Where has the money gone?: The case of Value Added Tax revenue performance in Indonesia

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WHERE HAS THE MONEY GONE?

THE CASE OF VALUE ADDED TAX REVENUE PERFORMANCE IN INDONESIA

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Abstract

Since its introduction in 1983, Value Added Tax (VAT) has played an increasingly important role as one of the major sources of revenue for the Indonesian government. In the last two and a half decades, however, there is declining trend in its collection performance as a percentage of Gross Domestic Product. This study aims to explore the determinants of this declining trend in VAT revenue using macroeconomic data. These determinants are decomposed into three broad categories: tax expenditure policy, taxpayers' noncompliance, and the share of aggregate consumption in the economy. It finds that the performance of VAT collection could mainly be explained by tax expenditure policies and the extent of noncompliance with tax laws. It is proposed that avenues of approach for reform could be directed toward reducing the scope of VAT exemptions, establishing a systematic approach in data collection and analysis to closely monitor trends and changes in taxpayers' behavior, simplifying the tax system by setting a single rate that is imposed on a single type of consumption tax, and improving audit effectiveness by building trust between tax authority and taxpayers.

Keywords: Indonesia, Value Added Tax, Tax Expenditure, Tax Revenue, Tax Noncompliance

1. Introduction

Although the name may suggest that VAT is a tax on value added, however, it is generally intended to be a tax on domestic consumption and is, supposedly, levied at all stages of production and distribution (Ebrill, Keen, Bodin, & Summers, 2001). As a tax on consumption (not on production or distribution activities), seller charges VAT on all of its

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sales while be able to claim credit for the VAT that it has been charged on its inputs. Nowadays the VAT becomes a prominent feature in the tax systems throughout the world (James, 2015). Further, Gillis (1989b) argued that VAT implementation could be associated with successful revenue results from comprehensive tax reforms in less-developed countries.

This widespread adoption may relate to the widely perceived (though often debatable) advantages of VAT (Ebrill et al., 2001; James, 2015). First, VAT could serve as an instrument to increase large amounts of revenue in a quick and relatively painless ways (Gillis, 1990). A study by Keen and Lockwood (2006) found that, all else equal, countries which adopt VAT tended to raise higher revenue than countries which did not adopt it. For Indonesia, significant increase in revenue could be observed after the adoption of VAT in 1983. In 1987 revenue from VAT reached 4% of Indonesian Gross Domestic Product (GDP); it was nearly three times the revenue compared to the outdated sales tax it replaced. In fact, Indonesia's tax reform of 1983 would be deemed a failure if not for the VAT's revenue success at that time (Gillis, 1989a, 1990).

Second, VAT is argued to be better for economic growth than other indirect tax systems due to its positive effect in encouraging savings, which could lead to increased investment and growth (Miki, 2011). The VAT – as a general consumption tax – does not levy tax on savings as well as on the interest from savings whereas, in comparison, income taxes are imposed on savings and on their interests. Furthermore, unlike income taxes, VAT is neutral to the choices of work or leisure. Under the progressive income tax system, higher tax rate – which will be imposed when people work harder and earn more – may adversely affect individual marginal incentives to work. Thus, relative to income taxes, VAT may have positive effects on economic growth since it does not distort capital accumulation and the supply of labor.

Third, VAT is considered to be neutral to the market choices related to production and consumption (James, 2015). Since VAT is supposed to be shifted to consumers, it does not influence the forms or methods of doing business. Further, when VAT is imposed on a broad base, it would not affect consumers' decisions on which products and services to buy. Moreover, when consistently levied on destination basis, the VAT would be neutral toward international trade.

In Indonesia, VAT was introduced in 1983 as part of a comprehensive tax reform to replace the sales tax which was unproductive of revenue due to the complicated exemptions structure and the use of multiple rates (eight tax rates ranging from 1% to 20%) (Gillis, 1989a). Thus, for simplicity, the VAT was levied at a uniform rate of 10% on all taxable

transactions and initially adopted with no exemptions by product category. To maintain this uniform rate, a tax on the sale of luxury goods was introduced to improve the political acceptability of VAT at the single rate (Gillis, 1989a). However, the tax on luxury goods was levied on very limited items and consumption on these items was much too small as percentage of total consumption thus its proportion to revenue was generally, and still is, not significant.

The Indonesian VAT was levied at national level and since its adoption VAT has been one of the major sources of revenue for the central government. Figure 1 shows that in pre-Asian financial crisis period of 1990-1996, on average, revenue from VAT was 23.1% of total central government revenue. In the next period, 1997-2003, the number was down to 20.2%. This decline may relate to the Asian financial crisis[1] which severely hit Indonesia and adversely impacted economic performance. In 2004 the country's situation was generally stable and the share of VAT in total government revenue was back to the pre-crisis level and for period 2004-2015 it reached 23.6%.
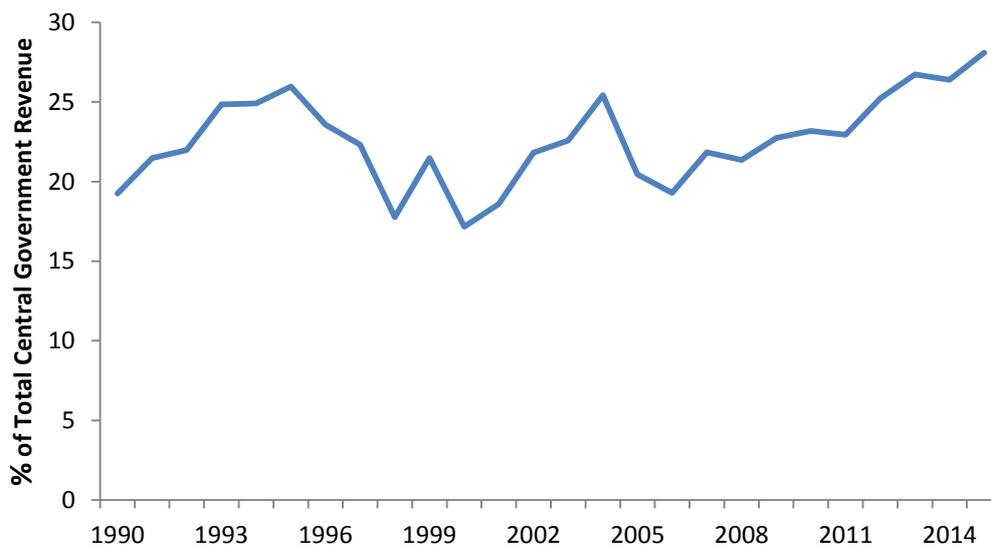

Figure 1. VAT Revenue as Percentage of Total Revenues of the Central Government
Source: Bank Indonesia (Various Years)

Nevertheless, there is a downward trend in VAT revenue as percentage of GDP in 1990-2015. Although the base for VAT imposition is not GDP but consumption (GDP basically reflects production, not consumption), however, the ratio of VAT to GDP may

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[1] For further discussion on the Asian financial crisis and its impacts on Indonesia economy see, for example, Hill (2000) and Aswicahyono, Bird, and Hill (2009).

provide a vivid first expression and assessment of the potential revenue gains from VAT. Data presented in Figure 2 show that in pre-crisis years, in period 1990-1996, yearly average VAT revenue reached 4.2% of GDP. In the crisis years, 1997-2003, VAT only garnered revenue at around 3.0% of GDP. As the economy recovered from the crisis revenue from VAT also improved. This increase in VAT revenue reflected Indonesia economic recovery which resembled a 'V' shape rebound (Aswicahyono et al., 2009, p. 354). However, in post-crisis years the revenue collected from VAT has not been able to reach the same level as in pre-crisis years: in 2004-2015, on average, VAT could only provide revenue at around 3.8% of GDP.
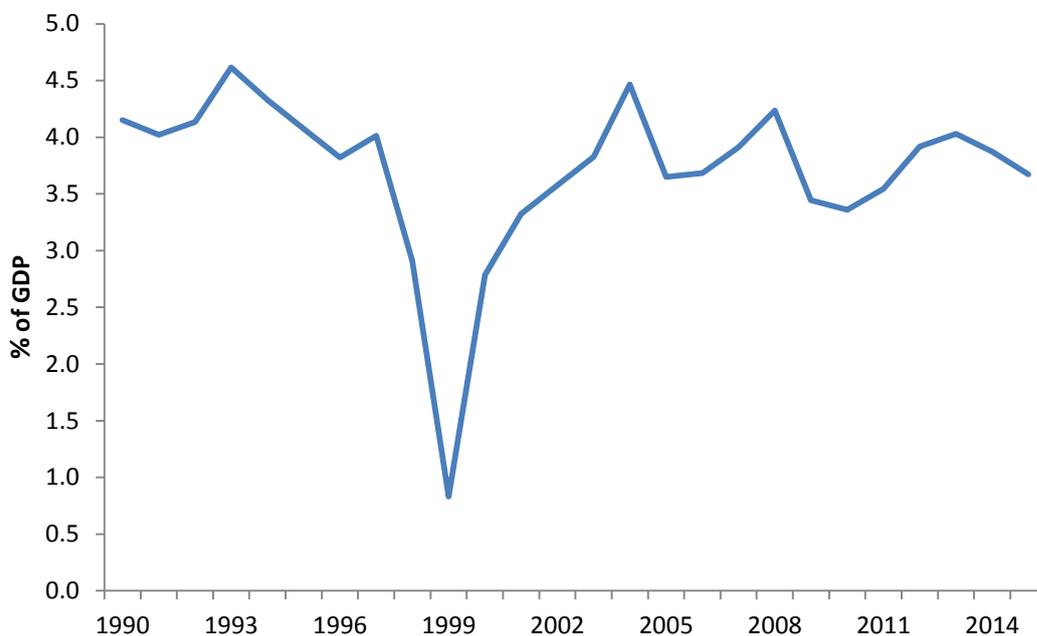

Figure 2. VAT Revenue as Percentage of GDP

Sources: Bank Indonesia (Various Years); Central Board of Statistics (Various Years).

Moreover, data in Figure 2 reveal that as real GDP rose by 109% from 1990 to 2015 the VAT to GDP ratio actually fell by 11%. As a rule of thumb, when GDP rises then VAT yield should also rise (Keen & Baunsgaard, 2005). A general consumption tax such as VAT should normally increase at least at the same growth rate as GDP; thus its GDP-elasticity should ideally equal to one (Bird & Gendron, 2006). In Indonesia, however, from 1990 to 2015 the GDP-elasticity of VAT was only 0.78. This decline in VAT yield could serve as one of major sources of concern particularly at times when the government faces budgetary

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pressures that stemmed from rising demands for expansions in public expenditures or the need to improve public infrastructures.

With these backgrounds, it might only natural to ask the possible causes of this decline. To answer the question, this study decomposes the possible determinants of VAT revenues into three variables: VAT gap due to noncompliance, VAT gap due to policy, and the share of aggregate consumption in GDP; as well as analyzes their empirical relationships.

2. Literature Review

In the tradition of public finance research, several factors have been identified as important for explaining the performance of tax collection. This paper presents a review on the available literature and discusses them according to three broad sets of factors: the degree to which the tax is administered, the structural features of the tax, and the scale of taxable activities.

2.1. Tax Administration

It might be inevitable that the performance of tax collection depends on the effectiveness of tax authority in detecting, punishing, and deterring nonconformity to tax laws. Bird (2004) argued that even the best tax policy in the world would worth little if its implementation was far from effective. In this respect, the yield, incidence, and efficiency of a tax system may depend on how it is administered. Hence proposals on tax policy should not only involve the design of the tax code, but should also include considerations on the administrative structure to enforce it (McLaren, 2003). So important does the administrative aspects of tax administration that, in the words of Jantscher (1990, p. 179): "tax administration *is* tax policy".

Recently there are efforts to collect comparative information about tax administrations in many countries. One of them is the study conducted by OECD (2013) which covered 52 countries. One of the key findings in the study noted the wide ranging institutional and organizational reforms implemented in the effort to improve efficiency and effectiveness of revenue bodies. Other cross-country empirical study by Robinson and Slemrod (2012) concluded, among others, that the extent of tax administration and enforcement may partly explained differences in tax collection performance between countries.

In the context of collection efficiency, the administrative and compliance costs associated with collecting taxes are relevant factors in evaluating the performance of tax administration. Using OECD (2013) dataset, Alm and Duncan (2014) found that the

efficiency performance for OECD countries in collecting tax revenues was high. However, when data from developing countries are included into the calculations, this performance seemed to be less impressive. Overall Alm and Duncan (2014) suggested that countries in their study should be able to maintain their levels of revenue with 10% to 16% less inputs.

Martinez-Vazquez and Bird (2010) argued that political decisions on the determination of VAT base may considerably affect the potential revenue from VAT in any country. Further, how fully this potential base could actually be reached may affect the actual revenues collected. How close this potential base could be reached may in turns depend on the interaction between the level of tax compliance (or tax morale) and the effectiveness of the tax administration. Thus, Martinez-Vazquez and Bird (2010) suggested that the revenue productivity of VAT could be improved in two ways. First, strengthens the VAT structure through base-broadening measures; second, strengthens the VAT administration and compliance.

Bird and Gendron (2006) studied VAT revenue declines in Ukraine and found that although real GDP rose by 49% from 1998 to 2004, the ratio of VAT to GDP actually fell by 33%. They argued that this degradation in collection performance was due to deteriorations in the efficiency of VAT administration. As the country's VAT administration was never very strong in the first place, as time has gone the growing private sector has increasingly exploited the inherent weaknesses in the tax administration.

Since the existence of tax evasion is likely to affect the performance of tax administration, brief overview of available literature on this subject might need to be discussed here. One of the pioneering studies on tax evasion is the work of Allingham and Sandmo (1972) which provides theoretical framework on taxpayer's decision in evading taxes. Kirchler, Hoelzl, and Wahl (2008) provided an excellent review of the available literature on the factors affecting compliance, including the degree of influence of each factor. They classified these factors into several groups: audit probabilities; fines; tax rate; subjective tax knowledge and participation; attitudes towards taxes; personal, social, and national norms; and perceived fairness.

Empirical studies on the effect of audit probabilities on improving compliance found weak cause and effect relations between the two (see, for example, in Fischer, Wartick, & Mark, 1992; Slemrod, Blumenthal, & Christian, 2001; Spicer & Thomas, 1982). Empirical studies on the impact of fines in improving compliance showed inconclusive results (for instance, see Friedland, 1982; Friedland, Maital, & Rutenberg, 1978; Park & Hyun, 2003). There were also mixed empirical results in studies on the impact of higher tax rates on

compliance (see Alm, Jackson, & McKee, 1992; Baldry, 1987; Park & Hyun, 2003). Increases in tax knowledge were found to have positive impact on compliance and higher degree of citizens' influence on budgeting process could be associated with higher compliance (Clotfelter, 1983; Kirchler & Maciejovsky, 2001). Although many studies found weak relation between attitudes toward taxes and self-reported tax evasion (Orviska & Hudson, 2003; Trivedi, Shehata, & Mestelman, 2004), Kirchler et al. (2008) confidently predicted that the better the tax attitude, the higher would be the tax compliance. Literature on the relation between norms and tax compliance generally proposed that voluntary compliance would materialize if taxpayers' norms favored tax compliance (Fjeldstad, 2004; Pommerehne & Frey, 1992; Wenzel, 2005). When taxpayers perceived that the tax system was fair then their trust in government would increase and this increased trust would boost voluntary tax compliance (Braithwaite, 2003b; De Juan, Lasheras, & Mayo, 1994; Wenzel & Thielmann, 2006).

Further, Aizenman and Jinjarak (2008) studied the collection efficiency of the VAT taking into account the political and structural factors of the economy. They identified that countries with greater polarization and political instability tended to have lower tax collection performance; in other words, political economy considerations could affect the efficiency of tax collection. Further, structural factors (such as the level of urbanization, share of agriculture in economy, and degree of economic openness) were also found to have affected collection performance through their impact on the degree of difficulty to evade taxes.

2.2. *Tax Structure*

One of the characteristics of a good structure in VAT system is that the tax is levied on a broad consumption base (James, 2015, p. 8). There are two reasons why a broad base for VAT may be advantageous (Bird & Gendron, 2007). First, a broad base could lower the efficiency cost of levying taxes since the rate required to achieve any revenue target would be lower because larger share of economic activities are covered in the tax net. Second, a broader base could simplify administration because there would be fewer avenues for evasion and the tax authority does not have to allocate its limited resources identifying different economic activities with different treatments.

Nonetheless, VAT system of developing countries typically exempt a large share of economic activity for a variety of reasons (Mackenzie, 1991). When a commodity is exempt from VAT, no tax is payable on its sale and the input tax paid will not be able to be recovered. One of the reasons for exemption is that the output may be hard to tax due to

difficulties in identifying its appropriate output (e.g. financial services). Another reason is that exemption may be necessary for distributional concerns and political necessities (e.g. agricultural products and basic foodstuffs). Sensitivity in taxing particular items and conditions imposed by donors may also be offered as other reasons for exempting particular goods or services from VAT.

One of the early attempts at examining the role of VAT structure in explaining the performance of VAT is the work of Bogetic and Hassan (1993). Their study focused on the impact of the complexity of tax system and width of tax base on collection efficiency based on a sample of 34 countries. They found that the more complex a tax system and the narrower a tax base, the lower would be its collection efficiency.

Agha and Haughton (1996) analyzed cross-country data of 17 OECD members to determine factors affecting the performance of VAT collection. They constructed an index of compliance and regressed this index against several variables. Their study found, among others, that lower compliance could be associated with higher VAT rate. Further, the use of multiple rates was found to have adverse effects on compliance. They also found that compliance tended to improve when tax authority has longer experience in administering VAT and when greater spending was spent on enhancing the capacity of the tax administration.

Jack (1996) examined VAT collection performance in five transition economies in Central and Eastern Europe by comparing revenues which would have been collected when there is no revenue leakage and the actual revenues. He argued that differences in revenue performance between countries in the sample were likely to be the result of VAT exemptions. Hence, regardless of the issues of evasion or administration effectiveness, when a country exempted some consumption from taxation then its collection performance may be lower than other country which did not exempt them.

2.3. Scale of Taxable Activities

Several studies have focused their attention on the impact of VAT (or taxes in general) on the behavioral patterns of consumption of economic agents; hence the direction of analyses is from taxes to consumption. For example, using an overlapping generation model Batina (1999) argued that when the taxation of bequest is switched from income tax to consumption tax, capital accumulation may be reduced. Seidman and Lewis (1999) argued that in a standard life-cycle growth model, converting income tax to consumption tax would, in the long run, always raise the steady-state capital/labor ratio, regardless of the elasticity of

saving. Using a two-class model with uneven distribution, Matsuzaki (2003) studied how consumption tax affected effective demand under economic stagnation and maintained that consumption would decrease effective demand when the ratio of poorer households to the total population was large.

Further, several empirical research have examined the relation between consumption behavior and fiscal policy variables such as tax revenues, government spending, government transfers, and government net debt. This line of research can be found in, among others, Aschauer (1985); M. Feldstein (1982); M. S. Feldstein and Elmendorf (1987); Kormendi (1983).

VAT is basically imposed on consumption hence the scale of consumption in a country's economy may affect the collection performance of VAT. Several studies have explored the impact of economic growth and consumption on VAT collections; in other words, the direction of analyses is from consumption to VAT performance. For example, a study prepared on behalf of the International Tax Dialog (2005) noted that extreme variations in the revenue performance of VAT across countries may be attributed to a wide range of factors including differences in tax design, economic environment, and characteristics (e.g. literacy of the population). Cross-countries empirical study by Baunsgaard and Keen (2010) found that, generally, GDP growth had a positive correlation with revenue performance of VAT. In other words, when GDP grew VAT yield also rose. Similarly, Sancak, Xing, and Velloso (2010) found, based on cross-countries evidence, that changes in VAT revenue performance was driven by shifts in consumption patterns. Further, they also found that tax evasion tended to move at the opposite direction of the economy; i.e. when the economy expanded (contracted) tax evasion decreased (increased).

3. Methodology and Data

Before setting out the methodological aspects, however, it might be necessary to briefly review the concept of VAT gap which will be used repeatedly in later discussions in this study. VAT gap could be decomposed into compliance gap and policy gap. Compliance gap is defined as the difference between the amount of VAT that is payable as stipulated by the law and the amount of actual revenue. Hence it represents imperfect implementations of the law and could serve as a rough measure on how well it is enforced (Keen, 2013).

Policy gap reflects the extent to which 'tax expenditures' (i.e. tax incentives and facilities provided by the government in the form of exemptions, zero-ratings and other reductions to the potential tax base) are embedded in the legal structure of the VAT (Hutton,

Thackray, & Wingender, 2014). In other words, it measures the difference between the revenue that would have been collected when the VAT was applied uniformly to all final consumption and the actual revenue collected amid exemptions, zero-ratings, and other reductions to the potential tax base.

In this study, the performance of VAT revenue is to be driven by the effectiveness of the tax authority in administering VAT, structural features of the VAT, and the scale of taxable economic activities. VAT gap which arise due to noncompliance is used as a proxy for the effectiveness of tax authority in administering the VAT. The argument here is that the more effective a tax authority, the less would be the VAT gap due to noncompliance. This is because the tax administration would be more effective at detecting, punishing, and deterring evasions. Thus, a negative sign for the independent variable of VAT gap due noncompliance is expected in the regression result.

VAT gap which arise due to policy is used as a proxy for the structural features of the VAT. Since exemptions and rate differentiations are highly likely to reduce VAT collection, the less exemptions and rate differentiations exist in the tax structure the higher would be the revenue collected. Thus, the regression result is expected to bring negative sign for the independent variable of VAT gap due to policy.

Consumption is basically the base of VAT; hence, theoretically, the level of VAT performance should be proportional to the level of consumption. Other things being equal, when consumption increases then VAT revenue should also increase, vice versa. Thus, the independent variable of the level of consumption in the economy is used as a proxy for the scale of taxable activities and expected to possess positive sign.

Hence, the model employed to decompose the factors affecting the performance of VAT revenue is as follows:

$$R_t = N_t + P_t + C_t \tag{1}$$

where R, N, P, and C denote VAT revenue, VAT gap due to noncompliance, VAT gap due to policy, and the level of aggregate consumption respectively. t denotes time. All variables in Equation (1) are expressed as percentages of GDP. Further, considering data availability, all data in this study covers the period 1995-2014.

3.1. VAT Revenue

Data on VAT revenue (R) are collected from the central government's financial reports.[2] These data show the actual amount of annual revenues collected from VAT for period 1995-2014.[3]

3.2. VAT Gap due to Noncompliance

The methodology employed to estimate the VAT gap due to noncompliance (N) follows Reckon (2009) and Barbone et al. (2013). Here, the gap is expressed as follows:

$$N_t = L_t - R_t \tag{2}$$

where L denotes the VAT Total Theoretical Liability (VTTL) and reflects the VAT payable according to the tax law; assuming complete compliance on the part of taxpayers.

As a consumption tax, VAT is payable by end consumers when they buy taxable goods and services. Producers will pay VAT for the inputs they use in producing (and selling) non-taxable or exempt goods and services. Thus, VTTL is comprised of four components:

(1) VAT Liability (VTL) from household consumption. This represents the VAT which is payable when households consume taxable goods and services. It is derived from the amount of consumption on individual goods and services times the VAT rate.[4]

(2) VTL from unrecoverable intermediate consumption. This represents VAT paid by industries from purchases of intermediate goods and services (i.e. input VAT) which cannot be claimed because these industries' sales – partially or wholly – are exempt from VAT.

(3) VTL from unrecoverable inputs to Gross Fixed Capital Formation (GFCF). This represents input VAT on GFCF activities which cannot be claimed by industries because their sales are exempt from VAT.

(4) VTL from government consumption. This represents input VAT paid and cannot be claimed by government since government activities are tax exempt.

Since exhaustive data on individual purchases made by consumers and producers is not available, national accounts aggregates are employed to arrive at estimates of VAT liabilities. Thus, the methodology used here can be categorized as 'top-down approach'

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[2] http://www.bi.go.id/en/statistik/seki/terkini/keuangan-pemerintah/Contents/Default.aspx
[3] Data in Rupiah and converted into U.S. Dollar using the exchange rates provided by the World Bank's World Development Indicators (WDI).
[4] VAT rate in Indonesia stays at 10% since the tax was introduced in 1983.

where figures from the national accounts are utilized to estimate the VAT liability accrued by different sectors in the economy.

The data source on aggregate purchases of goods and services is the World Input-Output Database (WIOD).[5] WIOD classifies these input-output data into four broad categories: intermediate consumptions, final consumptions, investments and exports. While purchases for consumption and investment can generate VAT liabilities, exports do not generate such liabilities because they are subject to zero-rating. Data for period 1995-1999 are from WIOD's 2013 publication whereas for period 2000-2014 are using data from WIOD's 2016 publication.

VTL from household consumption[6] and VTL from government consumption on taxable goods and services can directly be calculated since the amounts of these consumptions are stated in WIOD. These consumptions are multiplied by the VAT rate to arrive at estimations of VTL from household consumption and VTL from government consumption.

The VTL from unrecoverable intermediate consumption is calculated by, firstly, determining the amount of output in each industry that is exempted from VAT. Once the values of these exempt outputs are determined, these values are then multiplied by the VAT rate to arrive at the VTL from unrecoverable intermediate consumption. To determine the amount of output for each industry that is exempted from VAT, a '*propex*' factor for each industry is used (Reckon, 2009). There are changes in VAT regulations regarding exempted goods and services. Hence by examining these regulatory changes the *propex* factor for an industry in a particular year is set to zero if the regulations maintain that there is no exemption for all of the output produced by that industry – in other words, all of the intermediate consumption in that industry does not generate VAT liability. On the other hand, *propex* factor is set to one if all of an industry's output is exempted from VAT – in other words, all of the intermediate consumption in that industry generates VAT liability. If an industry's output only partially exempted from VAT, the *propex* factor is determined as the ratio of the value of exempt output to the total value of output produced by that industry. This requires the assumption that the proportion of intermediate inputs used in producing exempted goods or services is equal to the proportion of exempted output to total output.

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[5] http://www.wiod.org/home
[6] This category also includes consumption expenditure by Non-Profit Organization Serving Household (NPISH).

VTL from unrecoverable inputs to GFCF activities[7] is calculated from the values of investment purchases in each industry times the VAT rate times the *propex* factor. WIOD, however, combines all GFCF activities from various industries under one heading; hence its value has to be allocated into each industry. This study allocates the value of GFCF to each industry by, firstly, determining the ratio of intermediate consumptions of all industry to total consumption. Once this ratio has been determined, the next step is allocating GFCF by multiplying the each industry's intermediate consumption with this ratio. This involves an assumption that the share of intermediate inputs consumption is equal to the share capital expenditure. The method to determine the *propex* factor for each industry is the same as discussed previously in determining the *propex* factor for VTL from unrecoverable intermediate consumption.

3.3. VAT Gap due to Policy

VAT gap which arise from deliberate government tax expenditure policies is calculated as a residual and could be expressed as follows:

$$P_t = B_t - R_t - N_t \tag{3}$$

where *B* denotes the VAT base and is calculated as the sum of total household, Non-Profit Organizations Serving Households (NPISH), and government final consumptions times the VAT rate. It basically represents the VAT which could be collected when the tax is imposed on a truly broad base, i.e. when the VAT is levied on all final consumption; under conditions of complete compliance and no exemption. Here, the VAT base left uncollected after deducting actual VAT revenue and revenue loss due to noncompliance is being regarded as the revenue loss arising from government policies to exempt certain consumptions from VAT. Data on household, NPISH, and government final consumptions are from WIOD.

3.4. Aggregate Consumption

Data on aggregate consumption are from WIOD and consist of the amounts of final consumption expenditures by households, NPISH, and government.

4. Results and policy implications

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[7] This category also includes VTL from Changes in Inventories and Valuables.

Table 1 presents the results from regressing the independent variables of VAT gap due to noncompliance, VAT gap due to policy, and aggregate consumption against the independent variable of VAT revenue.

Table 1. Estimated regression coefficients

Dependent Variable: VAT Revenue (% of GDP)		
Independent Variables:		
VAT Gap due to Noncompliance (% of GDP)	-0.988	***
VAT Gap due to Policy (% of GDP)	-1.032	***
Consumption (% of GDP)	0.099	***
Constant	0.048	
Observations	20	
R-squared	0.99	

Note: *** significant at 1% level.

Sources: Bank Indonesia (Various Years); World Development Indicators (Various Years); World Input-Output Database (2013, 2016); own calculations.

Regression results presented in Table 1 show a very high coefficient of determination for the model with all variables is significant and possesses the correct sign. The results show that the performance of VAT revenue is mostly affected by tax expenditures policy and noncompliance; changes in both of them explain 96% of changes in the VAT collected by the government. Changes in the ratio of VAT gap due to policy/GDP explain 49% of changes in the ratio of tax revenue/GDP. Moreover, one percentage point increase in this variable would lower the ratio of VAT revenue to GDP by one percentage point. Changes in the ratio of VAT gap due to noncompliance/GDP explain 47% of changes in VAT revenue performance. Further, one percentage point increase in this variable would translate into reduced ratio of VAT revenue to GDP by almost one percentage point. Changes in the ratio of aggregate consumption to GDP, however, only explain 4% of changes in the ratio of VAT revenue to GDP. These results may suggest that efforts to improve the collection performance of VAT could be directed toward reducing tax policies which exempt goods and services from VAT

and enhancing the effectiveness and efficiency of the tax authority in detecting and deterring noncompliance.

Quantitative research would usually expand this regression specification by adding several variables to, for example, test its robustness or decompose the primary independent variables further. However, this paper does not follow this tradition and leaves analyses on robustness or decompositions for further research. Instead, the regression results are followed by reviews of recent conditions related to independent variables which exert significant effects on revenue as well as policy proposals which could be considered in the effort to improve the performance of VAT collection. This approach is deemed crucial considering the decline in VAT revenue faced by the government.

4.1. VAT gap due to policy

Figure 4 reports the VAT gap due to policy as a percentage of GDP for period 1995-2014. Over the study period, the annual average of the gap stood at 0.25% of GDP. Before the Asian financial crisis the trend in policy gap was declining with an annual average of 0.45% of GDP for period 1995-1996. During the crisis the gap increased significantly. For period 1997-1999 the gap increased to 0.57% of GDP and at its peak in 1999 it stood at 0.99% of GDP. In post-crisis period the VAT gap due to policy seems to be able to be brought down at an annual average of 0.19% of GDP for period 2000-2007. Nevertheless, a cause for concern is the increasing trend in the gap for period 2008-2014. In 2008 the gap was only at 0.02% of GDP but in 2014 it stood at 0.2% of GDP – it was an increase of 900%.

Since major source for this gap may relate to the existence of VAT exemptions, limiting the extent of exemptions in the VAT system may be important because exemptions could result in complex and often adverse outcomes (Ebrill et al., 2001; International Tax Dialog, 2013):

(1) Cascading effect could be introduced in the production and distribution chains.

Improper design of tax policies could cause 'cascading': tax levied on items which have already been taxed – in other words it is a tax on tax. In the case of VAT, exemption would break the VAT chain since seller of an exempted item will not be able to claim the input taxes paid for the goods and services used in production process. Hence these taxes may have to be included in the sale price to cover the increased costs of production and in turn could cause increases in consumer prices. Further, when VAT exemption is granted at the final stage of distribution chain the value added at this stage will escape tax thus causing a loss of revenue.
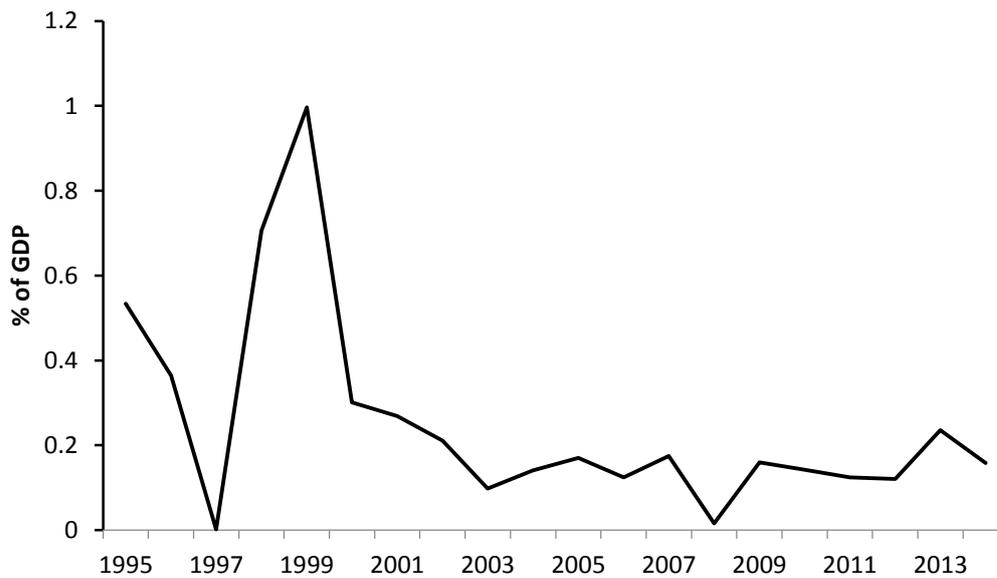
Figure 4. VAT gap due to policy, 1995-2014 (% of GDP)

Sources: Bank Indonesia (Various Years); World Development Indicators (Various Years); World Input-Output Database (2013, 2016); own calculations.

(2) Exemption may distort production input choices.

When an exempted item is used as input into production then the input tax paid on that item cannot be recovered and thus may have to be included in its price. This may induce producer to substitute away from that exempted intermediate input. This distortion may spread further to other economic sectors. For example, machine tool manufacturers' decisions would be distorted by the exemption granted on the production of steel since they use steel products as an input. This distortion, however, would also affect the prices of tooled products due to the consequent impact of the exemption on the prices for machine tools. This impact on the prices of tooled products would further hamper the competitiveness of items and production processes that extensively use these tooled products as intermediate input. Further, exemption may make the structure of the VAT system opaque thus contradicting two of the basic principles of good taxation: transparency and simplicity (Keen, 2014). This is because the effective rates of VAT would significantly differ from its statutory rates in a fortuitous and nontransparent ways due to the vagaries of input-output relationships along the production and distribution chains.

(3) VAT's destination principle for internationally traded items would be compromised.

Destination principle in VAT system means that VAT is levied in the jurisdiction where the final sale of an item occurred. In other words, as a tax on domestic consumption VAT is imposed in the location of consumption. Based on this principle export activity is usually zero-rated. When an item is exempted, however, the consequences of the exempted input from earlier stages in the production chain would inevitably be incorporated into the exported item. For example, exemption of banking services from VAT means that the exports of firms that make use of banking services would indirectly bear the unrecovered input taxes paid by the banks. Further, a firm would have an incentive to substitute exempted domestic item for imported item. This is because included in the price of the exempted domestic item are taxes from previous production and distribution chains; whereas the imported item could be zero-rated (rather than exempted) in its origin country hence does not bear input taxes.

(4) Exemption may encourage self-supply.

Since exemption could introduce cascading effects in the production chain, producer of an exempted item would have the incentive to do vertical integration to be able to self-supply the item in order to avoid incurring unrecoverable input VAT. As such, the distortion caused by exemption may have an adverse effect on economic efficiency. In the absence of exemption, a firm may refrain from self-supplying goods or services for reasons of, for example, economies of scale or the need for unique skills in producing intermediate inputs. The cascading effect introduced by exemption, however, may override these concerns and encourage firm to self-supply through vertical integration. This vertical integration may mitigate the problems associated with VAT exemption but firms may do so at the expense of economic efficiency. In other words, exemption may divert resources away from productive activity toward tax planning.

(5) Complications for partially-exempt seller.

When a trader sells both taxed and exempted items the recoverable portion of the amount input taxes that can be recovered is typically proportional to the value of taxed items in total sales. This arrangement, however, might increase the compliance costs that should be bore by the trader.

(6) Exemption creep.

When one particular item is exempted – aside from rising demands from producers of other items or other industries for similar facility – the government may also have to face increasing pressures for further exemptions in both upstream and downstream chains of production or distribution within that particular item. Hence it would feed on one another, creating a process of 'exemption creep'. Exempting a particular item or industry from VAT

would encourage interest groups from the upstream chain to press the government to also exempt goods or services used as inputs for the exempted item. By the same token, when the exempted item is an intermediate product the downstream industries that use the item would have the incentive to lobby the government to also exempt their output. At its extreme, the cycle of regulatory capture arising from exemption creep could make the value added from a whole chain of production and distribution in an industry escapes VAT.

At the start of tax reform 1983, the Indonesian VAT was designed to be levied at manufacturer-importer level. This was chosen considering the difficulties in administering the newly introduced VAT for hundreds of thousands of wholesale and retails firms at the time (Gillis, 1989b). Expansion of VAT to wholesalers was enacted in 1988 when the capability of the tax authority was deemed adequate in coping with increases in administrative burdens.

The original law of 1983 (before partially amended in subsequent reforms[8]) basically imposed VAT on a broad base with all goods was taxable and exemption was limited for the delivery of services related only to education, social, religion, and health. By the reform of 2009, however, the law expands the exemption to include no less than 60 items and groups of items. Moreover, besides the exemptions that are granted by the law, there are regulations which basically have the same effects as granting exemption on the imports and/or delivery of goods and services but are covered under different headings such as the VAT 'borne by the government', 'treatment for special economic zone', and 'treatment for strategic goods and services'. Hence an item which is actually taxable under the VAT law might escape the tax if it was, for example, being classified as strategic good.

Other form of VAT exemption may relate to the setting of threshold level of business size above which registration is compulsory (thus required to levy VAT on its outputs and entitled to recover the VAT paid on its inputs). In a hypothetical world where the costs of administering VAT borne by tax authority and the costs of complying with VAT law borne by taxpayers were zero there would be no need to set threshold; hence this would minimize distortions arising from different tax treatments while maximizing revenue. In the real world, however, there are trade-offs between administrative and compliance costs on one side and the need for revenue on the other side. Tax authority would be overwhelmed by the administrative tasks and taxpayers, especially small businesses, would incur excessive costs of compliance if the threshold was set too low. On the other hand, the basic objective of

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[8] There are tax reforms in 1994, 2000, and 2008/2009.

raising revenue would be compromised if the threshold was set too high (Keen & Mintz, 2004).

In this respect, the recent setting of the threshold in Indonesia might be counterproductive for revenue generation.[9] International best practice generally set the threshold relatively high during the introduction phase of VAT. This is due to the limited administrative capacity of the tax authority in implementing the new system (Ebrill et al., 2001). In 1983 when the VAT was first introduced in Indonesia, the threshold was set at Rp60 million of annual turnover; it was 51 times the GDP per capita[10] of that year. However, even after decades of implementation and experience gained by the tax authority, in 2013 the threshold was set significantly higher: at Rp4.8 billion or 126 times the GDP per capita. Although examination on the optimal threshold for compulsory registration is beyond the scope of this paper, this substantial increase may adversely affect the effectiveness of VAT in raising revenue for the government.

It may be important for the tax authority to assess the magnitude of revenue loss from tax expenditure policies in a systematic and continuous basis since this would enable decision makers to have more complete information on the costs of tax exemptions.

4.2. *VAT Gap due to Noncompliance*

Basically, tax authority is entrusted with the responsibility to enforce the tax laws.. When tax authority lacks effectiveness and efficiency, the intended effects of tax policy on resources allocation, income redistribution, macroeconomic stability, and economic growth could be distorted (Tanzi & Pellechio, 1995). The performance of tax authority, however, depends on the myriad of private and public actions (and reactions), various environmental factors with their complex interactions, the details of substantive as well as procedural rules contained in tax laws, and the results of administrative efforts (Bird, 2004).

Tax fraud and evasion are common in all types of taxes although, in theory, the invoice-and-credit design of VAT could reduce its exposure compared to other taxes (for further discussions on this issue see Agha and Haughton (1996); Barbone et al. (2013); Kopczuk and Slemrod (2006); Le (2003)). In practice, however, VAT can be fraudulently avoided and evaded in numerous ways such as by under-reporting sales, failing to register, failing to remit the collected tax, and falsifying tax credits or refunds (Smith & Keen, 2007).

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[9] Argument for a high level of threshold typically points to reductions in administrative burden hence resources could be focused on small number of taxpayers with high revenue payoffs (see, for example, in James (2015, p. 56)).

[10] Data on GDP per capita are from World Development Indicators.

Figure 5 reports the VAT gap due to noncompliance as a percentage of GDP for period 1995-2014. The gap rose significantly during and immediately after the Asian financial crisis between 1997 and 1999. Afterward, there was a declining trend in noncompliance with the lowest level reached at 2.2% of GDP in 2013. Nonetheless, the picture would look less impressive when even this lowest level is put into perspective. In 2013 the government revenue from VAT reached only 4% of GDP and with gap from noncompliance at 2.2% of GDP it would mean that more than one half of the revenue collected was lost due to noncompliance. Further, measured at 2013's value of GDP, this amounts to around US$20 billion of lost revenue each year from noncompliance.
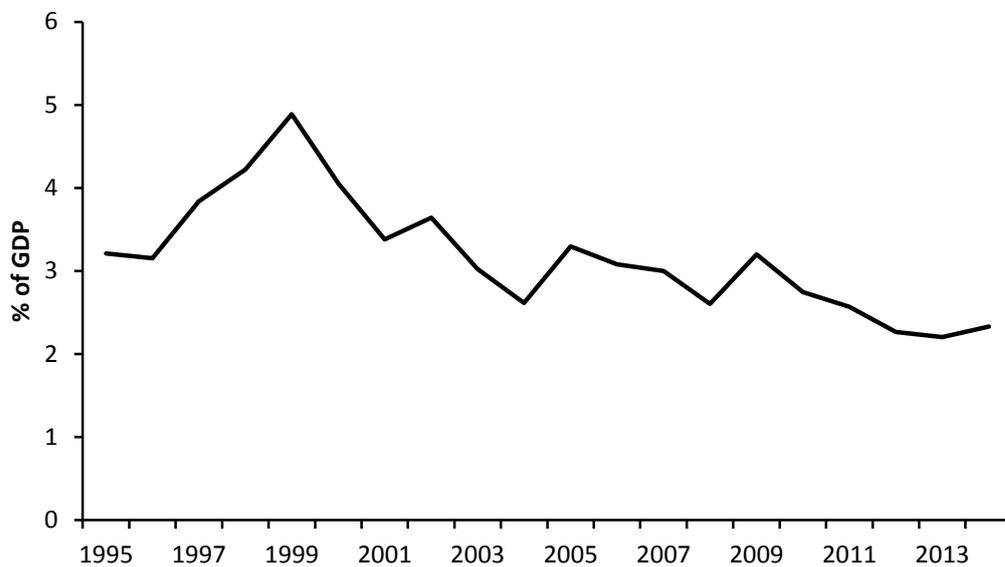
Figure 5. VAT gap due to noncompliance, 1995-2014 (% of GDP)
Sources: Bank Indonesia (Various Years); World Development Indicators (Various Years); World Input-Output Database (2013, 2016); own calculations.

As in any form of tax, enforcement of VAT requires a plethora of administrative elements such as identifying those required to pay the tax, processing returns submitted by taxpayers, ensuring the accuracy of returns through audit, and imposing penalties for delinquent payers. These have to be accomplished under condition of limited resources available to tax authority (Jantscher, 1990). Hence, solid analytical foundation developed from sound information and intelligent analyses is needed for effective and efficient tax administration (Bird & Gendron, 2006). This is because in order to solve a problem, one must understand the problem in the first place and thus full and careful identification of the size

and nature of the problem is necessary. Indonesian tax authority (or every tax authority, to be precise) operates within limited budget. Hence, it needs to allocate its limited resources as effectively and efficiently as possible in order to get the most out of them.

A more systematic approach in data collection and analysis would enable tax authority to closely monitor trends and changes in the behavior of taxpayers; hence administrative resources could be allocated efficiently and appropriate audit strategies could be developed effectively. In this respect, it may be necessary for the tax authority to break down the VAT gap due to noncompliance further by type of noncompliance (e.g., failure to register, data falsification, under-reporting of output tax, over-reporting of input tax, and failure to pay taxes due) as well as by economic sector (e.g., manufacturing, service, and trade) (Bird & Gendron, 2007).

Other measure which could be considered simultaneously with improvement in tax administration is to change the regulations as this would reduce the breadth of the problem faced by tax authority in administering VAT. Poor regulatory design in key aspects of VAT could have significant adverse impacts on compliance. One of these key aspects is related to simplicity and in this respect setting a single rate that is imposed on a single type of consumption tax could be important. Complicating Indonesian VAT system is the use of deemed input tax for certain types of seller (for example sellers of used car, gold jewelry, and tobacco). Under the deemed input scheme, the amount of input tax that can be recovered is determined as a certain percentage of the corresponding output tax (not the actual input taxes paid) to arrive at an effective tax rate. The amount of tax due is thus calculated by multiplying this effective tax rate with the amount of sales.

This is in essence a sales tax that is imposed at various rates depending on the types of business activities. Hence, in Indonesia, basically there are two systems of consumption taxes enacted in one jurisdiction. These rate and system differentiations may create scope for fraudulent misclassification, increase administrative and compliance costs, as well as distort allocation of resources between economic sectors. Moreover, imposing sales tax only for certain industries in a country where VAT is also imposed on other, broader economic sectors would break the chain of VAT in those industries imposed with the sales tax. This broken-chain would cut the information from the VAT's invoice-and-credit mechanism which supposedly flows to the tax authority thus adding to the complications in enforcing the law.

In self-assessed taxes such as the VAT, audit may serve as the essential part of the tax system. Basic principles in tax audit are that it should be conducted both randomly and selectively while taking into consideration the risk profile of each type of taxpayer. Taxable

activities hidden within informal sector may also be detected and included in the tax net through audit activities. Indonesian tax authority generally have adopted some of the international best practices in its audit system and the role of international organizations such as the International Monetary Fund (IMF) could be essential for this development (see Brondolo, Silvani, Le Borgne, & Bosch, 2008). For example, for audit purposes the head office provides general guidelines on taxpayers' risk profiles as well as provides a case selection system, sets requirements for auditors to meet certain qualifications, and establishes peer-review programs aimed at maintaining the quality of audits.

However, the significant gap due to noncompliance as discussed previously shows the possibility that the problem may lie on the ineffectiveness of these audit programs in improving compliance. The possibility of the ineffectiveness of audits as deterrence tool has been studied by, for example, Erard (1992) and Mason and Kinsey (1996) who found that audits do not always result in improved compliance. Bergman and Nevarez (2006) found similar result and argued, under the framework of game theory, that audit may not be effective in deterring evasion in a society with wide noncompliance equilibrium (i.e. when cheating is the norm in society). Moreover, in the case of Indonesia, although international best practices in tax audit systems have been adopted their implementations are less than satisfactory. For example, although taxpayers can request that audit quality assurance teams be set up, tax offices may arbitrarily reject these requests. Hence, the quality of audits might be suboptimal and taxpayers' trust in tax authority could be adversely affected.

In this context, one of the possible avenues of approach in improving compliance may be to build trust in tax authority. Prior studies based on national and international surveys found that trust in tax authority was positively related to tax compliance (Kirchler, 2007; Torgler, 2003; Torgler & Schneider, 2005). For the case of Indonesia, surveys conducted by Deloitte (2014, 2017) found that arbitrary and biased tax assessments were still common. Respondents in the surveys also perceived that the tax authority lacks fairness, professionalism, proper business conduct, and respect for taxpayers in conducting its audits. Moreover, they expressed low confidence in tax authority's ability in solving disputes in fair manners. This perception of unfairness might serve as fundamental barrier to compliance since citizens may be reluctant to pay their fair share of taxes when they do not believe that the tax authority is honest and that it has the capability in making sure that (almost) all other citizens paid their taxes fairly (Rothstein, 2000).

A synergistic tax climate may arise when there is mutual trust between taxpayers and tax authority. In this climate the taxpayers trust that the tax authority is benevolent and works

for the benefits of the society hence they may voluntarily pay their fair share of taxes. On the other side, tax authority trusts that taxpayers are honest and thus delivers supportive and respectful treatments as well as provides transparent procedures for taxpayers. In contrast, widespread lack of trust between tax authority and taxpayers could result in antagonistic climate where an attitude of 'cops and robber' is dominant. Tax authority identifies taxpayers as 'robbers' with strong tendency toward evasion hence need to be constantly monitored. On the other hand, taxpayers think that evasion is the right thing to do since they feel being constantly persecuted by tax authority (which they see as 'cops') (Braithwaite, 2003a; Kirchler et al., 2008).

5. Concluding remarks

The suboptimal collection performance of Indonesian VAT could mainly be attributed to revenue gap which arises from policy and noncompliance. In the policy aspect, a major cause for concern is that tax expenditures may have increased significantly in recent years hence scaling down the extent of exemptions could be important. In this respect, periodic assessments on the magnitude of revenue losses from tax expenditure policies may be necessary. In the aspect of noncompliance several avenues for reform are proposed: establishing a systematic approach in data collection and analysis to closely monitor trends and changes in taxpayers' behavior, simplifying the tax system by setting a single rate that is imposed on a single type of consumption tax, and improving audit effectiveness by building trust between tax authority and taxpayers.

This study does not explore the proximate causes of noncompliance and the detailed avenues of approach in managing trust between taxpayers and tax authority. Hence further research could be directed toward decomposing the extent of VAT noncompliance in Indonesia by types of evasion and by economic sectors as well as toward exploring policies aimed at creating optimum balance between the power possessed by tax authority and building taxpayers' trust.

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SUMMARY STATISTICS

Variables (% of GDP)	Minimum	Maximum	Mean	Std. Deviation
VAT Revenue	2.535	4.468	3.659	0.453
VAT Gap due to Noncompliance	2.203	4.886	3.166	0.698
VAT Gap due to Policy	0.002	0.997	0.252	0.241
Aggregate Consumption	62.414	88.918	70.670	6.582

Sources: Bank Indonesia (Various Years); World Development Indicators (Various Years); World Input-Output Database (2013, 2016); own calculations.

Appendix – B

CORRELATION BETWEEN VARIABLES

		REVENUE	NONCOMPLIANCE	POLICY	CONSUMPTION
REVENUE	Pearson Correlation	1	-.689**	-.535*	-.244
	Sig. (2-tailed)		.001	.015	.300
	N	20	20	20	20
NONCOMPLIANCE	Pearson Correlation	-.689**	1	.686**	.841**
	Sig. (2-tailed)	.001		.001	.000
	N	20	20	20	20
POLICY	Pearson Correlation	-.535*	.686**	1	.735**
	Sig. (2-tailed)	.015	.001		.000
	N	20	20	20	20
CONSUMPTION	Pearson Correlation	-.244	.841**	.735**	1
	Sig. (2-tailed)	.300	.000	.000	
	N	20	20	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Sources: Bank Indonesia (Various Years); World Development Indicators (Various Years); World Input-Output Database (2013, 2016); own calculations.