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THE ECONOMICS OF TOBACCO TAXATION IN BANGLADESH

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CONTENTS

Acknowledgements	
Executive summary	i
Chapter 1. Introduction	1
1.1 Background of the study	1
1.2 Tax structure of tobacco products in Bangladesh	2
1.3 Major issues in tobacco taxation	3
1.4 Objectives of the study	6
1.5 Format of the report	7
Chapter 2. Methodology of the study	9
2.1 Quantitative methods	9
2.2 Qualitative methods	13
Chapter 3. Tobacco use and its consequences in Bangladesh	15
3.1 Adult tobacco use	15
3.2 Youth tobacco use	21
3.3 Socio-economic dimensions of tobacco use	21
3.4 Health and economic consequences of tobacco use	23
3.5 Conclusion	24
Chapter 4. Supply of tobacco and tobacco products in Bangladesh	27
4.1 Tobacco farming	27
4.2 Manufacturing of tobacco products	30
4.3 Tobacco marketing through point-of-sale retailers	33
4.4 Conclusion	39
Chapter 5. Tobacco tax policy and administration in Bangladesh	41
5.1 Tobacco tax policy making process	41
5.2 Analysis of the present tobacco tax policy	42
5.3 Tobacco industry's influence on tobacco tax policy making	44
5.4 Note on tobacco tax policy: Way forward	45
5.5 Strengthening tax administration of NBR including tobacco tax administration	46
5.6 Imperatives for combating tobacco industries' influence on tobacco tax policy making	48
5.7 Conclusion	49

Chapter 6. Demand for tobacco products in Bangladesh	51
6.1 Existing evidence on demand for tobacco products	51
6.2 The Deaton Model	53
6.3 The data	54
6.4 Empirical results	56
6.5 Conclusion	59
Chapter 7. The impact of cigarette tax increase on government revenue and public health in Bangladesh	61
7.1 Simulation of cigarette tax increase	62
7.2 Conclusion	62
Chapter 8. Summary of findings and reccommendations	63
8.1 Summary of findings	63
8.2 Recommendations	64
Bibliography	69
Annexes	73

TABLES

Table 1.1 Tobacco tax structure in Bangladesh, FY 2019-20 3
Table 1.2 Tobacco prices and taxes, Bangladesh and selected countries 3

Table 2.1 Distribution of tobacco leaf farmers by districts 10
Table 2.2 Manufacturers of tobacco products by districts 11
Table 2.3 Retailers of tobacco products by districts 11
Table 2.4 Consumers of tobacco products by districts 12
Table 2.5 Data collection methods: At a glance 13
Table 2.6 Distribution of FGDs by districts 14
Table 2.7 Distribution of KII by districts 14

Table 3.1 Prevalence (%) of tobacco usage estimated in different national level studies 15

Table 4.1 Raw tobacco price by variety and grade, Bangladesh 29
Table 4.2 Cigarette Company Market Shares, Bangladesh, FY 2006-07 to FY 2016-17 30
Table 4.3 Segment-wise market shares of three cigarette companies, FY 2006-07 to FY 2016-17 31
Table 4.4 Buyers of tobacco products at retail outlet 36
Table 4.5 Aggregate International trade in tobacco products, Bangladesh, Year 2012-2016 39

Table 6.1 Price elasticities of demand for tobacco products in five South Asian countries 51
Table 6.2 Descriptive statistics of the variables 54
Table 6.3 Unit values and budget shares of different tobacco products 55
Table 6.4 Within-cluster regressions for unit values and budget shares 57

Table 6.5 Own-price elasticities of demand for tobacco products....58
Table 6.6 Results of TTRD study and the World Bank study....59

Table 7.1 Parameters and baseline values (FY 2017-18 as the base year)....61
Table 7.2 Simulation of cigarette tax increase....62

FIGURES

Figure 1.1 Price of 20-cigarette pack in international dollars (at purchasing power parity), 2016....4
Figure 1.2 Market shares of medium and low tiers of cigarettes (%)....4
Figure 1.3 Revenue shares of different tiers of cigarettes (%)....5
Figure 1.4 Affordability of tobacco products in Bangladesh....5
Figure 1.5 Revenue shares of tobacco products (%), FY 2016-17....6
Figure 1.6 Real growth rate of cigarette and *biri* revenue, FY 2011-12 to FY 2017-18....7

Figure 3.1 Current SLT users by types of products, 2017 (Source: GATS, 2017)....16
Figure 3.2 Percentage of SLT users by type of SLT use....16
Figure 3.3 Prevalence of tobacco use (2009 and 2017)....17
Figure 3.4 Percentage of respondents who increased tobacco use (n=492)....17
Figure 3.5 Prevalence of smoking any tobacco product, individuals aged ≥15 years....18
Figure 3.6 Percentage of current tobacco use by location (2009 and 2017)....22
Figure 3.7 Percentage of current tobacco use by wealth quintile....22

Figure 4.1 Tobacco agriculture, FY 2010-11 to FY2016-17....27
Figure 4.2 A map of Bangladesh showing the major tobacco growing districts....28
Figure 4.3 Reasons for growing tobacco in Bangladesh....29
Figure 4.4 Segment-wise market shares of cigarettes sold in Bangladesh, FY 2006-07 to FY 2017-18....32
Figure 4.5 Sale channels of cigarette, *biri* and SLT manufacturers....34
Figure 4.6 Change of brands of tobacco products in Bangladesh....34
Figure 4.7 Market shares of different retail channels in Bangladesh....35
Figure 4.8 Imports and exports of unmanufactured tobacco, 2014-2018....38

Figure 5.1 Tobacco tax policy making process in Bangladesh....42

Figure 6.1 Percentage of households consuming tobacco products by income deciles....55
Figure 6.2 Budget shares of consuming households by income deciles....56

ACRONYMS

ADR	Alternative Dispute Resolution
AKTL	Abul Khair Tobacco Limited
BATB	British American Tobacco Bangladesh
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BIGD	Brac Institute of Governance and Development
CSR	Corporate Social Responsibility
DALY	Disability Adjusted Life Years
DTI	Dhaka Tobacco Industries
FCTC	Framework Convention on Tobacco Control
FGD	Focus Group Discussion
GATS	Global Adult Tobacco Survey
GDP	Gross Domestic Product
GYTS	Global Youth Tobacco Survey
HDS	Health Development Surcharge
HIES	Household Income and Expenditure Survey
IHD	Ischemic Heart Disease
KII	Key Informant Interview
MRP	Maximum Retail Price
NBR	National Board of Revenue
SD	Supplementary Duty
SHS	Second Hand Smoke
SLT	Smokeless Tobacco
TTRD	Tobacco Tax Research and Dissemination
UIC	University of Illinois at Chicago
VAT	Value Added Tax
WHO	World Health Organization

EXECUTIVE SUMMARY

INTRODUCTION

The study details the present structure of tobacco taxes in Bangladesh, estimates the own- and cross-price elasticities of demand for tobacco products, and simulates the impact of cigarette tax increases on government revenue and public health with the goal of recommending an effective tobacco tax policy for Bangladesh. To examine the tobacco tax structure, the team used secondary data from the National Board of Revenue (NBR) and other relevant data. Then in order to analyze the data, the team applied the Deaton model, which exploits price variation across geographical space in household survey data to estimate price elasticities. The research used the Household Income and Expenditure Surveys from 2010 and 2016, conducted by the Bangladesh Bureau of Statistics, to estimate price elasticities. Lastly, the team used estimates of own-price elasticity of demand in the present study and Nargis *et al.*, 2014 to simulate various revenue and health outcomes of policy interventions.

TOBACCO USE AND ITS CONSEQUENCES

Bangladesh is one of the largest tobacco consuming countries in the world, with 37.8 million (35.3 percent) adults consuming tobacco products[1]. The prevalence of tobacco usage in Bangladesh differs by gender. Smoking prevalence is far higher among males (36.2 percent) than females (0.8 percent). The use of smokeless tobacco (SLT) is much higher among females (24.8 percent) than males (16.2 percent). It was also found that there was variation in prevalence of tobacco products between rural and urban areas. While the prevalence of *biri* use declined substantially from 2009 to 2017, the use of cigarettes and SLT products remained almost static over the same period. In 2018, about 0.126 million people died due to tobacco-attributable diseases, which constituted 13.5 percent of all deaths recorded in that year.[2] The overall economic cost of tobacco use was estimated to be 1.4 percent of GDP in 2018.

TAX STRUCTURE OF TOBACCO PRODUCTS

To analyze the economics of tobacco taxation in Bangladesh, the team examined the current tax structure of tobacco products. The tobacco tax structure has implications for how increased tobacco taxes lead to reduced tobacco use, higher government revenue, and improved public health. The government has developed a complex multi-tiered *ad valorem* tobacco tax system, which has created a large number of problems. First, as a direct result of the complex multi-tiered structure, compared with

many developing countries, tobacco prices and taxes are much lower in Bangladesh. Second, price differentials exist across price tiers. This has in turn led to the substitution to cheaper brands in response to increased taxes, creating large gaps in revenue collection. Obviously, a low-priced tier has yielded low revenue. Third, different tax rates for different tobacco products provide incentives for tax avoidance, as manufacturers can alter their pricing or production decisions in order to avoid higher tax liabilities. This in turn has led to revenue loss for the government. Fourth, there is an increasing trend in the affordability of tobacco products. This is because the real incomes of the buyers have outpaced increases in tobacco prices and taxes. Additionally, SLT is an area of growing concern for public health; it also holds the potential for revenue mobilization. However, there are challenges in *regulating* SLT products due to the heterogeneity of SLT products, which are often manufactured in small and unlicensed units, with tax evasion and illicit trade being common. Moreover, the lack of data on SLT products makes enforcement and monitoring difficult.

TOBACCO GROWING, MANUFACTURING AND POINT OF SALE RETAILERS

At present, tobacco cultivation is popular in the northern and hilly southeastern parts of Bangladesh; and is concentrated in the districts of Rangpur, Lalmonirhat, Nilphamari, Kushtia, Manikganj, Tangail, Bandarban and Cox's Bazar. Although widely grown, tobacco is a relatively minor crop in the overall agricultural production in Bangladesh. The study shows that the perceived high profit margin and high demand are at present the two main reasons for growing tobacco. Huge volumes of cigarettes (84 billion sticks) are supplied mainly by three companies-one multinational, British American Tobacco Bangladesh (BATB), and two are locally owned companies- Dhaka Tobacco Industries (DTI) and the Abul Khair Tobacco Limited (AKTL). Since FY 2014-15, BATB has held the top position in all four segments of cigarettes in the market.

SLT is manufactured mostly in the informal sector, which is complicated by the SLT heterogeneity, due to the prevalence of tax evasion and illicit trade. The study shows that about 97 percent of tobacco sales take place through grocery stores, tea stalls, *paan* (betel leaf) shops, and street vendors. The study also shows that tobacco companies incentivize retailers in terms of price reduction for large orders, gifts, promotional products, free samples, and cash incentives.

DEMAND FOR TOBACCO PRODUCTS

The cigarette market in Bangladesh is dominated by low-priced, high-tar cigarettes. On one hand, there has been a substantial decline in *biri* smoking. This can mostly be attributed to the structural decline in *biri* demand due to shifting composition of smoked tobacco products from *biri* to low-priced cigarettes in response to price and tax increases. Among the buyers of tobacco products, adult males and adolescent males are found to buy most of the cigarettes and *biris*. On the contrary, nearly 37 percent of all customers who buy SLT products are adult and adolescent females.

The estimates of own-price elasticities of demand show that the demand for cigarettes and *biris* is elastic, while that for SLT products is inelastic. Estimates of own-price elasticities of demand for cigarettes and *biris* in the study is substantially larger than most of the existing evidence, while the estimate of own-price elasticity for SLT products is consistent with existing evidence. The results suggest that the overall consumption of smoking tobacco products responds significantly to price changes. The results also show that rural households are more responsive to changes in prices of cigarettes than urban households. Based on

the household expenditure survey, households belonging to the lowest three quintiles (i.e., the poorest 60 percent) are more responsive to changes in prices of cigarettes than households of the fourth and fifth quintiles (the richest 40 percent). This is expected, as poor households respond more to changes in prices of cigarettes than rich households. Therefore, using the tax system to substantially increase the prices of tobacco products would lead to a substantial reduction in tobacco use, particularly among the poor while increasing government revenue. Interestingly, the survey results for SLT products show that urban households are as responsive as rural ones to price changes of SLT products.

IMPACT OF CIGARETTE PRICE INCREASES ON GOVERNMENT REVENUE AND PUBLIC HEALTH

The policy interventions that are simulated for FY 2019-20 is a mixed system of tobacco taxation, which takes the form of increasing the supplementary duty, along with imposing a specific tax, while reducing the existing four price tiers of cigarettes to two. The estimates of price elasticity of demand (-1.03) found from the study and Nargis *et al.*, 2014 (-0.49) have been used to simulate the various revenue and health outcomes of the policy interventions. In both scenarios for FY 2019-2020, the price per 10 sticks of low and medium tiers of cigarettes are proposed to be set at BDT 50 and the supplementary duty is proposed to be set at 60 percent; while the prices per 10 sticks of high and premium tier of cigarettes are proposed to be set at BDT 105, and the supplementary duty is proposed to be set at 65 percent.

Following the scenarios above, the high estimate of price elasticity (-1.03) found in the study led to the greatest health impact: it is expected to reduce the number of smokers by 3.22 million and avert the deaths of 1.06 million over the period of one year; while the revenue growth is projected at 12.1 percent. On the other hand, the low estimate of price elasticity (-0.49) of the other study is expected to lead to a higher revenue growth rate at 31.43 percent, but a more modest public health impact: it is expected to reduce the number of smokers by 1.27 million; and 0.42 million deaths would be averted over the period of one year. As expected, the overall results from the two elasticity estimates suggest that higher sensitivity to price changes results in higher health benefits, but lower revenue outcome, and lower sensitivity would increase revenue growth, but at the cost of lower health benefits. In general, the simulation results show that a policy intervention of reducing the existing four price tiers of cigarettes into two and introducing a specific tax component for all tiers would serve the dual purpose of reducing tobacco consumption and increasing government revenue.

The findings of the study indicate that the increase in the prices of cigarettes and *biris* led to more than proportionate reduction in their consumption. On the other hand, the increase in the price of SLT products leads to a much less than proportionate reduction in the consumption of SLT products. However, all tax increases would generate increased revenue, because tobacco users would have to be extraordinarily price sensitive for consumption declines to exceed the rate of tax increases. Overall, the results suggest that using the tax system to increase the prices of cigarettes, *biris*, and SLT products would lead to a substantial reduction in tobacco use while increasing government revenue.

RECOMMENDATIONS

1. Phasing out of the existing multi-tiered *ad valorem* tax system of cigarettes

2. Replacing the existing *ad valorem* taxes with specific taxes by amending the existing law. The government can first move towards a system of uniform specific tax structure by reducing the number of the current cigarette price tiers and adding a specific tax to the existing *ad valorem* tax structure

3. Increasing *biri* taxes substantially through a uniform *biri* specific excise tax that significantly raises *biri* prices in order to reduce its usage

4. Formalizing the SLT market in order to address the problems of informality and heterogeneity of SLT products
5. Harmonizing tax rates across all tobacco products in order to avoid substitution of one tobacco product by another

6. Implementing annual adjustments to specific excise tax rates for retaining their real value over time

7. Earmarking tobacco tax revenue for health promotion and comprehensive tobacco control

8. Strengthening NBR by reforming its legal framework and enhancing its institutional capacity

9. Undertaking strong advocacy programs to convince the government to address the conflict of interest in tobacco taxation

[1] World Health Organization, 2018. Global Adult Tobacco Survey, 2017 Available at: www.searo.who.int/bangladesh/gatsbangladesh

[2] Faruque GM, Wadood SN, Ahmed M, Parven R, Huq I. *et al.* 2019. The economic cost of tobacco use in Bangladesh: A health cost approach. Bangladesh Cancer Society.

CHAPTER ONE

INTRODUCTION

[1.1] BACKGROUND OF THE STUDY

With 37.8 million (35.3 percent) adults consuming tobacco products (cigarette, *biri*, smokeless tobacco (SLT) products, or others), Bangladesh is one of the largest tobacco-consuming countries in the world.[1] Tobacco consumption in Bangladesh varies by gender. Smoking prevalence is far higher among males (36.2 percent) than females (0.8 percent). However, the use of SLT is much higher among females (24.8 percent) than males (16.2 percent) in Bangladesh. Bangladesh has achieved remarkable advancement in the reduction of overall tobacco consumption by 18.5 percent from 2009 to 2017. The success may be attributed to both price and non-price measures taken by the government, and civil society such as NGOs and the media. The prevalence of tobacco consumption in both rural and urban areas declined substantially over the same period.

Although the overall prevalence of tobacco usage for adults declined from 2009 to 2017, the prevalence of cigarettes remained almost static over the years (from 14.2 percent in 2009 to 14.0 percent in 2017). In the same period of time the prevalence of SLT use declined marginally among women from 27.9 percent of adults in 2009 to 24.86 percent in 2017. The prevalence of SLT products is particularly alarming, because Bangladesh ranks the second (next to India) in 34 high SLT burden countries.[2] The high rates of tobacco usage in Bangladesh impose an increasing health and economic burden on the country. In 2018, about 0.126 million people died due to tobacco-attributable diseases, which constituted 13.5 percent of all deaths in that year.[3] The overall economic cost of tobacco use was estimated at BDT 305.70 billion ($3.6 billion USD), that is 1.4 percent of GDP in 2018.

While Bangladesh has achieved commendable success in reducing the prevalence of tobacco use, the prevalence of cigarettes and SLT products still remains very high. Evidence shows that the prevalence of smoking is higher when compared to many other countries in the region.[4] The high level of tobacco use poses the dual challenge of protecting public health and enhancing government revenue. In analyzing the economic impact of tobacco taxation, it is pertinent to discuss the existing tax structure of tobacco products in Bangladesh as well as the issues that emanate from it. The structure of tobacco taxes has implications on how increased taxes lead to a reduction in tobacco

use, higher government revenue generation, and an improvement in public health.

[1.2] TAX STRUCTURE OF TOBACCO PRODUCTS IN BANGLADESH

Tobacco taxes are governed by the Value-Added Tax and Supplementary Duty Act, 2012. The prices of cigarettes by tiers are determined by the National Board of Revenue (NBR) of the Government of Bangladesh and are used as the tax base for calculating tax liability of cigarette manufacturers. Based on these administered prices by tiers, cigarettes are categorized into four tiers – premium, high, medium and low. The government has developed a complex tax structure of cigarettes with the following characteristics:

- Administered retail prices of four tiers of cigarettes
- A complex multi-tiered *ad valorem* excise tax, (value-added tax (VAT), and supplementary duty (SD)
- Large variations in tax bases and tax rates between cigarette brands (taxed under four tiers)
- A standard VAT of 15 percent of retail price imposed on the cigarettes of all brands
- A health development surcharge (HDS) of 1 percent of maximum retail price (MRP).

Biris are divided into filtered *biri* and non-filtered *biri*. The government introduced the MRP replacing tariff value since FY 2017-18. The MRP of filtered *biri* increased from BDT 15 per 20 sticks in FY 2018-19 to BDT 17 per 20 sticks in FY 2019-2020, with SD increasing from 35 percent to 40 percent. On the other hand, the MRP of non-filtered *biri* increased from BDT 12.50 per 25 sticks in FY 2018-19 to BDT 14 per 25 sticks in FY 2019-2020 with SD increasing from 30 percent to 35 percent. So, the research finds variation in prices and taxes between the two types of *biris*.

According to the WHO Framework Convention on Tobacco Control (FCTC), SLT is a tobacco product that is consumed in un-burnt form, either orally or through the nasal passage. *Zarda* (chewing tobacco) and *gul* (tooth powder) are the most common forms of SLT products in the country. SLT products were historically not taxed in Bangladesh, because they were treated as cottage industries. In June 2003, the government took SLT out of the purview of cottage industries, and SLT was taxed for the first time beginning in FY 2003-04. The government introduced maximum retail price (MRP) for SLT products replacing tariff value in FY 2019-2020. The current retail price per 10 grams of *zarda* is BDT 30 with 50 percent SD, while the retail price of *gul* is BDT 15 per 10 grams with 50 percent SD.

There are large variations in prices and total tax incidence (TTI) within a tobacco product, as well as among the three major products, namely cigarettes, *biris* and SLT products (Table 1.1).

Table 1.1 Tobacco tax structure in Bangladesh, FY 2019-20

Tobacco products	Category	Tax base	Price (BDT)	VAT (percent)	SD (percent)	HDS (percent)	TTI (percent)
Cigarette (10 sticks)	Low	MRP	37+	15	55	1	71
	Medium		63+	15	65	1	81
	High		93+	15	65	1	81
	Premium		123+	15	65	1	81
Biri (sticks)	Without filter (25 sticks)	MRP	14	15	35	1	51
	With filter (20 sticks)		17	15	40	1	56
Smokeless (Pouch of 10 grams)	*Zarda*	MRP	30	15	50	1	66
	Gul		15	15	50	1	66

Source: National Board of Revenue (2019)
Notes: In case of cigarettes, *biris* and SLT products, MRP is inclusive of all taxes.

[1.3] MAJOR ISSUES IN TOBACCO TAXATION

1.3.1 Tobacco prices and taxes

The complexity of the multi-tiered *ad valorem* excise tax system has created a number of problems. First, the base on which the *ad valorem* tax is calculated can be manipulated. This in turns tends to result in lower tobacco prices than the system that relies on a specific excise tax, which results in higher tobacco prices and taxes. Compared with several developing countries, tobacco prices and taxes are much lower in Bangladesh (Table 1.2). The prices for the most widely sold brands are expressed in international purchasing power parity USD. Cigarette prices and taxes in Bangladesh and selected countries are given in Table 1.2 (WHO, 2015).

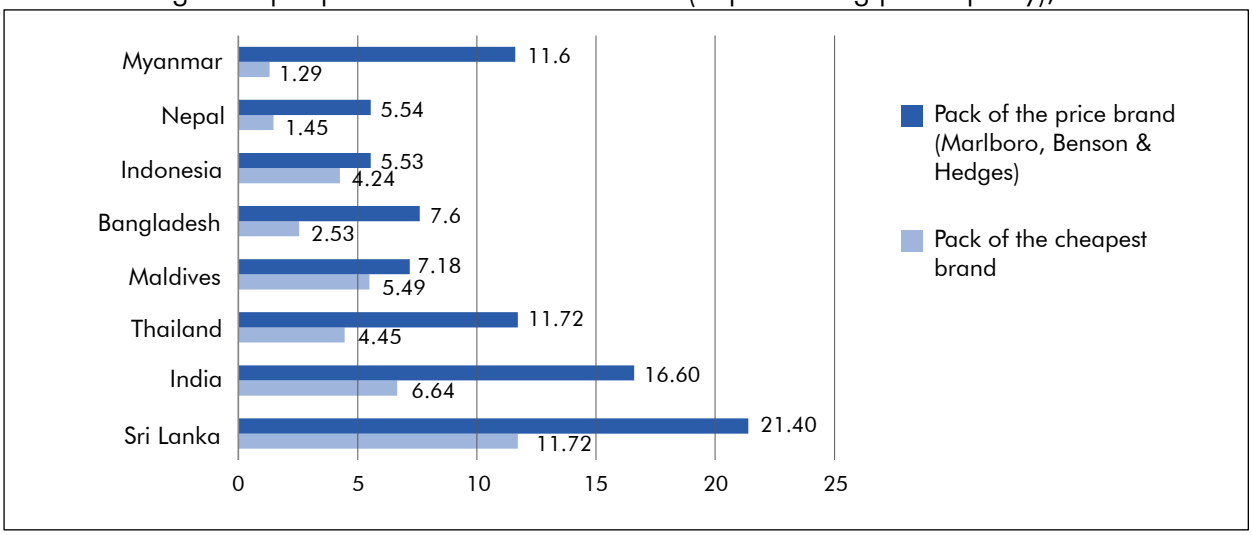
Table 1.2.
Cigarette prices and taxes, Bangladesh and selected countries

	Cigarette	
	Price	Taxes, percent of retail price
Pakistan	2.2	60
Bangladesh	3.4	77
Indonesia	5.2	57
Nepal	5.7	26
Thailand	7.1	74
India	9.2	43
Sri Lanka	19.6	62

Source: World Health Organization, 2015

When analyzing the cheapest and the most expensive brands of cigarettes in Bangladesh vis-à-vis neighboring countries, it is found that cigarettes are cheaper in Bangladesh. The prices of cigarettes (both the cheapest and the most expensive brands) per pack in USD in Bangladesh vis-à-vis several neighboring countries are shown in Figure 1.1.[5]

Figure 1.1.
Price of 20-cigarette per pack in international dollars (at purchasing power parity), 2018

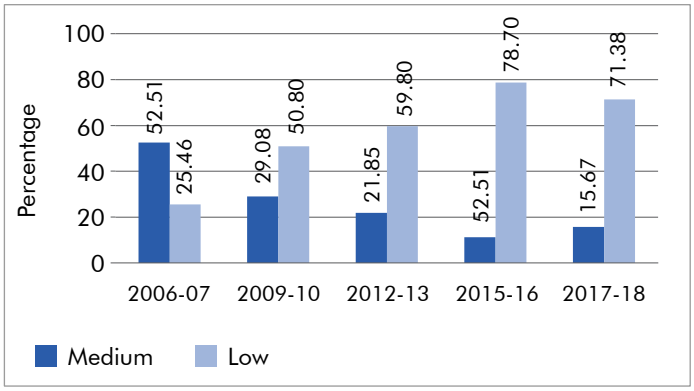


Source: WHO, 2019

[1.3.2]
Product substitution

Second, large price gaps between brands create opportunities for consumers to switch to cheaper brands in response to increased taxes.[6] In Bangladesh, the differential tax treatment has led to product substitution from the medium to the low tier of cigarettes. The market share of the low tier increased from about 25 percent in FY 2006-07 to 71 percent in FY 2017-18. While, the market share of the medium tier declined from about 53 percent in FY 2006-07 to 16 percent in FY 2017-18 (Figure 1.2).

Figure 1.2.
Market shares of medium and low tiers of cigarettes (percent), FY 2006-07 to FY 2017-18

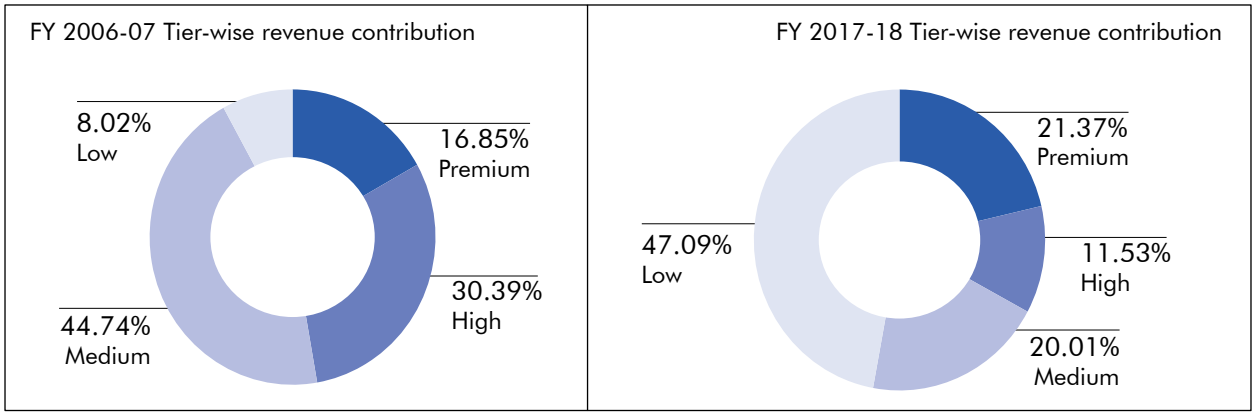


Source: National Board of Revenue (2018)

The substitution effect produces large gaps in the collection of revenue. This is evident from the fact that the revenue share of the low tier increased from 8 percent in FY 2006-07 to approximately 47 percent in FY 2017-18. This is compared with the revenue share of the medium tier, which declined from 45 percent in FY 2006-07 to about 20 percent in FY 2017-18 (Figure 1.3). The overwhelming share of low tier cigarettes in the market leads to loss of government revenue, as low-priced tiers yield lower revenue.

Lastly, the decrease in the smoking rate from 23.0 percent in 2009 to 18 percent in 2017 is reflected largely in the reduction of *biri* smoking, from 11.2 percent in 2009 to 5.0 percent in 2017 (GATS, 2017). The tax-paid sale of *biris* was 51.19 billion sticks in FY 2012-13. By FY 2016-17, tax-paid sale of *biris* decreased remarkably by 26.7 percent in four years to the level of 37.53 billion sticks. An insignificant part of this decrease (14 percent) can be explained by the *biri* price increase

Figure 1.3.
Revenue shares of different tiers of cigarettes (percent), FY 2006-07 to FY 2017-18



Source: National Board of Revenue (2018)

over this period. The residual 86 percent decrease can be attributed to structural decline in *biri* demand due to shifting composition of smoked tobacco products in Bangladesh from *biris* to cigarettes and other causes.[7]

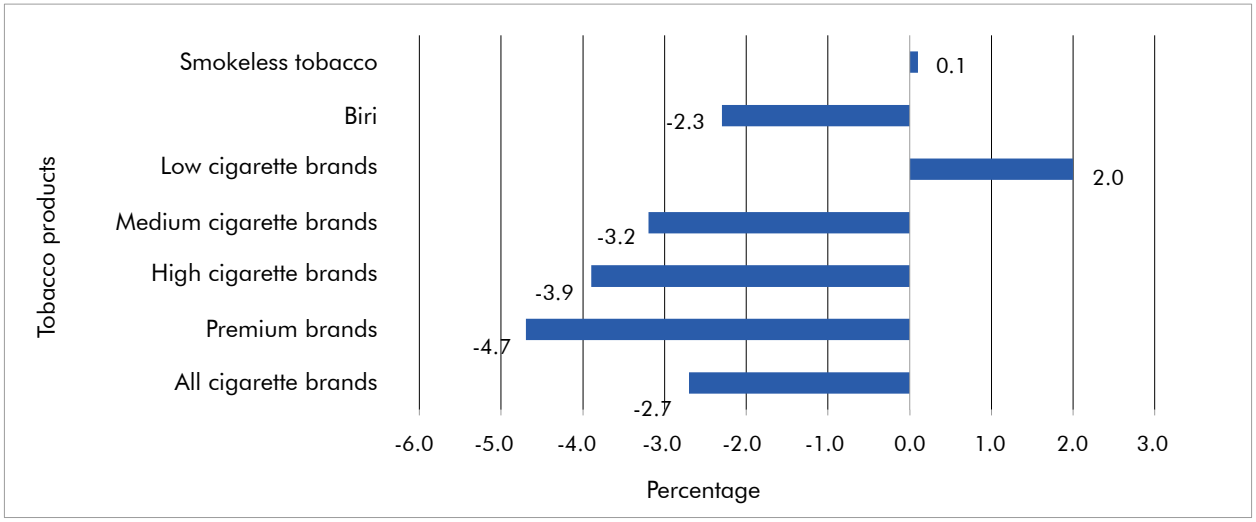
[1.3.3]
Affordability of tobacco products

Tobacco products are becoming increasingly affordable in Bangladesh. The following trends are observed in the affordability of tobacco products in Bangladesh from 2009 to 2015[8]:

1. The affordability of cigarettes increased overall and across all types of brands.
2. The affordability of *biris* increased.
3. There was no change in the affordability of SLT.

The affordability of tobacco products in Bangladesh is shown in Figure 1.4.

Figure 1.4.
Affordability of tobacco products in Bangladesh



Source: Nargis et al., 2018

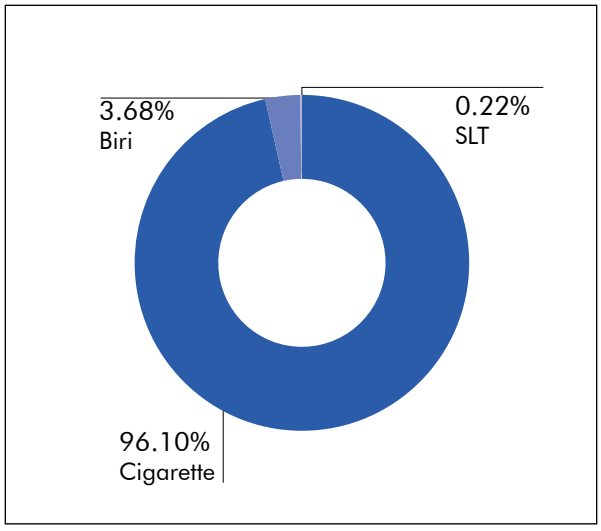
[1.3.4]
Informality and heterogeneity of SLT products

SLT is an area of growing concern for public health, but also holds the potential for revenue mobilization. The impact of SLT products on its users is formidable in terms of health, economic, social, environmental, and demographic costs.[9] However, there is the challenge of regulating SLT products because of the heterogeneity of SLT products. Moreover, the lack of data on SLT products makes the enforcement and monitoring difficult.

[1.3.5]
Tobacco taxation and government revenue

Tax revenues from taxes on tobacco products contributed BDT 22,866.91 crore (about 2.74 billion) USD in FY 2017-18, which is about 11 percent of total tax revenues, and more than 1 percent of GDP. The revenue shares from taxes on cigarettes, *biris* and SLT products are 96.10 percent, 3.68 percent and 0.22 percent, respectively (Figure 1.5).

Figure 1.5.
Revenue shares of tobacco products (percent), FY 2017-18



Source: National Board of Revenue (2018)

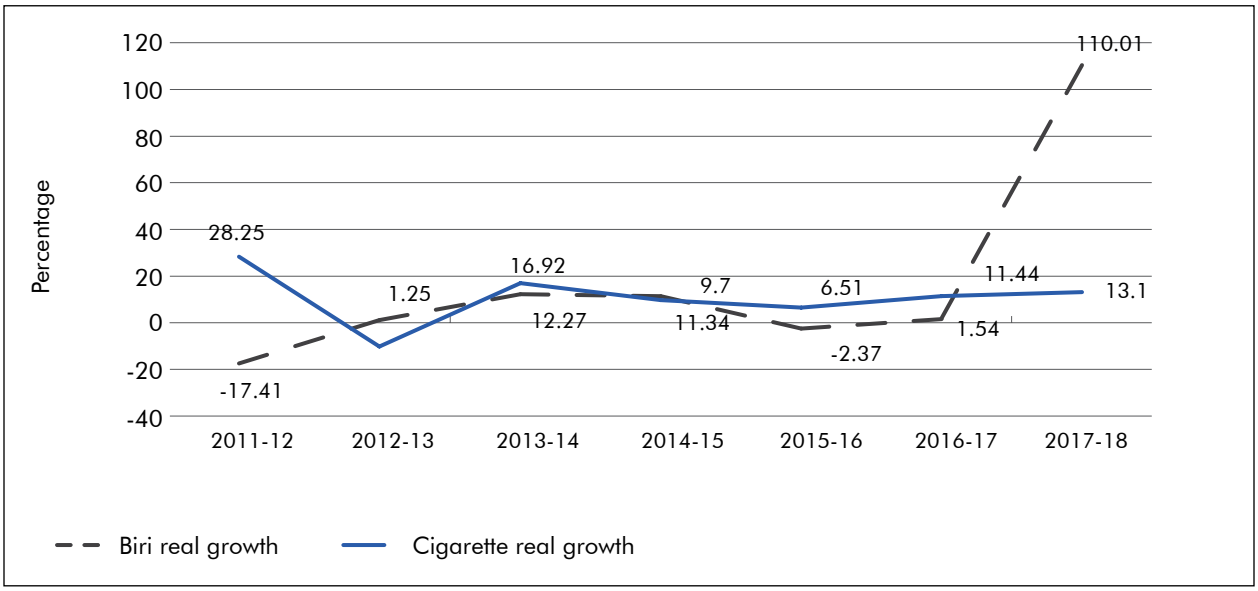
The average annual growth rate (adjusted for inflation) of cigarette tax revenue from FY 2011-12 to FY 2017-18 is about 11 percent. The real growth of revenue from *biri* taxes during the period from FY 2011-12 to FY 2016-17 was only 1 percent. The real growth of revenue from *biri* taxes was about 110 percent in FY 2017-18 as a result of changing the tax base of *biris*, from ex-factory to tariff value in FY 2017-18. This has made the average real growth rate of *biri* tax revenue about 17 percent during the period from FY 2011-12 to FY 2017-18 (Figure 1.6).

[1.4]
OBJECTIVES OF THE STUDY

- Examine the tax structure of tobacco products in Bangladesh
- Estimate the own- and cross-price elasticities of demand for tobacco products
- Simulate the impact of cigarette tax increases on government revenue and public health in order to suggest an appropriate tobacco tax policy
- Propose specific policy recommendations on tobacco tax policy and administrative reforms

For the first time in Bangladesh, the study has applied the Deaton model, which employs a technique that exploits price variation over geographical space to estimate a system of price elasticities using household survey data. Second, the study has analyzed both aspects of tobacco tax policy and tax administration for effective policymaking and enforcement.

Figure 1.6.
Real growth rate of cigarette and *biri* tax revenue, FY 2011-12 to FY 2017-18



Source: National Board of Revenue (2018)

[1.5] FORMAT OF THE REPORT

Chapter I delineates the background, tobacco tax structure, major issues, and objectives of the report. The methodology of the study is written in Chapter II. Chapter III deals with tobacco use and its consequences. The supply chain of tobacco and tobacco products is explained in Chapter IV. Chapter V discusses tobacco tax policy and tax administration in Bangladesh. The estimates of own- and cross-price elasticities of demand for cigarettes, *biris*, and SLT products using the Deaton model are given in Chapter VI. Chapter VII simulates the impact of cigarette price increases on government revenue and public health under different scenarios. Chapter VIII concludes the report with a summary of findings and specific recommendations on tobacco tax policy and administrative reforms.

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2 Mehrotra, R., Sinha, D.N. and Szilagyi, T., 2017. Global smokeless tobacco control policies and their implementation. *Noida: National Institute of Cancer Prevention and Research*.

3 Faruque GM, Wadood SN, Ahmed M, Parven R, Huq I. *et al*. 2019. The economic cost of tobacco use in Bangladesh: A health cost approach. Bangladesh Cancer Society.

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8 Nargis, N., Stoklosa, M., Drope, J., Fong, G.T., Quah, A.C., Driezen, P., Shang, C., Chaloupka, F.J. and Hussain, A.G., 2018. Trend in the affordability of tobacco products in Bangladesh: findings from the ITC Bangladesh Surveys. *Tobacco control, 28* (Suppl 1), pp.s20-s30.

9 Gupta, P.C., Arora, M., Sinha, D., Asma, S. and Parascondola, M., 2012. Smokeless tobacco and public health in India. *Government of India, Ministry of Health and Family Welfare*, pp.1-14.

CHAPTER TWO

METHODOLOGY OF THE STUDY

The study adopted both quantitative and qualitative research methods

[2.1] QUANTITATIVE METHODS

[2.1.1] Estimating price elasticities of demand for tobacco products

Price elasticity is the key parameter to ascertain the change in demand of a commodity with respect to changes in price. Own-price elasticity measures the responsiveness of the quantity demanded of a commodity to its own price changes. Cross-price elasticity shows the responsiveness of the quantity demanded of a good to price changes of its substitutes or complements. In the case of demand for tobacco products, such as cigarettes, *biris*, and SLT products, both own-price and cross-price elasticities are important for determining the responsiveness of a product to price changes of its own product, as well as its substitutes or complements. The study uses the Deaton Model (1987, 1990, and 1997) for estimating own and cross-price elasticity of demand for tobacco products in Bangladesh.[10] The Deaton Model is based on the theory of consumer behavior where households are assumed to choose both quantity and quality, so that expenditure on a good reflects quantity, quality, and price. The key aspect of using the Deaton Model is to estimate price elasticities of demand for tobacco products with spatial variation in budget shares of households and unit values with the household survey data. The budget share of a household is defined as the expenditure of the household on a tobacco product divided by the household's total expenditure on food. Unit value is a household's expenditure on a tobacco product divided by the quantity purchased of that product.

The study used the Household Income and Expenditure Surveys (HIES, 2010[11] and HIES 2016[12]) data of Bangladesh Bureau of Statistics (BBS) for estimating own- and cross-price elasticities of demand for cigarettes, *biris*, and SLT products. The HIES 2010 data comprises a total of 12,240 households, of which 7,840 (64.05 percent) households are rural and 4,400 (35.95 percent) are urban. The HIES 2016 data is about four times larger than those of HIES 2010, with a total of 45,702 households, of which 31,827 (69.64 percent) are rural and 13,875 (30.36 percent) are urban. Moreover, the study simulates the impact of cigarette tax increases on government revenue, and public health under different scenarios.

[2.1.2]
Understanding the supply chain of tobacco and tobacco products

In order to understand the supply chain of tobacco and tobacco products at a single point in time, the team conducted cross-sectional surveys, where quantitative data was collected from tobacco leaf farmers, manufacturers of tobacco products, point-of-sale retailers, and consumers under the Tobacco Tax Research and Dissemination (TTRD) Project of the BIGD, BRAC University. Information was collected from the highest growing (farmers) and consuming districts (point-of-sale retailers and consumers). Four questionnaires were developed and administered for collecting data from each of the four categories of stakeholders, namely, farmers, manufacturers, point-of-sale retailers, and consumers of tobacco products. Before finalizing the survey questionnaires, pre-testing was undertaken to identify inconsistencies as well as difficulties of the questionnaire. The pre-testing of questionnaires helped the research team to finalize the questionnaire by incorporating findings from the pre-test. Any changes or modifications to the questionnaire that arose from the pilot interviews were discussed among the research team. The survey took place from May to June 2018.

[2.1.2.1]
Survey of farmers

A survey of 1,000 farmers was conducted to understand the underlying reasons of the farmers to produce tobacco leaf, and whether and to what extent tobacco taxation influences tobacco farming. Available evidence shows that tobacco cultivation is popular in Kushtia, Rangpur, and the districts of Chattogram Hill Tracts (Census of Agriculture, 2008,[13] and Yearbook of Agricultural Statistics, 2017[14]). Tobacco cultivation also extends to Jhenaidah, Nilphamari, Lalmonirhat, Manikganj, and Tangail districts. Based on the data of the Census of Agriculture, 2008, and Yearbooks of Agricultural Statistics 2017 of BBS, the team prepared a list of tobacco cultivating districts with the land usage for tobacco, number of farmers involved in tobacco cultivation, and amount produced. From there, seven districts were selected. The seven districts have the highest land usage for tobacco farming to carry out the survey. The sample size was determined proportionately to the amount of tobacco leaf produced in a district. The distribution of tobacco leaf farmers interviewed in seven districts is given in Table 2.1.

Table 2.1.
Distribution of tobacco leaf farmers by districts

District Name	Number of Farmers
Bandarban	100
Kushtia	200
Lalmonirhat	200
Manikganj	75
Nilphamari	100
Rangpur	300
Tangail	25
Total	1000

Source: TTRD Sample Survey, 2018

[2.1.2.2]
Manufacturer survey

From NBR data, the team prepared a list of manufacturers of cigarettes, *biris*, and SLT products with their amount of sales in 2017. The districts with the highest concentration of manufacturers of cigarettes, biris, and SLT products were selected. The sample size was determined proportionately to the number of manufacturers in each category in each selected district. In the original design of the study, it was planned to select 500 manufacturers of different types of tobacco products with the highest sale of tobacco products in 2017. However, the team had to redesign the survey of manufacturers of SLT products because most of the NBR data for SLT manufacturers, which NBR gave to the team, was proven to

be incorrect. Consequently, the team ended up with 192 manufacturers in 26 districts with the following distribution:

- 10 cigarette manufacturers
- 52 *biri* manufacturers
- 120 SLT manufacturers
- 10 dual manufacturers

The survey has contributed to the exploration of how tobacco tax has influenced tobacco manufacturing over the years, and how tax increases influence the market by type of tobacco products. Table 2.2 shows the distribution of 192 manufacturers of tobacco products in 26 districts.

Table 2.2.
Manufacturers of tobacco products by districts

District	Cigarette	*Biri*	SLT	Dual manufacturers	Total observations
Barishal	0	3	2	0	5
Bogura	0	1	3	0	4
Barguna	0	0	2	0	2
Chandpur	0	0	7	0	7
Chattogram	1	0	0	1	2
Chuadanga	0	0	2	0	2
Cumilla	1	0	2	0	3
Dhaka	0	0	15	0	15
Gazipur	2	1	0	0	3
Jashore	0	1	6	0	7
Jhenaidah	0	0	1	0	1
Khulna	0	1	2	0	3
Kishoreganj	2	2	6	1	11
Kushtia	0	7	14	0	21
Lalmonirhat	0	4	2	0	6
Mymensingh	0	3	12	0	15
Narayanganj	0	0	1	0	1
Nilphamari	0	1	8	0	9
Noakhali	0	0	1	0	1
Narsingdi	0	0	1	0	1
Pabna	0	11	1	0	12
Patuakhali	0	0	4	0	4
Rajshahi	0	1	2	0	3
Rangpur	4	7	22	8	41
Sirajganj	0	6	4	0	10
Tangail	0	3	0	0	3
Total	10	52	120	10	192

Source: TTRD Sample Survey, 2018

[2.1.2.3]
Retailer survey

With NBR data on the volume of sticks sold for cigarettes and *biris* and the amount of SLT products sold in districts, the team selected the districts with the highest number of retailers for all tobacco products (cigarettes, *biris* ,and SLT products) for the point of sale retailer survey. The retailer survey was carried out with 997 retailers in 14 districts (Table 2.3). The survey helped the researchers to understand the proportion of market share for different types of tobacco products, whether tobacco tax has influenced tobacco sale over the years (by type of products), and the facilitators and/or barriers for increase (or decrease) in supply of tobacco products in the market.

Table 2.3.
Retailers of tobacco products by districts

Districts	Number of Retailers
Barishal	74
Chattogram	147
Dhaka	297
Jashore	25
Khulna	75
Kushtia	98
Lalmonirhat	25
Mymensingh	50
Nilphamari	25
Patuakhali	5
Rajshahi	50
Rangpur	99
Sylhet	25
Cumilla	2
Total	997

Source: TTRD Sample Survey, 2018

[2.1.2.4]
Consumer survey

The key objective of the consumer survey was to explore the dynamics of demand for different types of tobacco products. The consumer survey attempted to address the following key questions:

- What factors have influenced the demand for tobacco products (by type of products)?
- Is there any difference in demand for tobacco products by age, gender, education, occupation, location, and income level?
- What factors are responsible for influencing demand for tobacco products by age, gender, education, occupation, location and income level?
- How has tobacco tax influenced tobacco consumption over the years (by type of products, by age, education, occupation, gender, rural/urban, income level)?

Selection of study area

The selection of the study areas for the consumer surveys was based on the sales data of the tobacco products of NBR. The volume of sticks sold for cigarettes and *biris*, and amount of SLT products sold in the respective districts were used as proxy indicators to select the districts. Out of all divisions in Bangladesh, 16 districts were covered for the survey. Based on the sales data of NBR, the districts with the highest number of consumers for all tobacco products (cigarette, *biri*, and SLT products) across Bangladesh were selected.

Selection of respondents

A total of 2,847 consumers were selected randomly from the 16 districts. The sample size was determined proportionately to the number of consumers in each category (cigarettes, *biris*, and SLT products) in a selected district. Each district was selected as a stratum. On average, each district was divided into 10 clusters. A systematic random sampling method was adopted to select the households within the clusters of the district. Regarding SLT, one in every four households were interviewed in a cluster. For cigarettes and *biris*, smokers were interviewed both inside and outside households using the principle of one in four smokers in a cluster. The survey used the definitions of GATS 2009. The summaries of 2,847 consumers of tobacco products interviewed in 16 districts are given below:

- 734 cigarette smokers
- 723 *biri* smokers
- 1326 SLT consumers
- 64 multiple product consumers

The distribution of 2,847 respondents of consumers in 16 districts is shown in Table 2.4.

Table 2.4.
Consumers of tobacco products by districts

District	Cigarette	*Biri*	SLT	Multiple consumers	Total observations
Barishal	42	28	74	8	152
Bogura	0	49	50	0	99
Chattogram	150	0	93	1	244
Dhaka	262	0	339	4	605
Jashore	0	74	44	2	120
Khulna	50	0	57	0	107
Kishorganj	0	46	49	2	97
Kushtia	0	97	152	3	252
Lalmonirhat	0	60	99	15	174
Mymensingh	2	49	75	6	132
Narayanganj	39	0	40	1	80
Nilphamari	0	65	102	11	178
Rajshahi	48	0	0	1	49
Rangpur	100	157	152	1	410
Sylhet	41	50	0	9	100
Tangail	0	48	0	0	48
Total	734	723	1326	64	2847

Source: TTRD Sample Survey, 2018

The total sample size is 5,036, with the highest number of consumers (56.53 percent), followed by farmers (19.86 percent), closely followed by retailers (19.80 percent), and manufacturers (3.81 percent) (Table 2.5).

Table 2.5.
Data collection methods: At a glance

Survey of Stakeholders	Sample size	Percentage
Farmers	1000	19.86
Manufacturers	192	3.81
Retailers	997	19.80
Consumers	2847	56.53
Total	5036	100.00

Source: TTRD Sample Survey, 2018

Two limitations of consumer survey data were detected. First, it covered the characteristics of consumers of tobacco products only, not the households. Second, the data was not nationally representative.

[2.1.3]
Desk review and experience of working at the National Board of Revenue (NBR)

The research team conducted a desk review, collated and consolidated the findings and recommendations of policy documents, research reports, journal articles, and other relevant materials, to understand the current tax structure, tax rate, challenges of existing tax system, and best practices worldwide. Moreover, some members of the research team, who worked at NBR for a long period of time, and thereby, developed insights into the tobacco tax policy making process also contributed to the study.

[2.1.4]
Secondary data collection

For examining the tobacco tax structure in Bangladesh, the team collected data on tobacco tax, health surcharge, and National Board of Revenue (NBR) sales data from 2006-2007 to 2016-2017. Data was also collected on tobacco consumption by type of tobacco products (cigarettes, *biris* and SLT) from secondary sources, including GATS, 2009 and 2017,[15] Global Youth Tobacco Survey (GYTS), 2013, International Tobacco Control (ITC) Policy Evaluation Project,[16] 2014,[17] Bangladesh Demographic and Health Survey (BDHS) 2014,[18] Census of Agriculture 2008, Yearbook of Agricultural Statistics, 2017, Statistical Yearbooks of Bangladesh, and NBR annual reports.

[2.2]
QUALITATIVE METHODS

The study also uses qualitative method of research, focus group discussions (FGDs) with farmers and consumers of cigarettes, *biris*, and SLT products, and key informant interviews (KII) with manufacturers as well as retailers. The objective was to gain insights into the perspectives of farmers, manufacturers, retailers, and consumers on the implications of tobacco tax increases. In total, the researchers conducted 23 FGDs in 11 districts, and 25 KIIs in 9 districts of Bangladesh. Each FGD consisted of 10 respondents. The duration of each FGD was about an hour. The distribution of FGD and KII by districts is given in Tables 2.6 and 2.7 respectively.

Five checklists were used for conducting FGDs and KIIs. These include the following: (1) FGD with tobacco leaf farmers; (2) FGD with smokers (cigarettes and *biris*); (3) FGD with SLT consumers; (4) KII with manufacturers; and (5) KII with point of sale retailers.

Table 2.6.
Distribution of FGDs by districts

Name of district	Cigarette consumer	SLT consumer	*Biri* consumer	Farmers
Chattogram	1	1	1	-
Barishal	-	2	1	-
Dhaka	1	5	-	-
Narayangonj	-	-	-	1
Rangpur	-	1	-	1
Nilphamari	-	1	-	1
Kushtia	-	-	-	1
Khulna	-	1	-	-
Mymensingh	-	1	-	-
Kishorgonj	-	1	-	-
Manikgonj	-	1	1	-

Source: TTRD Sample Survey, 2018

Table 2.7.
Distribution of KII by districts

Name of district	SLT manufacturer	Biri manufacturer	Retailers
Chattogram	2		2
Dhaka	1	1	4
Rangpur		1	
Nilphamari	1		1
Jashore		1	1
Khulna		2	1
Mymensingh			1
Kishorgonj			2
Tangail	2	2	

Source: TTRD Sample Survey, 2018

Limitations of the study

The research has several limitations. All questionnaires were administered in the districts where a particular activity was most prevalent. Farmer surveys were conducted in the top growing districts. Manufacturer surveys were conducted in the top manufacturing districts. Retailer and consumer surveys were undertaken in the top consuming districts.

One of the most significant limitations of the study is the lack of adequate information for estimating price elasticities of demand for tobacco products. Estimates are made based on household level data that does not have information on the characteristics of the consumer. The data did not have tier-based price information. The price elasticities the team calculated are on overall prices of tobacco products. Household data did not have information of the market price of the product. The research used the variability in unit value as a substitute of market value. Gibson and Rozelle (2005)[19] found that there are significant biases using unit value as a proxy of market price even after correcting the use of Deaton model.

[10] Deaton, A., 1987. Estimation of own-and cross-price elasticities from household survey data. *Journal of Econometrics*, 36(1-2), pp.7-30.

[11] Bangladesh Bureau of Statistics 2011. Report of the Household Income and Expenditure Survey 2010. Dhaka: BBS 2011.

[12] Bangladesh Bureau of Statistics 2017. Preliminary Report of the Household Income and Expenditure Survey 2016. Dhaka: BBS 2017.

[13] Bangladesh Bureau of Statistics 2010. Census of Agriculture 2008 available at

[14] Bangladesh Bureau of Statistics 2018. Yearbook of Agricultural Statistics 2017. Dhaka: BBS 2018.

[15] WHO 2018. Global Adult Tobacco Survey 2017

[16] WHO 2013. Global Youth Tobacco Survey (GYTS), 2013

[17] University of Waterloo 2016. International Tobacco Control (ITC) Policy Evaluation Project 2014 available at www.itcproject.org

[18] National Institute of Population Research and Training 2016. Bangladesh Demographic and Health Survey 2014 available at dhsprogram.com/pubs/pdf/fr-bd04 [fr165].pdf

[19] Gibson, J. and Rozelle, S., 2005. Prices and unit values in poverty measurement and tax reform analysis. The World Bank Economic Review, 19(1), pp.69-97.

CHAPTER THREE

TOBACCO USE AND ITS CONSEQUENCES IN BANGLADESH

Tobacco is consumed in both smoking and smokeless forms in Bangladesh. Cigarettes and *biris* account for most of smoked tobacco consumption, while betel quid with tobacco, *zarda* and *gul* are popular forms of smokeless tobacco. Smoking prevalence in Bangladesh has declined since 2009, however, it remains high relative to other countries in the reagion. A considerable number of youths also consume tobacco products. The chapter outlines the trends in tobacco use and the resulting economic as well as health consequences in Bangladesh.

[3.1] ADULT TOBACCO USE

A number of surveys have assessed the extent of tobacco use in Bangladesh since the 2000s (Table 3.1). However, a direct comparison of the estimates from different surveys and data sources is not always possible, given the differences in methodologies, samples, and definitions used by the surveys. According to the most recent data from the GATS conducted in 2017, 35.3 percent of those aged 15 years and older consume some form of tobacco product.

Table 3.1.
Prevalence (percent) of tobacco usage estimated in different national level studies

Indicator	Health Cost Study 2004 (15y or older)	STEPS 2006 (25-64y)	GATS 2009 (15y or older)	STEPS 2010 (25y or older)	STEPS 2013 (25y or older)	GATS 2017 (15y or older)
Percentage of tobacco users	36.8	49.1	43.3	51	45.8	35.3
Percentage of men who smoke	41	48.4	44.7	54.8	33.2	36.2
Percentage of women who smoke	1.8	1.4	1.5	1.3	2.2	0.8
Percentage of men and women who smoke	20.9	27.4	23	26.2	17.1	18

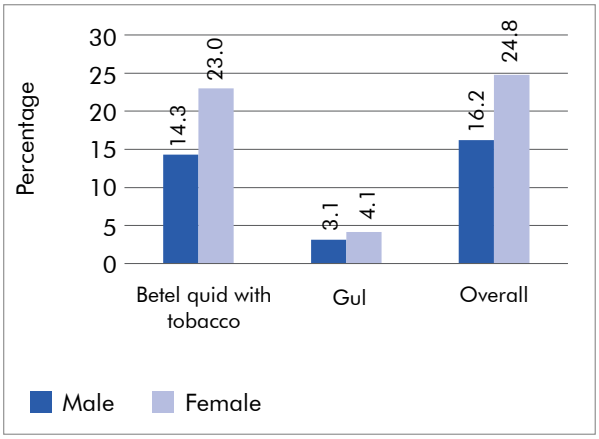
[Table 3.1 contd...]

[...Table 3.1 contd]

Indicator	Health Cost Study 2004 (15y or older)	STEPS 2006 (25-64y)	GATS 2009 (15y or older)	STEPS 2010 (25y or older)	STEPS 2013 (25y or older)	GATS 2017 (15y or older)
Percentage of men who use SLT	14.8	24.1	26.4	29.4	28.5	16.2
Percentage of women who use SLT	24.4	34.2	27.9	33.6	29.5	24.8
Percentage of men and women who use SLT	19.7	28.6	27.2	31.7	28.7	20.6

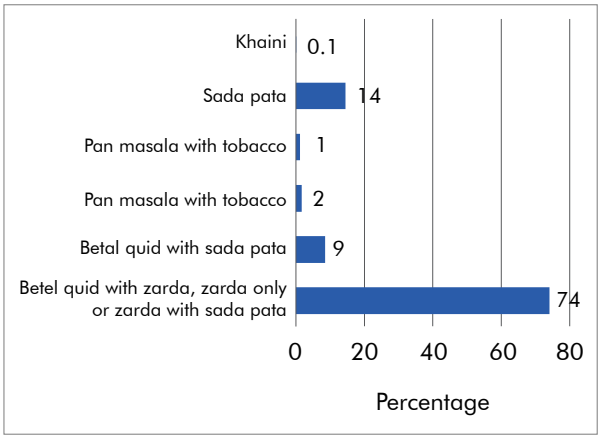
Sources: Health Cost Study, 2004; STEPS, 2006[20], 2010[21] and 2013[22]; GATS, 2009[23] and 2017[24]

Figure 3.1.
Current SLT users by types of product, 2017



Source: Global Adult Tobacco Survey (GATS), 2017

Figure 3.2.
Percentage of SLT users by type of SLT



Source: TTRD Sample Survey, 2018

The majority of tobacco users in Bangladesh are smokeless tobacco (SLT) consumers, with 20.6 percent of adults reporting the use of any form of SLT, of which 18.7 percent using betel quid with tobacco, and 3.6 percent using *gul*. Women are more likely than men to use SLT products (Figure 3.1). GATS (2017) reports that 24.8 percent of women use SLT while 16.2 percent of men use SLT.

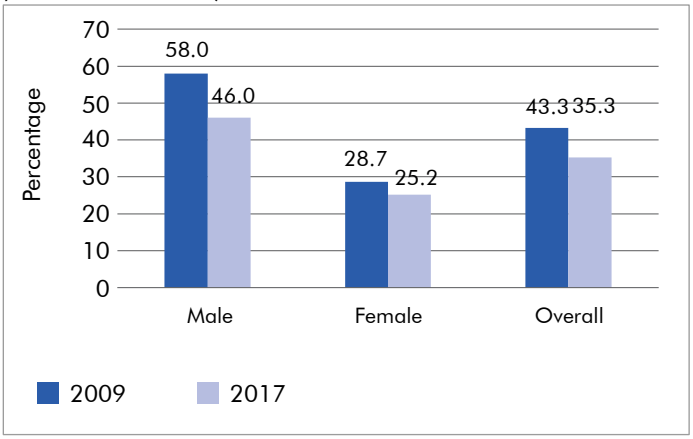
The TTRD consumer survey, which was conducted among tobacco users from selected districts with the highest smoking rates explored preferences of SLT products, found that among SLT users, the majority (74 percent) used betel quid with *zarda*, *zarda* only, or *zarda* with *sadapata*, while 14 percent used *gul* (Figure 3.2).

GATS (2017) suggests that 18 percent of tobacco users smoke in Bangladesh. The majority of them smoke cigarettes (14 percent) followed by *biris* (5 percent). The prevalence of smoking for men is higher than for women. It was found that 37.8 million adults use tobacco products in Bangladesh, 19 million of whom are smokers.

GATS (2017) also revealed a considerable decline in the prevalence of tobacco use among adults (15 years and older) from 43.3 percent in 2009 to 35.3 percent in 2017 (see Figure 3.3). This represented a 18.5 percent relative decline of tobacco use. Tobacco use declined by 20.8 percent among males and 12.2 percent among females over the same period. Although the consumption of *biris* declined substantially

from 11.2 percent of adults in 2009 to 5.0 percent in 2017, the consumption of cigarettes remained almost static over the years (from 14.2 percent of adults in 2009 to 14.0 percent in 2017). SLT consumption rates among women declined at a slower rate, widening the gap in the prevalence of SLT use between men and women.

Figure 3.3.
Prevalence of tobacco use (percent) (2009 and 2017)

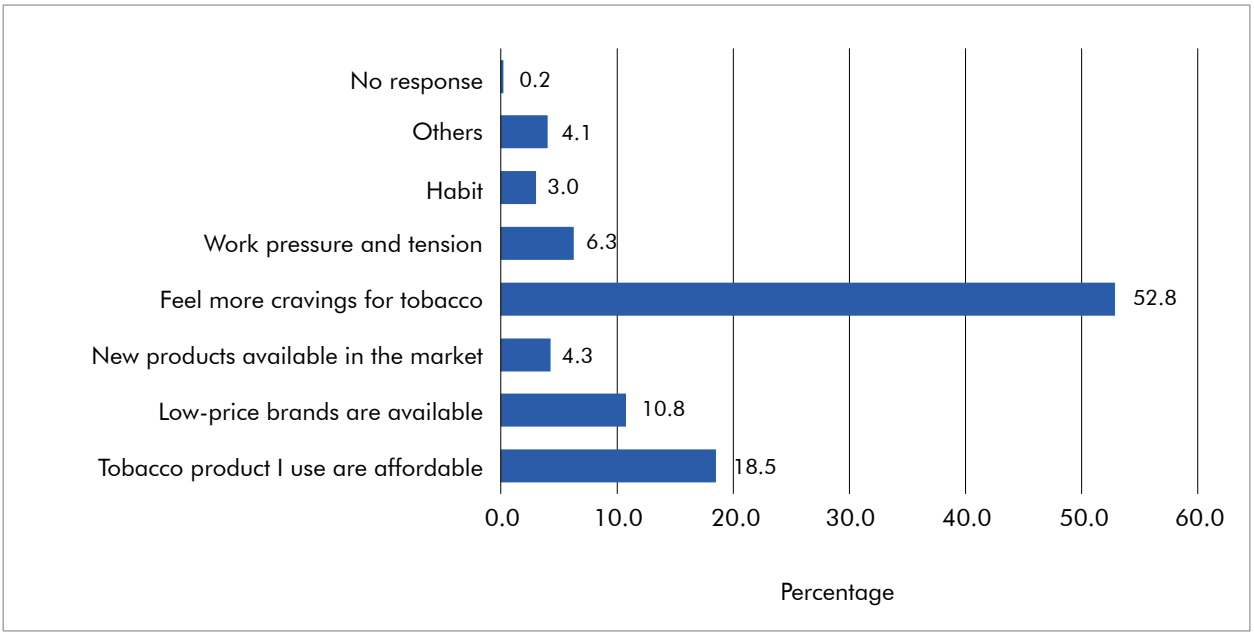


Source Global Adult Tobacco Survey (GATS), 2009, 2017

The TTRD sample survey found that 28 percent of tobacco users had actually increased tobacco consumption in the last five years preceding the survey. The main reasons were increased cravings for tobacco products, affordability of tobacco products, availability of low-priced brands, and new products (Figure 3.4). In the same survey 32 percent of the respondents, who were exclusively tobacco consumers from selected districts, informed researchers that they had reduced their tobacco consumption in the last five years preceding the survey. The major reasons being increased work pressure, pressure from the family, and attempts to quit tobacco use.

The TTRD sample survey found that 14 percent of the users switched brands. The reasons for brand switching were due to a change in flavor (54 percent), change in price (43 percent), and change in pack size (3 percent). Only 2.3 percent of the respondents stated that they switched from cigarettes to

Figure 3.4.
Percentage of respondents who increased tobacco use (n=492)



Source: TTRD Qualitative Survey, 2018

biris due to increased price of cigarettes and the availability of improved *biri* packet. About 2 percent of the respondents stated that they switched from *biris* to cigarettes, and the main reasons remained no difference of price between *biris* and cigarettes (40 percent), and increased price of *biris* (36 percent), etc.

The comparative analysis of the prevalence rates of smoking with other countries in the region suggests that the smoking prevalence among men in Bangladesh is slightly lower than Thailand, Pakistan and Indonesia (Figure 3.5). However, it is much higher than India, Sri Lanka, Myanmar and Nepal (WHO, 2015).

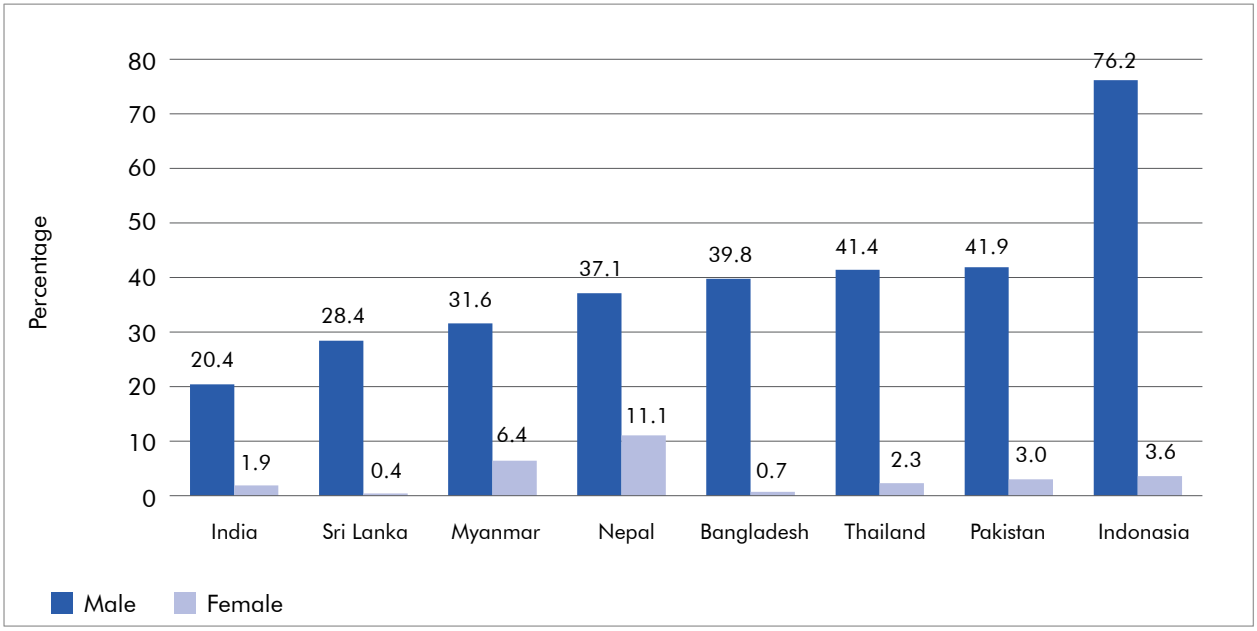
GATS (2009) reported that the average number of cigarettes and *biris* smoked per day were five and seven sticks respectively. SLTs were used, on average, eight times per day. The TTRD consumer survey found that, on average, cigarette smokers consumed 10.2 (Standard Deviation (SD)=8.14) cigarettes per day. *Biri* users smoked 19.7 *biri* (SD=9.88) per day. The increase in consumption rate reflects the greater affordability of tobacco products over time.

The female FGD participants in the TTRD study who used *zarda*, *shadapata* or *gul* stated that they used SLT a maximum of 10 to 12 times a day, and minimum of three to four times per day. The participants disclosed that SLT use increased over time. However, the frequency of SLT use often depended on mental status and mood.

GATS (2009) reported that almost 31.2 percent of smokers smoked within 30 minutes of waking up. In contrast, the TTRD sample survey suggested that around 45 percent of smokers smoked within 30 minutes of waking up. Around 48 percent of the SLT users also stated that they used SLT within 30 minutes of waking up. This is reflective of a high dependency on tobacco usage.

Most of the female FGD respondents in the TTRD study reported that they kept *zarda* and betel nuts all the time at home, and in cases

Figure 3.5.
Prevalence of smoking any tobacco product, individuals aged ≥15 years



Source: World Health Organization, 2015[25]

where SLT is not available at home, respondents would borrow from next door. The respondents have reported that SLT products were found in almost all nearby retail shops.

> *"We become restless when we find that our stock of paan (betel leaf with areca nut) is over. Then we keep thinking that when we can go out, we get some paan and then would feel good again."* (FGD participant, female SLT user, Dhaka)

> *"Even we are ok without any meal; we would not seek food from anyone else. But for paan, it is a total opposite. If we are out of paan-stock, we will request others to give us paan"* (FGD participant, female SLT user, Dhaka)

The average age of initiation for daily smoking was approixmately19 years. For males it was 18 years, and for females it was 27 years.[23] The TTRD consumer survey also suggests that the mean age of smoking initiation was 18.86 years (SD=10.53).

GATS (2017) reported that 66.2 percent of current smokers and 51.3 percent of current SLT users had planned or considered quitting. Nearly half of the smokers (45 percent) and 31.4 percent of SLT users had attempted to quit in the last 12 months. Among those who visited a healthcare facility, 57.2 percent were advised to quit smoking and 65.8 percent were advised to quit SLT use by a healthcare provider. The findings of the TTRD consumer survey suggested a similar pattern. More than 62 percent of the smokers expressed their willingness to quit; however, 31 percent stated that they were not interested in quitting smoking, while around 7 percent respondents were not sure about their willingness to quit smoking. A higher proportion of the SLT users (35 percent) was not interested in quitting. The survey also suggested that about 51 percent of the smokers had tried to quit smoking in the past, while the rest never attempted to quit smoking. Around 52 percent of the SLT users had stated that they tried to quit SLT use in the past.

Some female FGD participants (TTRD sample study) have said that they are confident about quitting SLT consumption whenever they want. However, some participants stated that due to its addictive nature, SLT users may continue their consumption despite increases in the price of SLT products, or unavailability of the products. The majority of male participants during FGDs also have agreed that smoking is addictive. They stated that, "they can live without food, but they cannot live without cigarettes." They informed the survey, "they do not feel hungry during Ramadan, but they feel unwell if they do not smoke."

Reasons for initiation of tobacco consumption

As part of the TTRD sample study, FGDs were conducted with adult tobacco consumers to identify the factors that influenced the respondents for initiating smoking and SLT use. The findings suggest that the major factors of SLT initiation included the tradition of hospitality, curiosity, and health conditions. The same survey found that the reasons for initiating smoking were curiosity and peer pressure.

The majority of the participants during FGDs stated that serving SLT as a tradition of hospitality remained a major reason for initiating SLT use. It is reported that people generally offer betel leaf with *zarda* to their guests and visitors as a sign of hospitality. It was also noted that serving betel leaf with *zarda* is a tradition and symbol of hospitality in most social events in Bangladesh, such as weddings. One female respondent said,

> *"My mother-in-law has taught me to chew betel nut. She told me, 'If you don't offer betel nut to the guests, it is not good. First, you have to learn (chewing) it and then you will be able to offer to the guests'."* (FGD participant, female SLT user, Dhaka)

Respondents often started using SLT after being offered by their friends, and gradually became addicted. Some respondents said that while preparing betel quid (betel leaf, areca nut, and *zarda*) for their family members, they started using SLT, which ultimately became a habit.

> *"I have my grandfather and grandmother. I used to smash betel leaf, nut and shada pata for them. While doing it, I became used to consuming betel quid with sadapata."* (FGD participant, female SLT user, Shingair, Manikganj)

> *"In our village, we saw that our mother, aunt, and grandparents took it (indicating SLT). Sometimes they offered us a little bit, we took it; or we just secretly took some paan from their collection and ate it, and thereby became used to it."* (FGD participant, female SLT user, Dhaka)

Most of the participants have reported that SLT use by a young child, even if in front of elder family members, is not viewed as an offensive act, due to the existing cultural norms. However, respondents further have stated that no one offers a cigarette or *biri* for smoking to their relatives or neighbors during their visits, because it is considered disrespectful to elders if someone smokes in front of them.

Many respondents stated that they started using SLT to get relief of poor health conditions, mainly toothaches.

> *"I had a toothache in my childhood. Then people told me to consume betel nut which would relieve my ache. Then I used to tuck some shadapata between the teeth."* (FGD participant, female SLT user, Shingair, Manikganj)

> *"When I was 8/9 years old, I had cavity in my teeth. I went under medical treatment, but nothing worked. One day my father applied gul in my teeth. Then the pain began to reduce. When I use gul, I feel relieved. Since then it has become a habit."* (FGD participant, female SLT user, Lalbagh, Dhaka)

> *"The teeth gum became swollen in pain. Then I took zarda and it was gone."* (FGD participant, female SLT user, Chattogram)

The initiation of SLT in order to avoid early morning sickness during pregnancy was reported by some respondents. The respondents stated that they had started using *paan* with *zarda* to avoid vomiting during pregnancy, which was mainly recommended by elderly family members. The participants also relayed that they started to use SLT to cope with boredom, frustration, as well as for mental relaxation, tension relief, and improving concentration.

The findings are consistent with other studies. Evidence suggests that many myths and misconceptions are attached to SLT use, such as: "SLT helps aid digestion if taken after a meal, pain relief, toothaches, headaches and stomach aches, or to cope with boredom, frustration and for mental relaxation purposes, tension relief, aiding concentration, combating bad breath, protecting from snake and scorpion venom, and finally, that its use is less harmful than smoking."[26]

Some participants identified "curiosity" as a major reason of initiating SLT use. Participants stated that they started using SLT out of curiosity at a very young age.

> *"Nobody had given it to us, we have started it (indicating use of SLT) on our own. One of my aunts used to using zarda. I told her, 'please prepare me a paan'. She gave it to me. It tasted good."* (FGD participant, female SLT user, Dhaka)

A few participants have stated that parents often encourage their daughters to consume SLT to look beautiful. It is perceived that a woman looks beautiful with the reddish face after consumption of SLT.

> *"My parents have told me that 'you will look beautiful when you chew betel nut'."* (FGD participant, female SLT user, Barishal Sadar)

It is also believed that the use of SLT makes the toddler smell better. One of the participants stated that,

> *"My husband has said that the child will speak sweetly if you exhale on to the face of the child after consuming betel nut with sweet zarda. Sweet smell will come out of the mouth of the baby. I am consuming betel nut for 24 years."* (FGD participant, female SLT user, Shingair, Manikganj)

Some participants also felt that without *zarda* or *sadapata*, the taste of betel leaf is bitter or tasteless, which remained a major reason of using SLT.

> *"Paan becomes watery taste without zarda or shadapata"* (FGD participant, female SLT user, Chattogram)

The majority of the male participants in FGD stated that curiosity, peer pressure, and offers by friends as well as colleagues contributed to the initiation of smoking. Male smokers within a family such as father or elder brother also influenced them to start smoking.

Some participants stated that they started smoking "to look smart". Other reported that smoking expedites their work speed, they feel more interested in their work, and can increase productivity. They have added that smoking overcomes fatigue.

[3.2] YOUTH TOBACCO USE

Tobacco usage by youth is a growing public health concern in Bangladesh. As with many countries, most tobacco use in Bangladesh starts in adolescence. GATS (2009) reported that 25 percent of daily smokers began smoking between the ages of 15 and 16, while 18.5 percent began smoking between the ages of 17 and 19. Furthermore, the average age of initiation of daily smoking for males is 18 years (GATS, 2009).

In 2013, the Global Youth Tobacco Survey (GYTS) was conducted in Bangladesh to understand tobacco use (smoking and smokeless), cessation, second-hand smoke (SHS), pro and anti-tobacco media messaging and advertising, access to and availability of tobacco products, and knowledge and attitudes towards tobacco among school children aged between 13 and 15 years. The survey found that the prevalence of tobacco users (any form) was 6.9 percent on average with considerable variation between boys and girls (9.2 percent and 2.8 percent, respectively). The prevalence of smoked tobacco use was 2.9 percent (4.0 percent for boys and 1.1 percent for girls). Overall, 5.1 percent of students had smoked cigarettes. The overall rates of current and frequent cigarette smokers were 2.1 percent and 1.4 percent, respectively.

The GYTS (2013) suggests that 4.5 percent of youth used SLT. In contrast to adult SLT use, the prevalence of SLT use among boys (5.9 percent) was higher than girls (2.0 percent). Overall, 10.1 percent of the students had used SLT at the time of the survey. The prevalence of SLT use among boys (13.0 percent) was considerably higher than among girls (5.0 percent). Interest in cessation was also reported to be considerably high among young smokers, with 60 percent of current smokers reporting that they wanted to stop smoking immediately, and 86.1 percent thought that they would be able to stop smoking if they wanted to.

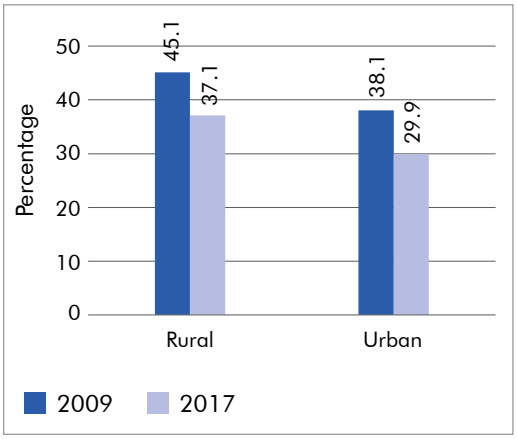
[3.3] SOCIO-ECONOMIC DIMENSIONS OF TOBACCO USE

There are differences in the rate of tobacco usage based on various socio-economic and demographic factors. Tobacco use is more concentrated in rural areas and among

persons with no formal education (62.9 percent). The smoking rate in rural areas is slightly higher (23.6 percent) when compared to urban areas (21.3 percent). SLT use is also more prevalent in rural areas (28.8 percent) compared to urban areas (22.5 percent).

The comparison of two rounds of GATS suggests a considerable decline in the prevalence of tobacco use in rural as well as urban areas between 2009 and 2017 (Figure 3.6). Despite the trend, tobacco consumption is still higher in rural areas as compared to urban areas.

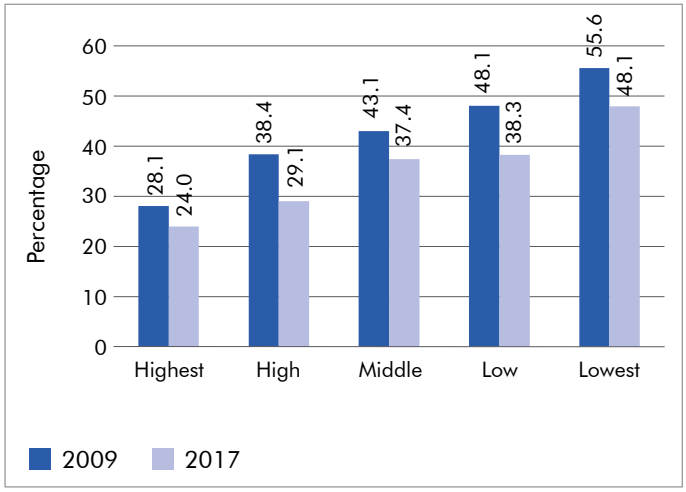
Figure 3.6.
Percentage of current tobacco use by location (2009 and 2017)



Sources: Global Adult Tobacco Survey (GATS), 2009 and 2017

There appears to be a strong socio-economic gradient in smoking in Bangladesh, as more financially secure individuals are less likely to use tobacco. Tobacco use is highly concentrated in the lowest quintiles of socio-economic status (48 percent). This is consistent with findings from high-income countries, as well as a growing number of low and middle-income countries, where smoking prevalence falls with income and education.[27] Smoking prevalence has declined in all wealth quintiles over the last eight years (Figure 3.7).

Figure 3.7.
Percentage of current tobacco use by wealth quintile



Sources: Global Adult Tobacco Survey (GATS), 2009 and 2017

Tobacco consumption constitutes a considerable portion of household expenditures, which has serious welfare implications, particularly for low-income households with limited resources. Spending on tobacco competes directly with spending on health, food, education, and other necessities. This can lead to reduced expenditures on basic commodities, generally described in the literature as the "crowding-out effect".[28] The TTRD consumer survey found that the average weekly spending of *biri* and SLT users for the products were BDT 74 and BDT 25.8, respectively. On average, SLT users spent BDT 15.69 for the last purchase, while the average amount of money *biri* smokers spent for the last purchase was BDT 22.4. It was found that on average, cigarette smokers spent BDT 537 per week. The average amount spent for the last purchase was BDT 16.7 for cigarette smokers. A recent study using data from Bangladesh Household Income and Expenditure Survey (2010), found that tobacco consuming households on average allocated less money to clothing, housing, education, energy, transportation, and communication when compared to non-consuming households.[28] The mean expenditures for food and medical purposes and expenditures of tobacco consuming households,

however, are greater than those of non-consuming households. Evidence shows that diverting household resources to tobacco, instead of food, health, and education, has significant negative health and distributional effects. It also increases disparities between the rich and the poor in terms of access to basic needs and human capital.

[3.4] HEALTH AND ECONOMIC CONSEQUENCES OF TOBACCO USE

A wide range of global evidence exists on the adverse health effects of tobacco consumption. Globally, tobacco consumption is directly responsible for more than seven million deaths per year.[29] About 80 percent of current tobacco-attributable deaths occur in low- and middle-income countries. Given the current trends, tobacco-attributable deaths are expected to rise to 8.3 million by 2030.[30] However, deaths caused by tobacco are anticipated to fall in high-income countries, but are expected to double to 6.8 million in low- and middle-income countries by 2030.

The leading causes of death from smoking are cardiovascular diseases, chronic obstructive pulmonary disease, and lung cancer. Evidence shows that nearly half of regular smokers will die prematurely as a result of their addiction. About a third of these deaths result from cancers caused by tobacco, with tobacco-attributable cardiovascular and respiratory diseases accounting for approximately 30 percent each.[31] About half of the deaths due to tobacco consumption occur in people aged 35 to 69, the period of life when individuals are normally the most economically productive (Jha *et al.*, 2008). Evidence suggests that adult SLT use in 113 countries in 2010 led to 1.7 million disability adjusted life years (DALYs) lost as well as 62,283 deaths due to cancers of the mouth, pharynx, and esophagus.[32] Based on data from the benchmark 52-country INTERHEART study, 4.7 million DALYs were lost and 204,309 deaths occurred as a result from ischemic heart disease (IHD). Over 85 percent of this burden was in Southeast Asia.[32]

There is growing evidence that exposure to second-hand smoke (SHS) during pregnancy is associated with negative consequences for pregnancy and infant outcomes. Infants born to women exposed to SHS during pregnancy are more likely to have lower birth weights compared to infants not exposed to SHS. In addition, SHS exposure during pregnancy has been associated with a slightly increased risk of stillbirth, pre-term delivery, and congenital anomalies, although results have been inconsistent. The mean birth weights are estimated to be about 33-40g less among women exposed to SHS.[33] Children exposed to SHS are also at an increased risk of chest infections, tuberculosis, and asthma. Moreover, SHS exposure in children and adolescents lead to poor cognitive function and academic achievement.[34]

In 2016, tobacco use killed more than 160,000 people, including 26 percent of deaths among men and 10 percent among women in Bangladesh.[35] About 0.126 million people died due to tobacco-attributable diseases, which constituted 13.5 percent of all deaths in 2018. One study suggests that approximately a quarter of all deaths among men aged 25 to 69 in Bangladesh are attributable to smoking.[36] A population based study in Bangladesh showed that tobacco use and hypertension are significant ($p<0.05$) factors for IHD in rural population with traditional lifestyles and thin body mass indexes.[37] Zaman *et al.*, (2007) suggests that the overall related risks and population attributable risks of diseases vary by gender for SLT usage. Though a large number of studies have assessed the adverse health effects associated with smoking tobacco, only a few studies have focused on SLT-related mortality and morbidity in Bangladesh. SLT use is associated with an increased prevalence of high blood pressure in the adult male in rural Bangladesh.[38,39] Chewing betel quid has been linked to obesity, cardiovascular disease, oral

cancer, strokes, and hypertension. The dual use of tobacco, especially in men, increases the risk of some cancers and carries a higher risk of IHD.

The female SLT users in FGDs (TTRD sample study) reported that they suffered from diseases due to SLT use, mostly gastric. Some SLT users have stated that consumption erodes teeth and makes them turn black. It also causes the gums to thin out and sores on the tip of the tongue as well as inside the mouth. Some participants reported that smoking caused chest pain, cough, headache, vomiting from coughing, and gastric-related diseases. A few respondents have reported that they reduced smoking due to sickness.

Healthcare costs of treating the numerous diseases caused by tobacco use are substantial, but are not the only associated negative costs. In addition to the direct medical costs for treating tobacco-related diseases, the economic costs associated with tobacco use include (but are not limited to): strain on the national healthcare finances, as well as indirect costs due to absenteeism, presentism for earners and informal caregivers, constrained education attainments, decreased school attendance and learning, and consequent loss of productivity at the macro-level.[30] The high rate of tobacco consumption in Bangladesh imposes an increasing health and economic burden. In 2018, the total annual costs incurred due to tobacco-related illnesses amounted to BDT 305.70 billion (3.6 billion USD) in Bangladesh, when both direct and indirect costs were taken into account. Indirect costs, which included lost productivity due to mortality and morbidity, are estimated to exceed healthcare costs. In 2018, lost productivity from tobacco-attributable diseases and premature deaths caused by the eight major diseases due to tobacco use was estimated to be BDT 182.40 billion. The study also suggested that when a household member was afflicted by one of the eight diseases caused by tobacco consumption, an average BDT 1,275 was incurred by the household.[40] This figure rose to BDT 22,528 when someone had been admitted to hospital. The poor pay an average BDT 17,371 when afflicted with tobacco-related illnesses. The study stated that out-of-pocket expenditures at the household level is higher for tobacco-related illness than for all other illnesses. The average household expenditure for tobacco-related illness appeared to be positively related to the wealth status of the household due to their ability to afford better healthcare facilities. Overall, the economic costs of tobacco use in Bangladesh were estimated at 1.4 percent of GDP in 2018.

Quitting smoking is effective in reducing the health consequences of smoking. Those who quit before reaching middle age may avoid almost all of the excess health risks associated with smoking. A few cessation programs are available, albeit they are not highly researched in the study. There are no national cessation practice guidelines or models. There are no national quitlines to support cessation. Pharmacotherapies (nicotine gum) are available, though this medication is not on the essential drug list.

[3.5] CONCLUSION

High tobacco consumption imposes a large and growing public health burden in Bangladesh. Tobacco use is more prevalent among lower socio-economic population in Bangladesh, which indicates that a disproportionate burden of disease, lost productivity, and health expenses are incurred by the most economically vulnerable populations. Low price and affordability, increasing population, as well as misconceptions regarding its health effects contribute to the high tobacco consumption in Bangladesh. Hence, tobacco control policies need to be strengthened. Specifically, considerable increases in prices and taxes of all types of tobacco products are needed to ensure that the affordability of tobacco products continues to decline. Tax increases should be comparable across all tobacco

products in order to reduce opportunities for substitution in response to changes in relative prices. Earmarking a proportion of the revenues generated from health development surcharge to support tobacco control programs may lead to reductions in tobacco use. Furthmore, bans on tobacco advertising, promotion, and sponsorship need to be enforced at all levels. Lastly, in addition to the policy recommendations above, cessation services should be available for tobacco users in Bangladesh.

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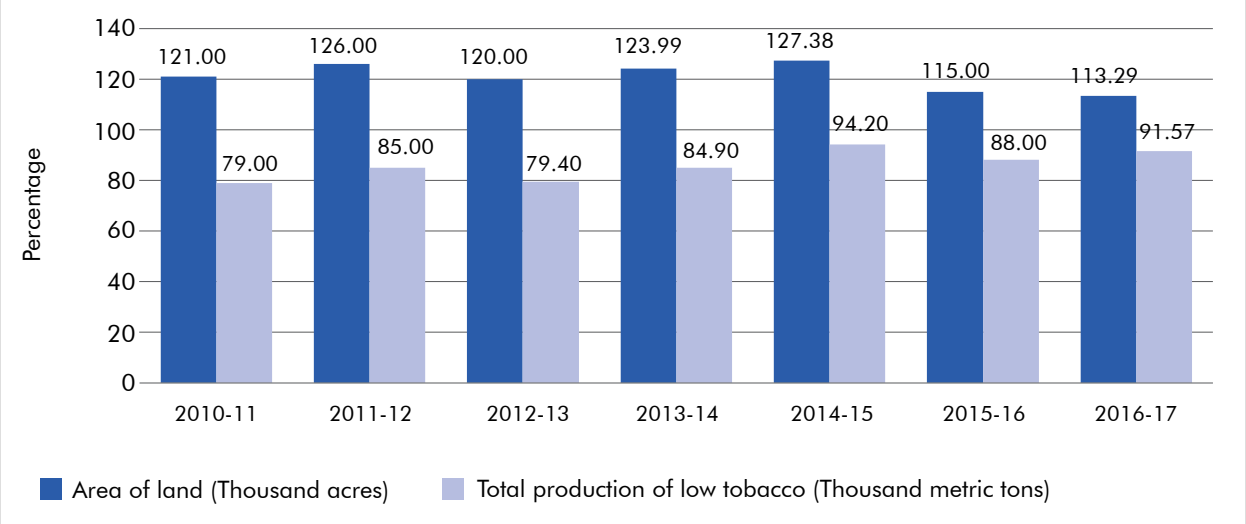
CHAPTER FOUR

SUPPLY OF TOBACCO AND TOBACCO PRODUCTS IN BANGLADESH

[4.1] TOBACCO FARMING

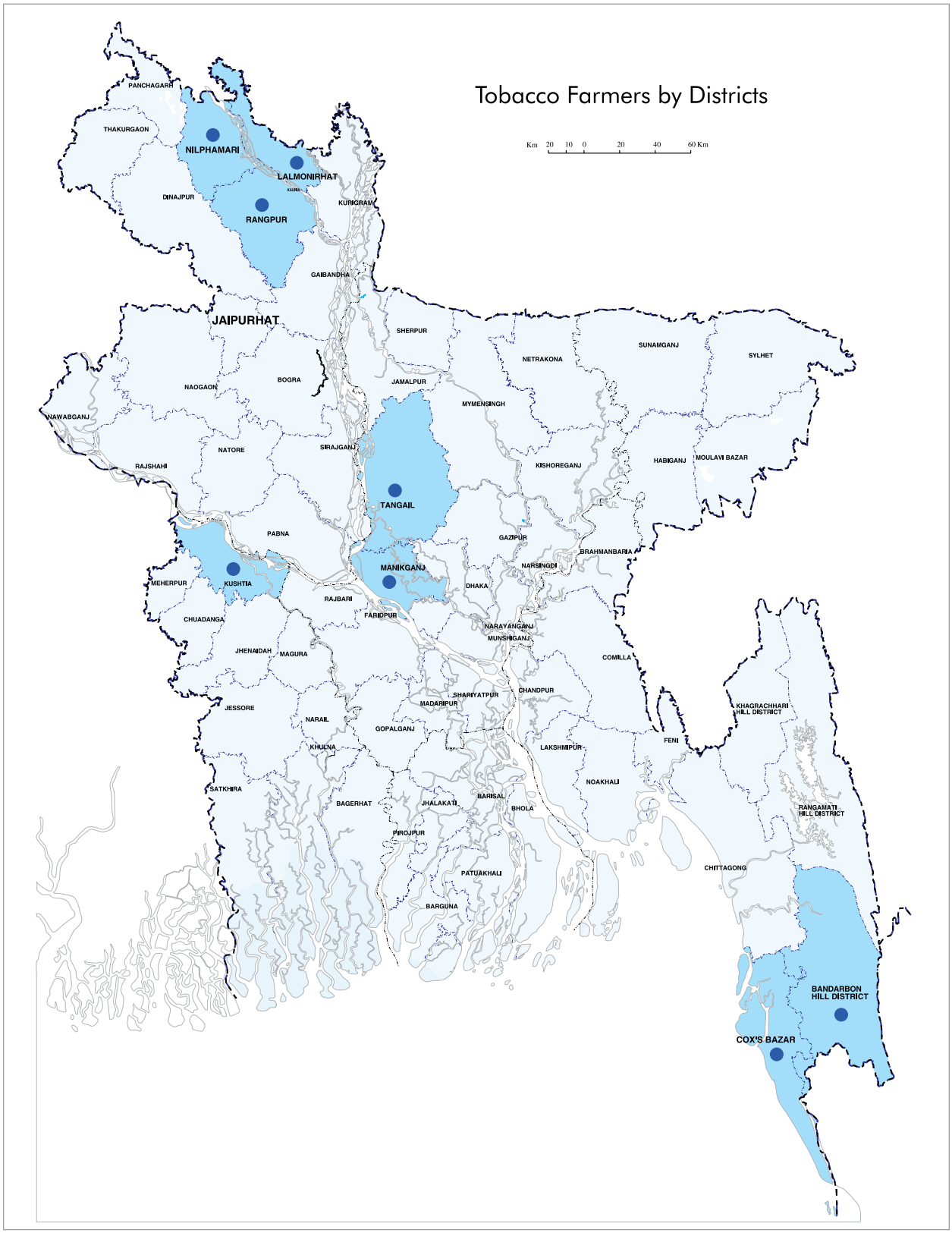
All tobacco products start with the cultivation of tobacco leaf. Tobacco is not an indigenous crop in Bangladesh and tobacco cultivation was introduced in the country during the mid-1960s. It was later widely pushed by the British American Tobacco Bangladesh (BATB) in the greater Rangpur area after the liberation of Bangladesh in 1971. According to the Bangladesh Bureau of Statistics (BBS, 2018), tobacco cultivation is popular in the northern and the hilly southeastern parts of Bangladesh and is concentrated in the districts of Rangpur, Lalmonirhat, Nilphamari, Kushtia, Manikganj, Tangail, Bandarban and Cox's Bazar. Although widely grown, tobacco is a relatively minor crop in the overall agricultural production in Bangladesh.[41] The Ministry of Agriculture is trying to introduce the vertical growth technology and high yielding varieties (HYV) in tobacco cultivation instead of conventional methods. As a result, the total land area devoted to tobacco farming has been falling steadily for the last few years, while the production per acre of land increased (Figure 4.1).

Figure 4.1.
Tobacco agriculture, FY 2010-11 to FY 2016-17



Source: BBS (2018), Yearbook of Agricultural Statistics 2017

Figure 4.2.
A map of Bangladesh showing the major tobacco growing districts



Source: TTRD Sample Survey, 2018

[4.1.1]
Varieties of raw tobacco

There are different varieties of tobacco that are grown in Bangladesh. The currently available varieties of raw tobacco are Bangla, Barley, DV, Jati, Motihar and Talim. The government sets the minimum price of raw tobacco every year. Table 4.1 shows the complete list of all varieties of raw tobacco available and their prices according to different grades of quality for FY 2016-17 and FY 2017-18.

Table 4.1.
Raw tobacco prices by variety and grade, Bangladesh

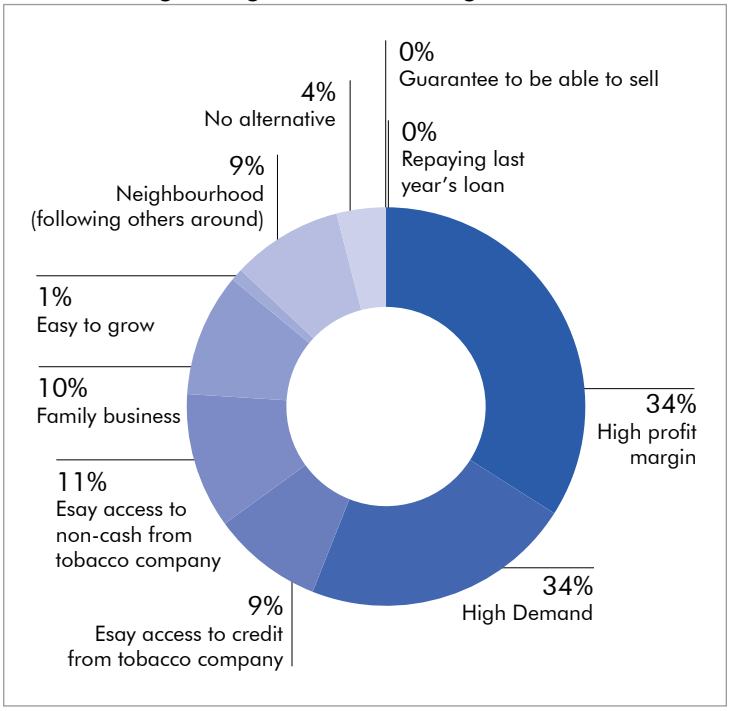
Varieties and Grade	Price for FY 2016-17 (BDT/KG)	Price for FY 2017-18 (BDT/KG)
Bangla 1	107	110
Bangla 2	103	106
Bangla 3	98	100
Bangla 4	93	95
Bangla 5	88	90
Bangla 6	81	83
Barley 1	84	86
Barley 2	82	84
Barley 3	80	82
DV 1	78	79
DV 2	76	77
DV 3	73	74
Jati 1	-	79
Jati 2	-	77
Jati 3	73	74
Motihar	68	68
Talim	73	73
Without any grade	-	30

Source: Ministry of Agriculture, Government of Bangladesh, 2018

[4.1.2]
Reasons for growing tobacco

The study has attempted to understand the underlying reasons why farmers grow tobacco. The TTRD Farmer survey results show that the perceived high profit margin and high demand are the two main reasons for growing tobacco (Figure 4.3). Survey respondents also state that easy access to various in-kind support and credit facilities from tobacco companies also influence the decision to grow tobacco. Farmers consider tobacco farming to be more profitable than growing other crops. This perception of profitability is related to the fact that tobacco has a high market demand. Institutional patronization by the tobacco companies in various forms also draws farmers into growing tobacco.[42] These companies provide different monetary and non-monetary support to the farmers at every stage of farming. The study reveals that during the preparatory and cultivation phase, tobacco companies provide seed, fertilizer, tent, polyethylene/plastic sheets, insecticides, etc. During the harvesting period, they provide shoes, socks, masks and hand gloves to the farmers free of cost. They also grade the cured tobacco leaves during the selling process.

Figure 4.3
Reasons for growing tobacco in Bangladesh



Source: TTRD Sample Survey, 2018

In addition to in-kind support, a farmer receives loans from tobacco companies of (on average) $88, $213 and $50 for the preparatory, cultivation and harvesting phases, respectively. The loans are recovered later from the farmers during the sale process. When asked about the reasons for not producing other crops, 32.94 percent of the respondents stated low profit margin as the main reason, while 12.94 percent stated less demand, 28.24 percent stated difficulty in obtaining loans, and other factors. On the other hand, 25.88 percent of the respondents have stated that non-tobacco products are also difficult to grow. Interestingly, about 80 percent of the respondents from the districts of Rangpur, Lalmonirhat and Nilphamari have stated that it is difficult for them to grow other crops, which gives an indication as to why Rangpur region produces the highest amount of tobacco in Bangladesh.

[4.2] MANUFACTURING OF TOBACCO PRODUCTS

[4.2.1] Cigarette Manufacturing

The reported legal market size of cigarettes manufactured and sold in FY 2017-18 was about 84 billion sticks. This volume of cigarettes is supplied mainly by three companies: one multinational, British American Tobacco Bangladesh (BATB), and two locally owned companies, Dhaka Tobacco Industries (DTI) and Abul Khair Tobacco Limited (AKTL). BATB, with a share of about 63 percent of the total market, not only leads the cigarette industry as a whole, but also dominates the cigarette market in every individual segment that is currently available. Table 4.2 depicts the market shares of these three cigarette companies from FY 2006-07 to FY 2016-17.

Table 4.2.
Cigarette company market shares, Bangladesh, FY 2006-07 to FY 2016-17

FY	Cigarette company market shares (percent)		
	BATB	DTI	AKTL
2006-07	49.08	46.72	4.20
2007-08	43.91	48.45	7.63
2008-09	39.76	47.29	12.95
2009-10	40.96	40.88	18.15
2010-11	34.88	44.38	20.74
2011-12	35.97	39.07	24.96
2012-13	46.55	36.53	16.92
2013-14	47.05	35.44	17.52
2014-15	49.79	31.98	18.24
2015-16	54.96	26.23	18.80
2016-17	62.94	20.67	16.39

Source: National Board of Revenue (2018)

According to NBR data, at the early stages of its operation, BATB operated only in the premium segment of the market, but changed its strategy in 2007 by introducing mid-priced and low-priced cigarettes in an effort to be the market leader in all segments. Since 2012, BATB has held the top position in the market. BATB manufactures and sells well-established international cigarette brands, namely Benson & Hedges, John Player Gold Leaf, Pall Mall, Capstan, Star, Pilot, Bristol, Derby and Hollywood in the market. These brands are positioned in all four market segments. However, not all other local companies operate in all of these segments. DTI, a subsidiary of a large local conglomerate, Akij Group, is the second largest tobacco manufacturing company with a market share of 20.67 percent. Marlboro, Winston, Navy and Sheikh are the brands marketed by DTI, and the company has a reasonable market share in the medium and low segments. Since 2007, DTI has marketed Marlboro, a Philip Morris International (PMI) brand, under an agreement with PMI in the premium segment of the cigarette market. In

August 2018, Japan Tobacco International, one of the largest tobacco manufacturing companies in the world, signed an agreement with DTI to acquire it for $1.47 billion. This takeover is expected to change the supply dynamics of the overall cigarette industry in Bangladesh. AKTL, the third largest tobacco company, operates only in the low segment with the brand name Marise. These three companies together account for more than 98 percent of the entire cigarette market (Table 4.3).

Table 4.3.
Segment-wise market shares of three cigarette companies, FY 2006-07 to FY 2016-17

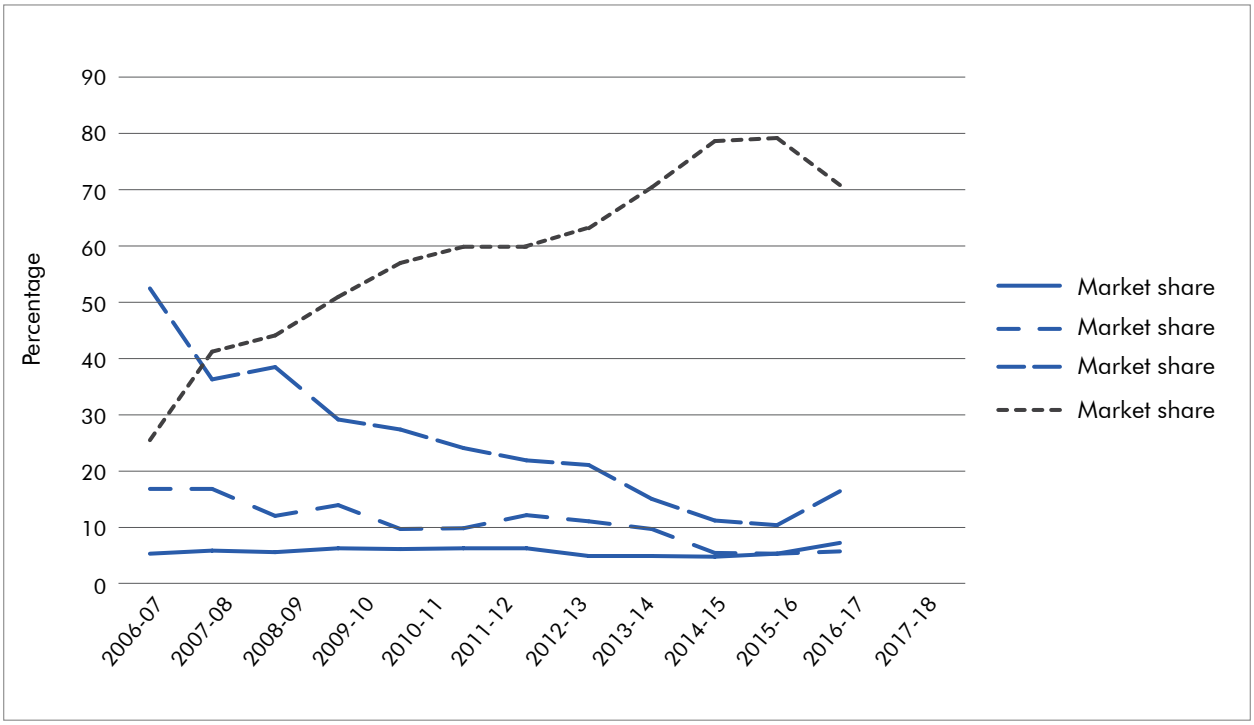
FY	Premium segment market share (percent)			High segment market share (percent)			Medium segment market share (percent)			Low segment market share (percent)		
	BATB	DTI	AKTL	BATB	DTI	AKTL	BATB	DTI	AKTL	BATB	DTI	AKTL
2006-07	100.00	0.00	0.00	91.85	8.15	0.00	54.12	45.88	0.00	0.00	83.51	16.49
2007-08	98.97	1.03	0.00	87.44	12.56	0.00	61.38	38.62	0.00	3.18	78.32	18.50
2008-09	99.32	0.68	0.00	92.91	7.09	0.00	59.58	40.02	0.40	0.61	70.35	29.04
2009-10	99.41	0.59	0.00	96.86	3.14	0.00	60.60	38.99	0.41	7.43	57.13	35.44
2010-11	99.42	0.58	0.00	96.99	3.01	0.00	51.89	45.67	2.44	9.37	55.41	35.22
2011-12	98.47	1.53	0.00	98.37	1.63	0.00	45.38	49.57	5.05	15.47	44.90	39.63
2012-13	98.16	1.84	0.00	99.19	0.81	0.00	57.64	41.18	1.18	26.45	45.69	27.86
2013-14	97.98	2.02	0.00	99.48	0.52	0.00	58.21	41.37	0.42	30.30	42.10	27.61
2014-15	96.54	3.46	0.00	99.27	0.73	0.00	58.79	41.09	0.12	37.77	36.33	25.90
2015-16	97.12	2.88	0.00	98.24	1.76	0.00	64.03	35.95	0.03	48.15	27.97	23.89
2016-17	96.13	3.87	0.00	98.33	1.67	0.00	65.64	34.35	0.01	58.04	21.26	20.69

Source: National Board of Revenue (2018)

There are a few other cigarette manufacturers, namely Alpha Tobacco Manufacturing Company, Azizuddin Industries Ltd., Bhorosha Tobacco Industry, International Tobacco Company, Sonali Tobacco Company Ltd., National Tobacco, and Nasir Tobacco. All of these companies operate only in the low segment, and their production and sales are concentrated in their surrounding areas.

The segment-wide market shares of the three major players in the Bangladeshi cigarette market, as shown in Table 4.3, depict the dominance of BATB in all four segments. The entire premium and high segments are dominated by BATB brands, Benson & Hedges, and John Player Gold Leaf. From FY 2014-15 to FY 2016-17, BATB has significantly gained market share in the low segment, while DTI and AKTL have dramatically lost their shares. The cigarette market in Bangladesh is dominated by low-priced, high-tar cigarettes, and the consumption of these types of cigarettes has increased over the last decade on a yearly basis except for FY 2017-18, as shown in Figure 4.4. Cheap cigarette brands are often sold in packs of 10 sticks in order to keep pack prices affordable for lower income smokers, while most of the premium brand cigarettes are sold in packs of 20 sticks. However, the share of premium brand low-tar cigarettes remained almost constant from FY 2006-07 to FY 2017-18 at around 5 to 6 percent of the total market.

Figure 4.4.
Segment-wise market shares of cigarettes sold in Bangladesh, FY 2006-07 to FY 2017-18



Source: National Board of Revenue (2018)

[4.2.2]
Biri manufacturing

Biris are a very cheap form of smoked tobacco in Bangladesh, which are popular particularly among the low-income population. The production process of *biris* is much more fragmented and labor-intensive than cigarette manufacturing. According to NBR data, the tax-paid sale of *biris* was 51.19 billion sticks in FY 2012-13, which decreased remarkably to 37.53 billion sticks during FY 2016-17. This substantial decline in *biri* smoking can be mostly attributed to the structural decline in *biri* demand due to the shifting composition of smoked tobacco products in Bangladesh from *biris* to low-priced cigarettes along with price and tax increases (Ahmed *et al.*, 2018).[43]

[4.2.3]
SLT manufacturing

According to GATS (2017), 20.6 percent (22.0 million) of adults use smokeless tobacco, of whom 16.2 percent are men and 24.8 percent are women in Bangladesh. A large number of SLT manufacturing units are spread throughout Bangladesh and they produce different kinds of SLT products, including sadapata, *zarda*, *gul*, Khoinee, Nasshi, and Kimam. The manufacturing of SLT products also increased dramatically because SLT products were not taxed before 2003 and were not included in the Tobacco Control Law until 2013. A case study in the box below on the manufacturer of *zarda*, a widely used SLT product, highlights how Kaus Mia made his fortune in the manufacturing of SLT products.

KAUS MIA, THE *ZARDA* MUGHAL

- Kaus Mia, now 87 years old, was born in a village in Chandpur district in 1931. He was admitted to a school in 1936 and stayed until the eighth grade. He started his business in 1950 with BDT 80 (US$ 24) as capital which he received from his mother.
- Kaus initially set up a stationary shop at Purana Bazar in Chandpur town at a monthly rent at only BDT 3 (US$1) in 1951. He started the tobacco business in 1955. After the initial success of the business, he moved to Narayanganj wrapping up his 20 years of business in Chandpur and commenced the *zarda* business in the name and style of Shantipuri *Zarda* with 3-4 workers.
- He left Narayanganj in 1978 and started the business as Hakimpuri *Zarda* in 1978. He set up the factory on a 3.5 katha (7 decimals) plot at Agha Nawab Dewri, Chawk Bazar, Dhaka and it has 4 floors. At present, 20-21 workers are employed on a regular payroll, but sometimes he hires temporary workers too. *Zarda* enjoyed cottage industries benefits until June 2003, as it was not taxed in Bangladesh. By June 2003, the government took *Zarda* out of purview of the cottage industry through a government order. In fact, this measure paved the way for charging 15 percent VAT on the ex-factory price of *zarda*.
- Kaus Mia has been on the list of the highest taxpayers nine times and has received a long-time taxpayer award from NBR. He now has different business enterprises, including the manufacturing of Hakimpuri *Zarda*. NBR recognizes one hundred taxpayers in each category of young, female and combined on the basis of their income tax payments in FY 2015-2016. As recognition of this, he was given a tax card by NBR.
- Along with the tobacco business, Kaus is now the sole agent of 18 companies. He said that he has been paying taxes since 1958. According to NBR data, he paid total taxes (both income tax and VAT and SD) to NBR amounting to BDT 12.90 crore (US$ 1.66 million) in FY 2013-14. In FY 2017-18, he paid total taxes to the tune of BDT 49.47 crore (US$ 5.90 million), which is 3.5 times of what he paid in FY 2013-14.

Source: TTRD Sample Survey, 2018

[4.3]
TOBACCO MARKETING THROUGH POINT-OF-SALE RETAILERS

The TTRD sample survey was carried out in 14 major tobacco selling districts of Bangladesh. The study finds that all of the 192 different tobacco manufacturing units (cigarettes, *biris* and SLT products) that have been surveyed sell their products through wholesale distributors, retailers or intermediaries. However, the dominance of each of these sales channels varies according to the nature of that particular industry (Figure 4.5).

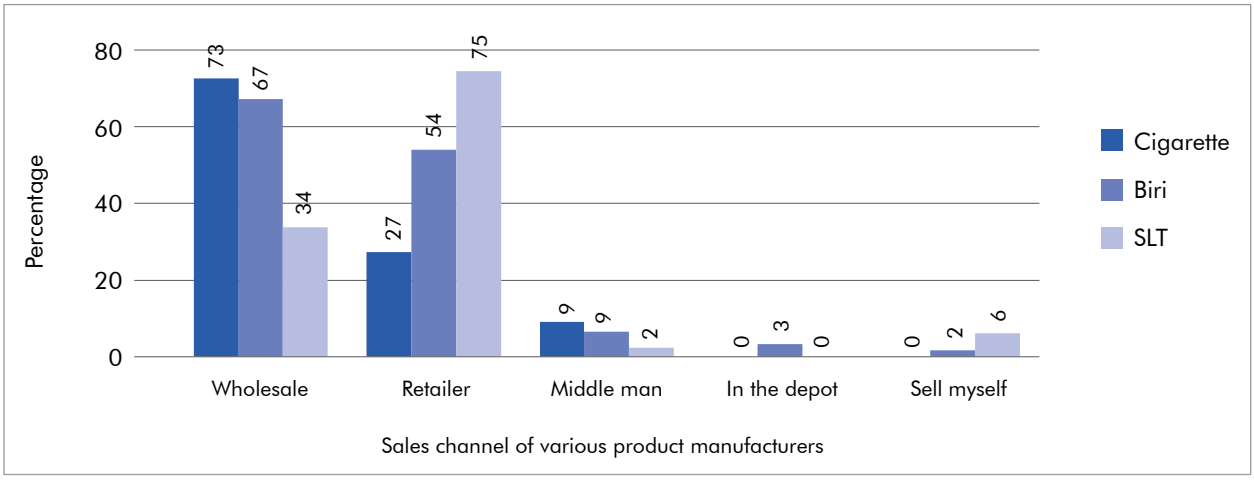
The majority of the cigarette and *biri* industries sell their products through wholesale buyers, whereas the SLT manufacturers sell their products mostly to the retailers. This is because the trade in cigarettes and *biris* occurs in a more formal and structured manner and also requires more capital. This is not the same in case of SLT products. The manufacturing cost and the market price for SLT products are substantially lower. As a result, small retailers can afford to be in the business. SLT products can be manufactured in a single room in small quantities, often by a person or two and hence the manufacturer/owner can sell the products directly without sacrificing any share of profit to the wholesalers or retailers. Among 120 SLT manufacturing units that were surveyed, 16 units had only one full-time employee. When asked how the number of buyers had changed

over the last five years, only 19 percent of the respondents said that the number increased, 59 percent of them replied that the number decreased, and 22 percent stated that the number remained unchanged.

We find from the retailer survey that the number of different cigarettes, *biri* and SLT brands changed over the last five years (Figure 4.6). We found a mixed response in this case. The majority of the respondents stated that the number of brands for all the three categories of tobacco products increased, while a few stated that the number decreased or remained constant. However, it is evident that in the case of cigarettes, the number of cigarette brands increased.

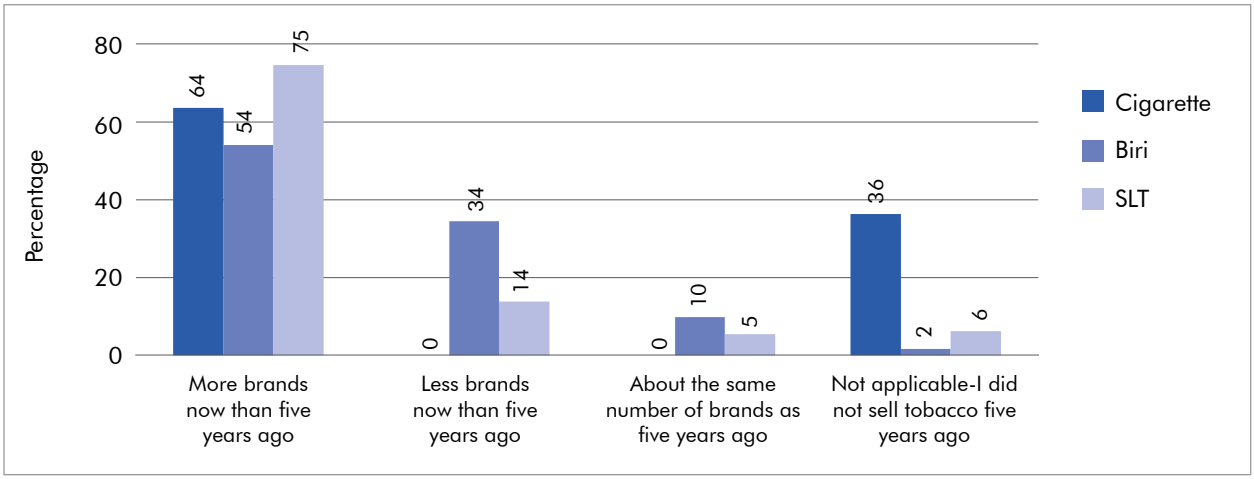
Tobacco products are sold through a variety of retail channels and the retailers remain the most important actor of the entire supply chain as they link tobacco manufacturers

Figure 4.5.
Sales channels of cigarette, biri and SLT manufacturers



Source: TTRD Sample Survey, 2018

Figure 4.6.
Change of brands of tobacco products in Bangladesh



Source: TTRD Sample Survey, 2018

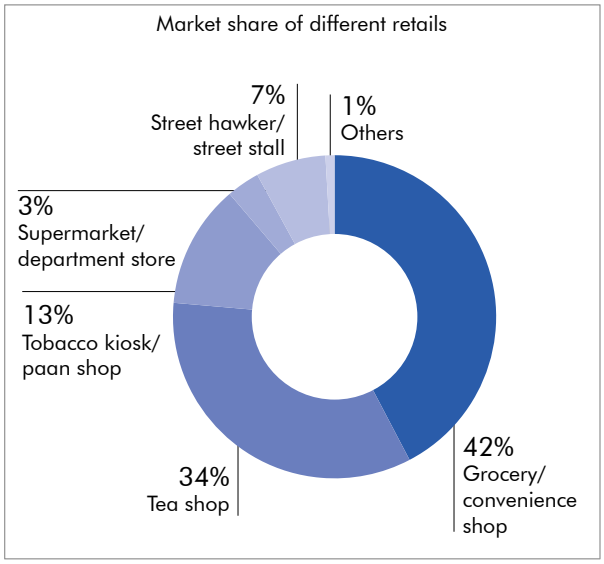
and wholesalers to consumers. The bans on promotion, advertising and sponsorship of tobacco products have positioned them as the primary point of communication between the suppliers and the consumers of the tobacco products due to their role in providing widespread access to and promotion of tobacco products.[44]

[4.3.1]
Market share by retailer type

The survey result shows that about 97 percent of tobacco sales in Bangladesh takes place through largely available and low-cost retail channels like grocery stores, tea stalls, *paan* (betel leaf) shops and street vendors. It is evident from the survey that small grocery stores dominate the retail channel for selling tobacco products with a market share of 42 percent, followed by tea shop and tobacco kiosks with market share of 34 percent and 13 percent, respectively (Figure 4.7).

Supermarkets accounted for 3 percent only of the retail sale of the tobacco products. The

Figure 4.7.
Market shares of different retails channels in Bangladesh



Source: TTRD Sample Survey, 2018

dominance of these numerous informal retail channels not only provides ample opportunities for tax avoidance and evasion, but also contributes to the widespread availability of various tobacco products in Bangladesh. Our study also tried to understand the retailers' perceptions about the underlying factors that drive the sales of tobacco products (cigarette, *biri*, SLT) in their area of operation.

[4.3.2]
Retailers' experiences of and attitudes toward selling tobacco

The study investigated the experiences and observations of retailers in relation to selling tobacco products. Adult and adolescent males buy most of the cigarettes and *biris*, while nearly 37 percent of all customers who buy SLT products are adult and adolescent females (Table 4.4). This gives a clear indication of the popularity of the SLT products among females. When asked how the number of customers changed over the last five years, 72.76 percent of the retailers have responded that the number has increased, while only 12.56 percent said that the number has decreased, and the remaining 14.67 percent replied that they have not noticed any change. Several aspects of demographic characteristics of the buyers of SLT products were observed in the retailer survey:

- Nearly 70 percent of the retailers who sell SLT products have stated that less than 10 persons under the age of 18 buy SLT products from them on a daily basis.
- About 47 percent of the SLT retailers have responded that on average more than 40 customers who are aged between 18 and 59 years buy SLT products from them each day.
- About 59 percent retailers have responded that less than 10 persons aged over 60 buy SLT products.

Table 4.4.
Buyers of tobacco products at retail outlet

Cigarette buyer		Biri buyer		SLT buyer	
Type	Percentage	Type	Percentage	Type	Percentage
Adult male	37.79	Adult male	67.56	Adult male	44.47
Adult female	11.48	Adult female	8.78	Adult female	32.83
Adolescent male	31.01	Adolescent male	17.56	Adolescent male	13.45
Adolescent female	6.63	Adolescent female	1.15	Adolescent female	4.41
Children (boy)	11.02	Children (boy)	4.58	Children (boy)	3.11
Children (girl)	2.08	Children (girl)	0.38	Children (girl)	1.74

Source: TTRD Sample Survey, 2018

- The increased number of inhabitants in a particular area and the affordability of tobacco products have been reported by the retailers as the two main driving factors for increased tobacco sales. It gives the underlying message that the real prices of tobacco products have not increased despite the increases in nominal price and tax.

Several other key observations from the retailer survey are as follows:

- When asked about the main reasons for selling tobacco, 77.28 percent and 35.88 percent of the retailers stated high demand and high profit margin as the reasons behind selling tobacco, respectively.

- When asked about the most frequently sold item of their business, the majority of the respondents (57 percent) have stated that cigarettes are the most sold item followed by food items (27.74 percent) and beverages (10.65 percent).

- Nearly 89 percent of the retailers stated that *zarda* is the most popular SLT product, while only 9 percent reported *gul* as the most sold SLT product. *Gul* is more popular in Nilphamari, Lalmonirhat, Mymensingh and Jashore districts in comparison to others.

- About one-third of the retailers stated that most of their tobacco sales take place between 4 pm to 10 pm when people leave work, while 11.75 percent mentioned that their sales are high during the early hours of the day from 8 am to 10 am when people go to work.

- Almost half (49.05 percent) of the respondents said that they observe the highest sales of tobacco on Friday, while 20.10 percent and 11.26 percent of the respondents mentioned Thursday and Saturday, respectively, as the highest selling day of the week. Altogether, more than 80 percent of the respondents responded that tobacco sales are high during the weekend when people try to relax and enjoy. This is alarming, as it tends to validate the popular belief among tobacco consumers that smoking can help to relax the mind.

- When asked which month of the year generally has the highest tobacco sales, the majority of retailers (27.84 percent and 14.67 percent, respectively) mentioned January and December as the highest selling month implying a seasonality effect. These two months constitute the winter season in Bangladesh, which explains why the perceived demand for cigarettes and *biris* is high during these two months.

- About 90 percent of the retailers stated that they are not aware of any changes in relation to tobacco control legislation that took place during the last three years, while the remaining 10 percent responded affirmatively.

Although the above findings are primarily reflective of the experiences and observations of the retailers of the most tobacco selling districts, it is expected that these trends will be similar in most of the other districts of Bangladesh.

[4.3.3]
Incentivizing the retailers

Tobacco manufacturers and distributors make substantial efforts to create and maintain relationships with retailers. According to a tobacco industry statement, there are more than 1250,000 retailers who sell tobacco products all over Bangladesh. The suppliers often compete for shelf space in retail outlets in order to prominently display their brands, as customers often perceive that the brand displayed most prominently is the one that is most popular.[45] This is why control of the retail space is highly valuable to tobacco manufacturers and distributors; hence, they offer incentives in various forms to the retailers.[46] Through the key informant interviews with retailers, and survey responses, the study has found several ways of incentivizing retailers in the Bangladesh market, which are somewhat similar to the practices in other countries. Some of the major incentives offered to the retailers are summarized below:

- ***Price reduction for large orders:*** Retailers are offered cigarettes at a discounted wholesale price for achieving certain sales volume or for ordering a minimum quantity. For example, most of the retailers hoard their stock before the budget declaration in the month of June in anticipation of price or tax increases in order to make higher profits later. However, if the price or tax structure remains the same for a particular brand of cigarette, the retailers who were hoarding the stock do not need to order for supply of tobacco in the regular manner. In this kind of situation, the manufacturers and the distributors offer lower prices for large orders in order to maintain their steady cash flow. About 28 percent of the retailers who participated in the survey stated that they have been incentivized by the suppliers in this manner.

- ***Gifts:*** Suppliers often send various gift items to the retailers and their family members who maintain steady sales of their brands. In Bangladesh, it is a common practice for the tobacco industry to send gifts during the time of religious and cultural festivals, such as Eid, Puja and Pohela Boishakh. Nearly 10 percent of the retailers mentioned that they received gifts from the distributors on various occasions.

- ***Promotional products:*** Tobacco suppliers also offer promotional products to retailers for achieving certain sales volumes. For example, there is a scheme called 'slide offer' under which the manufacturer of a certain brand gives promotional products, such as watches, umbrellas, small household items, etc., to any retailer who can sell a certain number of cigarette packets, which are of shell and slide category. About 9 percent of the retailers stated that they received promotional products from the tobacco suppliers at some point in time.

- ***Free samples:*** Free samples are often provided by the manufacturers when a retailer is asked to try a new product or if they maintain a product display. Nearly 8 percent of the respondents said that they received free samples many times.

- ***Cash incentives:*** In some cases, cash incentives are also offered as bonus

payments for achieving sales volumes or meeting prescribed promotional display or placement requirements.

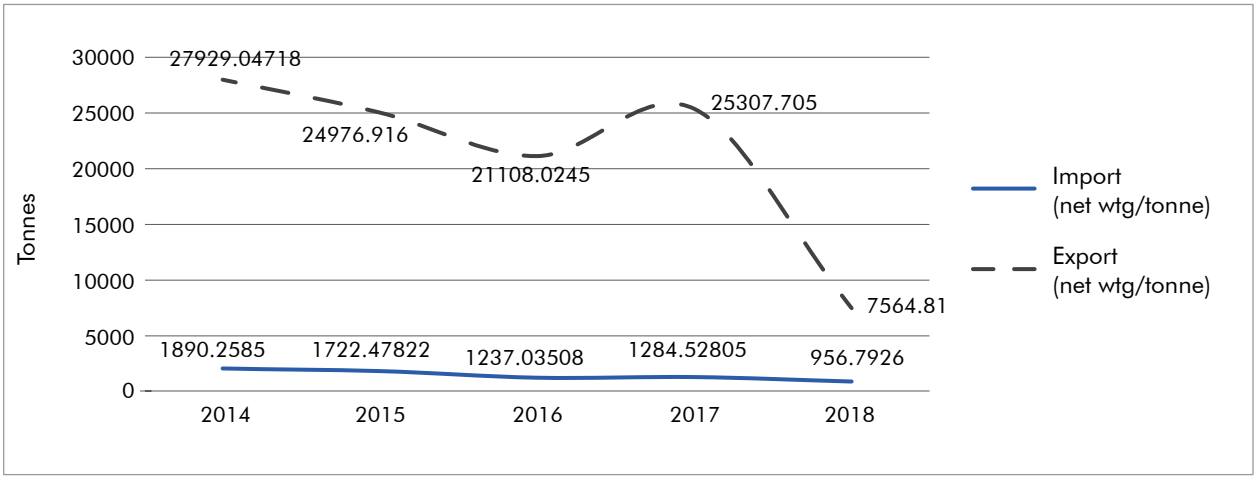
[4.3.4]
International trade in unmanufactured tobacco, 2014-18

There are considerable imports and exports of unmanufactured tobacco and tobacco refuse in Bangladesh. In 2003, the government introduced a 10 percent cash incentive for exporting tobacco as part of an export diversification program, but had to withdraw it in 2008 due to severe criticism from the anti-tobacco activists. The share of tobacco exports increased from about 2.5 percent in 2000 to nearly 34 percent in 2009.[47] In FY 2010-11, however, the government imposed a 10 percent duty on tobacco leaf exports in order to discourage tobacco growing. This may have contributed to the declining trend in exports, although imports of tobacco remained stable between 2014 and 2018 (Figure 4.8). However, the export duty was withdrawn in the FY 2018-19 budget. Owing to this policy change, it is apprehended that while the farmers may be inclined to engage more in tobacco farming with a view to making higher profits, the real beneficiaries will be the big tobacco manufacturing companies engaged in manufacturing and export of tobacco.

According to the data shown in Table 4.5, Bangladesh is a net tobacco exporting country. Although at some earlier point of time imports and exports of unmanufactured tobacco were almost similar (NBR), it is not the case now. In recent years, raw tobacco leaf exports have exceeded the quantity of imports by a significant margin.

Table 4.5 also shows that only 1,013 kilograms of manufactured cigarettes (H.S. code 2402.20.00) were imported into Bangladesh from 2012 to 2016, while 280,364 kilograms were exported. Moreover, cigarettes were imported mostly by different Embassies and High Commissions in Bangladesh for their own consumption and some tobacco manufacturing companies as samples. None of the imported cigarettes were intended for commercial sale. The reason behind this is the existing high import tax structure and as a result, Bangladesh has so far effectively managed to restrain the import of cigarettes into the domestic markets for commercial sales, unlike many other countries in the world.

Figure 4.8
Imports and exports of unmanufactured tobacco, 2014-2018



Source: National Board of Revenue (2018)

Table 4.5.
Aggregate international trade in tobacco products, Bangladesh, 2012-2016

H.S. heading	H.S. code	Import		Export	
		Net weight (Kg)	Assessable value (BDT)	Net weight (Kg)	Assessable value (BDT)
24.01 (Unmanufactured tobacco, tobacco refuse)	2401.10.00	5400443	89947860	46402767	6198945074
	2401.20.00	3377518	805871755	68595859	14332478962
	2401.30.00	212815	9039188	1842827	104288236
Subtotal		8990776	904858803	116841453	20635712272
24.02 (Cigars, cheroots, cigariloos and cigarettes)	2402.10.00	186	113837	94096	22816026
	2402.20.00	1013	4417762	280364	111598696
	2402.90.00	450	322085	282796	122523041
Subtotal		1649	4853684	657256	256937763
24.03 (Other manufactured tobacco)	2403.11.00	40	14283	0	0
	2403.19.00	60425	20414022	1930141	647015445
	2403.91.00	70715	52645715	385683	63121842
	2403.99.00	84580	49451871	1497130	160520000
Subtotal		215760	122525891	3812954	870657287
Total		9208185	1032238378	121311663	21763307322

Source: National Board of Revenue (2018)

[4.4] CONCLUSION

Tobacco control policies, some restrictions on tobacco cultivation and tobacco company marketing, and minimal resources dedicated to tobacco control appear to have had little effect on tobacco use in Bangladesh. Smoking prevalence dropped, but more could be done. The large number of small tobacco product vendors, particularly the street vendors, make effective enforcement of tobacco control, for example, the prohibition on sales to minors, difficult. Stronger and more comprehensive policies would help to reverse the upward trends in tobacco cultivation and sales in Bangladesh.

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CHAPTER FIVE

TOBACCO TAX POLICY AND ADMINISTRATION IN BANGLADESH

[5.1]
TOBACCO TAX POLICY MAKING PROCESS

The National Board of Revenue (NBR) is the apex institution for formulating tax policy and enforcing tax administration in Bangladesh. NBR was set up in 1972 under Presidential Order No. 76 of 1972. Since inception, NBR has been performing the dual task of formulating tax policies and collecting revenue for the government to finance basic state functions. Its tax policy functions are limited to the formulation of tax policy, granting exemptions, and preparation of the national revenue budget.

The formulation of tax policy involves policy units across the taxes, which remain constructively engaged throughout the year. Apart from its own research and policy analysis, NBR sends out letters to relevant Ministries/Divisions, trade bodies, academics, think tanks and its own field establishments soliciting proposals, recommendations, opinions, and observations on matters relating to tax policy. The information received from stakeholders and proposals put forward by anti-tobacco activist groups form the key inputs for policy making. Based on these various inputs, the Value Added Tax (VAT) policy wing of NBR prepares policy notes for the Finance Minister and the Parliamentarians and places them in the Parliament in the form of a Finance Bill in accordance with Article 81 of the Constitution. It is pertinent to mention that imposition of tax is a legislative business as enshrined in Article 83 of the Constitution. Article 83 also provides that the Parliament, through enactment of law, can authorize the government to modify the tax rates if it is needed in order to protect the interest of the people. Keeping this end in view, the Parliament passed the Value Added Tax and Supplementary Duty Act, 2012. Section 15 of the said Act provides for the imposition of multiple VAT rates: but the rate on tobacco products is 15 percent. Section 55 of the Act also provides for the imposition of supplementary duty on goods and services, which are socially undesirable and luxurious in nature. Once the Finance Bill is passed in Parliament, it becomes the Finance Act and the policy comes into force.

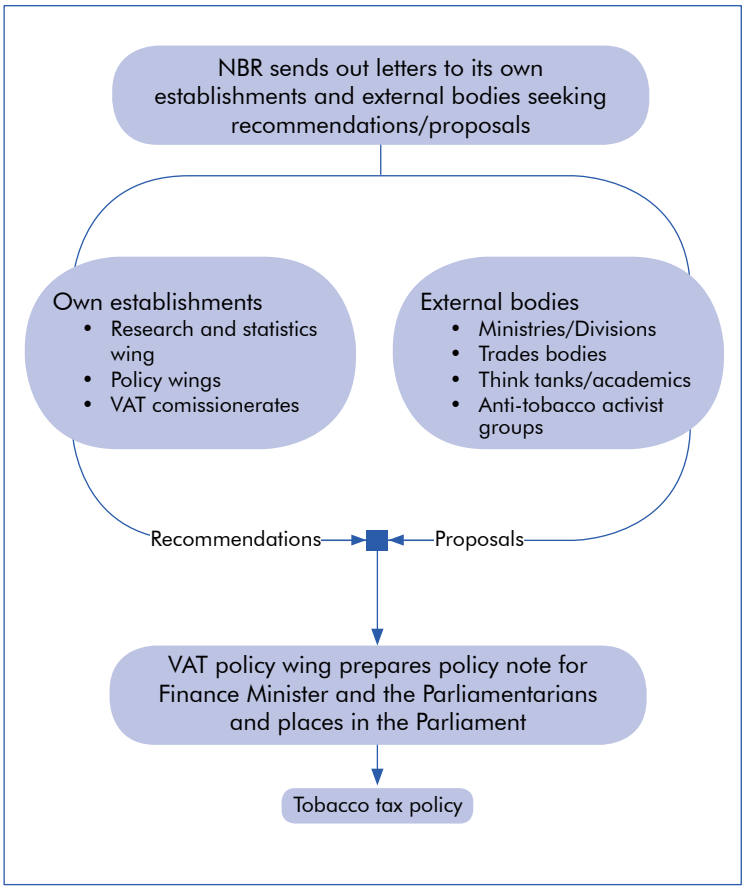
Section 58 of this Act provides for the adoption of a special scheme in order to deal with tobacco products.

There are a number of political, social and economic issues, which provide substance to develop an objective for a tobacco tax policy. Decisions about the right policy for tobacco products are complex since there may be a need to balance several different objectives with economic considerations, including the following:

- the likelihood of smuggling and tax evasion;
- the administrative capacity of tax units;
- the adverse effect on health;
- income levels of the people; and
- taxes in neighboring countries.

There are also additional issues unique to each tax administration to consider. Politics also plays an important role in shaping the tobacco tax policy. Figure 5.1 displays the tobacco tax policy making process in Bangladesh.

Figure 5.1
Tobacco tax policy making process in Bangladesh



[5.2] ANALYSIS OF THE PRESENT TOBACCO TAX POLICY

On the one hand, tobacco contributes to about 11 percent of total revenue collected by NBR. On the other hand, tobacco has emerged as a major risk factor for a number of non-communicable diseases including cancer, stroke and heart disease, which may lead to premature death. Amidst this serious dilemma, NBR does not have a written policy on taxing tobacco. Rather, every year NBR proposes revised taxes on various tobacco products based on the agenda of political leadership, the prevailing revenue target, and dialogue with the tobacco industry and public health stakeholders. However, NBR is in need of a written long-term policy for tobacco taxation that matches the government's commitment of making Bangladesh tobacco-free by 2040.

The current tobacco price and tax system has the following major problems:

- The price of tobacco in Bangladesh is one of the lowest in the world. The current tax system is *ad valorem*, which has a low tax base and yields low revenue. Moreover, low prices make tobacco products easily affordable to consumers.

- Every year the tax base of cigarettes (MRP) is increased. As the tax system is *ad valorem*, the government receives only a portion of increased prices. For example, if the MRP of a pack of 10 sticks of cigarettes is BDT 100 and the Total Tax Incidence (TTI) is 70 percent, the government gains BDT 70 and the industry retains BDT 30. Without changing the TTI, if the MRP is increased by BDT 10, the government would then receive BDT 7 as revenue, and the industry retention increases by BDT 3, which is not taxed at all. This encourages the industry to expand its business further, thereby increasing the risk to public health. At the same time, the government deprives itself of potential revenue.

- Cigarette taxation is currently based on four tiers of MRP with wide gaps between tiers. This structure has created opportunities for smokers to substitute to low-priced brands. As a result, smokers do not quit, but switch brands instead. The government also loses revenue, as low-priced tiers yield lower revenue (NBR, 2018).

- While the lowest tier of cigarettes has 71 percent of the market share, this segment contributes only 47 percent to tobacco tax revenue, as tax on this segment is disproportionately low compared to the other three segments.

- Some low-priced cigarette brands are available in the market at a price lower than the printed MRP, indicating tax evasion. Again, some high-priced cigarette brands are sold in the market at a price higher than printed MRP, indicating a loss of revenue by the government.

- *Biris* are extremely cheap, making it more affordable in the growing per capita income context of Bangladesh. Relatively low prices of *biris* encourage substitution as well. Data indicates that there is tax evasion by the *biri* industry, particularly taking the advantage of low-tech banderole.

- Available data indicates the existence of informal manufacturing facilities for SLT products (*zarda* and *gul*), thereby evading taxes at a large scale.

- Tax bases for cigarettes, *biris* and smokeless tobacco (*zarda* and *gul*) are different, thereby making the system complicated.

- The capacity of NBR to administer tax on tobacco products is low due to a shortage of trained personnel, modern equipment, and track and tracing system.

The use of evidence in framing a sound tobacco tax policy design and enforcement is important to meet the challenges of tobacco taxation. In the first place, research helps instill confidence in the tax system by providing evidence on both tax policy and administration. Second, research carried out to understand both micro and macro effects bring the big picture into focus. For example, a study found that the GDP growth rate in Pakistan, a key macroeconomic target, would be increased by focusing more on tax enforcement than increasing the tax rates given the large share of informal employment in the country[48]. Third, effective policy making requires evidence when developing policies and evaluating their impact. Fourth, evidence is critical for effective tax enforcement.

[5.3]
TOBACCO INDUSTRY'S INFLUENCE ON TOBACCO TAX POLICY MAKING

Bangladesh has a complex tax structure for tobacco products. Keeping it that way is in the interest of the tobacco industry. However, simplifying the tax structure and making it transparent is beneficial for both public health and government revenue. But that is not in the tobacco industry's interest. It is likely that the tobacco industry is allowed to have a voice in the country's tobacco tax policy making process. During the pre-budget consultation, NBR should reach out to public health groups and not the tobacco industry. There is global evidence that the tobacco industry tries to resist any increase in tobacco taxes[49]. The pressure from the tobacco industry and its political network in the NBR is evident from the fact that during the period from FY 2004-05 to FY 2009-10, SD rates in different price tiers of cigarettes remained the same. Rather, NBR tried to generate more revenue through increasing retail price by revising the price ranges within and across price tiers. This measure helped the industry widen their profit cushion. As a result, it did not help achieve public health objectives. Based on the report of PROGGA,[50] a local NGO, some evidence of the tobacco industry interference in tobacco tax policy making is narrated below:

- Ministry of Agriculture's Pricing Advisory Committee consults the tobacco industry about tobacco leaf pricing policies.
- The government has about 10 percent share in BTAB and several high-level government officials hold positions in BATB.
- Contrary to WHO FCTC Article 5.3 guidelines, several government officials are members of the BATB tobacco related corporate social responsibility (CSR) Committee and actively participate in these CSR programs.
- Although the government banned the use of subsidized fertilizer for tobacco farming in 2010, areas such as Bandarban still continues to use it.
- The government has given a 25 percent tax waiver on export of tobacco products.
- The government has also retained VAT exemption facilities for unprocessed tobacco at the local level production.
- Persons involved in tobacco business are awarded for being the highest or longest serving taxpayer, or any other recognition by the government.

Increasing the consumer price of *biris* through tax measures appears to be more challenging for NBR for political reasons[51]:

- First, several MPs are involved in the *biri* business.
- Second, it is claimed that about 2.5 million workers are involved in the *biri* industry, many of whom are poor women and children. Therefore, it is argued that controlling *biri* consumption will force *biri* manufacturers to downsize their production, which will cause unemployment for *biri* workers.
- Third, *biri* consumers belong to the poorer segment of the society. It is believed that raising prices and taxes of *biri* will, therefore, result in loss of popularity of the government among this population.

Ahmed, 2012 documented the following pressures from the *biri* industries:

- Every fiscal year during the pre-budget period, many MPs make written appeals to NBR not to increase *biri* price. Rather they demand complete withdrawal of tax from *biris*.

- In FY 2011-12, the *biri* manufacturers association created substantial pressure to split the tariff value (*biri* tax base) into three price bands, namely, 12 sticks per pack, 10 sticks per pack and 8 sticks per pack, which was successful. The splitting of tariff value had adverse effects on revenue and health.

- The tobacco industry influenced the Ministry of Finance to reduce the proposed tax on *biris* from 35 percent to 30 percent in FY 2017-18 budget (PROGGA, 2018).

- The scope of revenue evasion may increase because of the opportunity for swapping banderols between different price tiers.

The pressure of SLT manufacturers is evident from the fact that in FY 2018-19, the Finance Minister in his budget speech announced the replacement of ex-factory price with retail price as the tax base of SLT products. However, because of the pressure of the SLT manufacturers, the government retreated from the announcement of retail price and passed the budget with the outdated tariff value as the tax base. However, the government introduced the maximum retail price (MRP) for SLT products in FY 2019-20.

[5.4]
NOTE ON TOBACCO TAX POLICY: WAY FORWARD

The ultimate goal of the tobacco tax policy in Bangladesh should be to reduce tobacco consumption, the death and disability caused by tobacco use, and increase government revenues from increased tobacco taxes. The added revenues can be used for a variety of programs that benefit the poor and other vulnerable groups. Reducing price tiers gradually and finally moving towards a specific uniform tobacco tax over a certain period of time can help expand the government revenue base and mobilize additional resources to fund public service programs, particularly public health financing, and achieve a reduction in tobacco use. In order to realize this goal, there should be specific objectives and time bound targets that can be met within a particular period of time.

In view of the political and socioeconomic reality, the objective should be to reduce the number of price tiers, maintaining stable revenue earnings from the sector. In order to do this, the price and tax measures set forth below should be taken.

[5.4.1]
Tax and price measures for cigarettes

In the past, NBR made attempts to increase prices and taxes for cigarettes taking into consideration inflation and income growth of the people, but has not always been successful to implement those due to political decisions. Keeping the same principle in mind, a policy reform of a gradual price increase and reducing the price tiers of cigarettes from four to two (i.e., merging low and medium into one tier and high and premium into another tier) and setting higher SD rates at 60 percent and 65 percent, respectively, for the proposed two tiers would result in a significant increase in excise tax revenue while reducing tobacco use. The simulation results of this study presented in Chapter VII) suggest that the above policy interventions are projected to reduce the number of smokers by 3.22 million people and avert the deaths of 1.06 million people while enhancing the revenue growth by 12.1 percent over a period of one year.

However, the government should take tax measures to replace the existing *ad valorem* taxes with specific taxes. This is because unlike *ad valorem* tax, which is dependent on the industry's pricing strategy, specific tax is independent of the industry's pricing strategy

and produces a more stable stream of tax revenue. Specific taxes may be imposed by amending the existing law. As the first step, the government can move towards a system of uniform specific tax structure by reducing the number of the current cigarette price tiers and adding a specific tax for all tiers in the existing *ad valorem* tax structure.

A strategy to reduce industry profits should be adopted if someone decides to sell over the minimum price by imposing additional taxes. For example, let us assume that the floor price of one packet of cigarettes is BDT 100 and the amount of specific tax is BDT 80. If the industry sells the same pack of cigarette at BDT 120, then the specific tax component on the additional component would be more than 80 percent.

[5.4.2]
Tax and price measures for *biris*

Biris are already facing a structural decline and there is strong political will from the government to gradually abolish the *biri* industry. A policy reform of abolishing the tiers of *biris* based on filters may start from FY 2020-2021 (after the first year of the new government). The increase in *biri* taxes through a uniform specific *biri* excise tax would significantly raise *biri* prices and reduce their use. In addition, only hard packs, like those for cigarettes, should be made mandatory for *biris* as well. Policy makers should also seriously consider changing the security features of the banderols every two years at least in order to prevent the use of counterfeit banderols in the industry.

[5.4.3]
Tax and price measures for SLT

Measures should be taken to address the informality of the market for SLT products by formalizing the SLT manufacturing units through registration of SLT manufacturers. /The government introduce MRP for SLT products as tax base in FY 2019-2020. However, specific tax may be added. In addition to the price and tax measures, the packaging of SLT products should also be standardized and regulated with security features to ensure that the price increase does not help grow the illegal market of these products.

[5.5]
STRENGTHENING TAX ADMINISTRATION OF NBR INCLUDING TOBACCO TAX ADMINISTRATION

[5.5.1]
Redefining the status and regulatory power of NBR

We take a holistic approach to strengthening tax administration of NBR. There is a need for redefining the status, role and regulatory power of NBR based on international best practices. The objective is to give NBR a corporate entity with autonomy in financial, organizational, personnel and performance matters, and also empower it to make investments from revenue collection and implement transparent tax policies in an integrated manner. The NBR chairman and all the members must hold the position of secretary to the government, as has been done in the neighboring country, India. This step would help reduce leadership turnover.

[5.5.2]
Restructuring of NBR and its field formations (By function and size)

Presently, NBR tax offices are designed along type of taxes and territorial jurisdictions.[1] This design has severe limitations, particularly in scalability. Thus there is a strong case for the

[1] Territorial jurisdictions mean that all VAT related affairs (registration, audit, collection and enforcement of revenue) are done by a local VAT comissionerate

distribution of tax work according to function and size so that economies of scale can be achieved and more efficient and specialized approaches to tax management are possible.

[5.5.3]
Integrated revenue management program: Business process

An integrated revenue management program seeks to connect the three wings of NBR, namely, income tax, customs and VAT, at the transactional level by linking the taxpayer identification number (TIN) and business identification number (BIN) in the database. The methodology for setting up such an integrated system is to first centralize the database and transaction processing of the three wings at one location and then to build an information system that can mine data in the three databases and thereafter process the same for exception reports. The integrated revenue management program will enable the desired flow of information and consequent synergy among the three tax wings of NBR. Moreover, NBR must develop a database of all tobacco products for legal enforcement and monitoring.

[5.5.4]
Integrated revenue management program: Digitalization program

This program will seek to set up a country-wide integrated ICT platform to capture all tax payment information from tax returns, banks, tax deduction at source (TDS), third party collection agencies, etc. The integrated revenue management system will also receive third party returns (i.e., TDS returns), Annual Information Returns (AIR), and generate MIS reports, exception reports, etc. Under this program, a Central Processing Centre is to be set up for processing all income tax and VAT returns, whether e-filed or paper filed at one integrated processing center.

[5.5.5]
Strategic communication and taxpayer outreach, education and assistance

Bangladesh has a narrow tax base and a small percentage of the population bears the burden of taxation. Most of the direct tax revenues come from tax deduction at source (TDS), whereas a large percentage should be coming from corporate tax as well as from businesses and professions through advance tax (PAYE). The logical inference is gross under-reporting or non-reporting from various eligible categories. The taxpayer education program will make available a menu of offerings through remote outlets like websites, internet, as well as through customers facing one to one or group interface with the NBR Customer Service Wing.

[5.5.6]
Litigation management through alternative dispute resolution (ADR)

Dispute resolution is a key issue in taxation. It is estimated that more than 20,000 cases are lying with different courts involving about BDT 20 billion. Currently, the dispute resolution mechanism within NBR is inadequate and most of the disputes are taken to court. Following the South African model, NBR has introduced the alternative dispute resolution (ADR) mechanism to settle disputes out of the court system. Through an ADR mechanism, NBR and taxpayers would be able to iron out their differences with the help and guidance of a facilitator. However, the ADR mechanism needs to be strengthened so that a large amount of revenue would be collected through this mechanism.

[5.5.7]
Human resources (HR) and institutional development

In order to achieve the revenue target, NBR needs to recruit additional personnel and train the existing human resources. The restructuring

of the tax work by function and size will call for a major overhaul in the HR approach to deployment and training of personnel. A comprehensive HR policy has to be designed to create congruence between aspirations and skill sets of officers and staff and the organizational goals of NBR. It is proposed to put in place an effective ethics management policy that encourages adherence to expected ethics standards and values across NBR, and also the adoption of incentives/disincentives schemes based on quantifiable performance appraisal system. As part of its institutional development, NBR needs to expand and strengthen its existing research capacity to carry out in-depth research and also to strengthen research-policy linkage. Capacity building through two Tax Training Academies will pave the way for this institutional development.

[5.5.8]
Activating the tobacco tax cell of NBR

In May 2010, WHO provided technical assistance to NBR to establish a tobacco tax cell within NBR with the following objectives:

- develop tobacco database;
- conduct research on tobacco market trends;
- analyze the impact of tobacco tax on public health and government revenue; and
- formulate evidence-based tobacco tax policy.

WHO also provided technical assistance for developing a Tax Simulation Model and supported several training programs for NBR officials to strengthen their capacity. But since 2013, the cell has become non-functional. However, WHO has agreed to provide technical assistance to activate the cell. Once the cell becomes operational, it may be self-propelling in designing evidence-based tobacco tax policy.

[5.6]
IMPERATIVES FOR COMBATING TOBACCO INDUSTRIES' INFLUENCE ON TOBACCO TAX POLICY MAKING

- The Ministry of Health and Family Welfare (Health Services Division) should take the initiative to raise awareness about Article 5.3 of the FCTC among the Ministry of Finance, Ministry of Agriculture and Ministry of Industries.
- The Ministry of Agriculture should stop consulting the tobacco industry about tobacco leaf pricing policies.
- All interactions of the government with the tobacco industries and their representatives must be transparent.
- The government should also take the initiative to divest its shares in BATB. Until the offloading, only Investment Corporation of Bangladesh (ICB) should represent the government in BATB.
- Tobacco related CSR activities should be banned as required under Article 5.3 of the WHO FCTC. In order to avoid the conflict of interest, government officials must terminate their positions in tobacco companies.
- The government must withdraw all incentives provided to the tobacco industries, including the exemption of export duty and VAT. The government should enforce the ban on the use of subsidized fertilizer for tobacco growing.
- The government must stop giving awards for the highest taxpayer or the longest serving taxpayer award or any other recognition to the persons involved in the tobacco business.

- The government must expedite the adoption of a code of conduct for all government officials in dealing with the tobacco industry.

[5.7] CONCLUSION

Evidence from a growing number of low- and middle-income countries suggests that strong tobacco control policies will lead to significant reductions in tobacco use, while relatively weak policies will have a limited impact[52]. As the signatory of FCTC, the government needs to adopt comprehensive policies to curb tobacco use and ensure effective enforcement of the policies. Activating a tobacco tax cell at NBR would be a major step in enforcing tobacco control policies and tax administration in Bangladesh.

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[49]Yach, D. and Bettcher, D., 2000. Globalisation of tobacco industry influence and new global responses. Tobacco control, 9(2), pp.206-216

[50]PROGGA 2018. "Bangladesh Tobacco Industry Interference Index" (Report on Implementation of FCTC article 5.3) paper presented at the 12th Asia Pacific Conference on Tobacco or Health, Bali, Indonesia, 13-15 September 2018

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CHAPTER SIX

DEMAND FOR TOBACCO PRODUCTS IN BANGLADESH

[6.1] EXISTING EVIDENCE ON DEMAND FOR TOBACCO PRODUCTS

Numerous studies have highlighted the existence of a strong relationship between tobacco taxation and tobacco consumption[53]. Available evidence in South Asia suggests that the demand for tobacco products is responsive to price changes. However, behind the estimates of price elasticity, there are a variety of methodologies and data sources. Some studies use annual time series data, while others use cross-sectional data. The estimates of own-price elasticities of demand for tobacco products in five South Asian Countries are summarized in Table 6.1.

Table 6.1
Price elasticities of demand for tobacco products in five South Asian Countries

Country	Own-price elasticities	Methods of study	Source
Bangladesh	-0.27, cigarettes	Time series data on tobacco leaf and cigarettes for 1983-99 and used OLS	Ali, Rahman, and Rahman (2003)[54]
	-0.5 short run, cigarettes -0.7 long run, cigarettes	Time series data from 1970 through 2000 for Bangladesh, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and used **conventional and myopic addiction demand models**	Guindon, Perucic, and Boisclair (2003)[55]
	-0.66, cigarettes -0.22, *biris*	International Tobacco Control (ITC) Policy Evaluation Project Bangladesh Survey, 2009, 2010 and used **instrumental variable method of estimation**	Nargis *et al.* (2011)[56]
	-0.41 short run, cigarettes -0.57 long run, cigarettes	Annual time series data on aggregate cigarette consumption from 1981 through 2004 and used an **econometric methodology** that accounts for the time series properties of the data	Barkat *et al.* (2012)[57]

[Table 6.1 contd...]

[...Table 6.1 contd]

Country	Own-price elasticities	Methods of study	Source
	-0.49, cigarettes (-0.75, the low income group; -0.40, the medium income group; -0.36, the high income group based on housing index)	ITC Policy Evaluation Project Bangladesh, Wave 1 (2009) and Wave 2 (2010) Surveys and used the **probit model, weighted OLS and 2SLS**	Nargis *et al.* (2014)[58]
	-0.64, the lower priced *zarda* -0.39, the higher priced *zarda*	ITC Bangladesh Wave 3 Survey and used the **univariate Epanechniko kernel density function**	Nargis, Hussain and Fong (2014)[59]
	-1.3, cigarettes (-1.36 for the first poorest decile and -1.23 for the richest decile) -1.22, *biris*	HIES 2016 household survey data and used Quadratic AIDS Model	Carmen, Fuchs and Genoni (2018)[60]
India	-0.34, cigarettes -0.92, *biris* -0.87, leaf tobacco	Sample survey conducted by National Sample Survey Organization (NSSO), India from July 1999 to June 2000and used **Deaton Model**	John (2008)[61]
	-1.03 cigarettes -0.94 *biris*	Data from the National Sample Survey (NSS) rounds (NSS 50, 55 and 61 conducted in 1993/94, 1999/00 and 2000/05 and pooled data (NSS 55-57, 59-64, conducted between 1999/00 to 2007/08)and used **Deaton Model**	Guindon, Nandi, Chaloupka and Jha (2011)[62]
	-0.83, cigarettes, the lowest income group; -0.26, cigarettes, the highest income group; -0.43, *biris*, the lowest income group; -0.08, *biris*, the highest income group; -0.56, leaf tobacco, the lowest income group; -0.45, leaf tobacco, middle income group.	Data from the 2011-2012 Consumer Expenditure Survey, India and used Deaton Model	Selvaraj, Srivastava, and Karan (2015)[63]
Nepal	-0.89, cigarettes	Household level data (2003) and used **OLS** for estimating price elasticity	Karki, Pant and Pande (2003)[64]
Pakistan	-1.17, long run, cigarettes	Time series annual data from 1981 to 2009 and used **autoregressive distributive lag (ARDL) model**	Mushtaq N., Mushtaq S. and Beebe (2011)[65]
	-1.07, cigarettes -0.55, chewed tobacco	Household Integrated Income and Consumption Survey, 2015-16 and used **Deaton Model**	Nayab, D. *et al.* (2018)[66]
Sri Lanka	-0.53, cigarettes (-0.29, the richest quintile and -0.55 to -0.64 among the other four quintiles)	Sri Lanka Integrated Survey Data 1999/2000 and used **two-part demand model**	Arunatilake (2002)[67]

It appears from Table 6.1 that price elasticities vary across countries. Additionally, own-price elasticities of demand for cigarettes, *biris* and SLT products are generally higher among the poor than the rich income groups, because the poor respond more to price changes. The studies in Bangladesh show that own-price elasticity of demand for cigarettes ranges from -0.27 to -1.3, while that for *biris* ranges from -0.22 to -1.22. On the other hand, the own-price elasticity of demand for SLT products (*zarda*) varies from -0.39 to -0.64.

[6.2]
THE DEATON MODEL

In many developing countries, including Bangladesh, tobacco taxes constitute a major source of government revenue. A sound tobacco tax policy design requires knowledge of own- and cross-price elasticities of demand for tobacco products with a view to assessing the impact of tobacco tax increases on consumption, and government revenue. Such estimations would normally be obtained by the analysis of time-series data on aggregate demand, prices and incomes. Unfortunately, few developing countries have time-series data of an adequate length to estimate own- and cross-price elasticities of demand. However, many developing countries, including Bangladesh, *regularly* collect high quality household survey data o n expenditures and quantities of a wide range of commodities including tobacco products.

The study uses the Deaton Model to estimate the own- and cross-price elasticities of demand for cigarettes, *biris* and SLT products with spatial variation in budget shares of households and unit values with the BBS Household Income and Expenditure (HIES) 2010 and 2016 Survey data. The relevance of Deaton Model (1987[68], 1989[69], 1990[70] and 1997[71]) lies in the fact that it employs a technique that exploits price variation over geographical space to estimate a system of price elasticities using the household survey data in order to suggest more appropri ate tobacco pricing strategies for policy makers. To estimate price elasticities, Deaton uses the following two equations, which link the budget shares and unit values of multiple tobacco products to household expenditures, other household characteristics and the prices of commodities:

$$W_{Gic}=\alpha^{0}_{G}+\beta^{0}_{G}\ln x_{ic}+\gamma^{0}_{G}Zic+\Sigma^{N}_{H=}\theta_{GH}\ln\rho_{Hc}+(f_{Gc}+\upsilon^{0}_{Gic} \quad \text{.....(1)}$$

$$\ln UV=\alpha^{1}_{G}+\beta^{1}_{G}\ln x_{ic}+\gamma^{1}_{G}Zic+\Sigma^{N}_{H=}\psi_{GH}\ln\rho_{Hc}+\upsilon^{1}_{Gic} \quad \text{.....(2)}$$

In the first equation, W_{Gic} is the budget share of good G in the budget of household i living in cluster c. The budget share is the share of the budget devoted to the commodity (including both actual purchases and imputed expenditures). If the price of cigarette increases due to increases in tax, then the effect on revenue depends on the response of total demand to price, including purchasers and non-purchasers alike. In equation 1, the budget share of the household is taken to be a linear function of the logarithm of total household expenditure, x, a vector of household characteristics, Z, and the logarithm of N prices where N is the number of commodities. The term $f_{Gc}+\upsilon^{0}_{Gic}$ can be thought of as an error term with both cluster and idiosyncratic components. Equation 2, which is observed only for households that record positive purchases, relates unit value to the logarithm of total household expenditure, x, a vector of household characteristics, Z, and the logarithm of N prices where N is the number of commodities.

The coefficients, β^{0}_{G} and β^{1}_{G}, represent the elasticity of quantity demanded with respect to total expenditure and quality elasticity, respectively. The total expenditure elasticity can be calculated from $\varepsilon_{x}=1-\beta^{1}_{g}+\beta^{0}_{g}/w_{g}$, where w_{g} is the mean budget share of the g-th product.

Deaton (1997) points out two drawbacks of using unit value as a proxy for price. First, unit values are affected by the choice of quality. As unit values are computed by dividing household expenditures by physical quantities, they do not

take into account the nature of heterogeneity of the commodity. For example, in a household survey when households report expenditure and quantity of cigarettes, the enumerator has to overlook the fact that cigarettes are a heterogeneous commodity, and that price varies according to the brand (formally referred as quality in Deaton Model) chosen. High-income households may tend to purchase higher priced cigarettes so that reported unit values may be positively related to total expenditure. Second, because unit values are derived from reported expenditures and quantities, there is the probability of measurement error in both quantity and expenditure, which is transmitted to the unit value. Deaton's two-equation system assumes that there is no price variation within each cluster. The validity of this assumption requires both geographical proximity of the households and that households be interviewed at approximately the same time (Deaton, 1990). Hence, the variation in unit values within each cluster reflects differences in quality and measurement. Deaton's approach of two-equation system of budget shares and unit values attempt to correct for quality and measurement error by adopting a weak separability assumption (Deaton, 1988).

There are three stages to implement the Deaton Model. In the first stage, equations (1) and (2) are estimated by Ordinary Least Squares (OLS) one by one after cluster means are subtracted. The effects of household characteristics are purged from the budget share and unit value. Any residual variation in unit value and covariance with budget share residuals are assumed to reflect measurement error, and the first stage regression residuals give an empirical estimate of these errors.

In the second stage, the budget shares and unit values are averaged over clusters and then used to estimate inter-cluster errors-in-variables regressions. At the third and final stage, applying the weak separability assumption, the quality and price effects are removed. At this stage, we use the errors-in-variable estimator rather than OLS. The symmetry restrictions are added to increase the precision of the estimates of the parameters. Variance-covariance matrices for the estimated parameters and elasticities are obtained by bootstrapping.

[6.3]
6.3 THE DATA

Table 6.2 presents the descriptive statistics of eight variables used in the study. Demographic characteristics of households by deciles are presented in Annex 6.1.

Table 6.2.
Descriptive statistics of the variables

Variables	Description	Mean	Standard Deviation
Budget share	Share of the household expenditure on a tobacco product to monthly food expenditure.	Cigarette: 0.02 *Biri*: 0.006 SLT: 0.002	Cigarette: 0.04 *Biri*: .018 SLT: 0.005
Unit value	Ratio of the household expenditure on a tobacco product to its quantity purchased	Cigarette: 2.96 *Biri*: 0.62 SLT: 0.027	Cigarette: 1.71 *Biri*: 0.615 SLT:0.063
Monthly expenditure	Average food expenditure in a month	6780.78	4461.54
Annual expenditure	One year total expenditure	172393.7	162963.8
Household size	Number of members in a household	4.04	1.55
Household head's education year	Household head's education year	4.26	4.61
Male ratio	Ratio of males in the household	0.49	0 .19
Adult ratio	Ratio of adults in the household	0.71	0.21

Source: Household Income and Expenditure Survey, 2016
Note: SLT products include shadapata (dried leaf) and *gul*.

Table 6.3 shows the average unit values, budget shares of cigarettes, *biris* and SLT products and percentage of households consuming tobacco products by rural/urban clusters. We find the difference in unit values and budget share among cigarettes, *biris* and SLT products between rural and urban clusters. Both the unit value and budget share of cigarettes are higher in the urban area than in the rural area. This is because most of the high-priced cigarettes are sold in urban areas. If we consider the unit values as prices, it means that the prices of cigarette, *biri* and SLT products in rural Bangladesh are BDT 2.74 per stick, BDT 0.61 per stick and BDT 0.03 per gram, respectively. In urban Bangladesh, they are BDT 3.55 per stick, BDT 0.65 per stick and BDT 0.02 per gram respectively. Thus, we notice that urban households purchase higher priced cigarettes than rural households. The difference in unit values between cigarettes and *biris* is substantial across deciles (Annex 6.2).

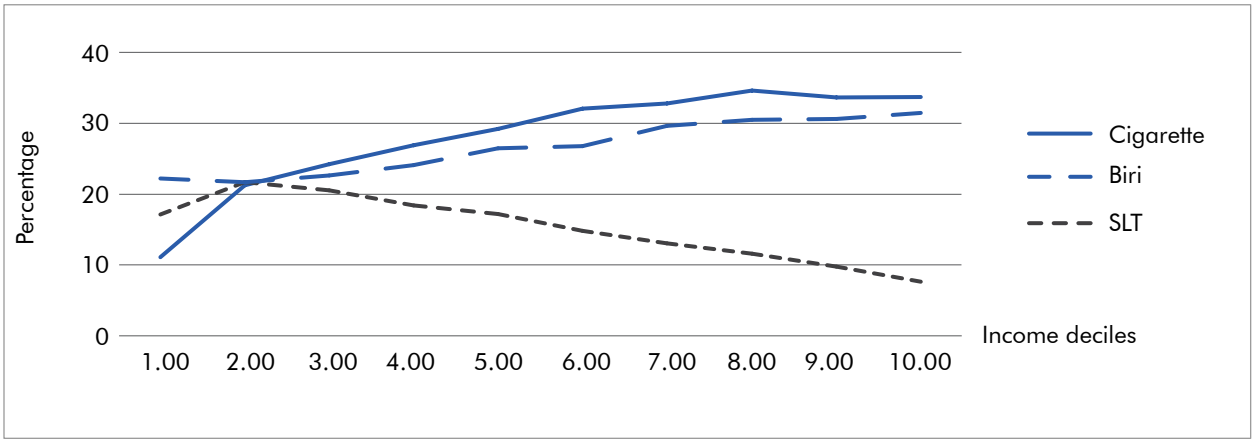
Figure 6.1 shows the percentage of households consuming any tobacco products by deciles. The consumption of both cigarettes and SLT products shows an increasing trend. This corroborates the findings of GATS 2017, which also display a high level of consumption of cigarettes and SLT products. On the other hand, the consumption of *biris* depicts a declining trend, mainly because of structural change. Of all the tobacco products, the highest percentage of households uses SLT products followed by consumption of cigarettes.

Table 6.3.
Unit values and budget shares of different tobacco products

Commodity	Rural			Urban		
	Percent consuming	Unit values	Budget share	Percent consuming	Unit values	Budget share
Cigarettes	25.97	2.74	0.018	32.49	3.55	0.026
Biris	18.58	0.61	0.008	7.36	0.65	0.003
SLT	28.96	0.03	0.002	21.21	0.02	0.015
Tobacco (all)	57.42	NA	0.028	49.56	NA	0.03

Source: Household Income and Expenditure Survey, 2016
Note: Unit values are all in BDT. Budget shares averaged over households who bought at least one of the tobacco products. Figures in Tobacco (all) shows the results of households with at least one type of tobacco product (including dual users).

Figure 6.1.
Percentage of households consuming tobacco products by deciles



Source: Household Income and Expenditure Survey, 2016

Figure 6.2 shows the budget shares of tobacco consuming households by deciles. On average, a household spends about 2.85 percent of its budget on tobacco products, with the highest share on cigarettes (about 2.04 percent) and the lowest share on SLT products (0.21 percent). By deciles, the budget shares on cigarettes, *biris* and SLT products show a declining trend. Detailed estimates of the budget shares of consuming households by deciles are given in Annex 6.3.

[6.4] EMPIRICAL RESULTS

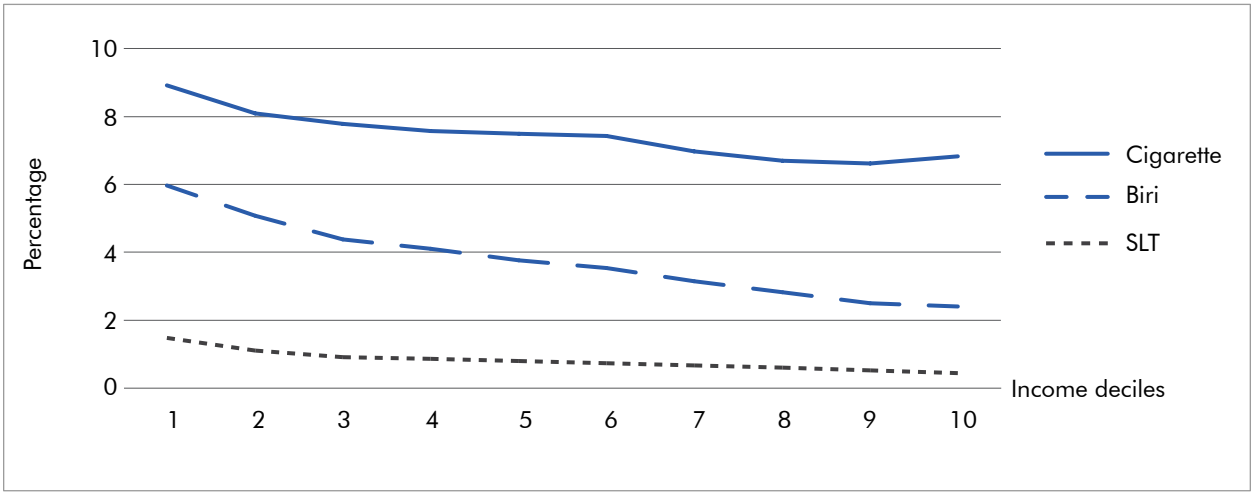
[6.4.1]

Within-cluster regressions for unit values and budget shares

The budget share of a household depends on the response of total demand to price changes, including purchasers and non-purchasers alike. On the other hand, unit value is observed only for households that record positive market purchases. Although households that record no expenditure are included in the analysis of budget shares, the whole clusters with zero expenditure are excluded because there is no way of estimating a price for them (Deaton, 1990). Following Deaton, we have excluded those clusters with zero consumption of any tobacco products.

Table 6.4 shows the estimated coefficients from both unit value and budget share equations, along with expenditure elasticities. The coefficient of the logarithm of household expenditure in the unit value equation gives the expenditure elasticity of quality. For cigarettes, there is a positive and statistically significant relationship in both urban and rural clusters. Cigarettes consumed by urban households have an elasticity of 0.224 in urban areas and 0.1 in rural areas. This implies that a doubling (100 percent) of the household expenditure would tend to raise the average expenditure on cigarettes by 22.4 percent in urban and 10 percent in rural areas, respectively. The increased expenditure on cigarettes and *biris* is likely to lead to the purchasing of higher priced products by both rural and urban households. The estimated coefficients of the logarithm of household size are negative and statistically significant in cases of cigarettes and *biris* in the urban area and in case of cigarettes in the rural area. It suggests that increases in household size work like reduction in income. With total household expenditure and other household characteristics remaining the same,

Figure 6.2.
Budget shares of tobacco consuming households by deciles



Source: Household Income and Expenditure Survey, 2016

an increase in household size has a significant effect of decreasing the average price paid by a household.

In the within-cluster regressions for budget shares, a positive coefficient indicates that the share of the household budget spent on a tobacco product rises with total expenditure. In case of cigarettes in both rural and urban areas, we notice a positive and statistically significant coefficient of the budget share.

Total expenditure elasticity (sum of expenditure elasticity of quantity and quality) varies across tobacco products. The estimates of total expenditure elasticity are positive for cigarettes, *biris* and SLT products suggesting that an increase in total household expenditure would result in an increase in expenditure on these tobacco products. The estimates of total expenditure elasticity for cigarettes and SLT products in both rural and urban areas are more than unity implying that increases in total household expenditure will tend to increase the consumption of cigarettes and SLT products more than proportionately in both rural and urban areas. However, the estimates of total expenditure elasticity of *biri* in both the rural and urban areas are less than one. Detailed estimates of within-cluster regressions for unit values and budget shares are given in Annex 6.4.

Table 6.4.
Within-cluster regressions for unit values and budget shares

	Rural					
	Unit value			Budget share		
	Cigarette	*Biri*	SLT	Cigarette	*Biri*	SLT
lnexp	0.1*** (0.015)	0.03 (0.025)	-0.74*** (0.025)	0.014*** (0.0007)	-0.0008*** (0.0003)	0.0002*** (0.0001)
lnhsize	-0.104*** (0.025)	-0.026 (0.02)	-0.01 (0.028)	-0.005*** (0.0008)	0.003*** (0.0004)	-0.0003** (0.0001)
Observations	8235	5904	9191	31500	31500	31500
Adjusted-R	0.36	0.63	0.67	0.13	0.20	0.24
F-stat	43.94	4.73	304.51	118.62	168.22	147.26
Clusters	1605					
Expenditure elasticity	1.71	0.87	1.64			
	Urban					
lnexp	0.224*** (0.022)	0.038 (0.044)	-0.728*** (0.044)	0.226*** (0.001)	-0.0008*** (0.0003)	-0.0004*** (0.0001)
lnhsize	-0.19*** (0.025)	-0.14** (0.055)	-0.008 (0.048)	-0.01*** (0.001)	0.002*** (0.0003)	0.0004*** (0.0001)
Observations	4511	1018	2942	13752	13752	13752
Adjusted-R	0.49	0.52	0.54	0.13	0.16	0.13
F-stat	90.33	2.39	103.01	89.85	50.97	50.12
Clusters	699					
Expenditure elasticity	1.63	0.67	1.51			

Notes: 1. Figures in parentheses indicate standard errors. 2. ***, ** and * indicate statistically significant at 1 percent, 5 percent and 10 percent levels respectively.

[6.4.2]
Own-price elasticities of demand for tobacco products

Using HIES 2010 and HIES 2016 data, we present the symmetry constraint estimates of own-price elasticities of demand for cigarettes, *biris* and SLT products together with bootstrapped standard errors (SE) (Table 6.5). The SEs are obtained using Deaton's approach from 1,000 replications of the bootstrap using the cluster-level data (Deaton, 1997). The estimates of own-price elasticities of demand for cigarettes, *biris* and SLT products are presented using the following three categories: (1) overall, (2) rural/urban clusters and (3) household expenditure quintiles. The results suggest that the estimates are negative, as expected. The estimates show that the demand for cigarettes and *biris* is elastic, while that for SLT products is inelastic. However, the overall estimates of own-price elasticities of demand for cigarettes and SLT products of HIES 2010 are higher than those of HIES 2016. It may be mentioned that the estimates of own-price elasticities of demand for cigarettes and *biris* are substantially larger than most of the existing evidence, while the estimate of own-price elasticity for SLT products is in keeping with the existing evidence. The results of HIES 2016 data also show that rural households are more responsive to changes in the prices of cigarettes than urban households.

Based on the household expenditure quintiles, our results also show that households belonging to the first three quintiles (i.e., the poorest 60 percent) are more responsive to price changes of cigarettes than the households of the fourth and fifth quintiles (the richest 40 percent). This is expected, as poor households respond more to changes in the prices of cigarettes than rich households. However, our results for SLT products show that urban households are found to be as responsive to price changes of SLT products as rural ones.

Table 6.5
Own-price elasticities of demand for tobacco products, HIES 2010 and 2016

	2016				
	Overall	Rural/Urban		Expenditure quintiles	
		Rural	Urban	Low (q1-q3)	High(q4-q5)
Cigarette	-1.03*** (0.02)	-1.38*** (0.023)	-0.89*** (0.033)	-1.23*** (0.03)	-0.83*** (0.034)
Biri	-1.34*** (0.02)	-1.26*** (0.02)	-1.55*** (0.49)	-1.20*** (0.03)	-1.30*** 0.07)
SLT	-0.30*** (0.016)	-0.32*** (0.018)	-0.32** (0.02)	-0.21*** (0.02)	-0.31*** (0.03)
	2010				
Cigarette	-1.13*** (0.039)	-1.02*** (0.067)	-1.27*** (0.04)	-1.16*** (0.06)	-0.76*** (0.079)
Biri	-1.05*** (0.022)	-1.04*** (0.022)	-0.84*** (0.068)	-1.02*** (0.028)	-1.01*** (0.005)
SLT	-0.37*** (0.04)	-0.58*** (0.048)	0.16** (0.08)	-0.11 (0.069)	-0.16 (0.107)

Notes: 1. Figures in parentheses indicate bootstrapped standard errors. 2. ***, ** and * indicate statistically significant at 1 percent, 5 percent and 10 percent levels, respectively.

[6.4.3]
Explanation for the divergent results between TTRD study and the World Bank study

The overall estimate of own-price elasticity of demand for cigarettes of the TTRD study (-1.03) is almost consistent with that of the Pakistan study (-1.07, Nayab *et al.*, 2018). Both the studies have used the Deaton model. However, Carmen, Fuchs and Genoni (2018) of the World Bank used the same data (HIES 2016) from BBS. But the overall estimates of price elasticities of cigarettes and *biris* are divergent, as given below (Table 6.6).

Table 6.6
Results of TTRD study and the World Bank study

Tobacco products	TTRD study	World Bank study
Cigarette	-1.03	-1.30
Biri	-1.34	-1.22

The different results may be explained in the following ways: In the first place, this study used the Deaton model, while the World Bank used the quadratic almost ideal demand system (AIDS) model. Unlike the World Bank study, this study has estimated the price elasticity of demand for SLT products. Detailed results showing the estimates of own- and cross-price elasticities of demand for tobacco products are given in Annex 6.5. Annex 6.6 and Annex 6.7 show the own- and cross-price elasticities of demand for tobacco products by different income groups and households living in the urban and rural areas respectively.

[6.5]
CONCLUSION

The present exercise indicates that the overall consumption of smoking tobacco products does respond significantly to price changes. The increase in the prices of cigarettes and *biris* leads more than proportionate reduction in their consumption. On the other hand, the increase in the price of SLT products leads to a much less than proportionate reduction in the consumption of SLT products. Findings from the study provide additional evidence of the effectiveness of tobacco prices at reducing tobacco use. Increasing the prices of tobacco products, in addition to leading to reduced tobacco use, can be expected to increase tax revenue[73]. We find the estimates of own-price elasticities of cigarettes and *biris* at more than -1, which is substantially larger than most of the existing evidence. Even so, all tobacco tax increases would generate increased revenue. This is because tobacco users would have to be extraordinarily price sensitive for consumption declines to exceed the rate of increases in tax. On the whole, our results suggest that using the tax system to substantially increase the prices of cigarettes, *biris* and SLT products would lead to a substantial reduction in tobacco use while increasing government revenue.

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CHAPTER SEVEN

THE IMPACT OF CIGARETTE TAX INCREASES ON GOVERNMENT REVENUE AND PUBLIC HEALTH IN BANGLADESH

Using the existing and new estimates of the price elasticity of demand for cigarettes as illustrated in Chapter VI, we have simulated the impact of cigarette tax increases on government tax revenue and public health in Bangladesh. A number of assumptions were used in the simulations. In the first place, per capita income is kept constant. Second, it is assumed that there is no substitution between tobacco products in response to the simulated tax and price increases. Third, we assume that the increases in taxes are fully passed through to consumers so that price increases by at least the amount of the tax increase. Fourth, we assume that the price elasticities are constant across the whole range of prices. Fifth, we assume that there are no increases in tax avoidance or evasion as a result of increased taxes.

A number of parameters were used for the simulation exercise, which are mentioned in Table 7.1.

Table 7.1
Parameters and baseline values (FY 2017-18 as the base year)

Parameters	Value	Source
Consumption of cigarettes (in million sticks)	84000	NBR
Total adult population (in million)	118	World Bank
Prevalence of cigarette smoking among adults	23%	GATS 2017
Income elasticity	0.23	Nargis *et al.* (2014)
Economic growth rate	7.20%	BBS
Inflation rate	5.51%	BBS
Percentage of decrease in cigarette consumption due to decrease in smoking prevalence	50%	University of Cape Town
Percentage of quitters who avoid premature death	33%	University of Cape Town
Population growth rate	1.00%	BBS
Specific Tax/10 sticks	BDT 5	Proposal

[7.1]
SIMULATION OF CIGARETTE TAX INCREASE

The policy intervention that is simulated for FY 2019-20 is a mixed system of taxation, which takes the form of increasing supplementary duty along with imposing specific tax while reducing the existing four price tiers of cigarettes to two. Two estimates of own-price elasticity of demand for cigarette (-1.03) found from this study and Nargis et al., 2014 (-0.49) have been used to simulate the various revenue and health outcomes of policy interventions.

Table 7.2 presents the results of the simulation of two scenarios for FY 2019-20. In each scenario, the price per 10 sticks of low and medium tier of cigarettes is proposed to be set at 50 BDT, and the supplementary duty is proposed to be set at 60 percent. The price per 10 sticks of high and premium tier of cigarettes is proposed to be set at 105 BDT, and the supplementary duty is proposed to be set at 65 percent.

For cigarette smoking-related outcomes, it appears that scenario A suggests the best health outcome, where it is expected to reduce the number of smokers by 3.22 million people and avert the deaths of 1.06 million people over the period of one year while revenue growth is projected at 12.1 percent. On the other hand, scenario B suggests the best revenue outcome (31.43 percent) while it is expected to reduce the number of smokers by 1.27 million and avert the deaths of 0.42 million people over a period of one year.

[7.2]
CONCLUSION

As expected, the overall results from the two scenarios suggest that higher sensitivity to price change (high estimate of price elasticity) is projected to provide higher health benefits but lower revenue, whereas lower sensitivity to price change (low estimate of price elasticity) would increase the revenue growth but at the cost of worsening health benefits. In general, the simulation results support a policy intervention of reducing the existing four price tiers of cigarettes into two and introducing a specific tax component for all tiers. This would serve the dual purpose of reducing tobacco consumption and enhancing government revenue significantly.

Table 7.2
Simulation of cigarette tax increase

Scenarios	Tier	Price Elasticity	Estimated total revenue (billion BDT)	Revenue growth (percent)	Reduction in smokers (million persons)	Deaths averted (million persons)
Scenario A	Low	-1.03	311.48	12.1	3.22	1.06
	Medium	-1.03				
	High	-1.03				
	Premium	-1.03				
Scenario B	Low	-0.49	365.32	31.43	1.27	0.42
	Medium	-0.49				
	High	-0.49				
	Premium	-0.49				

CHAPTER EIGHT

SUMMARY OF FINDINGS AND RECOMMENDATIONS

[8.1] SUMMARY OF FINDINGS

Currently, there are 37.8 million (35.3 percent) adults consuming tobacco products in Bangladesh. The prevalence of tobacco use in Bangladesh varies by gender. The smoking prevalence is far higher among males (36.2 percent) than females (0.8 percent), while the use of SLT is higher among females (24.8 percent) than males (16.2). We also find variation in the consumption of tobacco products between rural and urban areas. Although the overall prevalence of tobacco use declined by 18.5 percent from 2009 to 2017, the use of cigarettes and SLT products remained almost static over the period. In 2018, tobacco use killed about 0.126 million people, which constituted 13.5 percent of all deaths in that year. The overall economic cost of tobacco use was estimated at BDT 305.70 billion (US$ 3.6 billion), which is 1.4 percent of GDP in 2018.

With the above background, the study attempts to (1) examine the existing structure of tobacco taxes in Bangladesh, (2) estimate the own-and cross-price elasticities of demand for tobacco products, and (3) simulate the impact of cigarette tax increases on government revenue and public health with a goal to suggest appropriate tobacco tax policy for Bangladesh. First, for examining the tobacco tax structure, we used secondary data of NBR and other relevant data. Second, we used Deaton model, which exploits price variation over space, to estimate price elasticities with the household survey data. We used Household Income and Expenditure Surveys 2010 and 2016 data of the Bangladesh Bureau of Statistics for estimating price elasticities. Third, we used the estimates of own-price elasticity of demand of this study and another study in order to simulate the various revenue and health outcomes of policy interventions.

Tobacco tax structure matters, because it has implications on how tax increases lead to reduced tobacco use and higher government revenue. The complexity of the multi-tiered *ad valorem* excise tax system in Bangladesh has created the following problems:

- The base on which the *ad valorem* tax is calculated can be manipulated. This in turn tends to result in lower tobacco prices than the system that relies on specific excise tax resulting in higher tobacco prices and taxes. This is evident from the available data that, compared with many developing

countries, tobacco taxes and prices are much lower in Bangladesh.

- Price differentials exist across price tiers of cigarettes. This in turn leads to substitution to cheaper brands in response to increased taxes. This undermines the public health benefit of a tax increase and creates large gaps in the collection of revenue. Obviously, low-priced tier yields low revenue.
- The tax rate for *biris* is also differentiated between non-filtered and filtered *biris*.
- Different tax rates for different tobacco products provide incentives for tax avoidance, as manufacturers can alter their pricing or production decisions in order to avoid higher tax liabilities that can lead to revenue loss for the government.
- There is an increasing trend in the affordability of tobacco products, because real income of the buyers has outpaced the increase in tobacco prices and taxes.
- SLT is an area of growing concern for public health and also holds the potential for revenue mobilization. However, there are challenges of regulating SLT products because of heterogeneity of SLT products, which are often manufactured in small and unlicensed units, with tax evasion and illicit trade being common. Moreover, the lack of data on SLT products makes law enforcement and monitoring difficult.
- There is a conflict of interest among policy makers and government officials pertaining to tobacco tax, which seriously impedes sound tobacco tax policy.
- NBR is not strong enough to enforce tobacco tax policy effectively, because of shortage of trained personnel, modern equipment, and track and tracing systems.

The results of the study show that the overall consumption of smoking tobacco products does respond significantly to price changes. Poor households are found to be more responsive to the changes in the prices of cigarettes than rich households. As a whole, our results suggest that using the tobacco tax system to significantly increase the prices of tobacco products would lead to a substantial reduction in tobacco use while increasing government revenue. The simulation results support a policy intervention of reducing the existing four tiers of cigarettes into two and introducing a specific tax component for all tiers. This would serve the dual purpose of reducing tobacco consumption and enhancing government revenue. A few recommendations for achieving the dual objectives of protecting public health and enhancing tax revenue are given below.

[8.2] RECOMMENDATIONS

The government should replace the existing *ad valorem* taxes with specific taxes by amending the existing law. As the first step, the government can move towards a system of uniform specific tax structure by reducing the number of the current cigarette price tiers and adding a specific tax to the existing *ad valorem* tax structure.

- The government should increase *biri* taxes substantially through a uniform specific *biri* excise tax that significantly raises *biri* prices and reduces its use.
- The problems of informality and heterogeneity of SLT products may be addressed by formalizing the SLT market.
- The increases in prices and taxes of tobacco products must outpace the real income growth of consumers. For this,

there is a need for implementing annual adjustments to specific excise tax rates so that they retain their real value over time.

- Tax rates need to be harmonized across all tobacco products in order to avoid substitution of one tobacco product by another.

- There is a need for earmarking of tobacco tax revenue to support programs for health promotion and to also undertake comprehensive tobacco control programs.

- NBR may be strengthened by adopting the following measures:

  - Redefining its status and regulatory powers;

  - Restructuring it and its field formations by function and type;

  - Adopting an integrated revenue management program (business process and digitalization);

  - Developing a strategic communication and taxpayer outreach and education program;

  - Developing human resources and institutional capacity of NBR; and

  - Activating the tobacco tax cell at NBR in order to make it self-propelling in designing evidence-based tobacco tax policy.

The following measures may be taken to address the conflict of interest in tobacco taxation:

- The Ministry of Health and Family Welfare (Health Services Division) should take the initiative to raise awareness about Article 5.3 of the FCTC among the Ministry of Finance, Ministry of Agriculture and Ministry of Industries.

- The Ministry of Agriculture should stop consulting the tobacco industry about tobacco leaf pricing policies.

- The government should also take the initiative to divest its shares in BATB. Until the offloading of the shares, only Investment Corporation of Bangladesh (ICB) should represent the government in BATB.

- Tobacco related CSR activities should be banned as required under Article 5.3 of the WHO FCTC. In order to avoid the conflict of interest, government officials must terminate their positions in tobacco companies.

- The government must withdraw all incentives provided to the tobacco industries, including the exemption of export duty and VAT. The government should enforce the ban on the use of subsidized fertilizer for tobacco growing.

- The government must stop giving awards for the highest taxpayer or the longest serving taxpayer award or any other recognition to the persons involved in the tobacco business.

The contributions of the study are as follows: First, this is the first analysis of tobacco demand in Bangladesh using the Deaton model with the nationally representative household surveys (HIES 2010 and HIES 2016) data. Second, the study has estimated the own-price elasticity of demand for tobacco products by income groups and by regions (rural/urban). Third, the study has also simulated the impact of cigarette tax increase on the government revenue and public health in Bangladesh using the elasticity values estimated in this study and Nargis *et al.* (2014). Fourth, the results of the study are highly relevant to tobacco control policies in Bangladesh using price and tax measures.

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ANNEXES

Annex 6.1
Demographic characteristics of households (HH) by deciles

		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Urban	Rural	Overall
Household head education year	Overall	1.92	2.89	3.19	3.63	3.78	4.22	4.43	5.01	5.91	7.65	5.81	3.59	4.26
	Cigarette consumers	2.73	2.79	2.88	3.42	3.31	3.82	3.78	4.25	4.59	6.19	4.71	3.54	3.95
	Biri consumers	1.51	1.68	1.79	2.10	2.16	2.21	2.14	2.46	2.86	3.04	2.28	2.04	2.08
	SLT consumers	1.15	2.05	2.49	2.76	2.94	3.36	3.55	3.78	4.63	5.68	4.41	3.06	3.39
Number of members in the household	Overall	2.49	3.36	3.68	3.91	4.04	4.19	4.39	4.55	4.74	5.04	3.98	4.07	4.04
	Cigarette consumers	2.94	3.42	3.70	3.95	4.07	4.23	4.50	4.68	5.06	5.45	4.25	4.42	4.36
	Biri consumers	2.92	3.60	3.94	4.24	4.48	4.74	4.94	5.20	5.34	5.70	4.37	4.30	4.31
	SLT consumers	2.18	3.22	3.74	4.09	4.26	4.49	4.68	4.95	5.18	5.71	4.47	4.34	4.37
Adult ratio in the household	Overall	0.82	0.72	0.70	0.69	0.69	0.69	0.69	0.70	0.71	0.73	0.73	0.71	0.71
	Cigarette consumers	0.76	0.71	0.69	0.67	0.68	0.69	0.68	0.70	0.71	0.73	0.72	0.69	0.70
	Biri consumers	0.79	0.72	0.69	0.67	0.68	0.68	0.69	0.69	0.71	0.74	0.72	0.70	0.70
	SLT consumers	0.88	0.79	0.74	0.72	0.72	0.71	0.72	0.71	0.73	0.75	0.75	0.74	0.74
Male ratio	Overall	0.39	0.49	0.49	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.39
	Cigarette consumers	0.53	0.51	0.52	0.51	0.52	0.52	0.51	0.51	0.51	0.52	0.51	0.52	0.53
	Biri consumers	0.52	0.52	0.52	0.51	0.52	0.51	0.52	0.53	0.53	0.53	0.51	0.52	0.52
	SLT consumers	0.34	0.47	0.49	0.49	0.50	0.50	0.50	0.50	0.49	0.50	0.49	0.48	0.34

Note: Figures is the parenthesis are standard errors

Annex 6.2

Descriptive statistics for unit value of tobacco products by deciles

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Urban	Rural	Overall
Unit value of cigarette	2.31	2.50	2.52	2.64	2.71	2.82	2.89	3.09	3.20	4.07	3.36	2.74	2.96
Unit value of *biri*	0.51	0.52	0.56	0.58	0.60	0.68	0.70	0.72	0.76	0.84	0.65	0.61	0.62
Unit value of SLT	0.06	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.03	0.03

Note: Figures in parentheses indicate standard errors.

Annex 6.3

Descriptive statistics for budget share of tobacco products by deciles

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	Urban	Rural	Overall
Budget share of Cigarette	0.0099	0.0172	0.0189	0.0204	0.0219	0.0238	0.0228	0.0232	0.0223	0.0230	0.0262	0.0178	0.0203
Budget share of *Biri*	0.0102	0.0110	0.0090	0.0075	0.0065	0.0052	0.0041	0.0033	0.0024	0.0018	0.0026	0.0076	0.0061
Budget share of SLT	0.0033	0.0024	0.0021	0.0021	0.0021	0.0020	0.0020	0.0018	0.0016	0.0014	0.0015	0.0023	0.0021

Note: Figures in parentheses indicate standard errors.

Annex 6.4

Within-cluster regression coefficients of unit values and budget shares

	Rural					
	Unit Value			Budget Share		
	Cigarette	*Biri*	SLT	Cigarette	*Biri*	SLT
lnexp	0.1*** (0.015)	0.03 (0.025)	-0.74*** (0.025)	0.014*** (0.0007)	-0.0008*** (0.0003)	0.0002*** (0.0001)
lhsize	-0.087*** (0.017)	-0.026 (0.02)	-0.01 (0.028)	-0.005*** (0.0008)	0.003*** (0.0004)	-0.0003** (0.0001)
lnyexp	0.05*** (0.007)	-0.007 (0.0076)	0.015 (0.012)	-0.0023*** (0.0003)	-0.002*** (0.0001)	-0.00003 (0.00004)
edu_head	0.01*** (0.001)	0.008*** (.002)	-0.002 (0.002)	-0.00003 (0.00006)	-0.0006*** (0.00003)	-0.00008*** (0.000007)
adultratio	-0.05*** (0.025)	-0.024 (0.028)	0.094** (0.44)	-0.006*** (0.0012)	0.002*** (0.0006)	0.003*** (0.0002)
maleratio	-0.001 (0.03)	-0.007 (0.03)	0.037 (0.0438)	0.124*** (0.0012)	0.007*** (0.0006)	-0.0016*** (0.0002)
Observations	8235	5904	9191	31500	31500	31500
F-stat	43.94	4.73	304.51	118.62	168.22	147.26
Adjusted-R	0.36	0.63	0.60	0.13	0.198	0.202
cluesters						1605
Expenditure Elasticity	1.71	0.866	1.64			
	Urban					
lnexp	0.224*** (0.022)	0.038 (0.044)	-0.728*** (0.0439)	0.226*** (0.001)	-0.0008*** (0.0003)	-0.0004*** (0.0001)
lhsize	-0.19*** (0.025)	-0.14** (0.055)	-0.008 (0.048)	-0.0097*** (0.001)	0.002*** (0.0003)	0.0004*** (0.0001)
lnyexp	0.05*** (0.01)	0.0450** (0.022)	-0.023 (0.022)	-.0056*** (0.0006)	-0.001*** (0.0001)	-0.00003 (0.00005)
edu_head	0.022*** (0.0016)	0.006 (0.0046)	-0.009** (0.0035)	-0.001*** (0.0001)	-0.0002*** (0.0001)	-0.0001*** (0.00001)
adultratio	-0.11*** (0.037)	-0.18** (0.081)	0.138* (0.081)	-0.008*** (0.0023)	0.0014*** (0.0005)	.0021*** (0.0002)
maleratio	-0.06 (0.04)	-0.112 (0.089)	-0.0557 (0.08)	0.017*** (0.0022)	0.0025*** (0.0005)	-0.0012*** (0.0002)
Observations	4511	1018	2942	13752	13752	13752
Adjusted-R	0.40	0.52	0.54	0.13	0.16	0.13
F-stat	90.33	2.39	103.01	89.85	50.97	50.12
Clusters						699
Expenditure Elasticity	1.63	0.67	1.51			

Note: Figures in parentheses indicate standard errors.

Annex 6.5

Own-and cross-price elasticities of tobacco products

	Unconstrained		
	Cigarette	*Biri*	SLT
Cigarette	-1.039 (0.019)***	-0.013 (0.011)	-0.071 (0.007)***
Biri	-0.50 (0.035)***	-1.29 (0.02)***	0.177 (0.01)***
SLT	0.22 (0.037)***	0.179 (0.016)***	-0.31 (0.016)***
Residual	-0.001 (0.0001)	-0.00046 (0.00005)	0.00029 (0.00004)
	Constrained		
	Cigarette	*Biri*	SLT
Cigarette	-1.03 (0.019)***	-0.048 (0.01)***	-0.07 (0.0075)***
Biri	-0.137 (0.035)***	-1.34 (0.02)***	0.143 (0.01)***
SLT	-0.33 (0.037)***	0.22 (0.016)***	-0.2978 (0.016)***
Residual	-.0006 (0.0001)	-0.00073 (0.00006)	0.00025 (0.00004)

Source: Based on HIES-2016 data
Note: ***, ** and * indicate statistically significant at 1%, 5% and 10% levels.

Annex 6.6

Price elasticities lower 60% and upper 40% income households

	Unconstrained					
	Lower 60%			Upper 40%		
	Cigarette	*Biri*	SLT	Cigarette	*Biri*	SLT
Cigarette	-1.278*** (0.04)	0.124*** (0.029)	-0.07*** (0.013)	-0.825*** (0.036)	-0.0349 (0.03)	-0.10*** (0.016)
Biri	-0.0607*** (0.0597)	-1.083*** (0.034)	0.112*** (0.016)	-0.528*** (0.029)	-1.26*** (0.073)	0.223*** (0.038)
SLT	-0.0039 (0.03)	0.246*** (0.0006)	-0.21*** (0.0004)	-0.585*** (0.029)	0.161*** (0.019)	-0.319*** (0.0266)
Residual	-0.003 (0.003)	0.001 (0.0002)	0.0004 (0.0001)	0.0004 (0.0002)	-0.0004 (0.0002)	-0.0002 (0.0001)
	Constrained					
Cigarette	-1.232*** (0.0345)	-0.009 (0.021)	-0.0714*** (0.1164)	-0.827*** (0.035)	-0.044* (0.0233)	-0.104*** (0.0134)
Biri	-0.0045 (0.048)	-1.203*** (0.031)	-0.107*** (0.013)	-0.268* (0.155)	-1.3*** (0.07)	0.182*** (0.0277)
SLT	-0.275*** (0.047)	0.187*** (0.0226)	-0.21*** (0.019)	-0.667*** (0.088)	0.18*** (0.027)	-0.30770*** (0.0287)
Residual	-0.0015 (0.00017)	-0.0004 (0.0001)	0.0004 (0.0001)	0.00055 (0.0002)	-0.00044 (0.00014)	-0.00019 (0.0001)

Note: ***, ** and * indicate statistically significant at 1%, 5% and 10% levels.

Annex 6.7

Price elasticity of urban and rural households

	Unconstrained					
	Urban			Rural		
	Cigarette	*Biri*	SLT	Cigarette	*Biri*	SLT
Cigarette	-0.89*** (0.033)	0.09*** (0.017)	-0.125*** (0.0156)	-1.39*** (0.0244)	-0.0756*** (0.016)	-0.0184* (0.0097)
Biri	-0.366** (0.1613)	-1.454*** (0.049)	0.414*** (0.027)	-0.425*** (0.0413)	-1.23*** (0.022)	0.120*** (0.0148)
SLT	-0.2824** (0.124)	0.245*** (0.023)	-0.37*** (0.024)	-0.12*** (0.0251)	0.166*** (0.014)	-0.32*** (0.0175)
Residual	0.0004 (0.0002)	0.00043 (0.0001)	-0.00034 (0.0001)	-0.003 (0.0001)	-0.0008 (0.0001)	0.0006 (0.00005)
	Constrained					
	Cigarette	*Biri*	SLT	Cigarette	*Biri*	SLT
Cigarette	-0.92*** (0.0336)	0.073*** (0.022)	-0.11*** (0.019)	-1.376*** (0.024)	-0.107*** (0.012)	-0.0215** (0.0088)
Biri	0.66334*** (0.0668)	-1.55*** (0.0495)	0.334*** (0.0398)	-0.230*** (0.028)	-1.266*** (0.02)	0.102*** (0.011)
SLT	-0.865*** (0.0384)	0.286*** (0.0245)	-0.322*** (0.0202)	-0.076** (0.035)	0.178*** (0.0193)	-0.323*** (0.0177)
Residual	0.001 (0.0002)	0.0002 (0.00018)	-0.00029 (0.0001)	-0.0024 (0.0001)	-0.001 (0.0001)	0.00054 (0.00004)

Note: ***, ** and * indicate statistically significant at 1%, 5% and 10% levels.

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