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Article

Determinants of Value-Added Tax Revenue Transfers in Municipalities of Emerging Economies

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Abstract: This paper aims to test the hypothesis of the existence of significant tax competition between communes, which mainly concerns the share of value-added tax (VAT) proceeds, by exploring the system for allocating intergovernmental transfers in Morocco and analyzing the determinants of VAT transfers to local authorities. It contributes to fiscal federalism by assessing the design of the decentralized system and intergovernmental transfers. It aims to explore and understand the variables determining decentralization in Moroccan Municipalities over the period 2014–2018, based on institutional, budgetary, and political justifications, as well as their influence on local tax efficiency, highlighting the importance of intergovernmental transfers and their impacts on local government autonomy. We find that VAT revenue transfer antecedents include factors such as public expenditure, fiscal potential, tax effort, and political alignment. The results of this study can help better understand the relationship between VAT and economic variables and guide government tax policies in an emerging economy. This paper offers original perspectives on the importance of an informed vision for government decision-makers to develop effective tax policies considering stringent local budget constraints, the need for VAT revenue autonomy across levels of government, and the need for meeting the redistributive goals of the current VAT system.



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Keywords: tax policy; value-added tax transfer; redistribution; fiscal transfer; emerging economies; tax revenue; tax reform

1. Introduction

Policymakers and academics have recently expressed a strong interest in bolstering fiscal capacity (Akitoby et al., 2020) and examining the distributive power of pursuing redistributive taxes of various VAT systems (Lanterna & Liberati, 2024). For the purpose of improving tax systems and fostering economic growth, scholars are interested in VAT because of its potential to produce large amounts of revenue with minimal administrative and financial expenses (Heinemann & Stiller, 2025; Al Mazroui et al., 2023). Recently, there has been an increased focus in the literature on tax reform in developing economies, with a special focus on Africa (Onana & Mamoho, 2025; Kamasa et al., 2025; Caldeira et al., 2019; Eloundou et al., 2025). Specifically, it has been recognized that broadening the tax base for direct and indirect taxes is frequently used in different countries (Akitoby et al., 2020). The G20 leaders in 2010 highlighted the importance of strengthening fiscal capacity, calling on the IMF and development institutions to monitor revenue mobilization efforts, while UN members collectively recognized the need to increase tax revenues to finance sustainable

development goals by 2030 (Akitoby et al., 2020). The main source of tax income in Africa in 2021 was taxes on goods and services, which accounted for an average of 51.9% of total tax receipts. Of these, 27.8% came from VAT (Benkejjane et al., 2024).

VAT is a major consumption tax that is implemented in more than 130 countries, including many low-income countries (Keen, 2008), due to its critical role in fostering economic redistribution, poverty alleviation, and social cohesion (Alshira'h et al., 2025). It has become a major source of indirect taxes in many countries (Gonzalez-Martel et al., 2021). The Moroccan state's tax revenues come from several taxes. According to Benkejjane et al. (2024), the VAT, corporate income tax (CIT), income tax (IR), and registration fees constitute the main tax revenues, with an average of 26.53% for VAT revenues between 2000 and 2020.

The evolution of Morocco's tax system highlights the multiplication of tax expenditure and its importance in VAT, followed by corporate income tax, registration and stamp duties, and income tax (Jalal et al., 2022). According to Salhi and El Aboudi (2021), Morocco's VAT has increased dramatically in comparison to other taxes, accounting for an average of 8.75% of GDP. Tax revenues have also increased as a result of recent tax reforms. The COVID-19 crisis has accelerated these reforms of the Moroccan tax system to catch up on accumulated delays in economic policies (Benkejjane et al., 2024). For example, Dvorak (2021) examined the economic assistance programs that Lithuanian local governments put in place during COVID-19, emphasizing their readiness to provide exemptions from a range of fees and taxes. According to Vidican Auktor and Loewe (2022), Morocco upheld its social contract between 2010 and 2017 by eliminating the majority of subsidies, defending the need for reforms, and putting compensatory measures in place. Thus, in the interaction between the national and local governments, transfers are essential. Although Moroccan municipalities have become more dependent on transfers from the central government, the literature on fiscal incentives emphasizes the influence of transfer system design on local government behavior in decentralized systems (Brun & El Khdari, 2016). Sector-specific tax expenditure data reveal that the real estate industry receives the highest share, with the energy, tourism, and printing and publishing industries following closely behind (Jalal et al., 2022).

Since 1996, Morocco has allocated a share of VAT to municipalities, prefectures, and provinces according to a formula that attempts to take account of their fiscal capacity. These transfers aim to reduce both vertical and horizontal imbalances and provide incentives for municipalities to improve their revenue mobilization. Previous studies have supported the critical role of intergovernmental transfers of tax revenues between the upper levels of central government and the lower levels (El Khdari, 2017). According to this viewpoint, VAT has been and continues to be the main focus of tax reform as a means of raising public funds in many developing nations (Gómez-Antonio et al., 2022), it is controversial, and its introduction has encouraged business informality (Morrow et al., 2022). Furthermore, governments everywhere must contend with intense international competition that hinders the establishment of new companies and the luring of investment, which serves as the primary source of tax revenue (Nguyen et al., 2022). Overly complicated tax systems can deter investors and entrepreneurs from participating in the formal economy and cause them to pass up opportunities completely (Nguyen et al., 2022). As a result, tax complexity is a growing concern among policymakers and has gradually become the focus of tax system reform worldwide (Nguyen et al., 2022).

For this reason, several recent studies question the effectiveness of VAT in this context (Keen, 2008). In Morocco, according to Salhi and El Aboudi (2021), government revenues, mainly corporate income tax and VAT, are declining because of the slowdown in corporate sales. Specifically, it is argued that inflation has a positive impact on tax revenues, with a 1% increase in inflation leading to a 0.707% decrease in VAT (Salhi & El Aboudi, 2021).

According to Akitoby et al. (2020), internal resource mobilization represents a critical lever for developing countries. Improved tax revenue mobilization is essential if governments are to create fiscal space to fund public investments and services; however, tax revenue mobilization efforts can be hampered by financial crises, such as the 2007–2008 global crisis, even for developed countries (Akitoby et al., 2020). Moreover, the tax policies observed in developing countries are confusing in many ways, given the marked contrast between these policies and those observed in developed countries and those predicted in the literature on optimal taxation (Gordon & Li, 2009). Thus, the relation between central transfers and incentives created may vary across countries. This mixed reality justifies the current interest in the literature in the association between intergovernmental transfers and local fiscal efforts, yet with more extensive interest in developed countries than developing ones. In the empirical literature, very little empirical research has been carried out in developing countries due to the lack of non-aggregated and detailed statistical data.

This paper aims to address several key research objectives. First, it seeks to fill an important gap in the literature by investigating Morocco's intergovernmental transfer system, specifically the allocation of VAT revenues to local governments, especially municipalities. This research is timely, given Morocco's ongoing decentralized governance process as a result of the advanced regionalization reform introduced by the 2011 Constitution, which demonstrates the country's broader economic and social transformations. Second, the study looks at how VAT transfers affect local government decision-makers' behavior within the context of decentralized governance. It investigates the function they play in raising local revenues and optimizing resource allocation in order to improve public services and increase the efficiency of public spending. This study clarifies the mechanisms underlying VAT transfer distribution and their broader implications for regional governance.

Furthermore, this study aims to address the following research questions about value-added tax (VAT) transfers by positioning our paper within the Moroccan advanced regionalization process:

- (1) What impact do tax effort and fiscal potential have on how value-added tax (VAT) transfers are distributed among Moroccan municipalities?
- (2) Does the distribution of VAT shares among Moroccan municipalities depend on the political alignment between the central and local governments?
- (3) To what extent do demographic factors, such as population size and level of public spending, influence VAT allocations across Moroccan municipalities?

To this end, disaggregated data on revenue and expenditure, as well as other fiscal variables, were collected and calculated after being collected from the communes concerned, and sometimes via the local branches of the Kingdom's General Treasury (TGR). Population census data were provided by the *Haut-Commissariat au Plan* (HCP, 2014). Data on spatial variables were collected from local authority monographic data. Finally, political data were provided by the Ministry of the Interior with information on the 2015 local elections and the 2016 general legislative elections. This VAT share considers the fiscal choices of competing communes in terms of the construction tax and the patent tax.

By introducing spatial variables, we seek to measure the extent of spatial tax interactions as a function of the urban (proximity to the center)–rural (non-proximity to the center) gradient, within different provinces of the Souss-Massa region. Data analyses for this study were conducted using STATA 14. Econometric analysis was employed to ensure model robustness, aligning the results with economic theory. In order to estimate the factors that influence VAT transfers to Moroccan municipalities, this study models tax transfers in relation to four primary explanatory variables: political alignment, public spending, tax effort, and fiscal potential, all while adjusting for population size. The findings indicate that all of the major variables are statistically significant, with political alignment and tax

effort demonstrating especially high explanatory power at the 0.05 level of significance, highlighting their impact on transfer allocations.

This article, thus, provides an important basis for understanding the complex mechanisms governing relations between different levels of government, highlighting the critical nuances involved in devising fiscal policies aimed at alleviating economic and social disparities within a given society. Particular attention is paid to determining the optimal level of government for the redistributive function, highlighting its importance for the effective implementation of fiscal policies aimed at combating inequalities between decentralized levels of government. This research has shown that local authorities, which are less dependent on transfers and for which a significant proportion of revenue is made up of their own income, tend to provide a better range of services to citizens. The study revealed that this competition is stronger in neighboring areas than in areas far from the center of provinces in the Souss-Massa region.

This paper is organized as follows: Section 2 investigates the theoretical and empirical literature, while Section 3 discusses the methodology and econometric approach. Section 4 includes the empirical analysis, results, and discussion. Finally, Section 5 addresses theoretical, managerial, and policy implications as well as limitations and recommendations for future studies.

2. Literature Review and Hypothesis

Belcaid's (2022) study focuses on the sustainability of public finances regarding economic growth in Morocco for the period 1987–2019 by exploring the relationship between the size of the state, the level of fiscal discipline, and economic growth. He concluded that Morocco is in a relatively prudent fiscal position with recessionary effects on growth (Belcaid, 2022). This issue has attracted widespread public interest and policymaker attention in Morocco, particularly after the 2008 financial crisis and during the COVID-19 pandemic (Belcaid, 2022). For example, the disciplinary procedures used by regulatory bodies during COVID-19 promoted logical collaboration through response activities and public health initiatives (Ed-Dafali et al., 2022). El Khalifi et al. (2024) examine welfare changes at various tax rates and alternative spending policies in Morocco and discover that altering the tax composition while maintaining tax revenues can increase productivity.

In the same vein, the evolution of taxes as a percentage of GDP between 1985 and 2019 shows a significant increase in tax pressure on taxpayers (Salhi & El Aboudi, 2021). Ghiaie et al. (2019), using Morocco as a case study, aim to aid in the design of tax reform strategies in emerging economies. They conclude that raising tax revenues through various tax incentives for investment and entrepreneurship helps to create fiscal space for social spending and investment, which makes the progressive tax system stimulating growth, equity, and welfare.

Given its critical importance as a source of revenue for Morocco's public budget, numerous VAT reforms have been launched to transform it into an instrument of equity and redistribution. The literature distinguishes between two types of redistribution: tactical redistribution and targeted redistribution (Onana & Mamoho, 2025; Cole, 2009). Bungey et al. (1991) and Bradbury and Stephenson (2003) show that political proximity between central and local government increases central government support, and, hence, the level of transfers. For instance, previous studies showed a high proportion of VAT transfers between aligned local municipalities and central government (Cox & McCubbins, 1986; Lindbeck & Weibull, 1987; Dixit & Londregan, 1996). In a comparative analysis of 12 nations, Boex and Martinez-Vazquez (2004) discover that higher levels of political support for the central government in a region are nearly always accompanied by higher per capita transfers. The VAT is the primary source of funding for Morocco's state and local authority budgets,

accounting for 70% of indirect tax revenues and 36% of total tax revenues on average over the past ten years, according to [Bettah et al. \(2022\)](#). For this reason, since 2005, efforts have been made to modernize this tax, with the specific goal of combining the progressiveness and neutrality of the VAT through the restructuring of its various rates: 0% for necessities, 10% for mass-market goods, 20% as the standard rate, and a higher rate for luxury goods ([Bettah et al., 2022](#)). In this sense, China has implemented a series of important tax reforms, of which the reduction of the input VAT is a central decision and whose main objective is the VAT refund, which is a crucial measure to promote the modernization of fiscal governance ([Li & Bai, 2024](#)). This reform is aimed at and significantly promotes the green transformation of enterprises by further optimizing the allocation of resources in enterprises and their modernization ([Li & Bai, 2024](#); [Kobiyh & Ed-Dafali, 2024a](#)).

The case of China shows that the policy of reducing VAT rates can serve as an important tool for adjusting the maturity structure of corporate investment and financing, as well as for preventing corporate financial risks ([Zhao et al., 2024](#)). From the perspective of political economy and public choice theory, municipalities may be motivated by a desire to maximize their power and budget, rather than seeking to maximize the well-being of taxpayers ([Buchanan & Wagner, 1977](#); [Tullock, 1965](#)). Regarding transfer mechanisms, [Miri \(2019\)](#) points out that they vary from country to country and combine two aspects: conditional transfers, which are selective, and unconditional transfers, which are fixed. [Brun and El Khdari \(2016\)](#) explain that transfers between municipalities are differentiated into general-purpose transfers (unconditional) and specific-purpose transfers (conditional or earmarked). Unconditional transfers are allocated unconditionally to local expenditure. This type of transfer is provided in the form of budget support, which increases the financial resources of local government and, thus, relaxes its budget constraints, aiming to provide a stable source of revenue, which helps make local government budgets predictable.

Conditional transfers, on the other hand, finance specific projects aimed at stimulating spending in specific areas and can be matching or non-matching ([Brun & El Khdari, 2016](#)). Conditional transfers are used to invest in financing investment projects in infrastructure, social and urban development, and environmental protection. This makes local governments highly dependent on the central government, which can compromise their fiscal autonomy and ability to plan local policies. In some countries, VAT transfers depend on capacity and need ([Miri, 2019](#)). [Brun and El Khdari \(2016\)](#) use municipal data from 2005 to 2009 to study fiscal federalism in Morocco. They show that unconditional central government transfers have a favorable effect on local revenue mobilization, with a stronger incentive effect for unconditional transfers and a smaller effect for conditional transfers. In Morocco, conditional transfers account for 10% of local revenues, while unconditional transfers account for 29% ([Brun & El Khdari, 2016](#)).

According to [Miri \(2019\)](#), unconditionally transferred revenues, which are primarily VAT transfers, account for a sizeable portion of local authority budgets and are intended to lessen regional disparities. They made up 60% of total local authority revenues in 2014, amounting to 20 billion dirhams, as opposed to 7.8 billion in 2002, which represents an average annual growth rate of 8.2%. Based on data from local authorities (regions, provinces, prefectures, communes) grouped by region, [Miri \(2019\)](#) analyzed the relationship between transfers and local revenues in Morocco as a developing country over the period 2002–2014. He took into consideration the effects of transfers on total revenues to study the endogeneity effect of transfers by distinguishing regions according to their wealth and the political affiliation of local authority presidents, emerging that intergovernmental transfers can be considered as a kind of exceptional resource that reduce the willingness of local authorities to improve their taxation ([Miri, 2019](#)). Thus, social welfare gains can

be achieved by keeping lump-sum transfers constant, increasing public investment, and reducing public consumption (El Khalifi et al., 2024).

The incentive components of Morocco's tax system, specifically tax expenditure, and its economic efficiency were investigated by Jalal et al. (2022). They discovered that the real estate, automotive, and chemical industries show comparatively high efficiency and substantial returns on tax expenditures. According to Bird and Smart (2002), the redistributive effect can be strengthened, and impoverished areas can benefit by adding an effort correction to tax transfers (comparing actual to potential revenues). This is due to the fact that less wealthy regions are able to impose comparatively higher taxes than wealthier ones. Even in developed countries, where local authorities are expected to play a major role in the provision of social services, they inevitably rely heavily on central budget transfers to do so (Bird & Smart, 2002). An increase in government subsidies or transfers leads to a greater increase in local government spending than an equivalent increase in local income. This effect has been studied in the context of regional autonomy and decentralization in various countries, including Morocco (El Khdari, 2017).

The importance of intergovernmental transfers lies in their impact on local government spending decisions. A negative effect of transfers appears when they are used to bail out local governments in financial difficulty, particularly in the context of informational asymmetry and moral hazard (Pisauro, 2001; Kornai, 2008). Although intergovernmental transfers can raise local spending and income, Miri (2019) contends that, because they are viewed as exceptional resources, they may lessen local governments' motivation to enhance taxation. He maintained that transfers, such as shares of VAT, IS, and IR, account for a sizeable amount of the operating and total income of Moroccan local governments. For instance, Rosen (1978) points out that tax expenditures have the same economic effect as direct budgetary spending, as they both represent financial transfers from the state to individuals or firms.

According to Brun et al. (2009), the effect of aid on tax effort varies depending on institutional strength, with a negative influence in poor institutional settings and a favorable effect in developing nations with stronger institutions. Indeed, in a study on the tax effort in Sub-Saharan African countries, Caldeira et al. (2019) found that, excluding natural resource revenues, tax revenues average 13.2% of GDP, with fiscal effort at 0.57, meaning Sub-Saharan African countries could reach 23% of GDP by fully utilizing their fiscal potential. Particularly, revenue collection is dependent on the tax effort exerted by tax administrations in response to decision-makers' policies (Brun & Diakite, 2016). From the African perspective, Chigome and Robinson (2021) show that trade openness, economic growth, and financial deepening affect tax capacity, whereas inflation and corruption affect tax effort. Their results suggest that tax efforts in Southern African countries are more transient than persistent.

The design of efficient tax transfers is essential to ensure the effective delivery of public goods and services at the local level and to ensure national goals of equity and efficiency. Governments can therefore use VAT revenues to finance social spending. According to Delalibera et al. (2024), a revenue-neutral tax reform that removes VAT rate dispersion increases GDP by 5.99% in Brazil, where VAT rates range from 33.76% (for tobacco) to almost zero (for certain service sectors).

Similarly, Nguyen et al. (2022) examine the competitiveness of different tax systems to assess the performance of 88 countries' tax systems over the period 2005–2016 through the simplification of tax procedures and suggest that Norway is the easiest tax system to implement and one that policymakers should seek to emulate to improve the effectiveness of tax simplification. According to Nguyen et al. (2022), other countries that could be considered as possible benchmarks include Singapore, Ireland, and Estonia. This study

reveals the positive impact of certain factors linked to the macroeconomic environment on tax simplification performance, consolidating and validating the overview of the tax competitiveness of these tax systems (Nguyen et al., 2022). Martínez et al. (2022) investigated the relationship between fiscal decentralization variables and technical efficiency by looking at a sample of 28 OECD nations between 2004 and 2017. The findings demonstrate that the level of fiscal decentralization significantly and favorably affects the technical efficiency of tax collection. They also highlighted the importance of tax structure decisions and the indirect tax ratio.

According to Ofori et al. (2022), using ICT increases indirect tax revenues through VAT and direct tax revenues through personal income tax. This advancement is aided by tax compliance, government efficiency, and corruption control. According to Keen (2008), the challenges of tax design for developing nations are significantly shaped by the inclusion of input VAT and withholding tax. Similarly, Flores-Macías (2018) investigates how political support for tax reforms in Mexico is influenced by specific aspects of tax design, such as civil society oversight and the distribution of tax revenues. By reducing uncertainty about the benefits of tax reforms, tax design features will make taxes less unappealing to the general public, and elected officials will feel less intimidated by expanding tax resources (Flores-Macías, 2018).

Based on this theoretical foundation, the research methodology will empirically test the four hypotheses that investigate the factors influencing VAT revenue transfers in Morocco:

- H1.** *VAT transfers to Moroccan municipalities are negatively impacted by fiscal potential (PF).*
- H2.** *VAT transfers have a positive relationship with tax effort (EF).*
- H3.** *There is a positive relationship between VAT transfers and public expenditure levels (DEP).*
- H4.** *The amount of VAT transfers is increased when the central and local governments have political alignment (ALPOL).*

Through these hypotheses, our paper aim is to investigate empirically the distribution of VAT revenues and assess the effect of these transfers on fiscal disparities, local tax effort, and the temporal evolution of transfers at the local level.

3. Data and Methodology

3.1. Data

To investigate our research questions, we used the panel data analysis approach. This approach has received much attention in recent years, particularly in fiscal discipline (Olaide et al., 2025; Obeng & Aazam, 2025), because it accounts for both the effect of time changes and the differences between cross-sectional units that are inherent in the study sample. Specifically, a panel data analysis is used to find robust results (Singh et al., 2024) since it provides more variability than cross-sectional or time-series data (Zhu et al., 2023). It captures both individuality and dynamics, allowing for control over invisible aspects.

This methodology allowed us to investigate dynamic economic relationships (Nerlove, 2006) and produce more precise forecasts, which in turn led to a more accurate behavior analysis (Hsiao, 1974).

3.2. Model Specification and Testing

To evaluate the distribution of the VAT in Morocco, focusing on the communes of the Souss Massa region municipalities, our study aims to investigate the following function:

$$PTVA(Y) = f(EF, PF, POP, ALPOL, DEP) \quad (1)$$

In short, the model can be written in its general form with all explanatory variables (X_i, t) as follows:

$$Y_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it} \quad (2)$$

with: $t = 1, 2, 3, \dots, T$; and $i = 1, 2, 3, \dots, T$;

Y_{it} : represents the VAT share of a commune “i” in period “t”;

β parameters are to be estimated for each independent variable;

X_{it} : the independent variables explaining value-added tax revenue transfers between communes in the Souss-Massa region, commune i, during the period t (2014–2018);

ε_{it} = The random error term for commune i in period t.

In light of the sample used in the analysis, the previous function is rewritten according to the following formula:

$$PTVA_{it} = \alpha_i + \beta_1 PF + \beta_2 DEP + \beta_3 EF + \beta_5 ALPOL + \beta_6 POP + \varepsilon_{it} \quad (3)$$

3.3. Sample of the Study

The sample on which this empirical study will be conducted is made up of 175 different communes, which were selected according to the availability of data for the variables throughout the study period, to diversify the sample. This sample contains 175 communes in the SOUSS-MASSA region over the period from 2014 to 2018.

The data used to estimate the econometric model are annual data for the period 2014–2018, while the main source of data for this variable comes from the statistics of the Cours des Comptes.

3.4. Definition of Variables

The VAT share (PTVA) is the dependent variable of interest of this study. This variable represents a legal resource for local authorities in Morocco. Thus, local authorities' share of VAT proceeds is used to finance their local activities and projects. For the aim of this study, this variable is obtained based on a percentage of the VAT revenue collected by the Moroccan State, and this percentage e is determined each year by the Finance Act. However, this endowment can vary from year to year, depending on the VAT revenues collected all local authorities in Morocco benefit from a stable and equitable source of funding. However, if Moroccan government revenues are higher than forecast, the local authorities' share of VAT proceeds can be increased. Conversely, if revenues are lower than forecast, this share may be reduced. This uncertainty in VAT revenues can have an impact on local authorities' ability to finance their projects and local activities.

The independent variables of interest include public expenditure (DEP), population (POP), fiscal potential (PF), tax effort (TE), and political alignment (ALPOL). Data regarding these variables were handily collected at the micro level (individual municipalities) over the period of interest. Specifically, disaggregated data on revenue and expenditure as well as other fiscal variables were indeed collected and calculated after being collected from the communes concerned, and sometimes via the local branches of the Kingdom's General Treasury (TGR). Population census data (HCP, 2014) were provided by the Haut-Commissariat au Plan (HCP). Data on spatial variables were collected from local authority monographic data. Finally, political data were provided by the Ministry of the Interior with

information on the 2015 local elections and the 2016 general legislative elections. This VAT share considers the fiscal choices of competing communes in terms of the construction tax and the patent tax.

On the one hand, Fiscal potential is calculated by the Direction Générale des Impôts (DGI) of the Ministry of Economy and Finance of Morocco. The calculation of tax potential considers several criteria, such as the surface area of the municipality, the cadastral rental value of the real estate, the number of households, and population density. The ratio of tax revenues to Morocco's GDP, on the other hand, indicates the tax effort, which is the percentage of tax income in relation to national wealth. A binary variable is used to measure political alignment; it is given a value of one when the central government's ruling party is the same as the party that won the most recent municipal elections' absolute majority, and zero otherwise. Table 1 presents the list of variables along with their definitions.

Table 1. Definition of variables.

Variables	Descriptions	Measurement and Sources	Suggested References
Dependent variable			
PTVA	value added tax sharing	Collected from communes and local branches of the Kingdom's General Treasury (TGR).	Omodero (2022)
Independent variables			
PF	Fiscal potential	"Fiscal potential" is calculated by the <i>Direction Générale des Impôts</i> (DGI) under the Ministry of Economy and Finance of Morocco.	Mawejje and Sebudde (2019)
EF	Tax effort	"Tax effort" is defined as the percentage of tax income relative to national wealth.	Piancastelli and Thirlwall (2021)
DEP	Public expenditure	Disaggregated data on revenue, expenditure, and other fiscal variables were collected from communes and local branches of the Kingdom's General Treasury (TGR).	Alsharari et al. (2023)
ALPOL	Political alignment	Dummy variable that takes the value 1 if the ruling party also holds the municipal majority, and 0 otherwise. "Political alignment" is based on Ministry of the Interior data from the 2015 local and 2016 legislative elections.	Kitsos and Proestakis (2021)
Control variable			
POP	Population	Population statistics can be accessed through the official website of the Moroccan Haut Commissariat au Plan (HCP). https://www.hcp.ma (accessed on 9 March 2025).	Ferraz et al. (2023) and Okunogbe and Tourek (2024)

4. Results and Discussion

4.1. Descriptive Statistics

The descriptive statistics for the variables share of VAT revenue (PTVA), tax effort (EF), total expenditure (DEP), population (POP), political alignment (ALPOL), and tax potential (PF) are presented in Table 2.

Table 2. Descriptive statistics of all variables.

	Observations	Mean	Median	Maximum	Minimum	Jarque–Bera	Probability
PTVA	875	5,327,408	3,301,000	1.39×10^8	1,271,000	219,116.9	0.000000
PF	875	3,314,484	11,547.56	7.57×10^8	0.000000	4,379,122	0.000000
EF	875	2,780,771	286,024.6	2.45×10^8	24,810.08	750,806.8	0.000000
DEP	875	15,402,676	5,244,302	1.12×10^9	1,540,284	1,140,616	0.000000
ALPOL	875	0.537143	1.000000	1.000000	0.000000	145.8513	0.000000
POP	875	15,407.72	6584.000	421,848.0	1164.000	209,927.4	0.000000

This table presents the descriptive statistics for the main variables, including fiscal potential (PF), tax effort (EF), public expenditure (DEP), political alignment (ALPOL), and population (POP). The statistics reported include the mean, median, maximum, minimum, Jarque–Bera test statistic, and its associated probability value, assessing the normality of the data. Source: Authors’ calculation.

From 2014 to 2018, the average VAT distribution rate was 5,327,408 dirhams. The rural commune of LAKHNAFIF recorded the minimum value of 1,271,000 dirhams, while the urban communes of Agadir and Old Teima had maximum values of 138,821,000 dirhams and 63,998,000 dirhams, respectively. This highlights the disparities in VAT distribution between rural and urban areas revealed in previous studies (Zerwer, 2024), confirming the gap between rural and urban development (Njoya et al., 2025). The Jarque–Bera test results suggest that the exogenous variable, the share in VAT proceeds (PTVA), and all explanatory variables (DEP, PF, EF, POP, ALIPOL) follow a normal distribution, supporting the validity of the normality assumption and reinforcing the reliability of the statistical analysis. This variation in VAT distribution and public expenditure highlights the importance of considering economic, demographic, and fiscal factors when formulating tax reforms and policies to promote equitable resource allocation.

From Table 3, we note the presence of a strong and statistically significant correlation between the following variables: the share of VAT revenue (PTVA) and tax effort (EF), as well as public expenditure (DEP), with correlation coefficients of 69.16% and 69.80%, respectively; tax potential (PF) and tax effort (EF), with a correlation coefficient of 83.93%; and tax effort (EF) and public expenditure (DEP), as well as population size, with correlation coefficients of 92.90% and 88.55%, respectively.

Table 3. Correlation matrix.

	PTVA	PF	EF	DEP	POP	ALPOL
PTVA	1.00000					
PF	0.50699	1.00000				
EF	0.69168	0.83939	1.00000			
DEP	0.69803	0.77635	0.92909	1.00000		
POP	0.77254	0.75467	0.88555	0.91295	1.00000	
ALPOL	0.15279	0.08309	0.09859	0.12122	0.13852	1.00000

This table shows the Pearson correlation coefficients between fiscal potential (PF), tax effort (EF), public expenditure (DEP), political alignment (ALPOL), and population (POP). Source: Authors’ calculation.

4.2. Model Specification and Estimation

Model specification consists of choosing from among three specifications the one that best describes the observed data:

- grouped regression model;
- fixed-effects model or least-squares dummy-variable model (VMMC or LSDV model);
- random effects.

4.2.1. Grouped Regression Model

In this regression model, we neglect the panel structure and group all observations together and then we run the regression using the OLS method. The problem with this model is that it does not take into account the heterogeneity between individuals (communes); in other words, by grouping the 175 communes by pooling, we deny the individual heterogeneity that may exist between them. In effect, insofar as observations have been pooled, we conceal the heterogeneity or individuality that exists between variables. This model assumes that the data behavior of individuals is identical in different periods, and its estimation is based on the use of the ordinary least squares (OLS) approach or the least squares technique (see Table 4).

Table 4. Estimates of the pooled regression model.

Dependent Variable: PTVA				
Method: Panel Least Squares/Total Panel (Balanced) Observations: 874				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2,072,351	282,228.1	7.342823	0.0000
PF	−0.072766	0.009908	−7.343945	0.0000
EF	0.175640	0.033954	5.172883	0.0000
DEP	−0.020391	0.009420	−2.164707	0.0307
ALPOL	849,521.2	371,076.6	2.289342	0.0223
POP	186.0067	12.22940	15.20980	0.0000
R-squared = 0.824079		Adjusted R-squared = 0.811914		
F-statistic = 288.1995 (prob = 0) Durbin–Watson stat = 0.759800				

This table reports the pooled regression results analyzing the determinants of VAT transfers to Moroccan municipalities. Explanatory variables include fiscal potential (PF), tax effort (EF), public expenditure (DEP), and political alignment (ALPOL), with population (POP) as a control variable. Source: Authors' calculation.

With an R-squared of 0.824079, the independent variables (DEP, ALPOL, EF, PF, POP) explain 82.41% of the variation in the dependent variable (PTVA). This measure is refined by the adjusted R-squared (0.811914), and the significance of the model is confirmed by the F-statistic of 288.1995 ($p = 0$). This F-value must be compared with the F-table; however, to make it easier, we use the Prob value directly (F-statistic). If the p -value is below the critical limit, it means that the simultaneous influence of the predictor variables on the exogenous variable is statistically significant. If the p -value is above the critical limit, then we accept the null hypothesis (H_0), meaning that there is no simultaneous influence of the predictor variables. In our case study, the F-statistic value is equal to 22.48572 and the Prob value (F-statistic = 0) is less than 5%, i.e., there is a simultaneous influence of the explanatory variables (DEP, ALPOL, EF, PF, POP) on the dependent variable (PTVA).

According to the estimation results obtained, all the coefficients of the variables (DEP, ALPOL, EF, PF, and POP) are significantly non-zero, their p -values are below 5%, and their sign is compatible with economic theory. In fact, the existence of all null coefficients as well as the R^2 and Durbin Watson are significant, indicating a good specification of the model. Consequently, the estimated coefficients are consistent and reliable, and the individuals

(the communes) are homogeneous; we can, therefore, conclude that the pooled regression model could be appropriate for our estimation.

4.2.2. The Fixed-Effects Model (LSDV Model)

The term fixed effect is due to the fact that although the intercept may differ from one country to another, it does not vary over time, but is constant. The fixed-effects model, unlike the common-effects model, accounts for individual differences using varying intercepts while still relying on ordinary least squares. It employs the least squares dummy variable (LSDV) or within estimator to capture these variations. Individual heterogeneity among the 175 communes is captured by the fixed-effects model (LSDV), which allocates a unique intercept to each commune.

These estimation models are often referred to as the dummy variable technique of least squares, or LSDV for short. Thus, the fixed-effects model allows us to know the time-invariant differences between individuals, so that its estimation must not be distorted by the neglect of time-constant characteristics.

Stock and Watson (2012) point out that if the unobserved variable does not change over time, any change in the dependent variable must be due to influences other than the fixed characteristics. One of the characteristics of a fixed-effects model is that it cannot be used to study time-invariant causes of dependent variables. In other words, you cannot obtain a good estimate of slowly changing variables in the fixed-effects model. Another feature of this model is that it requires too many degrees of freedom, leading to uncertain estimations.

Fixed-effects models, which use variations in the constant term to explain differences between units, are inappropriate when error terms are correlated. They analyze within-entity changes under the assumption that time-invariant characteristics are distinct and uncorrelated with others. To estimate the model's coefficients, we use the ordinary least squares (OLS) method, known as the LSDV (least squares dummy variable) or within estimator. This method takes into account the within-group variance of the explanatory variables by introducing dummy variables.

The fixed-effects model showed significant improvement in predictive capacity, with a coefficient of determination (R^2) of 0.851846 (See Table 5). The fixed-effects model outperforms the pooled regression ($R^2 = 0.824079$) and random-effects models ($R^2 = 0.524101$), demonstrating its superior explanatory power. The findings emphasize the fixed-effects model's robustness, demonstrating that controlling for unobserved municipal differences significantly strengthens the explanation of VAT revenue distribution, particularly in the context of Morocco's decentralized governance and diverse social and economic factors across communes.

Table 5. Estimates of the fixed-effects model.

Dependent Variable: PTVA		Method: Panel Least Squares		
Cross-Sections Included: 175 Total Panel (Unbalanced) Observations: 874				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.94×10^8	3.74×10^9	-0.239060	0.8111
PF	-0.003571	0.007792	-0.458284	0.6469
EF	0.335788	0.035072	9.574124	0.0000
DEP	0.004859	0.008369	0.580614	0.5617
POP	58,229.05	242,400.8	0.240218	0.8102
R-squared	0.851846	Mean dependent var		5,330,418
Adjusted R-squared	0.813901	S.D. dependent var		8,794,187
F-statistic	22.44979	Durbin-Watson stat		1.454756
Prob(F-statistic)	0.000000			

This table presents the fixed-effects regression results assessing the impact of fiscal potential (PF), tax effort (EF), public expenditure (DEP), and political alignment (ALPOL) on VAT transfers to Moroccan municipalities, controlling for population (POP). Source: Authors' calculation.

It is important to observe that only one variable, tax effort (H2), has a statistically significant coefficient, according to the fixed-effects model's estimation results. In contrast, the estimation results from the random effects model indicate that all independent variables, including tax potential (H1), tax effort (H2), public expenditure (H3), and population size (control variable), are statistically significant, supporting the robustness of our initial assumptions relationships in explaining VAT revenue distribution.

4.2.3. The Random-Effects Model

The random-effects model, which uses error terms to capture differences, makes the assumption that entity variation is random and uncorrelated with independent variables. According to [Greene \(2019\)](#), the correlation of unobserved effects with model estimators is the primary difference from fixed effects.

The use of the random-effects model eliminates heteroscedasticity, and enables the estimation of variables that are constant over time, unlike the fixed-effects model, where the intercept absorbs all these variables over time.

4.2.4. Model Assumptions

Random effects assume that the entity error term is uncorrelated with the dependent variable, allowing time-invariant variables to play a role as explanatory variables ([Hsiao, 1986](#)). In this, we proceed to specify individual characteristics that may influence the explanatory variables; however, some variables may not be available, resulting in an omission of variable bias in the model.

The negative fiscal potential coefficient ($PF = -0.044392$), which indicates that municipalities with weaker finances receive higher VAT payments, supports H1. H2 is validated because tax effort ($EF = 0.183665$) has a positive effect on transfers and demonstrates that better-performing municipalities are rewarded. The negative coefficient for public spending ($DEP = -0.022573$) supports H3, implying that municipalities with higher spending may be perceived as requiring fewer transfers.

Given that political alignment ($ALPOL = 897,217.3$) significantly increases transfer amounts, indicating political favoritism, H4 is strongly supported. Finally, a sizable positive population coefficient ($POP = 166.7733$) supports the importance of controlling for population when implementing fiscal policies, emphasizing the significance of demographic demand in transfer distribution.

4.2.5. Inferential Statistics for Hypothesis Testing

The random-effects model has an R^2 value of 0.524101, indicating that the independent variables account for 52.41% of the variability in the dependent variable. This finding suggests that there are other factors not taken into account by the model that contribute to the variability of the dependent variable. The F-statistic, showing a value of 19.11835, is associated with a Prob (F-statistic = 0) of less than 5%. This finding indicates that there is a significant simultaneous influence of the explanatory variables on the exogenous variable. In other words, the combination of all the explanatory variables has a statistically significant overall impact on the dependent variable.

From Table 6, we observe that the values associated with all the variables, i.e., DEP, ALPOL, EF, PF, and POP, are below 5%, which implies that they are significantly non-zero at the 5% threshold. This result highlights the importance of the independent variable of our model in explaining the variation of our main dependent variable, PTVA.

Table 6. Estimation of the random effects model.

Dependent Variable: PTVA/Periods Included: 5/Panel EGLS (Cross-Section Random Effects)				
Cross-Sections Included: 175/Total Panel (Unbalanced) Observations: 874				
Swamy and Arora Estimator of Component Variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2,260,503	289,407.8	7.810788	0.0000
PF	−0.044392	0.007280	−6.097646	0.0000
EF	0.183665	0.026462	6.940843	0.0000
DEP	−0.022573	0.007020	−3.215437	0.0014
ALPOL	897,217.3	382,408.2	2.346229	0.0192
POP	166.7733	11.57882	14.40331	0.0000
R-squared	0.524101	Mean dependent var		3,626,320
Adjusted R-squared	0.521360	S.D. dependent var		6,540,620
S.E. of regression	4,525,236	Sum squared resid		1.78×10^{16}
F-statistic	19.11835	Durbin–Watson stat		0.945006
Prob(F-statistic)	0.000000			
Sum squared resid	2.58×10^{16}	Durbin–Watson stat		0.652232

This table shows the random-effects regression results examining the influence of fiscal potential (PF), tax effort (EF), public expenditure (DEP), and political alignment (ALPOL) on VAT transfers to Moroccan municipalities. Population (POP) is included as a control variable. **Source:** Authors' calculation.

As a result, each of these variables makes a substantial contribution to the explanation of the variations seen in VAT transfers, and the estimation results support the validity of the conclusions derived from the model. Important information about the model's quality, its capacity to explain the dependent variable's variability, and the relative contributions of each dependent variable in this regard are provided by this thorough analysis.

These findings provide a solid foundation for an informed interpretation of the underlying relationships, as well as for guiding future model adjustments or improvements. It is, therefore, necessary to use the Hausman test to evaluate the relevance of this model. This test allows us to select between a fixed-effects model and a random-effects model in order to determine whether existing individual specificities are stable or random. Nevertheless, before performing the Hausman test, we will estimate the random-effects model. In our research, we used the Hausman test to determine the relevance of the chosen model (Hausman, 1978). As prior studies have suggested, this test is critical because it allows us to determine whether a fixed-effects or random-effects model has greater potential for the structure of our data. Before beginning to apply the Hausman test, a preliminary step is to estimate the random-effects model. This preliminary step is critical for gaining a thorough understanding of the underlying relationships.

4.2.6. Hausman Test and Model Estimation Findings

The estimation results obtained by the random-effects model are, to some extent, better than those obtained by the pooled regression model and the fixed-effects model, which we will confirm or refute by Hausman's test. The results presented in Table 7 provide information on the Hausman test. The Hausman test statistic is calculated as 37.1107505. In addition, the statistical probability associated with this test is reported as zero ($p = 0.000$). In our case, the statistical probability associated with the Hausman test is reported as less than 5%. This means that the probability of obtaining a test statistic as extreme as that observed, if the null hypothesis were true, is less than 5% (Hausman, 1978). We therefore reject the null hypothesis and conclude that there is a significant correlation between the explanatory variables and the individual effects. Thus, we conclude that the fixed-effects model is best suited to our sample data.

Table 7. Hausman test results.

Correlated Random Effects—Hausman Test				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		37.1107505	4	0.0000
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
PF	−0.003571	−0.044392	0.000008	0.0000
EF	0.335788	0.183665	0.000530	0.0000
DEP	0.004859	−0.022573	0.000021	0.0000
POP	58,229.053825	166.773327	58,758,155,161.327440	0.8107

The table displays the Hausman test results, which determined the best model for explaining VAT transfers to Moroccan municipalities. **Source:** Authors' calculation.

Having rejected the null hypothesis, we opt for a fixed-effects panel model. This model takes into account correlations between explanatory variables and individual effects, which is consistent with the results of the Hausman test. However, it is also mentioned that the estimation result of this fixed-effects model is inappropriate compared to the other models. This indicates that the results obtained from the fixed-effects model do not provide a satisfactory explanation of the data, or do not correspond to theoretical expectations.

Therefore, for a more accurate and valid analysis, we choose to use the clustered effects model as a more appropriate alternative. Although the rejection of the null hypothesis in favor of the fixed-effects model is due to the correlation between the explanatory variables and the individual effects, we finally opt for the cluster-effects model because of its superiority compared with the other models, including the fixed-effects model. Following the results of the Hausmann test, we opt for the clustered effects model, then estimate the model parameters using the ordinary least squares (OLS) method, to obtain the results shown in Table 8.

Table 8. Baseline regression.

Dependent Variable: PTVA				
Method: Panel Least Squares/Total Panel (Balanced) Observations: 874				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20.72351	282228.1	7.342823	0.0000
PF	0.072766	0.009908	7.343945	0.0000
EF	0.175640	0.033954	5.172883	0.0000
DEP	−0.020391	0.009420	−2.164707	0.0307
ALPOL	849,521.2	371,076.6	2.289342	0.0223
POP	186.0067	12.22940	15.20980	0.0000
R-squared = 0.824079		Adjusted R-squared = 0.811914		
F-statistic = 288.1995 (prob =0) Durbin–Watson stat = 0.759800				

This table reports the baseline regression results examining the link between VAT transfers and key explanatory variables, including fiscal potential (PF), tax effort (EF), public expenditure (DEP), and political alignment (ALPOL), with population (POP) as a control variable. **Source:** Authors' calculation.

Statistical analysis relies on econometric tools, such as testing the quality of the model by comparing statistical results with the foundations of economic theory, ensuring that they are consistent or contradictory. On the basis of the results presented in the table above, we can say that the relationship between the dependent variable and the explanatory variables is very strong, thanks to the correlation coefficient (R^2), whose value amounts to

0.824079. This means that 82.40% of the total variability of the VAT distribution (PTVA) is explained by the independent variables, a sign of the good quality of the model in question. Concerning the significance of the model's parameters, the p -values of all the variable parameters, i.e., tax potential (PF), tax effort (EF), public expenditure (DEP), population size (POP) and political alignment (Alpol), are significantly non-zero, their p -values being zero or less than 5%, and their signs are generally compatible with economic theory. This shows that the model is capable of explaining changes in the distribution of the VAT and the ability of the independent variables to explain these changes.

The robustness and relevance of the model's parameters, namely tax potential (PF), tax effort (EF), public expenditure (DEP), population size (POP), and political alignment (Alpol), provide significant indications. Indeed, all these variables are significantly related to VAT distribution, demonstrating statistical significance within Morocco's fiscal context. Furthermore, it is noted that the sign of the coefficients is generally in line with the predictions of economic theory. This finding underscores the substantial ability of the model to explain the variations observed in the VAT distribution. The inclusion of these independent variables in the model makes it possible to account for significant changes in VAT distribution over time.

The consistency of the signs of the coefficients with theoretical expectations reinforces the economic validity of the model, indicating that the relationships established between the variables are in line with the principles and expectations of the economic field. Furthermore, the fact that all p -values are significantly non-zero suggests that these independent variables make a statistically significant contribution to the overall explanatory power of the model. This observation reinforces the reliability of the model insofar as it accurately and significantly captures the underlying factors influencing VAT distribution. In addition, analysis of the p -values of the model's parameters confirms the robustness and relevance of the set of variables included. The robustness of the obtained findings confirms the originality of this study by providing actionable insights, bridging knowledge gaps, and achieving optimal decision-making strategies in the complex puzzle of VAT distribution within Morocco's fiscal context.

4.3. Discussion

The objective of this paper was to explain the redistribution of the VAT through tax potential, tax effort, public expenditure, population size, and political alignment. These variables explain 62.40% of the total variability in VAT allocation. Although the complex nature of the studied phenomenon and the socioeconomic differences between the municipalities investigated, our significant results highlight the complex dynamics between the decisions of local elected officials, strategic interactions between communes, and the influence of these dynamics on the redistribution of the VAT quota for the selected Moroccan region. Transposing these lessons to the Moroccan context and the question of redistribution of the VAT share between communes in the Souss-Massa region, it becomes clear that strategic interactions play an equally crucial role in the fiscal sphere. From this perspective, we argue that the fiscal strategies adopted in these municipalities are more influenced not only by their internal needs and resources, but also by the policy orientations adopted by neighboring ones.

Using different non-parametric approaches to ensure the robustness of our empirical choices, we find that municipalities with higher overall budgets have less efficient spending. Fiscal incentives are strongly impacted by the transfer system's design, as unconditional transfers may reduce local tax collection efforts. To reduce these effects, some countries have introduced indicators, such as fiscal capacity and tax effort, into the formula to reward jurisdictions that have collected the most resources. This finding is consistent with [Brun](#)

and Diakite (2016), who found limited regional tax effort homogeneity, except in the West African Economic and Monetary Union, where VAT effort is notably efficient. Similarly, our findings indicate that in Morocco, differences in tax effort across municipalities have a significant impact on VAT transfer allocations, emphasizing the importance of local fiscal behavior in shaping intergovernmental transfers. Conditional transfers (for specific purposes) aim to encourage local governments to undertake specific programs or activities (El Khdari, 2017). The findings are consistent with previous research, which demonstrates that communes' share of VAT revenue is adversely affected by higher public expenditure rates, meaning that as public spending rises, their VAT allocation decreases. This observation suggests an inverse relationship between the two variables, in line with the precepts of economic theory. More specifically, this conclusion implies that when public spending increases, the communes' contribution to VAT revenue tends to decrease.

From the public choice theory perspective, the obtained results represent a reaction to fluctuations in budgetary policies, where higher levels of public spending can lead to increased tax pressure, thus reducing the share of communes in VAT output. Furthermore, analysis of the public spending variable highlights the importance of fiscal policy management in the context of municipal VAT revenues, highlighting the need for a balanced approach to maximizing tax benefits while maintaining adequate financial equilibrium. Indeed, public spending indirectly affects VAT distribution by influencing private sector performance through government taxes. These findings support the critical role of public spending efficiency when implementing tax reforms (Afonso & Kazemi, 2017; Afonso et al., 2021). Thus, some economists believe that the taxes used to finance public spending reduce the private sector's incentive to invest, depending on private sector perceptions (e.g., Kormendi, 1983).

The coefficient associated with the population growth rate (POP) is positive (18.600) and statistically significant at the 5% level. The estimation results show that as the population increases, so does the local authorities' share of VAT revenue. The relationship between the share of VAT revenue and population growth has been studied by several authors, since an increase in population is associated with an increase in consumption and, consequently, an increase in VAT revenue. Recent evidence suggests that population growth may be a driving force behind government function reform, according to recent data (Yin et al., 2024). In the Moroccan context, this highlights the importance of better aligning VAT transfers with demographic dynamics at the municipal level.

In the same vein, Joumard et al. (2013), using data from 30 OECD countries, showed that the association between population growth and VAT revenues in communes depends on the composition of the population; they found that population growth has a greater impact on commune VAT revenues. Our findings support previous studies regarding the positive association between tax revenue and population (Ferraz et al., 2023; Okunogbe & Tourek, 2024).

With regard to the coefficient associated with tax effort (FE), the results of the analysis are remarkable: a positive coefficient of 0.175640 proves to be statistically significant at the 5% threshold, with a probability equal to zero. These findings convincingly suggest that municipal tax effort exerts a substantial influence on the distribution of VAT revenues. The beneficial relationship between tax effort and VAT distribution can be explained as follows: the tax effort used by the same communes to collect tax revenues is positively correlated with the local authorities' share of VAT income, which is a gauge of the communes' fiscal wealth. Put another way, communes' share of VAT rises in proportion to the amount of work they put into increasing tax revenues. This beneficial effect is a sign of the communes' dedication to proactive budgetary control in the chosen Moroccan area. Tax effort gauges the resolve of communes to optimize this revenue through efficient tax policies, whereas

tax wealth, as indicated by VAT share, represents the capacity to create wealth. Practically speaking, this positive correlation provides policymakers with a useful viewpoint on the intricate relationship between municipal tax effort and VAT distribution, emphasizing the significance of considering both the inherent fiscal capacity of local governments and the efforts they make to maximize their financial resources.

In order to increase local government finance, it is crucial to take public sector fiscal efficiency into account, as demonstrated by these studies (Geys et al., 2010; Bucci et al., 2024; Narbón-Perpiñá & De Witte, 2018; Boufounou et al., 2024). According to this viewpoint, our research adds to the discussion of municipal tax laws and offers a better comprehension of the processes that underlie the allocation of tax income at the local level in an African setting. In this perspective, local authorities may take advantage of the positive association between tax potential and VAT distribution highlights with respect to VAT Revenue Transfers (Ueda, 2017; Cyan et al., 2014). Hence, the higher the local authority's contribution to VAT, the greater its fiscal capacity at the municipal level. This positive association underlines the importance of understanding the dynamics between the VAT and local fiscal potential.

From another perspective, our results confirm a positive relationship between the political alignment of communes the share of VAT revenue and the political alignment of communes. More specifically, our results are consistent with those of previous studies supporting the need to consider politically aligned political parties when formulating financing for local government matters, both in municipalities (Kitsos & Proestakis, 2021) and parliamentary systems (Baskaran & Hessami, 2017). Studies, such as those of Dahlberg and Johansson (2002), provide empirical validation of this hypothesis, while Banful (2011) makes the same finding for Ghana. The significant impact of the public expenditure on VAT distribution highlights the opportunities offered to municipalities when competing to attract capital and investment, supporting the theoretical evidence suggested by the literature review on the local tax competition phenomenon (Agrawal et al., 2025; Bischoff et al., 2025; Janeba & Osterloh, 2013; Martyniuk & Wołowiec, 2022). Based on this perspective, policymakers and local authorities may compete or collaborate for collecting and creating more local taxes, or engage in strategic collaboration to optimize the benefits of tax redistribution. The lessons learned from the analysis of the determinants of competition on the VAT share show the importance of considering the negative externalities of tax administration (Luo et al., 2024; Charlot et al., 2013; Antoniou et al., 2022), recalling that the decisions of one municipality can have significant repercussions on its neighbors and on the entire regional fiscal balance.

The advanced decentralization project needs to be more balanced, giving regions a greater role in the economy than municipalities (Wenjuan & Zhao, 2023; Onofrei et al., 2022), in order to take account of territorial coherence and externalities; they can also serve as intermediary entities between the central government and municipalities. Indeed, an appropriate balance of multi-level decentralization is essential to the effective operation of local governments, leading ultimately to holistic human development. The fact remains that Morocco still needs to apply the rules of good management of fiscal expenditure, as they point out Jalal et al. (2022), and consider a reform of the tax incentive system.

According to Miri (2019), local governments in Morocco are inefficient because they lack motivation to increase their own revenue collection, even though they receive larger transfer revenues. When transfers are available, they work less to mobilize revenue than when borrowing is involved. Furthermore, the political affiliation of local authority presidents does not appear to affect tax efforts and own-revenue mobilization as a result of the increase in transferred revenues (Miri, 2019).

5. Conclusions

This study adds to the body of knowledge on fiscal federalism by analyzing the decentralization framework and the motivational impacts of transfers among Municipalities on the decisions and output of local governments. It is based on a unique dataset of socio-demographic, political, and fiscal characteristics of 175 communes in the Souss-Massa region of Morocco. To undertake this research, the Kingdom's General Treasury, the *Haut-Commissariat au Plan* and the Ministry of the Interior were visited to collect the necessary data.

This research highlights that financial decentralization represents both a challenge and an opportunity to improve local financial autonomy and spending efficiency, and proposes improvements to the system of intergovernmental transfers to encourage greater local revenue mobilization and efficient resource spending. In summary, this study demonstrates the significant influence of public spending and population size on VAT distribution.

The other variables examined, such as fiscal potential, tax effort, and political alignment, also exert an influence, albeit to a less pronounced degree. These results offer valuable insights into the complex relationships between the VAT and economic variables, while also providing practical guidance for policymakers. Thus, local governments must balance centralization to achieve savings and decentralization to maintain local relevance (El Khdari, 2017). The Tiebout model suggests that mobility should be guided by the search for efficiency gains, but this is not always reflected in reality (Tiebout, 1956). Thus, the paradigm of intergovernmental competition, as idealized by some models, clashes with socio-economic realities that restrict the effective mobility of economic agents between different local authorities.

Local authorities' dependence on financial transfers has intensified, with 30% of VAT revenues allocated to local authorities and provinces. These unconditional transfers are designed to offset budgetary imbalances and encourage local authorities to expand their own resources by increasing the tax base. They help preserve local government autonomy and improve equity between territories, so that recipient governments can freely invest in projects that match their local preferences. Conditional transfers are put in place to specifically support infrastructure investments and social and environmental development initiatives; in this research, we have focused solely on the first type of transfer.

5.1. Research Contributions

Tax competition is also examined in the context of fiscal interactions, revealing the complex dynamics that emerge when different intergovernmental entities compete for limited resources. From a managerial point of view, these results provide essential insights into tax management and strategy at the local level. Fiscal decentralization and interjurisdictional competition, which are based on Oates's (1972) theories, demonstrate how a fair VAT distribution can support regional and local economic growth. Public managers can learn how tax strategies impact citizens' opinions and satisfaction with local public services by consulting the work of Timothy and Anne (1995), who examine how tax policies impact electoral behavior.

In keeping with Wilson's (2011) suggestions regarding tax competitiveness and the best use of available resources, this study also emphasizes the significance of implementing tax laws that support efficiency and equity. In line with Rodden's (2022) observations regarding the necessity of cautious fiscal management that is sensitive to local dynamics, the findings give public managers instruments for assessing local fiscal policies. In addition to theoretical contributions, the examination of the factors influencing VAT transfers to Moroccan communes makes important methodological advancements in the fields of

regional economics and public finance. Researchers can now better examine fiscal policies and how they affect local development, thanks to these methodological advancements.

At the level of local communes, the study aims to investigate the connections between VAT transfers and their drivers using sophisticated econometric models. A more dynamic and nuanced understanding of the consequences of tax policies can be obtained through the use of panel models, which allows for the consideration of both differences within communes over time as well as variations across communes.

Other studies that are interested in exploring the effects of local tax laws with a temporal component might employ this methodology as a guide. Several important methodological advances are provided by the examination of tax competition and strategic interactions with regard to the percentage of VAT transferred between Moroccan communes. It promotes the use of sophisticated econometric techniques, based on models of spatial interaction and tax rivalry, to investigate the strategic and spatial links among communes. These models demonstrate how the fiscal policies of one commune impact and are impacted by those of its neighbors, capturing the intricacy of interdependent budgetary decisions among local government organizations.

Regarding the type of data that are utilized, our study can incorporate geospatial data analysis methods to evaluate how geographic proximity and distance affect communes' financial plans. One significant methodological advancement is the incorporation of spatial analysis to investigate the impact of communes' physical closeness on VAT transfers. Our study adds a new perspective to the examination of local tax laws by using spatial analytic tools to find patterns of geographical dependence and spillover effects between communes. In other fields, such as fiscal, financial, or economic research, researchers who are interested in the relationships between territorial entities could find this methodological approach very helpful. Therefore, it is conceivable to add that this research has many management contributions in relation to the above. First of all, it offers important information to national and local decision-makers about how VAT redistribution policies affect municipal tax competition. Our findings support the creation of more equitable and balanced tax policies by highlighting the ways in which these policies affect local economic development. This improves the distribution of tax funds at the local level. Second, government leaders can gain a better understanding of how tax decisions affect citizens' and businesses' mobility by using these findings. Managers can more effectively plan investments in public services and infrastructure to draw in and hold on to important financial resources by understanding the dynamics of cooperation and competition among municipalities (Kobiyh & Ed-Dafali, 2024b).

Lastly, the creation of mechanisms for tracking and assessing local tax laws is another example of managerial contributions. This research makes it possible for tax management to be more flexible and tailored to local situations by offering instruments and techniques for evaluating the efficacy of VAT redistribution plans.

This study provides useful insights into the factors influencing VAT distribution in an emerging economy. The importance of fiscal potential, tax effort, public spending, population size, and political alignment supports the model being suggested. Based on the Hausman test results, the clustered effects model was preferred over other specifications, such as the fixed-effects model. Ordinary least squares (OLS) was used to make the estimates. Notably, the study finds an inverse relationship between the amount of budget and spending efficiency, implying that larger regional budgets do not always result in more effective public resource utilization. This emphasizes the need for additional research into the fiscal and institutional factors that influence regional budgetary performance.

Given the importance of these findings, we can draw the conclusion that the Moroccan government still has work to do in order to improve the efficiency of tax transfers and pub-

lic spending. The expansion of the policy toolkit intended to fortify the state's fiscal domain should be facilitated by public support for taxes. In order to make the transfer system more efficient and incentive-based, it should have two components: an incentive component and a redistributive component (Brun & El Khdari, 2016). Unconditional transfers include a tax effort indicator, which is a good way of encouraging revenue mobilization; however, the way it is defined highlights the problem of inequalities between communes, as the more revenue a commune collects, the more unconditional transfers it receives. This means that the richest communes become richer, thus widening inequalities between communes. Hence, the importance of effectively improving the transfer system and reducing dependence on transfers by effectively using resources to increase the autonomy and revenue-raising capacity of local governments (Brun & El Khdari, 2016). Since there is no one transfer model that works for all recipients, Bird and Smart (2002) stress that recipients must have a clear mandate, sufficient resources, and flexibility in order for intergovernmental fiscal transfers to be effective. When designing the structure of transfers, particular attention must be paid to the indirect incentives they create for different regions (Bird & Smart, 2002). Recently, reductions in VAT rates have become one of the tools available to promote certain sectors, such as culture (Gómez-Antonio et al., 2022), and changes in indirect taxation linked in particular to the VAT affect the consumption structure of different strata of Moroccan households in different ways (Bettah et al., 2022). This shows the need for comprehensive approaches combined with better-targeted social programs by applying rational tax exemptions to support productive sectors (Salhi & El Aboudi, 2021), and help support future tax reforms, as Ghiaie et al. (2019) point out for any emerging and developing economy. This work contributes to the documentation of the second-generation literature on fiscal federalism, which focuses on how, in decentralized countries like Morocco, the design of the transfer system can generate various incentives for local authorities.

5.2. Policy Contributions

This work provides a solid basis for the formulation of effective fiscal policies, while underlining the crucial importance of good intergovernmental coordination. It is essential to undertake concrete actions that create an environment conducive to better local resource mobilization and improved local government capacity. Shared management of local taxation by different levels of government could lead to a lack of communication and information sharing, as well as a lack of accountability on the part of those managing collection on behalf of others. Regional government should also have more powers to oversee and harmonize the prerogatives of lower levels of sub-national government. In fact, some communes receive more transfers than others, and the fact that a commune belongs to the same political tendency of the central government coalition seems to be decisive, and therefore affects the amount of transfers to be received. Based on the amount received, socioeconomic factors influence the impact of VAT redistribution, highlighting significant heterogeneity in the process. Ghiaie et al. (2019) emphasize that in Morocco, a comprehensive fiscal strategy combined with focused social programs can increase the tax base, lessen distortions, and encourage a more equitable tax system, which will ultimately improve welfare and reduce inequality. From this perspective, our research provides information on how to increase tax revenue collection and strengthen Morocco's economy. Specifically, our study highlights the significant impact of public expenditure and population size on VAT distribution, while the other variables examined (fiscal potential, tax effort, and political alignment) also exert an influence, albeit less marked. The results of this study can help to better understand the relationship between VAT and economic variables, and guide government tax policies.

Indeed, a comprehensive tax reform package for Morocco could include simplifying the VAT regime with a view to broadening the tax base (Ghiaie et al., 2019). Moreover, conditional transfers are more sensitive to political manipulation and local negotiations, especially when municipalities rely on transfers to finance their projects, being less motivated to collect revenues to meet their spending needs (Brun & El Khadari, 2016), so governments, when designing transfers, should take into account the fiscal incentives they may create for local officials. Furthermore, as observed in China, modern tax policies, such as changes to the VAT rate, may lessen the impact of investment incentives (Zhao et al., 2024). Therefore, in order to guarantee the efficacy of VAT rate policies, the government should encourage market-oriented reforms and increase competition. Moreover, every tax reform requires a more efficient design (Flores-Macías, 2018). According to Akitoby et al. (2020), combining administrative and tax policy reforms, such as raising the VAT, results in long-term revenue gains. From this, it is possible to achieve notable increases in tax revenue, even in developing and low-income nations. Nevertheless, an increase in taxation is not always desirable (Flores-Macías, 2018); thus, our findings suggest that the government should focus on the tax uncertainty that companies face during tax reforms enabling business adaptability to reduce the negative impact of tax uncertainty as they Chen and Jin (2023) demonstrate in the case of China. Evidence from countries such as Brazil indicates that tax policy changes affect the supply of public services and private goods in different ways (Delalibera et al., 2024). This highlights how crucial customized and open fiscal systems are. Moreover, intricate or badly planned tax structures can increase fiscal uncertainty (Chen & Jin, 2023), posing serious obstacles to entrepreneurship and foreign direct investment (Nguyen et al., 2022). Ensuring policy clarity and streamlining tax structures are essential for fostering private sector growth and economic stability. Moreover, some studies show that direct taxes generate the greatest incentives to move into the informal economy (Martínez et al., 2022). This sheds light on understanding the economic consequences of VAT rate reform, as mentioned by Zhao et al. (2024), and helps the government to undertake a better policy to control financial risk and furnish capital. Finally, as Salhi and El Aboudi (2021) suggest, it is a question of improving institutional quality and combating the informal sector and corruption. Indeed, corruption is a risk for Moroccan local authorities, influencing the virtues of decentralization (Miri, 2019). Martínez et al. (2022) demonstrate that in OECD nations, tax collection improves through decentralization, simplification, digitization, and education. Tax mobilization in Morocco is hampered by corruption, poor governance, and deteriorating democracy, according to the institutional quality index (Salhi & El Aboudi, 2021). On the other hand, in countries where institutional quality is higher, such as Northern European countries, national compliance is higher (Morrow et al., 2022).

5.3. Limitations and Avenues for Future Research

Although this research makes a significant contribution to our understanding of redistribution mechanisms in decentralized systems and to the criteria for choosing the parameters implemented, it does have certain theoretical limitations. The first concerns the application of economic models, which, although sophisticated, may not fully capture the complexity of the strategic behaviors of communes in a specific Moroccan context. The diversity of economic, cultural, and administrative contexts may require theoretical adaptations to better reflect Moroccan reality. Another limitation concerns the oversimplification of local tax dynamics, and models may fail to take into account qualitative factors, such as political relations between communes, residents' preferences, or the specificities of the Moroccan tax system, all of which can influence tax decisions. It would be relevant to analyze how changing consumption patterns and the expansion of e-commerce affect the VAT tax base and, consequently, the distribution of revenues to local authorities. This

could lead to recommendations for adapting VAT apportionment mechanisms to effectively capture revenues generated by the digital economy. To enhance VAT systems, compliance, and societal well-being, future studies could compare Morocco with other African nations on VAT-related topics, such as tax reform, environmental taxation, and VAT fraud (Al Mazroui et al., 2023). This would not only place Morocco in a global context but also identify strategies for improvement based on the successes and challenges encountered by other tax systems. From a broader perspective, future work should focus on the role of institutional characteristics and design in budget allocation and transfers as a means of increasing political support for taxation. In particular, further exploration of the role of public assistance in tax mobilization is strongly recommended. Finally, given the wide differences between tax systems in different countries, future research can use cross-national samples to study the impact of tax reforms and types of transfers on tax uncertainty and corporate behavior.

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