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Assessing tax evasion in developing countries

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Assessing tax evasion in developing countries

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Assessing tax evasion in developing countries

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Abstract

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1 Introduction

Tax revenues, in most developing countries, are the basis of public resources. Tax resources are then a privileged instrument in the service of the State to meet commitments as a guarantor of social welfare. Budgetary revenues come either from direct taxation, or from levies on goods and services still called indirect taxes, or from taxes on imports.

Following the serious financial and economic crisis of the 1980s, the Republic of Benin witnessed a drastic fall in tax revenues. During this period, the levies on the Beninese economy increased from 59.2711 billion to 21.23001 billion (INSAE, 1990). This situation has placed the Benin State in the inability to cope with operating and investment expenses. The political and administrative authorities of that time reacted by adopting the SAP (Structural Adjustment Program) as a way out of the crisis. Among those reforms, we have the introduction of VAT which is based on E.U VAT system as other African countries. The main innovation in the Beninese tax regime in 1991 was the introduction of VAT by Law N ° 91 - 005 of 22 February 1991 on the introduction of VAT in Benin.

Building the capacity of low-income countries to mobilize more tax revenues is currently at the top of the development policy agenda. Tax revenues alone account for 80% of total revenues in Benin (INSAE, 2005). The tax revenue is the main source of financing in Benin. To finance human and economic development, African countries need more resources. For Cnossen (2015) the contribution of the tax revenue to the GDP is around 41.8 percent for Benin using 2010 database which is not enough to finance education, health care, public utilities, and transportation systems. Fenochietto and Pessino (2013) found a positive and significant relationship between tax revenue and the level of economic development. Among other taxes, VAT is an easier tax handle and less detrimental to economic growth than the income tax. Arnold et al. (2001) suggest that income tax reduces the rate of economic growth more than consumption taxes do. There are many non-standar exemptions defined in their taxation system but as other Luxophone and Francophone taxing traditions there is no zero rate.

The increase in tax revenue mobilization depends on each countries' tax capacity which is the tax ratio that can be raised taking into account country's economic and institutional environment. VAT collection efficiency is developed by Ebrill et al.(2001) and Keen(2013) ; OECD (2008) calls it the "VAT revenue ratio". It measures a country's VAT performance as the ratio of the revenue actually collected to the potential revenue found by applying the standard rate, τ , to final consumption expenditures. This final consumption includes households, governments, and non-profit organizations consumption net of VAT. $1 - VAT\ C - efficiency$ is the share of VAT that is not collected. This includes the losses of the potential revenue on the account of exemptions, zero rates and lower than standard rates (policy gap) and losses on the account of compliance and administrations (compliance gap). This loss is very high in African

countries and Cnossen(2015) argues that this may be attributable to economic factors (such as the degree of monetization), the share of agriculture (perforce exempted) in GDP, lack of administrative effectiveness, or a combination of these factors. Cnossen (2015) evaluates the C-efficiency of Benin at 0.45 using data of 2010 which is telling us that Benin does not collect even the half of their potential VAT. Whereas The United States Internal Revenue Service (2005) reports tax evasion numbers, also referred to as the tax gap (difference between what taxpayers should pay and what they actually pay), in excess of \$300 billion per year, representing 2.7% of Gross Domestic Product (GDP). Other countries experience hidden economies between 6% of GDP (Switzerland) and 27% of GDP (Italy) (Giles, 1998). The aim of this work is to decompose the VAT in c-efficiency gap, the compliance gap in order to estimate the level of tax evasion in Benin and advice policies.

2 Fiscal Environment of Benin

In this section, we will discuss about the VAT application and the exemptions on differents goods in Benin.

2.1 VAT application in Benin

Indeed, this tax which is imposed on the expenditure is unique and with split payment. The VAT operating mechanism obliges any legal person liable to collect the tax in the course of its sales of goods and services to charge the collected VAT the amount of VAT paid upstream on its purchases of goods and services Services and to return the resulting net VAT to the tax window. The mechanism meets the following formula: the *Net VAT to be repaid = VAT collected or gross – deductible VAT*.

If the deductible VAT is higher than that collected, the absolute value of the difference constitutes a VAT credit recorded on the declarant's assets. But it is important to emphasize that the deduction of VAT incurred upstream is strictly subject to conditions and restrictions clearly set out in the dispositions of Articles 234 to 236 of the CGI.

In addition, there are some particularities worth noting in the application of VAT in Benin. Benin adopted a single VAT rate of 18% (see Art. 232 of the CGI). However, by way of derogation, a 0% rate is applicable to export operations in order to make Benin products abroad competitive (see art. 225 of the CGI).

For deliveries of tangible personal property, VAT is payable on delivery of the goods even if the price has not been paid. For its operations the generating fact and the exigibility coincide.

The VAT on services is due when the service is completed and this obligation can not be post-invoiced in any case, unlike other countries (France, Togo ...) for which the VAT Service is fixed at the payment (see art. 228 of the CGI).

For business carried out with the State and its sub-divisions, the VAT is payable and the amount of VAT is partially withheld at the source in accordance with the rate fixed by decree of the Minister in charge of finance and in force at the time Of the market or contract. The withholding tax rate currently in force is 40% (see Art. 230 of the French Tax Code).

A mechanism for the reimbursement of VAT credit is provided for producers, exporters, approved to the Community investment investment code and any taxable person who acquires investments qualifying for deduction for an amount in excess of 40 000 000 francs CFA Taxes comprises (see art. 243 of the CGI).

VAT is a monthly reporting tax for companies operating under the real and quarterly regime for companies operating under the simplified regim.

2.2 Exemptions of VAT

The exemption of VAT in Benin is based on the exemption harmonization of the WAEMU included in Directive 02-2016). The following are exempt from VAT:

(1) hospitalization benefits, including the transport of the wounded and sick people, And provision of care for citizens by the Public health centers, other health centers or By assimilated bodies, and the Care provided by the Members of the medical and paramedical.

(2) the supply of medicines and Pharmaceutical products, as well as Specialized equipment and products For medical activities in accordance

(3) deliveries of unprocessed and essential food products in accordance with the list, which is an integral part of the products cited below.

(4) services rendered in the field of school or university education by public and private institutions or by similar bodies;

(5) banking operations and insurance and reinsurance benefits, which are subject to specific taxation;

(6) transfers of immovables, real property rights and transfers of goodwill imposed on registration fees or equivalent taxation;

(7) deliveries, at their face value, of postage stamps for postage, tax stamps and other similar values;

(8) sales of books;

(9) sales of newspapers and periodicals, except advertising revenues;

(10) the sales, by their author, of original works of art;

(11) rentals of residential buildings;

(12) gas for domestic use.

These products are:

- But, millet, sorghum, fonio, wheat, rice with the exception of luxury rice and other cereals
- Manioc, potato, yam, potato, tarot and other tubers and roots
- Beans, soybeans, sesame, peanuts; Peas and other legumes

- Onions, tomatoes, eggplant, okra, chili and other vegetables and market gardening products
- Shell Eggs
- Fresh meat
- Unprocessed fish (fresh, smoked, salted or frozen)
- Unprocessed milk.

The following are also exempt from VAT:

- (1) les importations de biens dont la livraison est exonérée de TVA à l'intérieur du pays;
- (2) imports of goods placed under a customs suspensive procedure and the supply of services related to goods placed under the customs transit procedure;
- (3) exports of goods and services assimilated to exports;
- (4) shipments, alterations, repairs, maintenance, chartering and hiring of boats intended for fishing, industrial or commercial activities carried out on the high seas, deliveries, rentals, repairs and maintenance of objects incorporated or serving them To the operation of such vessels, the supply of goods for their refueling and the provision of services for the direct needs of such vessels and their cargoes;
- (5) deliveries, alterations, repairs, maintenance, charter and aircraft rentals, used by air navigation companies mainly engaged in international paid traffic, deliveries, rentals, repairs and maintenance of objects incorporated in them or used for Their operation, the supply of goods for their bunkering, and the provision of services for the direct needs of such aircraft and their cargo.

3 Literature review

Tax evasion has been the subject of a great deal of academic research in most developed countries over a long period of time (Richardson & Sawyer, 2001). From there on, little researches have been focused on developing countries. VAT is a tax levied at each addition of value in the processing of a raw material, the performance of a service, or the production and distribution of a commodity with each payer except the consumer reimbursed from payment at the next stage. In many countries, this VAT is not efficiently collected creating a gap between what taxpayers should pay and what they actually pay. In this section, we will discuss the VAT arguments, the determinants of efficiency, the methodologies used in the literature and some findings in African countries.

3.1 VAT arguments

In the literature, there are three broad theoretical arguments for the introduction of VAT. They concern revenue, neutrality, and efficiency, all of which are analysed in the context of the taxes that VAT replaced. For the IMF, The

revenue argument is of increasingly limited importance but the more important arguments are neutrality and efficiency.

3.1.1 Revenue arguments

Many economists have traditionally believed that VAT will become the dominant revenue-raising tool in the developing world. The World Bank has noted that VAT's revenue raising potential, even at moderately low rates, has proven to be substantial, even for countries at early stages of development. The VAT has established itself as a robust source of revenue, with signs that it has proved a relatively efficient instrument. It typically accounts for around one-quarter of all tax revenue; and no country has ever removed a VAT without subsequently reintroducing it. Keen and Lockwood (2010) find that countries with a VAT generally raise more revenue than those without, all else equal, though the likely gain varies with countries' openness and income levels (being less, for instance, in smaller countries, presumably because tariffs are then an easy revenue source, and perhaps lower in sub-Saharan Africa than elsewhere).

Ebrill et al. (2001) also address the question of revenue performance. The authors present data on eight SSA economies that adopted VAT in the 1990s to provide evidence that VAT has indeed raised more revenue than the taxes it replaced (sales taxes being used in this calculation). Ebrill et al.'s concluded that SSA countries that have adopted a VAT raise significantly more revenue than those SSA economies without a VAT, compared to any other region. They turn to the question of when VAT is most effective in raising revenue, in particular, what factors, in tax design and the economic environment, contribute to its revenue raising performance. They note that VAT revenues depend on three broad sets of factors: the rules describing rates, bases, thresholds, and other structural features of the tax; the scale of taxable activities; and the degree of compliance with the rules. We will discuss now the efficiency argument.

3.1.2 Efficiency/ neutrality argument

VAT is believed to minimize distortions, which violate efficiency in the economy. The main argument here is that VAT does not affect the relative prices of consumption, thus minimizing the potential for the tax system to interfere with the efficient allocation of resources (allocative efficiency). Also, since VAT is a consumption tax it minimizes the disincentive to save and invest (no tax on profits and investment). Thus, the existence of VAT is said not to violate either productive or allocative efficiency.

Scott Riswold (2004) notes that, in practice, efficiency is achieved by levying taxes on as broad a tax base as possible and at fairly low and uniform rates. However, they are quick to add that the concept of efficiency exists only if VAT has a broad base with few exemptions and a single rate. This is because, with exemptions, VAT may be distortive. This indicates an inefficient VAT in SSA due to the existence of rather high rates, narrow bases and many exemptions (Scott Riswold, 2004). The main advantage of VAT is that it is collected

throughout the production and distribution process rather than at the final consumption stage only. This ensures a better audit trail and likely decreases evasion compared to a system of sales taxes.

In developing countries any tax encourages informality, but a VAT may be less harmful than alternatives. A higher rate of VAT tends to increase informality, so the rate should be lower where informality is a greater concern. But other tax instruments, such as an income tax, also spur informality, and the VAT offers some advantages: if a trader's customers are registered for VAT, it is advantageous for them to register too. But 'bad' VAT chains can also form: if a trader's customer are not registered, better for them not to register either (de Paula and Scheinkman, 2006). It has also been argued that the VAT may deal with informality less effectively than tariffs, because unregistered traders will at least pay tariffs on their imports (Emran and Stiglitz, 2005). This though can be overstated: unregistered operators will incur unrecovered input VAT on imports just as they incur customs duty and, unlike tariffs, the VAT also reaches informal operators on their purchases from compliant domestic firms.

Scott Riswold (2004) reported that flawed design and implementation undermines the effectiveness of the VAT in many developing countries with refunds a particular problem. Common difficulties include: low (sometimes, as in Nigeria, zero) thresholds (pressurizing tax administrations and diverting attention from higher value and riskier taxpayers); extensive exemptions and zero rating (creating classification disputes and increasing compliance costs); inadequate preparations and public sensitization (making resistance more likely); and piecemeal implementation (as previously in Yemen, for instance). Refunding exporters requires balancing the risk of fraud against that of turning the VAT into a de facto export tax. This challenges all tax administrations, but significant and sometimes corrupt delays in refunding legitimate claims are commonplace in developing countries, and a major business complaint.

3.2 Determinants of tax evasion

The literature point out several sources of tax evasion. Several studies show that corruption affects tax administration and has a negative impact on the levels of tax revenues collected in a country (Nawaz, 2010). The corruption can manifest under divers forms as bribery, revenue fraud, embezzlement, extortion, patronage/nepotism, regulatory capture, collusion between tax officers and tax payers, political interference, revolving doors, and it is seen by some scholars as a tool to mitigate the burdens of excessive taxation on the economy through enabling better allocation of resources and enabling investment (Claudiu et al., 2016). Using a panel cointegration analysis on 15 countries in Europe Claudiu et al., (2016) find that tax evasion and corruption have a negative influence on entrepreneurship, but some endogeneity issues appear when investigating this relationship. Based on data for 45 countries, Richardson G. (2006) using the OLS regression analysis shows that non-economic determinants have the strongest impact on tax evasion. Specifically, complexity is the most important determinant of tax evasion. Other important determinants of tax evasion are

education, income source, fairness and tax morale. Overall, the regression results indicate that the lower the level of complexity and the higher the level of general education, services income source, fairness and tax morale, the lower is the level of tax evasion across countries. Income level represents an additional key determinant. Mason and Lowry (1981) and Witte and Woodbury (1983) find that middle income taxpayers are generally compliant with tax laws, while low income level taxpayers and high income level taxpayers are relatively non-compliant with tax laws. Chen B-L. (2002) finds that an increase in both unit cost of tax evasion and punishment-fines reduces tax evasion, whereas an increase in tax auditing reduces tax evasion only if the cost of tax enforcement is not too high. Using a standard AK growth model with public capital, he found that those policies have ambiguous effects upon economic growth, due to their indirect effects upon tax evasion and optimal tax rate. The behavior also is a key determinant. Allingham and Sandmo's (1972) classical model of tax evasion assumes that behavior is influenced by factors such as the tax rate (which determines the benefits of evasion), the penalties for fraud, as well as the probability of detection (which determine the cost). Allingham and Sandmo (1972) state that given the low probability of being audited in many countries and the comparatively low penalties for those being caught evading, rational and selfish taxpayers would decide to evade or underreport taxable income. Australian (1998) conducted an extensive review of compliance literature whilst compiling its second report to the Australian Tax Office. The research to date has revealed that taxpayer compliance decisions can be affected by factors that can broadly be categorized as psychological, sociological, economic and industrial.

3.3 Methodologies in the literature

According to Reckon (2009), two different methods are used for calculating the VAT gap. One common method is the so-called "top-down" approach, using macroeconomic data from national accounts to quantify the theoretical VAT liability for the whole economy, and comparing it to the actual VAT receipts of the tax administration.

Several other methods are developed in the literature in order to assess tax evasion. One further approach is direct measurement provided by surveys (Cole, & Eidjar, 2001). That is, respondents are asked whether or not they have evaded taxes in the past or whether or not they have reported all of their income on former tax returns (for a standardized test, see Kirchler & Wahl, 2010). One serious problem with direct survey measures, however, is measurement error due to systematic misreporting on questions that ask about sensitive behavior. More specifically, if respondents fear embarrassment or sanctions, they are likely to conceal their evasion behavior and provide socially desirable answers (Tourangeau & Yan, 2007). Another method developed is the RRTs (randomized response technique) which use randomizing devices such as coins or dice to generate a probabilistic relation between the sensitive question and a given answer (e.g., Boruch, 1971; Fox & Tracy, 1986; Warner, 1965). For example, in the classical RRT (Warner, 1965), respondents are offered two statements where

one is the negation of the other. For tax evasion, these could be the following: (A) I have made at least once false statement on my tax return in order to pay less. (B) I have never made false statements on my tax return in order to pay less. Respondents are then requested to use a randomizing device (e.g., dice), whose outcome should not be revealed to the interviewer, to choose one of the two statements (e.g., Statement A if the outcome is 1 or 2 and Statement B if the outcome is 3, 4, 5, or 6), and subsequently give a “yes” or “no” answer to the selected statement.

By exploiting the variation in tariff rates across time and products in the context of the trade reform in India of the 1990s, Prachi et al. (2008) identify a robust positive elasticity of evasion with respect to tariffs. Moreover, they provide some evidence on the impact of enforcement and the result is that improvements in enforcement can reduce the responsiveness of evasion to tariffs.

3.4 Finding in African Countries

There are few studies in this area on African Countries. A more recent analysis using the Fisman–Wei approach found a strong and positive effect from tax rates on tax evasion in Mozambique (Dunem and Arndt, 2009). For every percentage point increase in customs tax rates, evasion increases by 1.4% cited by (J. Levin and L.M. Widell, 2014). Bouët and Roy (2012) in a comparative study of Kenya, Nigeria and Mauritius also found a significant effect from tariff rates on evasion. The point elasticity for Kenya was similar to the above study on Mozambique, at approximately 1.4. However, this evasion elasticity is based on import tariffs only, excluding other taxes. The issue of tax evasion as a factor that contributes to poor tax performance is also discussed in Mwinyimvua (1996), who cites avenues for the evasion of import duties and sales and excise taxes that include under-invoicing, smuggling, the use of tax exemptions, complex tax schedules, excessive documentation, and corruption. In 2000, the Tanzania Revenue Authorities reported that tax exemptions were in the range of 2.3% of the tax-GDP ratio, which is equal to approximately 24% of total revenue collected (Sogema, 2013).

4 Methodological Framework

Defining the collection efficiency of the VAT as the ratio of the VAT revenue to aggregate consumption divided by the standard VAT rate, we will evaluate the C-efficiency of Benin in this paper. Theory suggests that the collection efficiency is impacted by political economy considerations – greater polarization and political instability would reduce the efficiency of the tax collection (Joshua and Yothin, 2005). In addition, collection is impacted by structural factors affecting the ease of tax evasion, like the urbanization level, the share of agriculture, and trade openness.

In order to evaluate c-efficiency, we need the potential revenue collected which is the revenue actually collected in the account of VAT. The potential

revenue may explicitly be defined as follow:

$$V = \sum_{i=1}^N T_i^* C_i^* \quad (1)$$

where V is the potential revenue; T_i^* the effective rate of VAT; and C_i^* the consumption of commodity $i = (1, \dots, N)$ that is actually taxed. More generally, non-compliance means that the consumption of commodity i may be substantially less than the true consumption (C_i). The structure of the effective rate of the VAT which captures revenue collected throughout the chain of production leading to the final consumption of the commodity i are to be distinguished from the statutory rates. This structure of the effective VAT rate depends on the structure of input-output relation (as discussed for instance in Ebrill et al., 2001). The effective VAT and statutory rates will equate for all commodities if and only if there are no exemptions at any stage of production.

We need also the final expenditure in order to compute the collection efficiency. In the national accounts expenditure on goods and services that are used for the direct satisfaction of individual needs (individual consumption) or collective needs of members of the community (collective consumption) is recorded in the use of income account under the transaction final consumption expenditure (FCE).

The most important part of final consumption expenditure is household final consumption expenditure. Government final consumption expenditure is made for collective consumption or for individual consumption in the form of social transfers in kind to households. Also non-profit institutions serving households provide individual consumption goods and services to households free of charge or at reduced prices.

From there on, the aggregate consumption measure used includes not only households' consumption of commodities, all of which, it is supposed, are properly regarded as forming part of the potential base, but also that of some commodity, which, reflecting the discussion of public consumption above, reflects consumption untaxed (on final sale) at household level but included in C as an item of government consumption: might reflect, in particular, the labor and other non-commodity input costs of producing both pure public goods (which could not be seen as part of the potential base) and commodities that are publicly produced but for which payment by households is trivial (which, in principle, could be). Thus the final consumption expenditure is defined as follow:

$$C = \sum_{i=1}^{N+1} C_i \quad (2)$$

Where C is the final consumption and C_i the true consumption paid by the household i .

Using the definition with (1) and (2), the c-efficiency becomes:

$$E^c = \frac{\sum_{i=1}^N T_i^* C_i^*}{\tau_s \left(\sum_{i=1}^{N+1} C_i \right)} \quad (3)$$

Where τ_s is the VAT rate and E^c is the C-efficiency. $\sum_{i=1}^N C_i$ represents the final household consumption of commodities but C_{N+1} represents the final consumption of the Government.

To have access to the decomposition, let's suppose that the fact that E^c is different than 1 comes mainly from two sources: the fact that the VAT rate differs for some particular goods (policy gap) and its imperfect implementation (compliance gap).

Let's access those sources by decomposing E^c :

$$E^c = \left(\frac{\sum_{i=1}^N T_i^* C_i}{\tau_s \left(\sum_{i=1}^{N+1} C_i \right)} \right) \left(\frac{\sum_{i=1}^N T_i^* C_i^*}{\sum_{i=1}^N T_i^* C_i} \right) \quad (4)$$

$$E^c = (1 - P)(1 - \Gamma) \quad (5)$$

Where

$$P = 1 - \frac{\sum_{i=1}^N T_i^* C_i}{\tau_s \left(\sum_{i=1}^{N+1} C_i \right)} \quad (6)$$

P is the policy gap. It can be equal to zero if $\tau_s = T_i^*$ meaning that there is no exemptions, no zero rate nor a rate lower than the VAT. Samely,

$$\Gamma = 1 - \frac{\sum_{i=1}^N T_i^* C_i^*}{\sum_{i=1}^N T_i^* C_i}$$

Γ is the compliance gap. It can be equal to zero if there is perfect implementation of the VAT.

There is an asymmetry between those gap because the policy gap P is calculated assuming perfect compliance and Γ is calculated assuming there is perfect policy implementation. But tax administrations naturally think of measuring implementation relative to the tax system they are asked to enforce, not some hypothetical one. To solve that problem, the policy gap can be decomposed as follow:

$$1 - P = \left(\frac{\sum_{i=1}^N T_i C_i}{\tau_s (\sum_{i=1}^N C_i)} \right) \left(\frac{\sum_{i=1}^N C_i}{\sum_{i=1}^{N+1} C_i} \right) \left(\frac{\sum_{i=1}^N T_i^* C_i}{\sum_{i=1}^N T_i C_i} \right) \quad (7)$$

$$1 - P = (1 - r)(1 - x) \quad (8)$$

Where the rate gap r is:

$$r = \frac{\sum_{i=1}^N (\tau_s - T_i) C_i}{\tau_s (\sum_{i=1}^N C_i)} \quad (9)$$

and the exemption gap x is:

$$x = 1 - (1 - \theta)(1 - \alpha) \quad (10)$$

Where

$$\theta = \frac{\sum_{i=1}^N (T_i - T_i^*) C_i}{\sum_{i=1}^N T_i C_i} \quad (11)$$

and

$$\alpha = \frac{C_{N+1}}{C}$$

θ captures the cumulation of unrecovered VAT on all items of private consumption. But α captures the value of commodities provided free of charge, many of which are typically VAT-exempt.

4.1 Compliance gap

The compliance gap Γ is simply the difference between the amount of VAT that is payable in principle and that actually received by government, expressed as a proportion of the former.

To estimate the compliance gap, various methods have been developed by making some distinction between top down and bottom up approaches. The top down approach uses operational information from audit and other activities to estimate VAT that is due but unpaid. The bottom up approach uses information on consumption disaggregated by commodity by merging household surveys, together with national accounts data in order to access unrecoverable VAT. The IMF, uses national accounts source and uses tables to mimic the chain structure of the VAT, estimating unpaid VAT by sector and aggregating this to arrive at an estimate of the overall gap.

The fact that direct tax estimations are rare in practice can be explained by the fact that reliable and comprehensive estimations for direct taxes are more difficult to perform than for the VAT. In general, due to complex taxation rules (e.g. numerous exemptions, deductions, credits, allowances) it is difficult to develop a good methodology for estimating the amounts of tax theoretically collectible. For a top-down estimation of a direct tax gap, it is frequently the case that the available independent data sources on income and assets are not sufficiently comprehensive or detailed to enable a robust estimate of tax liability. In particular, national accounts data does not provide sufficient information about off-shore fraud or assets (e.g. bank deposits, shares, real estate) that taxpayers may hold in foreign countries. As a consequence, top-down estimations may only capture a part of tax evasion and will be biased downwards to an unknown extent. Let's discuss further those two methods

4.1.1 Top down

Methodologies based on a macro perspective usually employ economy-wide aggregates and are referred to as top-down (or indirect) methodologies. Top-down methodologies are based on the assumption that the data source used for tax gap estimation covers the full tax base. Therefore, the data to estimate the tax gap is usually derived from macro model methods or from national accounts. National accounts describe the structure and evolution of the economy within a country or other geographic area and provide an exhaustive description of all productive activities. The difficulty in the estimation of the compliance is that the VAT liability (the share of VAT that should be collected) is hard to compute.

The top down method effectively estimates directly $\sum_{i=1}^N T_i^* C_i$ by using information on consumption disaggregated by commodity, generally from household surveys, together with national accounts data that enables some handle on such VAT as is in principle unrecoverable on intermediate purchases and those of traders below the threshold at which registration for the VAT is compulsory (Ebrill, 2013). This liability is compared to the VAT receipts that are actually collected in order to estimate the compliance gap.

4.1.2 Bottom up

Unlike the top-down approach, which theoretically starts with a data source that covers the full tax base, a bottom-up approach will use one or more data sources that cover components of the tax base. In the bottom-up methodologies, the components of the gap are estimated separately for different taxpayer groups and types of non-compliance, using data of individual cases. The data is gathered usually by the tax administration. The data gathering methods include audits, surveys and enquiry programs.

The tax gap is estimated by extrapolation of data for the whole population respective to the relevant component of the tax base (Ebrill, 2013). When

the extrapolation is based on operational risk-based audit data, rather than statistically randomly selected audits, it needs to be taken into account that operational audits are usually undertaken on returns where substantial non-compliance is deemed likely, i.e. biased toward the riskier side of non-compliance spectrum. Therefore, the outcome of extrapolation based on the risk-based audited returns is unlikely to be representative for all returns and is likely to give a misleading picture with respect to the unaudited returns and the overall return population. It is therefore advisable to use statistical means to adjust for this difference in outcome between audited and unaudited returns.

4.2 Policy gap

From a tax policy perspective, also a broader interpretation of the tax gap is possible which comprises the policy gap. Under a broader interpretation, the estimates include also revenue loss caused by tax policy choices of the legislator. These policy choices establish deviations to the general rules of taxation by providing for exemptions, allowances and lower rates in certain specific cases. The budgetary effects of these policy choices constitute tax expenditure, which is also referred to as the policy gap. To capture the policy gap, the tax gap can be estimated as the difference between the total amounts of taxes theoretically collectable under the general rules of tax law (i.e. ignoring deviations to the general rules) and the total amounts of tax actually collected. This estimate can then be decomposed into a compliance gap and a policy gap. The policy gap is defined as the difference between the total amounts of tax theoretically collectable under the general rules of tax law (i.e. if no exemptions, etc. would apply) and the total amounts of tax theoretically collectable based on the applicable tax law. The compliance gap corresponds to the 'general' definition of the tax gap, as described above.

In policy gap estimations, the general rules of taxation under the relevant national tax law (e.g. tax base, tax rate), need to be determined by assumptions. The assumptions on the general rules need to be adequately identified and clearly described for the purposes of policy gap estimation, because the deviations to the general rules will be estimated based on these assumptions. In practice, this can be a challenging exercise due to complex taxation rules with several exemptions and conditionality to the rule. However, well-defined assumptions on the general rules of taxation are important for a good interpretation of the results. Finally, the assumptions will also impact the comparability of the estimated policy gap results. The aspects of policy gap are further not analyzed
in this report.

5 Data Analysis

In this section, we will show both the revenue argument and the efficiency analysis and then the analysis in each important sector.

5.1 Revenue argument

In order to evaluate the impact of the introduction of VAT on Government revenues, we will use the data three years preceding the introduction of VAT to compute pre-VAT revenue, while the post-VAT revenue data is for three years subsequent to its introduction. We used tax-GDP ratios both before and after the introduction of VAT. The source of data is the world bank ratios. The table 1 shows that the revenue has increased significantly for Benin rising from 6.5 to 10.7 percents. We observe also an increasing trend for whole Sub-Saharan African countries. Benin is not doing so that well compared to whole Sub-Saharan African countries. This evaluation shows us that the introduction of VAT has improved the government revenue collection not only for Benin but also for other African countries.

Table 1: Before and after of VAT application in Benin and Sub-Saharan Africa

	3 years pre-VAT as % of GDP	3 years post-VAT as % of GDP
Benin (1991)	6.5	10.7
SSA (1991)	11.58	13.27

From the figure 1, the evolution of the Government revenue shows that there is an increase in the Government revenue excluding grants from 2001 to 2008. But it decreases on the period 2009 to 2013 which is a result of the world economic crisis that affected all economies in the world. This counter-performance is also attributed to some exemptions granted to the investors by the Government in order to cope with the crisis.

The Figure 1 shows that from 2001 to 2013, the Government expenditure is increasing in all the period while government revenue is almost stable between 2001 and 2006, increases between 2006 and 2008 and then decreases geometrically after 2008. From there on, while expenditures are increasing, government revenues are decreasing. As solution, the Government should improve its sources of revenue in order to finance its various expenditure in the future. Let's analyze the contribution of the tax revenue to the Government revenue excluding grants.

The figure 2 compares the government revenue to the tax revenue. From the figure, the tax revenue represents almost 90% of the government revenue excluding grants. This situation highlights the importance of the tax collection in the budget of the Government. The improvement in tax collection is a big source of revenue for the government. It would be interesting to evaluate the dynamics of the tax collection over time.

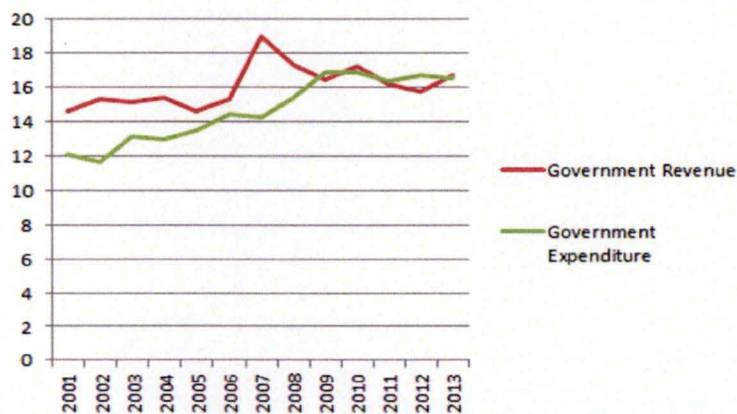


Figure1: Government expenditure vs Revenue excluding grants of Benin

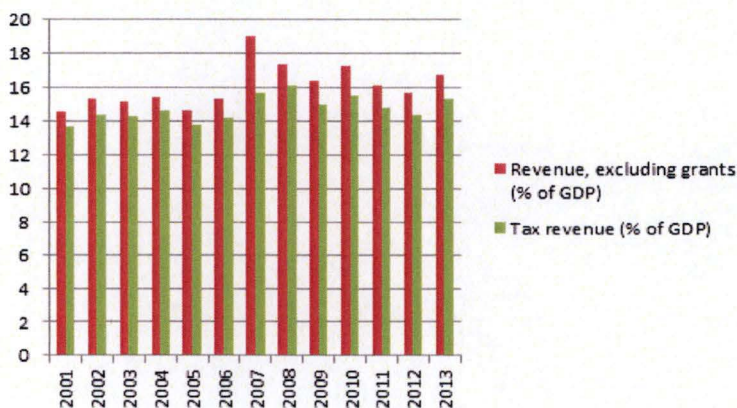


Figure 2: Government revenue vs tax revenue of Benin

The figure 3 shows the evolution of the tax revenue over time. It is clear to see that the tax collection is erratic over time. After an increase from 2007 to 2008, the tax revenue decreases in 2009. This decrease in 2009 could be attributed to a permanent increase of exemptions granted and the prohibition by the Nigerian government to import through the Benin national port (Bipen, 2012). This prohibition decreases geometrically the tax collected on the import

of rice. From, Bipen, 2012, the decrease after 2010 comes mainly from some dysfunctioning of the port management. The decrease in 2009 is the result of the economic crisis which leads to the contraction of the international trade and the protection of the Nigerian economy. In the following graph, we will analyze the contribution of the VAT to the tax revenue.

The figure 3 shows that the share of the VAT revenue in tax revenue is relatively high. This information highlights the importance of the VAT revenue in the tax revenue. As VAT contributes more to the tax revenue collection, it would be interesting to see its dynamic and analyze its collection. In developing countries, the actual VAT is not fully collected. We will analyze in the following section, the efficiency of the VAT.



Figure 3: Tax revenue vs VAT revenue of Benin

5.2 Efficiency argument

Following the introduction of VAT in Benin, government revenue has been increasing. The reforms have led to improvements in both theoretical VAT receipts and actual VAT receipts (Figure 4). The country is already benefiting from its adoption of VAT (i.e. by boosting tax revenue) and has even more room for further benefits if it closes the remaining VAT gap. But there is still a big gap between potential and actual VAT collected in Benin. Following the trends, less than half of the potential VAT is actually collected. But this gap is decreasing over time in Benin (Figure 5)

Theoretical vs Actual VAT collected

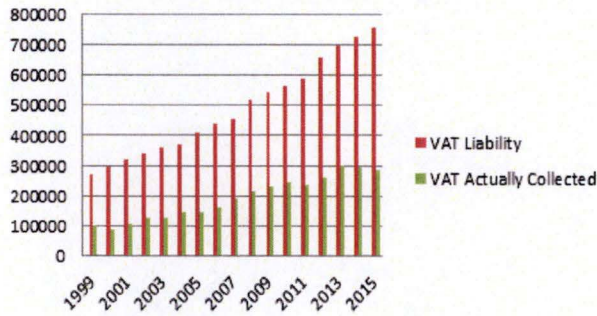


Figure 4: Potential vs Actual VAT in Benin

VAT gap



Figure 5: Dynamic of the VAT gap

The figure 6 shows the compliance and policy gaps in the VAT collection in Benin. Specifically, Benin has not made any effort in reduction of the policy and compliance gap. The compliance gap is important in the VAT decomposition. In average, it represents more than 40% of the GDP whereas the policy gap is around 20% in average. This is the result of corruption in tax collection administrations mainly custom duties, the politisation of the fiscal system, the smuggling, the proliferation of the informal sector (Hana Zídková, 2014).

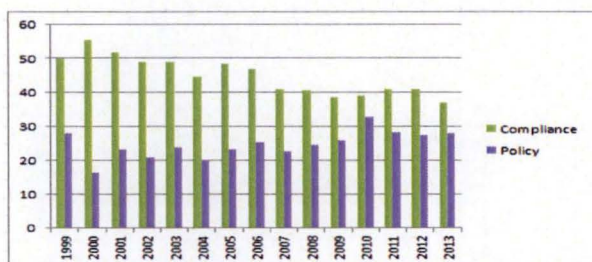


Figure 6: Evolution of compliance and policy gap in Benin

5.3 Contribution of each sector to tax revenue

It is important to evaluate which sector contribute more to the global VAT. The figure 7 shows that agriculture is contributing less to the total VAT. This situation could be explained by the fact that the agriculture sector is an informal sector which does not contribute to the tax revenue. Another reason is that most of these products are exempted. The service and the agroalimentary industry contribute more to the VAT. The products of these sectors are more consumed in Benin are mostly formal sectors.

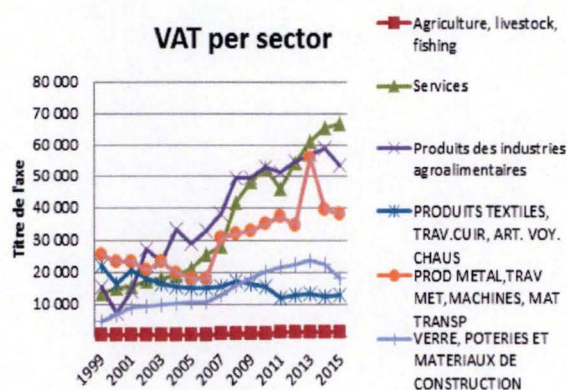


Figure 7: Actual VAT collected in each sector in Benin

The following figures compare the actual VAT to the potential VAT that should be collected in some key sectors of the economy of Benin. In the agriculture sector, the actual VAT collected is insignificant compared to the VAT

liability (Figure 8). As we showed so far, this situation is a result of the informality of the sector. The actual VAT collected is increasing in both service and agroalimentary industry but is still far behind the potential tax collected (figures 9 and 10). The Government of Benin should reform those sectors in order to improve tax collection.

Potential vs Actual VAT collection in Agriculture sector in Benin

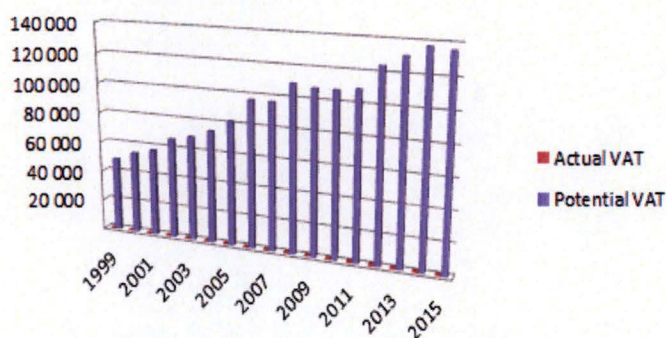


Figure 8: Potential vs Actual collection in Agriculture sector in Benin

Potential vs Actual VAT in service sector in Benin

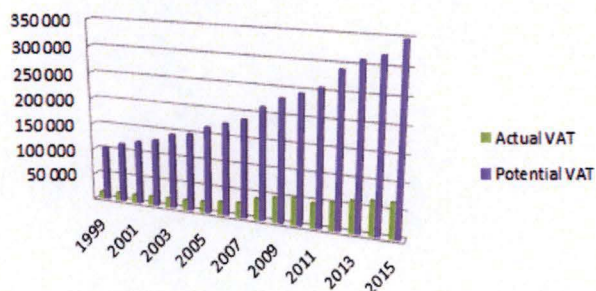


Figure 9: Potential vs Actual VAT in Service in Benin

Potential vs Actual VAT in Agroalimentary industry in Benin

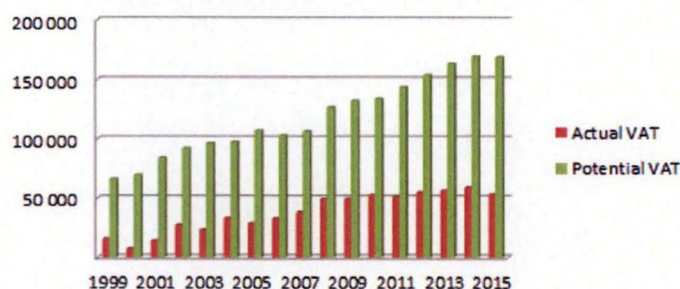


Figure 10: Potential vs Actual VAT in agroalimentary industry in Benin

6 Conclusions

The first conclusion is about the tax revenue collection argument. In this section, we show that Benin is in need of resources to finance its development. The resources of the Government of Benin come mainly from cotton production, tax collection, and other services. We show that the share of tax revenue in the total revenue excluding grants is actually low. To show this, we compare the evolution of the revenue of the Government to its expenditure. We find that while the Government expenditures are growing, there are less resources to follow. We evaluate also the share of VAT in the tax revenue and the result is that compared to other sources of revenue, VAT contributes more to the tax revenue. The improvement in its collection is important for revenue raising in developing countries. In our analysis, we show the impact of the tax collection on the GDP. We compute the mean of the taxes replaced by VAT three years before VAT introduction, and three years after VAT introduction. The result is positive for Benin saying that the introduction of the VAT improves the revenue of the Government. Ebrill et al. (2013)'s found the same result in SSA countries. They concluded that SSA countries that have adopted a VAT raise significantly more revenue than those SSA economies without a VAT, compared to any other region.

The second conclusion is about efficiency argument. In this section we found that less than 40% of the potential tax revenue is collected in Benin. The remaining part is on the account of the policy and the compliance gaps. To show this, we compute the VAT gap and we analyze its dynamics. The trend shows that VAT gap is decreasing over time meaning that the full tax collection

is improving in Benin but not sufficient to fill the gap. To further our analysis, we compared the potential VAT to the actual VAT collected. The result shows big gap potential and actual VAT meaning that Benin must make important effort to improve its tax collection.

Finally, we show that agriculture contribute less to the VAT collection and the service and agroalimentary sectors are contributing more but not sufficient. The Government of Benin should implement policies that could solve the problem of the informality of some key sectors of the economy. In order to improve tax collection, the Government should reduce the exemption of some goods.

References

- [1] Agha, A., Haughton, J.(1996), "Designing VAT Systems: Some Efficiency Considerations." *The Review of Economics and Statistics*, Vol. 78, No. 2, pp. 303-308.
- [2] Bipe (2012), implications des changements climatiques dans le secteur agricole.
- [3] Cnossen, S. (2015) Mobilizing VAT revenues in African countries, *Int Tax Public Finance* (2015) 22:1077-1108.
- [4] Cnossen, Sijbren, 2003, "Is the VAT's Sixth Directive becoming an anachronism?" *European Taxation*, pp. 434-42.
- [5] Ebrill, L., Keen, M., Bodin, J. and Summers, V. (2001) *The Modern VAT*, International Monetary Fund, Washington DC.
- [6] Houssa, R. and Megersa, K. (2017) Institutional quality, economic development and the performance of VAT, *BeFinD Working Paper No. 15*, Belgian Policy Research Group on Financing for Development, University of Namur.
- [7] IMF (1996) Benin-Recent economic developments, IMF staff country report No. 96/102, International Monetary Fund.
- [8] Keen, M. (2013) "The Anatomy of the VAT". IMF Working Paper No. WP/13/1111, International Monetary Fund.
- [9] Le, T M (2003); *Value Added Taxation: Mechanism, Design, and Policy Issues*, Practical Issues of Tax Policy in Developing Countries, World Bank, Washington, DC
- [10] Jeon Y., Rhyu S-Y. and Shields M. (2008) "Fertility in Sub-Saharan African Countries with Consideration to Health and Poverty". *IZA Discussion Paper No. 3526*.
- [11] Reckon LLP, 2009, *Study to Quantify and Analyze the VAT Gap in the EU-25 Member States* (Reckon LLP, London).