

## **Tax Reform and Revenue Productivity in Bangladesh**

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### **Introduction**

During the last two decades the developing countries and the transition economies have gone through a substantial reform in economic policy and institutions. Fiscal reform had been one of the important arena of reform that originated from both the endogenous impetuous of the reforming country and the influence of the donors. Fiscal reform had been important from the viewpoint of restructuring of both revenue and public expenditure. Revenue reform led to major changes in the tax system of many developing countries. There are competing theories of taxation that may have different implications to guide the reform in tax system. Motivation behind tax reform across countries was not also quit uniform. In many developing countries prime reason for tax reform had been to enhance revenue so as to mitigate fiscal crisis (Bird, 1993). However, such reforms were often ad-hoc and not in a nature of systematic improvements to enhance the long run productivity of tax system (Rao, 2000). In the recent years, one of the most important objectives of tax reform had been to reduce tax-induced distortion as desired for the efficiency of a market economy. Such reform is warranted in a developing country or in transition economies to meet the requirement of international competitiveness.

While history of reform in Bangladesh dates back to late 70s and many of the reforms came out of governments own initiative, major reforms in Bangladesh were conducted in the late 1980s and early 1990s within the package of structural adjustment policies under the auspices of the World Bank and the IMF. In the process of reform, Bangladesh also undertook considerable reform in its tax system in the 1990s. Reforming tax system includes both policy reform and reform in tax administration. Like other arena of reform, design of the fiscal reform was heavily influenced by the donors' philosophy of market oriented reform. Market

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oriented tax reform that include reduction of marginal tax rate, reducing custom duty, introduction of trade neutral tax may have negative implications for tax revenue. However, some of them may have positive implication for revenue as well through expanding the tax base. In Bangladesh, tax collections are still quite low leading to a large fiscal deficit. Tax-GDP ratio in Bangladesh has been lower even compared to that of other South Asian countries. Hence, enhancing revenue productivity is a major concern for any reform in our tax system so as to help fiscal sustainability. Declining foreign aid and negative implication of borrowing from central bank creates further impetuosity for raising additional tax revenue. Such a context highly warrants an examination of the revenue productivity of tax reform in Bangladesh.

Experience of recent tax reform in terms of revenue productivity had been mixed. The government of Ghana undergone fundamental tax reform, in 1983, which included the introduction of VAT to replace the existing sales tax, revaluation of the properties to broaden the tax base of the property tax, a review of the definition of income for the purpose of income tax and further improvement in the tax administration to increase tax collection and to combat evasion and fraud. A study by African Economic Research Consortium (Ariyo, 1997) showed that the tax reform succeeded in improving revenue generation, enhancing the efficiency of the tax administration and improving equity in the tax system. In Uganda, the tax system has been one of the victims of numerous economic crises resulting a low level of tax collection. Since May 1987, Uganda's tax system has undergone fundamental reform both in terms of market oriented policy and improvement in tax administration, which resulted in an improved tax-GDP ratio (Teera, 2002). India undertook major tax reforms since the early 1990s. However, market oriented tax reform resulted in a loss in tax-GDP ratio in the early years of reform which could not be recovered even by the end 1990s (Rao 2000).

Thus, while there is a crucial need of enhancing revenue collection in Bangladesh, experience from other countries show a mixed evidence about effect of market oriented tax reform on revenue generation. On this backdrop, the present paper examines the tax reform experience of Bangladesh with respect to revenue productivity. It highlights the evolution of tax structure over the years and estimates buoyancy of taxes to evaluate revenue productivity of our tax system in the pre-reform and post reform era.

Structure of the paper is as follows: Section II makes a short review of theory and experience about tax policy reform. Section III makes an

overview of the tax reform in Bangladesh. Section IV briefly discusses the evolution of tax structure in Bangladesh in the past decades. Section V examines the revenue productivity of tax system in Bangladesh in terms of tax buoyancy estimates in both the pre-reform period and the reform period. Some formal test about the structural changes in tax buoyancy relations has been conducted in section VI. Finally, section VII makes some concluding remarks.

### **Tax Reform: Theory and Experience**

Several theories may provide some insights and guidance about the desired reforms in the tax system. Optimal Tax theory that had an early origin (Ramsey 1927) had been formalized and analyzed further by many authors such as Mirrlees (1971), Newberry (1988), Ahmed and Stern (1991). The general principle of optimal taxation may be summarized as follows: (1) tax revenue is raised most efficiently by taxing goods or factors with inelastic demand or supply; (2) Taxation concerned with distribution and with externalities or market failures should go to the root of the problem as much as possible (AERC, 1998). Although optimal tax has theoretical rigor, it has limited practical appeal in reforming tax system because putting them into operation leads to intractably large number of rates, which would be difficult to calculate and virtually infeasible to administer (Thrisk, 1995, MxLure 1989, Deaton 1988).

Herberger tax model (Herberger, 1990) although grounded well in theory, draws much more practical experience that emphasize both efficiency and administrative capability in designing a tax policy. This approach emphasizes designing a tax system that would minimize tax-induced distortions and at the same time be administratively feasible and politically acceptable. Supply side Economics has important implication for tax policy. This school of macroeconomic though emphasize on reduced role of state to stimulate the economic activity of the private sector. Tax cut is suggested along with reduction in volume of public expenditure. Reduction of direct tax rates is particularly desired to minimize disincentive to work and investment. Such reductions in tax rate may not have much negative impact on total tax revenue collection as it may increase tax base by enhancing economic activity. Proponents of supply side tax model also emphasize on broadening the tax base with minimum exemptions and reducing marginal tax rates which in turn reduces distortion out of taxes.

The recent tax reform had been influenced by elements of all these tax models. However, exact formulation of tax reform has also been influenced by political, administrative, institutional and information and

the experience of previous reforms. Tax structures in most of the developing countries had been complex, inelastic, inefficient, and inequitable. It relied mostly on few taxes with a heavy dependence on taxes on international trade that undermines international competitiveness. Dependence of distortion indirect tax was wider spread because it was relatively easy to collect and politically less unpopular. On the facet of such weakness in the tax system, the developing countries took reform measures with a simultaneous objective of enhancing revenue and reducing tax related market distortions. The reform measures usually included broadening the tax base, reducing marginal tax rates, and lowering variance in tax rate. Broadening tax base complemented lowering tax rates to generate given amount of revenue and thus help ensure horizontal equity. Lowering marginal taxes not only reduce disincentive to work and invest rather it helps improving tax compliance. Attempt has been taken to make the tax system more comprehensive, simple and transparent through reform in tax administration.

In case of direct taxes, reform agenda includes identification of new taxpayer and new sources. The definition of tax base has been revised where possible with a view to broadening tax base. In case of indirect taxes, the most important agenda has been introduction of Value added tax (VAT). The VAT has become an instrument of choice for most developing countries contemplating reform of their sales tax as it can provide more revenue maintaining tax neutrality. Role of excise duty has been reduced by keeping it limited mostly in luxury goods. Regarding taxes on trade, custom duty rate has to be reduced along with reduced dispersion in rates, and export taxes have to be eliminated. Quantitative restrictions on trade have to be replaced by tariffs.

### **Tax Reform in Bangladesh: An overview**

Since the early 1990s the government of Bangladesh undertook considerable reforms in tax system that involves both tax policy and tax administration. The objective of the reform was to enhance the market economy as well as generate sufficient revenue with less distortion. The reform in tax system includes introduction of Value Added tax, a reduction in excise duties, a rationalization of personal income tax and corporate income taxes, a reduction in tariff rates, introduction of supplementary duty and strengthening tax administration.

#### ***Value Added Tax (VAT)***

The introduction of VAT is the most important and a bold step in the area of tax reform in Bangladesh. VAT was introduced in July 1991 replacing existing sales tax. As we indicated that VAT is attractive tax as it can

raise large amount of revenue without much distortion of in businesses' and consumers' decision. Objectives behind introduction of VAT in Bangladesh were to expand the tax base, bring transparency in the taxation system, solve the problem of cascading effect of indirect taxation, curb tax evasion, simplify the tax collection procedure and collect taxes more scientifically, and thus increase overall tax revenue. VAT is a transparent tax system in which the tax content of any goods is clearly known. VAT implies that tax in small amounts to be paid at different stages of production and hence the tax burden at every stage is relatively low. Under this circumstance, there will be less incentive to evade tax, resulting in increase in tax elasticity and rise in tax revenue.

Initially VAT was proposed to replace the existing sales tax on imported goods and the excise duties on domestically produced goods and services. In principle all domestically produced goods except unprocessed agricultural goods and all imports except unprocessed agricultural goods were brought under the operational purview of VAT. However for some initial administrative difficulties, a number of excisable goods and services were not brought under VAT in the FY 1992. Later in order to rationalize and to consolidate the VAT system, most of the excisable goods and services, including tobacco goods, petroleum products and natural gas were brought under VAT. Eventually coverage of VAT was extended to include wholesale and retail trade. Rate structure and assessment procedure of VAT on trade has gone through an evolution. Many other services were also brought under the VAT net. On the other hand, VAT on a few items was subsequently withdrawn at import stage. While coverage of VAT improved over the last one and half decade, still there is further scope in this regard.

### ***Income Tax***

Income tax system in Bangladesh was anachronistic and weak in a number of ways. Reform initiative in income tax system has been taken to achieve a variety of objective such as to reduce the high tax rates, reduce the number and rates of exemption, widen the tax base, check the tax evasion, encourage investment in industrialization, simplify the tax return and tax assessment system, reduce the discretionary power of the tax officials, strengthen the role of income tax through administrative reorganization in the context of overall resource mobilization and harmonize the tax laws with the welfare needs of the people

Since the early 1990s, steps had been taken to rationalize corporate income tax rate through gradual changes in rates in several successive budget. Corporate tax rate was reduced and it settled at 35% and 40% for

"publicly traded" industrial companies and "non-publicly traded" industrial companies by the FY 1996. Surcharge that was introduced in 1988 was abolished in 1992 to minimize distortion. To rationalize the tax structure of different categories of companies and to encourage foreign investment, the corporate tax rate for banks, insurance companies, financial institutions and non-resident companies was reduced step by step and it became 35% in FY 1999.

Important changes have also been brought in personal income tax. In 1992-93, the existing "filing threshold" system was replaced by the "conventional exemption limit" and the maximum rate of investment allowance was reduced from 30 percent to 20 percent in the FY 1993. Marginal tax rate had been reduced over few years. Highest tax rate that was 50% in the beginning of 1990s gradually brought down to 25% by the FY 1994. Similarly, number of tiers in personal income tax had also been reduced. In order to reduce the tax burden of the low-income group, the lowest rate reduced from 15 percent to 10 percent in FY 1998. The government has restructured, step by step, the income slabs for different tax rates including gradual increase in the exemption limit. This was helpful to reduce the tax burden of the poor as well as average income tax rate payable by all the tax payers. Wealth based surcharged on income tax has been eliminated in the FY 2003.

### ***Customs Duty***

Although reform in the custom duty is related with overall trade policy reform, the objectives of customs duty reform in Bangladesh were manifold. Reform in custom duty had been implemented to rationalize the duty structure, discourage and prevent smuggling, make consumer goods available at a reasonable price, ease assessment of duties as well as help flourish the local industries.

Since the early 1990s, Bangladesh has adopted a relatively outward-oriented trade regime with a definite slant toward export orientation. The biggest thrust in trade liberalization came in the form of tariff reduction and removal of quantitative restrictions. Tariffs were lowered across-the-board, and import restrictions were virtually eliminated, except for non-trade reasons such as health and national security. A review of the components of trade liberalization shows significant progress in opening up the economy through tariff reduction, removal of quantitative restrictions on imports, instituting a moderately flexible exchange rate system, and liberalizing the investment regime, for domestic and foreign investors.

During the period 1973-1990 there were innumerable customs duty rates and many of the import items were subject a to exorbitantly high

tariff rate. However, as a signatory to the Uruguay Round Agreement, Bangladesh was committed to reduce their custom duty rates. The top operative rate was brought down from 350% in 1991-92 to only 32.5% in FY 2003. Unweighted average and weighted average rate of custom protection fell from 70 percent and 24.1 percent in FY 1992 to 25.9 and 20.8 in FY 1995. The declining trend continued further and it reached to 13.4 and 8.1 percent respectively in FY 2006. In FY 1993 the number of tariff slab was 15, which was reduced to four tariff slabs. To simplify the tariff structure operative and statutory tariff rate has been made equal since FY 2002. Multiple duty rates or wide differences in customs duty rates for similar goods encourage misdeclaration of goods as well as their value. Hence duty rates were simplified through rationalization at the end of 1990s. This was supposed to make assessment more transparent and reduce the discretionary power of the customs officials.

**Table 1: Trends in Tariff Rationalization**

	FY 92	FY 95	FY 98	FY 01	FY 04	FY 06
Average unweighted customs duty	70.0	25.9	20.7	18.6	15.62	13.41
Average weighted customs duty	24.1	20.8	16.0	15.1	11.48	8.09
Top custom duty rate	350.0	60.0	42.5	37.5	32.5	25
Number of tariff slabs	18	6	8	5	5	4

*Source: NBR, Bangladesh Economic Review*

### ***Supplementary Duty***

Reduction of custom duty obviously reduced the revenue potential from the import. Although part of the potential revenue loss due to reduction in tariff was supposed to be compensated by the increase in volume of trade due to liberalization policy, it would not be sufficient to maintain a reasonable tax-revenue trend. Hence, supplementary tax was introduced to offset the revenue loss from tariff reduction. In FY93, there were only five effective supplementary duty rates. However effective supplementary duty rates increased over time and it became an important source of revenue particularly from import. In the FY 03, number of effective supplementary duty rates was reduced again. Very lately, reliance of supplementary duty started to decline. Supplementary duty was also imposed on domestic goods to compensate revenue loss out of limiting the scope of excise duty.

### **Reforms in Tax administration**

Tax administration is extremely important for revenue productivity of tax system, particularly in a country like Bangladesh where institutions are not developed enough and corruption is rampant in the society.

Reforming tax administration is also important to implement policy reforms. Due to extreme importance of tax administration, experts sometimes opine that "tax administration is tax policy in developing countries" (Jantscher and Bird, 1992). Tax administration in Bangladesh also faced a new challenge to improve professional, legal and technological capacity with the process of globalization and harmonization of Bangladesh economy with the global economy. Accordingly, the government of Bangladesh has undertaken measures to continuously upgrade and reform the tax administration in line with the trend of global trade and development. While some the input of reform in tax administration and policy came from the report of the Revenue Reform Commission (2003), a number of technical assistance projects supported by donors have been playing vital role in reforming tax administration.

Since the beginning of extensive reform era in FY 1992, several administrative changes is has been brought in to increase income tax collection so as to achieve the desired objective of augmenting the role of income tax in the resource mobilization. These includes setting up of tax offices in the newly created districts, division of the over-burdened taxes circles, creation of an independent and effective survey zone to identify new assesses, separation of directorate of Training and Inspection in order to strengthen the inspection program and to improve efficiency of the officers and staffs. Nationwide tax identification number (TIN), allocated and stored by NBR, was introduced in 1994 replacing the local registration number (GIR) A "Taxes Settlement Commission" was established in FY 1996 for quick disposal of income tax cases. The government introduced "Spot Assessment" system in FY 2000 to widen the tax base and to increase the number of taxpayer. The scope of self assessment system has been widened and the procedure has been made simpler over the years. Large Taxpayers' Unit for income tax was established in 2003 with the support from Department for International Development (DIFID), UK. Main objectives of establishing LCU were to modernize tax practices through functional organization, improve the management data and information system, provide better service to taxpayers, secure and increase income tax revenue, and to increase professionalism in the tax administration.

Although VAT was introduced in 1992 and subsequently its scope was widened, little steps have been taken to strengthen VAT administration until the late 1990s. To improve the VAT system Bangladesh Government implemented a technical assistance project "Strengthening and Modernizing VAT administration" with assistance from DFID during 1999-2002. Main objectives of this project were to help the VAT wing of NBR in the following areas: support to VAT policy formulation,



corporate planning and management; strengthen VAT audit, enforcement and investigation of fraud and implement tax payers' education program. Project outputs include improvements in strategic planning, operational procedures and the audit function, a taxpayer education program and the provision of advice to senior officials on policy and legislation. The project output also reports an increase in the number of companies registered for VAT.

To streamline customs procedure and facilitate trade by making use of modern techniques and information technology Bangladesh government undertook Customs Administration Modernization (CAM-1) project. The work being done under CAM-1 project are: computerized customs assessment and data processing, selection of imported consignments for detailed inspection on the basis of risk-based selectivity module, computerization of bonded warehouse management, post-clearance audit, strengthening internal audit and control and training of customs officials. The objectives of these reforms were aimed at making the customs administration modern, simple and free of harassment of the tax payers. Custom clearance procedures for import and export were simplified by bringing down signature requirement. Mandatory PSI (pre-shipment inspection) system was introduced in FY2001 for valuation and inspection of imported goods so as to assist custom authority for quick clearance and to reduce misdeclaration of imported goods.

In order to build a modern, efficient and time-befitting tax administration recently Bangladesh Government has taken a reform program Reforms in Revenue Administration (RIRA) with the financial assistance from the Government of the United Kingdom. The main objectives of Reform In Revenue Administration are to introduce a common TIN (Tax Identification Number) for income tax and VAT for ensuring much needed coordination between these two departments, prevent leakage by consolidating internal audit and inspection, achieve human resource development by increasing professional skills and adopt a coordinated tax education program for creating public awareness. National Board of Revenue (NBR) established Central Intelligence Cell (CIC) in January 2004 with an objective to enquire into tax evasion and avoidance cases and to prevent leakages in the tax system. Recently, the office of the Tax Ombudsman has been created to look after any injustice committed by tax officials to the tax payers in assessment of taxes.

### **Tax Structure and Revenue Productivity in Bangladesh**

Tax GDP ratio had been quite low. During the pre reform-period tax GDP ration had been around 5-6% only. Tax GDP ratio has increased over time, particularly with the implementation of the tax reforms. Despite this positive development, tax GDP ratio is still quite low compared to other

comparable countries It is the lowest among the neighboring SAARC countries, and it is also lower than sample of other developing countries in Africa and Latin America (table 2).

**Table 2: Tax GDP Ratio in Bangladesh and other Developing Countries**

	Year	Per capita income (PPP adjusted)	Tax-GDP percentage
Bangladesh	2005	2160	8.62
India	2005	3090	16.58
Pakistan	2005	2320	9.53
Nepal	2005	1560	10.14
Sri Lanka	2005	4540	14.27
Morocco	2005	4530	24.72
Ghana	2004	2270	22.36
Kenya	2004	1150	16.86
Uganda	2003	1280	11.90
Bolivia	2005	2710	16.59
Nicaragua	2005	3580	16.61

*Source: World Development Indicator CD-ROM 2007, Global Development Finance Yearbook, various issues, Bangladesh Economic review, Ministry of Finance.*

Low tax GDP ratio is manifested in the fact that the tax system in Bangladesh mostly relies on only a few taxes and the tax base is narrow. Over and above there is tax evasion due to inefficient and corrupt tax system. Currently the tax system of Bangladesh is comprised of Customs Duty, Excise Duty, Income tax, VAT, Supplementary Duty and a number of taxes with small yield e.g. tax on transfer of property and assets, electricity duty, narcotics duty, motor vehicle tax, land tax, stamp (non judicial) etc. A more diversified tax base is desirable to insulate tax revenue from cyclical or irregular changes in the economy. It also reduces distortionary affects of taxes as rates are usually lower with a well diversified tax base. Multiple tax-bases (with relatively low rate) help reducing tax evasion and it is also politically palatable. However, tax administration in Bangladesh is not efficient enough to diversify the tax base and tap the associated advantages.

Bangladesh relies mostly on indirect taxes for its revenue and the bulk of it comes from import taxes. This dependence on indirect tax is mainly due to the fact that income taxes are limited by administrative and other constraints. A recent study (i.e., Sarkar, 2004) shows that the number of registered tax payer is 1.25 million counting only 0.94 percent of population. Even many of the registered tax payers either do not pay tax

or they pay only a minimum tax. Consequently income tax collection was low, and until late 1990s, share of income tax was virtually stagnant. However, it has shown some tendency to rise in the recent years. Broadly speaking, despite some changes in the number and type of tax instruments used in the tax system in the reform period, dependence on indirect tax still remained significant. Among the indirect taxes, customs duty had the biggest share in total tax revenue, although very lately importance of VAT superseded that of custom duty. Excise duty had the second highest share during the pre-reform period. As the excise duty is gradually replaced by VAT and supplementary duty, share of excise fall drastically during the reform era. Sales tax that was another important indirect tax in the pre-reform period was abolished in 1991 and replaced by VAT. As supplementary duty was imposed on both import and locally produced goods, it counted considerable amount of tax revenue. Thus, while the pre reform tax revenue was dominated by three major indirect tax instrument viz. custom duty, excise duty and sales tax, the tax revenue in reform period is again dominated by three instruments of indirect tax i.e., VAT, custom duty and supplementary duty. It is only very recently that income tax became closer to supplementary duty in terms of revenue generation.

**Table 3: Tax Structure in Bangladesh**

	1979-80	1984-85	1989-90	1994-95	1999-00	2003-04	2004-05
Custom Duty	42.88	39.36	37.40	32.38	26.45	25.84	25.14
Excise Duty	19.53	25.19	28.86	1.57	1.62	0.58	0.46
Income Tax	12.46	14.28	13.69	13.13	16.20	17.16	18.06
Sales Tax	19.44	14.77	11.06				
Value Added Tax of which:				30.50	32.18	31.77	33.21
Domestic VAT				10.99	13.12	15.74	16.18
VAT on Import				19.51	19.05	16.03	17.03
Supplementary Duty of which:				13.49	16.50	19.07	17.72
SD on Domestic Goods				11.84	10.61	12.93	11.82
SD on import				1.65	5.89	6.15	5.90
Other-NBR	0.16	0.45	1.59	1.59	1.08	1.07	0.92
Non-NBR	5.53	5.95	7.40	7.34	5.96	4.51	4.54
Total	100.00	100.00	100.00	100.00	100.00	100.00	100
Tax-GDP Percentage	5.20	5.28	5.70	7.45	6.78	8.24	8.62

*Source: Authors calculation based on NBR data*

Despite a considerable trade policy reform, dependence on taxes on import is still quite high. While once about 60 per cent tax revenue in Bangladesh came from taxes on imports, the figure is still around 50 per cent. Thus, the government of Bangladesh still has to rely on import for its half of tax revenue. Although relative contribution of custom duty has declined over the years it is still the second important source of tax revenue. Decline in custom duty has mostly been offset by other taxes on import, such as VAT and supplementary duty on import. Supplementary duty is a temporary measure to offset the loss in revenue from custom duty due to trade liberalization. A high reliance of supplementary duty shows the vulnerability of revenue productivity of our tax system. Similar concern is there about import VAT. Ideally VAT should be a trade neutral tax. But import VAT in Bangladesh was not neutral as it is imposed discriminately on some import items. Any attempt to rationalize import VAT may also have adverse implication for revenue productivity of our tax system.

Figure 1: Share of Indirect Tax and Taxes on Import in Total Tax Revenue



Thus, although tax-GDP ratio has increased and new taxes have been introduced, sources of revenue are still confined among few taxes. Government is still highly dependent on indirect taxes, particularly on taxes on import. Hence, policy of further trade liberalization will have severe implication for our tax revenue unless aggressive measures are not taken to enhance tax revenue through other measures. Broadening tax

base and increasing tax revenue through relatively non-distortionary tax measures are of utmost importance.

### **Tax Buoyancy and Revenue Productivity of Tax in Bangladesh**

Revenue productivity of taxes is traditionally measured by tax buoyancy and tax elasticity. Tax revenue from any individual tax may change due to discretionary changes in the legal rates and rules governing the tax and/or due to endogenous changes in the base on which the tax is imposed. The base is affected by, among others, variations in GDP. Therefore growth in tax revenue in response to GDP growth can be decomposed in to two components: the "automatic growth" and the growth resulting from "discretionary" changes in the tax rates and rules. Responsiveness of tax revenue due to the combined effect is known as "buoyancy" of the tax. Elasticity of tax, on other hand, measure the responsiveness of tax revenue with changes in base focusing only on the "automatic part", abstracting from the discretionary changes. In the literature there are several methods to figure out the "automatic part" of changes in tax revenue that is needed to for estimation of elasticities. However, data requirement of these methods are quite involving and it is quite difficult to generate such information for Bangladesh<sup>2</sup>. Hence we will confine our analysis of revenue productivity in terms of tax buoyancy only. There are other arguments also in favor of importance of buoyancy analysis of taxes. Tax reform includes policy changes covering rates, rules, regulation and procedure of tax collection, all of them are discretionary. Hence, buoyancy will be a better measure than elasticity to analyzing the affect of tax reform on revenue productivity, although elasticity component is still helpful in decomposition of the "automatic growth" of revenue and the growth resulting from "discretionary" changes. Secondly, as tax-GDP ration is quite low in Bangladesh and enhancing revenue is the major concern regardless of its "automatic" and "discretionary" part, tax buoyancy also has strong appeal in the context of revenue productivity of tax in Bangladesh.

Tax (or revenue) buoyancy is defined as the ratio of percentage change in tax revenue to the percentage change in tax base Typically the base is taken to be GDP, although other bases are possible, such as consumption

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2. In the early years, budget speech of the finance minister used to provide perceived changes in tax revenue due to changes in tax measure. However, such information are no longer provided on a regular basis.

as the base for sales taxes, or imports as the base for tariffs. The revenue could refer to total tax revenue or to revenue from any given tax. The increases are measured in real terms, after adjusting for inflation, otherwise the estimate of tax buoyancy would be biased towards unity. As a practical matter, measures of tax buoyancy tend to vary a lot from year to year. Thus it is more useful to measure buoyancy over a longer period. There are a number of different ways to measure buoyancy addressing this issue. Following Houghton (1998), some of the more commonly used techniques are briefly explained in the appendix.

We estimate the tax buoyancy from the estimated least square regression of natural log of real tax revenue on real GDP. In particular we estimate the following equation:

$$\text{Ln}Y_t = a + b \text{Ln}X_t + u_i$$

Where, Y is Revenue out of the tax under consideration, X is Real GDP, and Ln stands for natural logarithm. Estimate slope coefficient (b) gives us the buoyancy of tax. As it uses information of all time period in concern, buoyancy measure out this approach is an average measure free from year to year fluctuation. Although the regression may be influenced by extreme values, the extent of influence is minimized by taking log.

Table 4 presents the results of tax buoyancy estimates in the pre-reform and the reform period.<sup>3</sup> It is evident that buoyancy of tax has been higher than unity in both the pre-reform and reform period and buoyancies in these two periods are virtually same. Although overall tax system has been buoyant in both the period, direct tax had been more buoyant compared to indirect tax. Interestingly enough, neither the buoyancy of direct tax nor that of indirect tax marked any significant difference over the two periods. Buoyancy at disaggregated level, however, shows different picture. While income tax and excise duty were highly buoyant in the pre-reform period, custom duty and sales tax was not. Sales tax had a negative responsiveness with GDP. Newly introduced taxes in the reform period such as VAT and supplementary duty were quite buoyant. In particular domestic VAT appeared to be a highly buoyant system that is indicative of expansion of VAT net. VAT on import came in effect after reform while sales tax on import is abolished. VAT on import was also quite buoyant while sales tax on import had

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3. Data of FY 1980 to FY 1991 has been used for estimation of tax buoyancy. Fiscal year year 93 and onward has been considered as reform period. We dropped the FY 1992 to allow for a transition period, the year when VAT was just introduced.

negative buoyancy. Supplementary duty on import appeared to extremely buoyant because of the excessive use of it. As government is phasing out excise duty, it experienced negative buoyancy in the reform period.

**Table 4: Estimated Buoyancies of individual taxes and of overall tax revenue**

	Pre Reform Period (FY 1980 – FY 1991)	Reform Period (FY 1992 – 2005)*
Total Tax Revenue	1.21	1.27
Direct Tax (Income Tax)	1.62	1.52
Indirect tax	1.26	1.22
Total Taxes on Import	0.59	1.36
Custom Duty	0.87	0.81
Excise Duty	1.97	-1.81
Value Added Tax		1.44
Domestic VAT		2.12
VAT on import / Sales Tax	-1.16	1.12
Supplementary Duty		1.94
Domestic SD		1.29
SD on Import		5.11

\* For new taxes (i.e., VAT and SD we dropped FY 1992 to avoid the problem of very low base)

Income tax has been buoyant in both periods, although buoyancy declined marginally in the reform period. Initially income tax revenue grew at a faster rate because of narrow base. As income tax revenue increased to a reasonable base by the early 1990s, it was a challenging task to maintain same growth rate of it in the reform period. However, simplification of rate structure and expansion of tax net had positive impact on income tax revenue. Consequently, despite stepwise extension of exemption limit and reducing tax rates, income tax maintained a buoyancy of 1.52 in the reform period, which is only marginally lower than that in the pre reform period. Despite this, decline in income tax buoyancy in the reform period raises some concern. Actually, sluggish performance of income tax for couple of years in the mid 1990s resulted in a decline in its buoyancy. Recently income tax collection is increasing at a reasonable rate due to strong effort of the tax administration. This is an indication that there is scope for enormous increase in income tax revenue through reform in tax administration.

Tax buoyancy of indirect tax also did not mark any changes out of reform. Although sales tax were abolished and scope of excise duty had been curtailed, indirect tax maintained its responsiveness with GDP in the

reform period because of the importance of newly introduced indirect tax i.e., VAT and supplementary duty. Although VAT collection has increased, role of supplementary duty is quite important in maintaining the high share of indirect tax. Actually, Potential for VAT has not been fully realized yet. As McCarten (2005) indicates that VAT collection in Bangladesh underperforms its potential by about 40% even after taking into account of constraints such as corruption and illiteracy.

An interesting phenomenon appears about dependence of our tax revenue on import. While in the pre-reform period, taxes on import counted for more than half of the revenue, its buoyancy was much lower than unity. On the other hand, although overall share of taxes on import in total tax revenue declined moderately, overall import tax became buoyant despite the fact that custom duty became slightly less buoyant in this era. Despite considerable reduction in custom duty, buoyancy of custom duty declined moderately from 0.87 to 0.81. Actually, increase in import with trade liberalization offset a large portion of potential loss of custom duty due to reduction of rates. Over and above imposition of VAT and supplementary duty on a wider base (due to increased import) generated huge revenue for the government. As a result, import tax buoyancy exceeded unity implying that revenue from import taxes have grown more than proportionately than the increase in GDP. However, non-trade taxes grown at even faster rate so that relative share of trade taxes experienced a moderate decline.

**Table 5: Changes Custom Duty and the Changes in Import**

Year	Import Weighted Average rate of Customs Duty (%)	% change	Volume of Import (million \$)	% change
1992-93	23.6	-	4071	-
1993-94	24.1	2.12	4191	2.95
1994-95	20.8	-13.69	5834	39.20
1995-96	17.0	-18.27	6947	19.08
1996-97	18.0	5.88	7152	2.95
1997-98	16.0	-11.11	7520	5.15
1998-99	14.1	-11.88	8006	6.46
1999-00	13.8	-2.13	8374	4.60
2000-01	15.1	9.42	9335	11.48
2001-02	9.73	-35.56	8540	-8.52
2002-03	12.45	27.95	9658	13.09
2003-04	11.48	-7.79	10903	12.89
2004-05	9.59	-16.46	13147	20.58

*Source: Bangladesh Economic Review, Ministry of Finance.*

While tax reform introduced many new taxes on the one hand, some of the previous taxes were either discontinued or curtailed in scope on the



other hand. Moreover, there had been considerable changes in buoyancy of some taxes at disaggregated level in the reform period. Despite these changes buoyancy of overall tax did not change at all during the reform period. It seems that reform measure were just sufficient to maintain a buoyant tax system over a longer period. It could not bring any improvement in the buoyancy of overall tax system. Bangladesh is a country with a very low level of tax effort. However, tax effort has grown since 1990s (Begum, 2007). Thus, although reform could not bring any significant change in overall buoyancy of tax, it played an important role maintaining a buoyant tax system over a longer period through increasing tax effort.

### **Structural Change in Tax-GDP Relation**

It is evident from the foregoing sections that although the overall tax-GDP ratio increased over time, there had been no change in overall buoyancy of taxes in the post reform period. However, individual tax items showed considerable changes in buoyancy in the reform period. This section provides a formal analysis about whether the tax buoyancy equation has changed or not. For this formal analysis we conduct alternative tests about stability of tax function over the pre-reform and the reform period.

First, we employ a dummy variable approach to conduct the stability of the tax function where a reform dummy is added in the tax buoyancy equation for years since 1992. We use both slope and intercept dummies to examine whether the changes in tax relation, if any, is due to change in intercept or in the buoyancy coefficient. In particular, we run the following regression using data covering both pre reform periods:

$$Y_t = \alpha_1 + \alpha_2 D_1 + \beta_1 X_t + \beta_2 (D_2 X_t) + U_t \dots\dots\dots (b)$$

Where,

Y = Tax Revenue

X= GDP

D<sub>1</sub> = 1 for observations in FY92 to FY2005

= 0, otherwise

D<sub>2</sub> = 1 for observations in FY92 to FY2005

= 0, otherwise

If  $\alpha_2$  and / or  $\beta_2$  are statistically significant, then there is a structural break in the tax buoyancy equation. Any change in tax buoyancy is indicated by the statistical significance of  $\beta_2$ .

Table (6) provides the summary results of the test of structural break using dummy variable approach. It is found that there had been no

structural changes in the tax buoyancy regression equation for overall tax revenue, direct tax and indirect tax. There is also no structural change in custom duty. However, there is statistically significant structural break in the equations for excise duty, sales tax or import VAT, and total tax on import. Buoyancy of excise duty declined, whereas buoyancy of sales tax / import VAT has increased. Overall taxes on import became more buoyant in the reform period. The results are quite consistent with the separate estimates of tax buoyancies over two periods as reported in the previous section.

**Table 6: Summary of Regression Results on Structural Change**

Tax Category	Differential Intercept coefficient ( $\alpha_2$ ) with t statistic and p-value	Differential Slope coefficient ( $\beta_2$ ) with t statistic and p-value	Statistical significance of the change parameter	Comment
Total Tax Revenue	-0.723 t = -0.48 P-value = 0.6357	0.077 t = 0.13 P-value = 0.6357	$\alpha_2$ and $\beta_2$ are not significant	No structural change in the reform period.
Direct Tax /Income Tax	1.270 t = 0.33 P-value = 0.7426	-0.097 t = -0.30 P-value = 0.7660	$\alpha_2$ and $\beta_2$ are not significant	No structural change in the reform period.
Indirect Tax	-1.016 t = -0.634 P-value = 0.5230	0.103 t = 0.757 P-value = 0.4570	$\alpha_2$ and $\beta_2$ are not significant	No structural change in the reform period.
Custom Duty	0.899 t = 0.50 P-value = 0.6228	-0.067 t = -0.43 P-value = 0.6690	$\alpha_2$ and $\beta_2$ are not significant	No structural change in the reform period.
Excise Duty	42.969 t = 3.401 P-value = 0.0026	-3.401 t = -3.51 P-value = 0.0020	$\alpha_2$ and $\beta_2$ both are significant	There is a structural change in the reform period
Sales Tax / VAT on import	-14.318 t = 4.63 P-value = 0.0002	1.280 t = 4.58 P-value = 0.0001	$\alpha_2$ and $\beta_2$ both are significant	There is a structural change in the reform period.
Total Tax on Import	-8.845 t = -2.67 P-value = 0.0139	0.767 t = 2.722 P-value = 0.0125	$\alpha_2$ and $\beta_2$ both are significant	There is a structural change in the reform period.

The dummy variable approach of test of structural break imposes the break point a priori. We have set the break point at FY 1992, the year of the start of comprehensive reform program including introduction of VAT. However, for practical reasons, break point of different tax relation may be different. Hence, we complement our test of exogenous structural break with the stability test where no pre-determined breakpoint is needed. In particular we apply the CUSUM test and the CUSUM of Square test of the stability where stability of the function is tested using the residuals of recursive regression. If the cumulative sum (or sum of

squares) of the recursive regression crosses the band set by the level of significance, the function is considered to unstable over the time period.

Table 7 presents the summary results of CSUM and CUSUM of Square tests applied in tax buoyancy relations. Graphical results of these tests are shown in the appendix B. It is again obvious that the tax buoyancy relation is stable over the entire study period for total tax revenue, direct tax and indirect tax. The relation is also virtually stable for custom duty. However, for other categories, the tax relations are generally unstable. Thus, the results of the CUSUM and CSUM of square tests of stability broadly conform to test of structural break reported in previous table.

**Table 7: Summary results of Stability Test of Tax Buoyancy Relation.**

<b>Tax Category</b>	<b>CUSUM test</b>	<b>CSUM of Square test</b>
Total Tax Revenue	Stable	Stable
Direct Tax / Income Tax	Stable	Stable
Indirect Tax	Stable	Stable
Custom Duty	Stable	Somehow stable
Excise duty	Somehow stable	Unstable
Sales tax /Vat on import	Unstable	Unstable
Taxes on import	Unstable	Unstable

### **Concluding Remarks**

Maintenance of a reasonable fiscal balance requires a larger share of the private sector's resources to be ceded to the government as tax revenue on the facet of increasing government expenditures along with declining foreign aid. The tax system of Bangladesh has undergone fundamental reforms since 1990s, which were designed primarily to enhance revenue collections on a sustaining basis. This generally involved placing a greater reliance on VAT, a reduction in excise taxes, a rationalization and reduction in the income tax rates for individual and corporate income taxes, a reduction in tariff rates and strengthening tax administration. This paper attempted to address the effect of tax reform on revenue productivity of individual taxes and of overall tax revenue

Overall tax system in Bangladesh has been found to be buoyant in both the reform period and in the pre reform period. Reform could not bring any significant change in the buoyancy of overall tax revenue. On the other hand, estimates of buoyancies of individual taxes show that the tax reform process change in buoyancies of some existing taxes, although custom duty and income taxes did not mark any significant change in buoyancy. More importantly, newly introduced taxes such as VAT and

supplementary duty have been much more buoyant than the taxes in the pre-reform period. These, along with other reforms in tax policy and tax administration, helped to maintain a buoyant tax system in the reform period even with a larger base. Tax-GDP ratio also maintained the past growth trend in the reform period. Thus, although reforms were not bold enough to bring any significant improvement overall buoyancy of tax, it played an important role maintaining a buoyant tax system over a longer period so as to maintain growing Tax-GDP ratio.

Despite the limited success of reform in augmenting revenue productivity of the tax system, our tax system has still many weaknesses. Tax-GDP ratio is still quite low compared to other countries. Tax structure remained heavily dominated by indirect tax in general and taxes on import in particular. Despite considerable reduction in custom duty, protective duty rate remained high because of VAT and supplementary duty on import. Any further trade liberalization measure will call for reduction and / or elimination of protective VAT and supplementary duty on import that may jeopardy our revenue collection. Despite introduction of few new taxes, the government is still dependent on a limited number of tax sources, leaving the tax system quite vulnerable to change in any of the important tax items.

Despite VAT being the major source of tax revenue, there is still untapped potential of collecting more revenue out of it. Although VAT net has been expanded over the years, there is still huge scope of further increase in the coverage of VAT and improving VAT administration. A VAT system can only operate effectively if the tax authorities have some information of the relative magnitudes of the inputs used by various production processes and the quantities of imported inputs used. Similarly the tax authorities should have some information on the type, quantity and the value of goods being exported by all VAT payers, otherwise the VAT system would be open to great abuse. So a strong linkage between customs and VAT administrations is needed. Further reform in tax system should keep this issue in account.

Although share of income tax revenue started to grow very lately, income tax base have not yet been diversified enough. Tax evasion is massive in case of income tax. In spite of repeated drives to identify new tax payers, many of the business as well as taxable persons still remained beyond the coverage of income tax. Sources of tax have not been diversified yet. New areas of taxes need to be identified to create a large and well diversified tax base. Hence, further reform in both tax policy and tax administration well deserved.

Finally we can say that Bangladesh needs to increase the tax-GDP ratio and there is no quick fix solution to it. To achieve this goal, further reform measures must be taken regarding tax policy and tax administration. Further reform should include further simplification of the tax regime, improving the capacity of tax administration, introduction of new tax and broadening of the tax base, rationalization of the exemption system and review of tariffs rates are required. Institutional reforms strengthening tax administration needs to be carried out so as to curtail the scope of tax evasion. Anti-corruption drive within and outside the tax department needs to be continued to extract enhanced revenue collection even out of given tax system.

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### **Appendix A: Estimation of Buoyancy of Tax**

Tax (or revenue) buoyancy is defined as

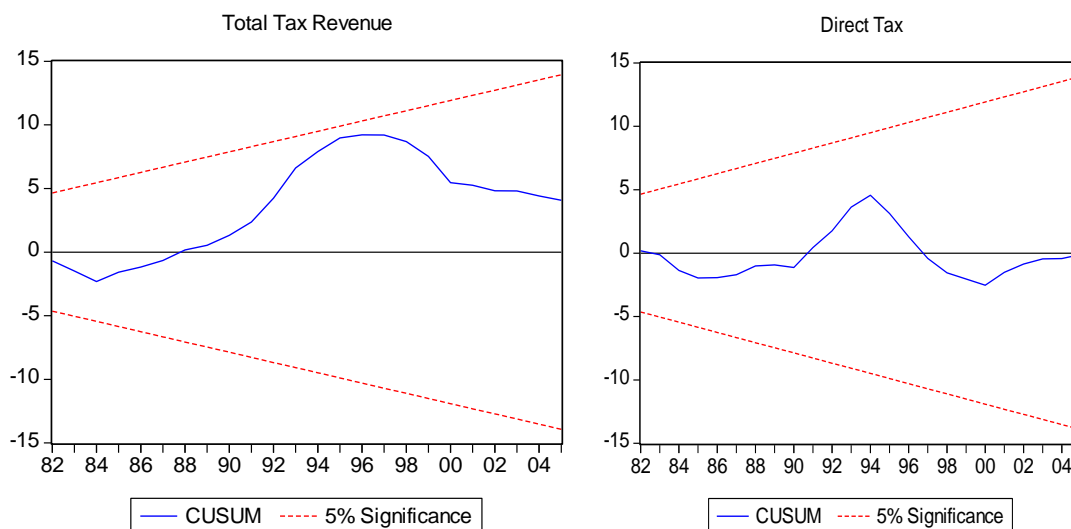
$$TB = \% \Delta \text{Revenue} / \% \Delta \text{base}$$

Typically the base is taken to be GDP, although other bases are possible, such as consumption as the base for sales taxes, or imports as the base for tariffs. The revenue could refer to total tax revenue or to revenue from any given tax. The increases are measured in real terms, after adjusting for inflation. If the increases were measured in nominal values, then the estimate of TB would be biased towards 1. As a practical matter, measures of tax buoyancy tend to vary a lot from year to year. Thus it is more useful to measure buoyancy over a longer period. There are a number of different ways to do this. Here are some of the more commonly used techniques:

- (a) Calculate buoyancy for each year, and then take the average. This has the disadvantage that it can be heavily influenced by usually high or low (or negative) measures of tax buoyancy for some of the years, and so is the least satisfactory approach.

- (b) Calculate the growth of tax revenue and of the base (GDP), between the end years and use these to calculate buoyancy. The problem here is that the result is sensitive to the end years chosen, but it does have the advantage that one only needs to have data on revenue and GDP for two years (appropriately spaced)
- (c) Calculate the growth of tax revenue, and of the base (GDP), between the average end years (e.g. the average of the first three years of the series, compared with the last three years of the series). This is less sensitive to the choice of years than the procedure in b, but requires more data.
- (d) Regress the log of tax revenue on the year, to get the average growth rate of tax revenue. Do the same for the base (e.g.). The growth rates are the coefficients of the independent variable (the year). The problem here is that it is least successful in cases where the coefficients in the regressions are not statistically significant or where the growth rate of the base is very small. It also requires more data.
- (e) Regress the log of the tax revenue on the log of the base (GDP). The coefficient on the log of the base is a measure of the tax buoyancy. This is an elegant approach that uses data for every year. Although the results are somewhat sensitive to unusual years (outliers) and to the time interval used, logarithmic transformation lowers the impact of outliers.

**Appendix B: Graphical results of CUSUM and CUSUM of Square Test of Stability of Tax Buoyancy Relations**



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