Fiscal Policies and Tobacco Control in India

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Abbreviations

AED	Additional Excise Duty
BED	Basic Excise Duty
CENVAT	Central Value Added Tax
CES	Consumer Expenditure Survey
CI	Confidence Interval
COTPA	The Cigarettes and Other Tobacco Products Act
FCTC	Framework Convention on Tobacco Control
FSSAI	Food Safety and Standards Authority of India
GATS	Global Adult Tobacco Survey
GDP	Gross Domestic Product
GST	Goods and Services Tax
GYTS	Global Youth Tobacco Survey
HCE	Household Consumer Expenditure
MPCE	Monthly Per Capita Expenditure
NCCD	National Calamity Contingency Duty
NCD	Non-Communicable Disease
NRHM	National Rural Health Mission
NSSO	National Sample Survey Organization
PPS	Probability Proportional to Size
SES	Socio-Economic Status
SGST	State Goods and Services Tax
VAT	Value Added Tax
WHO	World Health Organization
WPI	Wholesale Price Index
SLT	Smokeless Tobacco

Executive Summary

India faces the challenge of double burden of communicable and non-communicable disease, leading to enormous loss to both society and economy. This is exacerbated by the high tobacco use prevalence. More than one-third of Indian adults (34.6 percent, an estimated 275 million persons) consume tobacco products (GATS India, 2010). In order to reduce tobacco consumption, the effective implementation of the World Health Organization's (WHO) Framework Convention on Tobacco Control (FCTC), which India has ratified, is critical. The economic provisions, including price and tax measures and reducing the supply of tobacco, assume significance in this context.

Among the economic measures mentioned in the FCTC, tobacco taxation is the most cost effective intervention to reduce tobacco consumption. Considering the significance of tax and price measures, the FCTC recommends appropriate tax and price policies, which are governed by, and take into account, the national health objectives aimed at reducing tobacco consumption. However, the fiscal policy tool has not become effective in India as it is in many of other countries due to several limitations of the current tax structure. India's current tax regime vis-à-vis tobacco product is complex, yet has potential for improvement. Unlike the consumption pattern in the western nations, India's tobacco consumption is unique, where *bidi* smoking and chewing tobacco consumption is predominant, rather than cigarette smoking. However, the current tax regime is not reflective of this consumption pattern. The highest share of excise revenue is from cigarettes, at more than 75 percent of the total tax revenue from all tobacco products. Taxes on *bidi*s have historically been very minimal due to the widespread belief that they are regressive and adversely impact the poor; whereas chewing tobacco was brought under the tax net recently (Sunley, 2008).

Studies on tobacco taxation, revenue generation and its impact on reduction of consumption in the country are limited to cigarette and smoked forms of tobacco products (John, 2008; John *et al*, 2010). Given the complexity of tax structure for different tobacco products, more attention

is needed to understand the tax policy measures and their implications on tobacco consumption in the country. This study attempts to fill this gap by making a comprehensive analysis at the state level. This study envisages strengthening tobacco control initiatives, by producing and disseminating evidence for the need to have health-focused fiscal policy measures in India. Specific objectives are:

- To examine the current tax structure on all tobacco products (smoking and smokeless) and their contribution to revenue generation, at both the state and central levels;
- To examine the changing shares of household expenditure on different tobacco products over the years, in order to understand its relationship to changing tax structures of state and central governments;
- To analyse the changing tax structure on all tobacco products (including SLT) during the last one decade and examine its impact on tobacco consumption at the state level;
- To provide likely scenarios of revenue generation from an increase in tax on tobacco products and its distributional effects across populations in Indian states;
- To disseminate evidence generated from this exercise for stronger and more effective fiscal policies at all levels of government in India.

The first objective seeks to examine the current structure of tobacco taxes, in terms of tax exemptions, tax rates, etc. at both the central and state levels. An analysis of current tax structure is carried out across all products (smoked and SLT products). The administrative tax structure and difficulties encountered for implementation of various taxes are also studied in order to understand and provide inputs for future changes, especially in the context of the proposed roll out of the GST. The second objective examines in detail the shift in demand of tobacco products and aims to link the changes in demand with changes in the tax structure over the years. The third objective examines the impact of tobacco tax changes in the last 10 years (both at the central and state level) on consumption patterns of various tobacco products. Lastly, the fourth objective envisages capturing the likely impact on revenue generation

potential of the proposed tax increase at both central and state levels. This includes examining various scenarios of distributional aspects (rich-poor impact, especially on *bidi* consumption).

An appropriate tax policy for India is one which would promote both public health and public finance. Past evidence shows that price increase through taxation is the most cost effective method of reducing tobacco consumption. The results of this study demonstrate Indian consumer's increasingly inelastic tobacco consumption behavior, indicating that tobacco consumers are gradually becoming more and more resistant to price changes (as is so in higher income countries). Results also empirically show that the current taxation regime has a great scope of both maximizing revenue potential and promoting current users to quit by increasing tobacco taxes across products. Another important finding is the lack of credible national and sub-national estimates of units of tobacco products consumed and discrepancies between projected revenue and actual revenues accrued from tobacco at the state level, highlighting empirically for the first time ever the lack of regulation over the industry, and indicating the need for stringent tobacco licensing and improved tax administration to minimize illicit trade. These are indicative of the fact that tax and price measures, though important, need to be supplemented with more stringent tax regulation and administration.

Recommendations:

In order to strengthen tobacco control initiatives, the following recommendations are made for the need to have health-focused fiscal policy measures in India:

1. **Raise Cigarette Excise and Value Added Tax (VAT) rates**: Excise tax on cigarettes can be increased by 370 percent of present levels. Excise tax can be increased from the present Rs 1.12 per stick to Rs. 5.25 per stick, without any loss of revenue. This corresponds to an excise increase from Rs. 22.4 to Rs. 105 for a pack of 20 cigarettes. In 2011-12, VAT on cigarettes, which are consumed by only 5.7% of the population,[1] ranged from 12.5% in Kerala, Uttarakhand, and Chandigarh, to 40% in Rajasthan, with most states levying taxes less than or equal to 20%. VAT rates across states should meet if not exceed at least 70% share in final retail price.

1. **Raise *Bidi* Excise and VAT rates**: *Bidi* consumers exhibit distinct patterns of tobacco use behavior, and are more responsive to tobacco price increases than cigarette consumers. This has potential to influence reduced consumption and quitting among predominantly poorer *bidi* consumers. Excise on *bidis* can be increased by 100 percent of current excise, without any loss of revenue. *Bidi* VAT was nil in 2011-12 in the states of Andhra Pradesh, Bihar, Haryana, Karnataka, Kerala, Maharashtra, Odisha, Uttarakhand, and West Bengal. This is important as Uttarakhand, Haryana, and West Bengal are states with *bidi* consumption well above the national average.[1] *Bidi* VAT rates vary greatly across states and rationalization and equalization of *bidi* taxes across the states is imperative to minimize adverse health costs and effects, and maximize revenue potential.

2. **Tax increases on tobacco products should be indexed to both consumer price indices/inflation and rise in incomes**, to reduce the affordability of tobacco products and to minimize incentives for tobacco users to switch consumption to lower priced brands or products in response to tax increases. This assumes critical importance given that Indian consumers are becoming more and more resistant to price changes, suggesting that taxation has not kept pace with rising incomes and economic growth, and raising questions on the increasing affordability of all tobacco products. However, poorer consumers are more sensitive to tobacco price increases than richer consumers, leading to substantial reductions in their consumption.

3. **Simplify current VAT regime for improved tax administration and regulation**: While reported central excise revenues correspond roughly to estimated national cigarette and *bidi* consumption, reported VAT revenues from several states are grossly below expected revenue from state-level consumption estimates. The multiplicity of taxes also makes administration difficult and provides opportunities for tax avoidance and tax evasion. These findings highlight the lacunae in tax administration, regulation, and governance. Harmonizing the current VAT regime will expand the tax base and provide sustained revenues for the government, while at the same time improve tobacco control for public health goals.

4. **Strengthen tobacco product licensing and regulation of production, especially for smokeless tobacco**: Annual consumption of cigarettes and *bidis* estimated from multiple sources shows wide variability. Smokeless tobacco production and units of production by product are unavailable from any credible sources. Taxation on smokeless products is extremely heterogeneous, with central excise levies based on the manufacturing capacity of packaging machines, which is arbitrarily set on the presumed number of hours the machine is operational, and can be easily circumvented. In order to understand the magnitude of consumption, market, production and distribution, and taxation it is imperative to have strong monitoring, tracking and tracing systems, and licensing of all involved in the production and distribution of different smoked and smokeless tobacco products.

5. As India looks to move to a **unified Goods and Services Tax (GST)** by bringing together state and central taxes and addressing the complexities and distortions in the current system, it is important to increase taxes and employ supplementary excise on demerit goods such as tobacco. Tobacco taxes for all products should be well above current levels in the new GST.

Chapter I: Introduction

1.1 Background

With the growing burden of non communicable diseases (NCDs), which cause 63 percent of all global deaths and 80 percent in low and middle income countries, the use of tobacco as one of the significant risk factors of NCDs, and the single largest preventable risk factor for premature deaths, needs to be curtailed (WHO 2009). It has been observed that a higher proportion of NCD deaths occur below the age of 60 years in low and middle income countries, causing a huge loss of productive life years. The greatest impact of premature death falls on the poor in these countries, further deteriorating the poverty situation. Among developing countries, India faces the challenge of double burden of both communicable and non-communicable diseases, leading to enormous loss to both society and economy. This is exacerbated by the high tobacco use prevalence. More than one-third of Indian adults (34.6 percent, an estimated 275 million persons) consume tobacco products (GATS India, 2010). Use of these products is not uniform; with cigarette use concentrated more in urban areas and smokeless tobacco (SLT) and *bidi* (an indigenous hand-rolled smoked tobacco product) use concentrated in rural areas. SLT consumption in India is 25.9 percent, and is significantly higher in males (32.9 percent) than in females (18.4 percent) and in the rural population (29.3 percent) than the urban population (17.7 percent, GATS India, 2010). This is a departure from many developed and developing countries, where smoking prevalence is higher. Low cost, easy availability, cultural acceptability of chewing, and misconceptions about SLT having less severe health effects than its smoked counterparts are key factors for SLT consumption in the country.

The association between smoking and deaths has been clearly established by many studies. Deaths due to smoking alone could rise to one million annually among Indian adults by 2010 (Gajalakshmi *et al*, 2003). Another study estimated that there would be 930,000 deaths including 580,000 and 90,000 deaths among men and women smokers, respectively, in 2010 due to tobacco (Jha *et al*, 2008). Another study projected overall annual cancer related deaths due to tobacco consumption to be 84,000 and 35,000 among men and women, respectively

(Dikshit *et al*, 2012). Though studies related to mortality and morbidity due to SLT are regional-based, they reveal a strong association between oral cancer and use of SLT (Gupta and Ray, 2003; Jayalakshmi *et al*, 2011).

The disease burden attributed to tobacco consumption creates huge social and economic costs in terms of loss of productive life years causing a major dent in the national income of the country. A previous study estimated the total direct and indirect cost due to three major tobacco-related diseases in India to be US$ 6.5 billion in 1999 (Rath and Choudhary, 1999). This further increased by 11 percent in 2001-02 (Government of India, 2004). In 2004, a study found the direct medical costs of treating tobacco related diseases in India to be US$ 907 million for smoked and US$ 285 million for smokeless forms; indirect costs totaled US$ 398 million for smoked and US$ 104 million for SLT. More than 85 percent of the total cost was attributed to men, leading to the loss of potential bread earners of families (John *et al*, 2009). Another Indian study found a greater risk of borrowing or distress selling for hospitalization by individuals who used tobacco or were non-users from households that used tobacco (Bonu *et al*, 2005).

The cost of tobacco use considerably exceeds expenditures on tobacco control by the Government of India and is about 16 percent higher than total tobacco tax revenue. Given the under investment in public expenditure on health care in India (which was 1.1 percent of national Gross Domestic Product (GDP) in 2008-09), the high cost of tobacco-related illness may further encumber the government in providing additional resources for its treatment from the public exchequer. With reductions in tobacco-attributable diseases, public expenditure could be furthermore diverted for strengthening public health systems. The low public expenditure on health has led to many constraints in the public health care system, increasing household level poverty. For instance, a study estimated that in 1999-2000 32.5 million people have fallen below the poverty line in India due to out-of-pocket (OOP) expenditure on health, and overall poverty increased by 3.2 percent after accounting for OOP expenditure (Garg and Karan, 2009). Accounting for direct expenditure on tobacco increased rural and urban poverty by 1.5 percent and 0.72 percent respectively, leading to 14 million more poor people in 2010 (John el al, 2011).

It has further been observed that tobacco consumption is associated with increasing poverty among poor families due to diversion of scarce resources from essential items - food, education and basic health care - to tobacco (WHO, 2011a). A World Bank study concludes that the adverse health consequences of tobacco use are concentrated more heavily on the poor, and that smoking may be contributing to the widening mortality gap between the rich and the poor in developed countries (The World Bank, 1999). This is also acute in the South East Asian region, where tobacco use is higher among households belonging to low socio-economic status and these households spend a significant proportion of their income on tobacco. For instance, poor households in Bangladesh and Indonesia spend more on tobacco than on food and education (Health Bridge, 2011).

In order to reduce tobacco consumption, the effective implementation of the World Health Organization's (WHO) Framework Convention on Tobacco Control (FCTC), which India has ratified, is critical. The economic provisions, including price and tax measures and reducing the supply of tobacco, assume significance in this context. Across countries, taxation as a fiscal policy tool has been widely used in order to deter tobacco consumption. Past studies have revealed that an increase in tax on tobacco products is the most cost effective tool for tobacco control, especially in reducing tobacco use among youth and those with low incomes (van Walbeek, 2010). According to a World Bank study a 10 percent rise in tobacco tax could lower tobacco consumption by 8 percent in developing countries and save about 10 million lives (World Bank, 2008). Ninety percent of this reduction in death could occur in low and middle income countries. A study on the implementation of policy change for tobacco control estimated that raising tobacco taxes has lead to an estimated 7 million fewer smokers and 3.5 million fewer smoking-attributable deaths in compliant countries across the world from 2007-2010 (Levy et al, 2013). In simulating the impact of tobacco taxes on revenue and morbidity in India, it was observed that over 15 million of the *bidi* smoking and 3.4 million of the cigarette smoking population can be prevented from dying prematurely, if *bidi* and cigarette taxes are raised to the level of Rs. 98 per 1000 sticks and Rs. 3691 per 1000 sticks respectively (John et al,

2010). Overall, extensive mortality and morbidity caused due to tobacco consumption necessitate the development of concerted tobacco control programs and policies, including measures like price and tax to reduce demand. Raising the price of tobacco products through taxation has shown to be a highly effective, feasible and socially acceptable strategy for reducing tobacco consumption, particularly for adolescents and those with low incomes.

1.2 Research Problem and Justification

Among the economic measures mentioned in the FCTC, tobacco taxation is the most cost effective intervention to reduce tobacco consumption. Considering the significance of tax and price measures, the FCTC recommends appropriate tax and price policies, which are governed by, and take into account, the national health objectives aimed at reducing tobacco consumption. However, the fiscal policy tool has not become effective in India as it is in many of other countries due to several limitations of the current tax structure. India's current tax regime vis-à-vis tobacco product is complex, yet has potential for improvement. Unlike the consumption pattern in the western nations, India's tobacco consumption is unique, where *bidi* smoking and chewing tobacco consumption is predominant, rather than cigarette smoking. But the current tax regime is not reflective of this consumption pattern. The highest share of excise revenue is from cigarettes, at more than 75 percent of the total tax revenue from all tobacco products. Taxes on *bidi*s have historically been very minimal due to the widespread belief that they are regressive and adversely impact the poor; whereas chewing tobacco was brought under the tax net recently (Sunley, 2008). The complex tax structure is reflected in the fact that while taxes on smoking products (cigarettes and *bidi*s) are levied at specific rates depending on different lengths, smokeless products (*gutka, paan masala*, etc.) attract levies based on *ad valorem* (on the basis of value of the product). In spite of the fact that specific rates of excise duties are better than *ad valorem* taxes, ad valorem tax is imposed on a vast number of products in the country.   The importance of a specific taxes lies in the fact that the tobacco industry "has an incentive to raise the net-of-tax price, enhancing the consumption reducing impact of the tax increase", while the industry does not have such incentive if excise taxes are levied as an *ad valorem* tax.

In a federal set up like India, both the union and state governments levy tax on tobacco products. The Union government imposes the central excise while the states are assigned to impose Value Added Tax (VAT). Besides central excise duties which form a major component of central government taxes, the government also levies a National Calamity Contingency Duty on tobacco products since 2001, which has now become an earmarked tax for helping states during natural calamities. Another levy known as Additional Duty of Excise on Pan Masala and other tobacco products, also known as the Health Cess, was imposed since 2005 to fund the National Rural Health Mission (NRHM). Apart from this, the *Bidi* Workers' Welfare Fund is charged at nominal amount of Rs. 5 per 1000 *bidi* sticks.

The plethora of taxes mentioned above creates difficulty in administering tax. It has been further observed that the difference in tax rates on cigarette, *bidis* and smokeless products provides the consumer flexibility to shift to cheaper products when higher taxes are imposed. This is further exacerbated due to the politics of taxation in the country which favor low taxation for *bidis* consumed by a large number of people from lower income groups, in order to minimize potential regressive effects. In addition to low tax rates, major exemptions are doled out to the *bidi* industry (Sunley, 2008). Thus the irrational tobacco tax structure prevailing In India has serious implications on consumption by providing ample scope for product substitution.

The Union Government of India had indicated a tentative rollout of a unified Goods and Services Tax (GST) from the year 2012, which generated intense debate, especially on tobacco products (Poddar and Ehtisham, 2009; Government of India, 2009). The GST is expected to undertake simplification and rationalisation of the tax structure of all products and services. It is also likely to replace the current excise duty and service tax at the central level and VAT and local taxes at the states level. The reports indicate the tax rate structure could take 2 or 3 slabs, with a lower rate at around 4 percent on merit (essential) goods and a standard rate at 8 to 9 percent for normal products. There will also be a special rate of 1 percent on precious metals, besides a negative list of (exempted) items. Moreover, it is proposed to have a dual GST – a

Central and a State GST. The seeds of the current tax reform were sown with the establishment of VAT, which replaced the erstwhile states' sales tax. The success of the VAT regime could be assessed by its simplification of the tax rate structure and broadening of the tax base. The distortions and complexities which were responsible for the cascading effect on commodities and services were sought to be directly addressed. However, the present VAT structure is riddled with significant variations across states, which the GST may resolve.

It is widely believed that the starting base for the CENVAT is narrow, which entails a variety of area-specific, conditional and unconditional exemptions. While the government tried to address this issue by rationalizing CENVAT rates by a reduction in their multiplicity, unfortunately this policy has not been adhered to throughout and concessions have been re-introduced for several sectors/products, including tobacco products.

Studies on tobacco taxation, revenue generation and its impact on reduction of consumption in the country are limited to cigarette and smoked forms of tobacco products (John, 2008; John *et al*, 2010). For example, studies in India estimated that cigarettes were less price elastic where as this was close to unity in the case of leaf tobacco, and for *bidi*s this varied between -0.4 to -0.9 (John, 2008). Another study using data from 1981-82 to 1992-93 estimated the price elasticity of demand for cigarettes to be -0.67 (Sarma, 2000). A recent study, examining price elasticity of demand across products found higher price of elasticity of *bidi* similar to the previous study; and higher own price elasticity for cigarette than what was previously known (Guindon, 2011). People from low socio-economic status have been found to be more responsive to price increases than high socio-economic status, with greater reductions in both frequency and duration of consumption, leading to potential beneficial effects in terms of both health and expenditure; thus making tobacco tax increases progressive in their long-term distributional effects on the poor (Gruber and Koszegi, 2008).

Research in South Asian countries shows that individuals respond to changes in the prices of both cigarettes and *bidis*. Own price elasticity of cigarette is found to be -0.43 and -0.64 for *bidis* in Bangladesh (Nargis *et al*, 2010). The elasticity for cigarette and bidi are found to be

higher for individuals from the lower as compared to higher socio-economic status. In Sri Lanka, it has been observed that tobacco prices have no effect on tobacco use participation rate but have a statistically significant impact on tobacco consumption. A study from seven South East Asian nations shows low to high elasticity for cigarettes ranging from -0.10 to -0.65 in the short run and -0.80 to -1.40 in the long run. Additionally, this study indicates that rising income in the South East Asian region could lead to increase in tobacco consumption, other things remaining constant (Guindon *et al*, 2003). These evidences suggest that increasing tobacco prices can significantly reduce tobacco consumption, though the effect varies from moderate to high depending upon the product and socio-economic status of the individuals.

In a country with myriad varieties of tobacco use, tobacco policy should focus on both smoked tobacco and SLT. As stated earlier, SLT has emerged as a major threat to morbidity and mortality in India in recent years. A recent study enumerates the difficulties in including SLT in arriving at a rational tax system in India: i) the relative contribution to death and disease due to smokeless is less; ii) less negative externalities to non-smokers as compared to smoking; and iii) smokeless control is far less feasible than smoking (Jha *et al*, 2011).

However, this proposal intends to examine taxation of SLT differently for a variety of reasons. A report by the National Institute of Public Health, 2011, suggests that India accounts for 86 percent of the world's oral cancer cases. Ninety percent of these cases are due to chewing tobacco, unlike in the West where smoking is the main cause. Epidemiological studies have shown strong association of SLT products with cancer of the oral cavity (Crichtley and Unal, 2003; Boffetta *et al*, 2008; Gupta and Ray, 2003). Around 28 carcinogens have been identified in SLT products, and Indian products are no exception to these. The most abundant group of carcinogens is the non-volatile alkaloid-derived tobacco-specific *N*-nitrosamines and *N*-nitroso amino acids (IARC, 2008). Among the smokeless products available in India, the highest level of TSNA was found in certain brands of *khaini*, which is a mixture of tobacco, lime and menthol (Stepanov *et al*, 2005). *Khaini* is also the most widely consumed smokeless product in the country, with nearly 12 percent of all adults consuming it (GATS, 2010). One of the earliest

Indian studies has found that the incidence of oral cancer was 21.4 per 100,000 populations and the risk increased 8 times for chewers as compared to non-chewers (Wahi *et al*, 1966; Wahi, 1968). This was followed by many cohort and case control studies in different parts of the country, which demonstrated the association of SLT with oral cancers. With respect to negative externalities, consumption of SLT during pregnancy decreased gestational age at birth, and birth weight independent of gestational age (Gupta and Sreevidya, 2004). There are also environmental and sanitary concerns linked to SLT use due to widespread spitting and littering. A case control study in Bangalore estimated the risk of cancers with SLT use in men and women and found the risk to be significantly high in both (male Risk Ratio (RR) 4, Confidence Interval (CI) 1.8-8.9, *p value* <0.001; female RR 30.4 CI 12.6-73.4, *p value* <0.001) (Nandakumar *et al*, 1990). In a similar hospital-based case control study in Kerala, chewing tobacco was a significant predisposing factor for oral carcinoma (*p* <0.001) in both genders (Sankaranarayanan *et al*, 1989). An unprecedented rise in such cancers calls for immediate strategies for the control of SLT, which are now of greater importance than ever.

Bidi and smokeless tobacco production are largely an unregulated sector (Sunley, 2008; authors own calculations based on Annual Survey of Industry and National Sample Survey data for 2005-06; Monograph on Smokeless Tobacco in India, forthcoming/2014). They both need different tobacco control treatment than cigarettes, but certainly not by wishing them away. The Food Safety and Standards Act of 2011 prohibited sale of any food product in which tobacco and nicotine are used as ingredients (which SLT has been thus far classified as; Government of India, 2011); this paved the way for landmark legislation that lead to the ban of SLT products in 23 of 28 Indian states and 5 of 7 union territories (Campaign for Tobacco Free Kids, 2013). However, the implementation of the ban has been variable across states, which may potentiate smuggling and illicit trade.

1.3 Objectives

Given the complexity of tax structure for different tobacco products, more attention is needed to understand the tax policy measures and their implications on tobacco consumption in the

country. While some earlier studies attempted to capture the structure and impact of tobacco taxes in India, their primary focus was on the central government taxes, and their implications on revenue and morbidity. Currently, some organizations including the Centre for Global Health and Research, the Voluntary Health Association of India, the Campaign for Tobacco-Free Kids, and the Public Health Foundation of India are engaged in research and advocacy related to tobacco taxes, both at the central and state government levels. With growing interest from the state governments to increase tax on tobacco products and the use of tax policy to influence consumption, a study on state taxes and their impact on revenue and consumption could provide impetus to strengthen tobacco control initiatives in India.

This proposal attempts to fill this gap by making a comprehensive analysis at the state level. A thorough synthesis of tax structure and rates is critical, given that states can play a vital role in tobacco taxation. In addition, as the country moves into the GST regime, the state-level SGST (State Goods and Services Tax) would also play a critical role. While GST aims to bring about uniformity in tax structure, given the federal nature of the country, Indian states will continue to play a vital role in tobacco taxation, and therefore an analysis of the current and past trends in state taxes is paramount.

In order to understand some of the issues underlined above, this study envisages pursuing the following:

1.31 Overall Goal

To strengthen tobacco control initiatives, by producing and disseminating evidence for the need to have health-focused fiscal policy measures in India.

1.32 Specific Objectives

- To examine the current tax structure on all tobacco products (smoking and smokeless) and their contribution to revenue generation, at both the state and central levels;

- To examine the changing shares of household expenditure on different tobacco products over the years, in order to understand its relationship to changing tax structures of state and central governments;

- To analyse the changing tax structure on all tobacco products (including SLT) during the last one decade and examine its impact on tobacco consumption at the state level;

- To provide likely scenarios of revenue generation from an increase in tax on tobacco products and its distributional effects across populations in Indian states;

- To disseminate evidence generated from this exercise for stronger and more effective fiscal policies at all levels of government in India.

The first objective seeks to examine the current structure of tobacco taxes, in terms of tax exemptions, tax rates, etc. at both the central and state levels. An analysis of current tax structure would be carried out across all products (smoked and SLT products). The administrative tax structure and difficulties encountered for implementation of various taxes will be also studied in order to understand and provide inputs for future changes, especially in the context of the proposed roll out of the GST. The second objective examines in detail the shift in demand of tobacco products and aims to link the changes in demand with changes in the tax structure over the years. The third objective would examine the impact of tobacco tax changes in the last 10 years (both at the central and state level) on consumption patterns of various tobacco products. Lastly, the fourth objective envisages capturing the likely impact on revenue generation potential of the proposed tax increase at both central and state levels. This would also include examining various scenarios of distributional aspects (rich-poor impact, especially on *bidi* consumption).

1.4 Chapterisation

The section described above forms Chapter I of the study. Chapter II discusses the methodology including data sources and models used to estimate price elasticity and the impact of tax increase on prices. Chapter III presents the changing consumption patterns and household

resource allocation on tobacco products. Analyzing the tax structure at the central and state level, Chapter IV discusses the trend and pattern of revenue generation from tobacco products. Chapter V discusses the impact of tax increase of on prices and consumption of tobacco products over the years. Chapter VI concludes the study drawing significant inferences for policy level changes to make tobacco taxes more effective for tobacco control.

Chapter II: Methodology

Through this study, we attempt to analyze current evidence on tobacco consumption in terms of its determinants, as well as whether this consumption behavior is amenable to changes in price, i.e. taxation. We also model the effects of changes in price on central and state government revenue generation.

2.1 Data Sources

The study utilizes data collected primarily from secondary sources. The sources include tobacco taxation and revenue data obtained from both central and state governments. Taxes include all indirect taxes levied both by the central and state governments on all forms of tobacco. The tax data was collected from state and central government budget documents; publications of the Reserve Bank of India and Central Bureau of Commercial Intelligence, Government of India; as well as from the concerned ministries of excise and taxation in the respective states. Ministries of all states were approached for obtaining tobacco tax revenue data with a data collection instrument, which can be found in Annex 1. The following states provided tax revenue data for various years from 2007-08 to 2012-13: Andhra Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharashtra, Manipur, Orissa, Rajasthan, West Bengal, and Uttar Pradesh.

In order to study the tobacco consumption pattern in India, data from the Global Adult Tobacco Survey (GATS) India, 2009-10 was analyzed. The GATS was conducted with the objectives of measuring the impact of tobacco control efforts of the Cigarettes and Other Tobacco Products Act, 2003, and to systematically monitor adult tobacco indicators, including prevalence. A nationally representative sample was drawn from the 29 states and two out of the six Union Territories covering almost 99.9 percent of the population of the country. The survey included structured interviews with 69,296 respondents aged 15 years and above. The original GATS survey used probability proportional to size (PPS) sampling, separately at urban and rural levels.

In order to generate evidence on objectives 2 and 3, household consumption expenditure data obtained from the National Sample Survey Organization (NSSO) were utilized. The NSSO Consumer Expenditure Surveys (CES) are nationwide surveys conducted each year in order to identify important measures of the level of living of the relevant domains of the population, as well as estimate budget shares of different commodity groups for the rural and urban population. This is done by generating estimates of household Monthly Per Capita Consumer Expenditure (MPCE) and the distribution of households over MPCE ranges, separately for rural and urban areas, and by states and Union Territories. The surveys utilize stratified multiple stage sampling and are conducted in all states and union territories, by state and central agencies.

The surveys covered consumption expenditure information on every kind of good including addictive goods such as *bidi*, cigarette, *gutkha*, leaf tobacco, *zarda*, *paan masala*, etc; using a 365-day reference period for infrequently purchased goods and a 30-day reference period for consumables like food, fuel, *pan*, tobacco and intoxicants. Various household characteristics such as social group, religion, household type, household size; and person-level information, such as age and educational qualifications of household members, etc. are also collected in both surveys.

Definitions of Key Variables of Interest:

Household: A group of people normally living together and taking food from a common kitchen constitute a household.

Household size: The total number of persons normally residing together (under the same roof) and taking food from the same kitchen (including temporary stay-aways and excluding temporary visitors).

Household type: The household type, based on the means of livelihood/sources of the household's income during the 365 days preceding the date of survey. In rural areas, there are six household types: self-employed in agriculture, self-employed in non-agriculture, regular wage/salary earning, casual labour in agriculture, casual labour in non-agriculture, and others.

For urban areas, the household types are: self-employed, regular wage/salary earning, casual labour, and others.

Household monthly per capita expenditure: Household consumer expenditure is measured as the expenditure incurred by a household for domestic purposes during the reference period. It also includes the imputed values of goods and services, which are not purchased but procured otherwise for consumption. In other words, it is the sum total of monetary values of all the items (i.e. goods and services) consumed by the household on domestic account during the reference period.

Monthly per capita expenditure (MPCE): This is household consumer expenditure over a period of 30 days divided by household size.

Household consumer expenditure (HCE): During a specified period (reference period) the total value of expenditure incurred, or imputed value of such expenditure, or imputed value of goods received in cash or kind or social transfers, by households on 'consumption goods and services' during the reference period.

Religion: The religion of the household; if members of the household belong to different religions, then the religion of the head of the household. Values include Hinduism, Jainism, Islam, Buddhism, Christianity, Zoroastrianism, Sikhism, and others.

Social group: Whether or not the household belongs to the following categories: Scheduled Tribes, Scheduled Castes, Other Backward Classes, or others.

Sex: The sex of each member of the household is recorded. For the purpose of the price elasticity analysis, the derived variable male ratio, the ratio of the number of adult males to females in the household was calculated.

Age: The age in completed years of all household members.

Marital status: The marital status of each member of the household. Values include never married, currently married, widowed, and divorced/separated.

General educational level: Information regarding the level of general education attained by each member of the household was classified into: not literate, literate without formal schooling, below primary, primary, middle, secondary, higher secondary, diploma/certificate

course, graduate, and post-graduate and above education. A variable capturing the mean number of years of education of all household members was derived.

Tobacco products: In the present study three major tobacco products *bidi*, cigarette and leaf tobacco are taken into consideration. NSS follows the Use Approach (also called Consumption Approach) for measuring quantity (units of bidis or cigarettes) or volume (kilograms of leaf tobacco), and value (in Rupees) of the items consumed in a reference period. Whenever there is any intake of such items, the intake is made by an individual, and the household to which that individual belongs is called the consuming household. For the purpose of this study, the values under the entries of leaf tobacco, *zarda*, *kimam*, and *surti* in the source survey have been combined to form the category tobacco leaf.

Unit level records of the CES were extracted from both annual and quinquinnial (once in five years, with larger number of respondents than the annual surveys) rounds, spanning the years from 1999-2000 to 2011-12 (covering four quinquinnial rounds and seven annual rounds). Data were extracted and descriptive analyses carried out. Box plots and histograms were drawn for unit values (expenditure divided by quantity) of each tobacco product. In order to perform sensitivity analysis we first included all unit values in the models; followed by sequential omission of unit values, for a particular CES round: lying more than five standard deviations from the logarithmic mean at the national level; lying more than five standard deviations from the logarithmic mean at the regional level; lying more than five standard deviations from the logarithmic mean at the state level; and lying more than five standard deviations from the logarithmic mean at the state level and households with budget shares of any particular tobacco product greater than 10 percent of total household budget share (Cox and Wohlgenant, 1896).

The samples from the respective CES surveys analyzed include:

Table 2.1: National Sample Survey Consumer Expenditure Round Household Samples, 1999-00 to 2011-12

Survey Year	Rural Sample	Urban Sample	Total Sample
1999-00	71,385	48,924	120,310
2000-01	21,649	35,624	57,273
2001-02	37,466	28,676	62,630
2002	18,687	13,982	32,669
2003	26,143	14,870	41,013
2004-05	79,298	45,346	124,644
2005-06	18,992	20,444	39,436
2006-07	33,146	30,583	63,729
2007-08	31,673	18,624	50,297
2009-10	59,119	41,736	100,855
2010-11	59,695	41,967	101,662

Legend:
Columns show the frequencies of the number of households sampled in the respective survey year.

2.2 Empirical Frameworks

2.21 Consumption Pattern Modeling

Using the GATS India and NSS CES data, we explored the association between tobacco use (cigarettes, *bidis*, and SLT) and household consumption patterns by households and states, in terms of both consumption and expenditure. The exposure variables used for assessing associations with tobacco use were: age group, place of residence (urban or rural), gender (male or female), educational attainment (no formal education, up to primary education, up to secondary education, or higher education), asset quintile (lowest, lower, middle, higher, and highest), work status (worked in the last twelve months or not) in the case of GATS and expenditure tertile in the case of CES data. Using the GATS data, the variable called "asset quintile" was created using a summative score of inverse weighted proportions of possession of the following assets: electricity, flush toilet, car, moped/scooter/motorcycle, television, refrigerator, washing machine, fixed telephone, cell-phone, and radio. The summative score was then divided into quintiles to obtain asset quintiles, which were used as a proxy for wealth.

2.22 Deaton Framework for Price Elasticity

According to Deaton (1997), under the assumption of *laissez-faire,* prices set in a competitive market guarantee economic efficiency and provide the Government revenue collection avenues. The optimal tax theory is important to determine a price system that minimizes the distortion for any given amount of revenue, and is well documented in the literature (Mirrlees, 1971; Diamond and Mirrlees, 1971). The models of political economy related to taxation and price determination are relevant to developing countries, where empirical reality often does not support the idea that the government is the sole institution acting in the public interest. Hence, the models of optimal taxation are not explicitly accepted particularly for developing economies (in optimal taxation models prices are set to maximize a social welfare function subject to budgetary and behavioral constraints; these models often fail to describe the equilibrium that actually exists in developing countries (Deaton, 1981)). As tax instruments are available to governments in developing countries are typically much more limited than that in richer countries, this poses differences while levying indirect taxes on various goods.

In India there is a lack in data on prices and quantities consumed for different tobacco products. Therefore, an indirect method is utilized to get the proxy for prices of different tobacco products. One approach is to use available regional price data for constructing the consumer price index. However, according to Deaton (1997), such a procedure may lead to inaccurate estimates as prices are not collected from each and every location. In addition to this, it is technically not possible to disaggregate the price data at the household level, which is ideal for the present analysis. Therefore, we focus on another approach that considers unit values (expenditure divided by quantity) of each tobacco product as proxy for prices. NSSO CES surveys provide information on expenditures and quantity consumed of various products including tobacco products. Using these data sets the unit values are estimated. However, unit values are not the same as prices as there is quality variation across different brands of the same category of product which is not reflected in unit values. For example, there may be numerous brands of cigarettes available catering to both high and low end segments of the

market, and entire spectra in between. Deaton explains that unit values do not take into account the nature of heterogeneity, as it is computed by dividing expenditures by physical quantities (Deaton, 1997). This also does not take the variation of quality among different sizes and brands of cigarettes, *bidi*s, and chewing tobacco products by reporting the quantity consumed and expenditure incurred on it. It is well argued in the literature that consumers tend to adapt to changes in price not only by changing the quantity purchased but also by shifting their preferences from one brand or category to another, which is nothing but the change in quality; therefore unit values consists of two parts: the exogenous price and the endogenous commodity quality (Deaton, 1987, 1988, 1990, 1997; John, 2008). Thus, it results in an over estimation of price elasticity. Second, as mentioned by John (2008), unit values often suffer from measurement errors as they largely depend on the reporting of quantity. However, using unit values is most widely practiced in the literature.

A theoretical model developed by Deaton (1989, 1997) appropriate for survey data is followed here to estimate the own and cross price elasticity of tobacco products. The model is based on the theory of consumer behavior where the households are assumed to choose both quantity and quality so that expenditure on a good reflects the quantity, quality and price. It indicates that in addition to quantity, quality is augmented in the utility function of the household. It is assumed that the preferences for tobacco products are uniform at village level as it reflects the preferences of each household in a village in aggregate. Therefore, the households are assumed to be geographically clustered at the village level within the sample.

The budget shares that relate to the village demand patterns are regressed on average village prices. The unit values of each tobacco product (namely *bidi*, cigarette and leaf tobacco) are used as proxy for their prices. The following equations represent the budget shares and unit values to household expenditures, other household characteristics, and the underlying prices of commodities.

$$W_{Gic} = \alpha^0{}_G + \beta^0{}_G \ln x_{ic} + \lambda^0{}_G \cdot Z_{ic} + \sum_{H=1}^{N} \mu_{GH} \ln P_{Hc} + (f_{Gc} + u^0{}_{Gic}) \qquad (1)$$

$$\ln UV_{Gic} = \alpha^1{}_G + \beta^1{}_G \ln x_{ic} + \lambda^1{}_G \cdot Z_{ic} + \sum_{H=1}^{N} \phi_{GH} \ln P_{Hc} + u^1{}_{Gic} \qquad (2)$$

Where W_{Gic} is the budget share of good G in the budget of household I living in cluster (village) c. Here household expenditure is function of the logarithm of total household expenditure, household characteristics, and prices of tobacco products. In the above equations, x is the household expenditure, Z is a vector of household characteristics, N is the price of N number of tobacco products. The coefficients estimated from these two equations do not provide the elasticity as such. This is elaborately discussed by Deaton in his seminal work how elasticity is derived (Deaton, 1997). Without giving details of the derivation, we discuss the idea on how elasticity is estimated based on this model. The first element of the residual in the first equation (equation 1), i.e., f_{Gc}, is a village level effect that is the same for all households within a village and it can be considered either as random effect or as fixed effect (since the households are distinguished according to clusters, the model is similar to that of a panel data regression (John, 2004; John, 2008)). It is also assumed that the unobserved f_{Gc} and prices are uncorrelated with each other. u^0_{Gic} is the standard error that captures measurement error involved in the budget share and the variations in quality among products. Equation 2 represents the unit value. The natural logarithm of unit value is a function of household expenditure (x) and household characteristics (Z) and price as before. β^1_G is the expenditure elasticity of quality.

Now, differentiating equation (1) with respect to lnx, we get,

$[\delta W_{Gic}/ \delta \ln x_{ic}] * W_G = \beta^0_G$

$\Rightarrow \delta W_{Gic}/ \delta \ln x_{ic} = \beta^0_G/W_G$

$\Rightarrow \delta W_{Gic}/ \delta \ln x_{ic} = €_G + \beta^1_G - 1$,   if $€_{G=}(1 - \beta^1_G) + (\beta^0_G/ W_G)$

Here $€_G$ is the elasticity of expenditure with respect to quantity. Therefore, the total elasticity of quantity and quality together will be $€_G + \beta^1_G$. Since it is assumed that market prices do not vary significantly for a given commodity within a village at a certain point of time (cross section data), the non price parameters, i.e., α, β and λ can be estimated using simple ordinary least squares regression.

2.23 Simulation Model

Tobacco revenue generation has important implications on both government revenue policies and the public health aspect of encouraging tobacco users to quit. To determine the effects on taxation revenues with changes in cigarette and *bidi* price (assuming that all changes in price are due to changes in taxation), we utilize elasticity estimates from our models for the year 2011-12 to model likelihood scenarios of revenue generation. Leaf tobacco is excluded from the national analysis, due to the diversity of products that fall under this category, as well as its heterogeneous taxation across states. We also model changes in revenue from cigarettes, *bidi*, and SLT at the state level for key states that provided aggregate tobacco revenue data. Some key assumptions based on John (2008) which are prerequisite for this exercise include:

1. "There are no substitution effects due to price change

2. Change in price is commensurate with change in tax

3. Elasticity is constant across the entire range of prices

4. There is no tax evasion or smuggling as a result of increased taxes."

(John, 2008)

2.3 Limitations

The study is carried out using certain assumptions and available estimates. Some of these assumptions and estimates are restrictive given the limitations of data availability. For instance, the price elasticity estimates which are derived from the unit level records of NSS are essentially household based estimates. The head of the household (who is normally the respondent) may not reveal/know the actual expenditure incurred by the other members of the household, especially in a society where tobacco consumption is stigmatized for certain persons, especially women. This may lead to under-reporting, and is also subject to recall bias. Moreover, price elasticity estimates assumes a constant income which in actual practice may not be true. In addition, price elasticity may be significantly different across income quintile groups. This is expected to affect the behaviour of various income classes, especially the lower

income quintile which is more price-sensitive and hence an overall price elasticity may not really help decipher substitution effect due to tax and price changes on tobacco products. Additionally, it was not possible to obtain information on tax revenue from all states, which would have been ideal. The revenue data obtained was not segregated by tobacco product, as most states do not compile revenues at this level of disaggregation; this would have been more helpful for simulating taxation revenue projections by specific products.

Chapter III: Tobacco Consumption Patterns in India

The World Health Organization models the conceptual framework (proposed by Lopez et al, 1994) of the tobacco epidemic with respect to cigarette smoking as a continuum of four stages. This model illustrates the linkages between the indices used to monitor the epidemic in a particular country and the natural evolution involving tobacco marketing, dependence on manufactured cigarettes, and disease burden. India, along with countries in Asia, North Africa, and Latin America, is understood to be in stage 3, which is characterized by a marked downturn in smoking prevalence among men, a more gradual decline in women, and convergence of male and female smoking prevalence. However, the burden of smoking attributable disease and death continues to increase (Lopez and Collishaw, 1994).

Recent evidence suggests that Indian consumption patterns show marked deviations from the model in terms of gender and type of tobacco use, as tobacco use prevalence is rising in women, especially for SLT. A study using national cross-sectional data from 1998-99 found that smoking and SLT were systematically associated with socioeconomic markers at the individual and household level. Higher levels of education and standard of living were inversely related to the probability of smoking and chewing; with a stronger gradient for smoking. Caste was a key stratifier of differences in tobacco consumption, over and above the adverse effects of low education and standard of living. Scheduled tribes (OR 1.23, 95% CI 1.18 to 1.29) and scheduled castes (OR 1.19, 95% CI 1.16 to 1.23) were found more likely to consume tobacco than other caste groups. Significant differences were observed between states in tobacco consumption, even after controlling for demographic and socioeconomic markers, which may highlight the potential importance of the state context in influencing tobacco use (Subramanian et al, 2004). The two most recent nationally representative demographic and health surveys in 1998-99 and 2005-06 show a significant and positive trend for smoking by wealth, education and living environment for men and for chewing in women, with increasing prevalence for smoking in younger men and chewing in younger women (both between 15–24 years; Bhan et al, 2012). A study utilizing data from the WHO's World Health Surveys finds that in India, along with other

low and low-middle income countries, shows deviation in smoking patterns in women as compared to high income countries, with the less educated having much higher odds (Bosdriesz *et al*, 2014). Even among men, *bidi* smoking is concentrated among the socio-economically disadvantaged and cigarette smoking is concentrated in men with higher status occupations, education and household wealth, demonstrating that India has not yet transitioned to the later stages of the epidemic (Corsi and Subramanian, 2014).

Most studies focus on tobacco use prevalence, but very few have examined volume of tobacco consumption across households. Agrawal et al found increasing household income to be associated with higher volumes of cigarette and *bidi* consumption, but association between educational level and volume of consumption was inconsistent (Agrawal *et al*, 2013). Another study highlights the unmet need for tobacco cessation support, with higher odds of quit attempts seen in younger age groups (21-30 years) as compared to all others except the oldest age group; these younger age groups also had the lowest odds of successful quitting (Srivastava *et al*, 2013).

Table 3.1 summarizes the trends in tobacco consumption across the most recent nationally representative surveys. The surveys show regular tobacco consumption in males to be in the range of 45 to 57 percent from 1995-96 to 2009-10 while that for women has almost doubled from 10 to 20 percent, in the same time period. The increase in prevalence in women has been largely fueled by the increase in SLT use, from 8.6 percent in 1995-96 to 18 percent in 2009-10. More than one third of India's adult population (275 million persons) was estimated to be tobacco users in 2010 (GATS, 2010). About two in five adults from rural areas and one in four from urban areas used tobacco in some form or another. These persons comprised 68.9 million smokers (defined as persons smoking cigarettes, *bidis*, *hukkahs*, cigars and pipes), 163.7 million smokeless users (defined as persons chewing SLT) and 42.3 million users of both products (GATS, 2010). Almost 84 percent of tobacco users used tobacco on a daily basis. The prevalence of tobacco use among males was 48 percent and 20 percent in females.

Table 3.1: Tobacco use prevalence among adults greater than 15 years in India, in % of total

Survey	Strata	National Sample Survey, 52nd Health Round, 1995-96	National Family Health Survey-2, 1998-99	National Family Health Survey-3, 2005-06	Global Adult Tobacco Survey, 2009-10
Age Group		15+ years	15+ years	15 - 49 years (female) 15 – 54 years (male)	15+ years
Sample	Urban + Rural	396,546	315,597	198,754	69,296
Regular Tobacco Users	Male	51.3	45.1	57.6	47.9
	Female	10.3	11.2	10.8	20.3
	All	-	28.2	28.3	34.6
Regular Smokers	Male	35.3	29.3	33.6	24
	Female	2.6	2.4	1.5	3
	All	19.2	15.1	13.5	14
Regular Smokeless Users	Male	24.0	28.1	36.7	33
	Female	8.6	12.0	8.4	18
	All	16.4	18.6	18.9	32.9

Legend:
Columns show descriptive statistics of the individual samples from the respective nationally representative surveys, showing the survey-weighted frequency (%) of tobacco use.

3.1 Tobacco Consumption Patterns by States

Tobacco consumption patterns by regions and states and Union Territories are presented in Table 3.2. The highest prevalence of tobacco use is found in the East region (45 percent), followed by the North-East (44 percent). The lowest prevalence is reported in the North (19 percent). The highest state prevalence of tobacco use is in Mizoram (67 percent), and the lowest is in Goa (9 percent). States with higher prevalence than the national average include Arunachal Pradesh, Odisha, Sikkim, and Madhya Pradesh.

Table 3.2: Tobacco use prevalence in adults greater than 15 years in India, Global Adult Tobacco Survey, 2010 (%)

	Current Tobacco Users	Current Smoked Tobacco User	Current Cigarette User	Current Bidi User	Current Smokeless Tobacco User	Current Smoked + Smokeless Tobacco User
India	34.6	8.7	5.7	9.2	20.6	5.3
NORTH	18.9	11.7	6.1	7.7	5.0	2.2
Jammu and Kashmir	26.6	19.0	12.0	3.8	4.7	3.0
Himachal Pradesh	21.2	16.7	7.7	14.5	2.9	1.6
Punjab	11.7	5.2	3.7	4.2	4.8	1.7
Chandigarh	14.3	8.9	5.3	6.0	3.3	2.1
Uttarakhand	30.7	19.1	4.1	19.2	8.6	3.0
Haryana	23.7	17.3	3.8	15.4	4.1	2.3
Delhi	24.3	13.8	9.9	8.7	6.9	3.6
CENTRAL	38.1	8.9	3.5	12.6	22.6	6.6
Rajasthan	32.3	13.4	2.8	16.0	13.5	5.4
Uttar Pradesh	33.9	8.7	2.3	12.4	19.1	6.2
Chhattisgarh	53.2	5.9	5.7	9.5	40.6	6.7
Madhya Pradesh	39.5	8.1	5.1	13.4	22.6	8.8
EAST	45.4	7.8	7.4	10.3	29.8	7.9
West Bengal	36.3	14.4	10.3	15.7	15.0	6.9
Jharkhand	50.1	2.1	6.8	4.1	40.5	7.5
Odisha	46.2	3.0	4.7	6.5	35.9	7.3
Bihar	53.5	4.7	5.9	8.4	39.3	9.5
NORTH EAST*	44.1	9.5	12.1	8.6	24.9	9.8
Assam	39.3	6.6	8.8	5.3	24.9	7.8
Manipur	54.1	9.6	19.2	10.7	28.5	12.8
WEST	30.5	5.2	3.1	4.8	22.4	2.9
Gujarat	29.4	7.8	2.6	8.9	18.4	3.2
Maharashtra	31.4	3.8	3.4	2.7	24.8	2.8
Goa	8.8	4.2	3.7	1.5	4.0	0.7
SOUTH	24.1	10.7	8.0	6.5	10.8	2.6
Andhra Pradesh	29.2	14.1	11.1	6.8	11.8	3.3
Karnataka	28.2	8.8	4.4	8.3	16.3	3.1
Kerala	21.4	10.7	10.5	4.9	8.1	2.6
Tamil Nadu	16.2	8.1	6.0	5.3	6.6	1.5
Puducherry	15.1	9.1	8.2	2.8	4.8	1.3

Table 3.3 shows the survey weighted frequencies of households reporting consumption of cigarettes, *bidis*, leaf tobacco, or any tobacco products (among the previous three categories) across the four quinquennial rounds from 1999-00 to 2011-12. Overall, there has been a decline in self-reported tobacco consumption across the NSS CES rounds, from 62.6 percent to 43.6 percent in rural areas, and from 39.7 percent to 22.3 percent in urban areas. However, cigarette use has increased in both rural and urban areas over the same period. *Bidi* use has declined in both sectors, and leaf tobacco use has remained somewhat stagnant. However, given the increase in the Indian population, the absolute numbers of tobacco users have continued to increase manifold.

Table 3.3: Tobacco Consumption across households from the National Sample Survey Consumer Expenditure Quinquinnial Round Samples, 1999-00 to 2011-12

Survey Year	Any Tobacco		Cigarette		Bidi		Leaf Tobacco	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
1999-00	62.6	39.7	3.7	9.6	36.5	19.8	19.4	7.2
2004-05	52.9	27.3	5.7	10.7	34.5	13.6	20.7	6.2
2009-10	43.5	19.8	6.7	10.1	26.8	7.6	15.6	3.9
2011-12	43.6	22.3	6.7	10.8	23.8	7.3	19.1	6.3

Legend:
*Figures are survey weighted percentages of household consumption of the respective tobacco product
**Any tobacco refers to any of cigarette, *bidi*, or leaf tobacco

Table 3.4 depicts the average share of expenditure on tobacco by a household over total household expenditure from the four quinquennial CES rounds from 1999 to 2011. In all the years and across all sectors, the shares of all products have declined. The most marked decline in share has been observed in the share of total tobacco in total household expenditure, with the share declining from 3.22 percent in 1993-94 to 0.68 percent in 2010-11. This is primarily due to the large increase in MPCE over these years.

Table 3.4: Average share of expenditure on tobacco products in total household expenditure (%)

	Rural					Urban				
	1993-94	1999-00	2004-05	2009-10	2011-12	1993-94	1999-00	2004-05	2009-10	2011-12
Bidi	1.97	1.01	1.48	0.618	0.57	1.63	0.36	1.15	0.153	0.13
Cigarette	0.26	0.18	0.31	0.179	0.19	1.09	0.43	0.84	0.290	0.30
Leaf Tobacco	0.37	0.19	0.30	0.123	0.41	0.24	-	0.20	0.028	0.23
Total Tobacco	2.90	1.56	2.49	1.17	1.22	3.22	0.95	2.66	0.63	0.68

Legend:
*Figures are in survey weighted percentages
**The variation in values in 1999-00 may be because of a difference in reference period (mixed reference period of both 30 and 365 days, as compared to a 30 day reference period for all other rounds)

Table 3.5 shows the changes in monthly per capita expenditure and budget shares on all tobacco products for major states, from the year 1999-00 to 2010-11. Overall, MPCE on tobacco increased from 7.57 to 15.27 Rupees in rural areas, and from 8.10 to 15.54 Rupees in urban areas. In 1999-00 the states of Jammu and Kashmir, Rajasthan, Haryana, Chandigarh, Himachal Pradesh, Andhra Pradesh, and Gujarat recorded the highest expenditures, in that order. In 2010-11, the highest expenditure incurring states were Rajasthan, Gujarat, Andhra Pradesh, Uttarakhand, Kerala and Haryana, in order from highest to lowest. Household tobacco budget shares however, declined considerably in the same period, from 1.56 to 1.22 percent in rural areas, and from 0.95 to 0.68 percent in urban areas. Budget shares decreased most markedly in the states of Andhra Pradesh and Jammu and Kashmir, and rural areas of Kerala and Tamil Nadu. Rural Rajasthan was the only area to register an increase in tobacco budget shares, from 2.4 to 2.59 percent. Lowest budget shares in 1999-00 were observed in urban Goa (0.39 percent) and rural Punjab (0.46 percent); in 2010-11 both urban and rural areas of Goa recoded the lowest values (0.17 percent).

Table 3.5: Monthly Per Capita Tobacco Expenditure across Major Indian States

States	1999-00		2011-12	
	Rural	Urban	Rural	Urban
India	7.57 (1.56)	8.10 (0.95)	15.27 (1.22)	15.54 (0.68)
Andhra Pradesh	10.27 (2.26)	12.10 (1.56)	20.87 (1.33)	20.45 (0.77)
Assam	3.97 (0.93)	7.05 (0.87)	8.64 (0.82)	14.32 (0.59)
Bihar	4.21 (1.09)	4.21 (0.70)	7.21 (0.76)	5.34 (0.35)
Chandigarh	12.09 (1.22)	8.76 (0.61)	16.92 (0.72)	6.68 (0.27)
Chhattisgarh	-		9.35 (1.13)	12.92 (0.85)
Delhi	9.60 (1.05)	10.82 (0.78)	12.60 (0.48)	13.15 (0.59)
Goa	7.66 (0.88)	4.47 (0.39)	2.57 (0.17)	4.67 (0.17)
Gujarat	10.88 (1.97)	7.05 (0.79)	23.99 (1.59)	23.68 (0.98)
Haryana	12.09 (1.69)	9.79 (1.07)	18.90 (1.15)	10.63 (0.30)
Himachal Pradesh	11.33 (1.66)	13.24 (1.06)	23.13 (1.14)	26.09 (0.81)
Jammu and Kashmir	13.46 (1.99)	14.54 (1.53)	15.64 (1.03)	18.11 (0.79)
Jharkhand	-		6.12 (0.76)	9.54 (0.47)
Karnataka	7.22 (1.44)	5.99 (0.66)	17.44 (1.28)	16.46 (0.71)
Kerala	8.68 (1.13)	8.95 (0.96)	19.29 (0.69)	17.47 (0.59)
Madhya Pradesh	7.10 (1.77)	6.94 (1.00)	17.22 (1.75)	15.89 (0.73)
Maharashtra	5.60 (1.13)	5.93 (0.61)	15.20 (1.06)	11.48 (0.47)
Manipur	6.93 (1.29)	7.49 (1.06)	12.89 (0.96)	6.79 (0.46)
Odisha	3.38 (0.91)	3.20 (0.52)	6.99 (0.83)	9.28 (0.46)
Puducherry	5.85 (0.98)	7.00 (0.89)	14.71 (0.51)	15.40 (0.60)
Punjab	3.44 (0.46)	5.38 (0.60)	5.01 (0.27)	6.68 (0.40)
Rajasthan	13.17 (2.40)	9.18 (1.15)	34.79 (2.59)	24.57 (1.10)
Tamil Nadu	8.87 (1.73)	8.20 (0.84)	11.74 (0.81)	12.58 (0.54)
Uttar Pradesh	7.74 (1.66)	6.98 (1.01)	13.49 (1.40)	12.41 (0.71)
Uttarakhand	-	-	20.78 (1.55)	20.56 (0.83)
West Bengal	7.30 (1.61)	14.92 (1.72)	15.07 (1.33)	24.12 (0.98)

Legend:
*Figures are survey weighted values in Indian Rupees and percentage of total household expenditure

3.2 Socio-economic Determinants: Evidence from the Global Adult Tobacco Survey India, 2009-10

Table 3.6 depicts the socio-demographic characteristics associated with current smoking, chewing, and any tobacco use in India, based on the 2009-10 GATS data. Men had an odds of smoking 14.48 times that of women (95% CI 12.91-16.25, p-value<0.001); chewing 2.54 times

that of women (95% CI 2.39-2.71, p-value<0.001); and any tobacco use 5.3 times that in women (95% CI 4.97-5.66, p-value<0.001). Those with no formal education, working, rural residents, and belonging to the lowest asset quintiles recorded statistically significant higher odds of use of all tobacco products.

Table 3.6: Socio-demographic characteristics associated with current smoking, chewing, and any tobacco use in India, 2009-10

Covariates	Smoking	Chewing	Any Tobacco
[1]	[2]	[3]	[4]
Age Group			
15 to 20 years	0.15 [0.12-0.19]***	0.32 [0.28-0.36]***	0.17 [0.15-0.20]***
21 to 30 years	0.45 [0.39-0.50]***	0.73 [0.67-0.80]***	0.48 [0.44-0.53]***
31 to 40 years	0.81 [0.72-0.90]***	0.94 [0.86-1.02]	0.77 [0.71-0.84]***
41 to 50 years	1.09 [0.97-1.22]	0.91 [0.83-1.00]*	0.94 [0.86-1.03]***
Greater than 50 years	1.00	1.00	1.00
Gender			
Female	1.00	1.00	1.00
Male	14.48 [12.91-16.25]***	2.54 [2.39-2.71]***	5.30 [4.97-5.66]***
Educational Attainment			
No formal education	1.00	1.00	1.00
Up to Primary	0.70 [0.63-0.77]***	0.91 [0.84-0.99]*	0.79 [0.72-0.85]***
Up to Secondary	0.39 [0.35-0.44]***	0.62 [0.57-0.68]***	0.44 [0.41-0.48]***
Higher Education	0.24 [0.20-0.28]***	0.41 [0.35-0.48]***	0.27 [0.23-0.31]***
Work Status			
Not Working	1.00	1.00	1.00
Working	1.26 [1.15-1.37]***	1.21 [1.13-1.30]***	1.27 [1.19-1.36]***
Asset Quintile			
Lowest	1.01 [0.87-1.19]	3.18 [2.78-3.63]***	2.59 [2.30-2.92]***
Lower	1.12 [0.96-1.31]	2.60 [2.28-2.97]***	2.26 [2.01-2.55]***
Middle	1.09 [0.94-1.27]	2.04 [1.79-2.32]***	1.82 [1.62-2.04]***
Higher	0.99 [0.85-1.15]	1.42 [1.24-1.62]***	1.27 [1.13-1.43]***
Highest	1.00	1.00	1.00
Place of Residence			
Urban	1.00	1.00	1.00
Rural	1.21 [1.11-1.32]***	1.28 [1.20-1.37]***	1.30 [1.22-1.38]***

Legend:
Columns [2]-[4] show fully adjusted odds ratios with 95% confidence intervals (ORs and 95% CI), respectively, from logistic regression models of smoking, chewing, and any tobacco use, respectively, compared to no use amongst the 69,030 adults> 15 years from the Indian Global Adult Tobacco Survey 2009-10 data.
***$p<0.001$, ** $p<0.01$, * $p<0.05$

Chapter IV: Tobacco Tax Structure in India

With the growing evidence on tobacco tax as a cost effective intervention to reduce demand, this chapter discusses tobacco tax structure in India both at the central and state level. States are gradually increasing Value Added Tax (VAT) on tobacco products which, combined with central excise, could be an effective measure for tobacco control. The provisions of Article 6 – tax and price measures - of the Framework Convention of Tobacco Control (FCTC) and the challenges to implement it in its entirety are also discussed in view of the complex tax structure.

4.1 Tax Structure

The division of financial power between the centre and states as delineated by the Constitution of India entails that the central government impose union excise duty, income tax and other taxes, as defined in the central list. The state governments have the power to impose sales tax, tax on land, electricity and various other taxes as mentioned in the state list of the Constitution. Tobacco products enjoy specific provisions where the central government takes the responsibility for imposing excise duty; for alcohol and narcotic preparations the state governments have the power to impose excise tax. However, under a tax rental agreement of 1956-57 the states transferred their rights to impose sales tax on tobacco, textiles, and sugar. Alternatively, the central government imposed additional excise duty on these products and the proceeds were distributed among the states as per the formula suggested by the Finance Commission.

In view of implementation of state level VAT, the 12th Finance Commission recommended revoking the tax rental agreement and that central government should not impose additional excise duty on textile, sugar and tobacco products. These items should be formally integrated in to the design of VAT (Government of India, 2004). Based upon this recommendation, goods under the Additional Duties of Excise have been exempted from payment of any duty from 1

March 2006 and states are given power to impose sales tax or VAT wherever introduced on these products (Government of India, 2009).

4.11 Central Excise Structure

The central excise can be specific or imposed on an ad valorem basis. Specific excise duty is imposed on a tiered basis, for example on the basis of weight, length, volume, thickness of a product. Cigarettes of various lengths and whether filtered or not are taxed differently. Similarly *bidis* whether man made or machine made attract different types of tax. These are examples of specific tax and the tax rate varies according to specifications mentioned in the product. Ad valorem tax on the other hand is imposed on the basis of percentage of the retail prices of the product. For example, in India all other tobacco products other than cigarettes and *bidis* are taxed on an ad valorem basis. The SLT products of different varieties are taxed on the ad valorem basis.

Basic Excise Duty

Basic excise duty is imposed on all products manufactured in the country as per the Central Excise Act of 1944, except for manufactured salt. The rate of duty on these products is levied as mentioned in the Central Tariff Act of 1985. Later on this was defined as Cenvat (Central VAT).

National Calamity contingent Duty

The 'National Calamity Contingent Duty' (NCCD) was introduced in 2001 to provide funds for the Gujarat earth quake. Among other products this duty is imposed on all tobacco products with different rates. This is an earmarked tax used for calamity relief at the states. The revenue from this duty is managed by the central government and funds are transferred to states as per necessity.

Health Cess

The central government introduced a new levy called the Health Cess in 2005 to provide resources for implementation of various programmes under National Rural Health Mission (NRHM). This is imposed on all types of tobacco products except for *bidi*. For *bidi* another earmarked tax known as *Bidi* Workers Welfare Cess[1] is imposed and the revenue is used for carrying out various welfare activities for *bidi* workers in the country.

Education Cess

 In addition to the above duties, Government of India imposes education cess at the rate of 2 percent and secondary and higher education cess at the rate of 1 percent of the aggregate of all duties on tobacco products manufactured or produced.

Central Excise Rate on Tobacco Products

The excise duty structure is complex and for cigarettes, this is based on whether it is filtered or unfiltered. For instance, there are five product tiers in the filtered category and two tiers in the unfiltered category. The rate of excise duty varies according to length of the cigarette and more is the length, higher is the excise duty. The duty structure, as a sum of all the different excise types enumerated earlier is depicted in Figures 4.1 and 4.2 shows the large difference between the rate of duty for the filtered and unfiltered categories (also Table 4.1). In the unfiltered category, the tax rate was static from 2001-02 to 2007-08. In 2008-09, there was a 387 percent increase in tax rate on the <60 mm category and 142 percent rise in the 60-70 mm from the previous financial year. This was the first time a significant rise in the tax rate was made for unfiltered cigarettes, which are as harmful as filtered cigarettes in terms of health impact. During the same year (2008-09), the tax rate on the lowest length in the non-filtered category was made equal to the same length in the filtered category, with a view to reduce brand switching across the products. Overall, the tax rate on cigarette of <60 mm increased to Rs 669 in 2012-13 from Rs 135 (both for 1000 sticks) in 2001-02, with almost 396 percent rise over

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[1] Taxes collected from this are transferred to the Bidi Workers Welfare Fund, administered as a part of the Union government's reserve funds. Expenditures from the fund are governed by the Bidi Worker's Welfare Fund Act, 1976. Under this Act, *bidi* workers with an identity card issued by their employer are entitled to scholarships and

these 11 years. For the 60-70 mm category, this increased by 287 percent in the same period. In the filtered category, there are four product tiers (Fig 4.2). The tax rate on premium brand of filtered cigarette was almost three and half times more than the lowest brand in this category in 2012-13, allowing brand switching on a greater scale with respect to price changes. From 2001-02 to the financial year 2004-05, no increase in the tax rate was observed for various tiers of filtered cigarette; in 2005-06, there was a 10 percent increase for all the categories. From 2005-06 to 2007-08, there was almost 5 percent rise in each year and for the next two years, tax rate remained constant. Further, this increased by 18 percent for the 60-70mm category in the year 2010-11 and others categories witnessed an increase of 9 to 11 percent. It is evident that the availability of various tiers provides ample scope for consumers to switch across segments and brands in the event of a price increase. In the 2013-14 fiscal, non-filter cigarette length categories were revised to cigarettes not exceeding 60 mm, taxed at Rs 669, and between 60-70 mm, taxed at Rs 2,018, both per 1000 sticks. For filtered cigarettes, 2013-14 revised rates for 1000 sticks were: 60-70 mm, Rs 1,409; 70-75mm Rs 2,027; 75-85mm Rs 2,760; and others, Rs 3,290.

Figure 4.1: Excise Duty on Unfiltered Cigarettes
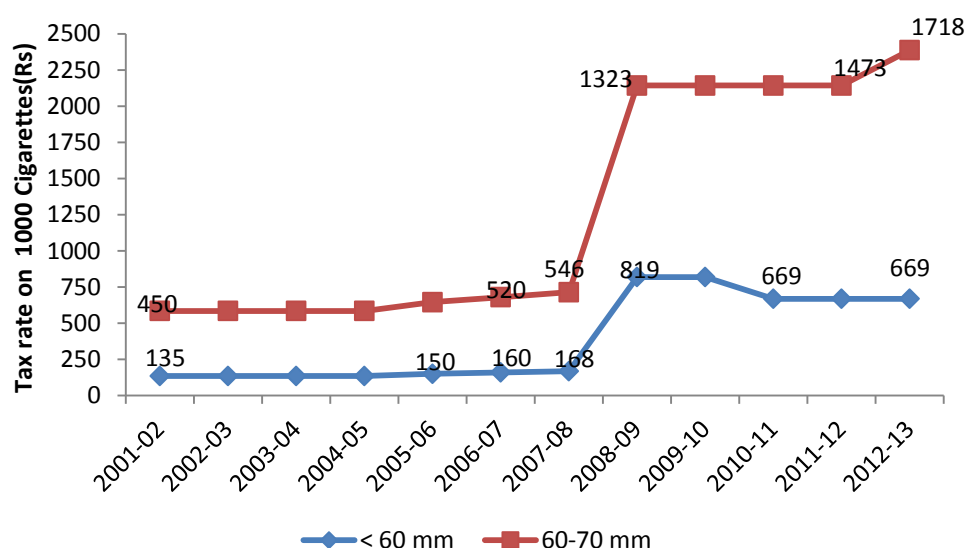
school uniforms for their children, maternity benefits, free health services, housing & life insurance, and sports & recreation services.

Figure 4.2: Excise Duty on Filtered Cigarettes
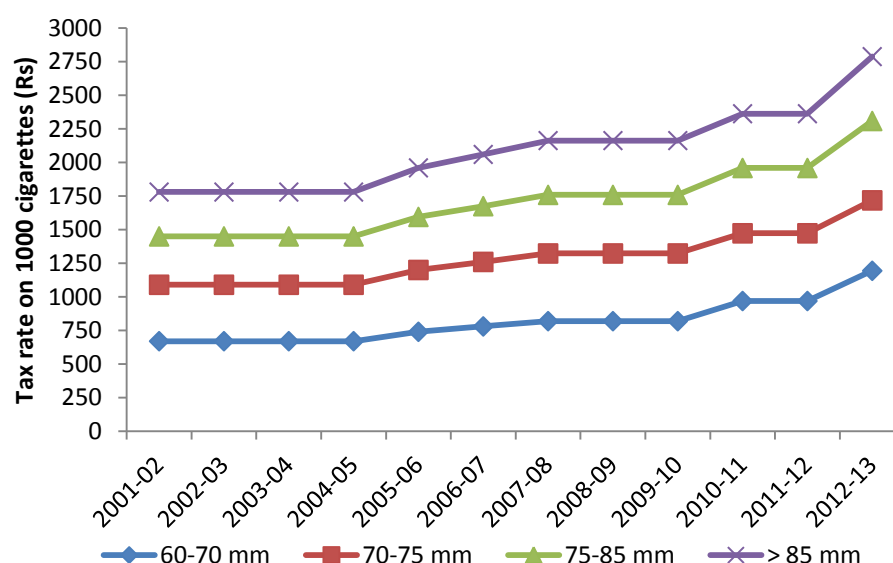
Table 4.1: Central Excise Duty on Cigarettes

Year	Unfiltered cigarettes (per 1000 sticks)			Filtered Cigarettes (per 1000 sticks)			
	< 60 mm	60-70 mm	<60mm	60-70 mm	70-75 mm	75-85 mm	> 85 mm
2006-07	160	520	-	780	1260	1675	2060
2007-08	168	546	-	819	1323	1759	2163
2008-09	819	1323	-	819	1323	1759	2163
2009-10	819	1323	-	819	1323	1759	2163
2010-11	669	1473	669	969	1473	1959	2363
2011-12	669	1473	669[#]	969	1473	1959	2363
2012-13	669	1718	669	1194	1718	2309	2788
2013-14	669	2018	669	1409	2027	2760	3290

Legend:
[#] 2011-12 introduced < 65 million
(-) Denotes no tax rate on this category
Total excise is the sum of basic excise duty, additional excise duty, health cess, and National Calamity Contingency Duty

In comparison to cigarettes, the tax rate on *bidis* is extremely low and is based on whether they are man or machine made. The government levies Basic Excise Duty, National Calamity

Contingency Duty, and *Bidi* Workers Welfare Cess on the manufacturing of *bidis*. In 2012-13, the excise duty on *bidis* was Rs 16/1000 for manmade as compared to Rs 28/1000 for machine made *bidis*. It was just Rs 6.5 for manmade and 15.5 for machine made *bidis* in 1999-2000 (Sunley, 2008). There was a 146 percent increase in tax for manmade and 81 percent increase in machine made *bidis* over the period of the last 13 years. In spite of this rise, *bidis* are most under-taxed and with the lowest prevailing tax rate for a number of years, resulting in low prices of *bidi*. In contrast, epidemiological studies indicate *bidis* are more harmful than, or at least as harmful as, cigarettes (Gupta et al, 2005). The political economy of India favors a low tax regime on *bidis* which need to be changed drastically on health grounds. The smoking prevalence pattern further suggests there are more *bidi* than cigarette smokers; among all smokers in India (14 percent of the total population) more than 60 percent are *bidi* smokers (GATS, 2009-10). This indicates that cheap *bidis* are available to a large number of people, causing severe health consequences. Another major concern regarding the taxation on *bidi* is that 98 percent of bidis are manmade, the production of which takes place largely in the informal sector as a household industry (Sunley, 2008). In this case, the scope for tax evasion is large.
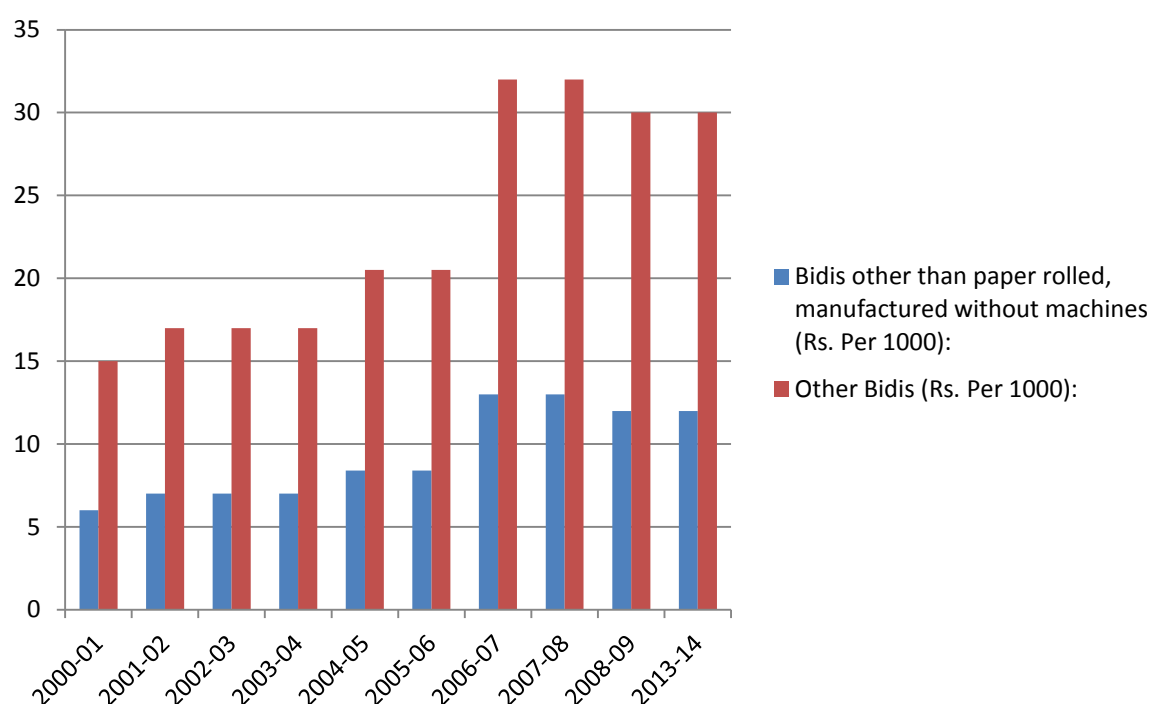
Tax Rate on Smokeless Products

There are myriad variety of smokeless tobacco used in India and the excise structure has been uniform unlike cigarette on which tax varies according to length and whether filtered or unfiltered. In the case of smokeless products, an ad valorem tax is imposed as a percentage of the retail price of the products. The basic excise duty as presented in the Table 4.1 is 60 percent whereas NCCD is 10 percent and total excise duty was 76 percent in 2012-13. The basic excise duty has almost increased to 60 percent in 2012-13 from 16 percent in 2002-03 with a 3.75 times increase over last 10 years. The increase is more profound in last 3 to 4 years. In spite of the increase in tax rate, this has neither generated enough revenue nor acted as a deterrent for reducing in consumption. The prevalence pattern and generation of revenue from smokeless products show wide variations. Comparing the prevalence pattern and revenue from the smokeless products, indicates that there is higher scope for increasing revenue collection from various smokeless products. Currently, nearly about 79 percent of total revenue is earned from cigarettes and the rest comes from a combination of smokeless products and bidi. One of the reasons for low revenue collection from chewing tobacco is that large volume of it remained outside the tax net adopting fraudulent practices. The intelligence wing of the Directorate General of Central Excise indicates that gutkha /pan masala, khaini, among other products are the major tax evading products in India[2].

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[2] http://www.dgcei.nic.in/a/profile_of_evasion.asp accessed on 23/11/2011
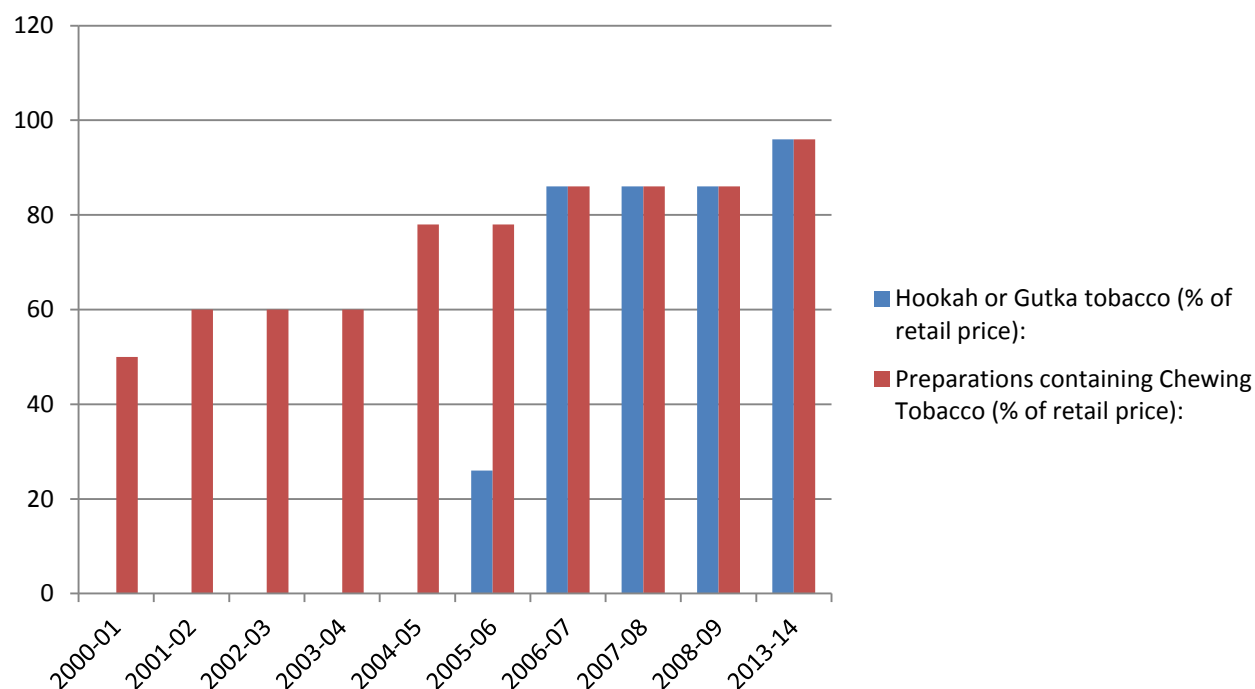
Table 4.2: Tax Rate on Smokeless Tobacco products

Product categories (%)	2010-11, 2011-12				2012-13				2013-14			
	BED	AED	NCCD	Total	BED	AED	NCCD	Total	BED	AED	NCCD	Total
Chewing Tobacco/preparations containing chewing tobacco	60	6	10	76	60	6	10	76	60	7.67	12.77	80.44
Pan Masala containing Tobacco	60	6	10	76	60	6	10	76	60	7.67	12.77	80.44
Snuff of Tobacco and preparation containing snuff of tobacco	60	6	10	76	60	6	10	76	60	7.67	12.77	80.44
Tobacco extracts and essence	60	6	10	76	60	6		76	60	7.67	12.77	80.44
Jarda Scented tobacco	60	6	10	76	60	6	10	76	60	7.67	12.77	80.44

Legend:
BED- Basic Excise Duty
AED- Additional Duty of Excise on Pan Masala and other tobacco products for National Rural Health Mission known as Health Cess
NCCD- National Calamity Contingency Duty
In addition to above, an education cess @ 2% and secondary and higher education cess @ 1% on aggregate duties of excise is charged

Additionally under the Chewing Tobacco and Unmanufactured Tobacco Packing Machines (Capacity Determination and Collection of Duty) Rules, 2010, jarda scented tobacco manufactured using packing machines and prepared in pouches, having a specified retail price per pouch attract additional duties, derived on the basis of the number of packing machines employed per month. These duties are classified based on the type of product: chewing tobacco (other than filter khaini; further divided into with or without lime tube/lime pouches); unmanufactured tobacco (with or without lime tube/lime pouches); and chewing tobacco commonly known as filter khaini. In 2013-14, the rate of duty ranged from Rs 8 lacs per packing machine per month for filter khaini for pouches with retail sale price per pouch up to Rs 1; to Rs 296.5 lacs per packing machine per month for unmanufactured tobacco with lime tube/lime pouches having a retail sale price per pouch of Rs 50. Theoretically, the manufacturing capacity of manufacturing machines is based on a certain number of (ideal) operational hours per day; however manufacturers may easily circumvent this by operating the machines for more than the prescribed hours.

4.12 Tax Structure at the State level

Besides the central excise as mentioned above, the states are assigned power to levy Value Added Tax (VAT) since March 2006. Since then, most of the states are imposing VAT in various proportions on both smoked and smokeless forms of tobacco. Across states, the rate on VAT varies and Rajasthan and Uttar Pradesh have made highest increase in the VAT rate on cigarettes. For instance, the VAT on cigarette was 50 percent in both the states in the financial year 2012-13. Like the central excise, policy makers prefer not to make sharp increase on VAT bidis. During 2010-11, many of the states did not impose VAT on bidi. However, it is observed that during financial year 2012-13, many have moved from a zero rate to levy at 5 to 15 percent range. It is further observed that some of the major bidi manufacturing states – Andhra Pradesh, Gujarat and West Bengal did not impose any VAT on bidis. For smokeless products,

most of the states imposed 20 percent VAT except Madhya Pradesh, Uttarakhand and Karnataka where the tax rate varied within range of 13 to 17 percent. The highest VAT on smokeless products was levied by Rajasthan with 50 percent followed by Uttar Pradesh with 30 percent. Overall, there are five states: Assam, Gujarat, Jharkhand, Jammu Kashmir and Rajasthan which imposed uniform VAT on all three forms of tobacco and the rate is highest in Rajasthan in comparison to all the Indian states. Like the central excise duty, the VAT on bidis has remained low in most of the states in comparison to other tobacco products. The tax rate on cigarettes and smokeless products are largely similar among the states. The lower tax on bidi is undesirable due to health reasons. Another important point to observe is that some states are levying higher tax rates in comparison to others showing the way to follow the pattern in a competitive policy making environment prevailing across Indian states.

Table 4.2 Value Added Tax rates across states (%)

State/UT	2010-11			2011-12			2012-13			2013-14		
	C	B	S	C	B	S	C	B	S	C	B	S
Andhra Pradesh	14.5	0	14.5	20	0	20	20	0	20	20	0	20
Assam	13.5	13.5	13.5	20	20	20	20	20	20			
Bihar	13.5	0	13.5	13.5	0	13.5	20	0	20	30	13.5	30
Gujarat	20	20	20	25	25	25	25	25	25	27.5	25	25
Haryana	20	0	20	20	0	20	20	0	20	20	4	20
Himachal Pradesh	13.75	4	13.75	20	13.75	20	22	15	22			
Jharkhand	12.5	0	12.5				20	20	20			
Jammu &Kashmir	13.5	0	13.5	25	25	25	30	30	30			
Karnataka	15	0	15	15	0	15	17	5	17			
Kerala	12.5	0	12.5	12.5	0	20	15	0	20			
Madhya Pradesh	12.5	0	12.5	13		13	13	13	13	13	13	13
Maharashtra	20	0	20	20	0	20	20	5	20	25	12.5	25
Odisha	12.5	0	12.5	13.5	0	13.5	25	10	25			
Punjab	12.5	12.5	12.5									
Rajasthan	20	20	20	40	40	40	50	50	50			
Tamil Nadu	12.5	0	12.5	20	14.5	20	20	14.5	20			
Uttar Pradesh	12.5	12.5	12.5	17.5	13.5	18.5	50	13.5	30			
Uttarakhand				12.5	0	12.5	12.5	8	12.5			
West Bengal	12.5	0	12.5	20	0	20	20	0	20	25	0	25
Goa	12.5	0	12.5	20	20	20	22	22	22			
Chandigarh	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5			
Delhi	20	0	20	20	12.5	20	20	20	20			

Legend:
C: Cigarette; B: Bidi; S: Smokeless Tobacco; UT: Union Territory

4.2 Revenue from Tobacco Products

Tobacco contributed to around 3 percent of gross tax revenue of India during the last decade. Data as presented from 1999 to 2010 shows that the share of tobacco revenue in the gross tax revenue declined over the years in spite of absolute increase in tax (Figure 4.3). This was 3.3 percent of gross tax revenue in 1999-2000, and declined to 2.23 percent in 2009-10. The decline was prominent from 2002-03 and reached its lowest in 2007-08. One of the reasons could be higher proportionate increase in gross tax revenue in comparison to tobacco tax

revenue during 2004-05 onwards. The share of chewing tobacco in gross tax revenue was less than one percent over the years. It started declining after 2005-06. Chewing tobacco accounted for just 0.19 percent of gross tax revenue during last 11 years.

Figure 4.3

Share of Tobacco in Gross Tax revenue of Government of India (%)
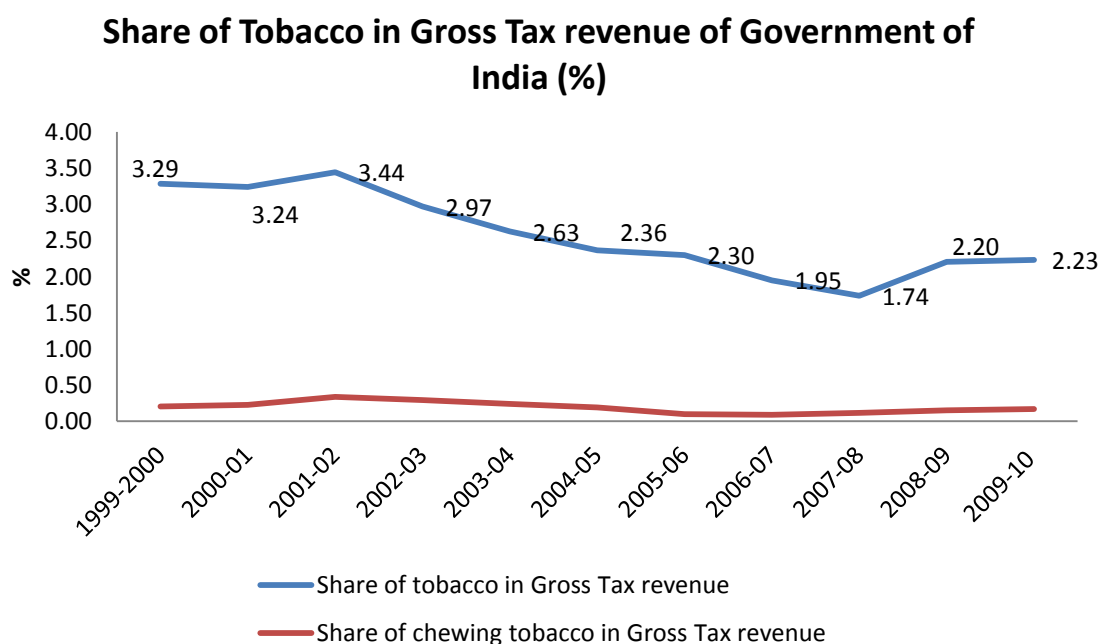
Source Tobacco tax: Directorate of Data Management, Customs and Central Excise, Ministry of Finance, Government of India
Gross tax revenue; Accounts At A Glance, Controller General of Accounts, http://www.cga.nic.in/accessed on 15/11/2011

Revenue from various tobacco products

Revenue collected from various tobacco products shows that cigarettes make a significant contribution to total excise revenue. On an average, 82 percent of the revenue was collected from cigarettes during last 21 years from 1990-91 to 2010-11. After 2002, a small reduction in the share of revenue from cigarette was noticed. During 1990-91 to 1999-00, the average share from cigarette was 86 percent of total revenue from tobacco products which reduced to 79 percent in last decade starting from 2000-01 to 2010-11. However it is important to observe that excise revenue collection from chewing tobacco is increasing over the years. This was Rs

72 crore in 1990-91, increased to Rs 351 core in 1999-2000 with a 5 fold increase in ten years. During the last decade, this increased from Rs 425 crore in 2000-01 to Rs 1053 cr in 2010-11. As a share of total excise revenue this was 5 percent on an average during 1990-91 to 1999-00 and increased to 7 percent to decade ending 2000-01 to 2010-11. The share of other tobacco products covering unmanufactured tobacco wholly or partly stemmed, preparations containing chewing tobacco, Jarda scented tobacco, snuff etc shows increasing trend over the years. It was 3 percent on an average during 1990-91 to 1999-00 which increased to almost 9 percent during last decade. In spite of changes in the pattern of revenue collection, cigarette remains as the single largest contributor of revenue.

Table 4.3 Excise revenue from different Tobacco Products (in Rs Crore)

Year	Cigarettes and Cigarillos of tobacco or tobacco substitutes	Bidis	Chewing Tobacco	Others*	Total Excise Revenue
1990-91	2084.4 (88.98)	165.7 (7.07)	72.3 (3.09)	20.3 (0.87)	2342.6 (100)
1991-92	2387.1 (88.71)	200.2 (7.44)	78 (2.9)	25.5 (0.95)	2690.8 (100)
1992-93	2767.7 (89.14)	231.8 (7.47)	79.3 (2.55)	26.1 (0.84)	3104.8 (100)
1993-94	2739.6 (87.62)	219.5 (7.02)	113.8 (3.64)	53.8 (1.72)	3126.7 (100)
1994-95	2742.9 (78.38)	220 (6.29)	150.8 (4.31)	385.6 (11.02)	3499.3 (100)
1995-96	3426.9 (84.91)	223.3 (5.53)	216.5 (5.36)	169.3 (4.2)	4036 (100)
1996-97	3982.7 (86.55)	241.5 (5.25)	212.1 (4.61)	165.1 (3.59)	4601.3 (100)
1997-98	4492.4 (86.16)	323.8 (6.21)	266.1 (5.1)	132.1 (2.53)	5214.3 (100)
1998-99	4592 (82.15)	323.3 (5.78)	555.5 (9.94)	118.8 (2.12)	5589.5 (100)
1999-00	4862.6 (86.18)	321.7 (5.7)	351.2 (6.22)	106.7 (1.89)	5642.1 (100)
Avg. Share (1990-2000)	*85.88*	*6.38*	*4.77*	*2.97*	
2000-01	5180.5 (84.75)	353.8 (5.79)	425.8 (6.96)	152.8 (2.5)	6112.9 (100)
2001-02	5059.5 (78.52)	357.2 (5.54)	630.7 (9.79)	396.4 (6.15)	6443.7 (100)
2002-03	5140 (80)	360.4 (5.61)	632 (9.84)	292.3 (4.55)	6424.6 (100)
2003-04	5495.3 (82.82)	336.4 (5.07)	613.5 (9.25)	190.4 (2.87)	6635.6 (100)
2004-05	5994.8 (83.6)	348.1 (4.86)	577.3 (8.05)	250.6 (3.49)	7170.8 (100)
2005-06	6989 (83.38)	370.7 (4.42)	367.8 (4.39)	654.6 (7.81)	8382.1 (100)
2006-07	7701.4 (83.73)	427.6 (4.65)	421.2 (4.58)	647.3 (7.04)	9197.4 (100)
2007-08	8148.8 (79.36)	484 (4.71)	691.6 (6.74)	943.7 (9.19)	10268.1 (100)
2008-09	9310.2 (70)	488.5 (3.67)	916.6 (6.89)	2585 (19.44)	13300.3 (100)
2009-10	9555.7 (68.98)	489.7 (3.53)	1062 (7.67)	2746 (19.82)	13853.4 (100)
2010-11	11170.5 (72.06)	471.6 (3.04)	1053.2 (6.79)	2807.1 (18.11)	15502.4 (100)
Avg. Share (2001-2010)	*78.84*	*4.63*	*7.36*	*9.18*	

Legend:
Figures in parenthesis indicate percentage to total
***includes unmanufactured tobacco covering wholly or partly stemmed, Preparations containing chewing tobacco, Jarda scented tobacco, Snuff, Preparations containing snuff, Tobacco extracts and essence, Cut-tobacco
Source: Directorate of Data Management, Customs and Central Excise, Ministry of Finance, Government of India

4.3 Tax rate, tobacco prices and tax revenue

Tobacco, the demand for which is inelastic in nature shows with increase in tax rate the tax revenue goes up. For cigarettes, in India specific excise duty is imposed and it is observed that if the tax is not increased regularly or is not inflation adjusted, the real price of cigarette would decline in comparison to prices of other products. This would make cigarette affordable to the consumers. The specific tax on cigarette is levied as per the length of the product and in this case, tax on various tiers need to be increased simultaneously in order to avoid substitution of low priced products to high valued products. The whole sale price index of cigarettes is more than the all commodity index for all most all the years except two years 2005-06 and 2006-07. After this the difference between WPI of cigarette and all commodities is increasing indicating higher increase in cigarette prices in comparison to all commodities. The increase in the WPI in recent years indicates increase in central excise for cigarettes which has been prominent since 2007-08. The cigarette tax rate is inflation adjusted and the price rise is steeper than all commodity index.

Figure 4.4
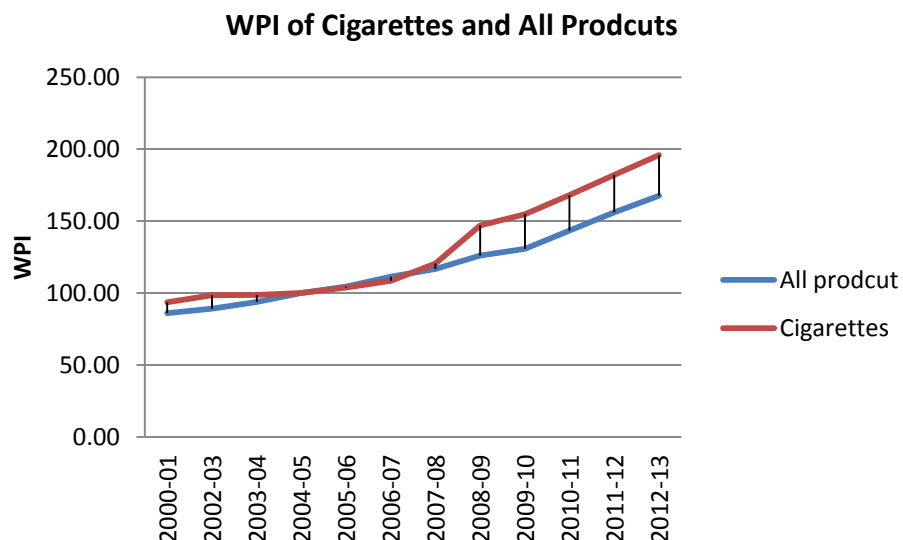
Sources: http://eaindustry.nic.in/Download_Data_0405.html
http://eaindustry.nic.in/Download_Data_9394.html

It is observed that with increase in tax rate of cigarettes, the wholesale price index of cigarettes and the revenue collection has gone up over the years. Up to 2004-05, the tax rate on cigarette remained constant and an increase in the tax rate is noticed after 2005-06. The tax collection pattern is similar to the behavior of tax rate and with the increase in tax rate, the revenue collection from cigarette has gone up (figure 4.5). Therefore, government revenue does not decline with increase in tax rate as observed form the analysis.

Figure 4.5

Tax rate and Tax revenue from Cigarettes
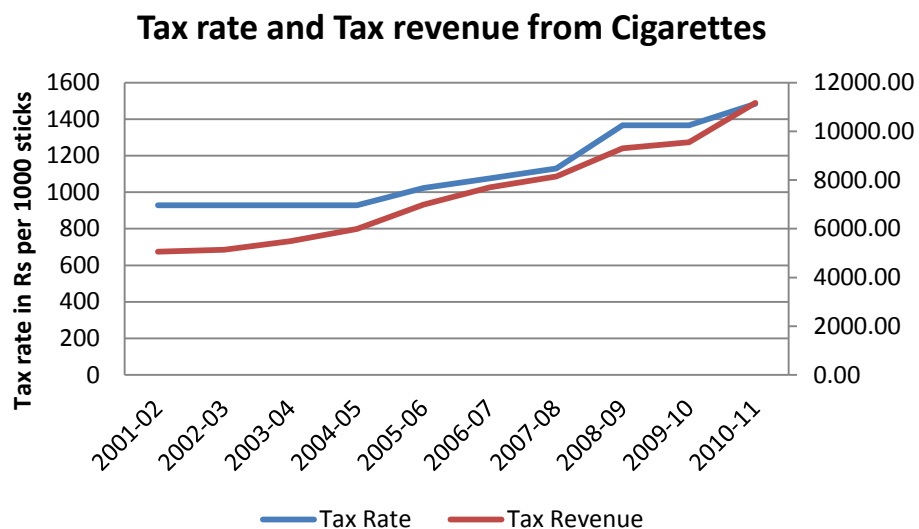
Note: Tax rate is the average of both and unfiltered categories

4.4 Relative WPI of Tobacco Products

Overall, the WPI of tobacco products exhibit increasing trend over the years due to rise in the tax rate. However, among the three products bidi, cigarette and Zarda, the relative WPI of bidi was small in comparison to two other tobacco products. This fluctuated between one and less than one up to 2009-10 indicating the increase in the prices of bidi was less than the general price index. However, the relative WPI of bidi started increasing from 2010-11 due to increase in tax rate. This clearly indicates that the bidi tax rate is low in comparison to other tobacco products.

The relative WPI of Zarda another popular form of smokeless tobacco shows increasing over the years and in the last three years, the increase in the price is more than that of cigarette. It is a fact that the consumption of smokeless tobacco is much higher in India in comparison to other tobacco products due to easy availability at low prices. This needs to be curbed effectively by deploying several methods. In the recent years, though the government has increased the tax rate, which is reflected in the higher relative WPI, the unit prices of these products are too small to deter consumption.

Figure 4.6
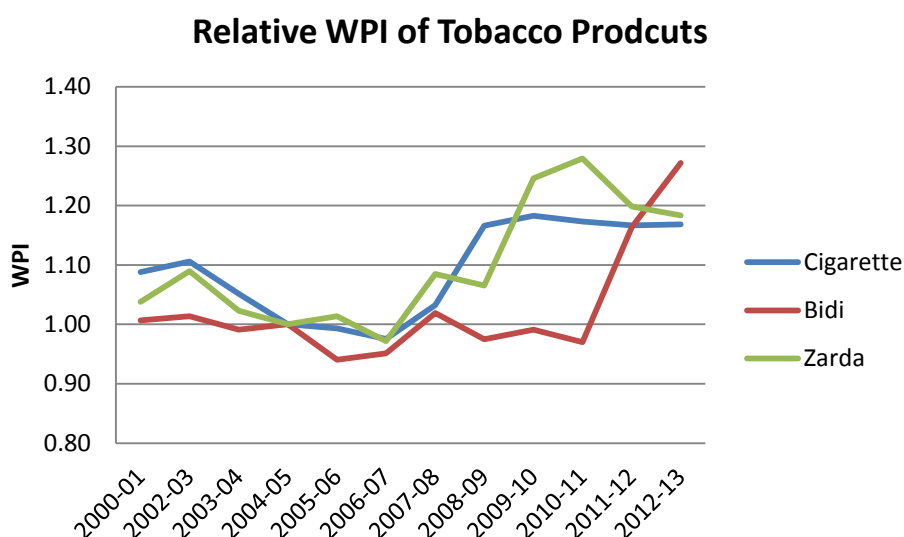
Sources: http://eaindustry.nic.in/Download_Data_0405.html
http://eaindustry.nic.in/Download_Data_9394.html accessed on 15.10.2013
Note: Presents data of WPI for 2004 series; Relative WPI is obtained by dividing WPI of the specific product by the WPI of all commodities in a given year

It is further observed that in spite of an increase in the tax rate and prices of tobacco products, the affordability is increasing particularly after 2000-01 taking per capita income in to consideration[3]. The average Indians have to spend a small fraction of their income to purchase tobacco products and these needs to be changed by sustained increase in the tax rate. The cigarette tax rate even has shown consistent increase, the excise burden is low. One earlier estimate suggested that this was 33 per cent for most popular brands and 62 percent for most popular brands[4]. The tax rate on bidi is very low and the smokeless products are available at low unit price which is easily accessible to all. In this scenario the current tax structure idea of the current tax structure as discussed in the tobacco literature needs to be changed in order to make it effective. The WHO's FCTC as ratified by India requires regular increase in the tax rate across all the products to make it inflation adjusted. Further the affordability factor especially the increase in income growth rate should be factored in while designing the tax rate across tobacco products.

In the case of India, the federal units –states are levying VAT, a consumption tax on tobacco products. However, one challenge is that the VAT rate is not uniform among the products across states. Due to free border across states, it is most likely for the products to move from high tax regime to low tax regime minimizing the impact of high increase in the prices. In order to make the tax system effective, the complexities ought to be minimized. Given these complexities, the proposed goods and service tax could introduce reforms in simplifying the tax structure and minimizing the differential tax rate applied to tobacco products. However, the political uncertainty especially reaching consensus on vital issues – uniform tax rate or two to three slabs for different products, revenue loss by the states and compensation mechanism and transfer of fiscal power between the union and state governments delays the process of

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[3]

[4] Sunley, Emil M. (2009), Taxation of Cigarettes in the Bloomberg Initiative Countries: Overview of Policy Issues and Proposals for Reform,
Available in:
http://www.tobaccofreeunion.org/assets/Technical%20Resources/Economic%20Reports/Sunley%20White%20paper%2012%2009%2009.pdf. Accessed on 23rd October 2013

GST roll out. This could have further implication on effectiveness of tobacco tax as an important tool of tobacco consumption.

Chapter V: Changing Tobacco Tax Structure and its Implications for Tobacco Consumption

Price increase, by means of increased taxation or otherwise, is considered to be the single most effective method to control consumption and encourage tobacco users to quit (WHO, 2008). Preceding the FCTC, the Government of India enacted "*The Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003*" (COTPA), enforced from May, 2004. In India, price and tax measures are under the ambit of the annual Finance Act (the Union Budget), with little input from the Ministry of Health and Family Welfare. The motivating rationale for price and tax measures for tobacco in the country is fiscal (to maximize excise revenue generation), rather than for the public health goal of reducing tobacco consumption. This is reflected in the differential taxation on tobacco products, with cigarettes taxed heavily compared to the other products like *bidis* and smokeless forms. The corresponding taxation rate in high-income countries is nearly two thirds of the retail price of a cigarette pack (Chaloupka *et al*, 2000). In contrast, *bidi,* and tobacco used for its manufacture, which are the most widely consumed smoking product (9 percent of the population, GATS 2010), is exempt from VAT in most states. Together with central excise, *bidis* attract a tax rate which is on average only 9 percent of retail price (Rao et al 2010). The taxation of smokeless tobacco products is even more complex, with raw materials like *betel* leaves, arecanut powder, betel nut, *kattha*, and unmanufactured tobacco, either exempt from tax or taxed between 4-5 percent, in most states. Further complicating governance and administration of *bidi* and smokeless tobacco tax are government subsidies. *Bidi* excise rates (per 1,000 sticks) depend on whether they are handmade (98 percent) or machine-made (2 percent), with handmade *bidis* produced by manufacturers producing less than 2 million pieces a year exempt from taxation (Sunley 2008).

Given the availability of myriad varieties of tobacco products, and their equally complex and inconsistent taxation, Indian consumers are presented with a wide choice of alternatives if their product of choice becomes too expensive. This substitution effect is particularly important for those belonging to lower socio-economic strata, and new initiators like adolescents with lower

disposable incomes. In middle and high income countries, tobacco is uniformly and highly taxed, irrespective of product type. It is therefore particularly important to determine the effect of the present differential taxation structure on dissimilar consumers' preferences on tobacco product substitution.

Overall, extensive mortality and morbidity caused due to tobacco consumption necessitate the development of concerted tobacco control programs and policies to curb the tobacco epidemic, including measures like price and tax to reduce demand. There has been a constant increase in the price and tax on tobacco products (with a particular focus on cigarettes), but cigarettes are becoming more affordable in the country (Belcher *et al*, 2008). Measures are required to improve tax administration and equally increase tax on the more prevalent forms of tobacco such as smokeless tobacco and *bidis*, alongside cigarettes. This part of the study focuses on the pricing instrument of tobacco and attempts to show how consumption of various tobacco products in India, including smokeless forms, is price sensitive.

International Evidence

Studies on price elasticities of tobacco in high and middle income countries are abundant in the literature. Particularly important for policymakers is the consistent evidence from various studies demonstrating the effects of higher prices on tobacco products and stronger restrictions on decreased consumption, above all among adolescents and persons belonging to the lower socio-economic strata (Chaloupka 1999). In high income countries, estimates of the price elasticity of cigarette demand range from −0.25 to −0.50, while estimates from low- and middle-income countries range from −0.50 to −1.00 (Chaloupka *et al*, 2000). These estimates suggest that increasing tobacco taxes in low and middle income countries could lead to reductions in tobacco consumption.

Guindon *et al* in their study of cigarette price data from more than 80 countries using various methods examined trends in prices and affordability during the 1990s and found immense

potential to increase tobacco prices through taxation. Overall, trends between 1990 and 2000 in real prices and minutes of labor indicated that cigarettes have become more expensive in most developed countries but more affordable in many developing countries. Cigarette prices have not increased with increases in the general price level of goods and services, making them more affordable to consumers (Guindon *et al*, 2002). More recently, Belcher and van Walbeek also have found that cigarettes have become less affordable in developed countries and more affordable in developing countries (Belcher *et al*, 2008). Studies from Russia (Ross *et al*, 2008), Ukraine (Ross *et al*, 2009), and Vietnam (Guindon *et al*, 2010), support this.

Another study on the variation in demand for tobacco according to price of cigarettes in 52 countries of the European region found that price elasticities for consumption were −0.46 (95% CI −0.74 to −0.17) and −0.74 (95% CI −1.13 to −0.35) for local and foreign brands, respectively (controlling for male to female prevalence ratios). It concluded that, on an average, smoking consumption decreases 5–7 percent for a 10 percent increase in the real price of cigarettes in Europe and strongly reinforces the inverse association between price and cigarette smoking (Gallus *et al*, 2006).

A study in Russia (Lance *et al,* 2004) used data from 1996-2000 to estimate the demand for cigarettes among men and women while controlling for wealth, age, education, household size, and community-level prices. They also estimated separate models for regional and community-level fixed effects, in addition to pooled cross-sectional data. The study accounted for the real increase in cigarette prices between 1996 and 1998, and their real decrease between 1998 and 2000. Young people (aged 13 to 19) were more price sensitive (total price elasticity −0.345) than middle-aged men (aged 25 to 54; total price elasticity −0.072). The total price elasticity in Russia increased with wealth and its effect on smoking participation was negative and significant. The relatively low level of price responsiveness was attributed to the high level of addiction among Russian male smokers, minimum tobacco control initiatives, and the high social acceptability of smoking in Russia.

Studies in developing countries have recently become more plentiful. Warner (1990) argued that price responsiveness in less developed countries is likely to be greater than in more developed countries, due to relatively lower incomes and relatively lower level of cigarette consumption.

Jime´nez-Ruiz et al (2008) conducted a pooled cross-sectional analysis of cigarette demand in Mexico using household survey data through a two-part model to estimate the price elasticity in 2008. The total price elasticity calculated by combining the elasticity of smoking participation and conditional elasticity of cigarette consumption was -0.52. Holding other factors constant, a 10percent increase in the cigarette tax would produce a 12.4percent increase in the price to the consumer, a 6.4percent decrease in consumption, and a 15.7percent increase in the revenue yielded by the tax (Jime´nez-Ruiz *et al,* 2008).

Hu et al in an empirical economic analysis and tax simulation model reviewed Chinese tobacco price elasticity estimates from recent literature. They found that empirically estimated price elasticities ranged from -0.007 to -0.84, depending upon variations in data sets (time series versus cross section; aggregate versus individual observations), model specification and estimated methods. They grouped the studies into three categories based on elasticity magnitudes. The high-end price elasticities (approximately -0.80) were attributed to long-run estimates; middle range of elasticities (from -0.50 to -0.60) similar to estimates from middle- or high-income countries; and low-end price elasticities (from -0.007 to -0.154) from the most recent studies based on nationally representative data sources (Hu *et al*, 2010). Hu proposed that the low price elasticities for cigarettes in China could be due to the availability of cigarettes over a large price spectrum, with substitution of higher prices cigarettes with more inexpensive brands; and due to the high affordability of cigarettes from rising disposable incomes.

In Indonesia, studies using both house-hold level and aggregate data have consistently reported price elasticity estimates in the range of -0.29 to -0.67 (Barber *et al*, 2008). Bird estimated long-run price elasticities of tobacco products for 1970 to 1994 of -0.43 (Bird, 1999). De Beyer and

Yurekli, using time series data for 1980 to 1995 found a price elasticity of demand for *kreteks* (an indigenous smoked product) to be -0.51 and income elasticity to be 0.35 (World Bank, 2000). Djutaharta *et al* (2005) estimated long-run price elasticity of -0.57 and income elasticity of 0.46, for the period of 1970 to 1996. For the period of 1970 to 2001, the models produced slightly lower elasticities of -0.33 to -0.47, and income elasticities from 0.14 to 0.51 (Djutaharta *et al,* 2005). Guindon using original time series model data from Indonesia from 1970 to 2000 estimated short-run price elasticity of -0.29 using a conventional model not accounting for addiction; and price elasticity of -0.32 using a myopic addiction model (Guindon *et al*, 2003). An estimate using household data from the 1999 national socio-economic survey found that conditional on tobacco product use, demand price elasticity was –0.6, which decreased (in absolute terms) with income (Adioetomo *et al*, 2005). Hidayat and Thabrany used individual pooled data derived from three-waves of the Indonesian Family Life Survey (from 1993 to 2000) to estimate short-run cigarette price elasticities of -0.38 and -0.57 (for males and females, respectively), and long-run elasticities of -0.4 and -3.85, respectively, using a myopic addiction model. They concluded that since the demand for cigarettes is more price sensitive in the long compared to the short run, an increase in the price of cigarettes could lead to a significant fall in cigarette consumption in the long run (Hidayat and Thabrany, 2010).

Guindon *et al* reviewed studies from Vietnam, Burma, China, Malaysia, South Korea, Taiwan, and Thailand. Almost all time series studies found that prices were significantly and negatively associated with tobacco consumption. Estimates of price elasticities however, varied. Estimates of short- and long-run demand price elasticities of –0.3 to –0.6 and –0.35 to –0.7, respectively, were observed. Studies using cross-sectional individual-level data using a two-part model to estimate participation and conditional demand elasticities varied from –0.02 to –1.3 and –0.06 to –0.64, respectively (Guindon *et al*, 2010).

A study from Sri Lanka found the total price elasticity of demand to be -0.29 in the richest expenditure quintile, varying from –0.55 and –0.64 among the other four expenditure quintiles (Arunatilake, 2002).

In Nepal, the total price elasticity of tobacco was estimated to be –0.88, with younger people and urban smokers more responsive to increases in price (Karki *et al*, 2003).

In Bangladesh, Nargis *et al* through two-part models estimated the price elasticity of the number of cigarettes smoked per day to be -0.22 and the price elasticity of the decision to smoke cigarettes to be -0.44. The total price elasticity of cigarette demand was estimated to be -0.66, meaning that if cigarette prices were doubled, cigarette consumption would reduce by 66 percent. The same study found that total price elasticity varied from -0.76 for low SES, -0.73 for medium SES, and -0.59 for high SES respondents; making lower SES groups consumption more vulnerable to changes in cigarette price than higher SES groups (Nargis *et al*, 2010).

In Pakistan, Mushtaq assessed the effect of taxes on tobacco demand from 2001 to 2009 and approximated the long-term price elasticity of cigarette demand to be –1.17. The estimations indicate that cigarette consumption could decrease by 11.7 percent in the long term with a 10 percent increase in cigarette price (Mushtaq, 2010).

Kostova in 2011 used a two-part model of cigarette demand with country fixed effects to estimate the impact of prices on smoking participation and on the number of cigarettes smoked among adolescent current smokers in 17 low and middle income countries, using data from the Global Youth Tobacco Surveys. The price elasticity of smoking participation was -0.74, the estimated price elasticity of conditional cigarette demand -1.37, and total price elasticity of cigarette demand -2.11 (Kostova *et al*, 2011).

Studies on price elasticities of tobacco products in the Indian context are scant in the literature. A study by the National Council of Applied Economic Research estimated the price elasticity of demand for cigarettes for the period 1981-82 to 1992-93 to be –0.67. An unpublished study by Suryanarayana (2002) estimated Engel elasticities (expenditure elasticities) for different tobacco products. He found that for a given percentage increase in consumer expenditures

(which may be used as a proxy for income), results in the demand for *bidis* and leaf tobacco rise by a smaller percent, while that for cigarettes rises comparatively more. Joseph used national level Global Youth Tobacco Survey (GYTS) data from 2000 and 2004 to estimate the price elasticity of youth cigarette, *bidi* and *gutkha* demand in India. Higher cigarette and *bidi* prices were found to significantly reduce the prevalence of cigarette and *bidi* smoking (elasticities of –0.17 and –1.17, respectively), and higher prices also significantly reduced cigarette consumption among young smokers (conditional demand elasticity of –0.3). Boys were more responsive than girls to changes in cigarette and *bidi* prices, suggesting that any increases in prices of these products would lead to larger decreases in male youth smoking (Joseph, 2010). John estimated the price elasticity of demand for three tobacco products (*bidis*, cigarettes, and leaf tobacco) separately for rural and urban areas in India using the 55th round National Sample Survey data (1999-2000). Cross-price elasticities between these tobacco products were also estimated. John found that own-price elasticity estimates of tobacco products ranged between -0.4 to -0.9, with *bidis* and leaf tobacco having elasticities close to unity. Cigarettes were found to be the least price elastic of all (John, 2008). The most recent Indian study uses pooled data from National Sample Survey rounds from 1999-00 to 2007-08, and shows that a 10 percent increase in *bidi* prices would reduce the demand by 6 to 9.5 percent (Guindon *et al*, 2011).

In this backdrop of a number of studies employing diverse methods, there exists scope for further study to see the price responsiveness of tobacco products in India, in order to suggest more appropriate tobacco pricing strategies for policy makers; particularly in environments where tobacco consumption and incomes are both ascending and vulnerable consumers are presented with numerous choices for tobacco product substitution.

5.1 Price Responsiveness (Elasticity Estimates) by Sector, 2011-12

We next discuss price elasticity estimates of tobacco products, for the year 2011-12. The analysis is done separately for rural and urban India, and for tertile groups generated on the basis of monthly per capita expenditure (in Section 5.3); using data from households consuming tobacco or alcohol, as these goods are commonly used by consumers with similar preferences

i.e. tobacco and alcohol use often go hand-in-hand. Households which do not consume tobacco are dropped from the analysis, as we assume that preferences of tobacco consumers and non-consumers are primarily different, i.e., tobacco is not an element in the utility function of non-users of tobacco. Thus, price of tobacco does not have any influence on their budget.

Covariates considered in the models include: natural log of household expenditure, log of household size, ratio of males in household, ratio of adults (>=15 years) in the household, mean years of education of household members, maximum years of education of any household member, religion dummies, social group dummies, and household type dummies, as discussed previously in variable definitions.

Table 5.2 shows the unit values and budget shares of *bidi*, cigarettes, and leaf tobacco using the NSS CES 2011-12 data. The mean unit value of *bidi* was Rupees 0.368, with nearly 0.9 percent of household budgets devoted to *bidis*. Rural households spent a higher proportion of their household budgets on *bidis* as compared to urban households (0.9 versus 0.6 percent, respectively). For cigarettes, the mean unit value was Rupees 3.11; with a reversal of the budget pattern seen for *bidis*, with urban households spending nearly twice the proportion of their budgets as compared to rural households (0.9 versus 0.4 percent, respectively). Since leaf tobacco is a fairly heterogeneous product, unit values do not assume much significance; with both urban and rural households allocating comparable proportions of budget shares to the products.

Table 5.2: Unit Values and Budget Shares of Bidi, Cigarette, and Leaf Tobacco, India, 2011-12

	Unit Values (Rupees)			Budget Shares (%)[*]		
	All India	Rural	Urban	All India	Rural	Urban
BIDI						
Observations	19570	14622	4932	50055	33914	16107
Mean	0.368	0.362	0.380	0.871	0.994	0.609
SD	0.206	0.183	0.214	0.018	0.019	0.014
Min	0.05	0.05	0.08	0	0	0
Max	4.191	3	2.5	0.354	0.354	0.227
CIGARETTES						
Observations	9957	5331	4607	50055	33914	16107
Mean	3.11	3.01	3.247	0.593	0.453	0.888
SD	1.115	1.084	1.191	0.018	0.016	0.021
Min	0.125	0.3333	0.5	0	0	0
Max	16	11	10	0.312	0.290	0.312
LEAF TOBACCO						
Observations	16924	12460	4459	50055	33914	16107
Mean	0.334	0.309	0.4035	0.275	0.302	0.222
SD	0.449	0.403	0.5505	0. 0066	0.0068	0.062
Min	0.019	0.019	0.035	0	0	0
Max	10	6	10	0.216	0.2159	0.1415
TOBACCO (total)						
Observations	NA	NA	NA	50055	33914	16107
Mean				2.233	2.233	2.297
SD				0.024	0.024	0.024
Min				0.0006	0.0006	0.00007
Max				0.478	0.478	0.312

Legend:
SD: Standard Deviation; Min: Minimum; Max: Maximum
[*]Mean budget shares have been multiplied by 100 to give percentages

Table 5.3 shows the estimations from unit value and budget share regressions as well as expenditure (income) elasticities. The expenditure elasticity of quality is the coefficient of ln x in

the unit value regression equation. It is positive and significant at least the 0.01 level in all cases except for *bidis* in urban areas. Cigarettes have expenditure elasticity of quality of 0.0843 in urban and 0.0781 in rural areas, implying that doubling of household expenditure would increase the average price paid per cigarette by 8 and 7 percent, respectively. For leaf tobacco, expenditure elasticity is highest of all products in urban areas, at 0.1369 and significant at the 0.001 level. This means that doubling of household expenditure would increase the average price paid per unit leaf product by almost 14 percent. Given the considerable heterogeneity of SLT products and the low unit prices, it is entirely plausible that consumers readily switch to more premium (packaged) brands.

Coefficients of the logarithm of household size are nearly all negative, and approximately equal in magnitude to the logarithm of household expenditure for leaf tobacco and *bidis* in rural areas. This may imply that increase in household size operates as a reduction in household income. For cigarettes, the magnitude is not nearly as equal as for other products, although still negative, suggesting that cigarette consumers are more recalcitrant to reductions in expenditure arising from larger household sizes.

Overall, budget share regression coefficients show opposite signs for logarithms of household expenditure and size. For *bidis* in both rural and urban areas, keeping expenditure and all other variables constant, increasing household size leads to an increase in budget share. For cigarettes, the opposite is noted, with increases in household size resulting in a decrease in budget share of cigarettes in both strata. For leaf tobacco, increase in household size also has a decreasing effect on its budget shares.

Total expenditure elasticity can be calculated as the sum of the expenditure elasticities of quality and quantity. For both bidis and leaf tobacco, expenditure elasticities are less than one and range between 0.15 for leaf tobacco in urban areas and 0.369 for bidis in rural areas, implying that increase in total household expenditure results in slight changes (increases) in consumption of these items. For cigarettes, the expenditure elasticity is high, at 1.105 in urban

areas and 1.383 in rural areas. This suggests that increases in household expenditure would lead to large increases in cigarette consumption, especially in rural areas.

Table 5.3: Income and Household Size Coefficients and Income Elasticities, India, 2011-12

	Unit Value Regression						Budget Share Regression					
	Bidi		Cigarettes		Leaf Tobacco		Bidi		Cigarettes		Leaf Tobacco	
Rural India												
	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value
Observations	14567		5362		12494		34035		34035		34035	
F-statistic	3.48	<0.0001	10.25	<0.0001	5.16	<0.0001	133.91	<0.0001	37.68	<0.0001	65.05	<0.0001
Adjusted-R	0.8059		0.7698		0.7563		0.6293		0.6310		0.6539	
Clusters	5030	<0.001	2797	<0.001	3708	<0.001	7144	<0.001	7144	<0.001	7144	<0.001
Exp Elasticity	0.3695		1.3829		0.3172							
lnexp	0.0265	<0.001	0.0799	<0.001	0.0402	0.003	-0.59	<0.001	0.21	<0.001	-0.19	<0.001
lhsize	-0.0280	<0.001	-0.0082	0.904	-0.0305	0.031	0.03	0.217	-0.26	<0.001	-0.05	<0.001
_cons	-1.3620	<0.001	0.4144	<0.001	-1.8794	<0.001	.0605	<0.001	-0.0128	<0.001	0.0210	<0.001
Urban India												
	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-value
Observations	4953		4727		4464		16293		16293		16293	
F-statistic	4.66	<0.0001	11.51	<0.0001	7.80	<0.0001	65.62	<0.0001	35.16	<0.0001	27.02	<0.0001
Adjusted-R	0.7182		0.7173		0.6641		0.3871		0.5411		0.4697	
Clusters	2481	<0.001	2422	<0.001	1924	<0.001	4659	<0.001	4659	<0.001	4659	<0.001
Exp Elasticity	0.3046		1.1059		0.1599							
lnexp	0.0164	0.201	0.0880	<0.001	0.1369	<0.001	-0.41	<0.001	0.17	<0.001	-0.15	<0.001
lhsize	0.0235	0.084	-0.0496	0.001	-0.1310	<0.001	0.01	0.674	-0.44	<0.001	-0.02	0.087
_cons	-1.3025	<0.001	0.5126	<0.001	-2.3548	<0.001	0.0464	<0.001	-0.0094	<0.001	0.0166	<0.001

Legend:

Coef: Coefficient; Exp Elasticity: Expenditure Elasticity; lnexp: log of household expenditure; lhsize: log of household size

Coefficients of budget share regressions are multiplied by 100.

Table 5.4 shows own and cross price elasticities of tobacco products from the same time period. *Bidis* exhibit the highest overall elasticity of -0.4844 in rural and -0.4789 in urban areas, indicating that a 10 percent increase in *bidi* prices would reduce consumption by 4.8 and 4.7 percent in rural and urban areas, respectively. Leaf tobacco also exhibit similar elasticities, at -0.4897 and -0.3791 for rural and urban areas, respectively. Cigarettes were least price responsive, with the lowest elasticities of all products at -0.2478 and -0.2094 in rural and urban areas, respectively. This means that a 10 percent increase in cigarette prices would reduce cigarette consumption by 2.4 and 2.09 percent in the respective areas.

Table 5.4: Own and Cross Price Elasticity Estimates of Tobacco Products, All India, 2011-12

Product	RURAL			URBAN		
	Bidi	**Cigarette**	**Leaf**	**Bidi**	**Cigarette**	**Leaf**
Bidi	-0. 4844	-0.0182	0.0218	-0.4789	0.0365	0.0241
Cigarette	-0. 0505	-0.2478	0.0738	0.0197	-0.2094	0.0645
Leaf Tobacco	0.0722	0.1158	-0.4897	0.0664	0. 2666	-0.3791

Legend:

Figures are own (shaded) and cross (un-shaded) price elasticity estimates derived from the National Sample Survey Organization Consumer Expenditure Survey, 2011-12

5.2 Price Elasticity Estimates 1999-00 to 2011-12

Table 5.5 depicts price elasticity estimates from NSS CES from the years 1999-00 to 2011-12. Broadly, elasticities across all three products have declined across the years, with consumers becoming more and more inelastic to price changes. From the quinquinnial surveys, elasticities for *bidis* in rural areas were -0.92 in 1999-00, -0.734 in 2004-05, -0.721 in 2009-10, and -0.484 in 2011-12. For cigarettes, elasticities from the same rural data were -0.312 in 1999-00, -0.494 in 2004-05, -0.241 in 2009-10, and -0.209 in 2011-12. Rural leaf tobacco elasticities ranged from -0.874 in 1999-00, -0.974 in 2004-05, -0.55 in 2009-10, and -0.489 in 2011-12. Elasticities from the annual CES rounds were also estimated, but due to small sample sizes and fewer households with positive tobacco consumption across all products, these elasticities are not considered robust.

Table 5.5 : Price Elasticity Estimates of Tobacco Products, 1999-00 to 2011-12

	1999-00		2000-01		2001-02		2002		2003		2004-05		2005-06		2006-07		2007-08		2009-10		2011-12	
	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U	R	U
Bidi	-0.920	-0.881	-0.006	-0.071	-0.039	--	-0.069	-0.249	-0.143	-0.201	-0.734	-0.617	-0.059	--	-0.047	-0.642	-0.061	(0.834)	-0.721	-0.576	-0.484	-0.479
Cigarette	-0.312	-0.170	0.140	0.036	(0.060)	--	-0.272	-0.036	-0.334	-0.028	-0.494	-0.395	-0.036	--	-0.183	-0.067	(0.038)	-0.143	-0.241	-0.288	-0.248	-0.209
Leaf Tobacco	-0.874	-0.899	-1.040	-1.082	-1.01	--	-1.00	-1.08	-1.00	-1.05	-0.974	-0.734	-0.409	--	-0.454	-0.328	-0.206	-0.049	-0.550	-0.308	-0.489	-0.379

Legend:

*R: Rural; U: Urban

**Figures are own price elasticity estimates derived from the National Sample Survey Organization Consumer Expenditure Surveys 1999-00 to 2011-12

***Figures in brackets () are estimated positive elasticities, which are not relevant for this analysis. We postulate that this may be because of insufficient numbers of positive values for the tobacco product in the respective sectors for that year

****For the years 2000-01 and 2005-06 for urban areas, matrices used to estimate elasticities had missing values and these results are excluded

***Columns highlighted in grey show elasticities estimated from quinquinnial Consumer Expenditure Surveys

5.3 Price Responsiveness by Tertile Groups, 2011-12

The tertile-wise analysis was done separately for wealth tertile groups generated based on reported household monthly per capita expenditure. *Bidi* elasticity was highest in the poorest wealth tertile as compared to the middle tertile. Leaf tobacco had higher elasticity in the poorest as compared to the middle tertile; however the highest elasticity was found in the wealthiest tertile. Some positive elasticities were estimated, which are not relevant for this analysis. We postulate that this may be because of insufficient numbers of positive values for the tobacco product in the respective tertile groups.

Table 5.6: Price Elasticity Estimates of Tobacco Products by Wealth Tertile, 2011-12

Product	T1	T2	T3
Bidi	-0.351	-0.247	(0.016)
Cigarette	(0.897)	(0.281)	(0.034)
Leaf Tobacco	-0.186	-0.160	-0.250

Legend:

*Figures are own price elasticity estimates derived from the National Sample Survey Organization Consumer Expenditure Survey 2011-12

**T1, T2, and T3 denote Tertile Group 1, Tertile Group 2, and Tertile Group 3, respectively

***Figures in brackets () are estimated positive elasticities, which are not relevant for this analysis. We postulate that this may be because of insufficient numbers of positive values for the tobacco product in the respective tertile groups

5.4 Price Elasticity Estimates by Major States, 2011-12

Table 5.7 shows price elasticity estimates from the NSS CES 2011-12, for the nine major states which provided aggregate or product-wise tobacco tax revenue data. Overall, *bidi* elasticities were higher than cigarette. *Bidi* elasticities ranged from -0.4113 in Himachal Pradesh to -0.9689 in West Bengal. Cigarette elasticities were lowest in Jammu and Kashmir (-0.1101) and highest in Rajasthan (-0.7627). Leaf tobacco elasticities were variable, with a low of -0.3931 in Andhra Pradesh and a high of -0.7813 in Uttar Pradesh.

Table 5.7 : Price Elasticity Estimates by Major States, 2011-12

States	Bidi	Cigarette	Leaf Tobacco
Andhra Pradesh	-0.594	-0.6361	-0.3931
Assam	-0.4361	-0.3859	-0.5195
Himachal Pradesh	-0.4113	-0.6024	-0.6748
Jammu & Kashmir	-0.4322	-0.1101	-0.4486
Kerala	Insufficient Observations		
Maharashtra	-0.6032	-0.5715	-0.6332
Rajasthan	-0.8825	-0.7627	-0.4829
Uttar Pradesh	-0.6072	-0.2040	-0.7813
West Bengal	-0.9689	-0.3619	-0.7298

Legend:
*Figures are own price elasticity estimates derived from the National Sample Survey Organization Consumer Expenditure Survey 2011-12

5.5 Simulation Exercise

Overall, the objective of tobacco control in the form of tobacco taxation in the country has so far been to maximize fiscal gains, and not to ameliorate health and deter consumption. This is reflected in the low tax rate on tobacco products (as discussed in Chapter 4), which are still not in line with committed targets agreed upon by all signatories to the WHO's Framework on Tobacco Control, including India. The FCTC stipulates that all tobacco products be taxed at a target tax incidence of 75 percent, in order to deter consumption, particularly in new initiates. However, in India the differential tax rate, with cigarettes taxed heavily compared to the other products like *bidis* and chewable forms, has not been a deterrent to consumption, with cigarettes becoming more affordable in the country (Belcher *et al*, 2008).

Given this scenario, we next attempt to model the likely changes in government revenues with changes in price i.e. tax. We employ the assumptions that there are no substitution effects due to price change; change in price is commensurate with change in tax; elasticity is constant across the entire range of prices; and, there is no tax evasion or smuggling as a result of increased taxes (John, 2008).

Central Excise

We explored all available data for information on the number of units of cigarettes, bidis, and leaf tobacco consumed in the country in 2011-12. Table 5.8 shows the various data sources and estimations for the number of cigarette sticks consumed in the country in 2011-12. National Sample Survey Consumer Expenditure Survey, 2011-12 estimates extrapolated for the 2011 Census population were the lowest, at around 15 billion sticks (NSS, 2011-12; Census of India, 2011); however given that this survey relies of self-reported information and is subject to both recall and social desirability among other biases, we do not feel they are robust. At the other end of the spectrum, industry estimates range from 108-137 billion sticks consumed for the same time period (ERC, 2013; Euromonitor, 2009). The GATS India 2009-10 estimated

46,358,000 cigarette smokers, consuming a mean number of 6.2 cigarettes a day, yielding an estimate of 104 billion sticks for 2009-10.

Table 5.8 : Estimates of Number of Sticks of Cigarettes consumed in 2011-12, India

Source	Number of Sticks	Description
Euromonitor International, 2009		
Euromonitor Sales, 2009	94,606,000,000	Projection of number of sticks expected to be consumed in 2009 (licit)
Euromonitor Illicit, 2009	43,060,165,845	Projection of number of sticks expected to be consumed in 2009 (illicit)
Euromonitor Total Consumption	**137,666,165,845**	Total Projected Consumption, 2011
Global Adult Tobacco Survey, India		Estimated number of cigarette users X Mean number of cigarettes consumed per day X 365 days, 2009-10
	104,908,154,000	(46,358,000 X 6.2 X 365)
ERC Group Ltd, 2013	**108,330,000,000**	Cigarette consumption, 2011
Annual Survey of Industry (ASI), 2011-12		
ASI Production	52,000,000,000	Number of sticks produced by registered enterprises, 2011-12
ASI Export	712,380,000	Number of sticks exported, 2011-12
ASI Import	2,190,500,000	Number of sticks imported, 2011-12
ASI Net Trade	1,478,120,000	Net Sticks (Import-Export), 2011-12
Total Sticks (Production+ Net Trade)	**53,478,120,000**	Total of Production and Net trade, Organized Sector, 2011-12
National Sample Survey Organisation, 2011-12		
NSS Consumer Expenditure Survey 2011-12 Extrapolated using Census, 2011	**14,775,464,304**	Self-reported total number of sticks consumed by households, using extrapolated population weights based on Census 2011 population, 2011-12

We therefore use the conservative estimate of 100 billion sticks consumed for 2011-12; the corresponding revenue accrued for cigarettes for the same time period was Rupees 111,705,000,000 (Rs 111.7 billion; please refer to Table 4.3). This yields an average excise of Rupees 1.03 per stick. We also rely on the ERC, 2013 estimate of unit cost of a cigarette to be Rs. 2.9965, which was Rupees 3.11 as per the corresponding NSS CES 2011-12 data (please refer Table 5.2). We also use a conservative price elasticity of -0.21, which is the value obtained from urban areas from our national estimation (rural cigarette elasticity is higher at -0.248). A

constant VAT is also assumed. Table 5.9 shows the change in excise revenue accrued due to changes in excise rates, assuming the above mentioned constants. As per the table, revenue from cigarettes increases from the current Rs. 111.7 billion to more than Rs. 239.4 billion, if excise tax is increased by 370 percent of its present levels. Excise tax can be increased from the present Rs 1.12 per stick to Rs. 5.25 per stick, without any loss of revenue. This corresponds to an excise increase from Rs. 22.4 to Rs. 105 for a pack of 20 cigarettes.

Table 5.9: Change in excise revenue from cigarettes due to change in excise rates

Increase in Excise (%)	Retail price per stick	Excise per stick	Consumption (Number of Sticks)	Excise Revenue in Rupees Billion
Baseline	2.9965	1.1171	100000000000	111.705
10%	3.1082	1.2288	97900000000	120.295
20%	3.2199	1.3405	95844100000	128.475
30%	3.3316	1.4522	93831373900	136.259
40%	3.4433	1.5639	91860915048	143.658
50%	3.5550	1.6756	89931835832	150.687
60%	3.6667	1.7873	88043267279	157.358
70%	3.7784	1.8990	86194358666	163.682
80%	3.8901	2.0107	84384277135	169.671
90%	4.0018	2.1224	82612207315	175.335
100%	4.1136	2.2341	80877350961	180.689
150%	4.6721	2.7926	72734486492	203.120
200%	5.2306	3.3512	65411458985	219.204
250%	5.7891	3.9097	58825725910	229.989
300%	6.3477	4.4682	52903055252	236.381
350%	6.9062	5.0267	47576688799	239.155
360%	6.9062	5.1384	46577578335	239.335
370%	7.1296	5.2501	45599449190	239.403
380%	7.2413	5.3618	44641860757	239.362
390%	7.3530	5.4735	43704381681	239.218

Legend:
Assumptions include: Price Elasticity of -0.21
Data Sources: ERC, 2013; Government of India

Information on the number of *bidis* produced and consumed in the country is harder to come by. Based on the prevailing excise rate of Rs. 10 for every thousand handmade *bidis* and excise revenue of Rs. 4,716,000,000 (Rs. 4.716 billion), it would imply that nearly 0.47 trillion *bidis* were consumed in the year 2011-12, assuming that 98 percent of *bidis* in the market are handmade (Government of India, 2012; Sunley, 2008). However, given the large informal sector manufacturing and *bidi* being a cottage industry, this figure is not complete without additions of estimations from informal enterprises, which are not under the excise net if they are produced by manufacturers making less than 2 million sticks annually. A recent study attempted to quantify the illicit trade in *bidis* and *tendu* leaf by triangulating estimates of the number of *bidis* produced using *bidi* tobacco production and *tendu* leaf production auction data; they conclude that the market for illicit *bidi* was nearly Rs. 12.88 billion, with an estimated number of 0.65-0.72 trillion sticks produced in 2008-09. The study also notes an overall decline in *bidi* production from a peak of 1.2-1.3 trillion sticks in the mid-1990s to nearly 0.6 trillion in 2008 (Lal and Wilson, 2012). From the GATS India, there were an estimated 73,314,000 *bidi* smokers in 2009-10, who consumed a mean number of 11.6 *bidis* a day. Based on these numbers, there were about 310,411,476,000 or 0.31 trillion *bidis* consumed in 2009-10 in the country. Since these are self-reported figures, they are also subjected to the biases enumerated earlier for self-reported cigarette consumption. Sunley estimated that there were 750 billion to 1.2 trillion *bidi* sticks consumed in India in 2008 but also mentioned that there are no credible estimates due to the fragmentation of *bidi* manufacturing and distribution (Sunley, 2008). For unit prices, we use the WHO's estimate of Rs 5.6 for a pack of 20 *bidis* of the most sold brand in 2010, with a price of Rs. 0.28 per stick (WHO, 2014). This yields a net excise of Rs. 0.0047 per stick. We also assume a conservative total national consumption of 750 billion *bidis* annually in 2011-12. We simulate changes in consumption and revenue generation using bidi price elasticities of -0.4789 for urban areas and -0.4844 for rural areas. From the GATS, 34 percent of total *bidi* consumers are apportioned to urban areas and the remaining to rural areas. A ten percent increase in *bidi* taxes will result in a decline in total bidi consumption; however total revenues will continue to rise to a tax increase of 100 percent of current excise.

Table 5.10: Change in excise revenue from *bidis* due to change in excise rates

Increase in Excise (%)	Retail price per stick	Excise per stick	URBAN		RURAL		ALL INDIA	
			Consumption (Million Sticks)	Excise Revenue in Rs. Million	Consumption (Million Sticks)	Excise Revenue in Rs. Million	Total Consumption (Million Sticks)	Total Revenue in Rs. Million
Baseline	0.2800	0.0047	255000	1199	495000	2327	750000	3525
10%	0.2805	0.0052	242788	1255	471022	2435	713810	3690
20%	0.2809	0.0056	231161	1304	448206	2528	679367	3832
30%	0.2814	0.0061	220091	1345	426495	2606	646585	3951
40%	0.2819	0.0066	209550	1379	405835	2670	615386	4049
50%	0.2824	0.0071	199515	1407	386177	2723	585692	4129
60%	0.2828	0.0075	189960	1429	367470	2763	557431	4192
70%	0.2833	0.0080	180863	1445	349670	2794	530533	4239
80%	0.2838	0.0085	172202	1457	332732	2815	504934	4272
90%	0.2842	0.0089	163955	1464	316614	2827	480569	4291
100%	0.2847	0.0094	156103	1467	301278	2832	457381	4299
110%	0.2852	0.0099	148627	1467	286684	2830	435311	4297
120%	0.2856	0.0103	141510	1463	272797	2821	414306	4284
130%	0.2861	0.0108	134733	1456	259583	2806	394315	4263
140%	0.2866	0.0113	128280	1447	247008	2786	375289	4233
150%	0.2871	0.0118	122137	1435	235043	2762	357180	4197

Legend:
Assumptions include: Price Elasticity of *bidi* is -0.4789 for rural areas and -0.4844 for urban areas
Data Sources: World Health Organization, 2011; Government of India

Change in Rural Bidi Consumption and Revenue due to Change in Central Excise

Legend:
- Excise Revenue-Rural
- Consumption in Million Sticks
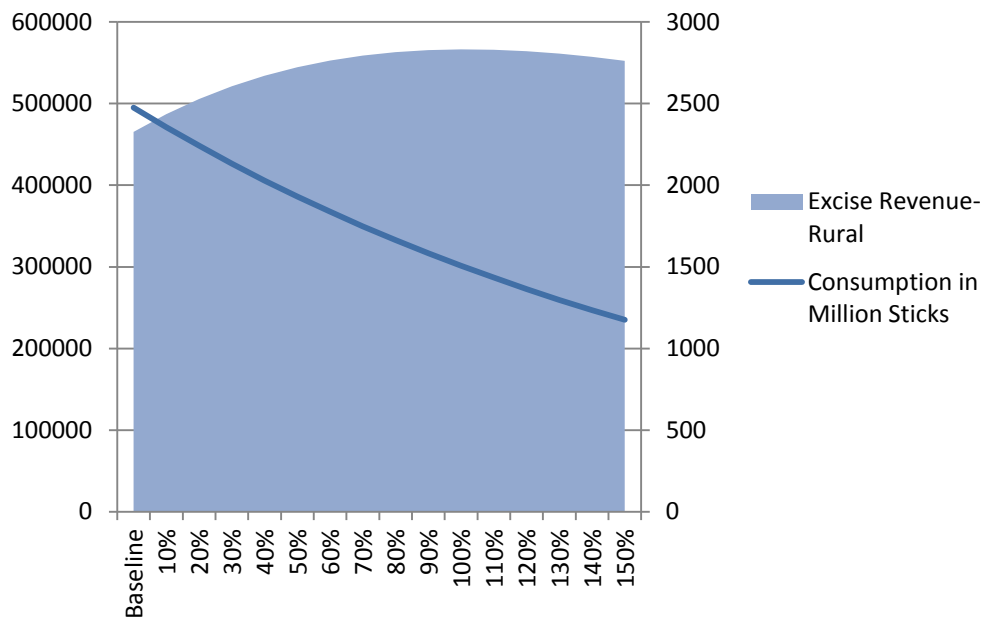
Change in Urban Bidi Consumption and Revenue due to Change in Central Excise

Legend:
- Excise Revenue in Rs Million
- Consumption in Million Sticks
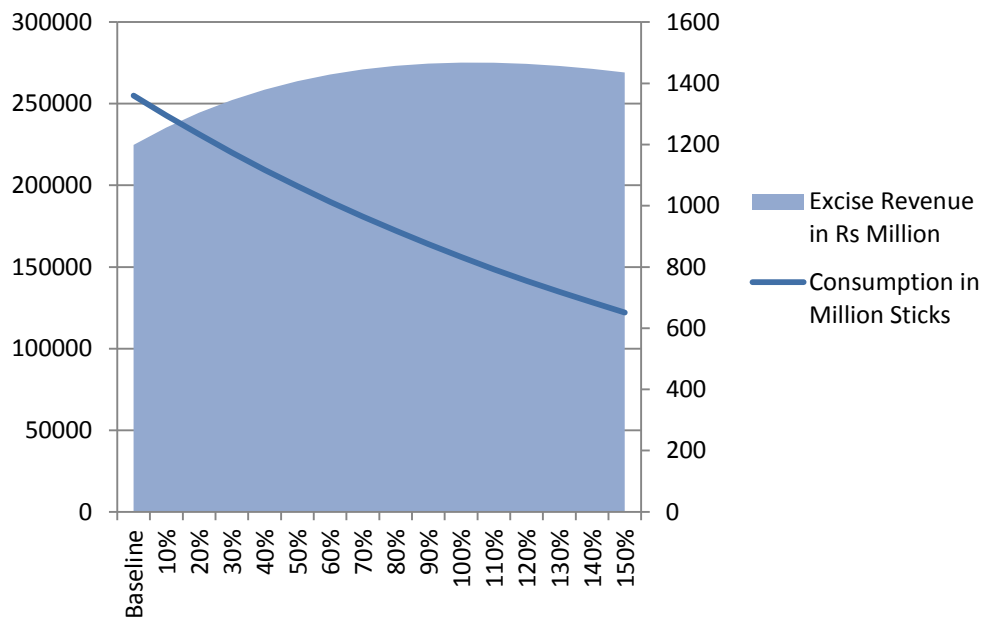
State Value Added Tax Projections

To understand the effect of change in the tax structure at the state level, we next model the changes in revenue accrued from VAT based on changes in the VAT rate, taking into account the price elasticity of major tobacco products at the state level (please refer to Table 5.7). We base our simulations on the assumptions applied to the previous models. Also, given the paucity of data on the number of units of the respective tobacco products in the state, we utilize state-specific prevalence data for each product category from the 2009-10 GATS India survey, to estimate the number of cigarettes and bidis, as a weighted proportion of the national consumption numbers used earlier for national excise models. Data on the prevailing taxation rate for each state for the respective period was obtained from state government tax notifications. Total revenue figures accruing from VAT have been provided by tax and excise departments of the respective state governments.

Uttar Pradesh

Table 5.11: Uttar Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	17.5	13.5	-	-
Proportion of National Consumption[1]	0.07	0.19	-	-
Total Number of Units[2]	7,459,228,841	145,691,939,657	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	3,903,041,491	5,507,155,319	9,410,196,810	7,577,000,000

Legend:
1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Uttar Pradesh State Commercial Taxes Department, 2014

Table 5.12: Tobacco Tax and Revenue Simulation, Uttar Pradesh, 2011-12

Scenario	Cigarettes PE=--0.2040					Bidi PE=-0.6072					Total Excise
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue (Rs.)	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue (Rs.)	Total Excise Revenue (Rs.)
Baseline	2.99	0.175	0.52325	7459228841	3903041491	0.28	0.135	0.0378	145691939657	5507155319	9410196810
10%	3.042325	0.1925	0.575575	7307060573	4205761389	0.28378	0.1485	0.04158	136845525081	5690036933	9895798322
20%	3.09465	0.21	0.6279	7157996537	4494506026	0.28756	0.162	0.04536	128536264798	5830404971	10324910997
30%	3.146975	0.2275	0.680225	7011973408	4769719611	0.29134	0.1755	0.04914	120731542800	5932748013	10702467624
40%	3.1993	0.245	0.73255	6868929150	5031834049	0.29512	0.189	0.05292	113400723521	6001166289	11033000338
50%	3.251625	0.2625	0.784875	6728802995	5281269251	0.2989	0.2025	0.0567	106515031589	6039402291	11320671542
60%	3.30395	0.28	0.8372	6591535414	5518433449	0.30268	0.216	0.06048	100047438871	6050869103	11569302552
100%	3.51325	0.35	1.0465	6069902227	6352152680	0.3178	0.27	0.0756	77872887004	5887190258	12239342938
150%	3.774875	0.025	1.308125	5475522625	7162668034	0.3367	0.025	0.0945	56932683021	5380138545	12542806579
200%	4.0365	0.525	1.56975	4939346121	7753538573	0.3556	0.405	0.1134	41623349546	4720087839	12473626412
250%	4.298125	0.6125	1.831375	4455673325	8160008736	0.3745	0.4725	0.1323	30430732147	4025985863	12185994599
300%	4.55975	0.7	2.093	4019362947	8412526648	0.3934	0.54	0.1512	22247836109	3363872820	11776399468
350%	4.821375	0.7875	2.354625	3625777143	8537345506	0.4123	0.6075	0.1701	16265340221	2766734372	11304079878
360%	4.8737	0.805	2.40695	3551811290	8549032184	0.41608	0.621	0.17388	15277708763	2656488000	11205520183
370%	4.926025	0.8225	2.459275	3479354339	8556689143	0.41986	0.6345	0.17766	14350046287	2549429223	11106118366
380%	4.97835	0.84	2.5116	3408375511	8560475933	0.42364	0.648	0.18144	13478711476	2445577410	11006053343
390%	5.030675	0.8575	2.563925	3338844650	8560547270	0.42742	0.6615	0.18522	12660284115	2344937824	10905485094
400%	5.083	0.875	2.61625	3270732220	8557053169	0.4312	0.675	0.189	11891551664	2247503264	10804556434

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.2040 for cigarettes and -0.6070 for bidis

Table 5.11 and 5.12 depict the Uttar Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. If all cigarettes and bidis estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 1.24 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to 490% of existing rates, to 85.75 percent of the total retail price before cigarette tax revenues start to decline. For bidis, VAT can be increased to 160 percent of 2011-12 rates before revenues start to decline.

Rajasthan

Table 5.13: Rajasthan tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	40	40	-	-
Proportion of National Consumption[1]	0.0269	0.136	-	-
Total Number of Units[2]	2,692,932,302	102,429,485,217	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	3,220,747,033	11,472,102,344	14,692,849,378	6,278,200,000

Legend:
1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Rajasthan State Commercial Taxes Department, 2014

Table 5.11 and 5.12 depict the Rajasthan tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. Rajasthan had the highest tobacco VAT rate of all states in 2011-12, which now stands at 50% for all tobacco products. If all cigarettes and bidis estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 2.34 times total declared revenue from all tobacco products for 2011-12.

Table 5.14: Tobacco Tax and Revenue Simulation, Rajasthan, 2011-12

Scenario	Cigarettes					Bidi				
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue
Baseline	2.99	0.4	1.196	2692932302	3220747033	0.28	0.4	0.112	102429485217	11472102344
10%	3.1096	0.44	1.3156	2487542355	3272610723	0.2912	0.44	0.1232	93390083147	11505658244
20%	3.2292	0.48	1.4352	2297817500	3297827676	0.3024	0.48	0.1344	85148408309	11443946077
30%	3.3488	0.52	1.5548	2122562959	3300160889	0.3136	0.52	0.1456	77634061276	11303519322
40%	3.4684	0.56	1.6744	1960675082	3282954358	0.3248	0.56	0.1568	70782855368	11098751722
50%	3.588	0.6	1.794	1811134394	3249175102	0.336	0.6	0.168	64536268382	10842093088

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.7627 for cigarettes and -0.8825 for *bidis*

Cigarette taxes can be increased to 130 percent of 2011-12 rates before revenues start to decline, and *bidi* taxes can be increased to 110 percent of 2011-12 rates.

Assam

Table 5.15: Assam tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	20	20	-	-
Proportion of National Consumption[1]	0.047	0.0146	-	-
Total Number of Units[2]	4716847333	11005821256	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	2820674705	616325990.4	3,437,000,696	1,375,200,000

Legend:

1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Assam State Commercial Taxes Department, 2014

Tables 5.15 and 5.16 depict the Assam tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. If all cigarettes and bidis estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 2.49 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to 240% of existing rates, to 30 percent of the total retail price before cigarette tax revenues start to decline. For bidis, VAT can be increased to 220 percent of 2011-12 rates before revenues start to decline.

Table 5.16: Tobacco Tax and Revenue Simulation, Assam, 2011-12

Scenario	Cigarettes					Bidi					Total Excise Revenue
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	
Baseline	2.99	0.125	0.37375	4716847333	1762921691	0.28	0.125	0.035	11005821256	385203744	2148125435
10%	3.027375	0.1375	0.411125	4534824195	1864379597	0.2835	0.1375	0.0385	10525857391	405245509.6	2269625107
20%	3.06475	0.15	0.4485	4359825329	1955381660	0.287	0.15	0.042	10066824751	422806639.5	2378188300
30%	3.102125	0.1625	0.485875	4191579670	2036583772	0.2905	0.1625	0.0455	9627810523	438065378.8	2474649151
40%	3.1395	0.175	0.52325	4029826610	2108606774	0.294	0.175	0.049	9207941706	451189143.6	2559795917
50%	3.176875	0.1875	0.560625	3874315601	2172038184	0.2975	0.1875	0.0525	8806383369	462335126.8	2634373311
60%	3.21425	0.2	0.598	3724805762	2227433846	0.301	0.2	0.056	8422336990	471650871.4	2699084717
70%	3.251625	0.2125	0.635375	3581065508	2275319497	0.3045	0.2125	0.0595	8055038874	479274813	2754594310
80%	3.289	0.225	0.67275	3442872190	2316192266	0.308	0.225	0.063	7703758628	485336793.6	2801529059
90%	3.326375	0.2375	0.710125	3310011752	2350522095	0.3115	0.2375	0.0665	7367797715	489958548	2840480643
100%	3.36375	0.25	0.7475	3182278399	2378753103	0.315	0.25	0.07	7046488056	493254163.9	2872007267
110%	3.401125	0.2625	0.784875	3059474275	2401304872	0.3185	0.2625	0.0735	6739190712	495330517.3	2896635389
120%	3.4385	0.275	0.82225	2941409163	2418573684	0.322	0.275	0.077	6445294605	496287684.6	2914861369
130%	3.475875	0.2875	0.859625	2827900183	2430933695	0.3255	0.2875	0.0805	6164215307	496219332.3	2927153027
140%	3.51325	0.3	0.897	2718771515	2438738049	0.329	0.3	0.084	5895393878	495213085.7	2933951135
150%	3.550625	0.025	0.934375	2613854122	2442319946	0.3325	0.025	0.0875	5638295751	493350878.2	2935670824

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of --0.3859 for cigarettes and -0.4361for *bidis*

Jammu and Kashmir

Table 5.17: Jammu and Kashmir tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	25	25	-	-
Proportion of National Consumption[1]	0.0418	0.0034	-	-
Total Number of Units[2]	4183830215	2620538935	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	3,127,413,086	183,437,725	3,310,850,811	1,273,600,000

Legend:

1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Jammu and Kashmir State Commercial Taxes Department, 2014

Tables 5.17 and 5.18 depict the Jammu and Kashmir tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. The state has the lowest price elasticity for cigarettes of all states, at -0.1101. If all cigarettes and *bidis* estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 2.59 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to more than 600% of existing rates, before cigarette tax revenues start to decline. For *bidis*, VAT can be increased to 230 percent of 2011-12 rates before revenues start to decline.

Table 5.18: Tobacco Tax and Revenue Simulation, Jammu and Kashmir, 2011-12

	Cigarettes					Bidi					Total Excise Revenue
Scenario	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	
Baseline	2.99	0.125	0.37375	4183830215	1563706543	0.28	0.125	0.035	2620538935	91718862.72	1655425406
10%	3.027375	0.1375	0.411125	4137766244	1701139147	0.2835	0.1375	0.0385	2507279242	96530250.82	1797669398
20%	3.06475	0.15	0.4485	4092209438	1835355933	0.287	0.15	0.042	2398914633	100754414.6	1936110348
30%	3.102125	0.1625	0.485875	4047154212	1966411053	0.2905	0.1625	0.0455	2295233543	104433126.2	2070844179
40%	3.1395	0.175	0.52325	4002595044	2094357857	0.294	0.175	0.049	2196033549	107605643.9	2201963501
50%	3.176875	0.1875	0.560625	3958526473	2219248904	0.2975	0.1875	0.0525	2101120979	110308851.4	2329557755
60%	3.21425	0.2	0.598	3914943096	2341135972	0.301	0.2	0.056	2010310530	112577389.7	2453713361
70%	3.251625	0.2125	0.635375	3871839573	2460070069	0.3045	0.2125	0.0595	1923424909	114443782.1	2574513851
80%	3.289	0.225	0.67275	3829210619	2576101444	0.308	0.225	0.063	1840294485	115938552.5	2692039996
90%	3.326375	0.2375	0.710125	3787051010	2689279599	0.3115	0.2375	0.0665	1760756957	117090337.6	2806369936
100%	3.36375	0.25	0.7475	3745355579	2799653295	0.315	0.25	0.07	1684657041	117925992.9	2917579288
110%	3.401125	0.2625	0.784875	3704119214	2907270568	0.3185	0.2625	0.0735	1611846164	118470693.1	3025741261
120%	3.4385	0.275	0.82225	3663336861	3012178734	0.322	0.275	0.077	1542182173	118748027.3	3130926761
130%	3.475875	0.2875	0.859625	3623003522	3114424403	0.3255	0.2875	0.0805	1475529059	118780089.3	3233204492
140%	3.51325	0.3	0.897	3583114253	3214053485	0.329	0.3	0.084	1411756693	118587562.2	3332641048
150%	3.550625	0.025	0.934375	3543664165	3311111205	0.3325	0.025	0.0875	1350740569	118189799.8	3429301004
200%	3.7375	0.375	1.12125	3352834051	3759365180						
300%	4.11125	0.5	1.495	3001449646	4487167221						
400%	4.485	0.625	1.86875	2686891102	5021127746						
500%	5.2325	0.75	2.2425	2405298987	5393882978						

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.1101for cigarettes and -0.43221 for *bidis*

West Bengal

Table 5.19: West Bengal tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	20	0	-	-
Proportion of National Consumption[1]	0.173665495	0.054665511	-	-
Total Number of Units[2]	17,366,549,476	102,483,027,384	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	10,385,196,586	0	10,385,196,586	4,198,600,000

Legend:

1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Jammu and Kashmir State Commercial Taxes Department, 2014

Tables 5.19 and 5.20 depict the West Bengal tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. *Bidis* were exempted from VAT in the state in 2011-12. If all cigarettes estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 2.47 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to 270 percent of existing rates, before cigarette tax revenues start to decline. Assuming that a minimum 12.5 percent VAT rate was applied on *bidis* (which was the minimum VAT for *bidis* in other Indian states), introducing any additional VAT will increase fiscal revenue for the state.

Table 5.20: Tobacco Tax and Revenue Simulation, West Bengal, 2011-12

Scenario	Cigarettes					Bidi					Total Excise Revenue
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	
Baseline	2.99	0.2	0.598	17366549476	10385196586	0.28	0.125	0.035	92553446861	3239370640	9730118507
10%	3.027375	0.22	0.6578	16738054050	11010291954	0.2835	0.1375	0.0385	83585943394	3218058821	10099491292
20%	3.06475	0.24	0.7176	16132303874	11576541260	0.287	0.15	0.042	75487301339	3170466656	10405804944
30%	3.102125	0.26	0.7774	15548475797	12087385084	0.2905	0.1625	0.0455	68173336712	3101886820	10656502498
40%	3.1395	0.28	0.8372	14985776458	12546092050	0.294	0.175	0.049	61568022118	3016833084	10858140615
50%	3.176875	0.3	0.897	14443441208	12955766763	0.2975	0.1875	0.0525	55602696455	2919141564	11016495791
60%	3.21425	0.32	0.9568	13920733070	13319357402	0.301	0.2	0.056	50215351196	2812059667	11136658043
70%	3.251625	0.34	1.0166	13416941741	13639662973	0.3045	0.2125	0.0595	45349985818	2698324156	11223113515
80%	3.289	0.36	1.0764	12931382619	13919340251	0.308	0.225	0.063	40956025692	2580229619	11279817276
90%	3.326375	0.38	1.1362	12463395882	14160910401	0.3115	0.2375	0.0665	36987796363	2459688458	11310257459
100%	3.36375	0.4	1.196	12012345585	14366765320	0.315	0.25	0.07	33404048773	2338283414	11317511739
110%	3.401125	0.42	1.2558	11577618798	14539173687	0.3185	0.2625	0.0735	30167530488	2217313491	11304297045
120%	3.4385	0.44	1.3156	11158624774	14680286753	0.322	0.275	0.077	27244598459	2097834081	11273013302
130%	3.475875	0.46	1.3754	10754794143	14792143865	0.3255	0.2875	0.0805	24604869314	1980691980	11225781895
140%	3.51325	0.48	1.4352	10365578143	14876677751	0.329	0.3	0.084	22220903526	1866555896	11164479491
150%	3.550625	0.025	1.495	9990447870	14935719566	0.3325	0.025	0.0875	20067920184	1755943016	11090767745
160%	3.588	0.52	1.5548	9628893562	14971003710	0.336	0.325	0.091	18123539397	1649242085	11006119404
170%	3.625375	0.54	1.6146	9280423904	14984172435	0.3395	0.3375	0.0945	16367549665	1546733443	10911841215
180%	3.66275	0.56	1.6744	8944565363	14976780244	0.343	0.35	0.098	14781697778	1448606382	10809094034
190%	3.700125	0.58	1.7342	8620861542	14950298087	0.3465	0.3625	0.1015	13349499080	1354974157	10698910461
200%	3.7375	0.6	1.794	8308872563	14906117378	0.35	0.375	0.105	12056066114	1265886942	10582210303

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.3619 for cigarettes and -0.9689 for *bidis*

Andhra Pradesh

Table 5.21: Andhra Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	20	0	-	-
Proportion of National Consumption[1]	0.140213037	0.059661753	-	-
Total Number of Units[2]	14,021,303,653	44,746,315,043	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	8384739585	0	10,385,196,586	6,248,900,000

Legend:

1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
2. Authors own estimations
3. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
4. Total tobacco revenue figure provided by Andhra Pradesh State Commercial Taxes Department, 2014

Tables 5.21 and 5.22 depict the Andhra Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. *Bidis* were exempted from VAT in the state in 2011-12. If all cigarettes estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 1.34 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to 250 percent of existing rates, before cigarette tax revenues start to decline. For *bidis*, assuming that a minimum 12.5 percent VAT rate was applied on *bidis* (which was the minimum VAT for *bidis* in other Indian states), introducing any additional VAT up to 260 percent will increase fiscal revenue for the state.

Table 5.22: Tobacco Tax and Revenue Simulation, Andhra Pradesh, 2011-12

Scenario	Cigarettes					Bidi					Total Excise Revenue
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	
Baseline	2.99	0.2	0.598	14021303653	8384739585	0.28	0.125	0.035	44746315043	1566121027	9950860611
10%	3.0498	0.22	0.6578	13129408528	8636524929	0.2835	0.1375	0.0385	42088383930	1620402781	10256927711
20%	3.1096	0.24	0.7176	12294246851	8822351540	0.287	0.15	0.042	39588333924	1662710025	10485061565
30%	3.1694	0.26	0.7774	11512209809	8949591906	0.2905	0.1625	0.0455	37236786889	1694273803	10643865709
40%	3.2292	0.28	0.8372	10779918143	9024947469	0.294	0.175	0.049	35024921748	1716221166	10741168635
50%	3.289	0.3	0.897	10094207550	9054504172	0.2975	0.1875	0.0525	32944441396	1729583173	10784087346
60%	3.3488	0.32	0.9568	9452115008	9043783639	0.301	0.2	0.056	30987541577	1735302328	10779085968
70%	3.4086	0.34	1.0166	8850865972	8997790347	0.3045	0.2125	0.0595	29146881608	1734239456	10732029803
80%	3.4684	0.36	1.0764	8287862388	8921055074	0.308	0.225	0.063	27415556840	1727180081	10648235155
90%	3.5282	0.38	1.1362	7760671461	8817674914	0.3115	0.2375	0.0665	25787072764	1714840339	10532515253
100%	3.588	0.4	1.196	7267015149	8691350119	0.315	0.25	0.07	24255320642	1697872445	10389222564

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.6361 for cigarettes and -0.594 for *bidis*

Himachal Pradesh

Table 5.23: Himachal Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12

	Cigarettes	*Bidis*	Estimated Total Revenue (Cigarettes and *Bidis*)	Reported State Revenue Total from All Tobacco Products
Tax Rate (%)	20	13.75	-	-
Proportion of National Consumption[1]	0.008411492	0.008350973	-	-
Total Number of Units[2]	841,149,162	6,263,229,456	-	-
Price Per Unit (Rs.)[3]	2.99	0.28	-	-
Revenue (Rs.)[4]	503,007,198	241,134,334	744,141,532	323,850,000

Legend:

1. Based on survey weighted GATS India 2009-10 proportion of sticks consumed in the state to estimated total national number of sticks consumed
1. Authors own estimations
2. Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)
3. Total tobacco revenue figure provided by Himachal Pradesh State Commercial Taxes Department, 2014

Tables 5.23 and 5.24 depict the Himachal Pradesh tobacco VAT rate, units consumed, and revenue, 2011-12 and the Tobacco Tax and Revenue Simulation, for 2011-12, respectively. If all cigarettes and *bidis* estimated to be consumed in the state to be taxed at prevailing rated of VAT, the net revenue generated would be almost 2.29 times total declared revenue from all tobacco products for 2011-12. Simulations show that VAT on cigarettes can be increased to 150 percent of existing rates, before cigarette tax revenues start to decline. For *bidis*, introducing any additional VAT up to 160 percent will increase fiscal revenue for the state.

Table 5.24: Tobacco Tax and Revenue Simulation, Himachal Pradesh, 2011-12

Scenario	Cigarettes					Bidi					Total Excise Revenue
	Retail price per stick[1]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	Retail price per stick[2]	VAT Rate	VAT Per Stick	Consumption	Excise Revenue	
Baseline	2.99	0.2	0.598	841149162	503007199	0.28	0.1375	0.0385	6263229456	241134334	744141533
10%	3.0498	0.22	0.6578	790478336.5	519976650	0.28385	0.15125	0.04235	6005622828	254338126.8	774314776
20%	3.1096	0.24	0.7176	742859921.5	533076280	0.2877	0.165	0.0462	5758611561	266047854.1	799124134
30%	3.1694	0.26	0.7774	698110039.8	542710745	0.29155	0.17875	0.05005	5521759868	276364081.4	819074826
40%	3.2292	0.28	0.8372	656055891	549249992	0.2954	0.1925	0.0539	5294649884	285381628.8	834631621
50%	3.289	0.3	0.897	616535084.1	553031970	0.29925	0.20625	0.05775	5076880935	293189874	846221844
60%	3.3488	0.32	0.9568	579395010.7	554365146	0.3031	0.22	0.0616	4868068822	299873039.4	854238186
70%	3.4086	0.34	1.0166	544492255.2	553530826.7	0.30695	0.23375	0.06545	4667845151	305510465.1	859041292
80%	3.4684	0.36	1.0764	511692041.8	550785313.8	0.3108	0.2475	0.0693	4475856680	310176867.9	860962182
90%	3.5282	0.38	1.1362	480867713.2	546361895.7	0.31465	0.26125	0.07315	4291764695	313942587.4	860304483
100%	3.588	0.4	1.196	451900242.1	540472689.6	0.3185	0.275	0.077	4115244413	316873819.8	857346509
110%	3.6478	0.42	1.2558	424677771.5	533310345.5	0.32235	0.28875	0.08085	3945984410	319032839.6	852343185
120%	3.7076	0.44	1.3156	399095182.6	525049622.2	0.3262	0.3025	0.0847	3783686071	320478210.2	845527832
130%	3.7674	0.46	1.3754	375053688.8	515848843.6	0.33005	0.31625	0.08855	3628063063	321264984.3	837113828
140%	3.8272	0.48	1.4352	352460454.6	505851244.4	0.3339	0.33	0.0924	3478840829	321444892.6	827296137
150%	3.887	0.025	1.495	331228236.8	495186214	0.33775	0.025	0.09625	3335756106	321066525.2	816252739

Legend:

1&2: Based on ERC, 2013 (cigarettes); WHO, 2014 (*bidi*)

3. Assuming a constant cigarette price elasticity of -0.6024 for cigarettes and -0.4113 for *bidis*

Chapter VI: Conclusions and Policy Implications

An appropriate tax policy for India is one which would promote both public health and public finance. Past evidence shows that price increase through taxation is the most cost effective method of reducing tobacco consumption. Our results are the first in the country to demonstrate Indian consumer's increasingly inelastic tobacco consumption behavior, indicating that tobacco consumers are gradually becoming more and more resistant to price changes (as is so in higher income countries). Results also empirically show that the current taxation regime has a great scope of both maximizing revenue potential and promoting current users to quit by increasing tobacco taxes across products. Another important finding is the lack of credible national and sub-national estimates of units of tobacco products consumed and discrepancies between projected revenue and actual revenues accrued from tobacco at the state level, highlighting empirically for the first time ever the lack of regulation over the industry, and indicating the need for stringent tobacco licensing and improved tax administration to minimize illicit trade. These are indicative of the fact that tax and price measures, though important, need to be supplemented with more stringent tax regulation and administration.

Based on our findings, we make the following recommendations:

2. **Raise Cigarette Excise and VAT rates**: Excise tax on cigarettes can be increased by 370 percent of its present levels. Excise tax can be increased from the present Rs 1.12 per stick to Rs. 5.25 per stick, without any loss of revenue. This corresponds to an excise increase from Rs. 22.4 to Rs. 105 for a pack of 20 cigarettes. VAT rates across states should meet if not exceed at least 70% share in final retail price

3. **Raise *Bidi* Excise and VAT rates**: *Bidi* consumers exhibit distinct patterns of tobacco use behavior, and are more responsive to tobacco price increases than cigarette consumers. This has potential to influence reduced consumption and quitting among predominantly poorer *bidi* consumers. Excise on *bidis* can be increased by 100 percent of current excise, without any loss of revenue. *Bidi* VAT rates vary greatly across states and rationalization and equalization of *bidi* taxes across states is imperative to minimize

adverse health costs and effects, while at the same time maximize revenue potential. This is of particular importance in high *bidi* consumption states such as Andhra Pradesh and West Bengal which have traditionally shunned *bidi* taxation.

4. **Tax increases on tobacco products should be indexed to both consumer price indices/inflation and rise in incomes**, to reduce the affordability of tobacco products and to minimize incentives for tobacco users for product substitution with lower priced brands or products in response to tax increases. This assumes critical importance in light of Indian tobacco consumption patterns and increasingly inelastic tobacco consumption behavior.

5. **Simplify current VAT regime for improved tax administration and regulation**: While reported central excise revenues correspond roughly to estimated national cigarette and *bidi* consumption, reported VAT revenue from states is grossly below expected revenue from state-level consumption estimates. The multiplicity of taxes for central excise also makes administration difficult and provides opportunities for tax avoidance and tax evasion. These highlights the lacunae in tax administration, regulation, and governance. Simplifying the current VAT regime will expand the tax base and provide sustained revenues for government, while at the same time improve tobacco control for public health goals.

6. **Strengthen tobacco product licensing and regulation of production, especially for smokeless tobacco**: Annual consumption of cigarettes and *bidis* estimated from multiple sources shows wide variability. Smokeless tobacco production and units of production by product are unavailable from any credible sources. In order to understand the magnitude of consumption, market, production and distribution, and taxation it is imperative to have strong monitoring, tracking and tracing systems, and licensing of all involved in the production and distribution of different smoked and smokeless tobacco products.

Annexure

Annexure I: Tobacco Taxation and Revenue Matrix

State Taxation Matrix

Please complete the following tables. For any clarifications please feel free to contact Swati Srivastava at swati.srivastava@phfi.org .

VAT Rate (in %); please specify in notes below if different									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Cigarette									
Cigar									
Cheroot									
Bidi									
Bidi leaf									
Betel leaf									
Tendu leaf									
Khaini									
Gutkha									
Pan Masala									
Unmanufactured Tobacco									
Other (specify) _____									

Tax Revenue (in Rupees Crore); please specify in notes below if different								
	2006	2007	2008	2009	2010	2011	2012	2013
Cigarette								
Cigar								
Cheroot								
Bidi								
Bidi leaf								
Betel leaf								
Tendu leaf								
Khaini								
Gutkha								
Pan Masala								
Unmanufactured Tobacco								
Other (specify) _____								

Entry Tax Rate (in %); please specify in notes below if different

	20 00	20 01	20 02	20 03	20 04	20 05	20 06	20 07	20 08	20 09	20 10	20 11	20 12	20 13
Cigarette														
Cigar														
Cheroot														
Bidi														
Bidi leaf														
Betel leaf														
Tendu leaf														
Khaini														
Gutkha														
Pan Masala														
Unmanufactured Tobacco														
Other (specify) _____ __														

Entry Tax Revenue (in Rupees Crore); please specify in notes below if different

	20 00	20 01	20 02	20 03	20 04	20 05	20 06	20 07	20 08	20 09	20 10	20 11	20 12	20 13
Cigarette														
Cigar														
Cheroot														
Bidi														
Bidi leaf														
Betel leaf														
Tendu leaf														
Khaini														
Gutkha														
Pan Masala														
Unmanufactured Tobacco														
Other (specify) _____ __														

NOTES:

Annexure II: Price Elasticity Estimates by Major States, 2011-12

Price Elasticity Estimates by Major States, 2011-12

States	Bidi	Cigarette	Leaf Tobacco	Outliers Removed
Andhra Pradesh	-0.594	-0.6361	-0.3931	bstleaf>=0.02 ***87 obs dropped
Assam (uvtleaf<= 0.2)	-0.4381	-0.6893	-0.6971	uvcig<=0.5 ***1 obs dropped
Assam (uvtleaf<= 0.15)	-0.3577	-0.6110	-0.5679	bscig>=0.03 & bscig<. ***3 obs dropped
Assam (uvtleaf<= 0.1)	-0.4361	-0.3859	-0.5195	bscig>0 & bscig<0.003 ***86 obs dropped uvbidi<=0.2 ***14 obs dropped uvtleaf<=0.15 & uvtleaf!=.
Himachal Pradesh	-0.4113	-0.6024	-0.6748	uvtleaf<=0.1 ***2 obs dropped bstleaf>=0.05 ***3 obs dropped uvbidi<=0.2 ***7 obs dropped
Jammu & Kashmir	-0.4322	-0.1101	-0.4486	bscig>=0.15 & bscig<. ****7 obs dropped bscig>0 & bscig<0.005 ***70 obs dropped uvbidi<=0.15 ***55 obs dropped bstleaf>0.03 & bstleaf!=. ***9 obs dropped uvbidi<=0.20 & uvbidi!=. ***5 obs dropped bsbidi>=0.1 ***4 obs dropped
Kerala	Insufficient Observations (leaf 74 obs.)			
Maharashtra	-0.6032	-0.5715	-0.6332	No outliers dropped
Rajasthan	-0.8825	-0.7627	-0.4829	uvcig==0.5 *** 1 obs dropped bscig>=0.06 & bscig<. ****17 obs dropped bscig>0 & bscig<0.007 ***57 obs dropped uvbidi<=0.35 ***38 obs dropped bstleaf>0.05 & bstleaf!=. ***18 obs dropped uvtleaf<=0.25 & uvtleaf!=0 ***53 obs dropped

Uttar Pradesh	-0.6072	-0.2040	-0.7813	uvcig==0.5 *** 1 obs dropped bscig>=0.08 & bscig<. ****11 obs dropped bscig>0 & bscig<0.0035 ***3 obs dropped uvbidi<=0.15 ***55 obs dropped bstleaf>0.04 & bstleaf!=. ***18 obs dropped uvtleaf<=0.10 & uvtleaf!=. ***76 obs dropped bsbidi>=0.09 ***21 obs dropped
West Bengal	-0.9689	-0.3619	-0.7298	bscig>=0.08 & bscig<. ****54 obs dropped bsbidi>=0.09 ***7 obs dropped uvtleaf<=0.15 & uvtleaf!=. ***162 obs dropped

Legend:
*Figures are own price elasticity estimates derived from the National Sample Survey Organization Consumer Expenditure Survey 2011-12

Annexure III: State Descriptive Statistics, 2011-12

Descriptive Statistics, State Samples from National Sample Survey Consumer Expenditure Survey 2011-12

State (outlier limit)	Sample	Overall Sample — Mean Unit Value Range (min-max)			Mean Budget Share (max)			Sample	After removing outliers — Mean Unit Value Range (min-max)			Budget Share (max)		
		Bidi	Cigarette	Leaf	Bidi	Cigarette	Leaf		Bidi	Cigarette	Leaf	Bidi	Cigarette	Leaf
Andhra Pradesh	2288	0.4089 (0.1- 2)	3.242 (0.5- 8)	0.5830 (0.04- 5)	0.0115 (0.2391)	0.0173 (0.2165)	0.0022 (0.2159)	2201	0.4085 (0.1- 2)	3.2476 (0.5- 8)	0.5234 (0.04- 5)	0.0119 (0.2391)	0.0179 (0.2165)	0.0007 (0.0198)
Assam (uvtleaf<= 0.2)	2549	0.3549 (0.1- 3)	3.1074 (0.5-5)	0.2513 (0.0467- 5.5)	0.0030 (0.0688)	0.0039 (0.1153)	0.0031 (0.1208)	1576	0.3572 (0.2- 3)	3.1055 (0.8105- 5)	0.4028 (0.2- 5.5)	0.0040 (0.0688)	0.0026 (0.0298)	0.0027 (0.1208)
Himachal Pradesh	903	0.4391 (0.106- 2.307)	3.264 (0.5- 5)	0.6683 (0.0187 – 5)	0.0219 (0.1749)	0.0066 (0.1605)	0.0013 (0.0909)	891	0.4421 (0.2- 2.307)	3.269 (0.5- 5)	0.6865 (0.1- 5)	0.0221 (0.1749)	0.0065 (0.1605)	0.0299 (0.0419)
Jammu & Kashmir	1609	0.4493 (0.1458- 2)	2.7004 (0.5- 7.5)	0.5798 (0.04- 5)	0.0068 (0.1507)	0.0135 (0.2279)	0.0007 (0.0691)	1514	0.4423 (0.2- 2)	2.7269 (0.5- 7.5)	0.4309 (0.04- 5)	0.0064 (0.0999)	0.0134 (0.1315)	0.0004 (0.0294)
Kerala	1036	0.5281 (0.1- 2.2667)	3.0231 (0.5- 11)	0.2819 (0.08- 3)	0.0073 (0.1330)	0.0298 (0.3122)	0.0005 (0.1091)		Insufficient Observations					
Maharashtra	3709	0.4715 (0.1- 2)	4.164 (0.4- 16)	0.3969 (0.03- 10)	0.0022 (0.1558)	0.0016 (0.2332)	0.0064 (0.1076)	Same	Same	Same	Same	Same	Same	Same
Rajasthan	2235	0.4798 (0.097- 2)	3.6707 (0.5- 5.76)	0.6736 (0.042- 4)	0.0251 (0.3537)	0.0020 (0.2013)	0.0039 (0.1254)	2051	0.4931 (0.352- 2)	3.8124 (2- 5.76)	0.7159 (0.26 – 4)	0.0259 (0.3537)	0.0011 (0.0569)	0.0034 (0.0498)
Uttar Pradesh	5411	0.3069 (0.092- 3)	3.2176 (0.5- 9)	0.2841 (0.04- 5)	0.0092 (0.2188)	0.00090(0.1614)	0.0028 (0.1354)	5202	0.3095 (0.15- 3)	3.2102 (1- 9)	0.2878 (0.1- 5)	0.0088 (0.0895)	0.0007 (0.0757)	0.0027 (0.0392)
West Bengal	3713	0.2364 (0.1- 4.1912)	2.7789 (0.6- 7)	0.4077 (0.04- 3)	0.0119 (0.1547)	0.0077 (0.2032)	0.0009 (0.1862)	3490	0.2346 (0.1- 2)	2.7524 (0.6- 7)	0.5321 (0.15- 3)	0.0122 (0.0879)	0.0065 (0.0797)	0.0008 (0.1862)

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