Value Added Taxation: Mechanism, Design, and Policy Issues

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I. Introduction

The idea of the value added taxation (VAT) traces back to the writing by von Siemens, a German businessman, in the 1920s. Not until 1948, however, was the tax first applied in France. At the beginning, France applied the GNP-based VAT covering up to the manufacturing level and subsequently replaced it with a consumption VAT in 1954. Theory and practice indicate that to be efficient, the VAT must be consumption-typed, broad-based, and applied through to the retail stage.

Empirical studies have shown the interlinks between the VAT performance of a country and its level of development. The revenue gains from VAT are likely to be higher in an economy with higher level of per capita income, lower share of agriculture, and higher level of literacy (Ebrill et al. 2001).[1] VAT proves to be an efficient tool for revenue collection; its performance, therefore, has direct impact on fiscal mobilization, macroeconomic stability, and development.

Compared with alternatives in indirect taxation, the VAT has more revenue potential: it is generally more broad-based and entails a trail of invoices that helps improve tax compliance and enforcement. Note also that the VAT may eliminate the cascading problem, which is typical for the turnover tax. Heady (2002) observes a clear, consistent trend for greater use of the VAT to collect sales tax revenues among OECD countries: "[The VAT becomes] the sales tax of choice in OECD countries" (p.4). While these countries continue to rely heavily on income tax collection, the VAT revenues have

[1] One should caution, however, that the IMF study also indicates significant negative impact of the interactive VAT and trade liberalization on the revenue collection: the introduction of VAT, which replaces trade taxes during the course of trade liberalization, is likely to reduce the overall tax revenues. The results imply that the VAT may not be as effective as trade taxes in raising revenues.

risen steadily in both absolute and relative terms: the general consumption taxes (mainly VAT—in recent years) increased sharply from 12 percent of the total tax revenues in 1965 to 18 percent in 2000 (Heady, 2002. p.16). A similar trend is applied to developing countries, which typically rely more on sales tax than OECD countries. The IMF assesses the growing importance and worldwide expansion of the VAT as follows:

> "[The VAT has become] a key source of government revenue in over 120 countries. About 4 billion people, 70 percent of the world's population, now live in countries with a VAT, and it raises about $18 trillion in tax revenue—roughly one-quarter of all government revenue. Much of the spread of the VAT, moreover, has taken place over the last ten years. From having been largely the preserve of more developed countries in Europe and Latin America, it has become a pivotal component of the tax systems of both developing and transition economies." (Ebrill et al., 2001. p. xi.)

This paper covers the mechanism of the VAT and presents critical issues in the tax design, implementation, and policy implications. The paper consists of six sections. Section II reviews the rationales for the VAT in comparison with other types of indirect taxes. Section III discusses the nature of VAT, alternative methods of VAT calculation, and three major types of VAT base. Section IV presents the mechanics of calculating VAT liability and introduces VAT performance measurement indexes. Section V analyzes critical issues in the VAT design, implementation, and policy implications. Section VI concludes.

II. The Rationales for VAT

In a nutshell, VAT is a form of indirect tax collected at various stages of production-distribution chains. If properly designed and implemented, the tax, at any stage, is effectively collected on the pure value added generated at that stage; as such, the VAT can be viewed as equivalent to the single retail sales stage tax but implemented in a

different fashion. We will discuss further the mechanism of the VAT in sections III and IV.

There are some good rationales for a VAT.

1. The VAT replaces other unsatisfactory indirect taxes (e.g., turnover and single-stage taxes)

Many developing countries have introduced the VAT to replace turnover tax or some type of single-stage sales tax. The replaced taxes are inherently troublesome in terms of either revenue leakage or economic inefficiency or both. To illustrate the relative advantages of the VAT, in what follows I will briefly review the problems with the turnover and single-stage taxation.

1.1.Turnover taxation

The tax is imposed on every stage of the production-distribution chain. The tax base at any single stage includes the sales value of the goods plus the tax charged accumulatively in previous stages. A serious problem with this tax is the "cascading effect," literally understood as the tax-on-tax effect. The tax generates a trail of accumulated distortions carried from the first stage of production on to the last stage of the retail sales distribution. To gauge how bad the cascading effect is, one may simply imagine a situation, in which a smart entrepreneur "negotiates" with his partners to vertically integrate, and by colluding, they can avoid a large part of the tax burden.

2.2.Single-stage taxation

The tax can be imposed at any single stage of the production-distribution chain—there may be manufacturing, wholesale, or retail sales taxation. The tax, at the first glance, is ideal, because its design is expected to eliminate the cascading effect and does

not require huge administration costs (the base is significantly smaller than the one with the turnover tax). It has many potential problems, however.

For example, the tax at manufacturing level needs "ring fencing" the production of capital goods in order to avoid any bias against capital and escalation of production costs. But it would require efficient monitoring to detect any potential reselling problem—ring-fenced firms may obtain their tax-free inputs, resell them to the market, and thereby erode the base. Likewise, the tax on wholesales stage is not easy to administer: the problem derives mainly from the obscure definition of the wholesale stage. For both manufacturing and wholesale stage taxation, the base is narrow, and hence the rates need to be high to collect sufficient revenues. However, higher rates provide stronger incentives for evasion and avoidance; taxpayers can easily avoid the taxes by artificially lowering price at the taxed level (manufacturing or wholesale level respectively) and raising price at the subsequent, untaxed, level.

On the other hand, the retail sales tax (which is currently applied, for example, at the state level in the U.S.) requires, *inter alia*, massive registration. Mikesell, in his brief on the topic entitled "*Retail Sales Tax*,"[2] indicates that to ensure the economic efficiency of a retail sales tax regime, two major principles must be followed. First, the tax must be applied to all sales for final consumption at a uniform rate. Second, there must be no tax on savings or production consumption. Both conditions are, however, practically hard to be met. It is not uncommon that tax regimes—applied in practice—feature multiple rates and exemptions. On the other hand, it is costly, administratively, to distinguish

[2] The topic brief is available at http://www1.worldbank.org/publicsector/tax/retailtax.htm (site visited on February 12, 2003).

consumption (to be taxed) from production purchases (to be exempted)—there are many items used for both production and final consumption.

The administration of the retail sales tax is not simple for at least two reasons: (1) the tax requires that all retailers be registered to collect taxes from their customers; and (2) multiple exemptions and rates, and limited coverage (the tax is typically extended only to goods and very few services) tend to erode the base and give rise to the need for setting high standard rate for sufficient revenue collection. The high rate, however, would become an attractive invitation to evasion and avoidance. An interesting vicious circle can be seen: narrow base—high standard rate—evasion and avoidance—narrower base etc. In addition, retailers in developing countries are largely small, informal, and mobile (no fixed business location); these typical taxpayer characteristics combined with the complex tax regime pose real challenge to tax administration.

In general, single-stage sales taxation is prone to serious revenue leakage. Especially, the tax collection is restricted to only one stage of the chain: if some businesses succeed in slipping out of the tax net (i.e., at the tax point), revenues will immediately drop. The VAT is relatively more advantageous than the alternatives, be it turnover tax or single-stage tax. First, the VAT is generally more broad-based (it is extended to cover both goods and services). Second, it is less risky in terms of revenue leakage (the invoice-based credit mechanism in administering the VAT facilitates collection and enforcement; even if revenues are missed in one stage, they are still collected in other stages). The VAT has, therefore, greater revenue potential than its alternatives.

Opponents to the VAT usually argue that the VAT is more complex to administer than other types of consumption taxation, and the complexity naturally leads to higher collection costs (defined as the combined compliance costs from the taxpayer side, and administration costs from the tax authority side). However, as described, the taxes replaced by the VAT in developing countries are generally far from being simple in their design and riddled with narrow base, multiple rates, and numerous exemptions. For example, the VAT, introduced in 1988 in the Philippines, replaced a web of indirect taxes including manufacturer's sales tax, turnover tax, advance sales tax on imports, miller's tax, forest charges, and other sorts of ad valorem taxes on services. McMoran (1995) indicates that the administration and compliance costs under a single-stage tax and a VAT extended to the same level in the production-distribution chain do not differ significantly.

2. **Invoice-based credit VAT, the most common form of VAT, is, in principle, self-enforcing and hence a buoyant tax**[3]

The VAT is, in principle, described as "self-enforcing." The description stems from the nature of the invoice-based credit VAT: a taxable business can claim for the refund of the input VAT only if the claim is supported by purchase invoices—the mechanism provides strong incentives for firms to keep invoices of their transactions and is an efficient means for tax authorities to check and cross-check for enforcement enhancement. In reality, the tax is, however, not at all self-enforcing—"ghost" invoices and false refund claims are common.[4]

[3] A tax is regarded as buoyant if the tax collection grows at a rate higher than the growth rate of the economy. Section III provides more detailed discussion.

[4] For detailed presentation of the most common types of VAT fraud and critical issues in administering refunds, see Brondolo and Silvani (1996).

Despite certain inherent problems in administration, the VAT is empirically found to be a buoyant tax (Tait, 1991). Most countries started the VAT with an initial idea of reforming the existing sales tax system on a revenue-neutral basis but then realized that the VAT is revenue-enhancing, largely due to the improved compliance. A recent survey by the IMF (Ebrill et al., 2001) shows that this is true for all regions, except for Central Europe, Russia, and some other countries of the former Soviet Union. Note another advantage of the VAT: being a buoyant tax, the VAT may allow for some relief in income taxes; and if the VAT introduction accompanies a reduction in income taxes, the whole tax system tends to be more politically acceptable and hence more stable.

3. Unlike income taxes, consumption-based VAT does not distort consumption-savings/investment decision

Being a consumption tax, the VAT does not have discriminating effect on savings/investment because savings are essentially excluded from the consumption VAT base. The following example helps illustrate.

> In a simplified world, a typical individual lives over two years. He earns income in year 0 and uses up his income over his two-year lifetime, years 0-1. Suppose his income in year 0 is $100. For simplicity, assume he could exercise two extreme options: consume all his income in year 0, or save all income to consume in year 1. Also, assume the discount rate, a measurement of his patience, is 10 percent, the same as the interest rate.
>
> **Case 1:** N*o tax world.*
>
> If he saves all his money in year 0, then in year 1, he will consume $110 or $100 in present value (i.e., 100*(1+10%)/1.1), the same as the amount earned in year 0. There would be no distortion: the individual would be indifferent between the two options.
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> **Case 2:** *Income tax of 30% (uniform rate applied to income from different sources).*

If he consumes now, he can consume $70 (i.e., 100*(1-30%)). But if he saves the money for the next year, then he can consume less, at just $68 in present value (i.e., {[100*(1-30%)]*[(1+10%*(1-30%)]}/1.1). Obviously, he is more likely to consume all his earning income in year 0! Put it differently, the income tax does discourage savings and investment.

Case 3: *Consumption tax of 30%.*

He can consume now at $70, net of tax. If he saves all his earned income to consume in the next year, then in year 1, he expects to earn a present value of the same amount, $70 (or {100*(1+10%)*(1-30%)}/1.1=$70). The consumption tax does not distort consumption-savings decision—the outcome is similar to the one in the no-tax world (case 1).

4. A VAT on destination principle may relieve exports from indirect tax burden on inputs if the tax is properly applied

Under destination principle, conventionally, the VAT zero rates exports. If properly applied, zero rating removes exports from all VAT burden: exporters do not collect the VAT when exporting but are still eligible to claim for refunds of all the VAT paid on their input purchase. (Section IV details and illustrates the mechanism of the zero rating.) This is true, however, only in the case where refunds of the input VAT are made in a timely manner.

In practice, it is not uncommon that the VAT refunds are delayed by as long as six months in developing countries. Without any interests earned on the portion of the eligible but delayed refunds, export-manufacturing firms lose in terms of time value of money. Desai and Hines (2002) argue further that empirically, the VAT is associated with less trade (fewer exports and imports). They explain that in addition to the delayed and incomplete refunds, exporters suffer from exchange rate appreciation, which is likely

resulted from the VAT introduction. One may, however, question the data and methodology applied in their paper.

III. The VAT Mechanism

1. The value added: how to measure it

The VAT, by definition, is the tax on the value added at each stage of a production-distribution chain. The value added, in turn, can be defined in two alternative ways. First, value added is equivalent to the sum of wages to labor and profits to owners of the production factors including land and capital. Second, value added is simply measured as the difference between the value of output and the cost of inputs. The two ways of definition of value added give rise to three major alternatives for computing the VAT liability as described below.

2. Three alternatives in VAT computation

2.1. The addition method

The tax liability is equal to the tax rate multiplied by the value added defined as the sum of wages and profits. If t_1 and t_2 are the rates on wages and profits respectively, then the tax liability will be the sum of (t_1*wages) and (t_2*profits). The addition method, in practice, would be politically hard to sell to the public, as taxpayers would simply view the VAT as an additional layer of tax burden on top of corporate and personal income taxes. On the other hand, the structure of the tax implies that the VAT, theoretically, can be used to replace both personal income tax and corporate income tax.[5]

2.2. The subtraction method

[5] This argument forms part of the core of the long-debated topic of tax reform in the United States (see, for example, Slemrod and Bakija (2000)).

The tax liability at any stage is equal to the tax rate multiplied by the tax base or value added measured as the difference between the values of outputs and inputs.

2.3. The invoice-based credit method

This is the most common method of the VAT computation. Under the invoice-based credit method, a firm at any stage of the production-distribution chain charges its customers the VAT on its output, submits the tax to the treasury, and then claims for the VAT already paid on its input purchase. Let t_1 and t_2 be the tax rates on output and inputs respectively, then the tax liability is the difference between (t_1*output) and (t_2*inputs).

2.4. Which VAT computation is the best practicable

The invoice-based credit VAT apparently has advantages over both addition and subtraction methods. The addition method relies on accurate information on wages and profits which are hard to obtain in developing countries, and thereby runs into the same problems faced in income taxation. The subtraction method, on the other hand, requires an explicit estimation of the tax base—this would be fine for a VAT with a single rate structure but would result in serious problems for a multiple-rate VAT regime. For the purpose of illustration, let us look at a simple case: assume a firm purchases a single type of input (I) subject to a tax rate of t_i and produces two types of output subject to different rates of t_1 and t_2, respectively. To properly refund the tax on inputs to the firm, the tax administration needs to know how to apportion the input (I) into the two types of outputs. Misaligned information, and the resulted monitoring problem inherently make the subtraction method practically hard to apply.

On the other hand, under the invoice-based credit method, the VAT on outputs and inputs is, essentially, assessed and collected separately, and the refunds are credited

on the basis of the invoice on input purchases. As the tax base does not need to be directly calculated, the system handles a multiple rate structure more efficiently than does the subtraction method.[6] An extra benefit of the invoice-based credit mechanism is that it requires firms to retain invoices and hence self improves the general record keeping practice. "Self-policing," a desired character of the VAT, is specifically related to the invoice-based credit VAT.

3. Three types of VAT base

3.1. GNP type (Product-typed)

A GNP-typed VAT taxes all final goods and services except for intermediate goods. Investment costs also enter the tax base—no capital expensing or depreciation is allowed. The advantage of this type of the VAT is that the base is relatively large. The big disadvantage is, however, that the investment items will bear the full tax burden.

3.2. Net national product type (Income-typed)

This type of the VAT excludes from the base the value of intermediate inputs and depreciation. The base is, therefore, similar to the one in income taxation.

3.3. Consumption type

The base excludes the value of both intermediate inputs and investment items from the gross value of goods and services. The base—as defined—is close to the one in retail sales taxation.

Most countries apply the consumption type VAT but introduce various ways of giving credit for capital goods. Rarely do countries allow for immediate and full credit of the tax charged on capital goods. They generally limit the credit in a certain period to the

[6] Note, however, the invoice-based credit method cannot escape from the apportionment problem in some complex cases, for example, where a firm produces both exempt and taxed output.

level of the VAT chargeable on output and allow the remaining credit to be carried forward to offset the tax in later periods (for example, this is a common practice in Latin America). On the other hand, some countries selectively grant immediate exemption of the VAT on the purchase of capital goods as part of an overall package of fiscal incentives to priority industries.

There are two important notes. First, both product and income-typed VATs entail cascading effect as they more or less charge the tax on investment items. Thus, they are not production-efficient. The income-typed VAT allows for partial and delayed refunds of tax: investment items are not immediately expensed but gradually deducted from the tax base over a specified period in the project's life—the investment items, therefore, bear partial tax burden in present value terms. However, the GNP or income tax base is relatively larger than the one of the pure consumption-typed VAT and is not commonly applied in practice—China and Brazil are among a few exceptional cases, which apply the GNP-typed VAT (China apply the GNP-based VAT at state level). On the other hand, the pure consumption base would relieve production from tax burden and hence makes the VAT more production-efficient. In addition, as a general consumption tax, the consumption-typed VAT does not distort the investment and saving behavior (discussed in section II).

IV. Calculation of VAT and Performance Measures

1. Some further basic concepts in VAT: exemption v. zero rating

An exempt stage is completely eliminated from the production-distribution chain: an exempt firm is not required to collect the tax on output sold to its consumers, but it is

not entitled to claim for the credit of the tax the firm has already paid on its input purchase.

A zero rated firm charges no VAT on its consumers—equivalently put, the firm charges the rate of zero percent on its sales—and then, it claims for refunds of the VAT previously paid on its input purchase. In essence, zero rating does not break the link between the zero-rated stage with others in the whole production-distribution chain—zero rating can be thought of as an extreme case of reduced rate on output of eligible products.

2. How the VAT is calculated: some illustration

The following examples are set up to illustrate the mechanism of the VAT calculation and to make contrast between the invoice-based credit method and subtraction method.

Let us look at the case of, say, producing bread. At the first stage, a farmer sells wheat to a miller. In stage 2, the miller makes flour and sells to the baker. At the final stage, the baker makes bread and sells it to final consumers. For simplicity, let us assume that the value added at the first stage makes up the total value of the output sold (i.e., wheat).

Let P_1, P_2, and P_3 be the price of wheat, flour, and bread respectively. Likewise, t_1, t_2, and t_3 are the VAT rates on wheat, flour, and bread respectively.

2.1. No exemption, no zero rating

Under subtraction method, the VAT in the whole chain would be calculated as follows:

$$\text{Tax liability} = t_1*P_1+t_2*(P_2-P_1)+t_3*(P_3-P_2) \qquad (1)$$

Under credit method:

Tax liability = $t_1*P_1+[t_2*P_2-t_1*P_1]+[t_3*P_3-t_2*P_2] = t_3*P_3$ (2)

In a single rate system, the tax liabilities in (1) and (2) are the same, and the effective tax revenues are equivalent to the ones received under a retails sales tax system.

2.2. Exemption

We now introduce exemption in the tax structure and analyze its revenue implications.

2.2.1. Exemption of the first stage

Under subtraction method: Tax liability = $t_2*P_2+t_3*(P_3-P_2)$ (3)

Under credit invoice method: Tax liability = $t_2*P_2+[t_3*P_3-t_2*P_2] = t_3*P_3$ (4)

Note, under the invoice-based credit method, the tax revenues are the same in both non-exemption and first-stage exemption cases. On the other hand, under the subtraction method, the revenues may be lower or higher in the first-stage exemption case than in the non-exemption case, depending on the relative magnitudes of t_1 and t_2.

2.2.2. Exemption of the second (middle) stage

Under subtraction method: Tax liability = $t_1*P_1+t_3*(P_3-P_2)$ (5)

Under invoice-based credit method: Tax liability = $t_1*P_1+t_3*P_3$ (6)

With the middle-stage exemption, the tax revenues under invoice-based credit method are higher than the ones without exemption. This is the case, because the exemption of the middle stage effectively eliminates this stage from the whole chain: the second firm (the miller) cannot claim for refund of its input tax (the tax paid by the firm on its purchase of wheat)—the tax burden hence carries on. This generates "cascading effect," which is typical in turnover taxation. The subtraction method, on the

other hand, collects less revenue when the middle stage is removed from the VAT chain (the value added generated in the second stage is effectively removed from the tax).

2.2.3. Exemption of the third (last) stage

Under subtraction method: Tax liability = $t_1*P_1+t_2*(P_2-P_1)$ (7)

Under credit invoice method: Tax liability = $t_1*P_1+[t_2*P_2-t_1*P_1] = t_2*P_2$ (8)

Under both methods, the tax revenues are less than the ones collected in the non-exemption case. As the last stage is out of the tax net, the value added in this stage escapes the tax. This indicates that the overall tax burden could be reduced by exempting the last stage.

2.3. Zero rating

2.3.1. Zero rating of the first stage

Under subtraction method: Tax liability = $t_2*P_2+t_3*(P_3-P_2)$ (9)

Under credit invoice method: Tax liability = $t_2*P_2+[t_3*P_3-t_2*P_2] = t_3*P_3$ (10)

Zero rating of the first stage does not change the effective tax revenues under invoice-based credit method. However, the tax revenues would be lower under subtraction method: the value added generated in the exempt stage (first stage) is not taxed.

2.3.2. Zero rating of the second (middle) stage

Under subtraction method: Tax liability = $t_1*P_1+0*(P_2-P_1)+t_3*(P_3-P_2)$ (11)

Under credit invoice method:

Tax liability = $t_1*P_1+[0*P_2-t_1*P_1]+[t_3*P_3-0*P_2]=t_3*P_3$ (12)

Under invoice-based credit method, zero rating of the second (middle) stage does not change the VAT revenues. Under subtraction method, the value added generated in the second stage is free of tax.

2.3.3. Zero rating of the third (last) stage

Under subtraction method: Tax liability = $t_1*P_1+t_2*(P_2-P_1)+0*(P_3-P_2)$ (13)

Under credit invoice method: Tax liability = $t_1*P_1+[t_2*P_2-t_1*P_1]+[0*P_3-t_2*P_2]=0$ (14)

Under invoice-based credit method, the tax revenues for the whole chain become zero if the last stage is zero rated. This implies that to completely relieve exports from the VAT burden, zero rating, but not export exemption, must be applied. A destination VAT regime (to be discussed later) zero-rates exports, but taxes imports.

Summary

- Under invoice-based credit method, zero rating of any stage prior to the final one does not affect the total tax burden borne by the whole chain. The tax revenues will, however, be eliminated if the last stage is zero-rated. Under subtraction method, zero rating of the last stage is equivalent to exemption: the value added in the last stage is relieved from the tax burden, but tax revenues are still collected on the value added generated in all preceding stages.
- If any middle stage is exempted and invoice-based credit method is applied, higher tax revenue is expected due to cascading effect: the exempt stage is eliminated from the chain, and the tax burden on the value added generated in all stages prior to the exempted one remains and carries on in the whole production-distribution chain.

- Under invoice-based credit method, exemption is expected to provide some tax relief if it is applied to the last stage. In this case, the value added generated at the last stage is not taxed.

3. VAT performance measures

The concepts of tax buoyancy and elasticity can generally be used to evaluate the performance of the VAT or any other type of tax or the whole tax system.[7] Tax buoyancy is defined as the ratio between the real growth rate of tax revenues and the real growth rate of GDP or GNP. The data on revenue collection used in estimating tax buoyancy incorporates the impact of any discretionary changes in the tax rate or base or both during the reporting period.

Tax elasticity is defined in the same way as tax buoyancy. However, the data on revenue collection used in estimating elasticity excludes the impact of any discretionary changes during the reporting period. Thus, tax buoyancy measures the efficiency of both underlying tax structure and discretionary changes, whereas tax elasticity measures the efficiency of the fundamental tax structure. In general, the VAT performance is considered to be satisfactory if the buoyancy or elasticity is greater than or equal to one: in this case, the VAT collection keeps up with the growth of the economy.

Other diagnostic tools for the VAT performance include efficiency ratio and C-efficiency ratio (for detailed discussion, see Ebrill et al. 2001, pp. 40-42). Efficiency ratio (E) is defined as the share of the VAT in GDP divided by the standard VAT rate. An efficiency ratio of, say, 30 percent, implies that if the standard VAT rate is increased by one percentage point, the shares of the VAT revenues in GDP is expected to increase

[7] Shome (1988) provides detailed discussion on tax buoyancy and elasticity in the context of developing countries.

by 0.3 percentage point. In general, the higher the ratio E, the better the performance of the VAT. The IMF survey shows that small islands and members of the European Union (EU) have the most effective VAT systems: their estimated efficiency ratios attained at 48 and 38 percent respectively, while the worldwide average was 34 percent. Note, the efficiency ratio is an imperfect and, even misleading, statistic. First, there exist problems in measuring GDP, especially in countries with relatively large informal sector. Second, in general, the GNP-typed VAT—where only intermediate inputs are exempted from the base, and hence there exists some degree of cascading—tends to improve E, but for economic efficiency, the consumption-typed VAT—which can get rid of the cascading effect if the tax is properly applied—is actually more desirable (discussed in section II).[8]

The C-Efficiency ratio is defined as the share of the VAT in consumption divided by the standard VAT rate. This statistic—based on consumption rather than GDP—is a more reliable diagnostic tool than the efficiency ratio E. The index may be higher or lower than 100 percent. Some caution should be noted. A too high ratio E, especially, the one far above 100 percent—that may be derived from multiple exemptions in the middle stage or inclusion of investment costs in the base (e.g., GNP-typed VAT)—does not necessarily mean the VAT is efficient but may instead indicate probable cascading problem. In general, the further the index deviates from 100 percent (either lower or higher the 100 percent benchmark), the less efficient the VAT system is. Consistent with the prediction under the efficiency ratio E, the IMF survey shows that the small islands and the EU achieve the best C-efficiency ratios of 83 and 64 percent respectively.

[8] The consumption-based VAT, by definition, relieves investment costs from the tax base and thereby minimize any potential cascading problem.

V. VAT Design Issues and Policy Implications

1. Origin versus destination principle

Under destination principle, the tax is imposed at the point of consumption (tax on consumption)—for a VAT to be effectively imposed on domestic consumption, the tax must be applied on destination principle. A destination VAT zero rates exports and taxes imports. Destination principle requires border tax adjustment, but generally, exporters have no incentives to under-declare their export values, and importers have no incentives to overvalue their imports as often seen in the VAT on origin principle (to be discussed later). If the VAT is properly applied, all inputs are free of tax burden. Therefore, the destination principle promotes production efficiency—a destination VAT puts all firms at different jurisdictions on equal footing: they face the same prices on their input purchase.

Under origin principle, tax is imposed at the point of production: exports are taxed, but imports are not (tax on production). In VAT, exports will be subject to tax, and credit is given in importing country at the rate applied there. The tax burden is the sum of the VAT on the value added generated in the exporting country at its applicable rate, and the VAT on the value added generated in the importing country at its own applicable rate. Origin principle results in global consumption efficiency as consumers in different countries face the same consumer prices (gross-of-tax prices, adjusted for differences in transportation costs in domestic distribution and foreign trade), even if the tax rates vary in different countries.[9]

Under origin principle, there is no need for border tax adjustment as the tax is imposed purely on domestic value added. Proponents of origin principle claim that this

[9] Zee (1995) offers excellent discussion on the global production efficiency under destination principle, and on the global consumption efficiency under origin principle.

principle virtually eliminates borders and thereby promotes smoother trade: exports is treated just as a normal stage in the whole production-distribution chain stretched beyond the border of a specific country or state within a federal system. This is the driving rationale for the proposed gradual application of origin principle to harmonize the VAT system in the E.U.; the proposal calls for the unique VAT treatment in terms of rates and the right to deduct input VAT across the E.U member countries.

However, the issue of valuation of imports—in order to correctly remove the imports from the tax base—and of exports—in order to levy the tax—becomes more critical under original principle than under destination principle. Importers have incentives to overvalue their imports (in order to claim for more refunds), while exporters have incentives to undervalue their exports (in order to remit lower amount of tax on exports). Incentive for transfer pricing adds another layer of problem in origin principle: firms within a multi-national corporation charge artificially high prices on the inputs supplied to firms located in high VAT jurisdiction, which in turn sell their outputs at artificially low prices to firms located in low VAT jurisdiction. In addition, origin principle tends to induce tax competition among different jurisdictions as importers pay tax at the rate applied in exporting state but receive credit at the rate applied in importing state.

Under strict origin principle, if the rate applied in exporting state is higher than the rate in importing state, part of the tax burden on the imports, measured as the difference between the export tax and import refunds, carries on and raises the total tax revenues in the chain. On the other hand, if the VAT rate in exporting state is lower than the one applied in importing country, the total VAT burden gets reduced—part of the

burden in the chain is subject to the lower rate applicable in the exporting country. A hypothetical example follows.

Example

State A exports a good to state B at price of $100. State B processes the good and sells it to final consumers at $300 (value added of $100 is generated in A, and $200 is generated in B). Both prices are exclusive of VAT.

Case 1: *The VAT rates are 10 percent in A (exporting state) and 5 percent in B (importing state).*

Under origin principle, the VAT collected in A is: 10%*100=$10, and the VAT collected in B is: 5%*300 minus the refund of 5%*100=$10. Hence, the total VAT, effective at final sales point, would be $20 (i.e., $10 is collected in A, and an additional $10 is collected in B). Alternatively, the total VAT burden is regarded as the sum of the VAT on the value added in A and the VAT on the value added in B at the rates applicable in the respective states: total tax revenues=10%*100+5%*(300-100)=$20. On the other hand, under destination principle, the tax is effective at the final sales at the rate imposed in the final sale jurisdiction (B, in this case): 5%*300=$15, which is lower than the VAT under origin principle. The difference is due to the fact that, under origin principle, part of the tax burden induced by the higher rate in exporting state (state A) adds up to the total effective tax burden on the final sales in importing state (state B).

Case 2: *VAT rates are 5 percent in A and 10 percent in B.*

Under origin principle: Tax in A=5%*100=$5; and tax in B=10%*300-10%*100=$20. Total effective tax at the final sales would be: $5 (collected in A)+$20 (collected in B)=$25. Under destination principle, the total effective VAT would be: 10%*300=$30, higher than under origin principle—this is true, because under origin principle, part of the value added is subject to the lower rate in A (the exporting state).

Some federal regimes and regional trade associations apply a mix of origin and destination principles. Specifically, origin principle is applied to transactions among member states or countries, while destination principle is applied to those between member and non-member countries. For example, until recently, a number of countries of the Commonwealth of Independent States (CIS) applied strict origin principle to their interstate sales and destination principle to sales to non member states. They are now switching to a destination VAT uniformly applicable to both inter-state and state-to-non-state member sales.[10] Brazil applies origin-like principle to its state-level VAT system. The system works as follows. Exports are taxed at the interstate sales rate (a standard rate of 12 percent, and a special rate of 7 percent granted to sales to poorer states), and imports are given full refunds. This implies that the effective tax rate is determined by the rate applied at the state of final consumption; the final tax impact is similar to the one under destination principle although the tax and refund mechanism mimics the origin principle.

2. VAT exemption

As discussed, a non-exemption VAT would avoid the cascading problem and thus would not generate distortion in production. In addition, a broad-based VAT minimizes deadweight loss inherent in any type of indirect tax.[11] These desirable features of the VAT are, however, sacrificed if the tax is riddled with numerous exemptions.

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[10] For example, the VAT legislation in Russia stipulates that effective from July 1, 2001, exports (apart from oil and gas products) to CIS countries be subject to zero rate (PricewaterhouseCoopers, 2002).

[11] The tax on selected goods changes the relative prices among different types of goods and services competing for scarce productive resources. A narrow-based sales tax is expected to cause greater distortion in consumption than the one induced by a more broad-based sales tax. In essence, a narrow-based indirect tax would signify the substitution effect in consumption, and hence provides distorted signals to suppliers. Jenkins and Shukla (1999) provide an analytical framework applied to a simplified two-good world.

Exemption tends to erode the base, reduce the revenue collection on the one hand, break the VAT chain and thereby induce cascading problem on the other. Even worse, exemption is likely to ratchet up: for example, exemption of unprocessed food ultimately exerts pressure on exempting their inputs (e.g., agricultural inputs).

Despite all the mischief, exemption is common in practice. In many instances, exemption covers more than just "standard" items such as financial, education, and health services, which are typically exempt for administrative practicability. There are various tempting rationales for exemption.

First, there always exists equity rationale for providing tax relief for merit goods (e.g., education and public health services) or goods consumed by the poor (e.g., staple or unprocessed food). In practice, exemption has become a preferable option for reducing regressivity of the VAT.

Second, exemption is a better option, economically and administratively, than zero rating or reduced rates for the goods and services that require for some tax concession. Note this is also the main reason for the common practice of exempting merit goods such as basic health service and education. From the economic efficiency perspective, these services (e.g., public health, and education) generate positive externalities and therefore deserve government subsidies—they should bear no tax burden. Hence, zero rating, in theory, seems to be the most appropriate (and practically, it is applied in some countries such as Australia). The problem is that zero rating is extremely complex as it goes hand-in-hand with the requirement for intensified audits and proper refunds. Exemption is generally less costly than zero rating in terms of both tax administration and revenue loss.

In addition, exemption is simpler than the reduced rate alternative (to be discussed in part 4), and politically, it is an easier sell to the general public.

Third, from the pure administration perspective, it would be more cost-effective to exempt hard-to-tax sectors and groups of taxpayers below certain threshold, as they pose serious challenge to weak administration in developing countries. Agriculture, financial service, public institutions supplying goods or services free of charge or at prices lower than market price, housing, and small traders are some typical examples. (The following part will discuss separately the exemption of these special sectors and groups of taxpayers.)

Exemption is always a tempting option for the VAT policy design, but its effectiveness is hard to quantify. For example, to effectively lower the tax burden on the equity ground through exemption, it is required that the exemption be allowed exactly at the final stage, where the poor consume the good. Otherwise, the tax burden is even higher than that in a non-exempt situation due to cascading effect. The cascading problem may, in turn, induce artificial vertical integration and, in certain cases, nullifies the advantage of the zero rating granted to exporters. (For example, producers-exporters of agricultural commodities may use VAT-exempt fertilizer; hence, they bear part of the tax burden, embedded in the inputs purchased by the fertilizer manufacturers and carried over to the agricultural exports.)

Exemption may also generate another technical problem in compliance and administration, particularly when a firm produces both exempt and taxable items. In this situation, the advantage of the invoice-based credit VAT in dealing with multiple rate structure disappears because the firm is required to apportion its inputs into those used in

producing exempt goods and those used in producing taxable goods. In short, exemption creates numerous efficiency and effectiveness problems; it tends to erode the integrity and sustainability of the VAT system. It is, therefore, advisable that VAT regimes minimize the number of exemptions to the extent possible.

3. Treatment of hard-to-tax sectors

Some economic sectors (e.g., financial services, agriculture, housing) and groups of taxpayers (e.g., small traders) are practically hard to tax. They are, therefore, commonly grouped in the hard-to-tax category. There are some reasons for this problem: it is administratively hard or financially costly to estimate the value added generated by these sectors, or the compliance costs for the taxpayers are prohibitively high. The question is, how to treat these sectors—or more specifically, should they be included in the tax net, and if they should, then how?

3.1. Financial sector

It is conceptually and practically hard to tax the financial sector using the invoice-based credit method. One example: a bank gets a deposit at 5 percent and loans out at 15 percent. Under a strict credit VAT, the bank has to divide the total 10 percent value added (i.e., 15%-5%) into two parts: one is the value added generated during the transaction between the lender and the bank; and the other is the value added attributed to the transaction between the bank and its borrower. The apportionment is next to impossible. On the other hand, the tax revenue potential in the whole process is expected to be negligible—only the financial services to final consumers/households are taxed, whereas the services catered to firms are treated as intermediate inputs and hence are to be credited. Given the practical problem and insignificant potential revenues, financial

services are generally exempted, except for certain types of fee-based services such as brokerage and safe-keeping (for example, E.U. countries). Despite these seemingly insurmountable problems, Israel attempted to apply a quasi-VAT on financial services using addition method: the tax was charged on profits and wages of financial institutions and was treated as final tax—no credit was allowed; this would avoid the vicious circle derived from the need to estimate the implicit VAT on the amount borrowed by registered firms.

3.2. Agriculture

Agriculture is classified as a hard-to-tax sector for numerous technical, social and political reasons. First, in developing countries, a large part of the sector is informal. Second, from the social perspective, agriculture merits certain special tax relief as most of the poor are active in the sector. Third, the sector hosts most of the political constituents and hence needs to be treated more favorably in taxation. In practice, the majority of countries with a VAT exempt agriculture. But exemption, alone, does not relieve the sector from tax burden—farmers pay the VAT on their input purchase but cannot claim for the credit under a pure exemption scheme. The problem entails the need to exempt agriculture and its main inputs such as farm machinery and tools. Some countries opt to exempt farmers and zero-rate agricultural inputs. But, the "stacked" exemption or the combined exemption and zero-rating requires effective monitoring—exemption or zero rating must strictly be limited to those inputs used solely by agriculture. The requirement proves to be too complex, practically, to the revenue administration: many items have both farm and non-farm uses (e.g., hand tools, and general items such as batteries). In addition, multiple exemption and zero-rating make

the VAT exposed to abuse. This calls for the need to bring back agriculture to the tax net. One feasible approach is to introduce high threshold for registration in agriculture.[12] Practically, the threshold needs to be the same as the one applied to small traders (more to be discussed below). For countries that still exempt agriculture, it is critical to limit the number of exemptions of inputs to those used for agriculture only, such as fertilizer and seeds.

3.3. Small traders and setting threshold

The VAT tends to impose high compliance costs on small traders who generally do not have sufficient resources to keep proper records of their transactions and to comply with accounting rules. On the other hand, the number of small traders is huge—including them in the tax net would, therefore, drain the limited resources of revenue administrations—but the revenue potential is expected to be insignificant because their turnover and value added are generally low. The IMF estimates that on average, the largest 10 percent of businesses account for at least 90 percent of total turnover (Ebrill et al., 2001, p. 117); this implies that the administration costs incurred in taxing the whole group of small businesses may well outweigh the potential benefits (in terms of extra tax collection). The problem is generally resolved by setting a specific threshold, under which businesses are exempted from the tax net.

Setting threshold is complex, however. Some countries recognize that the below-threshold—and hence exempted—businesses bear the burden of the tax on their input

[12] Some suggest that farmers with turnover below a specified threshold be allowed to register voluntarily. Farmers who sell most of their output directly to final consumers may have incentives to remain outside the VAT regime, while those selling to other firms may opt to register in. While it is true that voluntary registration provides additional tax relief to farmers, it may turn out to be administratively costly: the number of registered farmers may increase to a uncontrollable level and become a unbearable burden on the tax administration, but the additional revenue collection is expected to be negligible.

purchase and thus allow them to register voluntarily. Firms in middle stage or selling zero-rated goods/services have strong incentives to register in the VAT net in order to be entitled to claim for their tax credit. As a result, voluntary registration may extend the base to capture too many small, low-turnover businesses; it may, therefore, nullify the effect of exemption threshold and jeopardize the very purpose of its setting.

Practically, there is no standard, "one-size-fit-all" threshold for every country. Different countries are in different stages of development, have different economic structures, and particularly, have tax administrations of different capacity. The thresholds observed in different countries vary substantially. A recent IMF survey shows that the thresholds range from 0 (i.e., all businesses are required to register) to $700,000 (in Singapore), and the mean threshold is $90,000 (Ebrill et al. 2001, p.115). Even across developed countries, thresholds differ dramatically. For example, Denmark allows for complete exemption to businesses with annual turnover below $1,500, whereas the exemption threshold for Japan is over $200,000 (Tait 1991, p.13). In addition, many countries apply different thresholds to different types of activities. For example, producers may face a lower threshold than the one applied to traders.

Many developing countries have weak tax administration but set too low thresholds. The low thresholds generate unintended compliance and administration problems and ultimately threaten the sustainability of the whole VAT system. In practice, many countries start a VAT with a low threshold, but after some "learning by doing" period, they realize the need to adjust the threshold to a new, and significantly higher, level. For example, Ghana set the threshold at $20,000 in the first, failed VAT trial in 1995, but

sharply raised it to $75,000 in the second, successful introduction of the VAT in 1999. Box 1 presents the lessons learned from the failure and success of the VAT in Ghana.

Box 1: VAT in Ghana—failure and success lessons

The VAT, first introduced in Ghana in March 1995, was intended to overcome the problems in the existing sales tax system—such as narrow base, weak administration, and corruption-prone physical surveillance. The VAT rate was set at 17.5 percent, significantly higher than the standard rate of 15 percent applied in the replaced sales tax. A new revenue collection agency, the VAT Service, was established. A computer system was developed. However, the VAT was short-lived: It was removed just three and a half months after its introduction. The failure was due to multiple problems rooted in the tax policy design, timing, and implementation.

The high introductory VAT rate did not make the VAT politically acceptable. The timing of the VAT introduction was bad, and it actually fueled the civil unrest: its introduction coincided with several factors that were beyond the scope of the VAT and put upward pressure on inflation (e.g., agricultural prices were sharply increased due to unfavorable rainfall; the excise duty on petroleum products was also raised). In addition, the lack of preparation made the VAT doomed to fail—the VAT was actually launched only about three months after the primary VAT legislation was passed in December 1994. The conflict between the newly established VAT Service, and the Customs, Excise and Preventive Service (CEPS) was acute and eventually led to significant delays in the appointment of senior staff to the VAT Service and transfer of staff from the CEPS to the VAT Service. (The CEPS initially believed it would be responsible for administering the VAT; but in the end, it was resented that the charge was handed over to the VAT Service.) The threshold was set too low (25 million cedi or $15,000), while the public education failed to reach small traders and consumers.

The VAT was reintroduced in 1998. This time, the reformers learned well the lessons from the 1995 failed attempt. The legislation was enacted 10 months prior to the adoption of the VAT—this gave sufficient time to train and recruit capable staff for the VAT Service and to prepare the public for the tax. The rate was introduced at a substantially lower level (10 percent). In addition, many basic goods such as unprocessed food, agricultural inputs and machinery, drugs and health services, utilities, books, and educational materials were exempted to quench the initial public anxiety. The threshold was raised sharply

to 200 million cedi ($80,000)—it should also be emphasized that the country has recently halved the threshold, to 100 million cedi. The VAT was successful: from the first year after introduction, the VAT generated 20 percent more revenues than the replaced sales tax. After less than 2 years, the government raised the rate to 12.5 percent but maintained the reduced rate of 10 percent for imports subject to VAT. It is currently planning to broaden the base by reducing the number of exemptions. With benefits of the hindsight, we list some key factors for the success of the 1998 introduction of VAT:

1. Strong, clear political commitment from government leaders.
2. Good preparation for the tax administration (selecting experienced tax administrators, and allowing sufficient time to prepare for the VAT registration and collection).
3. Reasonably low introductory rate, high registration threshold, and good timing for the VAT introduction.
4. Well-designed public education campaign.

Source: Chapman (December 2001); IBRD (2002).

Different countries may treat the below-threshold exempt firms differently. The majority of developing countries do not apply any sales tax to these firms. Some may, however, subject them to turnover or sales tax or some type of presumptive tax.

The IMF recommends that for simplicity, efficiency, and transparency of the VAT, a high threshold be applied and that the threshold be specified uniformly for all types of activities in terms of turnover (Ebrill et al., 2001, p.122). Countries that just start a VAT may opt to set a relatively high threshold—in order to quench the initial anxiety among small businesses and to make the best use of limited capacity of tax administrations—and then can lower the threshold to a level suitable to the improved administration and to the needs for revenue mobilization.

3.4. Housing sector

The common practice is that residential buildings and rent are exempted, but office buildings are fully taxed.[13] Exempting residential building and residential rent is commonly practiced on the basis of both technical and equity grounds. Technically, it is hard to impute rent values for owner occupation: extensive information and subjective valuation are required. But, if residential building is VAT-exempt, residential rent also needs to be exempted to eliminate any discrimination against renting and in favor of owner occupation.

The treatment of real estate sales is non-uniform across countries with a VAT, even within the EU. (Table 1, due to Conrad (1990), shows the practice in selected countries in the European Community.) Generally, resale of residential housing is VAT-exempt. Otherwise, there arises the need to tax the purchaser and give credit to the seller; as such, the potential net revenue collection is likely to be minimal, while it is practically complex to apply a VAT credit because the seller may have lived in the building for many years. On the other hand, some may argue that at least, the original purchase of the new housing should be taxed; however, this would increase the market price of housing: owners of old houses would get windfall gain, while it would be unfair to the first-time home buyers. Some countries compensate for the VAT exemption of the real estate sales by imposing various transfer taxes, which are, in effect, the tax on turnover. The transfer taxes cascaded through the sale-resale processes but do not generate substantial revenues. From the economic efficiency perspective, these taxes should be removed.

[13] Taxing business buildings is a clear-cut case. Firms get credit in the VAT system as the rent or building service is regarded as an input. In addition, exempting business buildings would be troublesome: the VAT chain would be broken, and problems such as cascading would occur.

Table 1: Value added tax treatment of real estate sales in the European Community*

Country	Building land	New buildings	Old buildings
Belgium	Exempt/1	Exempt/1,2	Exempt/1
Denmark	Exempt/3	Exempt/3	Exempt
France	Taxable	Taxable	Exempt
Germany, Fed. Rep. of	Exempt/1	Exempt/1	Exempt/1
Ireland	Taxable/2	Taxable/2	Taxable/2
Italy	Taxable	Taxable	Taxable
Luxembourg	Exempt/1	Exempt/1	Exempt/1
Netherlands	Exempt/1	Taxable	Exempt/1
United Kingdom	Exempt	Zero-rated	Exempt

* The table is reproduced from Conrad (1990).
1/ Sales are exempt from value added taxation but are subject to other duties and transfer taxes.
2/ Sales are taxable if certain conditions apply.
3/ Services associated with real estate (such as construction) are taxable.

Many countries also exempt construction of residential buildings. The rationale is that if the VAT were imposed only on the housing built through contractors, the contractors would be disadvantaged: the market price of housing is increased, but people are expected to switch from hiring contractors to self-building.

Cnossen (1995) offers some broad guidelines for the treatment of the housing sector. He argues that the consistent and neutral application of the VAT to real estates (i.e., all building activities, forms of leasing, and sales are to be taxed at the standard rates) would be superior—on both efficiency and equity grounds—to widespread exemption or application of preferential rates.

3.5. Public Sector

The case, in which public institutions provide goods and services on commercial basis, is straightforward. They should be treated in a conventional way, neither exemption nor any other special provision is allowed: they collect the VAT on output

and claim for credit of their input tax. The full taxation treatment would preserve the VAT chain and thereby the VAT efficiency while maintaining tax neutrality across public and private sectors. New Zealand is the front-runner in extending the VAT base to a large part of the public sector (The VAT is referred to as the Goods and Services Tax—GST). Barrand (1991) indicates four arguments that support for taxing government departments and local authorities in New Zealand: "These are administrative simplicity, accountability and transparency of government operations, comprehensiveness of GST coverage and sound economic management." Basically, there is neither economic nor equity rationale for taxing public organizations more lightly than private firms.

However, taxing the public institutions that provide goods or services at subsidized prices or free of charge (e.g., state-subsidized public transportation, public museums, and basic food) poses a great challenge. Problems arise in taxing their outputs due to the lack of market prices. The common practice is exemption (for example, in the EU). However, if they are exempt, they become, in effect, final consumers in the VAT chain: they do not have to collect taxes on their outputs but pay tax on their inputs. Hence, they usually request for exemption of their input purchase—the chain of exemptions, if allowed, would effectively be equivalent to zero rating. A long list of subsequent exemptions—or effectively, zero rating—would quickly erode the base. On the other hand, if exemption is not extended to the input purchase by these public institutions, their decision over production will be distorted—their inputs effectively bear burden of the tax.

To overcome these opposing problems, Aujean, Jenkins, and Poddar (1999) propose a full taxation model. Their proposal treats public institutions as intermediaries, but not as

final consumers (this implies that exemption is ruled out). They recognize the complexity in valuing the subsidized outputs and propose that the VAT include in its base all explicit fees, subsidies, and grant payments regardless of the funding source. They also suggest that the system be complemented by reduced rates or zero rate for merit goods such as health, and education (but this complex multiple rate structure would obviously lead to all types of problems as discussed in part 4).

4. Rate structure of the VAT

Multiple rate structure is inherently complex, but yet, many argue for it on both efficiency and equity grounds. The efficiency argument hinges on Ramsey rule applied to consumption taxation. The rule specifies that to minimize dead weight loss, tax rate on a good should be set inversely proportional to the good's own demand elasticity. It implies that the rates should be differentiated across different groups of goods and services of various demand elasticities. On the other hand, supporters of a multiple rate structure on the equity ground would argue that tax rate differentiation is needed to mitigate the regressivity of a tax: lower rates must be applied to the goods and services consumed primarily by the poor. In practice, however, a multiple rate structure poses a great challenge to the tax compliance and administration.

A VAT with multiple rate structure requires firms to keep separate records for different purchases. This is, in turn, costly for auditing (more records to be checked; more incentives and opportunities for firms to misclassify goods) and is cumbersome for application of the self-assessment (complex for taxpayers to comply; and hard for tax administration to detect fraud). In general, a more complex VAT would require tax administration to collect more information to determine the tax liabilities and refunds.

The simplest VAT with single rate (plus zero rate and a few exemptions) requires at least 9 pieces of information from each taxpayer (the value of supplies at the two rates and the value of exempt supplies, the value of purchases at the two rates, two liabilities to VAT on output, and two liabilities to VAT on inputs). At least 17 pieces of information are required if the number of positive rates triples. (Tait, 1988, p.42.) Cnossen (1994) estimates that for a broadly "best practiced" VAT in New Zealand (with a single non-zero rate), the administration cost of the VAT is about $50 per registrant per annum; but the cost quadruples for the case of the United Kingdom, where the VAT is structured with two positive rates and multiple zero rating (cited in Ebrill et al. 2001, p.53). Box 2 presents the main features of the VAT in New Zealand.

Box 2: The VAT in New Zealand—simplicity and efficiency

The VAT in New Zealand, referred to as the Goods and Services Tax (GST), is regarded as the most simple and efficient VAT in the World. The GST Act was enacted in 1985, and the tax was introduced on October 01, 1986. The Inland Revenue Department mainly administers the tax, while the Customs Department collects the tax on imported goods and those subject to excise.

The VAT is consumption-based and applied on destination principle. The law stipulates that any business with annual net-of-GST turnover exceeding NZ$30,000 is required to register for the GST. Those making taxable supplies with annual turnover below the NZ$30,000 threshold may elect to register voluntarily. Credit for the VAT on capital assets is one-off adjustment if the assets cost less than NZ$10,000. For assets of over NZ$10,000, credit is made in successive GST returns according to a specified straight-line depreciation schedule, and on the basis of an apportionment of the asset use for taxable and exempt supplies.

The VAT structure is simple with a single standard rate of 12.5 percent plus zero-rate, and few exemptions. The zero-rate is strictly applied to a limited number of supplies, mainly exports, and taxable activities disposed as going concerns. Few VAT-exempt supplies are: (1) most financial services; (2)

supply of donated goods and services by a non-profit organization; (3) residential rental accommodation; (4) any fine metal, such as gold, silver, and platinum that is of a required fineness.

Housing sector is basically treated similarly to other taxable supplies, except for two special provisions. First, the rental of domestic accommodation is VAT-exempt. Second, the rate of 7.5 percent is applied to 60 percent of the value of supply of accommodation for individuals in a "commercial dwelling" (e.g., hotel, motel, and boarding house).

Partial exemption is allowed for firms that produce both taxable and exempt supplies. Firms can choose among the following three methods to apportion their creditable input taxes. (1) *Direct attribution method*: under this method, the apportionment is directly determined. (2) *Turnover method*: the credit for the input tax is determined on the basis of the ratio of the turnover of taxable supplies to the total turnover—this method is applied when the direct attribution method is technically infeasible. (3) *Special method*: the method is applicable when the first two methods are inappropriate. For example, when a firm's annual input tax attributable to exempt activities does not exceed the lesser of NZ$48,000 or 5 percent of the total taxable and exempt supplies, the firm is allowed to treat itself as fully taxable—and hence, eligible to claim credit for all input taxes.

The refunds from an excess of input credits over output tax should be made within 15 working days of the day following the receipt of the relevant VAT return. From March 08, 1999, an interest rate of 3.38 percent is applicable to the unpaid portion of the credit, starting from the expiration of the 15th working day till the day the full refund is made.

Source: Ernst&Young (1995); IBFD (2000).

In addition, a reduced rate on items such as basic foods—that account for a large share in total consumption of the poor—is intended to subsidize the poor, but a larger portion of the tax subsidy is, in fact, likely to be reaped by the rich. The rich, by spending more dollar amount on the food, are expected to gain more from the subsidy, whereas the poor is to gain less simply because they spend less dollar amount on the same food items. It is practically hard to measure the effectiveness if the distribution of

this rate reduction-induced subsidy across different income groups; it makes the subsidy less transparent and, thereby, ineffective for targeting equity concerns. However, in many developing countries with a multiple-rate VAT, a large proportion—even more than half of the base, in some cases—is taxed at reduced rates. In contrast, in EU countries, most of the base is subject to the standard rate (e.g., in Spain, 87 percent of the base is subject to the standard VAT rate, while the figure is even higher in Germany: 92 percent). The standard advice by the IMF and the World Bank is that the VAT be structured with a single non-zero rate in addition to zero rate exclusively granted to exports, and few selective exemptions. Currently, more than half of all countries apply the VAT with a single non-zero rate. The majority of countries (72 percent) that have just introduced the VAT over the last decade apply a single-rate structure (Ebrill et al. 2001, pp.68-69).

5. Distributional impact of VAT: Is VAT inherently regressive?

Conventionally, a tax system is considered to be regressive if the share of tax burden in total income is reduced as income rises. Defined this way, regressivity is inherently applied to the VAT, a tax on consumption: the poor generally spend a greater portion of their income on consumption than the one spent by the rich. Few relevant questions arise, however. What is the main purpose of the VAT—and more specifically, is the VAT designed to be a major effective vehicle for revenue mobilization, or is it established to target equity issues? Are there any anomalies in the way we conventionally define regressivity/progressivity—and, if it is the case, then is there any measurement more applicable for equity analysis? Last but not least, in terms of equity, how does the VAT fare with the alternative consumption taxes?

Many developing countries around the world have tapped into the VAT in the hope to raise revenues efficiently—at the least collection cost. As Tait succinctly puts it—the VAT is "…intended to be a neutral, efficient, buoyant revenue raising tax." (Tait, 1991, p.6.) Tax economists have long suggested that the VAT be designed as a "money machine," but not as a primary instrument to target equity issues. As a principle, in designing the VAT, one should refrain from excessive measures to mitigate regressivity of the VAT at the expense of its efficiency. The distributional impact of the VAT should not be analyzed in isolation, but in a broader context of the whole fiscal system encompassing both tax and expenditure programs. Progressivity is best achieved by complementing the VAT with a functioning income tax system, selective excises, and prudent, pro-poor expenditures. Income taxes and pro-poor expenditures are generally regarded as the most direct and cost-effective instruments in dealing with equity concerns. However, in poor developing countries, the base of the personal income tax is typically narrow—only a small portion of the population falls into the tax net, and tax administrations do not have sufficient capacity to collect the tax properly. It is, therefore, critically important to maintain a buoyant VAT system to efficiently collect revenues, which are in turn channeled to help the poor through such pro-poor social programs as housing, health care, and education.

On the other hand, the conventional definition of regressivity/progressivity becomes increasingly questionable. Critics often cite two major problems. First, it is hard to reliably measure annual income flow. In addition, the welfare impact of any fiscal policy is ultimately determined by the allocation of consumption. As a result, a more proper approach to determine progressivity of a tax system is to consider the share of tax burden

in total consumption across income groups. Apparently, if this approach is applied, a broad-based and single-rate structured VAT should, by and large, be proportional but not regressive. A growing body of empirical evidence—in the context of developed countries—tends to support the proportionality of a consumption-based VAT. Second, lifetime income, but not annual income, is a relevant concept in welfare analysis. The idea is derived from the observed income fluidity: over time, those in the lowest income groups may move up to higher income groups, while the well-to-do may slip to lower income groups. Empirical studies demonstrate that the regressivity of the VAT would be substantially reduced when the share of tax burden in total income were analyzed on the basis of lifetime, rather than annual, basis.

Conceptually and practically, the VAT is no less equitable than any of the alternative consumption taxes. As shown in section IV, when no exemption and/or zero rate is applied, the VAT is, in effect, equivalent to a retail sales tax in terms of revenue collection. But in reality, countries with a VAT commonly attempt to incorporate in it various progressivity features with multiple exemptions, zero rates, and reduced rates for the goods or services consumed mostly by the poor. Tait (1991) indicates that in UK, zero-rating food and other basic goods consumed by the poor makes the VAT even progressive (p.6). Trinidad and Tobago is another case-in-point (Due and Greaney, 1992; Ernst&Young, 1995; PricewaterhouseCoopers, 2002). The country incorporated in its VAT regime numerous zero rates and exemptions that were intended to make the system less regressive than the replaced purchase tax. The government allowed for significant VAT relief—including zero rates granted to numerous basic goods in addition to exports, and multiple exemptions covering health-related services, most of education, rental of

residential property, bus and postal services—and is committed to funding important transfer programs such as old-age pensions, food subsidies, and public assistance. Box 3 highlights the key developments in the VAT system in Trinidad and Tobago.

Box 3: VAT in Trinidad and Tobago—development and key success lessons

Trinidad and Tobago is an oil-exporting country. The VAT was introduced in 1989 when income from oil started falling. The advent of the VAT was accompanied by the elimination of multiple taxes: (1) purchase taxes; (2) excise taxes on edible oils and matches; (3) consolidated special levy; (4) wireless licenses; (5) electricity and telephone taxes; (6) hotel room tax; (7) airline ticket tax; (8) domestic stamp duties (but the stamp duty on imports was retained).

It should be emphasized that at the time the VAT was introduced, the purchase tax, the main tax to be replaced, exposed a number of problems. Basically, the purchase tax was levied on goods—on wholesale value basis—while services and most of inputs were exempted. The incomplete exemption of inputs resulted in dual, and yet, seemingly opposite problems: the cascading problem on the one hand, and the narrow base on the other—taxpayers could easily use the loopholes in the purchase tax regime to evade taxes on certain goods (some goods served as both input and consumption). There were multiple rates, and all the rates were high with the maximum reaching 85 percent—the rate structure included 20, 40, 60, and 85 percent. The complex and unreasonable rate structure, in effect, encouraged avoidance and evasion.

The idea of tax reform originated in 1983, and the VAT was considered in 1986. The VAT introduction was part of an integrated comprehensive tax reform covering both direct and indirect taxes. Not until September 1989 was the VAT legislation finally enacted, however. The law went into effect on January 1, 1990.

As of 1991, the VAT rate was 15 percent, lower than the lowest rate of the replaced purchase tax. The threshold was set at $30,000. Land and buildings were exempted, but the rental of business property and construction services were taxed. The initial VAT was rather complex with multiple zero rates and exemptions to accommodate equity concerns. Zero rating was relatively broad, extended to: (1) unprocessed food and a few basic processed foods; (2) medicines by prescription; (3) live animals, livestock feed, seed, fertilizer, and farm machinery; (4) piped water (5) exports, gas and oil; and (7)

veterinary and pest control services. Multiple exemptions covered basic services including public health, education, transportation, real estate brokerage, and financial services.

Currently, the standard rate remains at 15 percent. Effective from January 1, 1995, hotel accommodation and yachting services to non-residents are zero-rated. While a number of services including financial services remain VAT-exempt, effective from January 1, 1994, certain financial services are subject to a 15 percent transaction tax.

The VAT was administered by the VAT Administration Center of Inland Revenue—but not by Customs and Excise. The VAT was introduced in conjunction with the reduction in income taxes and increase in public funding of pro-poor transfer programs such as old-age pensions, food subsidies, and public assistance.

The introduction of the VAT was assessed as successful. In the 1991 budget, the tax was expected to yield 25 percent of the total revenue, whereas the replaced purchase tax contributed just less than 9 percent.

Some key lessons for the success are as follows.

1. Strong political commitment from the government.
2. Careful planning in all stages, from designing to administration.
3. Low introductory rate to pacify the anxiety among the public about the new VAT. (In retrospect, the designers of the VAT even believed that the applied rate of 15 percent was a bit too high and should have been reduced to 10 percent.)
4. Close cooperation between businesses and government from the embryonic stage of VAT.
5. Public and taxpayers' education.
6. Combination of the VAT introduction with abolishment of purchase taxes and with reduction of income tax rates.
7. Selection of capable staff for the administration.
8. Good timing for the VAT introduction. (The prices became relatively stable in 1989, and the VAT came into effect at the beginning of 1990.)

Source: Due and Greaney (1992); Ernst & Young (1995); PricewaterhouseCoopers (2002).

However, multiple rate structure, excessive exemptions, and numerous zero rating are detrimental to the efficiency of the whole VAT system, add unintended distortions, and impose greater burden on the tax administration. For example, Tait estimates that zero rating food, alone, may reduce the VAT base by up to 40 percent (1991, p.6). Multiple exemptions and zero rates inevitably reduce the VAT productivity—this would eventually dry up the funds needed to support the poor, drive governments to make ad-hoc changes in tax policy, and create more uncertainty in the business environment. It is, therefore, crucial not to fall into "equity trap:" in many cases, the equity gains are more than outweighed by the efficiency costs.

6. VAT refunds

As discussed in part II, a consumption-based VAT requires that investment costs and intermediate inputs be effectively excluded from the base. As such, a functioning refund system becomes essential for the VAT administration, and it is a crucial condition for the VAT to be an efficient, pure tax on consumption. Delay in VAT refunds would add a layer of "hidden costs" to registered firms and thereby discourage investment. The problem is especially serious for export manufacturers that usually have a huge backlog of refunds but must compete internationally. In Vietnam, for example, due to six-month delay in tax refunds, a typical export apparel-manufacturing project would lose 28 cents per each dollar of investment in the present value terms over its lifetime, while the loss to an export leather shoe-manufacturing project would be 5 cents (Le, 2003).

Cross-country experience indicates that delay in tax refunds is common in developing countries. The delay is generally derived from inefficient processing of refund claims and strong incentives for meeting revenue targets on the part of the tax administration,

and from the risk of large-scale abuse on the part of taxpayers. In addition, the treasury is under pressure to postpone the refunds during budget-crunching periods. On the other hand, there is legitimate requirement that refund claims be carefully processed, as the refunds normally account for a significant share of the total VAT collection. (It is estimated that in EU countries, the amount of the VAT refund account for 25-35 percent of the total VAT collection, while the figures stand at 30-40 percent in most developing countries.)

The refund issue is tackled differently in different countries. Most cap the amount of refunds of the VAT on intermediate inputs and capital items at the level of the VAT on output in each tax period and allow for the remaining balance to carry forward over the following period(s). In Ghana, for example, the excess tax credit—or the excess of input tax over output tax—is carried forward for three months, and after that, the refund will finally be made. Another example: Kazakhstan does not allow for VAT refunds, except for the zero-rated supplies; however, all excess input VAT may be carried forward to offset output VAT in future periods. Some countries may specify a certain time period for the VAT on capital goods to be fully credited; this is similar to the specification of fiscal depreciation schedule for corporate income tax purpose: the VAT in New Zealand offers one such example (see box 2). In some countries, firms are entitled to interest payments on the part of refunds unpaid after a specified period. For example, tax authorities and treasury bodies are liable for the interest imposed on the eligible non-refunded amount of tax beyond a 14-day term in Russia and 15-day term in New Zealand.

VAT refund for exports is a critical issue. A destination-based VAT zero-rates exports, and therefore, the sector is entitled to refunds of input VAT. However, VAT

fraud is a common and acute problem: firms may produce false invoices or generate false exports for refunds. Some established firms may even engage in the business of selling fraudulent invoices. Tax administrations are required to prevent such fraud and, at the same time, to facilitate the VAT refunds for genuine exporters. Efficient programs for processing VAT refunds to exporters deserve special attention. Box 4 presents major principles and mechanism for such programs.

Box 4: VAT refunds for exports

Most developed countries, including New Zealand, Japan, Canada, and EU countries, allow for complete refund of all excess tax credit, while developing countries often embark upon a hybrid system of refunds and carry-forward arrangement of the excess credit (generally, refund privilege is given to exports, and carry-forward allowance is applied to sales in domestic markets; the apportionment is usually made proportional to the ratio of exports in total turnover). In developed countries, refund claims are made as part of firms' regular VAT returns, but in others, separate claims for refunds are required.

To facilitate exports and to prevent frauds and abuses, special programs to deal with refunds to exports must be designed. In general, the programs are based on certain principles, including:

- Use of history of tax compliance for assessing refund claims.
- Application of pre-approval audits to high-risk claims and post-approval audits to lower-risk claims.
- Proper reference to the quality of record keeping of historical profiles for all refund claims.

Experience indicates that massive auditing is infeasible and inefficient, given the scarce resources of tax administrations. Some pre-screening schemes need, therefore, be designed in order to limit the number of refund claims to be audited and to facilitate refund processing. One proven approach is to establish a "gold-silver" scheme, in which refund claimants are grouped into "gold," "silver," and "others" categories. The criteria for the grouping must be simple and transparent. They are generally related to the claimant's history of exports, book keeping, tax compliance, and audit of records by tax officials. Those classified in "gold" or "silver" categories are granted with such privileges as fast, and without pre-approval audit refunds. The scheme helps tax administrations focus on checking and auditing high-risk refund

claimants. Even so, it is advisable that the target for pre-approval by desk verification and/or field audits be initially limited to a manageable portion of the total claims. As the profiling system improves, the target may later be raised.

In addition, refund audit should be strategically geared toward: (1) checking the turnover; (2) verifying the proportion of exports in total turnover, and reconciling with customs data (note, the export-turnover ratio is often used as basis for pro-rata apportionment of input VAT credit); (3) checking VAT credit resulting from purchases. Randomized sampling technique—best, if it is computer-based—can be applied to select the transactions for auditing. Some countries set a value threshold for refund audits—claims of refunds of over the established threshold deserve vigorous attention. For example, New Zealand assigns an Approved Refund Level (ARL) to each taxpayer at the time of registration. Taxpayers are entitled to an automatic refund, if the refund is below the set ARL. The claim is screened for possible audit only when the refund is above the ARL. On the other hand, first-time exporters claiming for refunds should be carefully audited, preferably on the premises of the taxpayers—the audit helps gather financial data on the claimant and establish the basis for profiling and determining an expected level of future refund claims.

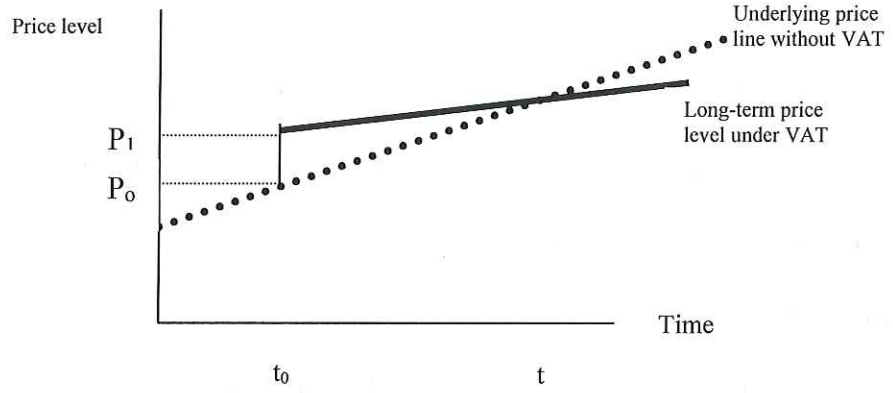
7. VAT and inflation

There has been concern that with the introduction of the VAT, a broad-based consumption tax, all businesses including exempt firms raise their prices—at the rate of the tax—and thereby trigger long-lasting inflation. Experience of countries adopting the VAT shows this concern is unfounded, however. It indicates that the VAT is not inflationary, even though in some countries such as Japan and Denmark, the VAT resulted in once-and-for-all increase in the general price level.[14] If the VAT is revenue-enhancing, it will help the government pursue tight monetary policy, and then the VAT

[14] For more details of the country survey on price effect of introducing a VAT, see Tait (1991, pp.7-9).

may even exert downward pressure on inflation—in this case, the VAT is deflationary rather than inflationary. Graph 1 below depicts this situation.

Graph 1: Impact of the VAT on general price level



Suppose, without a VAT, the underlying price level is shown by the dotted line. Let us assume the VAT is introduced in year t_0, and there is a once-and-for-all price adjustment: the general price level goes up from P_0 to P_1 in year t_0. As the government collects more revenues and contracts the money supply, the rate of growth of the general price level starts to fall. In graph 1, the price line without a VAT (the dotted line) lies above the long-term price level under VAT (solid line) from year t.

Although the VAT is non-inflationary or even deflationary, it is critical to consider the timing in introducing VAT. Practical experience indicates that the VAT should not be introduced when inflation is rising; otherwise, the VAT would be wrongly perceived as inflationary and become a hard sell to the public.

8. VAT in small countries

A recent IMF survey shows that the VAT performs relatively well in small countries and islands (with population of less than 5 million). The C-efficiency ratio (discussed in section IV) reaches 65 percent, on average, in small countries and is especially high in

small islands (83 percent), whereas the world average is 58 percent (Ebrill et al., 2001, pp. 41, 167-68). However, a relatively high C-efficiency ratio does not necessarily guarantee that being small is advantageous for adoption of the VAT.

Indirect taxes including the VAT are likely to perform better in countries which rely more on foreign trade. Prest (1979) further argues that the overall tax capacity of a country is positively correlated with the size of trade. On the other hand, as Alesina and Wacziarg (1998) empirically demonstrate, trade and country size are negatively correlated (cited in Ebrill et al., 2001, p.169): a smaller country is more likely to have more trade. Therefore, the high C-efficiency ratio, observed in small countries and islands, may simply indicate the following sequence of correlation: being small tends to raise importance of trade, which in turn favorably improves the VAT productivity.

When a country relies more on foreign trade, the tax administration may shift its focus to a few check points at the border, thereby reduce collection cost, and raise more tax revenues. In general, for smaller countries with more trade, any type of indirect taxes—be it trade tax, or excise, or VAT—tends to be more efficient. Also, note that in small countries, consumption-to-import ratio is typically low, and a broad-based tariff system may well capture most of the consumption base. From the collection efficiency perspective, trade taxes may even be superior to other types of consumption taxes including the VAT (Ebrill et al., 2001). On the other hand, the VAT, being a general tax (imposed on both imports and domestically produced goods), possess some important advantages: the VAT is less distortionary and has more revenue potential than tariff

alone.[15] In addition, the VAT may help jumpstart the construction of an efficient tax administration.

In certain extreme cases, the consumption-to-imports ratio converges to one: this is the case for small islands that virtually have no domestic manufacturing base. Then, the revenue and efficiency implications of tariff, VAT, and any other type of consumption tax (retail sales tax or excise) are, in theory, expected to be the same (the original, before-tax supply curve is simply horizontal at the world price). A legitimate question for the practicality of the tax policy design is, whether the VAT is necessarily a better choice for taxing consumption?

Typically, the VAT is an option when (1) a country has domestic manufacturing base with multiple production stages or has distribution stage generating significant value added; (2) if the first condition is currently missed, the country has sufficient growth potential for domestic manufacturing. For small islands without either of these two conditions, the VAT may not be a sensible choice, whereas a single-stage sales tax on border entry or at factory gate supplemented by an excise on selected services may be more suitable, administratively and economically.

VI. Conclusion

An increasing number of countries around the world have switched from various types of consumption tax to the VAT. This trend has set its footprint in almost all recent comprehensive tax reforms. The common form of VAT is consumption-typed, and applied on destination principle with invoice-based credit method. A VAT on destination

[15] From the pure economic efficiency perspective, the VAT generates only distortion on the consumption side, whereas tariff induces distortion on both production and consumption sides. The VAT is also more advantageous than tariff in terms of revenue potential: the VAT is effectively equivalent to the tax regime, where tariff is combined with tariff-equivalent excise tax on domestic production.

principle ascertains that it purely taxes domestic consumption and promotes production efficiency. A golden rule in designing an efficient VAT is that the tax be imposed on pure consumption, broad-based, and comprehensive in coverage over the whole production-distribution chain.

The VAT may become a "money machine," as usually acclaimed, but only if it is simple in rate structuring and broad-based. The practical advise is that the VAT rate structure be designed as simple as possible, preferably with one or—at most—two positive rates, few exemptions, and zero rating being exclusively granted to exports. Broadening base, in general sense, reduces deadweight loss and provides an opportunity for lowering the rates, and, thereby, increasing compliance. If so designed, the VAT is buoyant and efficient. Note that zero-rating generally provides strong incentives for frauds, creates excessive burden on tax administration, and effectively erodes the base.

Two major problems related to exemption deserve special attention. First, exemption may induce cascading effect and hence makes the system economically inefficient. Second, excessive exemption tends to break up the integrity of the VAT regime and hurt its sustainability. The VAT design should, therefore, minimize—to the extent possible—the number of exemptions. The rule is also applicable to hard-to-tax sectors.[16] New Zealand with a VAT regime that follows the best international tax practices essentially limits the exemption to certain types of financial services, supply of donated goods and services by non-profit organizations, residential rental, and finished fine metals (see box 2).

[16] A survey of 37 countries with a VAT, conducted by the IMF in the late 1990s, reveals that the majority have attempted to minimize the number of exemptions, except for selective hard-to-tax sectors such as education, agriculture, health, and financial services (Ebrill et al., 2001. pp. 62-66).

Taxing agriculture is an acute issue. Despite tempting rationales—technical, political, and social—for sparing the sector from VAT, the sector, in principle, should be brought into the tax net. Exempting agriculture tends to ratchet up to exemption of agricultural inputs and dwarf the benefits of the zero-rating granted to exports of agricultural commodities. The chain of exemptions leading up to the agricultural sector would be a nightmare for the administration: it is always technically hard to distinguish agricultural from non-agricultural inputs. Rather than exempting agriculture and its inputs, selective outright fiscal subsidies may be provided to agriculture—if necessary—through public funds. Note, taxing agriculture should be accompanied by setting a reasonable threshold, preferably the same as the one applied in other sectors, in order to maintain a manageable number of taxpayers in the net. For countries that still exempt agriculture—for any unavoidable reason—it is advisable that they limit exemptions to critical and pure-for-agriculture inputs such as fertilizer and seeds.

Small businesses are numerous. Their inclusion in the tax net would lead to high collection costs, strain the already thin capacity of tax administrations, but provide low revenue potential. They should, therefore, be excluded from the VAT base, and if necessary, be subject to some type of simplified taxes such as presumptive taxation. Threshold setting is the common procedure for excluding small businesses.

A reasonable threshold varies across countries, depending on the stage of development, capacity of tax administration, and tax culture of a particular country. It is sensible to set relatively high threshold level at the beginning—to accommodate the poor tax administration in the initial stage and to quench the nervousness of the public, when the tax is first announced—and to lower the threshold when administration gets improved

and the public becomes familiar with the new tax regime. The threshold should be uniform across sectors and set in terms of turnover. The related issue of voluntary registration is controversial. Some logically argue that the provision helps relieve the tax burden on small businesses, especially small farmers. It must be noted, however, that such provision tends to strike out the very purpose of setting exemption threshold, because the tax net is likely to become overcrowded with a large portion of small businesses.

That the VAT is inherently regressive has long been widely held. This is true, if regressivity is defined conventionally on the basis of the tax burden-to-annual gross income ratio. To reduce regressivity, many countries attempt to incorporate in the VAT structure multiple exemptions and/or zero rates. The provisions prove ineffective, however, and yet costly in terms of revenue loss and administration complexity. It is critical that regressivity be studied in an overall context of the applicable fiscal policies including direct, indirect taxes, and public expenditures. Countries with a VAT need to return to VAT its main purpose (i.e., collecting revenues effectively and efficiently), to strengthen income taxes, and to rationalize pro-poor public expenditures. Regressivity can be addressed more effectively with sound income taxation and government expenditures.

VAT refund is a big issue in both developed and developing countries. In the majority of countries, refunds get delayed—which become "hidden costs" to firms and hurt their financial cash flow. On the other hand, frauds, in various shapes forms, are widespread. Note also that VAT refund generally accounts for a significant share of the total VAT collection. The refund issue should, therefore, be resolved, but with great

care. The IMF promotes an efficient model for refund processing, which combines a pre-screening "gold/silver scheme" with randomized sampling for auditing of high risk refund claimants. Good cooperation between tax and customs agencies would be essential for identifying any unjustified refund claims. In addition, the tax regime should set transparent, severe penalty for refund fraud, specify mandatory time limit for refund processing, and impose interest on the part of refunds outstanding beyond the established mandatory time limit. The establishment of processing time period is critical to protect firms' cash flow and to avoid abuse by the tax administration.

Last but not least, to be successful—apart from being well designed, carefully prepared (from both administration's and taxpayers' perspectives)—the VAT should be introduced in good timing: country-experience studies show clearly that the VAT does not have significant impact on inflation, but its introduction during high inflation period tends to reduce the chance for its success.

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