Improving local tax collection through technology in Ghana

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Sector(s): Political Economy and Governance

Fieldwork: Innovations for Poverty Action (IPA)

Location: Ghana

Sample: 8120 residential and business properties

Initiative(s): Governance Initiative (GI)

Target group: General

Outcome of interest: Taxation

Intervention type: Digital and mobile Information

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Research Papers: Technology and Tax Capacity: Evidence from Local Governments in Ghana

Partner organization(s): Melchia Investments

Local governments in Ghana, like many in low- and middle-income countries, face challenges in collecting the property taxes that they need to fund public services. In partnership with the municipal government of Madina, researchers evaluated the impact of a new tax collection technology: tablets equipped with geographic property coordinates and GPS navigation. Tax collectors who used the tablets both delivered more bills and collected disproportionately more taxes than collectors in the comparison group. By saving tax collectors time locating taxpayers, the technology enabled them to invest more time in learning about taxpayers and following up with those who were most able to pay.

Policy issue

Tax collection is critical for development, because it enables governments to fund public goods and services that can boost productivity. In many lower- and middle-income countries, however, governments face challenges in efficiently raising tax revenue to fund development.

Tax authorities face information and enforcement challenges at multiple steps of the collection process. Locating taxpayers and delivering bills to them is the first hurdle. The United Nations has estimated that four billion people live in areas without physical addresses, predominantly in low- and middle-income countries, making it hard for tax collectors to find taxpayers. Second, revenue collectors must determine how much tax each individual or household owes. Previous studies indicate that leveraging pre-existing information about taxpayers' ability and willingness to pay, mainly from third parties including employers and financial institutions, can improve tax collection and payment. However, such third-party information remains limited in many

low- and middle-income countries. Finally, collectors must ensure that households actually pay the taxes they owe, which, due to low enforcement capacity, often necessitates multiple follow-up visits to households.

Governments around the world are increasingly exploring the use of technology, such as satellite data and geographic information systems (GIS), to collect information on taxpayers to build their tax registries, as well as to address other taxation challenges. While these technologies are promising, there is limited evidence on their impact on tax collector behavior, taxpayer compliance, and overall revenue collection.

Context of the evaluation

A key challenge in Ghana's local property taxation system is bill delivery, stemming from limited property addressing. According to a 2017 census of all 216 local governments, 43 percent of property tax bills were delivered and 30 percent of delivered bills were paid. Local officials cited missing owner data and difficulties locating properties as key challenges to delivering and collecting taxes. This is likely the result of absent official property addresses; only 27 percent of properties in the average district had a property number on a named street.

During a fiscal year, the local government conducts multiple six-week campaigns to collect property taxes. Collectors are assigned an area, referred to as a collection unit, to deliver bills and gather payments from property owners. Each collector moves to a new unit after a campaign. Property owners must pay their taxes within the six weeks of a campaign. While pay stations are available, most payments are typically made directly to the assigned collector.

To address this issue, a Ghanian firm developed a technology designed to enhance the delivery of property tax bills and collection of taxes. The technology, a geospatial database of properties embedded into a tablet with GPS capabilities, was designed to aid field tax collectors in delivering bills and collecting payments. The tablet provides navigational features to guide collectors from their starting point to the designated property locations.

Electronic Payment in Ghana

Photo credit: Shutterstock.com

Details of the intervention

In partnership with the government of Madina, researchers evaluated the impact of a new tax collection technology on bill delivery and tax collection.

The evaluation was embedded during one of the six-week tax collection campaigns in 2021. The researchers randomly assigned each of 56 collectors to a collection unit and gave each collector 145 bills. Then, they randomly assigned half of the collector-collection unit pairs to receive the GIS-enabled tablets and the other half to collect taxes as usual. Before the campaign, collectors assigned to the treatment group received training in how to use the handheld tablets.

The researchers gathered daily data from the collectors on the number of bills delivered and amount of revenue collected. They also conducted surveys with collectors, covering field challenges, bill delivery and tax collection strategies, hours worked, and self-assessed knowledge of households. Finally, they surveyed 4,334 randomly chosen households at the end of the campaign, exploring their interactions with and views on collectors, perspectives on taxation, attitudes towards enforcement and governance, and bribe activity. To address the sensitive nature of bribes, researchers asked indirect questions, for example, asking respondents about the likelihood that local collectors solicit bribes in their area.

Results and policy lessons

Tax collectors who used technology delivered more bills and collected disproportionately more taxes than the collectors in the comparison group. By reducing navigational challenges, the technology likely freed up tax collectors' time to identify households with a higher propensity to pay.

Tax bill delivery: Over the course of the tax collection campaign, the collectors that used technology delivered 21.5 more bills on average, a 27 percent increase relative to the 80.7 bills delivered by the average tax collector in the comparison group. This increase reflects the navigational advantage that the tablets provided in helping to locate properties.

Revenue collection: Over the course of the tax collection campaign, the collectors with technology collected an additional GHC 856 (Ghanaian Cedi) (US$55) on average, a 103 percent increase relative to the GHC 829 (US$54) collected in the comparison group. The collectors with tablets collected more taxes per bill delivered than tax collectors in the comparison group. This suggests that the impact on tax collection did not stem solely from the increase in bill delivery.

Targeting propensity to pay: Collectors using technology reported facing fewer challenges navigating and locating taxpayers, resulting in 63 percent (from 1.5 hours to 0.55 hours) reduction in time spent per bill delivered, without reducing the number of hours they worked weekly. They used the time they saved to make more and longer visits to property owners, allowing them to learn more over time about each household's propensity to pay. They made this assessment by asking questions about the owner's income, liquidity, and tax awareness; observing the owner's actions over repeated interactions; and gathering clues by surveying the property or talking with neighbors.

Collectors used this information to conduct more visits to households that were more likely to pay taxes. Tax collectors with tablets collected a larger share of payments from these higher-income households, resulting in more progressive tax collection.

Tax morale and leakages: Tax collection technology had no impact on citizens' perception of government integrity or enforcement capability, or on their satisfaction with government services. The technology increased the likelihood of households reporting bribes by 11.6 percentage points over the comparison group baseline of 13.9 percentage points (84 percent). However, there was a smaller increase in reported bribe amounts increased than in taxes paid.

These findings suggest that, in contexts where third-party information about taxpayers is limited, new technologies can help tax authorities locate and collect information on taxpayers. Future studies could investigate the longer-run impacts of this

technology, including how tax collectors' learning evolves over time and how citizens adapt to being more visible to the state.

Dzansi, James, Anders Jensen, David Lagakos, Henry Telli. "Technology and Tax Capacity: Evidence from Local Governments in Ghana." Working paper, February 2025.