

Original Paper

KRA Second University Symposium, 9th October 2020—Impact of Technology on Tax Administration

Dr. Gabriel N. Kirori¹

¹ The Catholic University of Eastern Africa, Nairobi, Kenya

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Abstract

This study investigates the theoretical basis for revenue mobilization and the role of technology in tax administration. Public finance theory supports the growth of the share of government expenditures to GDP with implications of constraints for public investment financing. The equilibrium predicted in the theory of loanable funds is no longer sustainable because of shortage of domestic savings creating a situation of excess demand for funds to finance public investments. Leveraging on technology can be an important administrative policy for boosting revenue mobilization. The study concludes that both tax administration reforms and quality of governance are complementary to technology in tax revenue mobilization in the developing economies.

Keywords

revenue mobilization, tax administration, government expenditures, loanable funds, technology, developing economies

1. Introduction

The theory of public sector economics stipulates that nations often face excess demand for loanable funds to finance public investments. For instance, on average, the sub-Sahara Africa (SSA) countries face an annual financing gap estimated at about \$230 billion over the next five years. The shortfall is due to low domestic saving rates. As external financing becomes increasingly more difficult and debt levels on the rise across the continent, tax revenues remain the most important component of domestic resources to fund public investments. Mobilization of domestic resources is imperative and boosting tax revenues has become the centre of many initiatives.

The task of tax administrations is to collect the right amount of tax from the right taxpayer at the right time, but often can include achieving uniformity in applying tax laws, providing quality taxpayer service, improving compliance, or other. In an environment of continuous technological innovation and

business change, tax administrations around the world use Information Technology (IT) solutions to meet operational and strategic needs.

2. Economic Basis for Government Activity

Everyone in the society benefits from government activities and expenditures. It is important to reflect what it would be like to live in a nation without government. There would be no system of courts to administer justice. For example, governments establish property rights to the use of resources and enforce contracts by providing a system of law enforcements and courts. Government power is used through these functions to establish rules that regulate the social interaction among individuals and to settle disputes among citizens. Further, provision of national defence would be difficult or disorganized. There would not be programmes of social security, driving on roads and over bridges that people take for granted could also be a problem because virtually all the highways, streets, and other public transportation facilities used everyday are supplied and maintained by governments or their agencies. There would be no public schools. The system of health care depends on government programmes to a great extent, and so on.

Modern public finance emphasizes the relationship between the economy and the government. Government goods and services are made available without charge for their use, and they are financed by compulsory payments, mainly taxes, that are levied on citizens and their activities. Government spending comprises purchases and transfers. The bulk of government purchases are consumption expenditures that use resources to satisfy current needs. Gross investment by government is expenditure for new capital such as roads, equipment, and structures. Transfer payments are government expenditures that redistribute purchasing power among citizens. Included in government transfer payments are social security pension benefits and cash payments to the elderly persons.

Growth in government expenditure, i.e., the rising ratio of expenditures to GDP, is influenced by several factors including, rising income leading to changes in efficient product mix, technical change, population change, relative costs of public services, urbanization, changing scope of transfers, availability of tax handles, threshold of war finance, and political and social factors.

3. Financing Government Expenditures

Taxes are the principal means of financing government expenditures. Taxes affect economic incentives to produce and consume or to use productive resources in the most gainful way. For instance, high taxes on interest from savings tend to reduce the incentive to save. Taxes on various consumer goods tend to reduce the amounts of these goods that will be consumed. Taxes on labour earnings can also reduce the incentive to work. In evaluating alternative means of financing government expenditures, desires for fairness in taxation must be balanced with the possible harmful effects of taxes on incentives to produce, consume, and invest (Auerbach & Hines, 2002).

Taxes may be classified as follows: they may be imposed in the product or in the factor markets; they may be imposed on the seller's or the buyer's side of the market; they may be imposed on households or firms; and they may enter on the sources or uses side of the taxpayers account. A country's tax system is developed in response to economic, political, and social influences. The major factors in the requirements for a good tax system include: adequate revenue yield, equitable distribution of the tax burden where everyone is made to pay his/her fair share, include both the impact point at which the tax is imposed and its final resting place (incidence), chosen so as to minimize interference with economic decisions in otherwise efficient markets, tax structure that should facilitate the use of fiscal policy for stabilization and growth objectives, tax system that should permit fair and non arbitrary administration and be understandable to the taxpayer (Mikesell, 2003).

4. Link between Saving, Investment and Growth

Within the framework of neoclassic economy, all goods and services in a closed economy are absorbed domestically in that the value of gross domestic product equals gross national expenditure (Solow-Swan, 1956). Total absorption consists of government consumption (G), household consumption (C), and firms' investment (I). In an open economy, total spending by residents comprises the absorption of domestically produced goods and services *and* goods and services produced abroad. The difference between residents' spending on domestically produced goods and services and total absorption is imports (M). Exports (X) are foreign spending on domestically produced goods and services. If the trade balance is in deficit, i.e., imports exceed exports, absorption (A) exceeds output (Y), i.e.,

$$Y - A = X - M$$

$$\text{where } A = G + C + I$$

The Current Account Balance (CAB) is defined as the sum of the trade balance ($X - M$), net income paid abroad (y_a) and net transfers paid abroad (t). Thus,

$$CAB = X - M + y_a + t$$

In a closed economy, domestic saving must equal investment. In an open economy, the difference between domestic saving and net domestic investment is the current account balance. When the current account balance is in deficit, the excess of net domestic investment over saving is financed by foreign funds or net capital inflows as measured by net foreign investment or the capital account surplus. Thus, an economy with access to foreign capital can augment its capital stock through foreign investment.

5. Taxation and Consumer Behaviour

When governments raise taxes, people alter their behaviours and make decisions they otherwise would not make, suggesting changes in resources allocation. For instance, taxes raise the prices buyers pay providing incentives to consume less, while they lower the prices sellers receive providing incentives to produce less. This results in the shrinking of the size of the market below its optimum (i.e., the size of the

market that maximizes total surplus) in the sense that revenues raised by government taxation may be less than the distorting market outcomes (Slemrod & Yitzhaki, 2002). The decisions made by market participants as a result of tax policies, has emerged as a significant topic in public sector economics. Taxation affects market behaviours such as consumer demand and tax avoidance behaviour. The effect of taxation on market behaviours necessarily takes into account the influences taxes have on the prices consumers pay, the quantities consumers demand, and the resulting tax revenues raised. Also essential are other margins of behavioural responses to taxation independent of the consumption basket, broadly defined as tax avoidance (Slemrod & Yitzhaki, 2002). Tax avoidance activities lead to revenue loss by government.

Consistent with the theory of consumer demand, a set of choices are available to a household, referred to as the opportunity set, the size of which is determined by the household's budget constraint. Tax policy affects the opportunity sets facing households in the manner that it is impossible for an individual to pay a higher tax bill without reducing consumption, increasing income, reducing savings, increasing borrowing, or some other behavioral response. The implications of these decisions determine the ultimate effect of taxation. Further, taxes affect both the demand and supply sides of the market such that, the effect of the tax will be determined by the relative ability of buyers and sellers to modify their behaviours in response to the tax imposition (Mikesell, 2003).

Regardless of the tax base or structure of a tax, tax policy (tax incidence, optimal taxation, tax compliance, tax reform, etc.) influences and is influenced by how consumers respond. Household decisions are also based on the concepts of economic efficiency, economic inefficiency, and distributional welfare. From an efficiency standpoint, standard public finance theory claims that a tax levied for revenue is worthwhile only if it can generate meaningful revenue while from an equity position, revenue must be raised at socially acceptable rates. Because tax obligations are functions of individual behaviours, they almost invariably have excess burdens (Auerbach & Hines, 2002). The total burden of a tax is comprised of the payment made by the taxpayer to the government in addition to the welfare cost in terms of the loss created by the changes in producer and consumer decisions that the tax produces. This is "excess burden" or "deadweight loss" on the economy and potentially lowers output and the satisfaction of the market participants. The efficiency objective in tax policy attempts to yield necessary revenue (the tax burden) while keeping economic distortion (excess burden) as low as possible. This also implies the Pareto criterion of public policy or the Pareto-efficient allocation of resources implying when one person is made better off without making anyone else worse off (Popa, 2007). When a public policy decision makes any individual worse off, it has not been in the interest of every member of the public and therefore does not meet the Pareto criterion.

In inefficient markets, economic activity creates externalities that result in a divergence between private and social costs. When the competitive outcome is no longer efficient, it may be deemed necessary for the government to intervene to limit the inefficiency that results, guiding economic behaviours to return the allocation of resources closer to the social optimum (Mikesell, 2003).

The influences of taxation on consumer demand is of primary interest to public policy makers, economists, and academic researchers in an endless quest for the ideal or “optimal” system of how to raise revenues efficiently and equitably, without compromising the productive activities that foster economic growth such as investment incentives, capital formation, and the supply of work effort. One problem, however, is that an efficient tax system may not necessarily be considered fair, and one that is considered equitable may not be efficient. Auerbach and Hines (2002) observed that designing an optimal tax system means keeping tax distortions to a minimum, subject to restrictions introduced by the need to raise revenue and maintain an equitable tax burden. A second problem is the magnitude of avoidance responses to tax policies and the significant implications of those activities on revenue and welfare costs (Slemrod & Yitzhaki, 2002).

Economic theory suggests that tax policies have powerful effects on market behaviours that influence and oftentimes distort economic decisions and social activities. In terms of economic incidence (or who actually bears the burden of the tax), which is different from the statutory incidence of a tax (or who is legally responsible for the tax), the problem is one of determining how taxes change prices. Distortionary taxation focuses on the ability of individuals to lower their tax liability by altering their behaviours (McGrattan, 1994). For instance, when a commodity is taxed, an individual may change his or her tax liability simply by reducing the purchase of that commodity. Behaviours that are altered due to distortionary effects of taxation shrink the size of the market below the level that maximizes total surplus. As a result, consumers respond to government tax policies in a myriad of ways (McGrattan, 1994). For instance, consumers will respond to a rise in the price caused by a product-specific excise tax simply by purchasing a substitute good. The magnitude of the distortionary effect caused by the tax will depend on how much quantity supplied and quantity demanded respond to changes in price, which in turn depend on the substitution possibilities, referred to as the substitution or distortionary effect of taxation. The more limited the substitution possibilities, the smaller the deadweight loss or inefficiency due to taxation. For goods and services that are inelastic in demand or supply, the amounts bought and sold change relatively little when price changes. Higher taxes on these goods cause a relatively low fall in consumption. The actual incidence of the tax depends on the elasticities of demand and supply.

Another effect of taxation takes income away from individuals, which necessarily makes them worse off. This is referred to as the income effect of taxation (McGrattan, 1994). When incomes change, consumer behaviours are altered as well. Whereas the substitution effect of a tax results from changes in relative prices holding utility constant, the income effect of taxation is due solely to the loss of income, relative prices are unaffected. In other words, the income effect is simply a change in purchasing power or real income. This is the same effect as the impact of a lump sum tax on consumption.

On the other hand, a lump sum or no distortionary tax is one for which the consumer’s tax liability is independent of his or her behaviour in that there is nothing an individual can do to lower the tax liability. These refer to taxes that must be paid regardless of income or wealth, such as a head tax or a tax on unimproved land. Such a tax is deemed efficient, in the sense that it is economically neutral because it

avoids all distortion of the free market process. The burden of a lump sum tax does not fall on any particular economic activity. As such, taxpayers' economic decisions are completely unaffected by the tax system, and every person pays an equal lump sum tax. A tax of this nature is also considered administratively efficient, in the sense that neither taxpayers nor the government would need to document taxpayers' income.

6. Need for Tax Revenue Mobilization

The model of financial markets and equilibrium stipulates equality of the supply of loanable funds, which is national saving, and the demand for loanable funds, which is investment (Solow, 1956; Swan, 1956). From the theory of public sector economics or public finance, nations often face excess demand for loanable funds to finance public investments (Barone & Mocetti, 2011). For instance, Caulibaly and Gandhi (2018) explain that, Sub-Sahara Africa (SSA) countries face a financing gap estimated at about \$230 billion over the next five years yearly, on average, to finance public investment. The shortfall is due to low domestic saving rates. Tax revenues in SSA are estimated at 15 percent of GDP in 2015, the lowest in the world, compared to 24 percent of the OECD and other emerging developing economies. Tax revenue mobilization disparities across SSA and the large gap compared with OECD are due to several factors including inadequate fiscal policy, low taxation capacity, leakages in revenue collection, and weak enforcement (Brookings, 2018). SSA has the lowest tax capacity in the world at 20 percent of the GDP due to factors including low level of economic development, large share of agriculture in economic activity, large size of shadow or informal economy that accounts for 34 percent of GDP, on average (Medina & Friendrich, 2018).

Tax revenues are the most important component of domestic resources. External financing becoming increasingly more difficult and debt levels on the rise across the continent, the mobilization of domestic resources is imperative. Boosting tax revenues has been the centre of many initiatives including the 2002 Monetary Consensus, the 2011 Buson Agreement, the 2015 Addis Tax Initiative, and the 2016 Platform for Collaboration on Tax as well as commitments by SSA countries and international development partners (Caulibaly & Gandhi, 2018). Two fundamental drivers of tax revenues mobilization are tax capacity and efficiency. Tax capacity is the optimum tax revenues as percentage of GDP a country can mobilize given the structural factors of the economy whereas efficiency in revenue mobilization is largely determined by governance. SSA has the low scores in governance as measured both by levels of corruption and accountability, in the International Country Risk Guide.

7. Technology and Tax Administration

Tax administration is the department of the government responsible for the management of tax obligations specified by the tax law (Hussey & Lubick, 1996). Its primary task is to ensure that the right amount of tax is paid by the right taxpayer at the right time, providing the government with the needed revenue to deliver goods and services as planned. The functions of the tax administration

include processing of registration filings and issuing Taxpayer Identification Numbers (TIN); validating and processing returns and payments received through different channels; maintaining the taxpayer's accounts; providing tools to identify and pursue delinquent taxpayers; automating appeal tracking; and providing taxpayer service staff with access to taxpayer information to enable a better level of service to taxpayers, among others. An administration that achieves this task is effective. An administration that does so at reasonable and minimal cost to the government is efficient. Tax administrations are expected to impose minimal costs on taxpayers and maintain a business friendly environment.

During the 1990s and 2000s important administrative and legislative reforms to improve revenue collection were undertaken in several emerging and developing economies. The reforms included the introduction of value-added tax, programmes to improve taxpayer services, rollout of electronic filing systems, creation of semi-autonomous revenue agencies, improved non-resource tax mobilization, and implementation of tax reforms for small businesses (OECD, 2017; Ebeke, Monsour, & Rota-Graziosi, 2016; IMF, 2018b). Boosting tax revenue mobilization necessarily requires administering policies to improve both tax capacity and efficiency. These policies include fostering strong and equitable economic growth, diversifying economic activity away from agriculture, reducing informality, and leveraging technology, so as to broaden the tax base and expand the taxation capacity and efficiency of the economy.

Jimenez, tSionnaigh, and Kamenou (2013) explain that for the past three decades, USAID has provided assistance in tax administration reforms to many countries including El Salvador, Bosnia, Herzegovina, Georgia, Costa Rica, Egypt, through Tax Modernization and Tax Policy and Administration Reform programmes, with a focus on mobilizing public sector revenues and creating enabling environment for private sector development. IT is a crucial component of tax administration reform as it enables tax administrations to better gather and analyze information, to proactively manage workload and resources, to foster a cooperative engagement with taxpayers, and to standardize the treatment of taxpayers and thus facilitate the uniform application of the tax law. However, tax administration systems of most developing economies have been fundamentally weak lacking viable infrastructure capabilities from the organizational, legislative and IT perspectives and have needed various policy reforms before IT implementation (Jimenez, tSionnaigh, & Kamenou., 2013).

The advent of information and communication technologies has offered profound avenues to support tax revenue administration effort presenting opportunity to formalize informal businesses, expand the tax base, simplifying processes and reducing costs of formalization to help firms make the transition to the formal sector, enhancing the efficiency of tax collection by modernizing and strengthening tax collection processes, reducing compliance costs, enforcing collection, and sealing leakages (Grimm, 2016). The most prevalent use of IT systems in tax administrations has been to underpin the core tax administration tasks of processing returns and payments and collecting relevant information, enabling the tax administration to move away from heavy manual processing and to direct its resources to

facilitating, monitoring, and enforcing compliance, facilitating voluntary compliance by opening multiple interactive and electronic channels with taxpayers. This may include support for electronic registration, filing, payment, information dissemination, and other functions. With respect to compliance monitoring and enforcement, the 'compliance performance system' of modern IT systems provides support to the tax administration's audit and collections function in collecting and managing information to target areas, where non-compliance poses greatest risks to revenues (Hussey & Lubick, 1996).

Martinez (2016) explains that changes in technology as reflected in new electronic methods such as e-invoicing, e-accounting, e-reporting, e-auditing, along with advanced tax-focused analytics have dramatically changed the tax compliance landscape. The evolving technology landscape leads to new business opportunities, detecting and/or reducing fraud, tax compliance, and tax analytics. According to the author, technology has become business-as-usual such that all tax payers including tax authorities, taxpayers, tax technology vendors, and tax advisory firms need to embrace technology solutions and data analytics in order to meet their tax compliance obligations.

Okunogbe and Pouliquen (2018) examined impact of e-filing on compliance costs, tax payments, and bribe payments using experimental variation and data from Tajikistan firms and found that firms that use e-filing have lower compliance costs, spending five fewer hours each month on fulfilling tax obligations. Further, the authors found that, among firms less likely to have been evading, e-filing reduces tax payments suggesting that tax officials had previously required them to pay higher taxes. These firms also pay fewer bribes as e-filing reduce opportunity for extortion. E-filing reduces compliance costs and makes the distribution of tax payments across firms arguably more equitable (Okunogbe & Pouliquen, 2018).

Cotton and Dark (2017) emphasize that IT is central to the effective administration of taxation systems as evolving business practices across the globe now demand efficient, comprehensive, accurate, and interactive capability to deal with administration of the whole revenue system within a country. According to the authors, tax administrations need to be able to deal with changing numbers of taxpayers and increasing amount of information required to manage the complexity of their interactions as well as better transparency of their operations, greater efficiency, and greater responsiveness to the needs of both taxpayers and the government. These needs cannot be met by traditional means but only by the effective use of IT.

8. Quality of Governance and Public Goods and Services Provision (including IT)

According to Mallick (2020), quality of governance and provisioning of public goods and services are complementary. The author explains that effective governance is vital in ensuring efficient delivery of public survives and similarly, optimal availability of public infrastructure particularly the accessibility of modern technologies can largely also ensure efficient delivery of public services through greater

accountability and transparency in information between the service providers, government agencies and the intended beneficiaries of those public services.

Andreoni et al. (1998) observe that all economies generally face practical difficulties in measuring the compliance gap (tax evasion) and obtaining the statistical information relating to the factors influencing the compliances, developing economies experience lesser degree of compliances or higher levels of tax evasion. These difficulties, along with inadequate economic structure in developing economies as reflected in low income base given the low level of economic development, as well as fragmented politics, weak institutional structure and low transparency, are factors that can explain the situation of low proportion of tax revenue to GDP experienced in developing economies compared to rich economies (Besley & Persson, 2014). The authors emphasize that effective enforcement by tax administration and availability of information about the potential tax payers, are critical factors that influence compliance behaviour of tax payers. Mallick (2020) argues that in the absence, in a developing economy, of information about the extent of improvement in effectiveness in tax administration, i.e., efficiency in tax collection by tax authorities, and the degree of tax compliances by the tax payers, the quality of governance and access to modern technology facilities are proximate measures of the extent of efficiency in tax administration and degree of tax compliances, and of the extent to which they are important for the improvement in tax revenue mobilization for a developing economy.

Most developing economies have performed poorly in the quality of governance as reflected in the global corruption perception index ranking by the Transparency International (Mallick, 2020). The author explains that, on account of absence of clear mechanism to establish accountability and in the name of public welfare improvement, corrupt officials channel public funds to wasteful projects which generate bribes, depleting public funds which could otherwise have been spent productively in provision of social services including health and education that could benefit the poor in most significant ways. Most governments in developing economies are not able to achieve efficiency in expenditure allocations because they fail to control their fiscal deficits. IMF (2016) points out that corruption imposes a greater social cost on nations as it weakens state's capacity to perform its core functions. It affects macro-financial stability, public and private investment, human capital formation, curbs on economic growth and thereby undermining the potential drivers of inclusive growth. Countries with higher corruption tend to have poor access and low quality infrastructure for a given level of public capital stock, thereby undermining the efforts to improve over the infrastructure gap and productivity of existing capital. Several studies (Mauro, 2004; Dreher & Herzfeld, 2005; Blackburn et al., 2006; Arnone & Iliopulos, 2007; Muralidharan et al., 2014) also point out that the countries that are less corrupt and maintain good transparency record achieve greater economic success in terms of higher growth, GDP levels and Human Development Index (of United Nations) based on measures such as life expectancy and years of schooling. Poor quality of governance and lack of modern

technology facilities can have adverse implications on the fiscal performance of economies as can be reflected in low levels of revenue mobilization and increases in fiscal deficits.

Facilitating the public with provisioning of access to public goods, services and modern technologies requires having more financial resources. The mobilization of financial resources hinges on methods and mechanism of tax revenue collection as well as many factors including adequate physical infrastructures, efficient tax collectors, transparency and accountability in the system, honesty and morality of the tax payers in complying with the laws, tracking of information on portion of income generated in the private sector, simplification of the tax laws, knowledge and awareness of the citizens to comply with tax laws and financial and real punishments associated with defaults in tax payments among others. With the revolution of technology in the global economy it is important to understand whether the use of technology has resulted in greater collection of tax revenues in view of potential contributory power of technology to confer towards transparency and accountability in the taxation system.

The use of technology is not only gaining importance in tax revenue mobilization for the governments, but also for the improvement of governance quality, as well as rapid improvement in general service delivery and public sector performance. For instance, e-governance is being used by many economies as a means to cut costs, improve the quality, timeliness and access to service delivery by public agencies (Mallick, 2020). The author argues that, unless tax administration is efficiently complemented with the quality of governance and proper institutional structure, technology alone may not drive tax revenue mobilization adequately to the desired productivity gains for developing economies. Quality of governance is crucial in enhancing minimization of leakages and wastage of public resources, as well as enhancing aggregate welfare maximization. It is important to examine the role of technology along with governance quality or institutional mechanism in tax revenue mobilization for a developing economy, argues Mallick.

9. Conclusion

SSA countries often face excess demand for loanable funds to finance public investments due to low domestic saving rates. They face a large financing gap compared with OECD due to inadequate tax capacity given the structural factors of their economies (inadequate fiscal policy, low taxation capacity, leakages in revenue collection, and weak enforcement, low level of economic development, large share of agriculture in economic activity, large size of shadow or informal economy) and inefficiency in revenue mobilization largely because of poor quality of governance. SSA has the low scores in governance as measured both by levels of corruption and accountability, in the International Country Risk Guide and International Transparency. Poor quality of governance will have adverse implications on the fiscal performance of economies in terms of low levels of revenue mobilization and increases in fiscal deficits. Quality of governance is crucial in enhancing minimization of leakages and wastage of public resources besides enhancing aggregate welfare maximization. Unless tax administration is

efficiently complemented with the quality of governance and proper institutional structure, technology alone may not drive tax revenue mobilization adequately to the desired productivity gains for developing economies.

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