# An analysis of the impact of jurisdictional fragmentation on property taxes in Ghana

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## Abstract

*Purpose*
Following decades of weak financial capacity of local governments in raising enough revenues to finance their budgets, this paper aims to examine the impact of jurisdictional fragmentation on property taxes in Ghana. Since independence in 1957, many local governments in Ghana are yet to build their fiscal capacity to collect enough own source revenues to support their local budgets. All local government laws in Ghana have assigned property taxes to local governments.

*Design/methodology/approach*
The paper uses quantitative econometric techniques with local level panel data from 2010 to 2016 to examine the impact of fragmenting assemblies in Ghana.

*Findings*
The paper finds that fragmenting local governments have an overall negative effect on property taxes in district assemblies in Ghana. However, fragmentation of metropolitan assemblies has an overall positive effect on property taxes, relative to district assemblies. In the case of municipal assemblies, fragmentation has a net positive effect on property taxes but an overall marginally negative effect, relative to district assemblies. Also, the paper finds that grants, capital expenditure and administrative expenditure of local governments do not impact on the collection of property tax revenues in all types of assemblies in Ghana.

*Originality/value*
The paper concludes that relative to metropolitan assemblies, fragmenting districts assemblies is not congruent with government efforts to promote the collection of property taxes in Ghana.

*Keywords*

Ghana; Local government; Fractionalization; Jurisdictional fragmentation; Own source revenues; Property taxes

## 1. Introduction

Low own source revenue collection is one of the major challenges facing many local governments. In Ghana, it is a key challenge facing many metropolitan, municipal and district assemblies (MMDAs) for the past three decades. Between 2005 and 2016, own source revenue averaged about 20 percent of total revenues of MMDAs in Ghana. Of the total own revenues, property taxes constitute about 20 percent. Local governments' revenue sources include property taxes, fees, licenses, permits, rents, user charges and other miscellaneous charges.

Notwithstanding the low revenue collection, local governments (also known as metropolitan, municipal and district assemblies) are frequently fragmented through carving out new assemblies from existing ones.

Ghana's public sector has three main categorizations, namely the central government, regional governments and districts governments also known as Assemblies (categorized in Metropolitan, Municipal and District Assemblies). The central government is led by the President of the Republic, who appoints heads of regions (regional ministers) and assemblies (metropolitan, municipal and district chief executives). Ghana has sixteen regions in 2020 after increasing the number from 10 region in 2018. There are 260 assemblies in Ghana as of 2020, following periodic fragmentation of 65 assemblies in 1988. As at October 2020, there were 6 metropolitans, 109 municipalities and 145 districts in Ghana. The strict minimum criteria for the creation of a district is a population size of 75,000 people, while municipalities are to have 95,000 people, and metropolitan areas should have 250,000 people. Bening (2012:2) reports that districts created between 2004 and 2007 were made by simply splitting populous districts in order to increase the number of parliamentary constituencies from 200 to 230.

Regions and assemblies are assigned different financial and political roles in Ghana through the Local Governance Act, 2016. Regions play coordinating roles through regional coordinating councils that are assigned the responsibility to coordinate and monitor the implementation of government policies within their jurisdictions. Assemblies have three broad expenditure functions, namely policy, production and provision. The policy responsibility involves setting the overall goals and standards in their geographic boundaries, while production involves design, construction and management of projects and services. The provision responsibility involves execution of the budget and delivery of services. Assemblies are empowered by Section 144-145 of the Local Governance Act, 2016 to collect revenues such as rates, fees, licenses, permits, rents, user charges and property taxes. The rates are set in consultations with the residents in the community as well as with inputs from the appointed and locally elected assemblymen and women.

Government fragmentation is often deployed to reorganize public sector operations to improve the efficiency of service delivery and to make governments more responsive to the needs of their citizens (Bardhan, 2002:185; Wildasin, 1995:5; Gómez-Reino and Martinez-Vazquez, 2012:20). Three approaches governments utilize are jurisdictional fragmentation, functional fragmentation, and metropolitan government (Bahl, 2013:88). The approaches are applied to implement decentralization reforms, facilitate independent decisions making, improve technical efficiency and regulate service delivery at the local level. However, there are many risks associated with the different types of fragmentation at the local level (Wildasin, 1995:5; Bahl, 2013:88-90).

When functional fragmentation is implemented alongside jurisdictional fragmentation, institutions are given new responsibilities, that enable them to bring to bear their technical and specialized expertise to improve service delivery. Functional fragmentation could be viewed as the aggregation of functions under one agency across different geographical areas, in order to improve the financing or effectiveness of implementation. However, fragmentation of functions could also lead to inefficiencies in the provision of certain specialized public services that require large scale production and heavy infrastructural setup to be more efficient and cost effective such as water supply and electricity production (Wildasin, 1995:5; McLure and Martinez-Vazquez, 2000:9-10).

Similarly, jurisdictional fragmentation could reduce economies of scale, create fiscal disparities and reduce markets of local governments (Bahl, 2013). It could also hamper service delivery, when subnational entities become too small and their administrative overheads begins to limit their efficiency. Jurisdictional fragmentation could reduce the actual resources available for executing programs as well as stretch the capacity available for collecting property taxes at the local level (Campbell, 2004:324; World Bank, 2015:32). Newly created local governments may have to tradeoff allocating resources for service delivery and incurring high overhead costs required for setting up offices and providing logistics.

Arguments in favor of fragmentation notes that large government size is incompatible with enhancing local democracy and service delivery, and hence the need to fragment some tiers of government to make them more sensitive to local needs (Schoburgh, 2010:105; Slack, 2006:109-110). At the same time, it is an opportunity for central governments to reduce their support to subnational budgets because they are expected to have more budgetary control (Wildasin, 1995:5). However, the reverse may be true as fragmented subnational governments may expect more central government transfers (Bird and Wallich, 1993:11). Governments may employ fragmentation as a tool to address pertinent issues in subnational jurisdictions. Some of these issues may include promoting economic development, dealing with equity concerns and externalities, addressing environmental problems, responding to local preferences, assessing national frameworks, promoting local accountability, resolving problems related to complicated policy reforms and putting in place appropriate fiscal structure (Slack 2006:116; and Smoke, 2013:57). On equity grounds, jurisdictional fragmentation could benefit newly created local governments through improvements in the quality and quantity of services provided, receipt of additional government transfers and an opportunity to collect own source revenues from those that easily evade taxes (Grossman, Pierskalla and Dean, 2017:823; Slack, 2006:116).

This article is divided into 7 sections. The second section explains the nature of fragmentation of assemblies in Ghana. The third section analyzes property taxes in Ghana. The fourth section explains the methodology used for the quantitative analyses in the paper, while fifth section presents the results of the estimation. The sixth section presents results of simulations of the effects of fragmentation on different types of assemblies. Finally, the seventh section gives the final conclusions and policy implication.

## 2. The nature of fragmentation in Ghana

Jurisdictional fragmentation is implemented in Ghana as a part of administrative decentralization at the local level (Dafflon and Madiès, 2013:107). Ghana adopted a policy of aggregating assemblies during the immediate post-independence era because decentralization was perceived as compromising the national agenda (Ayee and Dickovick, 2014:104). Assemblies were aggregated in 1974 to make them bigger and stronger to promote trade across the country. However, this aggregation policy was gradually reversed with population increases, adoption of economic liberalization policies by the central government, and the decision to pursue political decentralization in the 1980s after a prolong period of military rule and political instability in the 1970s. In the pursuit of a more inclusive governance system with the people at the center of development, jurisdictional fragmentation of assemblies became a populist policy.

Jurisdictional fragmentation takes place in regions and assemblies in Ghana. It is less frequent in regions compared to assemblies because the process is cumbersome and requires a referendum.

The 1960 Constitution of Ghana adopted after independence created eight regions, but successive fragmentation has doubled the number to 16 regions as of 2020. On the other hand, fragmentation depends on a criterion in the Local Governance Act, 2016, but it does not spell out the process for its application, which makes it difficult to independently confirm whether the criteria have been followed or not. Assemblies have been subjected to frequent fragmentation, leading to an increase in their number from 65 before 1988 to 260 by 2020 (Clarke, 2010:15-16). The main criteria for fragmenting assemblies are population size, geographic contiguity and economic viability. Ghana creates new assemblies by splitting existing ones, thereby making them smaller. Ghana's 1992 Constitution and the Local Governance Act, 2016 authorize the President to create assemblies at any time, subject to Parliamentary approval. The President also appoints chief executives to head the assemblies, a politically convenient way to exert his authority across all assemblies. Each chief executive presides over meetings of an assembly, of which, 70 percent are elected from the electoral areas within its geographical boundaries and 30 percent are appointed by the President of the Republic. All appointees and elected members of assemblies serve a four-year term equivalent to that of the President (Williams 2017:7).

The institutional rationale for creating new assemblies in Ghana is to promote national unity. Assemblies are supposed to assist the government to promote integration of the peoples and prohibit all forms of discrimination and prejudice against residents in the country. Empowering assemblies allows residents to get involved in creating social cohesion, accountability and development. In return, the people are required to honor their tax obligations to the government.

Political and opinion leaders lobby to get new assemblies created because of the associated benefits. There are traditional rivalries among stakeholders such as chiefs and politicians who lobby for their assemblies to be fragmented to enable them benefit from the siting of district capitals and to receive more intergovernmental transfers for development. New assemblies tend to directly benefit from new projects financed by the central government such as district hospitals, education centers, water and sewage facilities and provision of roads. These benefits make fragmentation of assemblies attractive, political and negotiated for by various local leaders.

## 3. Property taxes in Ghana

Property taxes are one of the own source revenues assigned to subnational governments in some countries. In Ghana, property taxes are administered at the local level by assemblies. Property taxes may include stamp duties and property transfer taxes, estate and gift taxes, and financial transaction taxes (Franzsen and McCluskey, 2017:4; IMF, 2014:93). It may be levied on mobile capital, and immobile properties (such as real properties), and personal properties. Where the real property consists of the land and permanent fixtures affixed to or improvements on it, and personal properties refer to movable such as shares, motor vehicles and race horses (Bell, 1999:8; Franzsen and McCluskey, 2017:4-5; IMF, 2014:93). In a narrow sense, property tax refers to a tax on ownership and occupation of real estate – that is, land and/or buildings and other improvements. In Ghana, property tax is defined as a recurrent tax on immovable property: a tax levied on the ownership of immovable buildings. The government of Ghana does not tax land, partly due to the complexity of its ownership.

Three approaches are suggested for classifying the property tax base. These are assigning value to the property (valuation), property component in the base (land, building or both), and the use

of property for residential or non-residential (Norregaard, 2013:23). Franzsen and McCluskey (2017:6) refer to the decision on the tax base as a key policy decision. The property tax base is determined by the value of taxable wealth and the quantity of property in a jurisdiction (Rosengard, 2012:8-10). It could also be determined as a function of the assessed value or market value of the property. In general, the base is affected by taxable wealth, number of properties, general valuation, assessment ratios, exemptions, exclusions, deductions, credits and deferrals (Bahl, Martinez-Vazquez and Youngman, 2010:5; Rosengard, 2012:10).

In the case of Ghana, property taxes are not imposed on lands irrespective of their location in the country. The Local Governance Act, 2016 imposes property taxes on immovable properties because of the complicated nature of land ownership. Land are currently owned by traditional chiefs, families, businesses, individuals and the central government. Historically, the lands were primarily owned by chiefs who fought several wars to gain more territories. At independence in 1957, the territories became the first demarcation of regions in Ghana. The chiefs allocated land to families, businesses and the government for farming, construction of road and residential properties, businesses and the provision of public goods and services. The rationale for focusing on immovable properties is to reduce the administration cost of collecting property taxes and to promote national cohesion given that chiefs are the primary owners of all lands. Also, the central government is exempted from paying taxes on State lands. Property taxes are imposed based on two main variables, usually the "rate input" and the "ratable value." Assemblies decide the rate input, which is the tax rate for different categories of properties. District valuation officers from the Lands Commission estimate the cost of immovable properties based on the cost of replacing the properties. The ratable value is determined as the difference between the replacement cost and the depreciated estimate of existing property. Estimations from the two government institutions result in the tax property owners pay.

Property taxes are described as a good local tax and appropriate for subnational governments when they can impose taxes, determine their tax bases, decide on set rates, administer taxes, and retain revenues collected (Bird, 2010: 6-28). In addition, Almy (2013:67) suggests that the choice of institutions to collect property taxes should be influenced by their administrative capacity, convenience to tax payers, and the fiscal interest of the institution. When subnational governments are functioning well, they tend to access the tax base of property taxes better than central governments (Ebel, 2003:13). They are sometimes assigned rating setting powers because property taxes may have a broad base, are revenue productive, and can produce very stable revenue for subnational governments (Bahl and Cyan, 2011:270).

Property taxes are a good source of subnational revenues (Rosengard, 2012:1; Bird and Slack, 2006:206; Schroeder, 2007:58). Kelly (2000:37) notes that almost all local governments are enthusiastic about strengthening property tax collections, in order to increase their revenues. In most Latin America, property taxes remain the main way to raise revenues for local development (Bird and Slack, 2006:206). These taxes are potentially good revenue generators because they are economically efficient (hard to avoid), and socially equitable (roughly progressive and a good proxy for tax on multi-year income). Property taxes are also described as appropriate to subnational governments due to the connection between services funded and property values (Slack, 2004:69; Bird and Slack 2006:209; Norregaard, 2013:4; Rosengard, 2012:1; Kelly, 2014:326). However, Bahl, Martinez-Vazquez and Youngman (2010:9) argue that the evidence about the equity of property taxes is mixed due to exemptions given to low-income housing.

However, property taxes are sometimes not perceived as good subnational taxes partly because of the high cost of administration, less efficient administration, and low yields. As a result, some authors suggest that even though subnational governments are best placed to administer the tax, devolving property taxes to them may not be a sound policy due to the difficulty in administering the tax equitably and because non-residential property taxes increase the cost of providing services (Bird, 1999:11; Slack, 2010:3; Bahl and Martinez-Vazquez, 2007:5). In Africa, a few countries are able to significantly increase revenue from property tax, although one could point to success stories in South Africa, Liberia and Sierra Leone (McCluskey, Franzsen and Bahl, 2017:552).

Property taxes are classified as a portion of general rates imposed in Ghana. Section 124 (1) of the Local Governance Act, 2016 lists three main sources of revenues to assemblies in Ghana. These are decentralized transfers from the national government, own source revenues and grants from non-state actors. The decentralized funds comprise of all forms of transfers from central government to subnational governments and allocations for the payment of the salary of subnational staff. The own source revenues comprise of fees, investment income and rates. General rates are paid by property owners based on the value of their properties. General rates encompass a rate assessed on any form of possessions of a person residing in an assembly. Property taxes are imposed as general rates in Ghana. Assemblies are empowered to impose, collect and retain property taxes. The determination of the actual property tax imposed on property owners is supervised by a committee within each assembly that determines the "rate input". After receiving the ratable values from the Valuation Division of Lands Commission, assemblies set up committees in order to determine the actual tax to be paid on each property (which is determined by multiplying ratable value by the rate input). The determination of the rate input is influenced by the average cost of local services provided in each assembly. Assemblies that provide more services have high average costs that are difficult to pass to property owners. However, the Local Governance Act, 2016 requires districts to use the cost of collection as the basis for the tax.

Property taxes are imposed on ratable immovable properties and form a small proportion of local government revenues in Ghana. Total property taxes collected in 2016 was about 0.02 percent of GDP. On average, property taxes represented less than a fifth of local own revenue and 3.5 percent of total subnational revenue between 2010 and 2016 (Table I). The structure of revenue sources of assemblies did not change between 2007 and 2016.  Progress in the collection of property tax has been slow due to the many challenges facing assemblies. The challenges relate to valuation of properties, poor data collection and storage, and lack of capacity to tax residents. Also, most homeowners in Ghana do not officially record capital improvements to their properties, nor do they keep records of their building cost (except commercial properties). Furthermore, the purchase or sale of houses are neither recorded nor documented for tax purposes within assemblies. These factors make the administration of property rates at the subnational level challenging. Table I shows the evolution of property rates in Ghana since 2007. It shows that property taxes in percent of total local revenues and grants ranged from 2.9 percent to 4.2 percent.

**Table I: Property tax revenues and other revenues in Ghana (in Ghana Cedi)**

| Year | Property rates | Total internally generated revenue | Total grants from all sources | Property taxes in percent of own revenue | Property taxes in percent of total revenue |
|------|---------------|-----------------------------------|-------------------------------|------------------------------------------|--------------------------------------------|
| 2007 | 6,883,658 | 42,056,471 | 193,355,580 | 16.0 | 2.9 |
| 2010 | 16,684,270 | 104,579,111 | 362,619,794 | 17.6 | 3.6 |
| 2011 | 19,239,926 | 109,528,032 | 457,013,197 | 20.5 | 3.4 |
| 2012 | 25,938,066 | 126,379,716 | 495,754,766 | 17.4 | 4.2 |
| 2013 | 23,342,766 | 134,361,043 | 605,020,969 | 18.6 | 3.2 |
| 2014 | 35,622,596 | 191,727,260 | 817,354,644 | 19.7 | 3.5 |
| 2015 | 49,245,654 | 249,778,251 | 1,142,250,998 | 17.1 | 3.5 |
| 2016 | 55,066,903 | 322,611,705 | 1,216,642,571 | 16.0 | 3.6 |

Source: Author computation with data from Ministry of Local Government and Rural Development, Ghana.

## 4. Analytical Framework Methodology

The panel data for the regression is obtained by aggregating from 216 assemblies to 170 based on their 2010 classification and maintaining their weights from 2010 to 2016 (Table V). This reconstruction allows mother and offspring assemblies to be together, in order to ascertain whether the assemblies performed better after fragmentation. The dependent variable is the log of property taxes (LPTax) by assemblies. It is the annual revenue obtained by assemblies in nominal Ghanaian cedis.

A dummy variable (Dfrag) is created to take a score of 1 if the assembly was altered or created after 2013 due to the government's fragmentation policy, otherwise the variable takes the score 0. This variable is expected to measure the impact of fragmentation. The age of assemblies (AgeAA) between 1988 and 2016 is created by allotting numerical number 1 for all assemblies that existed in 1988, and thereafter counts the age of the assembly until 2016. Assemblies that have not been fragmented have higher ages.

The logs of capital (LCap) and administrative expenditure (LAdmin) at local level are variables separately included in the model to measure their influence on the collection of property taxes. The administration cost is calculated as the sum of general expenses, staff salaries, cost of travels and transportation, and cost of repairs and renewables of the assembly. It excludes miscellaneous expenses of assemblies. It is the total cost of collecting all local taxes within each assembly.

Grants per capita (Tgrantpc), consumer price index for housing and utility (CPI), and log of population are included because they are important policy variables monitored by the central government at the local level. These variables could allow a test of whether higher grants per capita and larger population size permit more investment in tax administration. The log of population is an important policy variable that could help predict the size of property tax base and the economies of scale in tax administration. The housing and utility (CPI) data for the assessment period are the annual averages for the region adjusted to the 2012 base year and coincides with the year before creation of new assemblies. It is noted that Ghana does not produce assembly level CPI data and thus, the average CPI for each region is assumed for assemblies under them. This approach is adopted in line with the government's own practice.

Dyear represents individual year dummies for 2011 to 2016 to capture the time series trends and control for the year effects in the panel. The time series trends may be attributed to other

government policies or economic aggregates (such as economic growth) that affect property taxes. $\eta_{it}$ is the error term.

Finally, I constructed three sets of binary dummies variables for each metropolitan, municipal and district assembly which takes the score of 1 for each assembly and 0 otherwise. For instance, the binary dummy for metro has a score of 1 if the assembly was a metropolitan between 2013 and 2016 and a score of 0 otherwise.

The estimation model is stated with as follows with property taxes as the dependent variable:

$(LPTax)it = \gamma 0 + \gamma 1 (Lpopn)it + \gamma 2 (LCap)it + \gamma 3 (AgeAA)it + \gamma 4 (Frag)it + \gamma 5 (Tgrantpc)it +$

$\gamma 6 (CPI)it + \gamma 7(Admin)it + \gamma 8(dyear)it + \eta it$ ……………………………Model 1

Where subscript it stands for assemblies i (=1,2, …, 170) and at time t (=2010, 2011, … ,2016). $\gamma 1$, …,$\gamma 8$ are scalar parameters.

It is noted that the exogenous variables are not highly correlated. As shown in Table II below none of the exogenous variables have correlation of more than 70 percent. The results show that the correlation between grants per capita and log of capital expenditure is low at 14 percent. Also, the correlation between grants per capita and log of administrative expenditure is about 18.4 percent.

**Table II: Correlation matrix of exogenous variables in the model.**

| | Log of population | Log of capital expenditure | Age of Assemblies between 1988 and 2016 | Fragmentation of assemblies' dummy | Grants per capita | log of consumer price index for housing and utilities | Log of administrative expenditure |
|---|---|---|---|---|---|---|---|
| Log of population | 1.0000 | | | | | | |
| Log of capital expenditure | 0.3680 | 1.0000 | | | | | |
| Age of Assemblies between 1988 and 2016 | -0.0163 | -0.0669 | 1.0000 | | | | |
| Fragmentation of assemblies' dummy | 0.2630 | 0.1793 | -0.5035 | 1.0000 | | | |
| Grants per capita | -0.3054 | 0.1399 | -0.0833 | 0.1690 | 1.0000 | | |
| Log of consumer price index for housing and utilities | 0.1504 | 0.1869 | 0.1868 | 0.3201 | 0.3043 | 1.0000 | |
| Log of administrative expenditure | 0.5272 | 0.3208 | 0.0229 | 0.3342 | 0.1841 | 0.5655 | 1.0000 |

Source: Author computation with data from Ministry of Local Government and Rural Development, Ghana.

## 5. Estimation Results

The initial regression results of model 1 are reported in Table III. Model 1 is estimated using fixed and random effects estimators[1] with the log of property taxes as the dependent variable. The Hausman test is significant (Prob>chi2 = 0.0000), indicating that the fixed effects model is preferred. The results of the regression for the fixed effects model 1 are discussed below.

From the fixed effects specification of model 1, the coefficient of the fragmentation of assemblies' dummy is negative and significant at 10 percent, indicating that when assemblies are fragmented the property taxes are reduced by about 34.96 percent. Similarly, the coefficient of the age of assemblies is negative and significant at 1 percent level. It indicates that a one-time fragmentation of assemblies could have negative effects on property taxes that last for about 17 years. These two results show that the jurisdictional fragmentation of assemblies has negative short-term effects (represented by the coefficient of fragmentation dummy) and negative long-term effects as shown by the coefficient of the age of fragmentation (Table III). These results partly reflect how fragmentation of assemblies further weakens the already low local capacities and resources available in some assemblies to collect property taxes. It may indicate the negative political interference and lengthy administrative processes required before new assemblies begin to collect property taxes after their creation (Brierley 2020; Jibao, 2017; Williams 2017).

The coefficient of capital expenditure of assemblies was positive but not significant. Capital expenditures at the local level are usually financed using intergovernmental transfers from the central government and development partners because local taxes may be insufficient for the cost of major capital projects such as roads and provision for electricity. Jurisdictional fragmentation further reduces resources available to finance capital expenditures at the local level (Campbell, 2004:324, Litvack and Seddon, 2002:32).

The coefficient of consumer price index of housing and utilities was positive and significant at 1 percent level. It indicates that a percentage increase in the consumer price index of housing and utilities raises property taxes by 196.2 percent per annum. The result reflects that property values increase with consumer price indices in Ghana. The results could be partly explained by the fact that Ghana values properties using the replacement cost approach to determine the ratable values of properties. Also, the rate input is determined using the cost of providing services. These two variables are indirectly influenced by changes in local prices.

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[1] It is noted that the use of the General Methods of Moments (GMM) is unnecessary in this case given that the model is not dynamic; besides even in the dynamic case, it is possible for the Fixed and Random Effects models to yield better estimates than the GMM, at least for predictive purposes (Fosu, 2018).

**Table III: Results Fixed and Random effects estimation results of Model 1, with log of property rates as a dependent variable.**

| Variables | Fixed Effect Estimation | Random Effects Estimation |
|---|---|---|
| | Coefficient (Standard errors) | Coefficient (Standard errors) |
| Log of population | -0.0710 * (0.2837) | 0.9488**** (0.1628) |
| Log of capital expenditure | 0.0714* (0.0589) | 0.1035** (0.0588) |
| Age of Assemblies between 1988 and 2016 | -0.1588*** (0.0621) | 0.0022* (0.0098) |
| Fragmentation of assemblies' dummy | -0.5924**** (0.2101) | -0.6797**** (0.1832) |
| Grants per capita | -0.0013* (0.0017) | -0.0022* (0.0017) |
| Log of consumer price index | 0.7469**** (0.2319) | 0.6196**** (0.2332) |
| Log of administrative expenditure | -0.0196* (0.0641) | 0.2197**** (0.0609) |
| Dummy  2011 | -0.2424** (0.1345) | -0.3556**** (0.1336) |
| Dummy  2012 | 0.9484**** (0.3649) | 0.4479* (0.3601) |
| Dummy  2013 | 1.0334**** (0.3592) | 0.1649* (0.3253) |
| Dummy  2014 | 1.2664**** (0.3437) | 0.1755* (0.2647) |
| Dummy 2015 | 1.4081**** (0.3531) | 0.1436* (0.2105) |
| Dummy 2016 | 1.6625**** (0.4076) | 0.1322* (0.2130) |
| Constant | 7.9349*** (3.5993) | -8.4495**** (2.2298) |
| Number of observations | 1156 | |
| Hausman test Prob>chi2 =  0.0000 | Standard deviation in parentheses ** significant at 10 percent level *** significant at 5 percent level ****significant at 1 percent level | |

Source: Data from Ministry of Local Government and Rural Development. Note: the variables are defined in Table V.

The coefficient of administrative expenditure is negative but not significant in the fixed effects estimation. In the contrary, the coefficient of administrative expenditure is positive and significant at 1 percent level the random effects model. The results of the fixed effects model are preferred because subnational governments in Ghana do not pay for the entire administrative cost of their staff and thus, limiting their influence on property taxes. There are no incentives for local bureaucrats to aggressively collect property rates because their salaries and annual salary increases are determined by the central government without reference to their performance at the local level. Secondly, strong labor unions negotiate, and influence salary increases of many

government staff. Thirdly, the leadership of subnational governments are not elected by the residents, so they have low incentive to collect the taxes needed for development. Finally, most assemblies do not have designated offices for collecting property taxes, nor are tax payers segregated into small, medium and large to improve revenue collection.

The coefficient of grants per capita is not significant, indicating a lack of influence on property taxes in Ghana. The allocation of grants relative to the population size does not affect the payments of property taxes because the citizens are not involved in the selection and use of the grants for local development. Local choices are influenced by heads of assemblies who are appointed by the President of Ghana. Grants constituted about 80 percent of local revenues between 2010 and 2016 in Ghana. While the provision of grants is important for fiscal decentralization, excessive provision of grants tends to discourage local governments from making the effort to collect their own property taxes. In addition, there is political cost and little revenue incentive associated with strictly enforcing property tax laws in Ghana. On the other hand, grants could finance public investments necessary for voluntary compliance to ease the work of local tax administrations. It is worth noting, many assemblies do not have functional tax offices and thus the collection of property taxes is contracted to private companies.

The coefficients of the year dummies for 2011 to 2014 were all negative and significant in the fixed effect model at least at 10 percent level. The negative sign could be attributed to pre-fragmentation announcement effect as Ghana prepared for the 2012 elections, political debates of national policies as well as the effect of implementation challenges. The negative impact on property taxes is partly driven by the high utility prices due to electricity shortages and a rising housing deficit in Ghana between 2010 and 2016. It is also noted that during this period, the proportion of intergovernmental transfers to subnational governments increased significantly partly because the central government cleared outstanding arrears due to local governments and its tax revenues increased[2]. The year dummies for 2015 and 2016 were not significant, partly reflecting no policy change related to fragmentation of assemblies ahead of the 2016 elections in Ghana. It is noted that in 2018 and 2019, the government further created new 44 new assemblies by fragmenting existing ones.

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[2] Grants to subnational governments are by law calculated as 7.5 percent of total tax revenues. Allocation to each assembly increases when the government collects more tax revenues. Given that most assemblies lack the capacity to collect property taxes, intergovernmental transfers tend to substitute local tax effort rather than complement it.

**Table IV: Results of fixed effects estimation with interaction variables for Assemblies and using log of property rates as a dependent variable.**

Source: Data from Ministry of Local Government and Rural Development. Note: Further results with metro only,

| Variables | Fixed Effect estimation with Metropolitan and municipal interaction (A) | Fixed Effect Estimation with Municipal and District interaction (B) |
|---|---|---|
|  | Coefficient (Standard errors) | Coefficient (Standard errors) |
| Log of population size | -0.1032* (0.2861) | -0.1032* (0.2861) |
| Log of capital expenditure | 0.0643* (0.0588) | 0.0643* (0.0588) |
| Age of Assemblies between 1988 and 2016 | -0.1468*** (0.0622) | -0.1468*** (0.0622) |
| Fragmentation of assemblies' dummy | -0.7957**** (0.2249) | 0.7087* (0.6294) |
| Metropolitan fragmentation interaction | 1.5044*** (0.6354) | NA |
| Municipal fragmentation interaction | 0.7053*** (0.2823) | -0.7991* (0.6571) |
| District fragmentation interaction | N A | -1.5044*** (0.6354) |
| Grants per capita | -0.0017* (0.0017) | -0.0017* (0.0017) |
| Log of consumer price index | 0.0013*** (0.0005) | 0.0013*** (0.0005) |
| Log of administrative expenditure | -0.0056* (0.0641) | -0.0056* (0.0641) |
| Dummy 2011 | -0.2444*** (0.1347) | -0.2444*** (0.1347) |
| Dummy 2012 | 0.3392* (0.2413) | 0.3392* (0.2413) |
| Dummy 2013 | 0.5528*** (0.2885) | 0.5528*** (0.2885) |
| Dummy 2014 | 0.9516**** (0.3169) | 0.9516**** (0.3169) |
| Dummy 2015 | 1.2639**** (0.3471) | 1.2191**** (0.3467) |
| Dummy 2016 | 1.4958**** (0.4046) | 1.4958**** (0.4046) |
| Constant | 12.0514**** (3.4143) | 12.0514**** (3.4143) |
| Number of observations | 1,156 | |
| Hausman test | chi2(15) =370.56 Prob>chi2 = 0.0000 | chi2(15) =370.56 Prob>chi2 = 0.0000 |
| NA means variable not in model Standard deviation in parentheses ** significant at 10 percent level *** significant at 5 percent level ****significant at 1 percent level | | |

municipal only and district only interaction variables are also available. The results are consistent with Table 3 and could be shared upon request.

## 6. Overall and net effect of fragmentation

Three interaction dummy variables are created for metropolitan, municipal and district assemblies. These are metropolitan fragmentation interaction, municipal fragmentation interaction and district fragmentation interaction as defined in Table V. These three variables are added to Model 1 and re-estimated using fixed and random effects models. The interaction variables are introduced in two separate interaction regressions for (i) metropolitans and municipalities and (ii) municipal and district assemblies to avoid linearity. In both cases, the Hausman test was significant and pointed to the fixed effects model as the preferred model (Table IV). The results of the fixed effects model are shown in Table IV. It provides additional results for the calculation of the net and overall effect of the impact of fragmentation and the other variables in Model1. It is noted that the robustness of the model as measured by the probability of the F-Statistics remained the same for both models (A) and (B).

The results for fixed effects estimation with interaction variables for metropolitan assemblies show that the coefficient for the variable "Metropolitan fragmentation interaction" is positive and significant at 5 percent relative to district assemblies (net effect of 1.6113, Table IV(A)). It suggests that the overall effect relative to district assemblies after fragmenting metropolitan assemblies is a 99.2 percent increase of property taxes (calculated as ((1.6113-0.6198)*100). The results are underpinned by the fact the metropolitan assemblies tend to have wealthier populations who pay more for their properties. Metropolitan assemblies are also growth poles in Ghana and thus collect property taxes from owners of large industrial buildings, high value residential buildings and other commercial private properties. Compared to districts, Metropolitan assemblies tend to have better revenue collection systems, attract better trained personnel for property valuations, and have more logistics collecting all forms of taxes. Finally, the property tax base tends to increase faster in metropolitan assemblies relative to other assemblies during periods of strong economic growth and construction boom.

Municipalities have smaller population size, medium level technical capacities and reasonable number of human resources compared to metropolitans in Ghana. Relative to district assemblies, the coefficient of the interaction variable of municipal assemblies is positive and significant at the 1 percent level in the fixed effect estimation with metropolitan and municipal interaction variables (showing a net effect of 0.7187, Table IV (A)). However, the overall effect of the results (relative to districts) show that fragmentation of municipal assemblies reduces property taxes by 9.89[3] percent (calculated as ((0.7187-0.6198)*100).

District assemblies have smaller population size and lower capacities compared to municipalities and metropolitans in Ghana. From the fixed effects estimation with interactions for municipalities and district assemblies, the results show that the coefficient of district fragmentation interaction is negative and significant at 5 percent (net effect of-1.6113, in Table IV(B)). In the short term, the overall effect relative to metropolitan assemblies indicates that, fragmentation of districts could reduce property taxes by 61.98 percent in district assemblies (calculated as ((-1.6113+ 0.9915)*100). In the long term, fragmentation of districts assemblies could reduce property taxes by 176.9 percent, relative to metropolitan assemblies (calculated as ((-1.6113+ -0.1577)*100).

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[3] The overall effect is the same if Table IV (B) results are used. It is calculated as ((-0.8926+0.9915)*100).

These effects show the fragility of district assemblies in collecting property taxes during fragmentation, relative to other types of assemblies.

**Table V: Definitions of variables used for the estimations**

| Variable | Definition |
|---|---|
| Fragmentation of assemblies' dummy | Assemblies fragmented after 2012=1, 0 otherwise. |
| Dummy  2011 | Dummy 2011 = 1 if 2011, 0 otherwise. |
| Dummy  2012 | Dummy 2012 = 1 if 2012, 0 otherwise. |
| Dummy  2013 | Dummy 2013 = 1 if 2013, 0 otherwise. |
| Dummy  2014 | Dummy 2014 = 1 if 2014, 0 otherwise. |
| Dummy 2015 | Dummy 2015 = 1 if 2015, 0 otherwise. |
| Dummy 2016 | Dummy 2016 = 1 if 2016, 0 otherwise. |
| Metropolitan fragmentation interaction | Product of fragmentation of assemblies' dummy variable and a dummy for metropolitan assemblies. Product =1 if both occur, 0 otherwise. |
| Municipal fragmentation interaction | Product of fragmentation of assemblies' dummy variable and a dummy for municipal assemblies. Product =1 if both occur, 0 otherwise. |
| District  fragmentation interaction | Product of fragmentation of assemblies' dummy variable and a dummy for district assemblies. Product =1 if both occur, 0 otherwise. |

Source: Author based on data used for the paper

**Table VI: Basic descriptive statistics of the variables in the Model 1**

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Year | 1,190 | 2013 | | 2010 | 2016 |
| Log of property taxes | 1,181 | 10.5680 | 1.8836 | 1.9459 | 16.3584 |
| Log of population | 1,190 | 11.6693 | 0.5496 | 10.2589 | 14.5702 |
| Log of capital expenditure | 1,164 | 14.5030 | 0.8278 | 8.2353 | 17.4824 |
| Age of Assemblies between 1988 and 2016 | 1,189 | 13.8865 | 9.6291 | 0.0000 | 31.0000 |
| Index of fragmentation of Assemblies | 1,190 | 0.1546 | 0.3617 | 0.0000 | 1.0000 |
| Grants per capita | 1,190 | 34.0156 | 27.7017 | 0.7329 | 607.3773 |
| Log of consumer price index | 1,190 | 5.0636 | 0.4323 | 4.4437 | 6.1713 |
| Log of administrative expenditure | 1,186 | 13.8026 | 1.1551 | 9.4761 | 17.7363 |

Source: Calculation with data from Ministry of Local Government and Rural Development.

**Table VII: Variables, sources and basic descriptive statistics of the variables in the models**

| Variable | Description | Sources |
|---|---|---|
| Property taxes | Property taxes are imposed by assemblies on immovable properties. Property taxes are not imposed on land in Ghana. The tax is imposed on buildings or structures and it is paid by property owners. | The data for the paper was provided by the Ministry of Local Government and Rural Development. |
| Population | The paper used assembly population estimates published by the Ghana Statistical Service. | The data for the paper was provided by the Ghana Statistical Service. |
| Capital expenditure | Actual expenditure of assemblies on capital goods and projects. | The data for the paper was provided by the Ghana Statistical Service. |
| Age of Assemblies between 1988 and 2016 | The variable is allotted a numerical number value "1" for all assemblies that existed in 1988, and thereafter counts the age of the assembly until 2016. | The age of Assemblies variable was calculated based on data provided by the Ministry of Local Government and Rural Development. |
| Fragmentation of Assemblies | This is binary variable that takes a score of 1 if the assembly was altered or created in 2013 due to the government's fragmentation policy, otherwise the variable takes the score 0. | Fragmentation of Assemblies dummy was constructed based on data provided by the Ministry of Local Government and Rural Development. |
| Grants per capita | Grants per capita is calculated as grants divided by population size. Grants are the total nonrefundable receipts of Assemblies from all sources to their annual budget. | Data on grants provided to assemblies was from the Ministry of Local Government and Rural Development. Population size data was provided by the Ghana Statistical Service |
| Consumer price index | Consumer price index (CPI) of housing and utilities are end period (December) data by the Ghana Statistical Service. | The CPI data was provided by the Ghana Statistical Service. |
| Administrative expenditure | The administration expenditure of assemblies is calculated as the sum of general expenses, staff salaries, cost of travels and transportation, and cost of repairs and renewables. The variable excludes miscellaneous expenses of assemblies, which sometimes includes unclassified capital expenses. | The data was provided by the Ministry of Local Government and Rural Development. |

Source: Author based on data used for the paper

The net effect of the coefficients of consumer price index is the same and small relative to metropolitans and district assemblies (Table III). However, the overall effect varies among different types of assemblies. Relative to district assemblies, the coefficient of consumer price index in metropolitan assemblies reduces property taxes by 144.2 percent during period of fragmentation (calculated as (2.0618-0.6198)*100, Table III(A)). Relative to metropolitan assemblies, the coefficient of consumer price index in district assemblies reduces property taxes by 107.03 percent (calculated as (2.0618-0.9915)*100, Table III(B)). The overall effect impact is

much higher in metropolitan assemblies than district assemblies partly because of government subsidies to rural areas and lower cost of living in these districts.

It is noted that the coefficients for grants per capita, population size and administrative expenditure are not significant in the regressions (Table III). However, the coefficients of the year dummies from 2011 to 2014 were all significant and negative, indicating, other economic aggregates and factors could negatively influence property taxes paid to local governments. One of such factors not modeled in this paper is the low subnational capacity to collect property taxes as well as weak subnational tax administration and political interference in property tax administration in Ghana.

## 7. Conclusion and policy implication

It can be concluded that fractionalization of assemblies is likely to lead to a reduction in the property taxes, ceteris paribus. The results from the regressions indicate that fragmentation of assemblies impacts negatively on property taxes in Ghana. Jurisdictional fragmentation weakens existing capacity of assemblies, splits existing skilled human resources and fragments tax bases of assemblies. As a result, own source local revenues such as property taxes are reduced in Ghana (Mogues and Benin, 2012). The results showcase the negative effects of fragmentation in making local government units less effective in collecting property taxes (Work, 2002:8).

The effects of fragmentation on property taxes have both short-term and long-term dimensions. The coefficient of the variable for fragmentation of assemblies which represents short term effects is negative and significant, indicating that fractionalization of assemblies has a negative impact on fractionalized assemblies. The significantly negative coefficient for the age of assemblies suggests a longer-term negative effect of fragmenting assemblies. The government could address the longer-term inefficiencies resulting from fractionalization by introducing new technologies and providing technical assistance to newly created assemblies to enhance the ability to assess property values, and to build human capacity to collect the appropriate taxes (Bardhan, 2002:185, McLure and Martinez-Vazquez; 2000:9-10; Wildasin, 1995:5).

Grants to assemblies may not in themselves be an efficient way to promote the collection of property taxes at the local level even though it provides enormous support for the provision of local services in Ghana. The coefficient of grants per capita was not significant in the models. The grants allocated to subnational governments apparently do not influence the payment of property taxes and thus increasing grants may not influence tax related decisions of heads of assemblies because, they are not elected by the people. However, it is noted that in countries with well-functioning federal systems such as Brazil, high governmental transfers tend to increase property tax revenues.

Finally, the impact of fragmentation on property taxes differ across the different categories of assemblies in Ghana. These overall and net effects of fragmentation differ by magnitude and sign for the metropolitans, municipals and districts. Relative to metropolitan assemblies, the net effect of fragmenting district assemblies shows a large negative effect on property taxes, indicating the need to strengthen the capacity of district assemblies across the country. Its overall effect is also negative and large. Similarly, relative to district assemblies, the impact of fractionalizing metropolitan assemblies on property taxes of is large and positive. In the case of municipal assemblies, net effect on property taxes is positive though, the overall effect is small and marginally negative.

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**Annex 1: Description on the regression methodology**

The paper uses panel data which allows for analysis across different assemblies (cross sectional) and over time (years). It employs fixed, and random effects estimators of Model 1 for various analyses. It does not use General Methods of Moments (GMM) because it is unnecessary given that the model is not dynamic; besides even in the dynamic case, it is possible for the fixed and random effects models to yield better estimates than the GMM, at least for predictive purposes (Fosu, 2018).

A fixed effect estimator corrects for correlation of the unobserved individual specific effects with the regressors, but its major shortcoming is that the time-invariant variables in the exogenous variables tend to mimic the individual specific constant term. On the other hand, the random effects estimator assumes that the individual specific effects are distributed independently of the regressors. Its estimates are a weighted average of the between and within estimates of regressors. The random effects estimator is efficient and consistent when the regressors are not correlated with the error term (Greene, 2019:396-418).

To select the appropriate estimator and the results to report in the paper, the Hausman test is applied to the results of Model 1 using both the estimators. When the Hausman test is significant, the results of the fixed effects estimator are preferred. However, when the test is insignificant, it suggests that the individual specific effects are distributed independently of the regressors and thus the results of the random effects estimator are preferred.

Interactive variables are introduced in Model 1 because the impact on fragmentation on assemblies and the responses of assemblies could be viewed in relative terms. Assemblies are graduated over time from districts to municipals and then to metropolitans based on a clearly defined criterion in Ghana. A government's decision to fragment assemblies is not within the control of the assemblies but it could potentially impact on the activities of other assemblies that are not fractionalized. Though the decision to fragment assemblies does not vary with time, its impact varies with time and it may be captured using interactive variables. In this case, the interactive variables allow the determination of the relative impact of fragmentation decisions among different types of assemblies. As noted in Table 4, the paper defines three interactive variables for metropolitan, municipal and district assemblies. They are included in the model to show the relative impact of fragmentation. The coefficients of these variables in the regressions, after undertaking the Hausman test of the results of Model 1, gives the impact of fragmentation relative to the other types of assemblies. The paper further calculates the overall impact of fragmentation on property taxes for each type of assembly, relative to the others.