# Contribution of VAT to the GDP of Bangladesh: A Trend Study

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*Abstract: Over the years, Bangladesh experienced different types of consumption taxes. Before 1991, it was a sales tax regime. Value Added Tax (VAT) was introduced by the Government of the People's Republic of Bangladesh in 1991 to replace Sales Tax. The purpose was to increase the revenue base of government and make funds available for developmental purposes that will accelerate economic growth. Gross Domestic Product (GDP) of Bangladesh is increasing satisfactorily in the last two decades. The contribution of Value Added Tax (VAT) on the GDP growth of the country remained still unrevealed. This paper analyzes the relationship between VAT and GDP growth of Bangladesh and investigates how VAT contributed in the economic growth of Bangladesh based on the data for the years between 1991/92 to 2011/2012. For this purpose, Johansen co-integration technique was used to examine the relationship. The study reveals that the Value added tax has a positive impact on Gross domestic product and is contributing in the economic growth of the country.*

*Keywords: Value Added Tax (VAT), Gross Domestic Product (GDP), Sales Tax*

## Introduction

Value Added Tax (VAT) as a form of indirect tax was invented by a French Economist, Maurice Laure in the year 1954. Since then many developed countries introduced VAT as a form of consumption tax in their economies. In few years, VAT was found to be goldmine in some countries. From the experience of developed economies, the development agencies especially IMF was consistently advocating this form of tax to developing economies. In 1991, VAT was introduced to replace sales tax in Bangladesh. The purposes of Government were (a) to generate more revenues than sales tax used to provide (b) to introduce VAT as the main vehicle for resource mobilization (c) to remove the cascading effects that happens because of taxation of inputs (d) to adopt a flat rate of taxation on a broader base, covering a wide range of goods excepting the primary agricultural products (d) bringing transparency in taxation system and (e) bringing

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consistency in Tax- GDP ratio. On the other hand, GDP is defined as the total value of all goods and services produced within the territory during a given year. GDP is designed to measure the market value of production that flows through the economy. From the expenditure method of GDP measurement, GDP is mathematically expressed as the sum of private consumption expenditure (C) + gross domestic private investment (I) + net foreign investment (X-M) + government expenditure on goods and services (G). Hence, aggregate national expenditure (NE) = C + I + (X-M) + G.

Value-Added Tax (VAT) is placed on a product whenever value is added at a stage of production and at final sale or broad-based tax levied at multiple stages of production, with crucially taxes on inputs credited against taxes on output. Thus, the amount of value-added tax that the user pays is the cost of the product, less any of the costs of materials used in the product that have already been taxed. Many VAT systems can be described as having a basic rate, special rates for some goods and services, and exemption status for certain economic activities or specific goods and services. The revenues collected from VAT are generally used by the government: (1) to purchase goods and services; (2) to reduce or replace another tax; (3) to retire outstanding debt; or (4) to hold balances in commercial or central banks. From the above understanding a relationship could be established between VAT and GDP. Frank and Bernanke opined that expenditure method of measuring GDP assumes that goods and services produced in an economy are all purchased by economic agents, who are householders, firms, government and foreign sector. Thus total spending by these economic agents equals the market value of goods and services produced in the economy for the given period. Many of these goods and services are VAT registered, which informs this study. Therefore, the question of how much of the expenditures becomes VAT revenue is a major concern for policy makers? Actually, citizens of country build a nation. If citizens of economy understand their role, they would have no problem in sacrificing their personal resources for the purpose of economic growth of country.

In Bangladesh, the role of VAT as a source of revenue is increasing over the years. In the national budget for the fiscal year 2013-2014, government increases its expenditures largely to support the steady growth of Gross Domestic Product (GDP). To meet the increased expenditures, more emphasis was given in indirect form of taxation i.e. Value Added Tax (VAT). Hence, a question crop up here; Does any relationship exist between VAT and GDP? Or, what is the effect of VAT on GDP? Adequate studies were not conducted to systematically assess the impact of VAT on GDP or to determine how and to what extent VAT is affecting Bangladesh economy. The study is undertaken to get answers to these questions. This is hoped to serve as a guide for economic planning, policy formulation and implementation.

**Objectives**

The objective of the study is to determine the contribution of VAT to the GDP of Bangladesh. More specifically, the objective is to understand how VAT is contributing to the GDP growth of the country.

**Literature review**

At the beginning of the 2010s, more than 130 countries worldwide had VAT, and among the developing countries, around 70% (104 out of 144) had adopted this kind of indirect taxation (Ebeke and Ehrhart, 2011). VAT has tended to spread in regional bursts, particularly in countries participating in International Monetary Fund (IMF) programmes and in countries with a low tax revenue performance in the past (Keen and Lockwood, 2010). The underlying principle of VAT is that the more you buy the more tax you pay. VAT is a neutral tax on businesses in the sense that it does not represent a real cost to anyone but the end consumer. Everybody pays tax to the Government whenever they purchase goods or services. This tax is collected for the government by the supplier of those goods and services. VAT revenue has become a significant source of government revenue in Bangladesh. Therefore, the primary objective of fiscal policy is to raise more revenue through value added tax. The tax authorities have been guided by the need to design equitable and efficient VAT system capable of complementing government expenditure and, thus, reduce recourse to public borrowing. VAT rate in Bangladesh has been determined in a way that minimizes disincentive effects on economic activities. The effects of low tax effort in Bangladesh have been strengthened by the value added tax system. This, in turn, has addressed part of the worries of Kaldor (1963) who asked "will underdeveloped countries learn to tax?" Bird and Gendron (2007) noted that the underlying assumption of Kaldor's question is that a country wishing to develop needs to collect taxes an amount greater than  10-15 percent found in many developed countries. To meet the global aspiration of attaining the Millennium Development Goals (MDGs), these countries must spend more on economic and social infrastructures, which can only be achieved through improvement in tax efforts to realize the required level of public expenditure (Golit, 2008). Early works on tax effort include those of Musgrave (1969), Lotz and Morss (1970), Chelliah, Baas and Kelly (1975) and Tait and Gratz (1979) captured developments during the 1960s to the late 1970s. Musgrave (1969) noted that the tax performance of a developing country can be measured by the 'ability to give up approach', 'efficient resource use approach', 'ability to collect approach', and 'comparison with average performance or stochastic approach'. Going by these, VAT has no problems with the ability to give up and collect approaches.

According to Ajakaiye (2000) VAT performed impressively in all countries where it has been introduced. Owolabi and Okwu (2011) find evidences on Ajakaiye's findings in their study of contribution of Value Added Tax (VAT) to the development of Lagos State Development. In the study development indicators were infrastructural development, environment management, education sector development, Youth and social development, Agricultural sector development, health sector development and transportation sector development. The study revealed that VAT contributed positively to the development of the respective sectors. Eltony (2002) used time-series and cross-sectional country data for the period 1994-2000 for 16 Arab countries to examine the determinants of tax effort. The results showed that the main determinants of tax revenue share in GDP where per capita income, agricultural output-GDP ratio and mining-GDP ratio are found to be main determinants. The share of exports, imports and outstanding foreign debts were other variables found to be important. Also, country-specific factors such as the political system, attitudes toward government, the quality of tax administration and other institutions of government appeared to be important determinants of tax-GDP ratio. In another study, Teera (2003) attempted an assessment of Uganda's tax performance relative to 18 other Sub-Saharan countries aimed at evaluating the feasibility of raising tax revenues in Uganda. The study used pooled data to construct an index of tax effort for these countries, and also applied the model to individual tax shares to pinpoint the source of high and low effort. By extension, the model also incorporated value added tax. The result showed that Uganda's tax effort index for total taxes on income were less than unity, while the indices for international trade taxes and taxes on goods and services exceeded unity. One may be tempted to consider this as defining a place for value added tax.

Emran and Stiglitz (2005) argue that the current consensus that favors a reduction and eventual elimination of trade taxes, and almost exclusively relies on VAT as the instrument of indirect taxation in developing countries, is built on fragile results derived from a partial model that ignores the existence of an informal sector. The results from a more complete model demonstrate that replacing trade taxes with VAT can reduce welfare under plausible assumptions. The authors argue that the results raise serious doubts about the wisdom of the indirect tax reform policies pursued by a large number of developing countries. In their 2005 paper, Emran and Stiglitz extended their analysis to the case of a selective reform of trade tax and VAT in an economy with an informal sector. The term selective reform refers to tax changes that apply only to a subset of the commodities falling under the tax net. In the context of selective reform, Michael et al. (1993) show that, in a tradable-only economy with no informal sector, a reduction in the import tariff on the commodity bearing the highest tariff and also the highest total indirect tax burden, increases welfare under suitable assumptions of substitutability, when the lost revenue is compensated for by an increase in the consumption tax on the

commodity bearing the lowest indirect tax burden. The extant literature, however, completely ignores the implications of an informal economy in the efficiency of a consumption tax (VAT) as an instrument of revenue-raising, which can be especially important in developing countries.

Basher (2002) in his study reviewed the tax system in Bangladesh and opined that one of the major bottlenecks in the industrial growth of Bangladesh is the adverse tax system including VAT.  He argued that different types of taxes and duties including VAT increase production cost which in turn makes the product non-competitive. But over the years special provisions were enacted to modify the VAT Act. Now all exports are zero rated and input tax rebate is allowed to the manufactures. So VAT is not impeding the industrial growth of the country. This was evidenced in their (Faridy and Sarkar, 2011) attempt  to measures the incidence of Value Added Tax (VAT) in Bangladesh. They opined that from the very beginning VAT in Bangladesh has been quite instrumental in gradually mobilizing more domestic resources in line with the growth trend of economic development. However, the study did not attempt to assess the extent of impact of VAT in economic growth of Bangladesh. The study mainly focused on the incidence of VAT. Smith, Islam and Moniruzzaman (2011) reviewed the performance of Bangladesh VAT regime since the introduction of VAT in the economy. It was an economic analysis based on statistical data. The study concluded on the policy issues rather the impact of VAT on economic growth. So, none of the aforesaid studies examined the long run equilibrium relationship between VAT and GDP. Concurrent researches in different courtiers are now focusing on long run equilibrium relationship among the macroeconomic variables as the long run equilibrium relationship with short term adjustments could better assess the impact of one variables on other(s). Our study used co-integration technique that captures the long run behavior of the variables under study to systematically assess the contribution of VAT to the GDP of Bangladesh.

**Research Methods**

The functional relationship between Gross Domestic Product (GDP) and Value Added Tax (VAT) that the study will investigate is as follows:

GDP = f(VAT)

The study is focused to the data set of VAT revenue and GDP figures of the periods 1991/1992 (inception of VAT) to 2011/2012. While examining the data sets, they revealed steady growth over the years. GDP in Bangladesh is growing at more than 6% in the recent years. Exorbitant growth, particularly towards the later years of the study can also be observed with VAT. If the above said aspect of the data series is taken into

consideration, determination of the correlation between VAT and GDP may generate erroneous results. However testing the long run equilibrium relationship between the variables could provide some insights here. The data sets in the study are macro time series data and there is a research finding that many macro time series may contain unit root. And this finding has spurred the development of the theory of non stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non stationary time series are said to be co-integrated. The stationary linear combination is called the co-integrating equation and may be interpreted as a long run equilibrium relationship among the variables. The hypothesis used in the study is to find out whether there is a statistically significant relationship between Value Added Tax (VAT) and GDP in the long run. Johansen co-integration technique is used for this purpose and this is done by testing for the existence of a linear combination of the two non stationary time series. The advantage of using the technique is that it captures the behavior of the variables under the long run equilibrium condition taking care of the non-stationary of data at level.  Hence to achieve the objective of the study, the co-integration equation to assess the effect of VAT on GDP has been developed as follows:

$$GDP_t = \beta_0 + \beta_1 VAT_t + \varepsilon_\tau$$

In the model, Gross Domestic Product (GDP) is the endogenous variable and Value Added Tax (VAT) is exogenous variable and $\varepsilon$ denotes random error term. However, as highlighted by Nelson and Plosser (1982), macroeconomic data are integrated of order 1, and so we apply the first difference operator to these data in order to ensure that they are stationary before testing of a linear combination of the variables. It implies that before moving to identify a long run equilibrium between the variables, the time series data is to be tested to ensure whether the data is stationary or not; because regression with non stationary data may lead to spurious results. In the study Augmented Dickey Fuller test is to be used to test non-stationary of data. Here

Null Hypothesis ($H_0$): The series is non-stationary or it has a unit root

Null Hypothesis ($H_1$): The series is stationary or it has no unit root

Decision criteria: If the test statistic is greater than the critical value, it implies that the null hypothesis that the data is non-stationary is rejected.

The presence of co-integrating relation form the basis of the VEC specification. In the study VEC model is used to achieve the objective of the study. A Vector Error Correction (VEC) model is a restricted VAR designed for use with non stationary series that are

known to be co-integrated. The advantage of using the model is that it has co-integration relations built into the specification so that it restricts the long run behavior of the endogenous variables to converge to their co-integrating relationships while allowing for short term adjustment dynamics. The co-integration term is known as the error correction term since the deviation from long run equilibrium is corrected gradually through a series of partial short term adjustment.

The study made use of secondary data collected from annual reports of Central Bank of Bangladesh (Bangladesh Bank). The period covered was from 1991/1992 when VAT was introduced in the country to 2011/2012.

**Analysis and Findings**

Before estimating long run equation, stationary of the series was checked by using Augmented Dickey Fuller (ADF) test. The results of the test is in the following table.

**Table 1**

**Results of Augmented Dickey Fuller (ADF) test**

| Variables | Test for Unit Root in | Results of test with constant without trend | Results of test with constant with trend | Remark |
|-----------|-----------------------|---------------------------------------------|------------------------------------------|--------|
| logGDP | Level | 2.06 (0.999) | 1.6 (0.999) | Non stationary |
| | 1st Difference | -5.78 (0.000) | -6.163(0.000) | Stationary |
| logVAT | Level | 1.06 (0.995) | -2.68 (0.254) | Non stationary |
| | 1st Difference | -5.35 (0.000) | -5.06(0.0005) | Stationary |

From the results in the table, Null hypothesis that the series is non-stationary cannot be rejected for the two variables at level i.e. the series is non stationary at level. However, the null hypothesis is rejected at 1st difference for both variables at a very high level of significance which implies that the series contains one unit root and is of integrated order one I(1). The results again confirmed the findings of Nelson and Plosser (1982), macroeconomic data are integrated of order 1. According to Johansen co-integration technique when two variables are integrated of order one, there exist a co-integrated linear relationship between the variables at order zero.

Getting the result that the time series are stationary at first difference, the long run equilibrium relationship between Gross Domestic Product (GDP) and Value Added Tax

(VAT) is expected. To determine the co-integrating equation i.e. the long run equilibrium relationship, testing the number of cointegrating relations is required by Johansen maximum likelihood procedure. Results of the maximum likelihood procedure is given below:

**Table-2**

**Results of Johansen Maximum Likelihood Procedures**

| Hypothesized No. of CE(s) | Eigen value | Trace Statistic | 5 Percent Critical Value | 1 Percent Critical Value |
|---|---|---|---|---|
| None ** | 0.694924 | 27.88201 | 19.96 | 24.60 |
| At most 1 | 0.303582 | 6.512487 | 9.24 | 12.97 |

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Table 2 reveals that there is one co-integration equation.. Trace statistic in the table signifies the presence of one co-integration equation having long run relationship between the variables and the findings is significant at both 1 percent and 5 percent level. Table 3 shows the normalized co-integrating equation results of the test assuming no deterministic trend.

**Table-3**

**Normalized Co-integration Coefficients**

|  | GDP | VAT | C |
|---|---|---|---|
| Coefficient | 1.0000 | -0.9431 | -1.928 |
| Std. Error |  | 0.03634 | 0.05170 |
| Log Likelihood | 110.73266517 |  |  |

The table suggest the normalized co-integration equation as follows:

$GDP_t = 1.928 + 0.9431VAT + e_t$

Hence the estimate of long run relationship between Gross Domestic Product (GDP) and Value Added Tax (VAT) reveals that Value added Tax is positively related with Gross Domestic Product and the coefficient is statistically significant. The reasoning of having positive impact of VAT on GDP is due to fact that VAT has increased the revenue base of the Government. Government uses the revenue to meet different expenditures for development purpose of the country. These development project or expenditures become part of GDP.

Although VAT is positively contributing to the GDP of Bangladesh, some problems with current VAT system were noted while studying VAT system of Bangladesh for the purpose of this paper. Firstly, VAT in Bangladesh is regressive in nature. Secondly, it does not follow "ability to pay" canon of taxation. In current VAT system, VAT of a particular commodity is same for everyone. Hence the higher income groups are enjoying fewer burdens than the lower income groups. Thirdly, multiplicity of tax rates as well as prevalence of widespread exemptions eroded the efficiency of the VAT system in Bangladesh. Fourthly, Collection mechanism is old-fashioned, excise-type and based on control over physical shipment/production/delivery of goods and services. Fifthly, due to the presence of large informal sector, registered VAT payers are limited. Therefore to ensure the success of VAT on contributing to the GDP, the following recommendations could be suggested (a) uniformity of the tax rate and comprehensive coverage of the economic activities should be ensured to increase the efficiency of VAT system (b) initiative should be taken to increase VAT registrations so that all traders become VAT registered (c) as attitudes to tax compliance are poor and tax evasion is widespread, regular audit is to ensured that will contribute to better enforcement and (d) collection mechanism should be modernized.

**Conclusion**

The empirical investigation in the study reveals that Value Added Tax has a positive relationship with Gross Domestic Product and is contributing to the economic growth of the country. Finding the positive relation is important to any economy for some reasons. Firstly, net national income and net national expenditure both being major components of GDP reveals various indices like national income, national output and national product in relation to income of individuals, income from the sale of goods and services of industries and income from transactions in international trade. So knowing how these incomes relates to consumption behavior of economic agents namely individuals, government and families is important for policy makers. Secondly, the finding could help decision makers in the country to use Value Added Tax (VAT) as a tool for effective revenue generation and price stability.

In the economy like Bangladesh, where there is a presence of large informal sector, due to its characteristics, Value added Tax (VAT) can leads to rise in welfare i.e. it can contribute to the growth of the economy to a greater extent.

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