Validity of the Value Added Tax in the SAARC Region

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Value added tax (VAT) is considered as the reform tax system of the 21st century, which has been implemented popularly in more than 135 countries in the world. In SAARC region, Pakistan was the first adaptor of VAT. It implemented VAT in 1990. The basic objective of the study is to quantify the revenue effect of the value added tax (VAT), in the SAARC region and to check in particular, whether it has proved an effective form of taxation in those countries. It is first shown that a tax innovation, such as the introduction of a VAT boost the revenue ratio of SAARC countries which have adopted VAT and optimizing government to increase the tax ratio. Panel data of SAARC countries from 1995 to 2010 on various macroeconomic factors are obtained to determine the effect of VAT on revenue ratio. The results indicate prosperous set of determinants of VAT adoption as it proves to be a vital instrument to collect tax and enhance revenue ratio. Estimates shows that most of the SARRC countries have adopted value added tax have gained a more effective tax instrument to upgrade their GDP to revenue ratio.

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I.   Introduction

The foundation of Value Added Tax (VAT) can be traced as far back as writings of Dr. Wilhelm Von Siemens, who anticipated it as an alternative for newly established German turnover tax at that time in 1918. Since then several economists have recommended it in different context (Islam, 1992). Over last twenty years, a great number of countries implemented main tax reforms, largely by adopting the value-added tax (VAT). As an outcome, at beginning of 2010's, over 130 countries have a VAT worldwide and amid developing countries, 70% of them (104 out of 144) have adopted this type of indirect taxation. Also VAT has been likely to spread as regional bursts, in countries contributing in an IMF program and in countries with low precedent performance of tax revenue (Keen and Lockwood, 2010).

Although Value Added Tax (VAT) is an indirect tax as it is collected from someone other than the person who in reality bears the cost of tax, VAT imposed on sale of goods and services has progressively accepted by many governments in many countries (Hassan, 2005). The fundamental nature of VAT is that it is imposed on all transactions but, being endorsed against tax due on traders' sales, eventually comes to stand only on final consumption (Keen and Lockwood 2009). VAT operates on the principle that when raw material go through various manufacturing phases and manufactured product go through various distribution phases, tax must be levied on Value Added' at each level and not on gross sales price. More specifically, a value added tax can be termed as a broad-based tax levied on sales up to and including, at

least, the manufacturing stage, with systematic offsetting of tax charged on inputs except perhaps on capital goods-against that due on outputs (Ebrill et al, 2002).

As its name indicates, the Value Added Tax is paid on the value added at each production stage: firms pay VAT on the difference between total sales and total input costs. The tax base is thus equivalent to that of a retail sales tax, which is paid only at retail stage, covering total value produced by the whole production chain (Pomeranz, 2010). The VAT is a type of consumption tax with full tax credit. "Effectively, VAT is, thus, a tax on total consumption expenditures, the burden of which is eventually borne by consumers not by entrepreneurs". The tax will be charged at each level of production and distribution chain (Sujjapongse, 2005). An essential point here is that VAT is not, in practice, plainly a tax on final consumption, or flatly on formal sector sales. The real meaning of a VAT is that it is levied on all domestic sales by registered firms and on all imports, with complete credit or refund to registered taxpayers of VAT which has been charged on their own purchases. Only if this sequence of crediting and refunding is unbroken then VAT is equivalent to a tax on final consumption (Keen, 2008). The Value Added Tax (VAT) is a stern example of tax believed to aid enforcement through a built-in incentive structure that creates a paper trail on transactions between firms. VAT is ultimately a tax levied on goods and services purchased by end users (Taxud, 2007).

In 1954, France broadened a previous tax giving it a new name: the "Value Added Tax." Since then VAT has dominated to a position of extraordinary practical importance. Since its origin it has come to be taken up by more than 140 countries, including not only all OECD members other than United States, but also many developing countries (Keen, 2007). In Europe and Latin America VAT raised 20 percent or more of their revenue. Since early 1990s, amazingly, more than three-quarters of all countries in sub-Saharan Africa have

adopted VAT; and the former states of Soviet Union all did so in early months of their existence (Keen, 2009). Since the 1960s, value-added tax (VAT) systems have been increasingly adopted around the world. The greater part of VAT regimes are described by a consumption tax base with multiple tax rates, credit method of tax liability calculation and multiple exemptions (Giesecke and Hoang, 2009).

There are different types of VATs that differ a lot amongst themselves: in level of exemptions, number of rates, threshold, ease of obtaining refunds, treatment of services, nature and availability of simplified schemes (Keen, 2009). According to tax base, VAT can be classified as GDP type VAT (i.e., the tax base is GDP), consumption type (the tax base is consumption with investment being excluded), and income type VAT (i.e., the tax base is income or savings plus consumption) (Lin, 2007). VAT is superior to turnover tax and retail sales tax because it avoids cascading and taxation of business inputs that risks violating production competence as compared to turnover tax. VAT beats a sales tax because it protects revenue by collecting it all through production chain: if a retailer in some way escapes tax, everything is lost under an Retail sales tax but only tax on retailer's value added under VAT (Keen, 2009).

An absolutely functioning VAT is just equivalent to any other tax on consumption counting in the ability to tax different commodities at different rates. VAT is trying to do much more than are tariffs: for example, services like telecoms, ever more important in low income countries as somewhere else, are simply not subject to customs duties. In general, introduction of a VAT is often proposed to mark a fundamental modification in the way of doing tax business, moving away from administrative evaluation and toward generalized confident self-assessment, not least relative to import control (Keen, 2009).

Majority of world's VATs are destination based, which suggest that taxes are imposed only on goods and services consumed contained by taxing jurisdiction. Destination based VATs are usually thought to promote exports, since exports are excluded from tax while imports are taxed. Economic theory suggest that exchange rate adjustment stops destination based VATs from affecting exports and imports, since exchange rate appreciation entirely undoes the effects of introducing a VAT (Desai and Hines, 2005). VAT is admired for many useful advantages. It is easy to administer, it have strong incentives for proper reporting of primary tax base, and it agrees to (indirect) taxation of all kinds of income, irrespective of its legality or source. The attractiveness of VAT system looks like to be well-motivated. Also, many tax practitioners stress on benefits of having a uniform VAT rate, thus taxing all purchases of goods and services by a single VAT rate. It is argued that a uniform rate evades significant administrative disturbance for defining every good and service which rate to apply, it reduces ability of tax-thinking, changing sales from high rated to low rated divisions and it steepens the rising slope for special interest groups looking for reduced VAT rates for their desired sector or product. Uniform rates of VAT boost trade activities and create an encouraging atmosphere for growth and economy (Taxud, 2007).

In most countries, tax reforms by initiating VAT had a positive impact on whole tax structure and also on individual tax handles, although impact of reforms is not always consistent. The reforms have a superior impact on direct taxes as compared to the impact on indirect taxes, so it suggests that revenue leakage is still a main problem for indirect taxes. Better reaction of direct taxes can be recognized to relative efficiency of reforms in direct taxes as it not only made tax system simpler but also reduced paths for evasion and corruption. Reforms enhanced automatic changes in GDP through responses in tax revenues. There is a marginal increase in reaction of private

consumption to changes in GDP, nevertheless, which improved elasticity of excise duties and sales tax/VAT (Muriithi and Moyi, 2003). In short, a VAT piles up reasonably well comparative to other tax instruments in terms of its costs of administration, compliance burdens, and potential for evasion (Toder and Rosenberg, 2010).

VAT helps increasing tax revenues to finance the fund required for socio-economic growth of economy. It has an in-built capacity to increase more tax revenues without changing the existing tax structure and is yet capable to expand the tax-base. Evidence from research reveals that presence of a VAT has been related with a higher ratio of common government revenue and grants to GDP. The encouraging revenue effect associated with existence of a VAT is smaller; however, where ratio of imports to GDP is higher, reflecting that in such economies other forms of taxes, most evidently tariffs, are no less efficient at raising revenue than VAT. Current empirical work proposes that in developing countries presence of a VAT is linked with lower trade flows. (There being no considerable effect in high income countries) (Desai and Hines 2002).

VAT has been spreading in the Asian region as well. The Republic of Vietnam adopted VAT briefly in 1973. China in 1984, Indonesia in 1985, Taiwan in 1986, Philippines in 1988, Japan in 1989, Thailand in 1992, and Singapore in 1994 while Mongolia has been implementing this tax since 1998. In the South Asian Association for Regional Cooperation (SMRC) region, VAT has been considered in great depth in India. This country introduced VAT in a different way under the name of modified value added tax (MODVAT) in 1986. Unlike the VAT system of other countries, the-Indian MODVAT system is designed to correct the excise duty. This tax is adopted mainly to avoid the disadvantages of input taxation, such as tax cascading. Among the other members of the SAARC countries, Pakistan adopted VAT in 1990, Bangladesh in 1991, and Nepal in 1997 while Sri Lanka introduced VAT in 1998.

The objective of study is to empirically estimates:

• Whether VAT is an efficient form of taxation in the specific context of SAARC countries.

• To check the impact of VAT on the revenue ratio of the SAARC countries.

The study divides in to the following sections: after introduction which is presented in Section 1 above, Section 2 shows the literature review. Data source and methodological framework are presented in Section 3. Results and discussions are explained in Section 4. Final section concludes the study.

II.   Literature Review

The extensive literature on comprehensive tax reform generally recommends a fiscal regime with significant reliance on consumption-based taxation, which results in more saving and investment and a higher growth rate than under a tax regime more heavily weighted toward income taxation. In the case of the typical VAT these standard results can be augmented by efficiency gains from a harmonization of VAT rates that would remove distortionary subsidies, although concern is often expressed about the potentially regressive effects of such measures (Acosta, 2011).

Nellor (1987) observed whether or not ratio of government revenue to GDP rises systematically after implementation of VAT in 11 European countries. The experiential tests propose that normally a country introducing VAT shows a higher tax ratio than countries without VAT. According to Nellor, implementation of the VAT instantly increased tax ratio, which then continues growing at the higher level. Roth (1990) find out whether VAT rates and revenues have increased significantly over time and whether application of a VAT was related with a raise in overall tax burden and government spending in the countries (under observation) with VATS. Roth

argued that higher residuals after implementation of VAT could be stable with other competing hypotheses. He concluded that expansion rate in total government spending did not increase considerably after implementation of VAT. VAT countries did not seem to have increased levels of taxes and spending than non-VAT countries either after or before VAT was imposed.

Agha and Haughton (1996) undertakes a cross-country analysis, analyzing a sample of 17 OECD countries for determinants of VAT fulfillment. They formed an index of compliance and regressed it against variables which symbolize characteristics of countries and their VAT rates. Their findings indicate that a higher VAT rate is related with lower compliance, and this tradeoff limits revenue-maximizing VAT rate to below 25% also compliance is considerably lower with multiple VAT rates. Moreover an extra dollar spent on administration lift up revenue by $12, and longer experience with managing a VAT also raises compliance. Several OECD countries are ranged along a limit, collecting about 8% of GDP through a VAT, but by rates of 14% to 22% on bases between 60% and 40% of GDP. For these, the base could only be expanded if tax rate were lowered.

McGowans and Billings (1997) studied growth pattern of VAT in EU countries and determined whether implementation of VAT lead to an increase in the overall tax burden. They found that consumption taxes like the VAT have often been disapproved as it said to be a money machine for government, a regressive tax and it is said to be pre-empt state tax base. The estimation is done through Ordinary Least Square (OLS) and Seemingly Unrelated Regression (SUR). Results show that VAT can be put into practice without becoming money machines for government. EU countries used VAT to substitute a number of indirect taxes and not to boost overall tax burden. However there are can be a difference in the findings from prior authors as they may have used few years of data in their analysis. Desai and Hines (2002) analyzed the effect of value-added taxes (VATs) on international trade.

Destination-based VATs are normally thought to encourage exports, as exports are free from tax while imports are taxed. Verification from 136 countries in 2000 specified instead that reliance on VATs is linked with fewer exports and imports. Countries with VATs have one-third lesser exports than do countries without VATs. These patterns continue with the inclusion of geographic controls and income. The effect of VATs on exports is powerful in low-income countries than it is in high-income countries resulting in a considerable pessimistic effect of VATs on exports even among high-income countries.

Keen and Mintz (2004) focused on central trade-offs to be faced in selecting threshold for a VAT: among the desires to boost tax revenue, shrink administration and compliance costs, and reduce the distortions arising from the discrepancy treatment of firms above and below threshold. One frequent advantage apparent in the value-added tax is vision of its yielding information helpful for enforcement of the income tax. Practically, distributional effects are logically a major concern. Much importance is often given to regressive nature of the compliance costs linked with VAT, generally thought to be more oppressive, relative to value added, for minor traders than major. The equity features of the threshold choice are therefore a bit subtle. The issues at chance in setting threshold for a value added tax are vital. Experience shows certainly, that they can be essential to the success or failure of the tax and their neglect has been adverse. Ebrill et al. (2005) provide an outline of recent VAT experiences around the world, giving context and opinions for the discussion at ITD conference. Empirical analysis specifies that importance of high literacy, length of time VAT has been in position and international trade enhance VAT revenues. While the former two factors indicate that tax is more successful in developed countries, there is empirical proof that it has also been successful in many developing countries. Though the net benefits depend on individual country circumstances to some extend experience show that VAT has verified to be suitable for developing

countries. It has been a core element in broad trend in the direction of tax reform marked in many developing and transition countries. While a lot remains to be done, VAT has served to support and stabilize revenue mobilization in various countries while contributing to improved economic efficiency. Furthermore, the complexity of indirect taxes that VAT has usually replaced contradicts the concern that VAT is essentially "too complex" for developing countries.

Aizenman and Jinjarak (2005) assess political economy and structural factors describing collection efficiency of Value Added Tax [VAT]. They considered the case where collection efficiency is explained by probability of audit and by penalty on underpaying. Authors evaluated evidence on VAT collection efficiency in a panel of 44 countries over 1970-99. Results are consistent with economic theory and illustrate that a one standard deviation rise in fluidity of political participation and durability of political regime, increase VAT collection efficiency by 3.6% and 3.1%, respectively. A one standard deviation increase in trade openness, urbanization, and share of agriculture changes VAT collection efficiency by 3.9%, 12.7% and 4.8%, respectively. Additionally, a one standard deviation rise in GDP/Capita increases the tax efficiency by 8.1%. Sujjapongse (2005) offered an overview of Thailand's tax system including local taxes administered by local government and major taxes administered by central government. This paper describes the Roadmap for Tax Reform that would sketch the framework for future trend of taxation in Thailand. Author recommended that tax structure needs to be transformed with views to promote fiscal sustainability and national competitiveness. Tax administration needs to be more efficient. Results reveal that ratio of tax revenue to GDP for Thailand is still quite low even with the legislative tax rates that are generally no less than other countries. To promote greater equity tax structure should be reformed. Government should raise revenue from direct tax comparative to indirect tax

whereas local governments should have more capacity to raise their own revenue and have greater financial independence.

Keen and Syed (2006) observed the impact of domestic tax system on trade balance in OEDC countries. Using an unbalance panel of 27 OEDC member countries for 1967-2003 they found two major impacts. First, VAT itself shows no impact, in both short and long run. Although an increase in dependence on VAT is related with strong dynamic effects. Results thus tend to verify the view that VAT is naturally trade neutral. Second is that alteration in corporate tax having dominant dynamic effects, of a kind steady with it being basically source-based tax? In short run, greater corporate taxation is related with greater net exports, consistent with the view that such an increase direct capital to flow abroad. This increase turns into a constant reduction in net exports, nevertheless, steady with an increased inflow of income from abroad related with the initial outflow. Over the long run though, this effect turn down to zero, leaving net exports unchanged. But some feature of domestic tax policy do have powerful effects on trade performance which can be quite complex. Albrecht (2006) enlightened that between 1995 and 2001, share of green tax revenues in EU-15 GDP declined slightly. It was a surprising evolution but there are strong economic efficiency opinions to set environmental taxes at low levels, below Pigovian or marginal pollution damage level. This paper gives an alternative to re-launch the argument on green tax reform in Europe consumption taxes that are distinguished according to environmental impact of products. This instrument entails less institutional innovations than emission taxes. Results narrates that a sensible classification of products in a sustainable and thus low VAT category can powerfully limit economic costs of tax reform whereas price reduction for green products can bound unwanted distributional consequences.

Keen (2007) considers three of the most famous series of attacks on VAT. One is fear that VAT essentially does too good a job of

increasing tax revenue. Second is the vision that VAT does a bad job of taxing informal sector and that for developing countries tariff might be a more suitable revenue-raising instrument. Third attack is the most factual, by criminals rather than theorists: sophisticated VAT fraud, aiming its refund provisions, has become a serious concern in European Union and elsewhere. Keen concluded that VAT is in fact simply a uniform tax on final consumption, toward which all our simple textbook models in principle are valid. But a less than absolutely functioning VAT is a logical mess, with particularities of compliance behavior and production relationships. And it is imperfectly functioning VATs that we view in practice and have to understand better. Martinez et al. (2007) compared value added tax and retail sales tax by taking case of Georgia and found that VAT is an interesting choice for taxation and it can be a less disruptive tax mechanism than a retail sales tax. The managerial challenge of imposing a new tax like a VAT cannot be undervalued. While impacts of national VATs are well known, there are only a few examples of a VAT that is implemented at sub national level for instance a state or province. By comparison, since all sales are taxable under VAT, vendor does not need to make differences between taxable and exempt sales, but must report for tax paid on purchases in order to maintain input credits.

Lin (2007) investigate effects of China's forthcoming value-added tax (VAT) reform of eliminating investment from tax base on capital accumulation and wellbeing of rich and poor. He considered three alternative methods for the composition for the loss of tax revenue and found that if rich and poor have similar rate of time preference then VAT reform, along with a cut in transfers to the poor, do not affect capital accumulation; it decreases or increases capital accumulation if rich has a higher or lower rate of time preference respectively; and it boosts utility of rich and reduces utility of poor. He also found that with government spending being endogenous, a

decline in tax rate on investment, reduces interest rate, increases wage rate and the capital- and output-labor ratios. Keen (2008) investigate implications of a unique feature of value added tax (VAT) that is forced by practitioners but has been mostly overlooked by theorists. It explains that VAT functions, relatively, as a tax on purchases of unofficial operators from formal sector businesses and, not least, on their imports. It also stresses the potential significance of withholding taxes that are imposed by many developing countries which have also been overlooked. It is shown, in a simple model of informality, that if both of these tools are optimally arranged then common prescription that a small economy should not organize tariffs remains applicable even in the presence of an informal sector; and a simple policy is established simplifying normal prescription developed in models without informality for organizing these instruments so as to protect government revenue and raise welfare in face of efficiency-improving tariff cuts. Keen recognized conditions under which a VAT alone is fully most favorable, particularly because it is particularly a tax on informal sector production. But they are preventive: in general, a well-organized tax structure needs deploying both a VAT and withholding taxes.

Keen and Lockwood (2009) explores causes and consequences of significant rise of value added tax (VAT). They explore what has shaped its adoption and whether it has proved an effective form of taxation. Their findings show that in the beginning a tax innovation, such as introduction of a VAT, decreases marginal cost of public funds only if it also directs an optimizing government to raise tax ratio. They analyzed a panel of 143 countries for 25 years, describing both the probability of adoption of VAT and revenue impact of the VAT. The estimates suggest, very uncertainly, that most of countries which have adopted a VAT have got a more effective tax tool, though this is less obvious in sub-Saharan Africa. Giesecke and Nhi (2009) developed a framework for economy-wide modeling of value-added

tax systems. CGE models are well-suited to analysis of a complex tax like VAT because it facilitates correct representation of VAT payments in the CGE model database. Also it allows the model's tax theory to address the full details of the VAT system as implemented by tax authorities. In particular, we model multiple exemptions, multiple rates, multiple degrees of refund ability crosswise commodity users, and multi-product enterprises. Applying the tax system to Vietnam they analyzed industrial, macroeconomic and distributional effects of simplifying Vietnam's complex VAT system. Results indicate that this core policy could produce an aggregate consumption gain of 0.25 per cent, but with undesirable distributional consequences so they examined a new alternative policy. This alternative policy delivers an equivalent real consumption gain, with slight impact on Gini-measured inequality relative to core policy.

Khan (2010) studied viability of implementing value added tax on socio-economic conditions of Pakistan like inflation, per-capita income, unemployment, law and order situation, GDP and political stability. His analysis is based on comparison between developed and developing countries through both primary and secondary data collection tools in order to implement VAT effectively in Pakistan. The results of the study recommend that government of Pakistan needs an efficient source of revenue like VAT to make its repertoire in international circles. The issue concerning its implementation needs to be dealt with forceful and effective manner. Pomeranz (2010) analyzes the part of information in tax enforcement for the Value Added Tax (VAT) through two random field experiments among over 445,000 Chilean firms. The results propose a possible explanation for variations in tax evasion among developed and developing economies. In various developing countries, domestic production plays a significant role, gains from trade and division of labor are comparatively small, and production chains lean to be shorter. Furthermore, if gains from trade are little, division of labor may not

only be small, but also more elastic regarding taxation. If division of labor directs to transactions among agents, which as compared to home production, are observable by the tax authority, small taxes possibly can be enough to depress such division of labor and thus erode the observable tax base. All these reasons may make it difficult for developing countries to build up an effective tax system, while they decrease the number of transactions that can direct to verifiable paper trails through VAT or through other types of third-party reporting. These findings verify that when evasion is done, significant differences appear between taxes that are alike in standard models but produce different information on taxable transactions.

Sancak et al. (2010) examined tax revenue in business cycle by estimating the correlation between tax revenue efficiency and output gap. They found an optimistic and significant relationship between these variables. Their outcomes are consistent for quarterly and annual data across developing and advanced economies. Their findings also include that a decline (improvement) in VAT C-efficiency is motivated by shifts in consumption patterns and alteration in tax evasion during contractions (expansions). Results recommend that mainly during most important economic booms and downturns, policy makers should look past simple, long-run revenue elasticities and should include the effects of economic cycle on tax revenue efficiency in their analysis. Auriol and Warlters (2011) gave estimate of marginal cost of public funds (MCF) in 38 African countries. They developed a plain general equilibrium model that could handle taxes on five main tax classes including value added tax, and can be adjusted with slightly more than national accounts data. A main aspect of their model is precise recognition of informal economy. Study accomplished that broadening tax base to take in sections of informal economy by eliminating some tax exemptions offers prospective for a low MCF source of public funds, and less portion of MCFs on other tax instruments.

Aamir et al. (2011) purposed a comparison of direct and indirect taxes in India and Pakistan, through a sample of tax revenue collected under heads of both types of taxes from 1999-2000 to 2008-2009. The results indicate that India is generating more tax revenues from direct taxes while Pakistan generates more tax revenue from indirect taxes. The outcomes of these two types of fiscal policies can be very diverse. A large number of indirect taxes results in increasing gap between rich and poor leading towards exploitation of labor class. Pakistan is failing to decrease its fiscal deficit regardless of large parts of country's economy, with rich landlords, not being taxed. Approximately 65% of country's budget goes to defense expenditures, debt retirement, and current expenditures of government, whereas 60% of economy is not included in the tax net. In such circumstances, Pakistani fiscal policy makers must undertake a careful analysis of long term planning. Unegbu and Irefin (2011) examined the impact of value added tax (VAT) on human and economic developments of emerging Nations from 2001 to 2009 since VAT is becoming a significant source of revenue. Considering the State of Nigeria data was collected from both primary and secondary sources. Through regression, discriminate analysis and ANOVA in testing the hypotheses they found that VAT allocations to the State in the said periods were very considerable and the allocations alone accounts for 91.2% of the variations in expenditure pattern. Details obtained via secondary data prove to a very significant VAT impact on human and economic development of the State from but data acquired from primary sources advocate minimum VAT impacts. Authors recommend for further research on the impact of value added tax among the administrative areas to have a positive impact on both economic and human development of the developing states.

Ebeke and Ehrhart (2011) studied the effect of adopting value-added tax (VAT) in developing countries on stabilization of tax revenues. Using a panel of 103 developing countries they observed over 1980-

2008 and some alternative estimation methods in order to handle the self-selection bias and endogeneity issue of VAT adoption. The results indicate strong evidence that the presence of VAT leads to notably lower tax revenue instability. Generally, countries with a value added tax, experience tax revenue instability forty to fifty percent lower than the countries which do not have a VAT system. Those effects reduce with the levels of trade openness and economic development. Mooij and Keen (2012) focuses on two basic tax design issues that come up in addressing current fiscal challenges. Their research investigates the idea, well-known in troubled Euro zone countries, of a "fiscal devaluation" changing from social contributions to value added tax as a way to take off a nominal devaluation. Empirical evidence is offered which advice that in Euro zone countries this may certainly improve the trade balances in short-run, although, as theory foretell, the effects eventually fade away. The paper then review wider scale for VAT reform in meeting fiscal consolidation requirements, developing and starting to apply a methodology for discovering additional VAT revenue in a manner less distortionary and fairer than further increasing the standard rate.

In general, despite the fact the literature considers the emergence of the informal sector as a consequence of tax distortions, this literature has not been focused in the elements that the traditional fundamental tax reform literature does: efficiency gains, redistributive impact or tax revenue implications as the dynamic analysis mostly rely on the dynamic impact on the rate of growth. Present study tests the validity of VAT in the context of SAARC countries over a period of 1995-2010.

III.   Data Source and Methodological Framework

The data comes from Asian Development Bank (ADB various issues), SAARC Annual Report, World Bank Development Indicators (WDI, 2010) and IFS (2010). The current study brings an unbalanced panel

data of SAARC countries for 16 years i.e. 1995 to 2010. Countries included in the sample are Bangladesh, Bhutan, India, Maldives, Pakistan, Sri Lanka and Nepal. Table 1 shows the variables identification and their data source as a ready reference.

Table 1

Variables Definition and Data Sources

Variables	Definition	Data source
R	The ratio of general government revenue plus grants to GDP at current prices	WDI (2010)
Independent Variables		
OPEN	The value of imports plus exports as a fraction of GDP	WDI (2010)
YPC	GDP per capita at PPP (units: 1000 constant 2000 US dollars)	WDI (2010)
AG	Share of agriculture in value-added	WDI (2010)
SERV	Service sector, relative to GDP	IFS (2010)
DEF	Overall deficit, relative to GDP	IFS (2010)
V	Dummy variable (= 1 if VAT present, = 0 otherwise)	Idea conceived by Ebrill et al. (2001)

Source: WDI (2010) and, IFS (2010)

In empirical and theoretical literature, there exist a few studies that clarify the relationship between VAT and government revenue in the context of SAARC region. In this study, we find the impact of VAT on government revenue following three separate methods i.e., Pooled Least Squares (Common Constant Method) and Fixed Effect [(i.e., Least Squares Dummy Variables (LSDV)]. Random effect model is ruled out due to the unbalanced dataset.

3.1. The common constant method (Pooled LS method)

The pooled OLS of estimation give results under principal statement that there is no difference between data matrices of cross-sectional dimension (N). In other words, the hypothesis using that data set is a priori homogenous. However in this case it is quite restrictive; that's why, we include fixed effects in method of estimation.

Pooling of data into panel data of time series from different cross section will result in differences among the time series or cross sectional data observations that can be captured by adding a dummy variable in the model. The inclusion of dummy variables to account for the systematic differences in linear panel data observations can be estimated by using a common constant method, fixed effects model or random effects model.

The common constant method works under the principal assumption that "there are no differences among the data sets of cross-sectional data sets". This method, also known as "pooled OLS" method, assumes the common constant α for all the cross sections in the model. This method works efficiently if data set is priori homogeneous i.e. all the cross-sections taken have the same conditions prevailing there e.g. a sample of low income countries only or EU countries etc. This method, although easy to apply and estimate but is very restrictive because of the homogeneity assumption that cannot be applicable on all data sets (Astreiou and Hall, 2007).

3.2. Fixed effect model

The model is called fixed effect model because although the intercept in the model may differ across the subjects but each entity's intercept is time-invariant. It means that the model allows different constants for each group (sections). The general equation of the revenue ratio (r) following Keen and Lockwood (2009) is

$$R_{it} = \alpha i + \beta_1 V_{it} + \beta_2 OPEN_{it} + \beta_3 YPC_{it} + \beta_4 AG_{it} + \beta_5 SERV_{it} + \beta_6 DEF_{it} + u_{it} \ldots\ldots\ldots(1)$$

Where

where i = 1, 2… 7; and t = 1, 2... 16 are country and time indicators respectively, Vit a dummy variable taking the value unity if country i has a VAT in year t and zero otherwise, α is a scalar, OPEN is the value of imports plus exports as a fraction of GDP, YPC is GDP per capita at PPP, AG is Share of agriculture relative to GDP, SERV is service sector, relative to GDP and DEF is overall deficit, relative to GDP. The term µi is a country-specific effect.

In fixed effects method constant is treated as group specific. This means that model allows for different constants for each group. To allow fixed effect intercept to vary among subjects we use a dummy variable technique. This is known as one-way fixed effects model. But we can also allow for time effect by introducing time dummies. This will allow both individual and time effects in the model and it will be known as two-way fixed effects model. Fixed effects estimator is also known as least-squares dummy variables (LSDV) estimator because in order to allow for different constants for each group, it includes a dummy variable for each group. If OLS is applied to fixed effect model then it produces estimators known as fixed effect estimators.

3.3. F-Test for Model Specification (Common constant VS Fixed Effects)

For assessing the validity of the fixed effect and common constant method, we need to apply some tests. To do this the standard F- test was used. The null hypothesis is that all the constants are the same (homogeneity) and that therefore the common constant method is applicable:

$Ho : \alpha 1 = \alpha 2 = ... = \alpha n$

The F-statistics is:

$$F = \frac{(R^2_{FE} - R^2_{cc}) / (N-1)}{(1-R^2_{FE}) / (NT-N-k)} \sim F(N-1, NT-N-k)$$

Where

R^2_{FE} = Fixed effect R^2

R^2_{CC} = Common constant R^2

N = No. of cross sections

T = Time period

K = No. of parameters

IV.   Results and Discussion

In the first step, we estimate the pooled least square model. The estimates of VAT-augmented revenue equation are reported in Table 1. Result shows that agriculture value added and overall deficit has a negative impact on governmental revenues and grants, however, services value added, trade openness, per capita GDP and dummy variable significantly increases governmental revenues and grants in the context of Pakistan.

Table 1

Common Constant Estimates

Variable	Coefficient	t-Statistic	Prob.
LOG (AG?)	-0.554	-2.619	0.010
LOG (SER?)	1.344	2.468	0.015
LOG (DEF?)	-2.419	-4.736	0.001
LOG (OPEN?)	1.759	2.512	0.013
LOG (YPC?)	1.199	4.767	0.001
V	-0.357	-2.158	0.033
R-squared	0.659	Mean dependent var	1.036
Adjusted R-squared	0.643	S.D. dependent var	0.740
S.E. of regression	0.442	F-statistic	41.063
Durbin-Watson stat	1.809	Prob(F-statistic)	0.000

Source: Author's Calculation

The empirical results, given in Table 1, appear to be very good in terms of the usual diagnostic statistics. The value of R adjusted indicates that 64.3% variation in dependent variable has been explained by variations in independent variables. F value is higher than its critical value suggesting a good overall significance of the estimated model. Therefore, fitness of the model is acceptable empirically.

The result of fixed effect model is presented in Table 2 except agriculture value added; all variables are significant at 5% and 10% level respectively. Services value added has a positive impact on total revenue received, however, total deficit led to decrease governmental revenues around 0.086 percent when one percent increase in total deficit. Trade openness, per capita GDP and value added dummy significantly increases the SAARC's revenues which validate the VAT

in the SAARC region. The usual diagnostic tests i.e., F-statistics and Durbin Watson show that there is no serious distortion in the model stability and auto-correlation in the model.

Table 2

Fixed Effect Model Estimates

Variable	Coefficient	t-Statistic	Prob.
C	3.276	2.413	0.068
LOG (AG?)	-0.190	-2.865	0.389
LOG (SER?)	0.297	3.668	0.050
LOG (DEF?)	-0.086	-2.285	0.077
LOG (OPEN?)	3.449	3.994	0.003
LOG (YPC?)	3.400	6.764	0.001
V	0.003	2.338	0.046
R-squared	0.959	Mean dependent var	1.036
Adjusted R-squared	0.946	S.D. dependent var	0.740
S.E. of regression	0.171	F-statistic	73.824
Durbin-Watson stat	1.767	Prob(F-statistic)	0.000

Source: Author's Calculation

A standard F-test was used to verify whether fixed effect method or simple common constant OLS method would be used to estimate our

equation. This F-test was based on null hypothesis that all constraints are homogeneous. The calculated F-statistics with (6,91) is equal to 112.33 while the critical value of F-statistic with (6,91) is equal to 2.17 hence the calculated value of F-statistics is bigger than the critical F-value so we have rejected the null hypothesis i.e. common constant method was not a feasible choice for our estimation.

V.   Summary and Conclusion

The significant rise of VAT has attracted comparatively little analytical or empirical attention. This study seeks to help fill this gap, investigating the revenue impact of spread of VAT. Using a panel of SAARC countries observed over 16 years, we estimate our model characterizing the impact of VAT on revenue once adopted. This is of interest not merely in itself but also, it has been revealed, as an indicator of whether or not VAT has verified as an effective form of taxation. A vital question in assessing the consequences of the VAT in SAARC countries is simply i.e., has it facilitated countries to raise their tax revenues? The simplest experimental framing of this question provides a clear-cut answer: a dummy is introduced for presence of a VAT in the standard revenue equation. A complex picture appears allowing the impact of VAT to fluctuate with country conditions. The revenue gains are likely to be greater in more open an in higher income economies as indicated by Rodrik (1998). The impact of VAT in countries with larger agricultural sector is not significant as this is a hard-to-tax-group. These contrasting effects imply that though some countries might have gained (or would gain) revenue from implementing VAT, others have (or would) not. This ambiguity has been investigated by calculating forecasted revenue effects for each SAARC country in the sample. Though these calculations can only be suggestive, the idea that emerges is that countries which have adopted VAT have increased revenue and improved effectiveness as compared to those that have not. It does propose that significant work is

leftovers to be done to improve the functioning of VAT in most of the region for better results and effectiveness of the tax system. The following recommendations has been made in the context of SAARC countries i.e.,

• Tax structure needs to be improved with views to uphold fiscal sustainability and national competitiveness.

• Tax administration needs to be more effective.

• The ratio of tax revenue to GDP for SAARC countries is still moderately low regardless of the legislative tax rates that are generally no less than other countries.

• To promote greater equity tax structure should be reformed. Government should raise revenue from direct tax comparative to indirect tax.

• Local governments must have greater capability to raise their own revenue and have greater financial independence.

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