)	(0.029)	(0.026)	(0.025)	(0.029)
Corruption	0.884***					0.202***
	(0.219)					(0.059)
Law and Order		0.914**			0.076	
		(0.416)			(0.048)	
Bureaucracy Quality			1.440***	-0.012		
			(0.548)	(0.101)		
Property right x corruption	-0.016***					
	(0.004)					
Property right x Law and order		-0.019**				
		(0.008)				
Property right x Bureaucracy Quality			-0.028***			
			(0.011)			
Internal conflicts				0.006	0.055**	0.045**
				(0.019)	(0.024)	(0.019)
Property right x Bureaucracy Quality x Internal conflicts				0.000		
				(0.000)		
Property right x Law and order x Internal conflicts					-0.000***	
					(0.000)	
Property right x Corruption x Internal conflicts						-0.000**
						(0.000)
Urban population (log)	0.166	0.204	0.362***	0.279**	0.185	0.099
	(0.124)	(0.145)	(0.128)	(0.141)	(0.166)	(0.139)
GDP per capita (log)	0.173*	0.161	0.071	0.163	0.166	0.225**
	(0.088)	(0.102)	(0.100)	(0.117)	(0.109)	(0.100)
Natural resources rents (log)	-0.094***	-0.115***	-0.105***	-0.090***	-0.107***	-0.097***
	(0.027)	(0.033)	(0.030)	(0.030)	(0.035)	(0.029)
Government expenditure (log)	0.006	0.056	0.056	0.046	0.043	-0.001
	(0.039)	(0.048)	(0.046)	(0.049)	(0.049)	(0.040)
Foreign direct investment (log)	-0.010	-0.001	0.000	0.001	0.006	-0.006
	(0.009)	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)
Constant	-4.656***	-7.164***	-7.065***	-5.768***	-6.314***	-3.438**
	(1.412)	(1.700)	(1.440)	(1.372)	(1.399)	(1.409)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Countries	21	21	21	21	21	21
Observations	256	256	256	256	256	256
R-squared	0.900	0.887	0.887	0.884	0.887	0.897

The dependent variable is property tax revenue in percentage of GDP.
Robust standard errors are in parentheses. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

5.5.3 Sensitivity to alternative estimation

Table 5.5 employs an alternative estimation to assess the sensitivity of our previous results, which involves using the fixed effects estimation method proposed by Driscoll and Kraay, accompanied by

corrected standard errors. This approach is well-suited for dealing with heteroscedasticity, cross-sectional dependence, autocorrelation, and missing values in the data (Driscoll and Kraay, 1998; Joshi et al., 2021; Hoechle, 2007). Our results according to which internal conflicts exert a negative effect on property tax revenues and that this negative impact is mitigated by the specific contexts of the definition of property rights are consistent even when controlling for heterogeneity and autocorrelation with different lags. Moreover, the control variables keep their same effects as in our baseline specification. Indeed, the urban population continues to have a positive impact on property tax revenue, and natural resources have a negative influence.

Table 5.5: Robustness checks: using Driscoll and Kraay estimation

	[1]	[2]	[3]	[4]
	Lag 3	Lag 4	Lag 5	Lag 6
Internal conflicts	1.034***	1.034***	1.034***	1.034***
	(0.176)	(0.173)	(0.163)	(0.142)
Property right	0.247***	0.247***	0.247***	0.247***
	(0.029)	(0.029)	(0.028)	(0.024)
Internal conflicts x Property right	-0.020***	-0.020***	-0.020***	-0.020***
	(0.003)	(0.003)	(0.003)	(0.003)
Urban population (log)	0.291**	0.291***	0.291***	0.291***
	(0.110)	(0.098)	(0.088)	(0.084)
GDP per capita (log)	0.068	0.068	0.068	0.068
	(0.041)	(0.041)	(0.044)	(0.041)
Natural resources rents (log)	-0.089***	-0.089***	-0.089***	-0.089***
	(0.017)	(0.019)	(0.017)	(0.016)
Government expenditure (log)	0.009	0.009	0.009	0.009
	(0.015)	(0.012)	(0.013)	(0.013)
Foreign direct investment (log)	0.005	0.005	0.005	0.005
	(0.007)	(0.007)	(0.007)	(0.006)
Constant	-13.629***	-13.629***	-13.629***	-13.629***
	(1.550)	(1.503)	(1.363)	(1.170)
Country fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	256	256	256	256
Countries	21	21	21	21

Note: The dependent variable is property tax revenue expressed in percentage of GDP. lag(.) specifies the maximum lag to be considered in the autocorrelation structure. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

5.5.4 Endogeneity issue: reverse causality

In this subsection, we emphasize the significance of examining the question of endogeneity by highlighting the potential for reverse causality. Indeed, property tax revenues can also be a source of conflicts

between different groups within a community, as they may be used to finance public services or infrastructures that could benefit one group of residents but not others. This can create resentment and conflicts between different groups within the community. Due to the challenges of identifying suitable instrument variables that meet the conditions of exogeneity and relevance, it is difficult to carry out a two-stage least squares estimation. Although the sources of endogeneity are not limited to reverse causality, here, we used the lag of the explanatory variables to mitigate potential reverse causality between internal conflicts and property tax revenue in the model. Moreover, this estimation also helps us to minimize the risk of reverse causality between our dependent and all the independent variables used in our estimation (Gemmell et al., 2013; Iimi, 2005). The results in Table 5.6 are consistent with the previous findings of a negative impact of internal conflicts on property tax revenue mobilization, as well as the moderating role played by property rights protection.

Table 5.6: Impact of internal conflicts on property tax revenue (Lag model)

	[1]	[2]
Lag Internal conflicts	0.569*	0.602**
	(0.290)	(0.285)
Lag Property right	0.173***	0.165**
	(0.064)	(0.065)
Lag [Internal conflicts x Property right]	-0.011*	-0.012**
	(0.006)	(0.006)
Lag Urban population (log)		0.313**
		(0.154)
Lag GDP per capita (log)		0.099
		(0.130)
Lag Natural resources rents (log)		-0.049
		(0.031)
Lag Government expenditure (log)		0.020
		(0.040)
Lag Foreign direct investment (log)		-0.015
		(0.016)
Constant	-9.043***	-10.545***
	(3.247)	(3.350)
Country fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
Countries	25	21
Observations	284	242
R-squared	0.885	0.892

The dependent variable is property tax revenue (% of GDP).
*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses.

5.6 Conclusion and policy implications

Analyzing and understanding the interaction of the factors that explain the low collection of property taxes in Africa is a nameless essential. This understanding prompts us to rethink political and institutional systems for protecting property rights, often sources of internal instability undermining favorable conditions for higher tax revenues. To achieve this, we utilized a sample comprising Sub-Saharan African countries spanning the period from 1996 to 2019. The regressions were conducted employing the Ordinary Least Squares (OLS) estimator while incorporating country and time-fixed effects. The results remain robust when alternative estimators based on the Driscoll and Kraay method are employed to generate estimates consistent with autocorrelation and heteroskedasticity. Furthermore, they exhibit equal stability under reverse causality analysis, which addresses potential endogeneity between internal conflicts and property tax revenues.

Our empirical findings indicate that internal conflicts diminish property tax revenues, whereas more robust protection of property rights and higher government quality are associated with more significant property tax revenues. Specifically, in countries with strong property rights protection, the negative effect of internal instabilities on property tax revenues is less pronounced. Likewise, when governments excel in law enforcement, anti-corruption efforts, and bureaucratic quality, they are better equipped to safeguard property rights, mitigating the adverse effects of internal conflicts on property tax revenues. Furthermore, systems that effectively protect property rights and demonstrate efficiency in public actions can significantly attenuate the impact of internal conflicts on property tax revenues, resulting in minimal negative effects in these countries.

To address the challenges of increasing property taxes, African states must take urgent steps to minimize internal conflicts by adopting a comprehensive and multidimensional approach while addressing the underlying causes of conflict, aiming to consolidate peace and strengthen governance and institutions. Specifically, promoting inclusive governance structures that give all groups a voice in decision-making can help mitigate grievances and reduce the likelihood of conflict. In this regard, administrative decentralization can serve as a tool to promote power-sharing and inclusive political processes. States also need to strengthen the rule of law, promote accountable governance, and build effective and impartial institutions, which are essential. Additionally, initiatives favoring regional cooperation and integration can help resolve cross-border conflicts and promote peace and stability on the African continent. For instance, regional organizations such as the African Union (AU) for conflicts like the ongoing crisis between Rwanda and the Democratic Republic of Congo, as well as sub-regional bodies such as ECOWAS for countries like Mali, Niger, Burkina Faso, or Sierra Leone, must play a key role in conflict prevention, mediation, and peacekeeping efforts. Nevertheless, we acknowledge that governments must play a key role, particularly in establishing stronger protection of property rights on land and ensuring that there

is greater effectiveness in public action to moderate the consequences of internal conflicts for greater collection of property taxes.

Our analysis complements existing studies by highlighting the importance of institutional political systems in the link between property tax revenues and internal conflicts. However, it may be criticized for focusing extensively on the macro impacts of internal conflicts. Nevertheless, several insights can be gained by examining the micro dimension of conflicts. In this regard, by studying the impact of internal conflicts on property tax, it is possible to identify various types of conflicts (tribal, civil wars, ethnic, etc.), as well as their intensity and duration. Similarly, some countries have undertaken significant tax reforms that could influence the relationship between conflicts and property tax. Therefore, in future research perspectives, and to the extent of data availability on conflicts, it will be necessary to reanalyze the impact of internal conflicts on property tax while considering the different types of conflicts, their intensity, and duration. Subsequently, analyzing the impact of tax administration reforms, such as SARAs, will be necessary for property tax collection. Finally, conducting a comparative analysis of property tax collection in countries with centralized power versus decentralized power would be relevant. The power and management capacity of conflicts may require local, central, or even both sets of skills, depending on the nature of the conflicts.

Appendix chapter 5

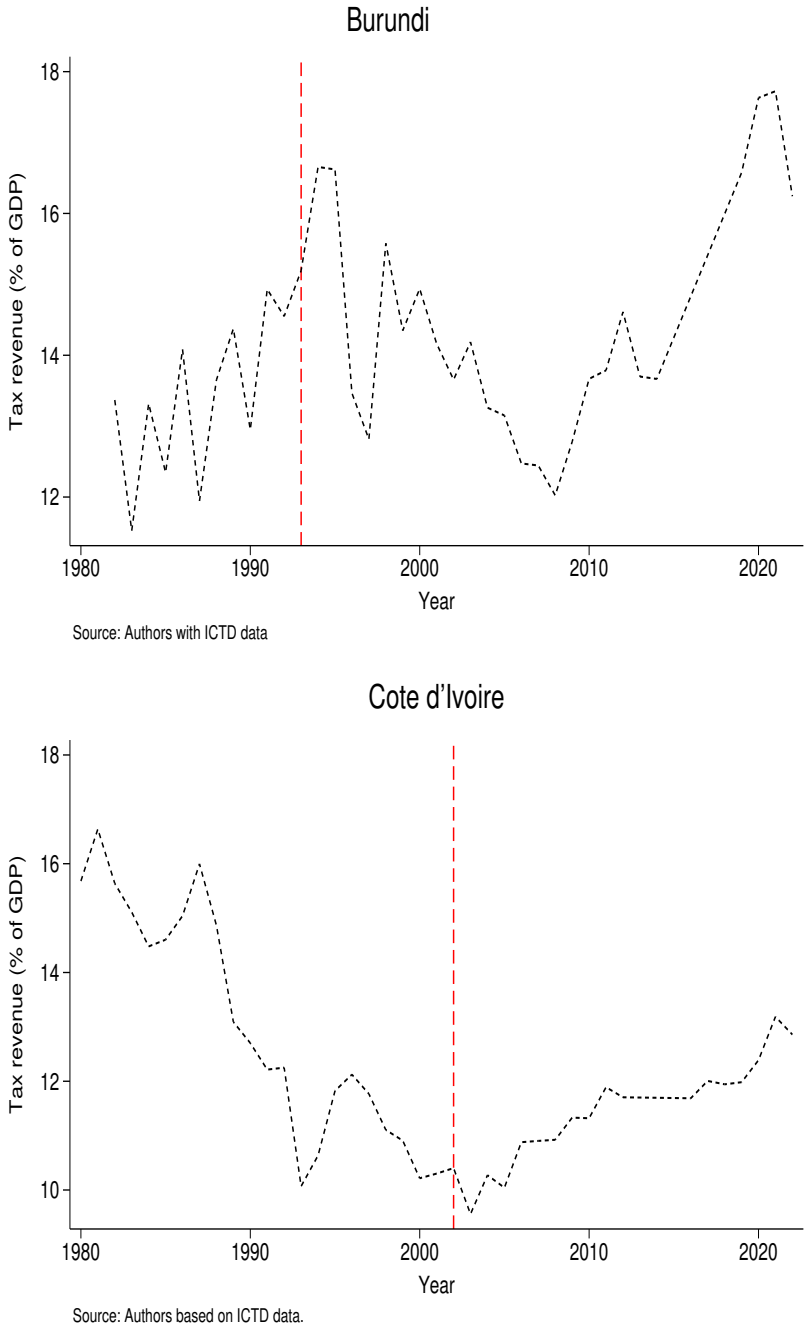

Figure D1: Evolution of tax revenue in Cote d'Ivoire and Burundi

Note: The figure shows the evolution of tax revenue as a percentage of GDP. The red vertical line indicates the year of the onset of each country's most significant civil war. In Burundi, the civil war spanned from 1993 to 2003. Observing the dashed line of tax revenue, it is evident that it begins to

decline three years after the onset of the crisis and remains very low throughout the crisis period. In Cote d'Ivoire, the civil war occurred in 2002 and ended in 2007. This conflict immediately resulted in decreased tax revenues, which recovered after the end of the civil war.

Table D1: Descriptive statistics

Variables	N	Mean	Sd	Min	Max
Property tax revenue	572	0.137	0.265	0	1.333
Quality of government	734	0.375	0.125	0.0556	0.875
Internal conflict	734	8.192	1.743	1.333	12
Foreign direct investment	1,011	4.646	9.450	0.00125	161.8
GDP per capita	1,015	1,744	2,106	234.7	13,741
Government expenditure	862	14.61	7.148	0.911	62.13
Total natural resources rents	1,012	11.51	10.89	0.00117	62.72
Urban population	1,065	37.64	15.79	8.246	89.74
Corruption	734	2.043	0.813	0	5
Law and Order	734	2.923	1.064	0.500	6
Bureaucracy Quality	734	1.194	0.790	0	3.500
Property rights index	800	49.75	2.229	44.13	54.72

Table D2: List of Countries

Benin	Ethiopia	Namibia
Botswana	Ghana	Niger
Burkina Faso	Guinea	Rwanda
Burundi	Guinea-Bissau	Sao Tome and Principe
Cameroon	Kenya	Senegal
Cape Verde	Lesotho	Sierra Leone
Central African Republic	Liberia	South Africa
Chad	Madagascar	Swaziland
Comoros	Malawi	Tanzania
Congo, Democratic Republic of the	Mali	Togo
Congo, Republic of the	Mauritania	Uganda
Cote d'Ivoire	Mauritius	Zambia
Equatorial Guinea	Mozambique	Zimbabwe

Table D3: Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
[1]Property tax revenue	1											
[2]Quality of government	0.208***	1										
[3]Internal conflict	0.151*	0.359***	1									
[4] GDP per capita	0.568***	0.491***	0.402***	1								
[5]Foreign direct investment	-0.194**	-0.123*	0.0105	-0.0433	1							
[6]Government expenditure	0.0516	0.429***	0.534***	0.520***	0.177**	1						
[7]Total natural resources rents	-0.244***	-0.411***	-0.326***	-0.179**	0.345***	-0.281***	1					
[8]Urban population	0.472***	0.106	0.175**	0.702***	0.126*	0.121	0.216***	1				
[9] Law and Order	-0.119	0.728***	0.379***	0.177**	-0.0454	0.335***	-0.363***	-0.186**	1			
[10]Bureaucracy Quality	0.316***	0.729***	0.171**	0.583***	-0.134*	0.336***	-0.269***	0.190**	0.267***	1		
[11]Corruption	0.260***	0.658***	0.205***	0.268***	-0.0793	0.228***	-0.232***	0.245***	0.240***	0.237***	1	
[12]Property rights	0.449***	0.647***	0.430***	0.732***	-0.180**	0.568***	-0.513***	0.247***	0.475***	0.505***	0.381***	1

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

Table D4: Description of variables

Variable	Measurement and description	Source
Property tax revenue	Total property tax revenues.	ICTD
Internal conflict	The highest score of the internal conflicts variable is given to countries with greater internal stability and the lowest score is given to a country faced with internal instabilities.	ICRG
Property rights	Corresponds to property rights protection.	QoG
Quality of government	Corresponds to the combination of corruption, bureaucracy quality, and law and order.	ICRG
Real GDP per capita	GDP per capita (constant 2015 US$)	WDI
Urban population	Urban population refers to people living in urban areas as defined by national statistical offices.	WDI
Government expenditure	They include all current expenditures by the general government on purchasing goods and services and compensation of employees	WDI
Total natural resources rents	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	WDI
Foreign direct investment	Foreign direct investment, net inflows (% of GDP)	WDI
Law and Order	To assess the "Law" element, the strength and impartiality of the legal system are considered, while the "Order" element is an assessment of popular observance of the law.	ICRG
Bureaucracy quality	The institutional strength and quality of bureaucracy is another shock absorber that tends to minimize policy revisions when governments change.	ICRG
Corruption	This is an assessment of corruption within the political system.	ICRG

CHAPTER 6

Post Decolonization, Institutional Settings, and Property Tax Revenue Mobilization in Sub-Saharan Africa (SSA): Lessons from former French colonies

This chapter was presented at the Africa Meeting of the Econometric Society (AFES 2024) ENSEA Abidjan, Côte d'Ivoire.

6.1 Introduction

Property tax revenue is an essential vector of domestic tax revenue mobilization in many developed countries (Norregaard, 2013; Bahl and Vazquez, 2008). However, in developing countries, and singularly in Sub-Saharan African (SSA) countries, it occupies an insignificant place in total tax revenues (Kelly, 2014; Norregaard, 2013; Bahl and Vazquez, 2008). In a context where African countries[1] seek additional resources to finance their development policies, and domestic resource instruments, such as property tax, deserve special attention. In this context, it is important to understand how this tax works in order to identify best practices and develop strategies to enhance the collection process.

Furthermore, property tax is challenging to evade due to the immobility of properties. Unlike other types of taxes, the tax base cannot relocate in response to tax reforms since properties cannot be hidden. Similarly, the efficient and effective collection of property taxes is essential to ensure that governments can finance the essential services and infrastructure required by their citizens.

However, despite its great potential, property taxation receives little consideration in African countries. Indeed, its collection level remains lower for several reasons: property valuation issues, the colonial origin legislation influence, the level of institutional quality, property rights problems, inter-ethnic conflicts, omission of the property in the cadaster, tax delinquency, and the various exemptions measured in the application of this tax (Monkam et al., 2010; Affroumou and Amedanou, 2024; Norregaard, 2013).

Although property tax revenue collection is, on average, low in most African countries, its evolution appears to differ significantly between former British and French colonies (Monkam et al., 2010; Norregaard, 2013). Based on this argument, the following questions are: What are the fundamental causes of the differences in property tax revenue evolution across African countries? It is important, before another word, to indicate that there is no consensus on the answer to this question. Nevertheless, one of the main arguments explaining these differences found in the literature can be their tax legislation inherited from their former colonies and the quality of their current institutions (Lee and Paine, 2019; Monkam et al., 2010). In this vein, we investigate how French colonial legacies have long-term implications for property tax revenue through their lasting effect on the institutional background of SSA countries.

For some scholars, the question of studying the persistent effect of colonial history on the current economic environment of SSA countries is outdated. Indeed, for them, colonialism has significantly impacted Africa's institutional and economic development, but this impact is not persistent (La Porta et al., 2008; Young, 2004; Maseland, 2018). However, other scholars and practitioners believe that this question is still relevant today in African countries (Bournakis et al., 2023; Michalopoulos and Papaioannou, 2016; Huillery, 2014, 2011, 2009).

In light of the previous discussions, we hypothesize that the differences in property tax revenue

[1] In this chapter, African countries means Sub-Saharan African countries (SSA).

collection between former French and British colonies can be attributed not only to their colonial legacies' tax legislation but also to the structure of their current institutions. We do not affirm that these differences are only due to these factors, but they constitute an important determinant in explaining these differences. It is essential to understand that successful mobilization of property tax revenues cannot be achieved without good governance rules that can enhance the property tax base and improve citizens' compliance.

According to many studies, former British colonies prospered more in all aspects of development policies comparatively than former French, Spanish, and Portuguese colonies because of the good economic and political institutions they inherited from Britain's system (North et al., 2000; Lee and Paine, 2019; Bournakis et al., 2023). In Africa, the common consensus is that countries of former British colonies collect more property tax revenues than former French colonies because of the better quality of their institutions and their tax collection strategies (Monkam et al., 2010; Norregaard, 2013). Many of their current administrative practices and laws are derived from the history of British colonialism.

As for property taxes, a model of legal clauses was produced in Whitehall for the colonial administration to use and adapt to local conditions. Since then, the shadow of this model persists in the administration of property tax today, and similar laws can be found in the different land codes of British colonies. Additionally, the British government has preferred to allocate certain rights of power to local elites to establish mediation networks responsible for preserving British rule (Bournakis et al., 2023; Njoh and Akiwumi, 2012). Today, more former British colonies collect property tax at the sub-national level as inherited from British rule. Contrary to these countries, this tax remains administrated at the central level in former French colonies as inherited from the French colonial taxation rule. Indeed, in the colonial period, the French state represented a centralized bureaucracy with limited power assigned to local elites. Moreover, it was the responsibility of the colonial states to decide all the policies regarding taxation and land management (Bournakis et al., 2023; Njoh and Akiwumi, 2012). In the post-colonial era, this significant power of central administration remains predominant in former French colonies.

Likewise, we do not argue that the main point of the difference between the two groups is the pair *centralization versus decentralization* because some former British colonies, particularly in Eastern Africa (Tanzania, for instance), have recently recentralized some key aspects of their property taxation in the goal to improve their property taxes collection. Another point explaining the differences in property tax management between the two groups is the critical place of traditional leaders and indigenous communities in land management in African Francophone countries. In addition, many landowners remain informal or unknown to tax authorities, and property tax reform is not seriously at the center of the SSA French program. The numerous reforms going in this direction remain cumbersome, inappropriate, or counterproductive (Norregaard, 2013).

In this regard, what does the data teach us about the level of property tax collection in SSA? Figure 6.1 below is consistent with the previous assessment that, on average, SSA French countries collect less

property tax revenue than former British colonies. So far, to the best of our knowledge, few studies

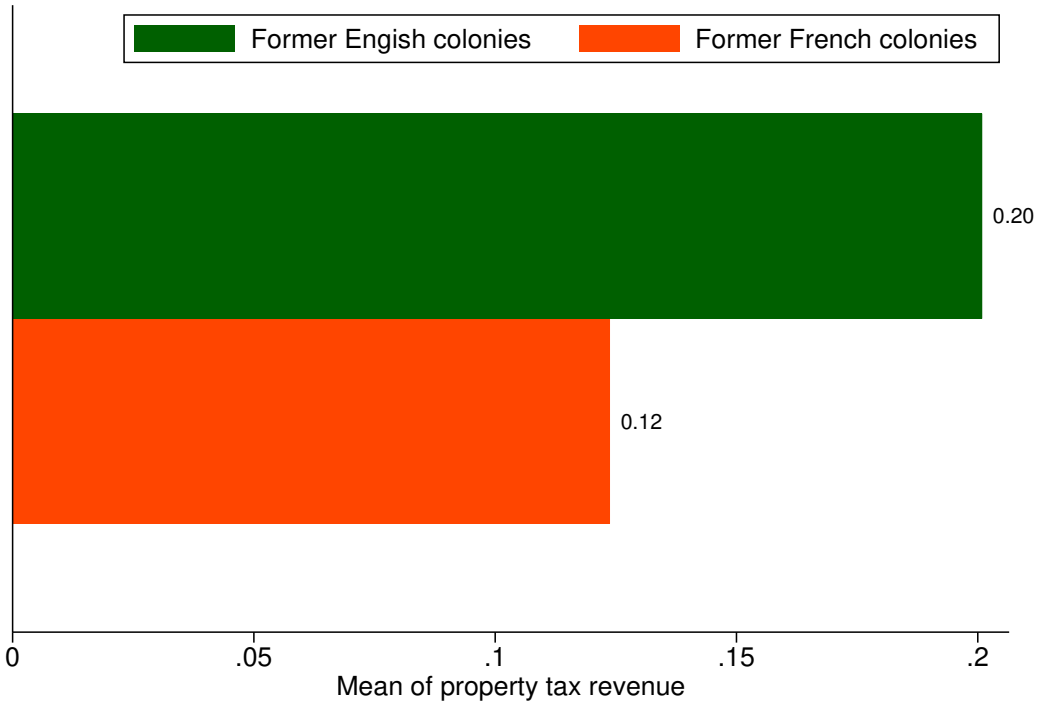

Figure 6.1: Property tax revenues by Former colonies

have investigated the relationship between legal origins and property tax revenues in the literature. Nonetheless, colonial origin and property tax revenue have been broadly examined empirically separately in the literature. Thus, this chapter will be the first to give an empirical answer to the role of colonial legacies through institutional performance on property tax revenue mobilization in SSA.

In addition, our chapter aims to contribute to the existing literature by examining the potential long-term implications of French colonial legacies on property tax revenue evolution, taking into account the lasting impact of these legacies on the institutional background. Furthermore, this research adds to the body of empirical literature exploring various factors influencing African property tax revenues. Likewise, the chapter extends the empirical literature on the role played by colonial legacies in SSA.

To conduct our investigation, we focus our analysis on institutional variables from the World Bank government indicators (WGI), which can capture the different laws in place in one country. After independence, SSA countries adopted some institutional rules similar to those of their colonizer, which became the leading institution for African governments (Djankov et al., 2003; La Porta et al., 2013, 2008). Moreover, according to various scholars, the governments of the British colonial system favored a better rule of law than other forms of colonization (Lee and Paine, 2019; Olsson, 2009). For this purpose, the variable rule of law is employed in the econometric analysis in the first step of our work. In addition, because institutions left by the colonizer may persist over time through the cultural legacy and differ

according to legal origins (Pistor, 2013), interaction terms are used. More explicitly, the chapter first analyzed the combined effect of the rule of law and the legal origins on property tax revenues in SSA countries.

In the second stage, we examine the impact of various institutional variables derived from the WGI on property tax revenue collection, specifically focusing on control of corruption, government effectiveness, regulatory system, voice and accountability, and political stability. We do that because institutional quality encompasses multiple components, and the impact of these different variables could affect property tax revenues differently. Similarly, some studies argued that former British colonies performed better than former French colonies in all economic aspects because they were more democratic (Olsson, 2009). Thus, to consider this aspect, we also empirically test this assertion.

This chapter's results reveal that institutional quality's role in property tax revenue mobilization may consider each country's particular history. Indeed, our findings show that former French colonies tend to collect less property tax revenues than former British ones and validate the assessment that colonial history has implications for the level of property tax collection today in African economies. These results are robust to various aspects of institutional measurement and using alternative estimator. Finally, the chapter suggests that former French colonies must review or update their property tax rules and governance around property taxation more.

The remainder of the chapter is structured as follows: Section 6.2 discusses the relationship between colonial legacies, institutions, and property tax revenues. Section 6.3 presents the data and some descriptive analysis. Section 6.4 introduces the econometric approach, and section 6.5 discusses the principal results. Section 6.6 concludes.

6.2 Colonial legacies, institutions, and property tax revenue

6.2.1 Colonial legacies and current institutions

The main arguments about institutional persistence emphasize dependency through cultural and political-economic transmission (North, 2010; Acemoglu et al., 2005). Indeed, colonial legacies are supposed to influence the early institutions (Marchand, 2016; Acemoglu et al., 2005), which, in turn, have persisted through time to form the basis of the current institutions (Marchand, 2016). Furthermore, it has been repeatedly stated that the different types of colonization affect the domestic institutional environment differently and persist over time (Acemoglu, 2001; Engerman and Kenneth, 1994; Maseland, 2018; Michalopoulos and Papaioannou, 2020). Thus, the type of institutions a country faces is strongly influenced by its history (Maseland, 2018; Djankov et al., 2003; La Porta et al., 2008).

African countries have indeed become independent vis-à-vis their former colonial powers. However, it

is good to note that in many of these countries, there are still features in their respective legislation that are similar to colonial practices. Nowadays, many rules and political actions in SSA countries originate from their former colonizers. For instance, contrary to former British colonies, former French colonies had highly centralized management of their political system, as was the case in the colonial era. Indeed, in the colonial period, the French colonizers had monopolistic power and controlled all the economic and political strategies. In this vein, Michalopoulos and Papaioannou (2016) argue that colonial and precolonial heritages continue to have a profound impact on African societies today.

Grier (1999) examines the relationship between colonial power identity and contemporary economic growth in older African countries and concludes that former British colonies are doing better economically than French colonies. For the author, one element that can explain these disparities is the relatively better level of institutions in former British colonies. In fact, in the colonial period, the British state left better institutions and promoted the local elites, contrary to the former French colonizer (Bournakis et al., 2023; Njoh and Akiwumi, 2012). Moreover, Acemoglu et al. (2001) conducted a study that exploits differences in the mortality rates faced by European colonialists to estimate the effect of institutions on economic performance. They find that Europeans adopted varying colonization strategies in different colonies, which resulted in distinct institutions. According to the authors, the choice of colonization strategy was influenced, in part, by the setting ability of Europeans in the colony. As a result, when Europeans faced high mortality rates, they could not settle and created less supportive institutions. These institutions, the authors claim, persist today and are responsible for much of the variance in income per capita between former colonies. Olsson (2009) also finds a strong positive effect of colonial duration on democracy. He argues that this positive relation is based mainly on the historical experience of former British colonies and post-1850 colonized countries in a more liberal era.

Contrary to the abovementioned studies, Maseland (2018) concludes that although colonialism has significantly impacted Africa's institutional and economic development, this impact is not persistent. According to the author, colonialism significantly shocked institutional variables in African societies, but its impact was temporary. In fact, after having dominated for a long time, these societies had their political independence. Consequently, according to the author, the current actions of governments in SSA are not the fact of their former colonizers. In the same order of ideas, Young (2004) affirms that institutional development in African countries is no longer dominated by what has been imported from colonial powers but influenced by internal processes and autonomous conflicts.

6.2.2 Institutions and property tax revenues

Regarding property tax revenue determinants, there is no doubt that the quality of institutions plays a significant role. Indeed, good institutional rules can help countries implement policies that facilitate the

collection of property tax revenues. In this case, the level of property tax revenue mobilization depends mainly on the quality of institutions in a country.

One significant challenge in mobilizing property tax revenue in Africa is identifying the tax base and the legal authority in charge of collecting property tax issues. Unfortunately, many of these countries lack a clear definition of the rules governing this tax. In some of these countries, all unidentified or unregistered land is automatically the property of the state (e.g., Gabon, Cameroon, Côte d'Ivoire). In contrast, in other countries, the law allows customary chiefs to exploit land effectively (Monkam et al., 2010). This generally creates land disputes with customary chiefs, who often represent the guarantors of land ownership in their constituencies. Thus, establishing good institution rules is essential in defining property tax revenue collection to avoid untoward questions. Moreover, in Africa, the collection of property tax revenue is very limited to large cities where the identification and granting of land titles are much more rigorous.

If African countries want to boost the level of their property tax revenue mobilization, they must Consider small cities. That can only be possible with clear institutional rules considering all cities regarding potential property tax revenue evaluation. Indeed, another reason for the lower level of property tax revenue collection in Africa is the fact that it is poorly administrated or undervalued. Dillinger (1988) reports that the Philippines Property Tax Administration Project succeeded in producing tax maps and updating property assessments. Still, this effort has never substantially improved the collection of property tax revenue because poor collection practices were never addressed.

In African Francophone countries, property taxes are unpopular due to their highly centralized management. Indeed, they do not accord more importance to this tax because of his marginal contribution to total tax revenue. Therefore, they prefer to focus on categories of tax revenue, including VAT and income tax, which form the bedrock of total tax revenues. Additionally, because politicians' goal is to protect their electorate, they sometimes do not take some measures to improve property tax revenue collection. Indeed, since the payment of this tax is unknown to a large part of the population or traditionally challenging to accept, policies to collect this tax could harm their electorate.

Monkam et al. (2010) point out that the coverage, tax assessment, and collection indicators are shallow, implying that the property tax is not being used optimally, although it has enormous potential. According to the author, unlike countries in English-speaking Africa, countries in French-speaking Africa are reluctant to entrust property tax revenue management to local governments and, therefore, delay the implementation of property tax legislation, which is supposed to be a locally managed tax. One of the arguments given by African French countries for collecting property tax revenue at the central level is the high level of corruption existing in local authorities. Similarly, it is important to note that most African local resources are mobilized by large cities, creating significant disparities between local authorities.

For Chambas et al. (2007), property tax is a local tax per excellence. According to the usual rule

for the distribution of taxes between levels of government, «everything mobile goes to the State, and everything that is immobile goes to the subnational government». Based on this principle, redefinition of their property tax legislation management is required if Francophone African countries want to enhance their property tax revenue mobilization. This can be made possible by implementing good property tax rules and institutional management. For instance, in Niger and Algeria, property tax revenues are less than 0.1% of GDP on average (Norregaard, 2013).

All expert opinions show that the decentralized management of property tax collection is more advantageous than the centralized system of this tax. In this vein, Chambas et al. (2007) indicate that fiscal decentralization is associated with closer relationships between government and citizens, which is expected to naturally enhance domestic revenues' mobilization by increasing their compliance. Taxpayers, through paying the property tax, will be able to request a development spend and have control over the use of the public funds of the local authority.

Despite significant divergences among Francophone and Anglophone-speaking countries, most African local communities count on property tax revenues as their primary source of income and self-government (Franzsen and McCluskey, 2017). At the same time, in Africa, the importance and prevalence of customary and historical land tenure practices do not help the coverage and the collection of property tax revenue and create several internal conflicts due to the problem of property rights definition. Overall, we contribute to this literature by providing evidence that institutions adapted to the current African environment are necessary to improve property tax revenue mobilization.

6.3 Data and descriptive analysis

The core data set regroups 34 African countries [2] over the period 1996-2019. Figure 6.2 presents a global view of the countries considered. Here, the chapter focuses on former French colonies and compares them to ex-British colonies. Our dependent variable is property tax revenue from the International Centre for Tax and Development (ICTD) database. Figure 6.3 illustrates the time-varying link between legal origin and property tax revenues. It indicates that, on average, French colonies (in black dashes) collect less property tax revenue than British colonies (in solid black). However, in the last few years, we observe a substantial increase in property tax revenues in former French colonies. Moreover, as we observe, the gap in property tax revenue between the two groups has reduced over time. This can undoubtedly be attributed to the 2015 Addis Ababa Tax initiative, which invites countries to focus on domestic revenue to finance their development.

The legal origin variable is coded according to the most recent colonizer who had the most significant

[2]The data are composed of former French colonies and former English colonies. Table E2 in the appendix presents the countries list considered in this chapter.

effect on SSA countries' institutional infrastructure at independence. It takes the value 1 for former French colonies and 0 otherwise. To consider the tax legislation and the different laws in place that could influence the collection of property tax revenues, we first used the WGI variable, namely the rule of law, as our primary institutional variable. When we explore the correlation between legal origin and property tax revenue, Table E5 (in the appendix) shows that the correlation is negative. This means that former French colonies collect less property tax revenues. Looking at the relationship between property tax revenue and the rule of law, the unconditional correlation in Table E5 reveals a positive and significant correlation between property tax revenue and the rule of law. However, Figure 6.4 shows that, on average, the level of rule of law evolution is relatively higher in former British colonies than in former French colonies over the period considered. We, therefore, assume that high legal standards are positively associated with property tax revenue, as shown in Figures 6.5 and 6.6.[3]

Based on the literature on the determinants of property tax revenue, we select the following control variables: GDP per capita, Inflation, urban population, natural resources, government expenditure on education, and trade openness to reduce the potential omission variables that could skew the results.[4]

GDP per capita: A high GDP value implies a greater level of development and, therefore, a higher taxpaying capacity. This leads to a more substantial, stronger public revenue level (Brun et al., 2015). Moreover, the development of a country is associated with more opportunities to collect more property tax revenue (Norregaard, 2013). Indeed, a good level of development can promote a good capacity to collect more property tax revenue by increasing tax compliance. The increase in the level of development should also foster the quality of buildings and the cities, which should facilitate the identification of owners.

Total natural resources rents: The effect of natural resources on property tax revenue is ambiguous, as it is generally the case in the literature about the relationship between total tax revenue and natural resources (Ndikumana and Abderrahim, 2010; Bornhorst et al., 2009b; Mawejje, 2019; Thomas and Trevino, 2013). In fact, from one point of view, the dependence on natural resources can increase the property tax base through the implementation of new constructions in the area where natural resources are located. On the other hand, property tax revenue, already poor in most African countries, could be abandoned in favor of natural resources. For instance, Bornhorst et al. (2009b) find that countries with significant revenues from natural resources are likely to reduce their domestic tax efforts significantly. Finally, the impact of natural resources on property tax revenue is not yet clear.

Urbanization: is defined as the percentage of the population living in urban cities. This variable is generally used in the literature to measure the degree of urbanization (Oyvat, 2010; Qiao et al., 2019). It represents one of the better determinants of the property tax base and could boost property tax revenue

[3]The figures 6.5 and 6.6 were constructed based on the median of the rule of law.
[4]Table E3 describes the variables in more detail.

mobilization (Bahl and Vazquez, 2008; Awasthi, 2020). Urban expansion can create more opportunities to enhance the property tax base. Moreover, property tax is essentially collected in urban areas. Most of the property tax collected is levied on businesses, which are also generally located in urban environments.

Trade openness: Generally, when a country is more open to the world, trade openness (or trade) can positively affect property tax revenue (Alfirman, 2003). It creates opportunities for investment and the establishment of new businesses. For example, opening a country to the world could increase the volume of new business establishments and enhance the country's property tax revenue base. Consequently, trade openness could boost property tax revenues. The less open the country is, the less it will have this opportunity. In addition, property tax exemptions granted to foreign companies can hamper the collection of property tax revenues.

Inflation: An increase in inflation is anticipated to result in a corresponding rise in property tax revenues. Indeed, inflation may even prompt an increase in the property tax rate. This, in turn, can lead to a greater rental value, further boosting property tax revenues. However, it is equally important to note that high inflation can also lead to declining compliance with property tax payments.

Government expenditure: It is used to consider the fact that government expenditures offer the opportunity to improve the education level of the citizens. It is used to monitor the efforts made by the government to put in place infrastructure that improves the living conditions of their citizens. Consequently, it could enhance the population's motivation to accomplish property tax obligations by paying their property taxes. Moreover, several studies consider public expenditure as an essential determinant of tax revenue (Combes and Ouedraogo, 2016; Sepulveda and Martinez-Vazquez, 2012).

Agriculture: In Africa, agriculture is generally exempt from paying property taxes or qualified as *a hard-to-tax sector*. Indeed, agriculture is associated mainly with the informal sector, which is usually outside the scope of taxation (Ndikumana and Abderrahim, 2010; Mawejje and Francis Munyambonera, 2016). Thus, a negative effect of this variable on tax revenues is expected (Bird and Slack, 2004b; Baunsgaard and Keen, 2010).

In addition to these variables, we also find it relevant to include SARAs (Semi-Autonomous Revenue Authorities) in our regressions. Indeed, **SARAs** is used to control the different tax autonomy agencies implemented in some African countries, which could influence property tax revenue mobilization. The variable takes the value of 1 from the year a country starts adopting SARAs, and 0 otherwise. Table E1 in the appendix presents the descriptive statistics of our variables.

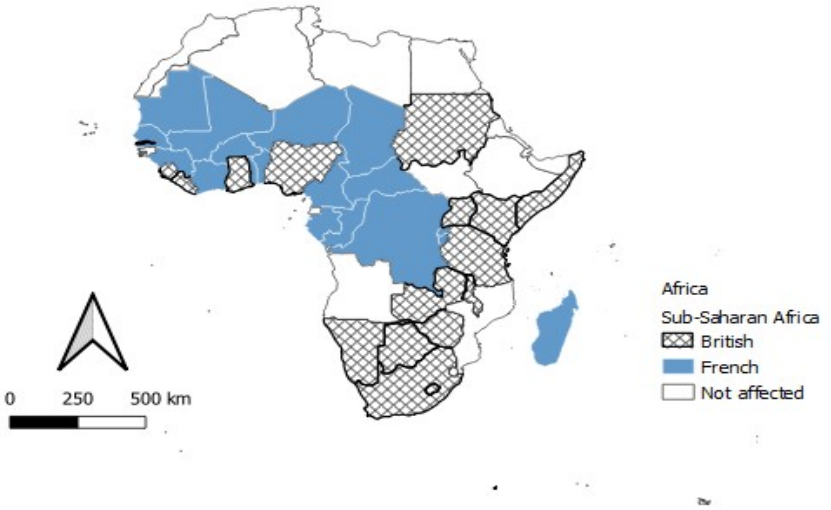

Figure 6.2: Sub-Saharan African countries by legal origin

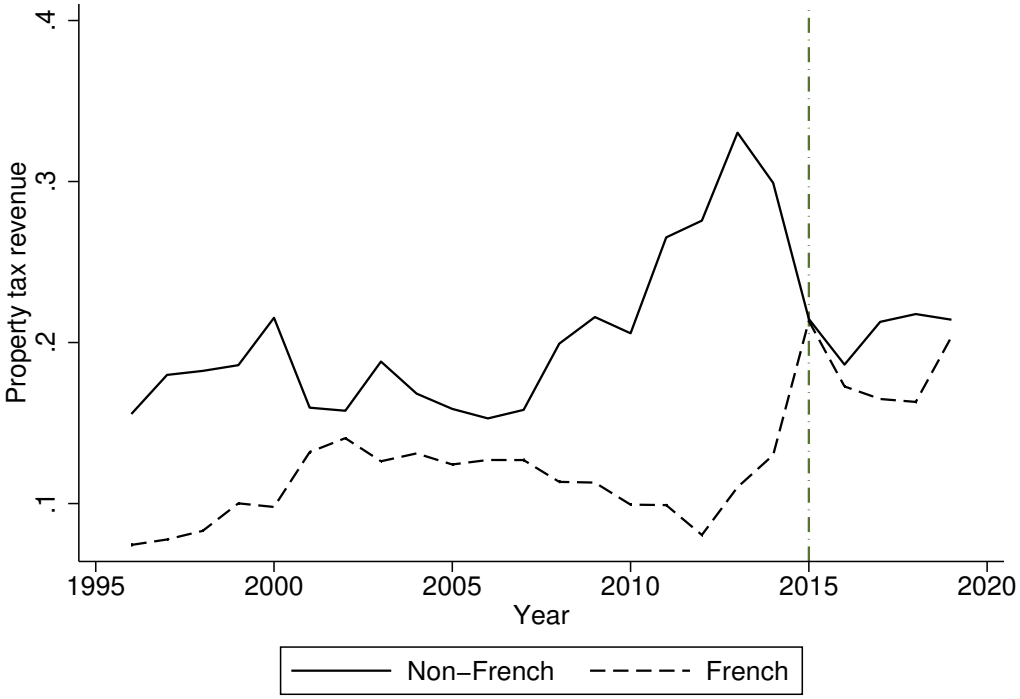

Figure 6.3: Property tax revenue trend by legal origin

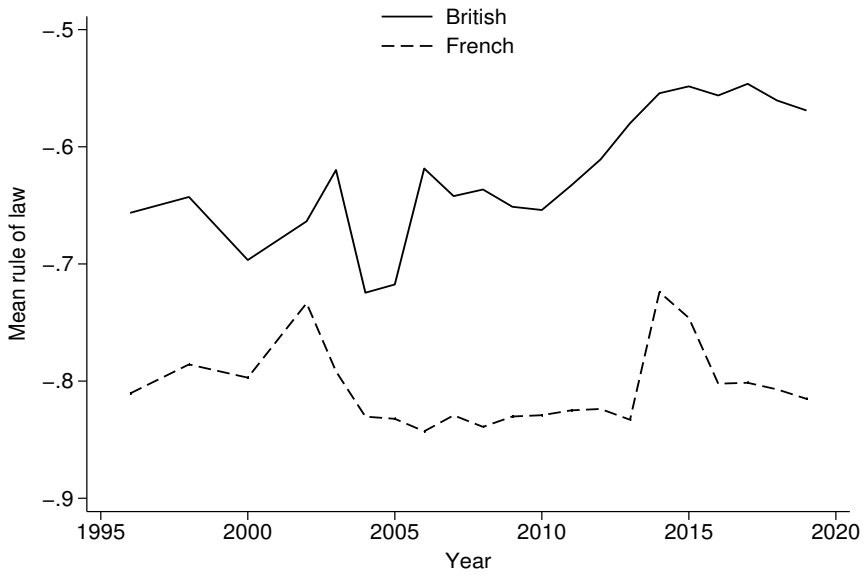

Figure 6.4: Rule of law trend by legal origin

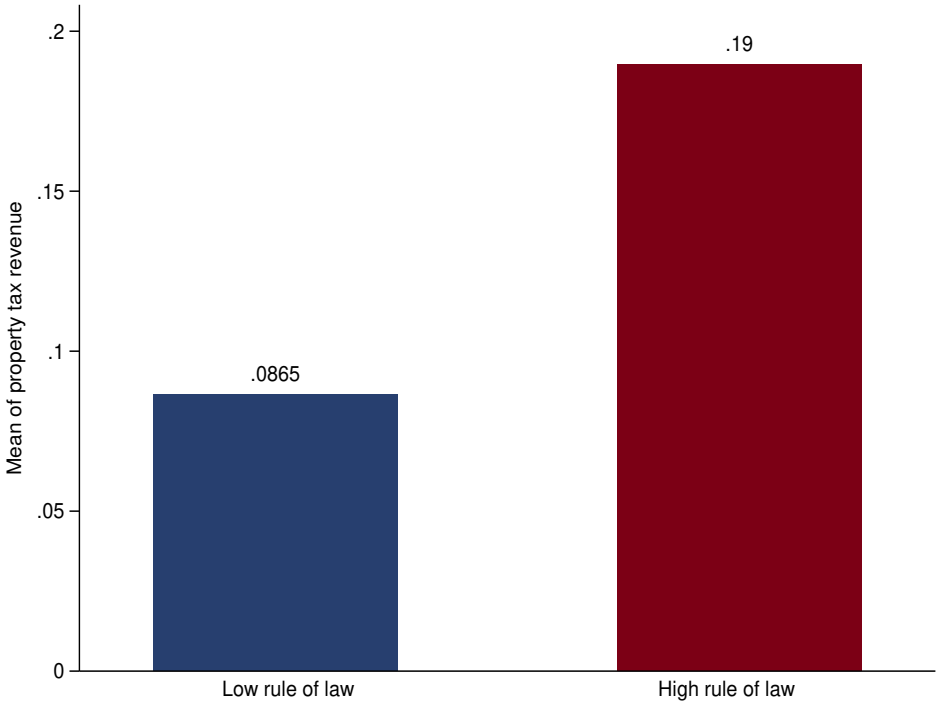

Figure 6.5: Property tax revenue across rule of law level (Full sample)

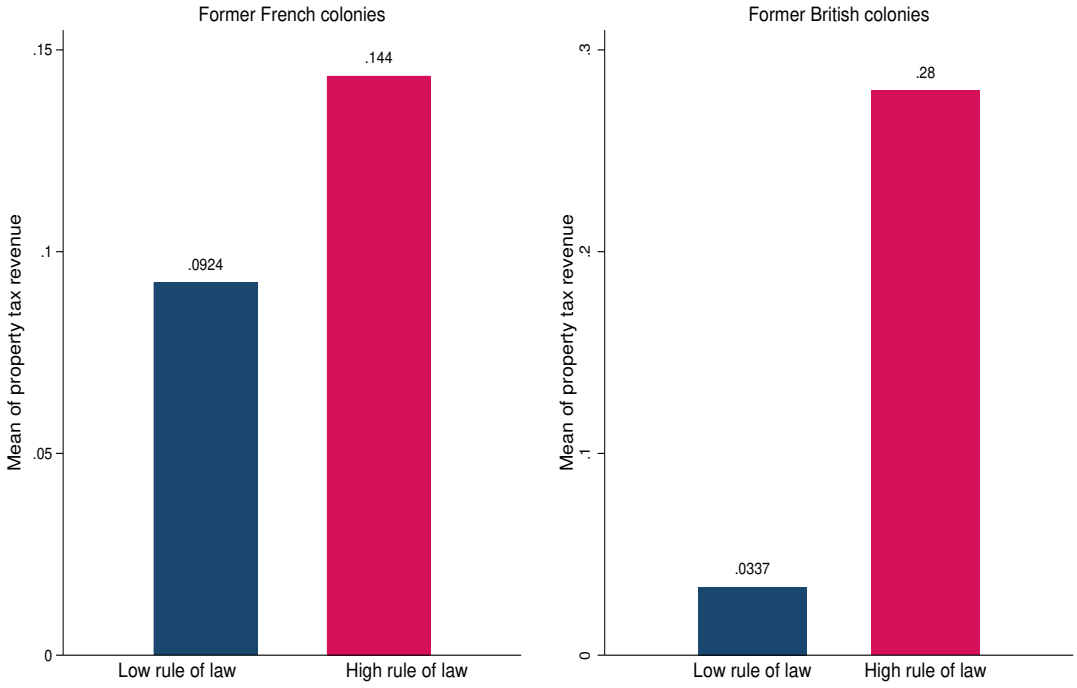

Figure 6.6: Property tax revenue across rule of law level by legal origin

6.4 Econometric investigation

We have postulated that differences in property tax revenue collection between SSA countries could be attributed to their colonial legacies, which influence the current African institutional quality. Thus, interaction terms are applied to analyze the effect of historical legacies on property tax revenue collection via institutional performance. Indeed, in the first step of our analysis, the institutional variable rule of law is crossed with the dummy variable legal origin. Our intuition is that the level of institutional quality can affect property tax revenue differently according to the colonial origins of the countries. Thus, here, the group of reference is former British colonies. The idea is to use econometric analysis to compare ex-French colonies to ex-British colonies in terms of property tax revenue collection. However, it also shows if the differences between the two groups can be attributed to their colonial legacies through institutional quality indicators.

Likewise, the goal is to confirm or reject the common idea that former French colonies collect less property tax revenue than former British colonies (Monkam et al., 2010; Norregaard, 2013). In this vein, we primarily examine this idea graphically. Thus, Figure 6.3 shows the evolution of property tax revenue between the two groups. We notice that, on average, former British colonies collect more property taxes than former French colonies. We conduct our econometric investigation using the pooled OLS (POLS) estimator to give an empirical answer to this observation. Numerous studies have used

this method extensively to capture the effect of legal origin persistence (Bournakis et al., 2023; Emenalo and Gagliardi, 2020; Lee and Paine, 2019). The advantage of this estimator lies in its applicability to models, including variables that remain constant over time. We complement this estimator with Driscoll-Kraay's estimator in robustness checks, as it is robust to heteroscedasticity, cross-sectional dependence, and autocorrelation and also minimizes the endogeneity bias (Driscoll and Kraay, 1998; Presbitero et al., 2014; Joshi et al., 2021; Hoechle, 2007). Specifically, we estimate the following model:

$$Property\_tax_{i_t} = \alpha_0 + \alpha_1 LEGAL_i + \alpha_2 RL_{i_t} + \alpha_3 LEGAL_i * RL_{i_t} + \sum_{k=4} \alpha_k Z_{i_t} + \lambda_t + \epsilon_{i_t} \tag{6.1}$$

Property_tax$_{it}$ is the total property tax revenue for country i in year t, and Z_{it} is a vector of control variables. RL represents the variable rule of law,[5] and LEGAL [6] is the colonial legacies variable equal to 1 for former French countries and 0 otherwise. LEGAL*RL is the interaction term between the variable's rule of law and legal origin. α_3 gives us an idea of the effect of the interaction term on property tax revenues. ϵ_{it} represents the error term capturing omitted and noise. λ_t captures time-specific effects that could potentially impact property tax revenues in all SSA countries. Doing so allows us to control for these important determinants and obtain more accurate and reliable results. Note that in this chapter, we are most interested in the coefficient of the interaction (α_3). The total effect of legal origin on property tax revenue for former French colonies is given by:

$$\frac{\partial Property\_tax}{\partial LEGAL} = \alpha_1 + \alpha_3 RL \tag{6.2}$$

Similarly, we can also derive the total effect of the rule of law on property tax revenue in former French colonies (Legal = 1) by:

$$\frac{\partial Property\_tax}{\partial RL} = \alpha_2 + \alpha_3 \tag{6.3}$$

6.5 Empirical results

6.5.1 Preliminary results

Table 6.1 presents the preliminary results. The column [1] shows the impact of colonial legacies on property tax revenue without controlling for other variables. Then, in column 2, we add year-fixed effects

[5] We use this variable as a proxy to capture the different legislation text in place in a country.

[6] LEGAL=1 if former French colonies, 0 if former English colonies following (La Porta et al., 1999). Because there are two groups, which one gets the value 1 and which one gets the value 0 must be correctly specified to facilitate a better interpretation of the results; if you want to treat the former French colonies as the reference category, it will get the value 0. Creating two dummies in the same regression is inappropriate because of collinearity problems.

to the previous regression. In the third column, we include the rule of law variable to consider the tax legislation law's effect on property tax revenue. Finally, in columns [4]-[5], we add the interaction term between legal origin and rule of law to evaluate their conjoint effect on property tax revenues.

The estimated coefficient is - 0.077 when we only consider the effect of legal origin on property tax revenues and is statistically significant at the 1% level. The negative sign indicates that, on average, former French colonies collect less property tax revenue than former British Colonies. Moreover, this result remains valid when we add time-fixed effects and the variable rule of law (see columns [1], [2], and [3]). Also, in column [3], the results indicate that the rule of law positively impacts property tax revenues. However, it is not enough to say that the country is a former French colony for it to collect less property tax revenue because the effect is not as direct as it may seem. Indeed, there are some mechanisms through which colonial legacies may affect the collection of property tax revenues.

Thus, from columns [4]-[5], the results indicate that the gap in property tax revenues among former colonies varies according to the level of the rule of law. Indeed, the interaction term between legal origin and the rule of law is statistically significant at the 1% level, implying that institutional quality plays a relevant role in explaining differences in property tax revenues. Thus, for 1 unit increase in the rule of law, former British colonies should expect to collect an additional 0.179 percentage points of GDP. In contrast, former French countries expect to collect an additional (0.179-0.127)= 0,052 percentage points of GDP (column 5). In other words, property tax revenue mobilization differs between former French and former British colonies, and that is strongly linked to the institutional rule in place.

Furthermore, it should be noted that the differences in property tax revenue mobilization between the two groups increase as the quality of rules and laws established in these countries improves. In essence, former British colonies, on average, collect a higher level of property tax revenue due to the implementation of well-structured legal frameworks compared to former French colonies. This result joined previous literature arguing that former British colonies provide more economic outcomes than former French colonies (La Porta et al., 2008; Lee and Paine, 2019).

6.5.2 Core results

We now consider more property tax revenue determinants to reinforce the previous results. Indeed, the level of property tax revenue does not depend only on the variables presented in Table 6.1. The idea is to see whether omitted factors influence our preliminary results. Naturally, we cannot control all possible variables affecting property tax revenues. However, we do our best to consider some important determinants of property tax revenue, which have been highlighted in several studies and adapted to the context of African countries. When we do so, the results in Table 6.2 are consistent with the previous results and confirm that former French colonies collect, on average, less property tax revenue than former

Table 6.1: Estimates of the effect of legal origin and rule of law on property tax revenue

Dependent variable: Property tax revenue (% of GDP)					
	(1)	(2)	(3)	(4)	(5)
Legal origin	-0.077***	-0.079***	-0.043*	-0.099***	-0.100***
	(0.026)	(0.026)	(0.026)	(0.037)	(0.038)
Rule of Law			0.095***	0.182***	0.179***
			(0.015)	(0.032)	(0.033)
Legal origin*Rule of Law				-0.129***	-0.127***
				(0.035)	(0.036)
Constant	0.201***	0.154***	0.191***	0.264***	0.214***
	(0.024)	(0.040)	(0.043)	(0.034)	(0.046)
Time FE	No	Yes	Yes	No	Yes
Observations	581	581	503	503	503
Countries	34	34	34	34	34
R-squared	0.022	0.035	0.089	0.103	0.110

*** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses.

British colonies in all the specifications. From this point forward, we will continue to utilize the complete regression displayed in column [9] as our main specification. Many reasons could explain these results.

First, the governance strategy employed in former French colonies differs markedly from former British colonies, featuring a highly centralized approach. Indeed, former French colonies are characterized by the absence of real autonomous power at the sub-national levels in their strategy of property tax collection. Specifically, the lack of genuine autonomous power at sub-national levels in the collection of property tax stands out as a defining characteristic of former French colonies. However, property tax is inherently local, necessitating efficient local management for optimal performance. Secondly, the rule of law is generally better upheld in former British colonies compared to former French colonies (Olsson, 2009; La Porta et al., 1999). Furthermore, tax legislation in the latter continues to resemble that inherited from the colonial era. Likewise, property tax remains a low priority in these countries (Monkam et al., 2010; Norregaard, 2013).

To further delve into the nature of this relationship, we will scrutinize the margin plot graph depicting the relation between the fact of being a former French colony for different values of the rule of law on property tax revenue (as presented in equation 6.2) relative to former French colonies. The margin effect calculation is based on the specification in column [9] in Table 6.2. It is important to note that the fact that former French colonies tend to collect less property tax revenue than former British colonies is not always true for all former French countries for each value of the rule of law. Indeed, the interaction term coefficient may not fully capture the conditional effect of former French colonies on property tax revenue. The margins plot will help us thus to facilitate the comprehension of the results by highlighting the

different heterogeneities between countries. The right part of Figure 6.7 (b) indicates that the marginal effect of the rule of law on property tax revenue is positive for both groups. However, the graph shows that the effect is more pronounced and significant for former British colonies. The positive impact for former French colonies is nonetheless insignificant because the confidence intervals cover 0.

On the other hand, we observe in Figure 6.7 (left side, panel (a)) that, despite having a weaker rule of law, some former French colonies managed to collect more property taxes than some former British colonies. This could be attributed to recent improvements in property tax legislation in countries like Benin, Côte d'Ivoire, Senegal, and more recently, Togo. In our view, this result may hold true in the short term. Indeed, in the short run, the absence of solid institutional rules may not immediately lead to increased landowner disputes, allowing for smoother property tax collection. Moreover, this scenario might temporarily boost land values, leading to a short-term increase in property tax revenues. However, in the long term, a weak rule of law could encourage tax evasion on property taxes, ultimately harming property tax collection.

Figure 6.7 also shows that when the rule of law increases, former French colonies tend to collect less property taxes than former British colonies. That implies that the difference between former British and French colonies grows more and more negatively as the quality of the rule of law increases. This can mean that, in some of these countries, the effort in terms of the rule of law improvement does not affect all the sectors in the economy, certainly not including property taxation already fairly collected. Or even faced resistance from certain citizens temporarily leading to low property tax revenue collection. This invites countries to be sure that their volunteer to enhance their level of rule of law do not create some distortions. Finally, Figure 6.8, which presents predicted probabilities of the rule of law by legal origin, also confirms that the magnitude of the effect of the rule of law on property tax revenue is more important in former British colonies for the high value of the rule of law. Similarly, it also shows that for some lower levels of rule law, certain former French colonies collect more property tax revenue than ex-British colonies, as shown in Figure 6.7 (a). Overall, the results indicate that, even with improvements in the rule of law, legal systems inherited from French colonization continue to hinder the efficiency of property tax systems.

Regarding the control variables, the results show a positive link between GDP per capita and property tax revenue. This implies that countries with higher GDP per capita collect more property tax revenues. Likewise, we find a positive association between urbanization and property tax revenues, reflecting that urban expansion creates opportunities in favor of property tax base enhancement. This can, therefore, result in more property tax revenue collection. Finally, the coefficient for trade openness is negative and significant at the 1% level. This result contradicts our expectations but could be attributed to the relatively lower degree of African countries' opening to the world.

Finally, even after introducing control variables, the effects of legal origin, rule of law, and their

interaction term remain consistent. This indicates that the baseline prediction is not affected by omitted variable bias.

Table 6.2: Estimates of the effect of legal origin and rule of law on property tax revenue: taking more determinants

Dependent variable: Property tax revenue (% of GDP)										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Legal origin	-0.100***	-0.062*	-0.063*	-0.064*	-0.060*	-0.079**	-0.074**	-0.188***	-0.174***	-0.101**
	(0.038)	(0.035)	(0.035)	(0.035)	(0.034)	(0.038)	(0.037)	(0.057)	(0.054)	(0.042)
Rule of Law	0.179***	0.079***	0.061**	0.061**	0.062**	0.100***	0.091**	0.259***	0.264***	0.089***
	(0.033)	(0.028)	(0.029)	(0.030)	(0.030)	(0.038)	(0.038)	(0.074)	(0.077)	(0.028)
Legal origin*Rule of Law	-0.127***	-0.097***	-0.103***	-0.104***	-0.069**	-0.075*	-0.073*	-0.207***	-0.220***	
	(0.036)	(0.037)	(0.037)	(0.038)	(0.035)	(0.039)	(0.039)	(0.071)	(0.078)	
GDP per capita (log)		0.109***	0.112***	0.112***	0.061***	0.066***	0.050**	0.057*	0.057*	0.044
		(0.017)	(0.017)	(0.017)	(0.016)	(0.022)	(0.025)	(0.030)	(0.030)	(0.032)
Total natural resources rents			-0.002***	-0.002***	-0.003***	-0.001	-0.001	0.001	0.001	0.002
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Inflation				-0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000
				(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Urbanization					0.004***	0.004***	0.004***	0.005***	0.005***	0.007***
					(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Trade						-0.002**	-0.002**	-0.002***	-0.002***	-0.002***
						(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Agriculture							-0.002	-0.001	-0.000	-0.001
							(0.001)	(0.002)	(0.002)	(0.002)
Government expenditure								-0.009	-0.008	0.005
								(0.013)	(0.013)	(0.013)
SARAs									0.028	-0.005
									(0.038)	(0.033)
Constant	0.214***	-0.594***	-0.606***	-0.599***	-0.343***	-0.287**	-0.093	-0.034	-0.065	-0.080
	(0.046)	(0.112)	(0.111)	(0.112)	(0.103)	(0.139)	(0.191)	(0.247)	(0.255)	(0.267)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	503	503	503	502	502	464	455	343	343	343
Number of countries	34	34	34	34	34	32	32	29	29	29
R-squared	0.110	0.208	0.214	0.214	0.231	0.237	0.238	0.356	0.357	0.338

Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses.

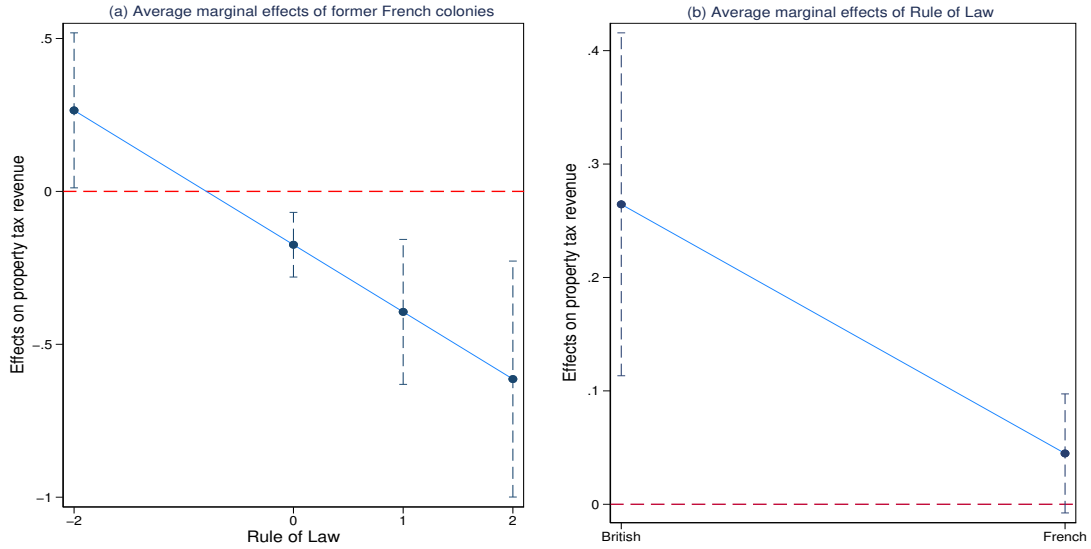

Figure 6.7: Average marginal effects

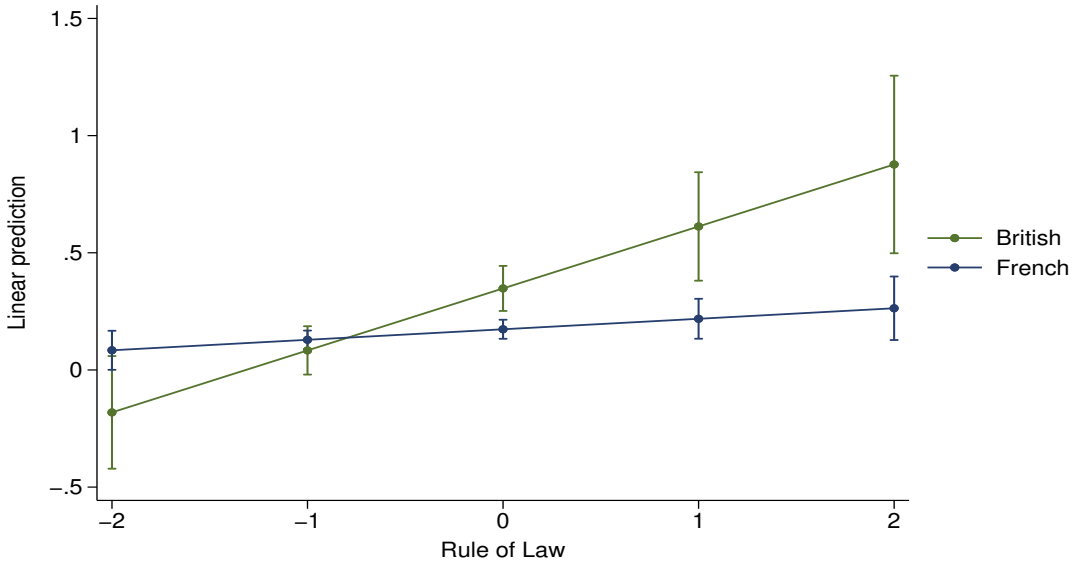

Figure 6.8: Predicted probabilities of rule of law by legal origin

6.5.3 Controlling for alternative institution variables

In the previous section, we used only the variable rule of law as the institutional variable to explain the differences between former British and former French colonies regarding property tax revenue collection. Thus, here, we aim to explore the impact of alternative institutional indicators by substituting the rule of law variable with other institutional measures derived from the World Bank Government Indicators. Specifically, these variables include Control of corruption, Voice and accountability, Government

effectiveness, Political stability, and Regulatory quality. By incorporating these additional variables, we seek to determine whether our previous findings remain valid. Thus, we estimate the following equation:

$$Property\_tax_{i_t} = \alpha_0 + \alpha_1 LEGAL_i + \alpha_2 INST_{i_t} + \alpha_3 LEGAL_i * INST_{i_t} + \sum_{k=4} \alpha_k X_{i_t} + \epsilon_{i_t} \quad (6.4)$$

In this equation, INST represents the alternative institutional variables mentioned previously. These variables are presented below:

Control of corruption: Corruption explains why some African countries fail to give property tax management to local governments. Indeed, according to them, local authorities do not have the competencies and the tools required to collect this tax. Moreover, for them, the level of corruption is higher at the sub-national level than at the central administration level. However, according to the legal origin theory, former British colonies tend to exhibit lower levels of corruption than former French colonies (La Porta et al., 2008, 1999; Angeles and Neanidis, 2015). On the other hand, Ali et al. (2020) show that because British colonial rule gave greater autonomy to local chiefs, they faced a higher level of corruption than ex-French colonies' customary chiefs. Thus, the effect expected from corruption on the relationship between legal origin and property tax revenue can be ambiguous.

Government effectiveness: Regarding government efficacy, the idea is that a more efficient government is more likely to put in place policies that could enhance property tax revenue collection.

Political stability: It is used to consider political instability that could potentially harm property tax revenue mobilization. Specifically, property tax collection needs political stability. Moreover, compared to former French colonies, British colonies had better political stability. The recent elections in Liberia and Nigeria are tangible proof of this. By contrast, former French colonies are always at the heart of political instabilities. This is particularly the case in Burkina Faso, Mali and Niger.

Regulatory quality: According to the World Bank, Regulatory Quality captures perceptions of the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development. Thus, by improving the private sector development, regulatory quality could encourage property tax revenue mobilization because property tax revenue is collected in most cases in the private sector (Businesses).

Voice and accountability: It captures perceptions of the extent to which a country's citizens can participate in selecting their government, as well as freedom of expression, association, and free media (World Bank definition). It also reflects one aspect of democratization. This variable can influence property tax revenue considering citizens' willingness to implement the policy.

Table 6.3 presents the results of this investigation. The findings indicate that whatever the institutional variable considered, the results corroborate those obtained previously. Indeed, on average, the coefficient of interaction between legal origin and each institution variable used remains statistically sig-

nificant and negative. This implies that former French colonies collect less property tax revenue than ex-British colonies. On the whole, the findings confirm that institutional quality plays an important role in explaining property tax revenue differences between former British and French colonies. These findings are closely related to the arguments developed by La Porta et al. (1999).

Table 6.3: Robustness check: using alternative institutional variables

Dependent variable: Property tax revenue (% of GDP)					
	(1)	(2)	(3)	(4)	(5)
Legal origin	-0.183***	-0.080*	-0.181***	-0.161***	-0.268***
	(0.051)	(0.042)	(0.049)	(0.046)	(0.053)
GDP per capita (log)	0.078***	0.087***	0.035	0.030	0.023
	(0.029)	(0.031)	(0.027)	(0.035)	(0.032)
Total natural resources rents	0.001	-0.001	0.000	0.002	-0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Inflation	-0.001	0.000	-0.000	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Urbanization	0.004***	0.005***	0.005***	0.003**	0.004**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Trade	-0.002***	-0.002***	-0.001	-0.001**	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Agriculture	-0.000	-0.001	-0.000	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Government expenditure	-0.016	0.008	-0.011	-0.033**	-0.024*
	(0.013)	(0.012)	(0.014)	(0.014)	(0.013)
SARAs	0.034	0.028	-0.002	0.033	0.046
	(0.039)	(0.035)	(0.032)	(0.037)	(0.036)
Control of Corruption	0.239***				
	(0.066)				
Legal origin*Control of Corruption	-0.220***				
	(0.072)				
Political Stability		0.010			
		(0.041)			
Legal origin*Political Stability		-0.040			
		(0.043)			
Regulatory Quality			0.312***		
			(0.079)		
Legal origin*Regulatory Quality			-0.261***		
			(0.074)		
Voice and Accountability				0.527***	
				(0.081)	
Legal origin*Voice and Accountability				-0.453***	
				(0.076)	
Government Effectiveness					0.388***
					(0.060)
Legal origin*Government Effectiveness					-0.371***
					(0.062)
Constant	-0.172	-0.390	0.072	0.228	0.234
	(0.244)	(0.263)	(0.222)	(0.276)	(0.245)
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	343	343	343	343	343
Countries	29	29	29	29	29
R-squared	0.370	0.329	0.376	0.490	0.413

Significance levels: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors are in parentheses.

6.5.4 Exploring the role of democracy

Following the study of Olsson (2009), who investigates the impact of Western colonialism on contemporary levels of democracy (hereafter Democ in equation 6.5). We use democracy as another institutional variable to explore its effect on African property tax revenues. Indeed, this variable could also explain the property tax revenue differences between former French and British colonies. To be honest, we cannot place all institutional variables in the same basket, as they do not have the same implications. Thus, to explore this relationship, we estimate the following model:

$$Property\_tax_{i_t} = \alpha_0 + \alpha_1 LEGAL_i + \alpha_2 Democ_{i_t} + \alpha_3 LEGAL_i * Democ_{i_t} + \sum_{k=4} \alpha_k X_{i_t} + \epsilon_{i_t} \quad (6.5)$$

Here, we assumed that the differences in property tax revenue mobilization between former British and French colonies could also be explained by the fact that British itself was more democratic than other decolonizing powers (Olsson, 2009; Acemoglu, 2001; Lange, 2004). Indeed, British colonies were characterized by more accessible elections as well as more freedom of expression relative to French colonies. Moreover, Lee and Paine (2019) highlight that democratic powers are more likely to spread democracy than dictatorial powers. In this vein, many scholars and practitioners agree that Britain did more to promulgate democracy in their colonies before granting them independence. This was not the case with the other colonies. To illustrate this overview, Figure 6.9 graphically presents the average degree of democracy in SSA countries. We can note that although democracy levels are not uniform in all former British colonies, the higher values of democracy are found in these countries (For instance, Mauritius, South Africa, and Botswana). On average, the graph shows that compared to former British colonies, there are more former French colonies with low levels of democracy.

Regarding the French system, it is important to note that France, while never totally authoritarian, experienced a less democratic era in the 1950s and 1960s when Charles de Gaulle revised the constitution to establish personal power after being elected following a military revolt in Algeria (Lee and Paine, 2019). This period also coincided with the wave of independence for French colonies in Africa. Thus, the literature points out that France maintained a certain level of influence over their former colonies even after they gained independence, which may explain why former French colonies are less democratic than former British colonies (Lee and Paine, 2019; Narizny, 2012). In the same order of ideas, in French history, under Louis XIV, King of France and Navarre, from 1643 to 1715, France experienced a highly centralized government structure. Thus, according to Njoh and Akiwumi (2012), this also partly explains the model of French colonial authorities in Africa. Moreover, after independence, the governments of African countries formerly colonized by France retained this type of governance in their countries.

To explore this assessment, we used the variable polity2 as a proxy for the democracy level. The

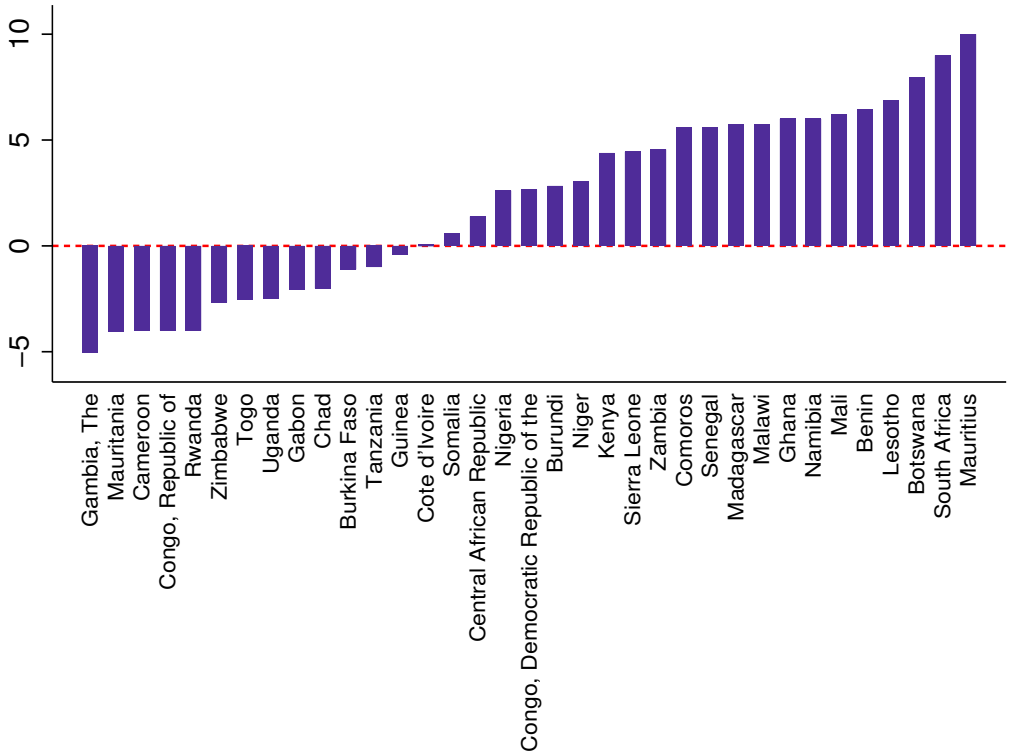

Figure 6.9: Cross-country average of democracy degree

higher value of this variable means a more democratic environment. Econometrically, our results in Table 6.4 shows that ex-French colonies have experienced less pronounced gains in terms of property tax revenue, as evidenced by the negative and statistical significance of the interaction term between the variables legal origin and democracy.

6.5.5 The marginal effect of the alternative institution variables

This part presents the marginal effects of the former French colonies' property tax revenue relative to that of former British colonies across different values of alternative institutional variables used previously in Tables 6.3 and 6.4, with a confidence interval of 95%. The results of this investigation are presented in Figure E1 (in the appendix). The points in blue indicate the coefficients calculated. The graphs show that the impact of legal origin on property tax revenues in SSA is not uniform (homogeneous), given the specific characteristics of their institutional quality.

On average, for lower values of institutional indicators, the marginal impact of former French colonies on property tax revenues is positive and statistically significant up to a threshold, where it becomes negative and statistically significant for high institutional quality levels. This means that when the gap at the institutional level becomes substantial between the two groups, the former French colonies tend to

Table 6.4: Robustness check: the role of democracy

Dependent variable: Property tax revenue (% of GDP)	
	(1)
Legal origin	0.017
	(0.039)
Democracy	0.039***
	(0.008)
Legal origin*Democracy	-0.033***
	(0.008)
GDP per capita (log)	-0.012
	(0.042)
Total natural resources rents	-0.000
	(0.002)
Inflation	-0.001
	(0.001)
Urbanization	0.007***
	(0.002)
Trade	-0.002**
	(0.001)
Agriculture	-0.004
	(0.003)
Government expenditure	0.006
	(0.019)
SARAs	0.008
	(0.031)
Constant	0.254
	(0.356)
Time FE	Yes
Observations	261
Countries	30
R-squared	0.493

Robust standard errors in parentheses.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

collect less property tax revenue than ex-British colonies. Figure E2 in the appendix also confirms these results. Indeed, it highlights that, on average, the effect of institutional quality on property tax revenue is more pronounced and significant in former British colonies.

6.5.6 Persistence effect after independence

Considering the time since the country was independent vis à vis the colonialism system, we interact the variable legal origin with the post-colonial country Age and the variable rule of law. Indeed, we have assumed that the inheritance of colonial and pre-colonial legacies affects the institutional development of African countries several years after their independence (Maseland, 2018; Lee and Paine, 2019). Thus, to evaluate this persistent impact, the variable Age is used to capture the duration of the country's independence from its previous colonial power. The variable Age is calculated as follows:

$$Age = 2019 - Ind.year \tag{6.6}$$

Where Ind.year means the date of independence year. To conduct the ideas developed in this part, we estimate the following equation:

$$Property\_tax_{i_t} = \beta_0 + \beta_1 LEGAL_i + \beta_2 RL_{i_t} + \beta_3 Age + \beta_4 LEGAL * RL_{i_t} * Age + \sum_{k=5} \beta_k X_{i_t} + \mu_{i_t} \tag{6.7}$$

This is another way to explore the persistent effect of colonial legacies on property tax revenue in African countries. The results in Table 6.5 indicate that despite their independence, former French colonies remain largely dependent on the legislation left by their colonizer. Indeed, as reflected by the negative and statistically significant interaction term between legal origin, Age, and rule of law, former French colonies experienced less property tax revenue than ex-British colonies. In addition, the results reveal a positive trend in property tax revenue over time in former French colonies, as evidenced by the positive and statistically significant effect of the variable Age. Overall, the results agree with previous studies that claim that the colonial legacy persists today in the economic spheres of African countries. However, these results are contrary to those of Young (2004), who argued for the end of the influence of colonialism in African societies in the 1990s.

6.5.7 Excluding 2015 periods

Figure 6.3 illustrates that differences in property tax revenues fluctuate significantly throughout the analyzed period, with no consistent pattern. Notably, in 2015, there were no observable differences in property tax revenues between former British and former French colonies. Moreover, after 2015, the gap between the two groups diminishes further. This raises the question of whether the Addis Ababa

Table 6.5: Robustness check: the role of independence length

Dependent: Property tax revenue (% of GDP)	
	(1)
Legal origin	-0.264***
	(0.048)
Rule of Law	0.273***
	(0.058)
Age	0.022***
	(0.002)
Legal origin*Rule of law*Age	-0.004***
	(0.001)
GDP per capita (log)	0.086***
	(0.025)
Total natural resources rents	-0.003**
	(0.001)
Inflation	0.002
	(0.001)
Urbanization	-0.002
	(0.001)
Trade	0.001
	(0.001)
Agriculture	0.001
	(0.001)
Government expenditure	0.004
	(0.009)
SARAs	-0.178***
	(0.037)
Constant	-1.577***
	(0.218)
Time FE	Yes
Observations	343
countries	29
R-squared	0.661

Robust standard errors are in parentheses.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

Agenda, adopted in 2015, influenced this trend. To investigate this, we conduct an analysis focused solely on the period before 2015, excluding the years that follow. The results of this investigation are presented in Table 6.6. They remain consistent with our baseline findings, indicating that our results are not influenced by the effects of the 2015 period and its corollaries.

6.5.8 Sensitivity using an alternative econometric approach

To evaluate the validity of our baseline results, we investigate an alternatively econometric technical approach based on Driscoll and Kraay's corrected standard errors (Driscoll and Kraay, 1998; Joshi et al., 2021; Hoechle, 2007). Note that this method is robust to heteroscedasticity, cross-sectional dependence, and autocorrelation, and minimizes the endogeneity bias. For Hoechle (2007), assuming that the panel

Table 6.6: Robustness checks: Excluding 2015 periods

Dependent variable: Property tax revenue (% of GDP)		
	(1)	(2)
VARIABLES		
Legal origin	-0.132***	-0.299***
	(0.041)	(0.061)
Rule of Law	0.193***	0.433***
	(0.036)	(0.086)
Legal origin*Rule of Law	-0.144***	-0.379***
	(0.038)	(0.088)
GDP per capita (log)		0.015
		(0.039)
Total natural resources rents		0.001
		(0.002)
Inflation		-0.002
		(0.001)
Urbanization		0.004***
		(0.002)
Trade		-0.002*
		(0.001)
Agriculture		-0.001
		(0.002)
Government expenditure		-0.002
		(0.018)
SARAs		0.036
		(0.045)
Constant	0.234***	0.335
	(0.049)	(0.328)
Times FE	Yes	Yes
Countries	34	29
Observations	394	245
R-squared	0.152	0.484

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

data are cross-sectionally independent is inappropriate. Moreover, based on a Monte Carlo simulation, the author found that this estimator is a good alternative to performing a pooled OLS estimator. In this model, the lag used to resolve the potential autocorrelation problem must be clearly defined. By default, the lag length is obtained by the following equation directly calculated by the *stata* software :

$$m(T) = floor[4(T/100)^{2/9}] \tag{6.8}$$

Likewise, it is interesting to compare the results of the pooled OLS estimator with the Driscoll and Kraay estimator. Table 6.7 presents the results of the Driscoll-Kraay standard error estimation. The results are consistent with our previous results obtained with the pooled OLS estimator, confirming that, on average, former French colonies continue to collect less property tax revenue than former British colonies.

Table 6.7: Robustness check: using Driscoll and Kraay corrected standard errors

Dependent variable: Property tax revenue (% of GDP)				
	(1)	(2)	(3)	(4)
	Lag 3	Lag 4	Lag 5	Lag 6
Legal origin	-0.174*	-0.174*	-0.174**	-0.174**
	(0.090)	(0.086)	(0.080)	(0.072)
Rule of Law	0.264*	0.264*	0.264*	0.264**
	(0.133)	(0.134)	(0.131)	(0.125)
Legal origin*Rule of Law	-0.220*	-0.220*	-0.220*	-0.220*
	(0.126)	(0.126)	(0.122)	(0.115)
GDP per capita (log)	0.057*	0.057*	0.057**	0.057**
	(0.029)	(0.028)	(0.027)	(0.027)
Total natural resources rents	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Inflation	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Urbanization	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)
Trade	-0.002**	-0.002**	-0.002**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Agriculture	-0.000	-0.000	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Government expenditure	-0.008	-0.008	-0.008	-0.008
	(0.011)	(0.010)	(0.009)	(0.008)
SARAs	0.028	0.028	0.028	0.028
	(0.034)	(0.033)	(0.031)	(0.028)
Constant	-0.065	-0.065	-0.065	-0.065
	(0.290)	(0.282)	(0.274)	(0.264)
Time FE	Yes	Yes	Yes	Yes
Observations	343	343	343	343
Countries	29	29	29	29
R-squared	0.357	0.357	0.357	0.357

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. lag(.) is the maximum lag considered in the autocorrelation structure.

6.6 Conclusion

This chapter evaluated the effects of colonial legacies on current institutional indicators in Africa and explores how their persistent influence affects property taxation in former French colonies compared to former British colonies over the period 1996-2019. Specifically, we examine the combined impact of legal origin and institutional quality on property tax revenues in sub-Saharan Africa. The tested hypothesis suggests that the colonial period continues to influence the post-independence economic environment in sub-Saharan Africa, with particular relevance to property taxation. The econometric investigation employs pooled Ordinary Least Squares (POLS) and Driscoll and Kraay estimators.

Our findings reveal the persistent effect of colonial legacies on property tax revenue in SSA through their current institutional quality. Importantly, the results highlight that, on average, former French colonies tend to collect less property tax revenue than former British colonies. Indeed, the coefficients of the interaction between the legal origin (based on former French colonies) and the different institutional quality variables are statistically significant with a negative sign. Furthermore, our results survived after a battery of additional robustness tests, confirming the main findings of this chapter.

The results of this chapter are contrary to those of Young (2004) and Maseland (2018), who found the end of the impact of the colonial system's influence on contemporary economic outcomes in Africa. Indeed, their assertion could be true for other outcomes but not for property taxation. Thus, the main contribution of this chapter is to refresh or extend the literature on the relationship between colonial legacies and taxation in Africa, focusing on property taxation. In this context, regarding the management of property taxation, this chapter has significant implications and deserves particular attention in Africa. More broadly, our chapter points out that former French colonies have the greatest need to review or update their property taxation legislation policies. Overall, the results of this chapter cannot generalize the long-term effects of colonial legacies on all macroeconomic outcomes in SSA countries, but they highlight the persistent impact of colonial tax legislation in these countries.

Appendix chapter 6

Table E1: Descriptive statistics

Variables	N	Mean	SD	Min	Max
Property tax revenue	581	0.153	0.247	0	1.357
Legal origin	888	0.541	0.499	0	1
Agriculture	847	23.73	13.91	1.798	79.04
GDP per capita	867	1,649	1,924	270.7	10,644
Government expenditure	582	3.746	1.983	0.622	13.22
Inflation	865	13.50	94.97	-27.05	2,630
Total natural resources rents	867	10.59	9.816	0.00117	58.69
Trade	812	62.35	28.32	1.219	165.1
Urbanization	888	37.32	15.43	7.412	89.74
Government effectiveness	777	-0.795	0.633	-2.445	1.161
Regulatory Quality	777	-0.670	0.645	-2.548	1.197
Rule of Law	777	-0.722	0.669	-2.591	1.024
Voice and Accountability	777	-0.556	0.698	-2.197	1.007
Political Stability	777	-0.639	0.949	-3.313	1.201
Control of corruption	777	-0.676	0.588	-1.849	1.245
Polity2	629	2.070	4.890	-6	10
Age	888	60.05	20.26	29	172
SARAs	888	0.351	0.478	0	1

Table E2: Country list

Country	Ind.date	Legal origin	country	Ind.date	Legal origin
Benin	1960	French	Malawi	1964	British
Botswana	1966	British	Mali	1960	French
Burkina Faso	1960	French	Mauritania	1960	French
Burundi	1962	French	Mauritius	1968	British
Cameroon	1960	French	Namibia	1990	British
Central African Republic	1960	French	Niger	1960	French
Chad	1960	French	Nigeria	1960	British
Comoros	1975	French	Rwanda	1962	French
Congo, Democratic Republic	1960	French	Senegal	1960	French
Congo, Republic	1960	French	Sierra Leone	1961	British
Cote d'Ivoire	1960	French	Somalia	1960	British
Gabon	1960	French	South Africa	1934	British
Gambia	1965	Bitish	Sudan	1956	British
Ghana	1957	British	Tanzania	1961	British
Guinea	1958	French	Togo	1960	French
Kenya	1963	British	Uganda	1962	British
Lesotho	1966	British	Zambia	1964	British
Liberia	1847	British	Zimbabwe	1980	British
Madagascar	1960	French			

Note: Ind.date means independence date
French= Belgium or France
English= England or American

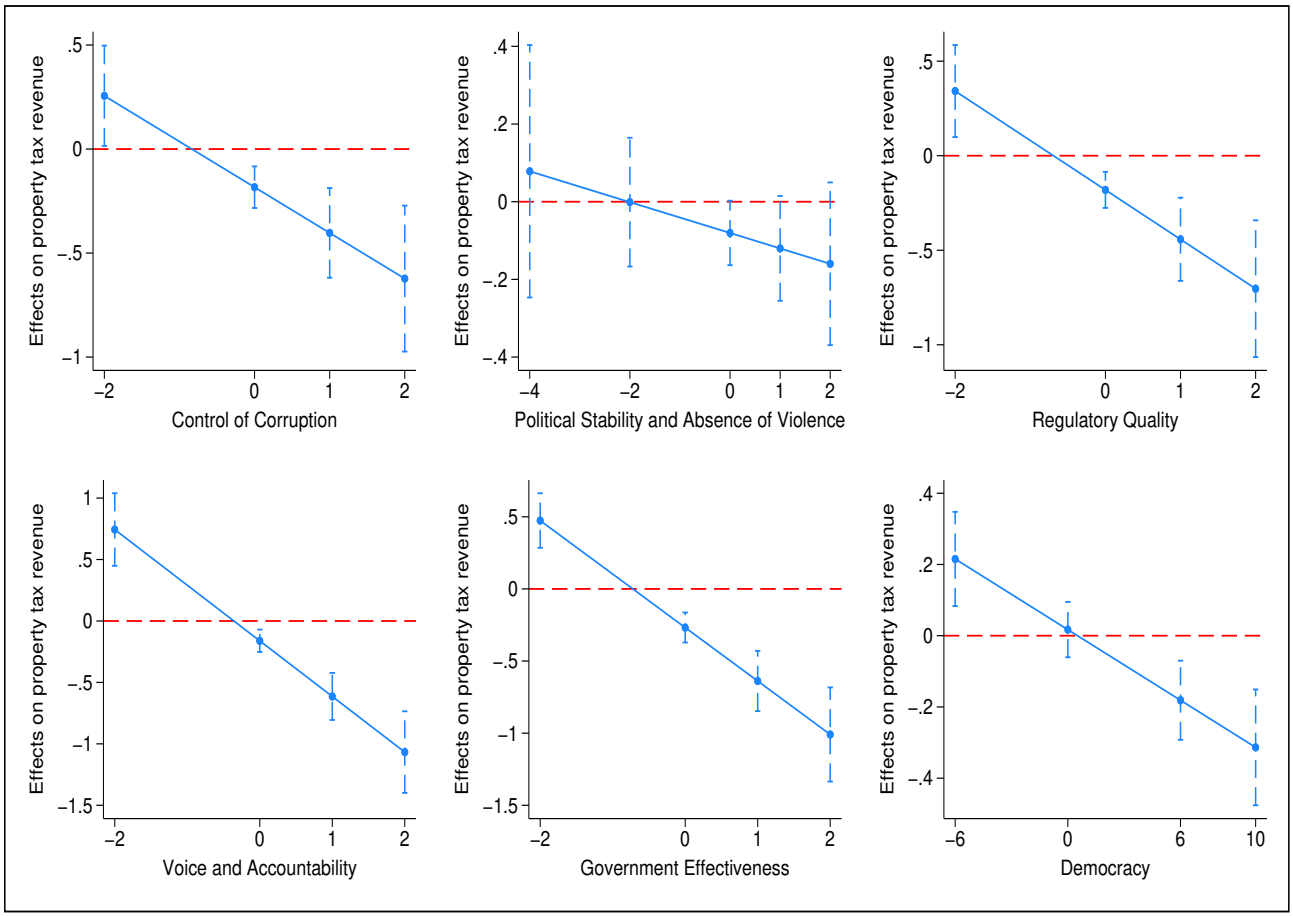

Figure E1: Average marginal effects of former French colonies with 95% CIs

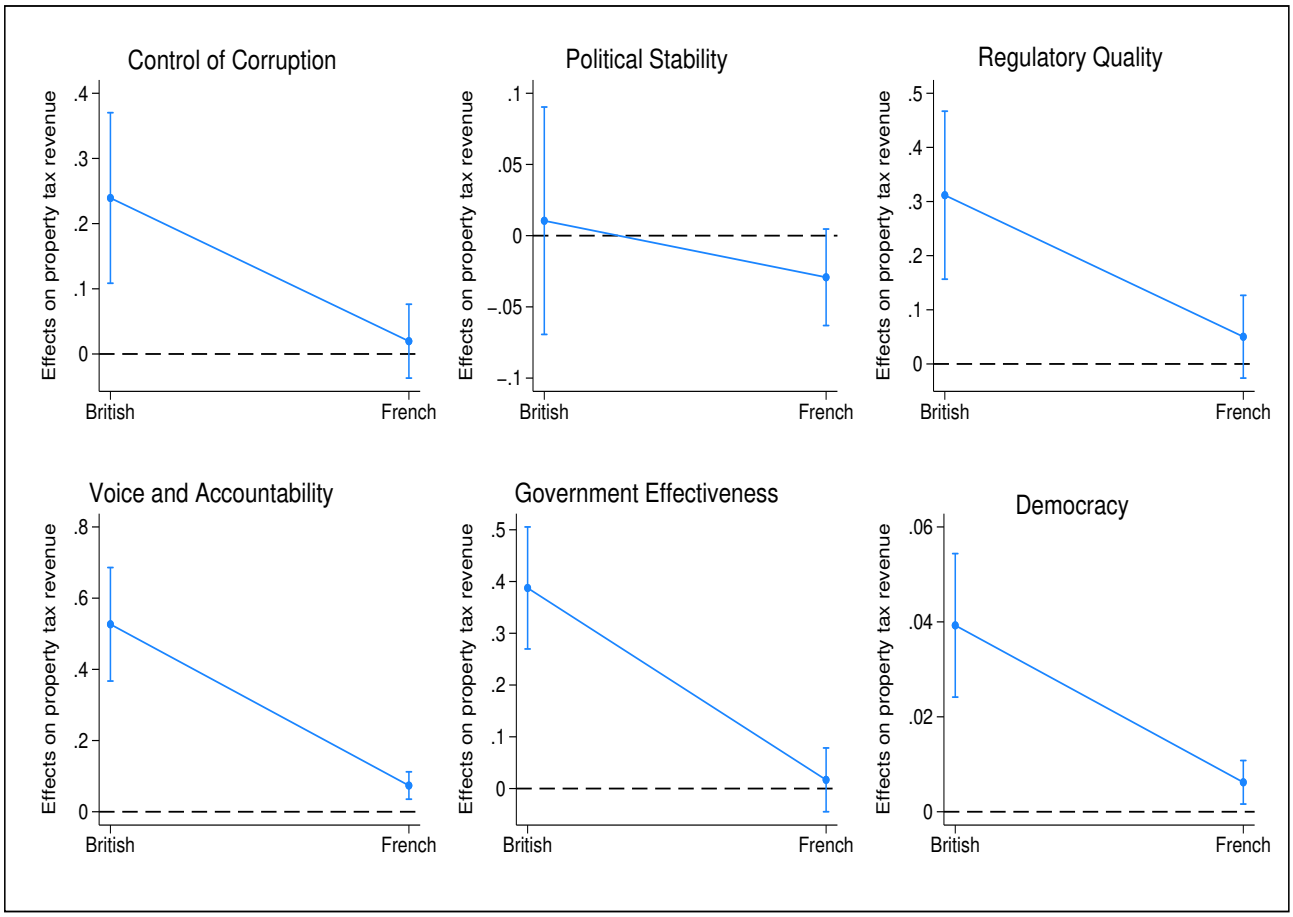

Figure E2: Average marginal effects of institutional variables with 95% CIs

Table E3: Data sources

Variables detail.

Variable	Definition	Source
Property tax revenue	Total property tax revenues.	ICTD
Real GDP per capita	GDP per capita (constant 2015 US$)	
Urban population	Urban population refers to people living in urban areas as defined by national statistical offices.	
Total natural resources rents	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.	
Inflation, GDP deflator (annual %)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.	WDI
Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	
Agriculture, forestry, and fishing, value added (% of GDP)	Agriculture, forestry, and fishing corresponds to ISIC divisions 1-3 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production.	
Government expenditure on education	Government expenditure on education, total (% of GDP)	
Legal origin	Legal origin is a dummy variable taking 1 if the country is a former French country and 0 if not.	Author construction
Rule of law	capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	
Government Effectiveness	capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	
Control of Corruption	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	
Rule of law	capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	WGI
Voice and Accountability	capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.	
Political stability and absence of violence	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.	
Regulatory Quality	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	
SARA's	Corresponds to a dummy variable taking 1 if Semi-Autonomous Revenue Authority is adopted and 0 otherwise.	Author construction
Polity 2	The polity score captures the regime authority.	Polity IV project
Age	It captures the duration of the country's independence from its previous colonial power.	Author construction

Table E4: Adoption year (SARAs)

Country	Adoption year (SARAs)
Botswana	2004
Burundi	2009
Gambia	2004
Ghana	1985
Kenya	1995
Lesotho	2003
Liberia	2013
Malawi	1995
Mauritius	2005
Rwanda	1998
Sierra Leone	2002
South Africa	1997
Tanzania	1996
Togo	2012
Uganda	1991
Zambia	1994
Zimbabwe	2001

Table E5: Correlation matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
[1]Property tax revenue	1																	
[2]French colony	-0.387***	1																
[3]GDP per capita	0.483***	-0.275***	1															
[4]Total natural resources rents	-0.172**	0.145*	-0.229***	1														
[5]Government expenditure	0.297***	-0.501***	0.337***	-0.205**	1													
[6]Agriculture	-0.464***	0.286***	-0.728***	0.111	-0.414***	1												
[7]Inflation	-0.00837	-0.227***	-0.0214	0.267***	0.0357	0.0414	1											
[8]Urban population	0.416***	-0.119	0.527***	0.0598	0.0478	-0.639***	-0.128	1										
[9]Trade	0.0704	-0.0348	0.439***	0.245***	0.364***	-0.511***	0.00660	0.318***	1									
[10]Regulatory Quality	0.478***	-0.395***	0.757***	-0.538***	0.427***	-0.569***	-0.0302	0.234***	0.170*	1								
[11]Voice and Accountability	0.468***	-0.331***	0.635***	-0.475***	0.349***	-0.420***	-0.0466	0.213**	0.171*	0.789***	1							
[12]Rule of Law Estimate	0.369***	-0.242***	0.682***	-0.504***	0.366***	-0.467***	-0.0473	0.131	0.272***	0.864***	0.853***	1						
[13]Government Effectiveness	0.470***	-0.320***	0.795***	-0.491***	0.413***	-0.621***	0.00204	0.244***	0.216**	0.920***	0.782***	0.880***	1					
[14]Political Stability	0.178**	-0.177**	0.413***	-0.402***	0.224***	-0.316***	-0.0426	0.178**	0.211**	0.579***	0.684***	0.771***	0.599***	1				
[15]Control of Corruption	0.427***	-0.288***	0.618***	-0.431***	0.474***	-0.506***	0.0572	0.123	0.210**	0.821***	0.665***	0.835***	0.851***	0.596***	1			
[16]Age	0.558***	-0.0690	0.140*	0.0750	-0.143*	-0.0968	-0.00887	0.333***	-0.302***	0.112	0.0719	-0.0843	0.0594	-0.172*	-0.0148	1		
[17]Polity2	0.365***	-0.293***	0.461***	-0.421***	0.340***	-0.279***	-0.0315	0.0567	0.0971	0.571***	0.832***	0.623***	0.549***	0.409***	0.472***	0.0660	1	
[18]SARAs	0.236***	-0.723***	0.384***	-0.157*	0.358***	-0.266***	0.174**	0.0261	0.0880	0.431***	0.271***	0.333***	0.406***	0.212**	0.353***	0.179**	0.242***	1

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

CHAPTER 7

General Conclusion

Learning by doing

– John Dewey

According to the 2030 Agenda for Sustainable Development Agenda, Developing countries aim to achieve concrete and significant development results in poverty reduction and inclusive prosperity for decades to come. Therefore, developing countries must quickly make more financial resources available to finance the achievement of the Sustainable Development Goals within the time frame. While VAT and income taxes account for 4.83% of GDP, respectively, the share of property taxes in GDP is, on average, only 0.2% in sub-Saharan Africa. This thesis aimed to draw the attention of political decision-makers to the importance of property taxation in terms of increasing overall tax revenue and combating urban sprawl. Specifically, the thesis revisited the main determinants of property tax revenues and investigated the mechanisms through which these determinants can influence property tax revenue collection. It also examined some institutional factors influencing property tax revenue mobilization in sub-Saharan Africa. The findings of the thesis contribute thus to a deeper (re)understanding of the policies surrounding property taxation issues.

This thesis is organized in two parts. The first comprises three chapters (chapter 2, 3, and 4), and the second two (chapter 5 and 6).

Chapter 2 investigates the causal relationship between property tax revenue, income inequality, and urbanization in a panel of 115 developing and developed countries from 2000 to 2018. The results reveal a mixed picture across developing and developed countries. In both groups, the findings indicate that urbanization Granger-causes an increase in property tax revenue, with a unidirectional relationship observed in developing countries. In developed countries, however, there is a positive bidirectional causality between urbanization and property tax revenues. Additionally, the study finds that urbaniza-

tion reduces income inequality in both developed and developing countries, with unidirectional causality. When examining the full sample, the findings demonstrate bidirectional causality between property tax revenue and income inequality, as well as positive unidirectional effects of urbanization on property tax revenues. More specifically, the findings highlight a negative effect of income inequality on property tax revenues. Conversely, we find that property taxation increases income inequality. Finally, the analysis of impulse responses reveals distinct dynamics between developing and developed countries while confirming previous findings.

Chapter 3 examines the relationship between the urbanization process and property tax revenue collection in 71 developing countries over the period $1996-2019$. The results show that urbanization positively and significantly impacts property tax revenue mobilization in developing countries. This positive association can be attributed to urban expansion, which creates new land opportunities and increase the taxable base for property tax revenue collection. These findings survive after a battery of tests, reflecting a clear positive impact of urbanization on property tax revenue mobilization. Furthermore, we provide some evidence that digitalization and financial development are effective transmission channels through which urbanization can influence property tax revenue mobilization in developing countries.

Chapter 4 reevaluates the impact of Fiscal Decentralization (FD) on property tax revenue in a sample of developed and developing countries for the period $2005-2019$. Our findings reveal a robust positive effect of FD on property tax revenues. Furthermore, a higher level of democracy contributes to the positive relationship between fiscal decentralization and property tax revenue. However, our analysis indicates that a higher level of control of corruption can negate the positive effect of the relationship between fiscal decentralization and property tax revenue. The chapter also demonstrates that lower levels of ethnic fragmentation positively influence the relationship between fiscal decentralization and property tax revenues. Moreover, we observe that the effect of fiscal decentralization on property tax revenue is more pronounced in developed countries than in developing countries. Finally, the chapter demonstrates that countries with below-median property tax revenue are less likely to benefit from fiscal decentralization than countries with above-median property tax revenues.

Chapter 5 explores the implications of internal conflicts for property tax revenues and highlights the moderating role of property rights in Sub-Saharan African countries from 1996 to 2019. Estimates indicate that internal conflicts reduce property tax revenues, and property rights play a moderating role in the influence of internal conflicts on property tax revenues. Specifically, when property rights are clearly defined, the effect of internal conflicts is quantitatively weaker compared to situations where property rights are ambiguous or poorly enforced. Moreover, in addition to the positive impact of protecting property rights on property tax revenues, the estimates also provide evidence of government effectiveness, further reinforcing the interconnected relationship among internal stability, property rights protection, and property tax revenues.

Chapter 6 investigates how French colonial legacies long-term influenced property taxation in sub-Saharan Africa over the period $1996 - 2019$. Specifically, we examine how legal origins interact with institutional quality in determining property tax revenues. The results show that former French colonies tend to collect less property tax revenue than former British colonies. Additionally, our findings indicate that even in the presence of high institutional quality, ex-French colonies experience weaker levels of property tax revenue than ex-British colonies. This result implies that legal systems inherited from French colonization continue to hinder the efficiency of property tax systems. These results remain robust when accounting for a set of controls and various alternative institutional variables and when employing an alternative estimation method.

From the results of this thesis, some recommendations can be formulated: (I) Firstly, the thesis suggests that governments in developing countries could leverage their high levels of urbanization to boost their property tax revenues by implementing appropriate policies that can capture this high level of urbanization and take into account the urban planning system. Specifically, they can focus on strengthening financial sector development, updating the land cadastre, and improving digitization and the street addressing system to identify the tax base better. (II) Second, policymakers should grant more fiscal autonomy to their local government in order to collect more significant property tax revenues. Indeed, the thesis suggests that enhancing local government autonomy can promote property tax revenue collection, a relevant consideration for both developed and developing countries. The success of policies concerning the relationship between property tax revenue and fiscal decentralization depends on implementing accompanying policies tailored to each initial levels of property tax revenue. (III) Third, countries should prioritize establishing robust institutions capable of clearly defining property rights. This clarity will facilitate the straightforward identification of the tax base and help prevent internal conflicts over land management. (IV) Finally, the thesis suggests that because former French colonies collect less property tax revenue compared to former British colonies in Africa, they have the greatest need to review or update their property taxation legislation policies.

Like any research work, this thesis has some limitations. Firstly, it suffers from a data unavailability issue, significantly redirecting some chapters, mainly due to the lack of infra-national level data. Such data would have enabled a local-level analysis applied to specific countries. Efforts and travels were made to gather data in Côte d'Ivoire, but unfortunately, these efforts did not yield the desired results. Secondly, the data we used on property tax revenues only provides the total collected property tax revenues. It would have been helpful to distinguish between the portion of these revenues paid by businesses and that paid by individuals. This distinction would have allowed for a more precise assessment of the tax burden on households. Detailed data on the composition of property tax revenues by country is also necessary to better understand the differences in property tax calculation between countries. Therefore, future research could focus on actual data collection efforts. In developing countries, this would involve

encouraging governments to digitize property tax revenue data.

CHAPTER 8

Résumé Extensif en Français

8.1 Introduction

Les recettes foncières constituent une source indéniable d'accroissement des recettes fiscales globales (Franzsen and McCluskey, 2017; Norregaard, 2013; Awasthi, 2020). Cette forme d'imposition, prélevée sur les biens immobiliers, englobe les terrains, les propriétés résidentielles, commerciales et industrielles. Toutefois, le mode d'application de la base foncière taxable varie significativement d'une juridiction à l'autre (d'un pays à l'autre). En fonction des législations fiscales, on peut retrouver des pays où il est possible de mesurer les recettes foncières uniquement sur les terrains ou les bâtiments, ou dans certains cas sur une combinaison des deux. En outre, un constat beaucoup évoqué dans littérature et par les praticiens est que dans la majorité des pays en développement, les recettes foncières sont majoritairement collectées auprès des entreprises privées. En effet, contrairement aux pays développés, cette taxe reste méconnue par une grande partie de la population ou peu exploitée par l'administration fiscale dans les pays en développement. De ce fait, la collecte des recettes foncières repose principalement sur les entreprises privées. Cependant, face à la montée croissante des besoins de financement et au reflux de la mondialisation, l'utilisation d'une telle taxe comme source de financement peut contribuer significativement à la mobilisation des recettes intérieures et, par conséquent, être une source importante de financement de l'économie nationale.

Les recettes foncières, en tant qu'impôt local par définition, peuvent jouer un rôle crucial dans le financement des services publics fournis aux collectivités locales. Cela soulève la question de savoir s'il est approprié de gérer la taxe foncière de manière décentralisée ou non. D'un autre côté, la taxation foncière peut être un outil efficace dans la lutte contre l'étalement urbain, contribuant ainsi à désengorger certaines grandes villes en Afrique, telles que Dakar et Abidjan. Néanmoins, l'instauration d'une taxe foncière dans les pays africains se heurte à plusieurs obstacles, le principal étant lié à la protection ou à la mauvaise définition des droits de propriété.

Certaines études considèrent la taxation foncière comme une piste de recherche à explorer. Toutefois, malgré les nombreuses contributions des chercheurs, des praticiens et des organisations internationales, la littérature sur la taxation foncière dans les pays en développement demeure largement sous-exploitée. De plus, de nombreuses études antérieures étaient limitées par l'indisponibilité de données, ce qui restreignait considérablement leurs conclusions. Nous tentons donc de combler cette lacune dans cette thèse en extrayant des données sur les revenus fonciers provenant de l'ensemble des pays concernés et issues de l'UNU-WIDER Government Revenue Dataset.

La question qui se pose est donc de savoir comment appliquer efficacement la taxation foncière dans un contexte de sous-développement, ou du moins quels sont les obstacles à la mise en œuvre de cette taxe. Sur la base de la littéraure, nous avons pu identifier que l'efficacité des systèmes de taxation foncière dépend fortement de la qualité de la gouvernance, de la définition de la protection des droits de propriétés,

de l'histoire de la taxe et des conditions socio-économiques des pays. Ainsi, en se basant sur une analyse empirique, cette thèse vise à examiner plusieurs problématiques en mettant en lumière les déterminants des recettes foncières et leurs implications plus larges pour un développement économique durable. Plus spécifiquement, la thèse est structurée en deux parties distinctes. Dans la première partie, nous revisitons les principaux déterminants de la taxation foncière, tels que l'urbanisation et la décentralisation fiscale, qui ont été analysés dans la littérature antérieure. Ensuite, dans la seconde partie, nous analysons la relation entre les institutions et les recettes foncières dans le contexte Africain. Cela inclut l'étude des effets des conflits internes et de l'héritage colonial sur les recettes foncières en Afrique.

8.2 Contributions de la thèse

8.2.1 Investigation de la relation de cause à effet entre les recettes foncières, l'inégalité des revenus et l'urbanisation : Une approche PVAR

L'inégalité des revenus et l'urbanisation constituent une préoccupation majeure tant pour les pays développés que pour les pays en développement. Cependant, les pays en développement sont caractérisés par un niveau élevé d'inégalité et des taux d'urbanisations beaucoup plus importants que les pays développés (Chambas et al., 2007; Awasthi, 2020; Sulemana et al., 2019). Dans le contexte économique actuelle, la mobilisation des recettes intérieures est au cœur de nombreuses politiques et est considérée comme un atout majeur de financement dans le processus de développement économique des nations. Par exemple, la politique fiscale peut jouer un rôle non négligeable sur la réduction des inégalités de revenus et participer au processus d'urbanisation des pays. En effet, selon certaines études, la politique fiscale peut être un instrument potentiel pour atteindre les objectifs de redistribution des gouvernements et, par conséquent, réduire les inégalités de revenus (Cabrera et al., 2015; Piketty and Saez, 2014; Chancel and Piketty, 2021; Doyle and Stiglitz, 2014). D'autre part, comme le souligne Norregaard (2013), la politique fiscale, en particulier la taxe foncière, peut être une source de réponse aux besoins d'urbanisation, et *vice versa* ou également un vecteur de lutte contre l'étalement urbain (Taranu and Verbeeck, 2022).

De même, dans la littérature, il existe un débat assez controversé sur le sens de causalité entre l'urbanisation et l'inégalité des revenus (Sulemana et al., 2019; Liddle and Messinis, 2015; Robinson, 1976). Tandis que certaines études s'intéressent à l'impact de l'urbanisation sur les inégalités de revenus, d'autres se focalisent sur l'effet des inégalités de revenus sur le processus d'urbanisation. Sur la base donc de ces différentes littératures, nous postulons qu'il existe une relation causale entre l'urbanisation, l'inégalité des revenus et les recettes foncières. La question est donc d'examiner empiriquement *"quelle"* variable cause *"quelle"* autre variable.

Ce **chapitre 2** part du principe que les inégalités de revenus et l'urbanisation peuvent avoir une

influence significative sur les recettes foncières. De même, les recettes foncières peuvent, à leur tour, jouer un rôle important dans la réduction des inégalités de revenus et le processus d'urbanisation. Ainsi, nous postulons qu'il existe une relation étroite entre ces trois facteurs. Plus précisément, un changement dans l'une de ces variables peut considérablement affecter les deux autres variables. Par conséquent, ce chapitre vise à examiner empiriquement la relation de cause à effet entre les recettes foncières, les inégalités de revenus et l'urbanisation dans un panel de pays développés et en développement sur la période 2000-2018, en utilisant l'approche des panel-VAR (PVAR) basée sur la méthode d'estimation des moments généralisés (GMM).

Ce chapitre complète ainsi la littérature existante en examinant le sens de causalité entre ces variables. L'objectif est de déterminer s'il existe une association bidirectionnelle entre l'urbanisation, l'inégalité des revenus et les recettes foncières. Les résultats révèlent une image assez contrastée entre les pays en développement et les pays développés. Ils indiquent que l'urbanisation influence positivement les recettes foncières aussi bien dans les pays en développement que les pays développés, avec une relation unidirectionnelle dans le cas des pays en développement. Cependant, une relation positive bidirectionnelle entre les deux variables est constatée dans le cas des pays développés. En outre, les résultats révèlent que l'urbanisation réduit les inégalités de revenus à la fois dans les pays développés que dans les pays en développement, avec une causalité unidirectionnelle. Lorsqu'on considère l'ensemble de l'échantillon, les résultats démontrent une causalité bidirectionnelle entre les recettes de l'impôt foncier et les inégalités de revenus, tout en révélant des effets positifs (unidirectionnel) de l'urbanisation sur les recettes de taxe foncière. Plus spécifiquement, les résultats mettent en exergue un effet négatif des inégalités de revenus sur les recettes de l'impôt foncier. Inversement, nous trouvons que la taxation foncière augmente les inégalités de revenus. Enfin, l'analyse des réponses impulsionnelles révèle des dynamiques distinctes entre les pays en développement et les pays développés, tout en confirmant les résultats précédents.

8.2.2 L'impact du processus d'urbanisation sur la mobilisation des recettes foncières dans les pays en développement : Le développement financier et la digitalisation ont-ils de l'importance ?

Au cours des dernières décennies, les pays en développement ont été caractérisés par une urbanisation croissante. La population urbaine a en effet connu une augmentation significative, en parallèle avec le développement rapide des zones urbaines. Cette urbanisation est étroitement associée à la modernisation, à l'industrialisation et au progrès socio-économique des villes (Cobbinah et al., 2015a; Un-Habitat and Programme, 2011; Poku-Boansi, 2021; Cobbinah et al., 2015b,c). En 2016, les Nations Unies estimaient que deux tiers de l'humanité vivraient dans des villes d'ici 2050. Selon la Banque mondiale (2022), plus de 50% de la population mondiale vit aujourd'hui dans des zones urbaines. D'ici 2045, la population

urbaine mondiale augmentera de 1,5 fois pour atteindre 6 milliards de personnes. De plus, selon ONU-Habitat, 40% de la population africaine vivait en milieu urbain en 2011. Le même rapport indique qu'en 2025, ce pourcentage devrait approcher les 50% de la population totale. Dans un contexte où ces pays rencontrent déjà des difficultés à fournir des services publics adéquats, cette urbanisation rapide exigera une expansion et une amélioration des services publics pour répondre aux besoins croissants de la population. Cela représente un défi majeur, surtout compte tenu des performances limitées en matière de mobilisation des recettes fiscales dans les pays en développement. Pour faire face à ce problème, les pays peuvent tirer parti des opportunités créées par l'urbanisation pour augmenter leurs recettes fiscales.

Parmi ces possibilités, on peut envisager d'améliorer la gestion et la collecte des recettes foncières. Il est important de noter que malgré la croissance rapide de l'urbanisation, la mobilisation des recettes foncières ne connaît pas une augmentation significative. Par exemple, selon l' ICTD, les recettes de la taxe foncière collectées par les pays africains représentent moins de 0,5% du PIB. Parmi les obstacles à la faible collecte des recettes foncières se trouve la gestion des terres, qui est une composante essentielle du développement urbain. Par exemple, dans les pays en développement, de nombreuses situations d'insécurité foncière résultant de litiges fréquents concernant la définition des droits de propriété.

Toutefois, le développement urbain, également défini comme les améliorations physiques apportées à la zone urbaine au fil du temps, pourrait être une opportunité pour accroître les recettes foncières à partir d'une politique de collecte efficace adaptée au développement des villes. En effet, la modernisation des villes marquée par l'émergence de nouveaux bâtiments ainsi que de nouvelles entreprises constitue un vecteur incontournable pour accroître la base de la taxe foncière.

Le **chapitre 3** examine ainsi la relation entre l'urbanisation et la mobilisation des recettes foncières dans 71 pays en développement de 1996 à 2019. Pour ce faire, nous utilisons des régressions de panel à effets fixes incluant les effets fixes pays et année et réalisons plusieurs tests de robustesse pour explorer la validité de nos résultats. Les résultats indiquent que l'urbanisation a un effet positif et significatif sur la collecte des recettes foncières dans les pays en développement. Ces conclusions résistent à une série de tests, démontrant clairement un impact positif de l'urbanisation sur la collecte des recettes foncières. Les résultats montrent également que la digitalisation et le développement financier constituent des canaux de transmission efficaces par lesquels l'urbanisation peut influencer positivement la mobilisation des recettes foncières dans les pays en développement.

8.2.3 (Re)visiter la relation entre la décentralisation fiscale et les recettes de l'impôt foncier : Perspectives des pays en développement et des pays développés

Pour faire face à leurs besoins de financement, les pays en développement ont besoin de lever des recettes fiscales supplémentaires. C'est dans cette optique que plusieurs pays à travers le monde ont expérimenté des politiques de décentralisation fiscale afin d'accorder une autonomie à leurs gouvernements locaux respectifs. Cette politique pourrait inciter les autorités locales à améliorer leur niveau d'imposition et, par conséquent, à améliorer la fourniture des services publics. Le présent **chapitre 4** réexamine ainsi l'impact de la décentralisation fiscale sur la mobilisation des recettes foncières dans un échantillon de 42 pays développés et en développement, couvrant la période 2005-2019. Nos résultats révèlent un effet positif significatif de la décentralisation fiscale sur les recettes foncières. De plus, les résultats montrent qu'un niveau élevé de démocratie contribue également à renforcer la relation positive entre la décentralisation fiscale et les recettes foncières. Nos résultats indiquent également qu'un niveau élevé de corruption réduit l'effet positif de la décentralisation fiscale sur les recettes foncières. Enfin, les résultats du chapitre mettent également en exergue que des niveaux plus faibles de fragmentation ethnique influencent positivement la relation entre la décentralisation fiscale et les revenus de l'impôt foncier.

Par ailleurs, ce chapitre met en évidence que les pays dont les recettes foncières se situent en dessous de la médiane ont moins de chances de bénéficier de la décentralisation fiscale que les pays ayant des niveaux de recettes foncières supérieurs à la médiane. En résumé, l'étude suggère que renforcer l'autonomie des gouvernements locaux peut favoriser la collecte des recettes foncières, ce qui est pertinent à la fois pour les pays développés et les pays en développement. Cependant, le succès des politiques liées à l'impact de la décentralisation fiscale sur les recettes foncières dépend de la mise en œuvre de politiques appropriées, adaptées différemment selon les pays présentant des niveaux initiaux variés de recettes foncières. En d'autres termes, ces politiques risquent de ne pas être efficaces si les niveaux initiaux de recettes foncières dans chaque pays ne sont pas pris en compte.

8.2.4 Conflits internes et le rôle modérateur des droits de propriété en Afrique Subsaharienne : implications pour la taxation foncière

Analyser et comprendre les facteurs expliquant la faible collecte des impôts fonciers en Afrique revêt une importance capitale. Cette réflexion nous amène à repenser les systèmes politiques et institutionnels afin de protéger les droits de propriété, souvent à l'origine de conflits internes, compromettant ainsi les conditions propices à l'augmentation des recettes fiscales locales. Pour ce faire, ce **chapitre 5** utilise un échantillon constitué des pays d'Afrique subsaharienne sur la période de 1996 à 2019. Les régressions

ont été réalisées en utilisant l'estimateur à effets fixes, intégrant des effets fixes pays et années, afin de minimiser les problèmes liés aux facteurs inobservés. De plus, les résultats restent robustes lors de l'utilisation d'estimateurs alternatifs basés sur la méthode de Driscoll et Kraay, qui prend en compte les questions d'autocorrélation, d'hétéroscédasticité et de variables omises. Ces résultats demeurent également stables lors de l'analyse d'un potentiel problème de causalité inverse entre les conflits internes et les recettes foncières.

Les résultats empiriques indiquent que les conflits internes réduisent les recettes de l'impôt foncier, tandis qu'une meilleure protection des droits de propriété et une meilleure qualité de la gouvernance sont associées à des recettes foncières plus élevées. Plus précisément, dans les pays où la protection des droits de propriété est forte, l'effet négatif des conflits internes sur les recettes foncières est moins prononcé. De même, lorsque les gouvernements appliquent efficacement l'état de droit, mènent des efforts de lutte contre la corruption et affichent une bonne qualité de la bureaucratie, ils sont mieux en mesure de protéger les droits de propriétés, atténuant ainsi les effets négatifs des conflits internes sur les recettes foncières. De plus, les systèmes qui protègent efficacement les droits de propriété et démontrent une efficacité dans les actions publiques peuvent atténuer significativement l'impact des conflits internes sur les recettes foncières, entraînant ainsi des effets négatifs plus faibles dans ces pays.

Pour faire face aux défis liés à l'augmentation des impôts fonciers, les États africains doivent prendre des mesures urgentes pour réduire les conflits internes liés à la gestion de la terre. Ils doivent adopter une approche globale et multidimensionnelle qui vise à traiter les causes sous-jacentes des conflits, à consolider la paix et à renforcer la gouvernance et les institutions. Plus précisément, la promotion de structures de gouvernance inclusives, offrant à tous les citoyens une voix dans le processus décisionnel, peut contribuer à atténuer les griefs et à réduire la probabilité de conflits. Dans cette optique, la décentralisation peut être utilisée comme un outil pour favoriser le partage du pouvoir et des processus politiques inclusifs. En outre, les États doivent renforcer l'état de droit, promouvoir une gouvernance responsable, et bâtir des institutions efficaces et impartiales.

Nous reconnaissons toutefois que les gouvernements locaux et les chefs coutumiers doivent jouer un rôle clé, notamment en renforçant la protection des droits de propriété et en assurant une action publique plus efficace pour atténuer les conséquences des conflits internes, dans le but d'améliorer la collecte des recettes foncières.

8.2.5 Post décolonisation, Cadre institutionnel et mobilisation des recettes de l'impôt foncier en Afrique Subsaharienne : Leçons des anciennes colonies françaises

La littérature met en exergue des différences significatives dans la collecte des recettes foncières entre les pays d'Afrique subsaharienne (Monkam et al., 2010; Norregaard, 2013). Ces divergences sont généralement attribuées à leurs héritages coloniaux. Ainsi, sur la base de leur histoire coloniale, ces pays sont generalement regroupés en deux groupes à savoir : les anciennes colonies Françaises et les anciennes colonies Britanniques. Dans cette optique, ce chapitre 6 examine si les héritages coloniaux ont une influence à long terme sur la fiscalité foncière en Afrique Subsaharienne. Plus précisément, nous évaluons comment les origines légales interagissent avec les institutions des pays Africains pour influencer la collecte de leurs recettes foncières.

Les résultats de ce chapitre montrent qu'en moyenne les anciennes colonies Françaises collectent moins de recettes foncières que les anciennes colonies Britanniques. De plus, les résultats indiquent que même lorsque la qualité institutionnelle élevée, les anciennes colonies Françaises continuent d'afficher des niveaux plus faibles de recettes foncière que les anciennes colonies Britanniques. Ces résultats restent robustes après la prise en compte de diverses variables de contrôles et d'autres variables institutionnelles alternatives, ainsi qu'en utilisant une méthode d'estimation alternative. En conclusion, ce chapitre souligne la nécessité d'une réforme profondeur de la législation foncière dans les anciennes colonies françaises. Les systèmes actuels présentent des lacunes importantes qui freinent l'élaboration de politiques fiscales foncières plus équitables et efficaces.

8.3 Recommandations, limites, et pistes de recherches futures

8.3.1 Principales recommandations

A l'issue de ce travail de recherche, nous pouvons formuler les recommandations suivantes :

(I) Premièrement, la thèse suggère que les pays en développement pourraient tirer parti de leurs processus d'urbanisation pour accroître leurs recettes foncières, à condition de mettre en place des politiques adéquates capables de capter ce fort niveau d'urbanisation. Cela implique de développer le secteur financier, de moderniser le cadastre via une véritable politique de digitalisation et d'adressage des rues pour mieux identifier la base taxable (image satellites, géoréférencemment, cartographie numérique), et de s'appuyer sur un plan d'urbanisme adapté.

(II) Deuxièmement, la thèse recommande aux gouvernements de réviser la législation fiscale encadrant la taxation foncière en accordant une plus grande autonomie de gestion de l'impôt foncier aux collectivités

locales.

(III) Troisièmement, pour une meilleure gestion du foncier et une augmentation des recettes fiscales foncières, les pays d'Afrique Subsaharienne doivent prioriser l'établissement d'institutions robustes capables de définir clairement les droits de propriété. Cette démarche est essentielle pour garantir une meilleure protection des droits de propriété, simplifier l'identification de la base taxable, et atténuer les conflits internes liés à la gestion du foncier.

(IV) Enfin, la thèse suggère que parce que les anciennes colonies françaises collectent, en moyenne, moins de recettes foncières que les anciennes colonies britanniques, elles ont le plus besoin de réviser ou de mettre à jour leur législation fiscale encadrant la gestion du foncier.

8.3.2 Limites de la thèse et pistes de recherches futures

Comme toute recherche, cette thèse n'est pas exempte de limites. La principale contrainte rencontrée est le manque de données au niveau infra-nationales (locales), ce qui a nécessité la réorientation de certains chapitres. L'absence de ces données a constitué un frein majeur à l'analyse économique souhaitée. Ces données auraient permis de mener des études de cas spécifiques, notamment sur la Côte d'Ivoire et le Burkina Faso. Malgré des efforts importants, incluant des démarches administratives et des voyages sur place, il n'a malheureusement pas été possible d'obtenir les données escomptées.

Deuxièmement, les données sur les recettes foncières utilisées donnent le montant global des recettes foncières collectées dans le pays. Il aurait été pertinent de disposer des données distinguant la part des recettes payée par les entreprises et celle payée par les particuliers. Cela nous aurait permis d'appréhender la part de cette taxe supportée par les ménages et celle supportée par les entreprises. Cette distinction est pourtant cruciale pour comprendre l'incidence de la fiscalité foncière sur les différents acteurs économiques. En effet, sans connaître la répartition des recettes foncières entre entreprises et particuliers, il est difficile d'évaluer l'efficacité des politiques fiscales mises en place et de cibler les mesures de manière adéquate. Aussi, des données détaillées sur la composition des recettes foncières par pays s'avère nécessaire pour mieux comprendre les différences de fiscalité foncière entre les pays. Par conséquent, de futures recherches devraient s'orienter vers une collecte de données plus détaillées sur les recettes foncières, et la numérisation des données cadastrales est une piste serieuse pour y parvenir, en particulier pour les pays en développement. Cette numérisation s'avère être un outil clé pour faciliter et optimiser cette collecte de données.

Enfin, notre thèse complète les travaux existants en soulignant le rôle primordial des systèmes politiques et institutionnels dans la mobilisation des recettes foncières. Toutefois, elle adopte principalement une approche macroéconomique. Ainsi, pour de futures recherches, il serait judicieux, dans la mesure où les données le permettent, de réexaminer certains chapitres abordés dans cette thèse en adoptant une

approche microéconomique.

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