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A VAT Revenue Simulation Model for Tax Reform in Developing Countries

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Summary. — In this paper, we develop a model to simulate policies and revenues for a value-added taxes (VAT) system in countries that have an indirect tax system containing sales, excise taxes, and tariffs. An application of the model is carried out for Nepal, which has recently introduced the VAT to replace its sales tax system and rationalize its excise and tariff systems. The study shows that, in a developing country, tax policies that might seem very realistic and politically noncontroversial are likely to yield a very narrow tax base. If a government of a developing country wants to rely more on the VAT over time, it must move aggressively to broaden the base and enhance compliance. © 2000 Elsevier Science Ltd. All rights reserved.

Key words — VAT, reform, revenue, model, Asia, Nepal

1. INTRODUCTION

Import tariffs and excise taxes often constitute the most important revenue sources in developing countries. Because of growing concerns in recent years about economic efficiency and tax simplicity in a competitive and integrated world economy, many countries are lowering trade taxes and replacing distorted excise taxes with consumption-type value-added taxes (VAT). With respect to the latter, one of the most important questions is the revenue potential of alternative designs of this new tax as governments attempt to replace or enhance the level of revenues generated by their current tax system.

The potential revenue which can be raised from the VAT depends on a number of factors, such as how broad the tax base will be and the extent to which businesses will comply with the tax. This issue has not been widely discussed in the public finance literature. The main purpose of this paper is to provide an analytical framework which can be used to estimate the potential tax base and associated revenues for a VAT in a typical developing country. The model developed for this purpose should be detailed enough to facilitate the estimation of the potential revenues for alternative tax options. Such a model can then be used to assist decision makers in setting their tax policies. To illustrate, the model is applied to the economy of Nepal. We chose Nepal because it is typical of many developing countries, having very limited statistical data and moving from a highly distorted indirect tax system to a VAT.

Section 2 presents alternative approaches to the estimation of the VAT base. Section 3 describes the detailed methodology employed in this paper to estimate the tax base. Section 4 presents the application of this methodology to Nepal. We present concluding remarks in the final section.

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2. ALTERNATIVE APPROACHES TO THE ESTIMATION OF A VAT BASE

The potential tax revenue of a VAT is greatly dependent on the number and level of tax rates, the scope of the tax base, and the degree of tax compliance. The proposed VAT is assumed to be a multistage consumption tax based on the destination principle, similar to a European-style VAT. The tax is applied to the sales of goods and services at all stages of the production and distribution chain. At each stage, vendors are able to claim tax credits to recover the tax they paid on their business inputs. As a result, the tax system is in effect applying the tax only to the value added by each vendor. Since the only tax that does not get refunded is the tax imposed on final consumption, the tax is equivalent to the retail sales tax on final consumption.

While imposing a tax at a destination principle, imports are taxed in the same way as domestically produced goods, and exports are not subject to tax. Therefore, the tax essentially applies to goods and services consumed domestically.[1]

A common feature of the tax base in most VAT countries is to not tax a number of important goods or services because of political and socioeconomic considerations, technical difficulties, or administrative complexity. These goods and services generally fall into two major categories, zero-rated and tax exempt. For zero-rated commodities, the VAT is not levied on the selling price of these items. The vendor, however, receives full credit for the VAT paid on inputs used in production. If zero-rated sales occur at an intermediate stage, purchasers would not have a credit to deduct against any subsequent tax due. This would, in fact, provide a cash flow cost and benefit to the vendor and purchaser, respectively. The net revenue implications for the government would nevertheless be nil. By comparison, if zero-rated sales occur at the retail stage, it would effectively remove all the tax burden from consumers and the government would lose all the tax revenue from the sales of these goods and services.

For conceptual and technical difficulties, countries employing a VAT generally exempt the domestic sales of financial intermediation and insurance services.[2] For administrative and compliance simplicity, most VAT countries also exempt small businesses from the tax. When these goods and services are exempted, the VAT is not applied to these sales. Unlike zero-rated goods and services, vendors of exempt products are not eligible to receive any credit for the taxes paid on the inputs used to produce that good or service. The denial of input tax credits increases the production cost for the vendor, although the value added of the vendor escapes tax.

Like zero-rated sales, tax exemption can occur at either an intermediate or the retail stage. Consider the tax exemption at the retail stage where goods are sold directly to consumers. Only the value added at the retail stage will not be subject to tax. In contrast, if tax exempt sales operate at the intermediate stages of the production-distribution chain, sales by the subsequent businesses acquiring the goods are effectively overtaxed to the extent that the inputs prior the exempt stage are not creditable. As a result, the tax base is not reduced, but is augmented by the cascading effect.[3] The government could ultimately collect a greater amount of tax revenue than it would otherwise.

Multiple tax rates are a common feature of some VAT systems in the developing countries.[4] It is not uncommon to observe that a lower rate is applied to goods or services which are regarded as the necessities of life. At the same time, there are luxury goods which may be subjected to a higher rate of VAT or, alternatively, a noncreditable excise tax.

Keeping in mind the above characteristics of the VAT system, three alternative approaches can be used to estimate the tax base and associated revenues, for which input–output (I–O) tables, national accounts and family expenditure survey data are often required. The first approach is simply to construct an aggregate tax base.[5] It begins with the Gross Domestic Product (GDP) of the economy, which is the sum of the value added in the domestic production of all goods and services. Because we are considering a destination principle VAT, we need to subtract exports and add imports to the GDP. For a consumption type VAT, the base is also reduced by the gross capital formation of the private sector. The base is further reduced by zero-rated or exempted consumption expenditures. Since vendors of exempted goods and services are unable to claim any credits for taxes paid on the inputs acquired to produce that good or service, the tax base will have to be upward adjusted.

The second approach computes the base by summing the value added of each industrial