

ANALYSIS OF ALCOHOL PROHIBITION POLICY IN INDIA WITH

SPECIAL REFERENCE TO MAHARASHTRA

A THESIS

SUBMITTED IN FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

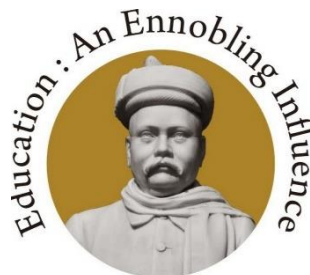
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IN

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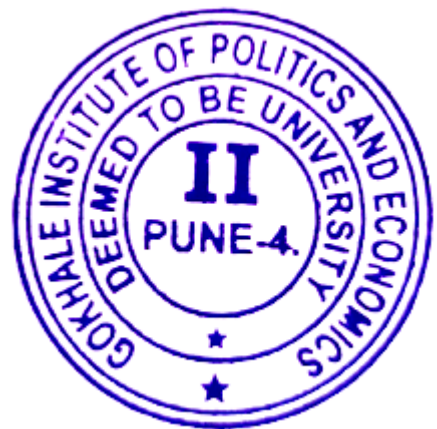
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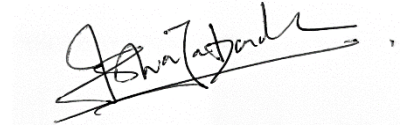
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DECLARATION

I Ishan Jagdish Janbandhu hereby declare that this thesis on the topic entitled, "*Analysis of Alcohol Prohibition Policy in India with Special Reference to Maharashtra*" is submitted for the award of Degree of Doctor of Philosophy in Economics to the Gokhale Institute of Politics and Economics, Pune 411004.

It is an original contribution and has been completed during my tenure as a research scholar at Gokhale Institute of Politics and Economics, Pune. This thesis has not been submitted by me elsewhere for the award of any degree or diploma in part or full. The information gathered by me elsewhere for the thesis is original, true and factual. Such material as has been obtained from other source has been duly acknowledged in the thesis. I hereby request, to consider the thesis for the award of the degree of 'Doctor of Philosophy'.



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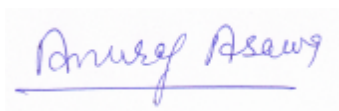
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CERTIFIED that the work incorporated in this thesis entitled "Analysis of Alcohol Prohibition Policy in India with Special Reference to Maharashtra" submitted by Ishan Jagdish Janbandhu was carried out by candidate under my supervision. It is an original contribution and has not been submitted elsewhere for the award of any other degree. Such material as has been obtained from other source has been duly acknowledged in this thesis. I recommend that the thesis should be considered for the award of the degree of 'Doctor of Philosophy'.



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Sincerely,
Ishan Janbandhu

Dedication

In loving memory of my beloved father- Jagdish Janbandhu

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ACRONYMS

AAC	American Addiction Centers
ADRI	Asian Development Research Institute
AIDS	Acquired Immune Deficiency Syndrome
ASHA	Accredited Social Health Activist
AW	ASHA Workers
BJP	Bhartiya Janata Party
BS	Budget Shares
CEBs	Census Enumeration Blocks
COVID	Corona Virus Disease
CL	College Lecturers
DALYs	Disability Adjusted Life years
DiD	Differences in Differences
DLHS	District Level Household Survey
DMI	Development Management Institute
FMM	Finite Mixture Method
FSUs	First Stage Units
GOI	Government of India
GRAS	Government Receipt Accounting Accounting System
GST	Goods and Service Tax
HH	Household
HIV	Human Immunodeficiency Virus
HSC	Higher Secondary Certificate
IARD	International Alliance for Responsible Drinking
IEC	Indian Excise Committee
IHDS	India Human Development Survey
IMFL	Indian Made Foreign Liquor
IML	Indian Made Liquor
INC	Indian National Congress
MLDA	Minimum Legal Drinking Age
MO	Medical Officers
MPCE	Monthly Per-Capita Consumption Expenditure
MVA	Maha Vikas Aghadi
NCAER	National Council of Applied Economic Research
NFHS	National Family Health Survey
NIMHANS	National Institute of Mental Health and Neurosciences
NSDP	Net State Domestic Product
NSSO	National Sample Survey Office
OBC	Other Backward Classes
Oth	Others
PEPSU	Patiala and East Punjab States Union
PSUs	Primary Sampling Units

RTO	Regional Transport Office
SC	Scheduled Castes
SCM	Synthetic Control Method
Sis	Sisters
SOTR	States Own Tax Revenue
SRSWOR	Simple Random Sampling Without Replacement
SSC	Senior Secondary Certificate
SSUs	Second Stage Units
ST	Scheduled Tribes
Sus	Sub-Units
UFS	Urban Frame Survey
VAT	Value Added Tax
WHO	World Health Organization

Chapter 1 Introduction

1.1 Background

Alcohol consumption is a subject that is frequently debated and contested. Various studies present different perspectives on alcohol intake and its potential advantages and disadvantages. The discourse surrounding alcohol use is multifaceted, influenced by factors such as individual health, cultural norms, and societal repercussions. A consensus on the matter of alcohol consumption remains elusive (with the exception of recent health-focused research), and the debate continues to evolve with new studies and shifting societal perceptions.

To offer an overview of various viewpoints based on previous research, multiple studies have highlighted the adverse effects of alcohol consumption (a widely held belief in India). Conversely, some studies have demonstrated the positive impact of alcohol when consumed in moderate amounts (typically ranging from 0.22 to 0.99 oz. of ethanol per day). Moreover, some studies have explored the pleasurable aspects of alcohol and its potential benefit for health.

Let's begin by briefly examining key findings from both the perspective.

On the negative side, alcohol is recognised as a significant risk factor. According to the WHO (2018) report on alcohol, alcohol-related mortality surpasses due to diabetes, tuberculosis and HIV/AIDS. The report indicates that alcohol consumption has led to nearly 3 million deaths worldwide, and in terms of disability-adjusted life years (DALYs), harmful alcohol use accounts for 132.6 million DALYs globally. From India's perspective, the report highlights that the burden of alcohol-attributable diseases is higher in low and middle-income countries. Additionally, another study focusing on behavioural emergencies suggests that alcohol intoxication is a major contributor to severe risks of injuries or death to self or others.

Conversely, on the positive side, research by Criqui and Ringel (1994) suggests an inverse relationship between wine ethanol consumption and Coronary Heart Disease (CHD), with light to moderate consumption potentially improving longevity. Doll (1997) emphasized the beneficial effects of alcohol, indicating that small to moderate amounts of alcohol consumption can reduce mortality from vascular disease by approximately one third. Power et al. (1998) observed that the younger population exhibits improved health and a lower incidence of chronic illnesses with moderate alcohol consumption. Poikolainen (1998) concluded that moderate drinkers show lower mortality rates than abstainers, while heavy drinkers show higher mortality rates. Baum-Baker (1985) noted that the psychological benefits of moderate drinking, including stress reduction, increased happiness, improved social interactions, improved problem-solving, improved short-term memory, lower rate of clinical depression,

and geropsychiatric treatment. Several other studies, including research from the American Cancer Society, also support the idea of moderate drinking, indicating that the lowest risk of harm is associated with consuming one drink per day.

Furthermore, the dimension of pleasure enriches the perspective on alcohol on consumption. Cahalan (1970) found that pleasure is the most common motivation to drinking, and Warburton (1999) suggested, “pleasure is beneficial for health and enhances immunological resistance to disease”. Survey research conducted in various countries further establishes the perception of drinking as positive activity that elevates mood, promotes relaxation enhances social interactions and contributes to overall well-being. In the context of pleasure and moderate consumption Peele and Brodsky (2000) argued that overemphasis on the harms associated with alcohol, coupled with the neglect of the benefits of moderate consumption, needs to correction to create a comprehensive model of the effects of alcohol.

However, a recent study on alcohol consumption suggests that health benefits are associated with zero alcohol consumption (0 gm of ethanol per week). The study identifies protective effects of alcohol on ischemic heart disease and diabetes among women but notes an offsetting risk of cancer, injuries and communicable diseases (Burton and Sheron, 2018).

In conclusion, alcohol consumption, from a health perspective, presents contradictions. Although the recent study by Burton and Sheron (2018) appears to have addressed the health aspect of consumption (as long as new developments do not challenge the findings), policy consideration, especially in terms of prohibition, requires examination from multiple dimensions including culture, religion, class, caste, federal structure, revenue, and corruption to develop a feasible and effective solution. Given that the consumption aspect remains uncertain, except from health standpoint (including medicinal use), let’s now explore prohibition as a policy measure to address alcohol related issues.

1.2 Alcohol Consumption and Prohibition Policy

The policy of alcohol prohibition was a hotly debated topic in the early 20th century, both globally and in the USA. Proponents believed it to be the solution to the alcohol problem and were supported by figures such as Prof. Irving Fisher, who claimed in a 1927 round table discussion that no economists doubted the efficacy of prohibition.

In India, Mahatma Gandhi and other leaders like G. K. Gokhale and B.G. Tilak rallied against alcohol and its negative effects. Gandhiji believed that prohibition would benefit the independence movement and protect the moral fabric of India. As a result of Gandhiji's efforts

and the beliefs of the Indian National Congress, alcohol prohibition was included in the directive principles of the Indian constitution in 1950. Since then, several states in India have tried to prohibit alcohol following Article 47 of the Indian Constitution. The planning commission (Government of India) set up a Prohibition Enquiry Committee in 1954 and then in 1964 to understand the working of prohibition in India and developed a national program to fulfil the directive principle of the Indian Constitution with comprehensive public support.

Despite the hiatus mentioned over illicit liquor and several objections raised over implementing the said objective, both the committee favoured prohibition. They held the Gandhian belief that the only country where prohibition could be successful was "India". The rationale stated was that alcohol consumption is not respectable in India and is limited to only a few classes. Since independence, several states tried alcohol prohibition; however, they eventually had to repeal it, citing financial losses and impractical implementation.

In recent times, prohibition is no longer seen as the best solution to alcohol problems in developed countries. Research from Thornton (1991) suggested that prohibition in the USA (1920-1933) was a failure. However, the policy debate on alcohol prohibition in India is ongoing. Several states such as Gujarat, Mizoram (till 2014), Nagaland, Lakshadweep, and some districts of Manipur, Meghalaya and Maharashtra, continue to enforce prohibition. Bihar banned the sale and consumption of alcohol in 2016, and other states like Madhya Pradesh and Kerala are exploring the possibility of statewide prohibition. Historically, Maharashtra had introduced total prohibition in 1949, but lifted later due to problems caused by illicit distillers and traffickers. Currently, only the districts of Wardha and Gadchiroli enforce prohibition, but the recent lifting of the ban in Chandrapur district raises the possibility of lifting the ban in remaining districts as well.

Over this premise of contradictory opinions on alcohol consumption and the prohibition policy in India, this dissertation tries to address the following **research questions**

- (a) How have social and political attitudes towards alcohol has evolved over time in India, especially with respect to prohibition, and why?
- (b) What factors have influenced alcohol consumption in India and Maharashtra?
- (c) What is the impact of prohibition policy on the budgets of states and households?
- (d) What can we learn from the experience of prohibition policy in Gadchiroli district of Maharashtra regarding the benefits and costs of such a policy?

Based on the above-stated objectives, this dissertation is presented in seven chapters. The present chapter, **Chapter 1**, provides an introduction to the topic of this dissertation, **Chapter 2** focuses on exploring the literature and practices associated around alcohol consumption in India from the Vedic era to the present. **Chapter 3** concentrates on the prevalence and differential response to prices and income in India and Southern-India . **Chapter 4** specifically focuses on the state of Maharashtra regarding alcohol prohibition and its policies. **Chapter 5** is dedicated to the impact of prohibition on state revenues/financial losses and other gains related to household budget share allocations. **Chapter 6** presents qualitative and quantitative analytics of a primary survey conducted in Gadchiroli district of Maharashtra State to answer the question number 4 of this desertation. **Chapter 7** concludes the thesis by highlighting the key findings and offering recommendations.

The second chapter provides an in-depth review on the important studies on the topic related to alcohol consumption in India. The findings and policy suggestions presents a bird eye view on the topic. Secondly, alcohol has been part of Indian civilization since a very long time and has mentions in several historical and religious texts in India. Considering the importance of religion and culture in shaping the present-day lifestyle of Indian households, a literature overview on these aspects helps develop clearer understanding on variations in alcohol consumption patterns in India. Literature surrounding religion and culture is hence elaborated in this chapter. Thirdly, alcohol has been considered as a vice in most of the known history of India and hence several attempts were made to control the consumption of liquor. So, what attempts were made? were they effective in controlling the liquor consumption? if not, what really worked in managing the excessive liquor consumption? are some of the imperative questions pertaining the prohibition policy. The literature around these questions is covered in this chapter. Lastly, the prohibition policy comes with the problem of illicit liquor, this problem becomes even more difficult to control in the developing countries (like India). In the light of several hooch tragedies in Gujarat state and presence of illegal liquor in recently alcohol prohibited state of Bihar and easy availability of Mahua liquor in alcohol prohibited district of Gadchiroli (Maharashtra), etc. is presented in the second chapter.

The literature from the developed countries as well as from India suggests prices/taxes as an important method to control liquor consumption. However, the existing literature (to authors' knowledge) from India has not taken up the question surrounding the effects of prices and income over the entire distribution of alcohol consumption- as the response to prices for light drinkers may be different than that from heavy drinkers. Relying, just on method based

on means masks this important heterogeneity among drinker types and addressing this heterogeneity is important from policy perspective. Further, the details of consumption characteristics based on several socio-economic characteristics including poverty is also useful from policy perspective. The chapter 3 makes use of quantile regressions and descriptive analysis on existing nationally representative (sample) data sources like NSSO and NFHS to address gap in the literature.

The alcohol consumption is prohibited in few of the districts of Maharashtra namely Gadchiroli (since 1993), Wardha (since independence), and Chandrapur (2016-2021). The existing literature on district level alcohol prohibition does not suggest prohibition at the district level may serve as an effective solution especially if the districts are surrounded by wet districts. This allows exploration on the topic of district level prohibition in Maharashtra. chapter 4 presents the prevalence of alcohol consumption in various districts of Maharashtra based on various socio-economic groups. Following the descriptive analysis using DLHS survey, the effect of prohibition, prices, income, education, and enforcement is analysed using the three rounds of NSSO consumption expenditure (2004-2012) with the help of Heckman sample selection method.

The prohibition policy has direct impact on state government revenue. Alcohol makes a sizeable portion of the state government own tax revenue, hence foregoing such a large source of revenue would naturally put financial pressure on several government schemes and development projects (in line) along with committed expenditures (like salaries and pensions of state government employees). The first question that arises is how much loss the state government must face due to prohibition policy. The answer to this question may not be so straightforward. The answer depends on the difference between the counterfactual i.e., how much the revenue would have been raised had prohibition was not in place and the current revenue from the source when prohibition is in place. Simply said, it is the difference between the counterfactual and revenue during prohibition times. Secondly, literature suggests alcohol prohibition is associated with increase in household expenditure on food item along with other beneficial expenditures on individual and family. The household budget is hence analysed (using NSSO data) in the chapter 4. Both analysis have been conducted using the synthetic control method.

There are several aspects of alcohol prohibition policy which are not captured in nationally representative sample surveys. So, analysis purely based on secondary data sources keeps studies devoid of several aspects of ground reality on alcohol prohibition as a policy. Moreover, the nationally representative sample surveys do not include a few of the pertaining

questions on alcohol consumption on which this research want to ponder upon. Owing to these limitations, a primary survey was conducted in alcohol prohibited Gadchiroli district of Maharashtra. The outcome of survey provided a much elaborate view on prohibition policy and is presented in chapter 6. This chapter also explores individual level analysis which is performed to measure the price and income elasticity using finite mixture methods.

Lastly, the conclusion chapter (chapter 7), presents the important findings from this dissertation along with the relevant literature for further policy considerations.

Chapter 2: Prohibition Policy in India and Social and Economic

Impacts of Prohibition: A Review

2.1 Introduction

According to history, the policy of alcohol prohibition was hotly contested both internationally and in the United States in the early 20th century. The prohibition was supported by those who think it is the greatest way to combat the problem of alcohol abuse. Prof. Irving Fisher, one of its most ardent advocates, even hosted a roundtable discussion on alcohol prohibition in 1927, claiming that not a single economist had any doubts about it (Fisher, 1927). In India, it was (Mahatma) Gandhi M.K. and earlier Gokhale G.K and (Lokmanya) Tilak B.G. who gathered momentum against alcohol problems in India (Chand, 1972). According to Gandhi, the one thing most deplorable next to untouchability was the drink curse. Gandhi believed prohibition would strengthen the Indian independence movement and safeguard Indians from moral corruption (Fahey & Manian, 2005). It was the effort of Gandhi and the belief of the Indian National Congress that alcohol prohibition got enshrined in the directive principles of state policy of the constitution of India in the year 1950.

Since then, several states in India have tried to prohibit alcohol following Article 47 of the Indian Constitution. The planning commission (Government of India) set up a Prohibition Enquiry Committee in 1954 and then in 1964 to understand the working of prohibition in India and developed a national program to fulfil the directive principle of the Indian Constitution with comprehensive public support. Despite the hiatus mentioned over illicit liquor and several objections raised over implementing the said objective, both the committee favoured prohibition. They held the Gandhian belief that the only country where prohibition can be successful is “India”. The rationale stated was alcohol consumption is not respectable in India and is limited to only a few classes. Since independence, several states tried alcohol prohibition; however, they eventually had to repeal it, citing financial losses and impractical implementation.

In recent times the idea of prohibition does not appear to be the most suitable method to resolve the problem of alcohol in developed countries¹. Research from Thornton (1991) even suggested that prohibition policy in the United States of America (1920-1933) was a complete

¹ Temperance and Prohibition Policy experimented in several countries like the USA, Finland, Iceland, Norway, Denmark, Britain, Turkey, Russia/USSR, Canada. Presently, alcohol is prohibited mostly countries with a Muslim majority.

failure². However, the policy debate in India appears to be far from over. Alcohol continues to remain prohibited in Gujarat, Mizoram (till 2014), Nagaland, the union territory of Lakshadweep and in some districts of Manipur, Meghalaya and Maharashtra. On the 26th of November 2015, Bihar chief minister announced a total ban on the sale and consumption of alcohol as an electoral promise. Soon after he came to power, the prohibition law was brought into force on the 5th of April 2016.

Similarly, the Bharatiya Janata Party (BJP) government in Maharashtra banned alcohol in the Chandrapur district of Maharashtra on the 1st of April 2015. Prohibition remained in force till May 2021 and got repealed when Maha Vikas Aghadi (MVA) government came to power. States like Madhya Pradesh and Kerala have been exploring the possibilities of statewide alcohol prohibition. Chief Minister of Andhra Pradesh also had cleared his intent to fulfil his poll promise on alcohol prohibition.

Over this premise of continuing debate, this chapter tries to overcome a critical research gap by considering the prohibition experience in India based on exhaustive literature and collaborating it with several dimensions of alcohol research.

This chapter is arranged in the following manner; Section 2.2 provides a brief on historical elements of alcohol in the Indian context. A historical review is vital as countering the alcohol menace has been tried several times in the known history of India. The outcome of such efforts is worth noting for any policy consideration in the coming times. Also, the policies during colonial India are significant, as it marks the transition into the present era making it highly relevant. Section 2.3 provides a literature review on some essential studies on prohibition in India, Section 2.4 presents a brief review on illicit/unrecorded liquor. Section 2.5 presents the socio-economic and cultural aspects of alcohol consumption and Section 2.7 concludes this chapter.

2.2 History of Temperance and Prohibition Policy in India

According to Hassan (1922), the Vedic era cherished alcoholic beverages however, the post-Vedic period tried to reduce its consumption allowing alcohol to be used for specific purposes only. In the Mauryan empire during the Buddhist era, various administration policies

² Similar to studies of Fisher and Warburton, Thornton showed the fall in consumption of alcohol at the beginning, which subsequently increased. However, the fall coincided with the production of a more potent form of alcoholic beverage and spirits. The prohibition led to an increase in crime and homicide rate. The corruption of public officials was widespread. Prohibition led to increased government spending along with the loss of a significant source of tax revenue. No significant improvements in productivity and absenteeism were observed

were brought in force along with the propagation of Buddha teachings, which led to moral and cultural change amongst the masses against the consumption of alcohol. It was followed by a period in medieval India where consumption was restricted among the kings and the courts and eventually in the colonial era, British administered policies to extract revenue (excise) which fostered the consumption of alcohol among Indian populace (Hassan, 1922).

The Indian independence movement led to the inclusion alcohol prohibition as the directive principle in the constitution, following which in the post-independence period several states tried alcohol prohibition but had to repeal it over time. However, it was only the state of Gujarat where prohibition sustained since independence, although its success remains debatable.

2.2.1 Ancient India

Intoxicants have been a part of Indian culture for a long time; instead, India is considered the ancient home of distillation (Allchin, 1979). It is worth noting that alcohol consumption in India was not abhorred by all the members of the higher caste Hindus (even during the colonial period). The references in Vedas (see Appendix 2.8.2) have been used as the rationality for alcohol consumption since long. To cite a reference, the excise committee in the year 1914 reported for the district of Moradabad as follows: "...I am informed by persons in this district that Banias and Kayesths do not regard the use of intoxicants, more especially the drinking of liquor or spirits, as forbidden by their religion...And from the not infrequent references to the "*soma juice*" (the then intoxicant) in the *Vedas*, it is to be presumed that even the Brahmans could find a sanction in the foundations of their religion for the drinking of intoxicants..." (Government of India (Excise), 1914)

To elucidate this, it must be noted that liquor *Soma*³ is praised in the various hymns of Rigveda. God and liquor came to be closely identified in one symbol, and liquor was associated with deities' worship. Such was the praise for Soma that it was considered to be "...gifted with such properties that even God may have envied..." (Hassan, 1922). To add more light on Soma, Prof. Ragozin details the process and consumption in the Vedic era as follows: "...The fluid is then mixed with sweet milk and sour milk or curds with wheaten and other flour and brought into a state of fermentation; it is then offered thrice a day and partaken of by the Brahmans...It was unquestionably the greatest and holiest offering of ancient Indian worship... The gods drink

³ Soma is identified with a plant of the family of milkweeds "*Asclepias acida*" or "*Sarcostemma viminale*" (Ragozin, 1895)

the offered beverage; they long for it; they are nourished by it and thrown into a joyous intoxication..." (Ragozin, 1895). Apart from Soma, the other intoxicating drink commonly consumed by poorer classes was *Sura*⁴. Although Aryans celebrated drinking with much zeal and enthusiasm, the later period suggests "...Vedas considered wine is unfit to be drunk, unfit to be given, unfit to be accepted..." (Hassan, 1922)

Considering that drink is an evil that needs to be rooted out, Manu vehemently opposed the consumption of drinks (see Appendix 2.8.3). He considered drinking the most harmful of the king's vices, and drinking was a mortal sin for the Brahman. The rules were set not only for prevention but even for punishment; as the Brahman, if he indulges in the drinks, he was to be "excluded from all fellowship at meals, excluded from all sacrifices, excluded from instruction and matrimonial alliances; excluded from all religious duties". For women who drink, rules were like "no libations to be performed at her death", Manu further states "in the next birth she would descend into the body of a jackal or some equally low animal or would be born in the hell" (Chand, 1972) developing fear to maintain abstinence.

During this time the other legislators who strongly condemned drinking were, Apastamba, Gautama and the Institutes of Vishnu. Apastamba dictates the punishment of death by drinking hot liquor. Gautama states the possibility of purification for a brahman only after his death, whereas Institutes of Vishnu declare even the smelling of spirituous liquors a crime (Hassan, 1922).

Although there has been an attempt by early legislators, including Manu, to drive out this evil from society, drink always made its existence visible (Hassan, 1922)

It is understood from the ancient scriptures that mere regulation is not enough to overcome the vice. The behavioural aspects of the people are difficult to change by enforcing stringent religious laws or punishment. It requires a moral and social awakening among every individual of the society. The major success in this direction can be observed since the influence of Buddhism over Indian society.

According to Hassan (1922), "...If today it is abhorrent to a Hindu to eat flesh, let him remember it is a result of Buddha's teaching; if it is obnoxious for him to drink wine, let him again remember that Buddha still exerts his purifying influence...". To understand this success, one needs to fathom the fundamentals of Buddha's teachings, elaborated in the following subsection.

⁴ Sura is identified with "country spirits" (Hassan, 1922)

2.2.2 The Influence of Buddhism

Buddha's teachings have two aspects *Pariyatti* (theory) and *Patipatti* (practice)⁵. As far as *Pariyatti* is concerned, injunctions are available in *Jatakas* (stories of Buddha's previous birth leading to the fulfilment of *Paramitas* (qualities to attain Buddhahood)), Eightfold Noble Path and the five major *Sila* (morality). *Patipatti* is practising the insight meditation based on *Silav*(morality), *Samadhi* (right concentration), *Pragya* (wisdom of *Annata* (impermanence)) (Hart, 2012). Literature suggests *Patipatti* is synonymous with insight meditation- *Vipassana* (observe in a specific way) having a "know thy self" approach.

The essence of Buddha's teaching does not lie on punishment nor developing fear, but much on understanding the true nature of the cause of suffering, knowing thy self and developing the wisdom. Buddhism does not consider alcohol addiction or addiction in general as a biological disease; instead, it considers it as a disease of the mind. Thus, the solution lies in understanding the true nature of craving that arises in the mind of an individual rather than external solutions. According to Buddhism, "Addiction is an addiction to a certain type of vibration/pleasure-feeling, which is a result of a chemical process induced by addictive goods. The mind craves these vibrations as the addiction reaches the deep unconscious level. *Vipassana* reaches the unconscious level of the mind by working with the sensations, and thus it removes the roots of addiction" (Scholz, 2010)

Modern research on addiction and alcohol justifies the benefit of *Vipassana/Insight* meditation as well. In contradiction to moral or disease models of addiction, Buddhism provides an alternative to overcome one's ignorance of false refuge and come out of the grasps of craving and attachment (Marlatt, 2002). A study that compared the effect of meditation found meditation showed the most consistent and reliable reductions in drinking (Marlatt et al., 2017). Another study found meditation was associated with significant drops in daily alcohol consumption (Murphy, T. J. et al., 1986). Recent studies have found that meditation can treat panic attacks and anxiety disorder, depression and depression relapse, each one of which is directly related to alcohol consumption. *Vipassana/ Insight*-meditation has proven to reduce impulsiveness (Emavardhana and Tori, 1997). Neurobiological and psychophysiological studies further demonstrated the effectiveness of meditation⁶. The American Addiction Centres

⁵ The Buddhist literature (Tiratana Vandana) states the importance of following the *Dhamma* (*Patipatti+Pariyatti*) in pali as, "*svākhāto bhagavatā dhammo sandiṭṭhiko akāliko ehipassiko opanayiko paccattam veditabbo viññūhī ti*" (Well proclaimed is the Law/*Dhamma/Dharma* by the blessed one, visible in this world, immediate, invites everybody to come and see, leads to a goal, is to be understood individually by the wise ones)

⁶ Meditation increases alertness, relaxation, attentional control, and reduced readiness of action.

(AAC) also mentions that Vipassana/Insight-meditation helps reduce “stress,” a significant reason for alcohol consumption⁷.

Considering the influence of teachings of Buddha and “know thy self” approach, it was observed that during the reign of Chandragupta Maurya drinking was significantly reduced-although not completely eradicated. Chandragupta Maurya allowed drinking saloons to remain open for the habitual drinker, along with counter attractions. Kautilya *Arthashastra* (Economics) also describes the function of the officer in charge and means to control the liquor problem. *Arthashastra* suggested “restrictions on the number of shops, appropriate location and severe penalties”. Additionally, the liquor was not allowed to be taken out of the village and the shops were required to provide accommodation to the drinker until he regained his sobriety. These actions along with the influence of Buddha’s teachings (among masses), helped a significant reduction in the consumption of liquor at that time.

In the reign of Emperor/Samrat Ashoka, who was a staunch Buddhist, drinking was reduced to “infinitesimal proportions” states Hassan (1922). Ashoka considered the spread of Dhamma (Buddha’s Teaching/ Law of Nature) as his moral duty which includes avoidance from any kind of intoxicants in the five most important *Sila*. Emperor/Samrat Ashoka credited most of his success to the spread of the teachings of Buddha for the social order maintained during his reign. The effect of the reforms during the Mauryan period can be traced from Fa-Hein accounts who arrived in India at about 399 A.D., which states, “...the people of this country kill no living creature nor do they take intoxicating liquor...” (Legge, 2000). The testimony of Hiuen-Tsang, who arrived in India about 630 A.D. during the reign of Buddhist emperor Harshavardhana (590 A.D. to 647 A.D.), also suggest high morality observed both among masses and the nobles.

2.2.3 The Muslim Rule

By the time of King Harshavardhana, the acceptance of the prophet Muhammad has widely grown in Arabia. Although an average Muslim would hate the idea of drinks, the Koran (see Appendix 2.8.4) has only two such references on drinking. One that drinks are associated with both profit or sin, just that sin is greater than profit, the other is to shun wine, gambling, and status for the reason that they are an abomination of satans work. The follower of the faith

⁷ The other benefit include mood improvement, easing depression and anxiety, improved concentration, attention and focus. Meditation tend to relieve post-traumatic stress disorder (PTSD) and attention deficit hyperactivity disorder (ADHD) symptoms, boosting creativity and promoting emotional stability (American Addiction Center, 2020)

gave high importance to the simplicity of life as led by the example of Muhammad and giving away the luxuries. However, later Caliphs did exhibit their weakness and also consumed in excess. Allaudin Khilji (1296-1316) drank wine in quantity, but later on, he gave up drinking and prohibited selling and drinking wine, beer, and intoxicating drugs. Following is an excerpt from Ziai-d-din Barani- "...of wine were brought out of the royal cellars and empties at Badaun Gate in such abundance that mud and mire were produced as at the rainy season..." (Hassan, 1922). For those who did not follow the prohibition: "...Outside this gate, huge holes were dug in which wine drinkers were mercilessly incarcerated, and the severity was such that many die..." (Hassan, 1922). This factor of fear deterred many from drinking, but Atreya (1938) notes "the evil still continued to an extent".

During the establishment of Muslim rule over India, the kings were guided by the fear of the enemies such that indulgence into drink habits may lead to loss of the kingdom. Hence, once the stability of the domain was reached, the kings resorted to the drink habits⁸. Jehangir (1605-1627) is one of the many examples which establishes the idea that drinking was common among the ruling class. Following is an excerpt from his memoirs: "...They should not make wine or rice-spirit (darbahra) or any kind of intoxicating drug, or sell them; although I myself drink wine, and from the age of 18 years up till now, when I am 38, have persisted in it ..." (Rogers & Beveridge, 1909).

It is observed that during the Muslim rule, drinking habit was promoted rather than discouraged. However, this effect was limited only to the affluent class, whereas the masses remained uninfluenced. It turns out that the significant change in the habits of consumption was brought by the rule of the East India Company in the colonial era. However, it must be noted that Christianity (a major religion among the English) discourages excessive consumption of liquor (see Appendix 2.8.5)

2.2.4 Colonial India

The East India company considered excise as a legitimate source of revenue and thus preferred promotion of consumption to maximise the revenue. The initial system that was brought under practice was the pure farming system. In this system, the government had no

⁸ The major exception to drink habit was Aurangzeb. The other exception was Tipu sultan; he even ordered the felling of all the trees tapped for toddy.

interest in the manufacture, or sale of liquor. The government used to get its dues from the individual bidders.

It must be noted that in this system, bidders who bought the farms were reluctant to gain high profits as it was one way to keep the competition away and encouraging the hereditary occupation. Also, higher sales may increase the bid price, which added to their reluctance. Hence, it can be said that this system led to the least possible incentive to promote consumption from the government revenue perspective.

The government's aim all along was to tax the liquor before it was sent out to a retail seller so as to realise maximum revenue. Over time, this was realised by the evolution of the central distillery system; wherein pot-stills scattered all over the country were collected into government enclosures called distilleries. This allowed the government to impose the still-head duty (sufficing the government intentions to maximise revenue). As the conditions differed over various provinces, this led to the evolution of several systems⁹.

The introduction of the distillery system led to an increase in competition for manufacturing, supply and sale of liquor leading to more considerable revenue for the government. Although the settled policy of the government had been to minimise the temptation to those who do not drink and discourage excesses among those who do, this never really brought into effect the reduction in consumption (Government of India (Excise), 1905). To avoid any blame, the government also outlined the restrictions on the number of shops, but it never really benefited. Instead, the government ensured that no loss of custom or revenue would be entailed. This was made possible by an appropriate location for the shops and removing the additional ones. Moreover, the government policy was perverted states Hassan (1922), such that "departmental rules regarding the location of shops were broken in 20 to 40 percent of the cases" (Hassan, 1922).

The government's policy, which suggested a reduction of consumption by increases of taxation, was utilised in such a way that tax increases never reduced the increases in consumption. This was also observed in excise report of Government of India (1914) (see Table 1)

Table 1 The Statistics Showing Increases in Provincial Consumption in Lakh Proof Gallon

Province	1900-1901	1911-1912	Difference	Percent Change
Punjab	248524	565238	316714	127.44

⁹ This includes 1) The District Monopoly System, 2) The Contract Distillery System, 3) The Free Supply System, 4) The Modified Distillery System.

Central Provinces	266180	1067000	800820	300.86
Bengal with Berar and Orissa	608298	1876319	1268021	208.45
Madras	886369	1628178	741809	83.69
United Provinces	1214798	1538504	323706	26.65
Bombay and Sindh	1717775	2933034	1215259	70.75

Source: Report on Indian Excise Committee (1914)

The government's lack of willingness to control alcohol consumption (which was also opposed in several religious texts of India) the Indian political leadership started working against the British tactics, and Mahatma Gandhi even launched a vigorous campaign against alcoholic drinks. Later, in the year 1925, government accepted the recommendation by Indian political leadership and tried to introduce prohibition by stages. However, over time the government reverted to its old policy. This led to strong reactions. In Calcutta, the 44th session of the Congress, the Indian National Congress (INC) adopted the clause on "total prohibition of intoxicating drinks except for medicinal purposes" in its Bill of Rights. Later, all parties convention drafted "...It shall be the duty of Commonwealth to save its citizens from the evils and temptations of alcoholic liquor..." (Planning Commission, 1964). In 1937, Congress ministries introduced prohibition in the parts of Madras, Bombay, U.P., Bihar and Central Provinces.

Post-independence, since the constitution was adopted, total prohibition was brought in Andhra Pradesh, Assam, Madhya Pradesh, Orissa, Mysore and Kerala. Over time, nearly all the states introduced the prohibition; however, the implementation did not work out as expected and was reversed, citing financial losses. In the next section, we provide India's experience with prohibition as a policy measure to control alcohol consumption with the help of select vital studies.

2.3 Overview of Some Important Studies on Prohibition in India

The following section details some of the crucial studies on the topic of "alcohol consumption and prohibition policy".

2.3.1 Prohibition in Salem District (1938)

The first experiment on prohibition was conducted in the district of Salem in southern India. The results were actually encouraging. However, it must be considered that these findings address only the short-term effect of prohibition. Thomas P.J. surveyed four villages and Salem (Town), intending to observe the changes in Consumption, Budget Shares, Income,

Trade and Employment due to prohibition. The study report concluded, “liquor consumption completely stopped during the prohibition period, except in the border villages, and among a few urban labourers; the budget shares on food, clothes and amusement were improved; borrowings among labourers were reduced; the position of women and children among the working classes was substantially improved (Thomas, 1939). The report also suggested: Raising the standard of living is the only sure way of permanently controlling the drink evil and suitable counter-attractions must be given to erstwhile drinkers. The report was cautious about the fact that, more prolonged time must elapse before one can assess the results of prohibition fully, and therefore resurveys must be carried out in Salem annually for another four years (Thomas, 1939).

2.3.2 Dry Area Scheme in Ahmedabad (1948)

The short-term study was conducted to account for the effect of prohibition within four months of its introduction in the area of Ahmedabad, Gujarat. The departmental officers observed during prohibition that the savings of households were utilised for beneficial purposes and gambling was largely reduced. The officials also noted that there was a contraction in the cases of beating, abusing, quarrels and brawls in Chawls (building for labourers accommodation) and mohallas which was testified by both women and children of the study area. The study mentioned that the overall economy showed improvement creating a positive case for prohibition as a reliable policy option (Prohibition Research Advisory Board, 1948).

2.3.3 Prohibition in Andhra (1954)

This study conducted by the government of Andhra Pradesh found overwhelming evidence that prohibition had neither eliminated nor reduced the drink habits. The study team reported that the law was disregarded, and corruption was rampant; illicit distillation and smuggling seemed feasible only due to corruption in the administration of the law. On the question of improving the drinking classes economic, social and physical condition, the committee reported betterment of conditions for a minority. However, the bulk of them felt that the state of the classes was either just as it was before or worse. On the question of efficiency and well-being of labour, the committee reported deleterious drinks had resulted in the deterioration of the physique and lowering of the efficiency of labour. Regarding the effect of prohibition on juveniles and juvenile delinquency, the committee reported ill effects as boys

were used to screening the adults to sell contraband stuff. This not only introduced them to crime but also initiated the habit of drinking (Government of Andhra, 1954)

2.3.4 Enquiry on Nation-wide Prohibition (1954)

As stated earlier, the Government of India had set up a Prohibition Enquiry Committee to understand the working of prohibition in India. The committee largely favoured the prohibition policy and suggested better implementation. However, this committee also mentioned the difficulties in implementation of alcohol prohibition policy.

It is worthwhile to note these difficulties as effectiveness of prohibition policy would largely be dependent on resolution of these problems. The committee detailed four major areas namely administrative, economic, social and other difficulties.

On the administrative front the difficulties reported were:

- 1) Lack of enforcement staff,
- 2) Easy availability of required raw material,
- 3) Vast sea coastline and vast adjoining border to the wet states,
- 4) Scattered growth of toddy producing trees helping illicit tapping and detection complex,
- 5) Lenient attitude of Magistrates in prohibition cases,
- 6) Dearth of reliable panch & witnesses,
- 7) Frequent adjournments of prohibition cases.

On the economic front the difficulties mentioned were:

- 1) Unemployment in general,
- 2) Unemployment of people employed in excise trade,
- 3) The Lucrative nature of smuggling and other illicit activities,
- 4) Financial needs of people.

On the social front difficulties particularized were:

- 1) Indifferent attitude of the educated class,
- 2) Lack of active opposition,
- 3) Custom of drinking liquor at social and religious functions.

Finally, on other difficulties front the difficulties elaborated were:

- 1) Exclusion of 'consumption for medicinal purposes' in Article 47 of the Indian Constitution,
- 2) Fundamental Rights under the Constitution,
- 3) Limitation of power of the state legislature (Planning Commission, 1954).

Apart from mentioning the difficulties in implementation, prohibition committee suggested:

- 1) Better implementation of prohibition laws,
- 2) Prohibition on an advertisement from 1st of April 1956,
- 3) Reduction in liquor shops,
- 4) Reduced number of open days for liquor shops,
- 5) Reduction in supplies and strength of distilled liquor,
- 6) Progressive reduction in the number of shops and quantities of *ganja, charas, bhang* and other drugs,
- 7) No permits on health grounds,
- 8) Mobile squads of police to attack the illicit supply of liquor and drugs,
- 9) The committee also pressed the role of education, press, counter-attractions, and recreation centres.

The committee further recommended setting up a central research institute and a central committee under the planning commission or the ministry of home affairs. On the financial aspects, the committee supported the government's view to give adequate assistance to states that depend on excise for a considerable part of their revenue to introduce prohibition in their areas and push through other social welfare schemes. The committee also drew particular attention to the then recommendations of the Taxation Enquiry Commission regarding the steepening of estate duties, rationalisation of rate structures and tightening up of tax collections (Planning Commission, 1954) (see Appendix 2.8.1 for responses of State Governments on select important questions)

2.4.5 Study Team of Prohibition (1964)

The study team was again set up by the planning commission to explore the possibilities of national level prohibition following the directive principles enshrined in the constitution. The study team hugely favoured the prohibition policy. Yet the committee again acknowledged the presence of extensive scale misuse of spirituous preparations (which are in many cases used as a substitute for potable alcohol in both dry and wet states). The committee noted that the

relative success of prohibition laws in Madras and Gujarat was due to 1) low propensity to drink among the people of Madras and Gujarat, 2) Strong hold of traditions and religion 3) satisfactory period of education and preparation preceding prohibition 4) Existence of a large number of social workers.

The study team analysed the budget of 21,197 working-class in 50 different centres spread all over the state. The analysis reveals that 10 to 25 percent of working-class families drink in wet areas compared to 15 percent in the entire country. For drinking families, 9 percent of the average income was spent on drinking. The intensity of “illicit liquor” was found to be 20 percent. The ratio of consumption between dry and wet areas was suggested to be around 87:130. The illegal liquor bill in wet regions was estimated to be about nine crores rupees, and in dry areas, it was about 43 crores rupees. The committee recommended that the Scheduled Tribes can be given relaxation in production and consumption at home.

The committee stated that the liquor trade must not be run for private profit, and absolute control over bonded warehouses, breweries and distilleries were imperative; If required, they could be shifted to the public sector.

The study team also found that the drinking demand is inelastic; thus, the demand could be shifted to lower liquor content varieties if the prices of lower liquor content drinks were reduced (Planning Commission, 1964).

2.4.6 Studies using National level surveys

The earliest of work relating to determination of demand was done by Musgrave and Stern (1986). They used the NSSO data of 1973/74 and 1977/78 separately and estimated the demand using Probit models. The model included the variables based on the socio-economic characteristics of a household and a separate analysis was conducted for arrack and toddy. The study reported positive and significant effect of income (MPCE), number of children, manual workers and household belonging to SC/ST group for arrack participation. For toddy participation, the study reported non-significant effect of income and significant effect of household belonging to SC/ST group and household belonging to manual worker (occupation). The other section of the work includes application of Beach-MacKinnon method to estimate demand equation. The empirical specification included per capita consumption of arrack as a dependent variable with per capita state domestic product and market price of arrack as explanatory variables. The study found both price elasticity and tax elasticity were significant and close to unity.

Analysis conducted by Mahal (2001) focused on excise revenues, price elasticity, minimum legal drinking age, and crime aspects of prohibition and its impact on rural India. Mahal (2001) utilized the National Council of Applied Economic Research (NCAER) -1994 data to fit the demand model on alcohol participation of frequent consumers. The empirical framework included a vector of individual and household level socio-economic and demographic characteristics, set of policy parameters specific to each state (prohibition, minimum age, effectiveness of enforcement of minimum drinking age laws), region dummies, and prices of alcohol and its potential complements and substitutes. This study observed gender, tribal indicator, literacy status, and price variable was statistically significant in explaining the variation with expected signs.

According to this study, the price elasticity of demand for alcohol participation was -0.50 for people aged 25 years and above and -1.00 for those aged between 15 and 25. The study suggested 1) Considerable reductions in alcohol consumption follow for people aged between 15 to 25 years on account of prohibition. 2) Increasing the legal drinking age from 18 years to 21 years achieved nearly 60 percent of the effect of prohibition on alcohol consumption. 3) Increases in the minimum age beyond 21 years do not appear to be effective. The study claimed, “if some of the tax revenues from an alcohol tax are used to school and educate the public, the gains in terms of reduced alcohol consumption rates would be significant. Also, improved law enforcement may help”. From the policy perspective it was observed that prohibition leads to reduction in participation however, enhanced enforcement may substantially reduce alcohol participation among youths and the gains could be even greater than achieved by Gujarat. From the perspective of older groups (25+) prohibition could be a better alternative than minimum legal drinking age requirements.

Another study conducted by Rahman in the year 2004 analysed the NSSO pooled cross-section data and applied a Heckman selection model to study alcohol prohibition in India. The econometric specification included monthly per capita consumption expenditure (proxy for income), household size, vector of household characteristics, variable for prohibition policy along with state and year dummies. The study also conducted a unit value analysis to analyse the effect of prohibition on the price of alcohol. Furthermore, the relationship between alcohol and addictive goods like pan and tobacco was analysed.

The study found that with increase in income, quantity of alcohol consumed increased but there was a fall in the budget shares of alcohol. The rural household had significant

preference for arrack and toddy compared to urban households whereas the preference for IMFL was lower. The SC/ST group, labourers, and households who owned land showed more likelihood in participation along with higher consumption in quantity. Alcohol participation was reported to be lower in female headed households and in households with higher proportion of females. The prohibition led to reduction in total alcohol participation by approximately 26 percent and a significant decrease in budget shares. Analyses by alcohol types suggested prohibition increased toddy participation but led to fall in participation of beer and IMFL. The budget shares for IMFL and beer implied rise of their prices. The unit value analysis suggested expenditure/income elasticity of quality as positive and total prohibition significantly decreased the unit values. The analysis on addictive goods suggested (whole) tobacco and pan are complements to alcohol.

Additionally, it was also found that: 1) The state with a higher proportion of revenues from state excise enact less prohibition. 2) A grant from the centre is not significantly related to prohibition policy. 3) States with a higher share of central union excise enact prohibition. Prohibition is enacted by non-alcohol producing states to extract higher central transfers. 4) The alcohol industry has a significant effect in deterring prohibition. 5) Tax instruments could be used to curtail consumption effectively. 6) Bidis and leaf tobacco are a complement to arrack and toddy and a substitute to Indian Made Foreign Liquor (IMFL) in both rural and urban sectors. 7) Prohibition increased food and fuel budget shares due to increased consumption of pulses, fruits, vegetables and dairy products, 8) Prohibition led to a decrease in burglaries and total crime but also resulted in higher liver disease deaths and homicide deaths (Rahman, 2004).

More recently Luca et.al. (2015) assessed the effect of alcohol prohibition on alcohol consumption using linear probability model. They utilized NFHS 2 (1998-99) and NFHS 3 (2005-06) data to fit the demand model with empirical specification including a dummy variable for prohibition. The econometric specification included a host of socio-demographic characteristics of husband and wife belonging to a household along with state level controls (state literacy, per capita GDP, unemployment rate, police and police expenditure per capita, percent male adults) considering none of the states changed its prohibition status across two sample waves. The study observed that husbands were 14 percent points less likely to drink in prohibited states than the sample mean of roughly 30 percent.

2.4.7 Bihar Prohibition (2017)

Asian Development Research Institute (ADRI) conducted a short-term study just after six months of introducing prohibition in the state of Bihar. The study focused on crime rates and purchasing behaviour of the population. The study showed a substantial impact of prohibition on crime rates in Bihar. The study showed a 66.6 percent fall in kidnapping for ransom, 28.3 percent fall in murder, 22.8 percent fall in dacoity, and a marginal fall of 2.3 percent on crime against women. In terms of purchasing behaviour of the population, the study showed a substantial increase in the purchase of milk and milk products after prohibition. A considerable increase was also observed in lifestyle expenditure (ADRI, 2017).

The Development Management Institute (DMI) conducted another study to ascertain the impact of prohibition in Bihar on violence against women children and overall impact on village society. The study found a considerable fall in the negative behaviours post-prohibition. The study also reported utilising the saved time by men to interact with family and additional economic work (DMI, 2017)

2.4.8 A Challenging Alternative

Hardiman (1985) study on peasants and tribal of south Gujarat provides an intuitive solution of allowing peasants to tap their trees for toddy, citing the stability and responsible drinking in society before introducing the Bombay Abkari Act of 1878. However, he concluded the system is unlikely to be implemented as “a capitalist would want the market and government will want the excise revenue” (Hardiman, 1985)

On the effectiveness of the prohibition policy, the findings from Salem, Ahmedabad, and Bihar show a positive outcome. However, it must be perceived that these are short term outcomes. Over time, illicit liquor tends to make its way into the prohibited region. The recent report published by the National Family Health Survey 5 (NFHS 5) in the year 2021 notes 15.5 percent of men over 15 years of age consume alcohol in dry Bihar. The hooch tragedies are also often reported in Bihar and Gujarat, showing the weakness in the effective implementation of the prohibition policy. The next section elaborates on this critical issue of illicit liquor.

2.5 A Review on the Illicit Liquor/Unrecorded alcohol

Globally, there is a serious problem with illicit alcohol. Studies have suggested high taxation on alcoholic beverages, stringent rules (including total prohibition), and restricted access to licenced dealers are a few of the factors that contribute to its survival/development. Secondly, the illicit liquor trade thrives in many nations, especially in developing countries, as a result of deficient law enforcement, unemployment, and poverty. It frequently results in the production and distribution of tainted or subpar alcohol, posing serious health risks to users.

From the prohibition policy perspective, First, the policy/stringent law like total prohibition encourage private parties to produce illicit alcohol and sell it for much higher prices than they otherwise could have done. Second, the easy availability and use of illicit alcohol provides justification for the failure of the prohibition policy's implementation. Third, if this is coupled with a loss of a significant share of revenue to the government, it is likely to impede the developmental aspects via governmental agencies. Thus, a brief review of Indian experience on illicit/unrecorded liquor is vital for a reliable study on the topic and is presented next.

To begin with let us note what the WHO SEARO Report on Alcohol Policy situation in the WHO South-East Asia (SEA) region states,

“... Existing policies and legislations often lack effective implementation and enforcement and do not take into account public health interests adequately. Most Member States in the SEA Region have no alcohol policy-specific infrastructures to support the alcohol policy process, including designated responsible agency, policy and strategy, law and regulation.... Despite their illegal status, smuggling and untaxed alcoholic beverages, sale of alcohol to underage minors and drink-driving offenders are commonly found...” (WHO, 2018)

Taking the above-mentioned note into account the findings specific for India is now presented.

The early experiments on prohibition in India claimed that they were successful in tackling illicit liquor. According to Atreya (1938), during the four months of prohibition in the Salem district, the situation regarding illegal distillation appeared to be satisfactory. Illegal distillation was controlled to a good extent, but it did seem to be done on a small scale and in a very covert way (Atreya, 1938). Similar findings were reported in the case of the dry area scheme at Ahmedabad. According to this study, 1) The working class both from Hindu and

Muslim backgrounds did not apply for permits. 2) Illicit distillation of country liquor was also under control. 3) Illicit tapping of palm trees was low; it was mostly facilitated by a small number of palm trees (only 500) in the whole district. 4) It was estimated that the illegal consumption within Ahmedabad would have been less than 5 gallons. 5) The study report also stated that the increase in the sales of methylated spirits was due to an increase in population in Ahmedabad (Prohibition Research Advisory Board, 1948)

The problem of illicit liquor was widely reconnoitered by Andhra Pradesh Prohibition Enquiry Committee in the year 1954. According to the report, 1) Illicit distillation, smuggling, and corruption were rampant. 2) A class of intermediaries came into existence who used to negotiate between corrupt officers and illicit distillers. 3) The village headman would also get involved in the crime; 4) The rich bootlegger would employ the poor and needy and would even pay the fines if the employed had to face a trial in the court of law. 5) The bootleggers could carry the illicit profession with impunity by regularly paying (mamools) to subordinate staff in the area (Government of Andhra, 1954)

The National level report by the prohibition enquiry committee in the year 1954 viewed the problem of illicit distillation as not very serious. However, the committee did mention that enforcement of the prohibition needs to be tightened up to tackle the problem of illicit distillation. While stating the problem of illicit distillation in dry areas the committee pointed out that the rise in illicit distillation in wet areas was even higher, hence the problem of illicit distillation needs to be tackled considering a general rise throughout the country rather than an isolated crime of dry areas. The committee stated the attributable reason for the rise in illicit distillation were:

- 1) Presence of hardened addicts,
- 2) A small number of professional lawbreakers,
- 3) Prevalence of poverty and unemployment,
- 4) Easy availability of raw materials,
- 5) Existence of wet pockets in the neighbourhood of dry areas.

The committee hence presented measures to control illicit distillation by the creation of mobile squads, frequent raids, and control of base material used for illicit distillation (Planning Commission, 1954)

The national level study by the study team on prohibition in the year 1964 observed the following:

- 1) There is the tendency in the opponents of prohibition to exaggerate the extent of illicit distillation and converse is true for the protagonist.
- 2) Even if there is a fall in the quantity consumed in the dry areas, all of the quantity consumed is illicitly produced. The committee mentions the quantity was reduced by 40 percent.
- 3) The illicit distillation in the dry areas was found to be around four times that of wet areas and this can be confirmed by the crime figures.
- 4) The cost of illicit production is generally around Rs. 0.75 – Rs 1.25 in all the areas, wet or dry, however, the selling cost in dry areas is substantially higher ranging between Rs.4 to Rs.10. Thus, leading to substantial profit margins to one involved in illicit distillation. The committee estimates the profit around 200 to 1000 percent. This acts as a motive to manufacture and sell the contraband liquor.
- 5) Illicit activity reduces social welfare even if there is a reduction in total consumption of alcohol.
- 6) The drinking bill for illicit liquor was approximated to around Rs. 9 crores in wet areas, Rs. 43 crores in dry areas and the drinking bill for the country as a whole was estimated to be around Rs. 146 crores (Planning Commission, 1964)

During the Andhra Pradesh prohibition (1993-1996), illicit arrack was easily available (rather it was home delivered with some increases in the cost). Secondly, the prohibition failed to affect the consumption of habitual drinkers by much. According to Reddy (1999), there was a fall by only 12 percent in habitual alcoholics during the prohibition. The arrack consumer which were mostly poor shifted to illicit arrack. The budget share on arrack by alcoholics' pre-prohibition was about 16.6 percent, which saw only a marginal fall to 15.4 percent, showing illicit arrack was effortlessly obtainable (Reddy, 1999)

From the year 1995 to 1997 the state of Haryana observed a statewide prohibition. It was reported that prohibition led to a significant increase in deaths of poor people due to consumption of spurious liquor. The state government filed 98,699 cases and over 13 lakhs bottles were seized¹⁰

The report on Hooch Tragedy in Gujarat noted a very large quantity of illicit liquor was entering into the State of Gujarat, from Daman. The Commission on Hooch Tragedy mentioned the presence of 467 bootleggers in the City of Ahmedabad. The commission also mentioned

¹⁰<https://www.icmrindia.org/freepercent20resources/casestudies/Thepercent20Indianpercent20Liquorpercent20Industrypercent20Prohibitionpercent20Story.htm>),<https://www.indiatoday.in/magazine/states/story/1996-0915-ban-on-alcohol-proves-to-be-mixed-blessing-in-haryana-834498-1996-09-15>

the availability of illicit liquor was generally through the bootlegging network which supplied liquor from the rural areas and neighbouring states to the cities. The commission noted the major reason for the availability of liquor was demand-supply dynamics, smuggling, bootlegging and poor enforcement¹¹ (Government of Gujarat, 2009)

The study titled “*Patterns & Consequences of Alcohol Misuse in India - an epidemiological survey*” conducted in the year 2012, adds detail on illicit liquor in Surat district in the state of Gujarat. This study reiterates “Gujarat is dry by law and wet by preference”. According to this study,

- 1) There was a widespread local illicit distillation,
- 2) Liquor was diverted from defense canteen,
- 3) Liquor was also smuggled from Maharashtra, Madhya Pradesh and Rajasthan via rail routes and roads,
- 4) Illicit liquor (desi-Daru) was sold loose and could be obtained from provision stores, pan-gallas and home shops.

The recent prohibition in Bihar (2016) presents a similar picture. News reports have suggested prohibition had not deterred the production of liquor to a large extent. People were also reported to move towards weed, charas and bhang. According to one report, over 3.87 million litres of illicit liquor was confiscated within the span of nine months¹².

In terms of unrecorded-alcohol, according to the World Health Organization (WHO) the total unrecorded-alcohol¹³ was 24.8 percent globally and the largest share of unrecorded alcohol was observed in the Eastern Mediterranean (54.5 percent) which was followed by South-East Asia (47.4 percent) in the year 2010 (World Health Organization, 2014) In the year 2016, the estimates showed a marginal increase in unrecorded alcohol globally to about 25.5

¹¹ The report pointed towards the slow disposal of the prohibition cases, low conviction rate and small quantum of punishment to the convicted. The pendency of the charge-sheeted cases in the court was above 67 percent. The conviction rate was as small as 8.5 percent and the punishment exceeding three months’ prison term in convicted cases was only a little more than 1 percent.

¹²<https://www.hindustantimes.com/cities/patna-news/bihar-over-3-87-mn-litres-of-illicit-liquor-confiscated-in-9-months-say-police-101636781895331.html>

¹³ Unrecorded alcohol refers to alcohol that is not accounted for in official statistics on alcohol taxation or sales in the country where it is consumed because it is usually produced, distributed and sold outside the formal channels under government control. Unrecorded alcohol consumption in a country includes consumption of homemade or informally produced alcohol (legal or illegal), smuggled alcohol, alcohol intended for industrial or medical uses, and alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction). Sometimes these alcoholic beverages are traditional drinks that are produced and consumed in the community or homes. Home-made or informally-produced alcoholic beverages are mostly fermented products made from sorghum, millet, maize, rice, wheat or fruits. Unrecorded consumption also includes so-called surrogate alcohol, commonly ethanol that was not produced as beverage alcohol but is used as such (e.g. mouthwash, denatured alcohol, medicinal tinctures, aftershaves and perfumes) (WHO, 2018)

percent with 45.4 percent in the South-East Asia Region and 70.5 percent in the Eastern Mediterranean Region (World Health Organization, 2018). The survey conducted by International Alliance for Responsible Drinking in five states (Andhra Pradesh (AP), Kerala (KR), Maharashtra (MH), West Bengal (WB), and Madhya Pradesh (MP)) reported the highest share of unrecorded alcohol in West Bengal with 52 percent and Maharashtra the lowest with 8 percent. Analysis by gender suggests the share of unrecorded alcohol was 54 percent among women and 28 percent among men. By sector, unrecorded alcohol consumption in rural and urban areas was 34 percent and 23 percent respectively (IARD, 2018).

The literature clearly presents the availability of illicit/unrecorded liquor is a significant problem in India and the prohibition policies are not largely effective in the country. In the next section the socio-economic and cultural aspects of alcohol consumption is presented.

2.6 Socio-economic, Culture and Revenue Aspects

The literature discussed earlier briefly reviewed the Indian experiment with alcohol prohibition, how it manifested over time, and the case of illicit/un-recorded liquor. Taking the discussion ahead, it is essential to note that class, caste, occupation, and culture have a significant impact on alcohol consumption in India.

A survey conducted by Thimmaiah (1979) in the state of Karnataka noted that the backward castes consume more than the forward castes. The study notes that in terms of occupation, agricultural labourers and manual labourers consume more than any other occupation overall (contrarily, in urban areas, technical and professional job individuals consume more than other occupations). The importance of the caste/social category was also stressed by the study conducted by Bombay University in 1951 in the area of south Gujarat, which pointed out 80 percent of the family of tribals, untouchables, and other low caste people consumed one or more drinkers. In contrast, only 7.5 percent of high caste families did so (Hardiman, 1985).

Hardiman (1985) noted that drinks occupied a central place in the culture of the poor and landless peasant of south Gujarat¹⁴; even their religion made drinking respectable and allowed them to drink without any guilt. The role of society, culture and occupation is further elaborated by the study of Doron (2010), which shows how caste, class, culture and profession

¹⁴Hardiman states, “Drinking provided an important means by which the peasants expressed their mutual solidarity. To drink together was considered a mark of friendship, and it was considered impolite not to offer drink to a guest. Drinks were served at meetings of village or tribal panchayats to put a seal on the discussion”

are interlaced (citing the case of divers who are engaged in risky and stigmatised occupation of recovering the corpses from rivers). Moreover, country liquor is also considered as remuneration in some professions (Chowdhury et al., 2006). The differences by social category/caste and class/wealth index also come out clearly from the recent NFHS 4 report of 2016 elucidating tribal men and men from the lowest quintile group of wealth index has the most significant proportion of alcohol consumers in the contemporary period (see Table 2)

Table 2 Alcohol Consumption by Social Category and Wealth Index

Social Category/Caste and Class/ Wealth Index	Percent of men who drink alcohol	Frequency of drinking		
		Almost every day	About once a week	Less than once a week
Caste/Tribe				
Scheduled caste	36.3	13.0	42.0	45.0
Scheduled tribe	41.3	15.9	43.9	40.2
Other backward class	28.5	10.6	40.0	49.4
Other	21.1	9.2	38.6	52.2
Don't know	26.0	12.0	44.9	43.0
Wealth Index				
Lowest	35.4	15.7	39.8	44.5
Second	29.9	13.8	39.3	46.9
Middle	30.0	12.0	40.9	47.1
Fourth	27.8	9.3	41.7	49.0
Highest	25.1	7.7	41.6	50.7

Source: NFHS 4 report (2016)

The other important aspect of alcohol prohibition policy is the reliance of state governments (which enacted the prohibition) over the central assistance through grants and central transfers (considering the share of excise revenue pre-prohibition). The policy like prohibition skews the equation of centre-state fiscal relationship towards the centre (vertical imbalance) and more so in the present times when several state taxes are subsumed under the Goods and Service Tax (GST)^{15 16}.

¹⁵ The goods and service tax (GST) since July 2017 has replaced multiple indirect taxes levied by state governments subsuming State VAT, Luxury Tax, Entry Tax, Entertainment and Amusement Tax (except when levied by the local bodies), Taxes on advertisements, Taxes on lotteries, betting and gambling, State Surcharges, and Cesses.

¹⁶ The 7th schedule of constitution clearly defines the Union, State and Concurrent list. However, over the years there has been transgression of centre in to state subjects through centrally sponsored schemes and

Apart from revenue consideration by the state, the effectiveness of prohibition in Salem district pre-independence and non-effectiveness of prohibition post-independence points towards the change in perceptions in terms of prohibition in post-independence India. In the pre-independence era, prohibition was essentially a tool against imperial powers to attain freedom along with the moral compass embedded in it. In contrast, in the post-independence era, it has a revenue consideration and a moral compass embedded in it. Needless to say, on most occasions, the revenue consideration mattered the most to the government in the post-independence era. Contrarily, the moral compass effectively lures the women voters and has been used effectively to bring prohibition in several states post-independence¹⁷.

Thus, the prohibition in the current times can be reflective of the loss of state excise revenue, skewed centre-state fiscal relation, weak/no intent for policy implementation, rampant corruption in public officials, additional expenditure to state exchequers along with people consuming deleterious drinks (adversely affecting their health), showing the policy which was constructed for the benefit of masses turn out to be regressive for democracy and economy as a whole.

2.7 Discussion & Conclusion

The decision to consume or abstain from alcohol is influenced by a multitude of factors associated with alcohol consumption. Worldwide, peasants and labourers often consider some form of alcohol as a nourishing drink, using it for relaxation and recreation. Pleasure is a significant motivator for alcohol consumption and has been associated with various positive health benefits. Moderate drinking, especially when accompanied by meals, is an integral part of several Western cultures and has demonstrated health advantages. Therefore, a one-size-fits-all approach like total prohibition may not be an acceptable solution to all citizens of any given country. Historical readings from ancient and medieval India also suggest that stringent regulation and punishment is not an effective solution.

The general consensus that emerges is that implementing a policy such as prohibition poses significant challenges over an extended period. Prohibition leads to a substantial loss in state revenues, which can impede the normal functioning of state governments, especially when

enlargement of concurrent list. Moreover, there is a rise in the share of conditional and tied grants on the expenditure side of the states.

¹⁷ Luring women voters in the name of prohibition is a part of popular politics as pointed out by several newspaper and research articles.

governments are indebted¹⁸. Additionally, it results in state governments heavily reliant on central aid, disrupting the fiscal balance between the center and the states and creating a vertical fiscal imbalance. The initial positive results of prohibition are often due to supply shocks, and over the longer term, alcohol finds its way back into the market through illegal means. Moreover, prohibition tends to increase smuggling activities, the production of illicit liquor, and corruption rather than solving the social problems. Illicit or Home-brewed liquor substitutes that emerge during prohibition can have negative health effects and are likely to increase mortality, contrary to the expected positive health benefits of prohibition policy. Positive outcomes, such as reduction in total crime and domestic violence, as observed by Rahman (2004), can be addressed through alternative policy measures, such as raising taxes or prices, as suggested by Mahal (2001) and Rahman (2004) and implementing effective education programs alongside strict enforcement of laws regulating the minimum legal drinking age, as advocated by Mahal (2001).

In conclusion, the most rational approach to reducing alcohol consumption involves education and cultivation of moral values, alongside spiritual progress at both individual and societal level. For individual struggling with addiction, a counter attraction approaches such as Vipassana meditation, Transcendental meditation, Yoga, etc. has proved to be helpful. From a government perspective, pricing and taxation can yield positive benefits. Poverty alleviation programs can contribute to relatively sober society. Regulating the physical availability of alcohol, implementing drink-driving countermeasures, imposing restrictions on marketing, employing persuasion strategies, providing treatment, and early intervention services can be essential steps to combat the alcohol menace. In the Indian context factors such as occupation, class, caste, and culture significantly influence alcohol consumption. Therefore, any public policy regarding alcohol must take these aspects into account before considering comprehensive prohibition. In the current scenario, a localized government-level solution may be more practical than imposing a blanket ban across an entire state or the country, especially given the gravity of the problem.

¹⁸ However, sin tax reform act 2012 (Philippines) is considered a lesson to several countries to mobilise the resources for revenue generation. The sin tax reform simplified and increased the tobacco and alcohol excise taxes. The reform led to sizable gains in finance, health and good governance (World Bank, 2016)

2.8 Appendix

2.8.1 The replies of various state governments on select question of prohibition and revenue (1954-55)

State Government Replies Sought on	1) Effectiveness of Prohibition 2) Improvement in condition of Drinking Classes 3) Attitude of Women 4) Active support of general public 5) Corrupt Practices 6) How to Balance the State Finance
Government of Andhra	1) Prohibition neither eliminated nor reduced the drink evil 2) Improvement in only those who have completely abstained from drinking 3) Women welcome prohibition 4) No active support from the public 5) Regular payments and bribes for sheilding prohibition offence 6) Agriculture Income tax can help balance state finance
Government of Assam	1) Addicts still consuming liquor Country spirits- 25 percent, Toddy- 10 percent, Foreign liquor- 30 percent 2) Too early to tell 3) Women welcome prohibition 4) Yes 5) Neglegible 6) New industries as new sources of revenue over the span of years
Government of Bihar	1-5) No Prohibition 6) Industrailise the state
Government of Bombay	1) About 30 percent of previous addicts consume liquor and drugs 2) Prohibition has been instrumental in improving the condition of drinking class 3) Women support prohibition 4) Ameliorative activities-Yes, Enforcement-Not satisfactory 5) No failure of enforcement but corrupt practices like bribes taken by officials 6) Increase in sales tax.
Government of Himachal	1-5) Prohibition applied at very small portion 6) Starting government sponsored industries, exploitation of forests and reduction on overall expenditure
Government of Hyderabad	1) Prohibition not in force

Government of Madhya Pradesh	<ol style="list-style-type: none"> 1) About 20 percent of previous addicts consume liquor and drugs 2) Improvement in condition of drinking classes 3) Women support prohibition 4) Not received active support 5) Petty enforcement staff started collecting bribes from offenders 6) Introduction of sales tax, motor spirit and lubricants tax, tobacco tax etc
Government of Madras	<ol style="list-style-type: none"> 1) Around 25 percent of previous addicts consume liquor and drugs 2) Improvement observed 3) Women support prohibition 4) No support from general public 5) Corrupt practices observed in lower ranks 6) Sales tax almost compensated excise revenue
Government of Mysore	<ol style="list-style-type: none"> 1) About 50 percent of previous addicts consume liquor and drugs (bordering wet districts 50 percent; Interior districts negligible) 2) yes 3) Women support prohibition 4) Normal public apathy 5) Corrupt practices are reported 6) Difficult to find sources, need central assistance
Government of Orissa	<ol style="list-style-type: none"> 1) 15-20 percent arrack and 2 percent toddy consume liquor and drugs 2) Yes 3) Women support prohibition 4) no strong condemnation of drink by public 5) no corrupt practices 6) Taxation introduced on sales, entertainment, agriculture income, motor spirit & lubricant, stamp duty, court fees, land rent, motor vehicle act tax rise
Government of Punjab	<ol style="list-style-type: none"> 1) Consumption reduces by 20 percent 2) Improvement observed 3) Women support prohibition 4) Will come if properly mobilised 5) Not observed 6) Subsidy by union government, nationalisation of transport and key undertaking industries
Government of Travancore-Cochin	<ol style="list-style-type: none"> 1) Arrack addicts observed-15 percent, toddy- 20 percent Foreign liquor-15 percent

	<ul style="list-style-type: none"> 2) Yes 3) Women support prohibition 4) No active support from public due to poverty and food value of toddy 5) very scarce 6) Introduction of sales tax.
Government of Uttar Pradesh	<ul style="list-style-type: none"> 1) Country spirits: 60 percent, toddy 10 percent, foreign liquor 80 percent of previous addicts consume liquor and drugs 2) Improvement observed 3) Women support prohibition 4) No 5) Large scale illicit distillation, however no evidence of corrupt practices 6) Union government to subsidise state government
Government of Kutch	No specific response
Government of West Bengal	<ul style="list-style-type: none"> 1) Prohibition not introduced in the state; 6) central subvention required
Government of Madhya Bharat	<ul style="list-style-type: none"> 1) Prohibition effective to a great extent 2) Improvement 3) Women support prohibition 4) No 5) No such instances 6) Difficult to find alternate source of income
Government of PEPSU	<ul style="list-style-type: none"> 1) No prohibition introduced 6) Prohibition not advisable and hit heavily to state revenue
Government of Saurashtra	<ul style="list-style-type: none"> 1) Only addicts of foreign liquor observed, nil for country liquor and toddy. 2) Improvement 3) Women support prohibition 4) Yes; 5) Very few 6) Loss in finances not significant
Government of Ajmer	<ul style="list-style-type: none"> 1) Prohibition not in force
Government of Bhopal	<ul style="list-style-type: none"> 1) Prohibition not in force

Government of Coorg	1) Prohibition not in force, consumption is issued by permit; 6) It will be very difficult to raise revenue if prohibition is introduced
Government of Delhi State	1) No prohibition introduced 6) Tax increases by state and central contributions
Government of Manipur	1) No alcohol prohibition in the state
Government of Tripura	1) Prohibition still in its inception
Government of Vindhya Pradesh	1) Prohibition not in force

Source: Report on Enquiry on Nation-wide Prohibition (1954)

2.8.2 Excerpts from “Vedic India”

“...There is, however, a divine liquor which gives the gods (the Powers of Nature) strength and immortality, without which they would lose their might, their eternal youth, their life even, without which the world-our world at least-would become barren and dead, and uninhabitable; and that heavenly liquor, the veritable AMRITA or drink of immortality, is-the rain, the dews, perhaps it were more correct to say, the moisture which is diffused through nature, exhilarating, vivifying, calling forth and fostering life in all its forms...”

“...We have tasted Soma- the god has descended into us, --we have become like unto the gods- immortal life is ours...”

"...The days dawn prosperously for him who says: Come, let us press the soma for Indra! That king's power is never shaken in whose house Indra drinks strong soma mixed with milk: he flourishes in peace, conquers in war, and dwells securely at home, enjoying high renown..."

“...Indra holds no kinship with those who press no soma; he is neither friend nor brother to them...”

“...In one place Soma is called “the soul of Indra”...”

Source: Vedic India (1883)

2.8.3 Excerpts from the “Manusmriti”

Sura is of three kinds made from jaggery, grains and mohuwa flowers, respectively known as gaudi, paishti, and madhvi. These three are similar. Brahmin is forbidden to drink these beverages.

Sura, all other intoxicating drinks and decoctions and flesh are the food of the yakshas, rakshasas, and pisachas; a brahmin who eats (the remnants of) the offerings consecrated to the gods must not partake of such substances.

A brahmin, stupefied by drunkenness, might fall on something impure, or (improperly) pronounce Vedic texts, or commit some other act which ought not to be committed.

When the Brahman which dwells in his body is (even) once (only) deluged with spirituous liquor, his brahminhood forsakes him and he becomes a sudra.

The slayer of a brahmin (a twice-born man), he who drinks (spirituous liquor called) sura, he who steals (the gold of a brahmin), and he who violates guru's bed, must each and all be considered as men who committed mortal sins (mahapataka).

For violating guru's bed, (the mark of) a female part shall be impressed (on the forehead with but iron); for drinking (the spirituous liquor called) sura, the sign of a chalice; for stealing (the gold of a brahmin), a dog's foot; for murdering a brahmin, a headless corpse.

Excluded from all fellowship at meals, excluded from all sacrifices, excluded from instruction and matrimonial alliances, abject and excluded from all religious duties, let them wander over (this) earth.

Such (persons) who have been branded with (indelible) marks must be cast off by their paternal and maternal relations, and receive neither compassion nor salutation; that is the teaching of Mann.

A twice-born man who has (intentionally) drunk, through the delusion of mind, (the spirituous liquor called sura) shall drink that liquor boiling; when his body has been completely scalded by that, he is freed from his guilt.

Or to remove (the guilt of) drinking sura, he may eat during a year once (a day) at night grains (of rice or oilcake, wearing clothes made of cow hair and his hair in braids and carrying (a wine cup as) a flag.

Sura, indeed, is the filth (mala) of grain; sin also is called dirt (mala); hence brahmin, kshatriya, and vaishya shall not drink sura.

He who has drunk water which has stood in a vessel used for keeping (the spirituous liquor called) sura, or other intoxicating drinks, shall drink during five (days and) nights (nothing but) milk in which the sankhapushp (plant) has been boiled.

Drinking (spirituous liquor), associating with wicked people, separation from husband, rambling abroad, sleeping (at unseasonable hours), and dwelling in other men's houses, are the six causes of the ruin of women.

She who drinks spirituous liquor is of bad conduct, rebellious, diseased, violent natured, or wasteful, may at any time be superseded (by another wife).

Source: Prohibition Enquiry Committee (1964); Liquor Menace in India (1972)

2.8.4 Excerpts from the “Holy Quoran”

The Quoran has laid down a course of conduct for men to help them live nobly and attain to the heights within their reach. It condemns various evils, including gambling and drinking liquor.

In Chapter II verse 219 God says to the Prophet:

“They will ask thee about wine (all alcoholic' drinks) and el maisar (a game of chance), say in them both is sin and profit to men; but the sin of both is greater than the profit of the same.”

Chapter V, verse 91, says: O ye, who believe; verily, wine and el maisar and statues and divining (arrow) are only an abomination of Satan's work. Satan only desires to place enmity and hatred between you and God by wine and el maisar and to turn you from the remembrance of God and prayer.”- The Koran- (EH Palmer's Translation)

2.8.5 Excerpts from the “Holy Bible”

Christianity discourages excessive consumption of liquor, though it does not strictly prohibit drinking. In all churches, wine is required for the ritual. In Anglican churches, it is partaken by the priest and the congregation and in Catholic churches, it is required for the ritual of mass and is taken by the priest alone. In Catholic institutions, the quantity of wine used is only about an ounce but in Anglican churches, it is a little larger than that. Without wine, the Communion service cannot be held in Anglican churches, nor the ritual of mass in Catholic institutions.

In Chapter 23 of the Proverbs indulgence in Wine is condemned.

Verses 29 to 32 say:

29. Who hath woe? who hath sorrow? who hath contentions? who hath babbling? who hath wounds without cause? who hath redness of eyes?

30. They that tarry long at the wine; they that go to seek mixed wine.

31. Look not thou upon the wine when it is red when it giveth his colour in the cup when it moveth itself aright.

32. At the last, it biteth like a serpent and stingeth like an adder.

Chapter 3: Prevalence and Differential Response to Price and Income in India

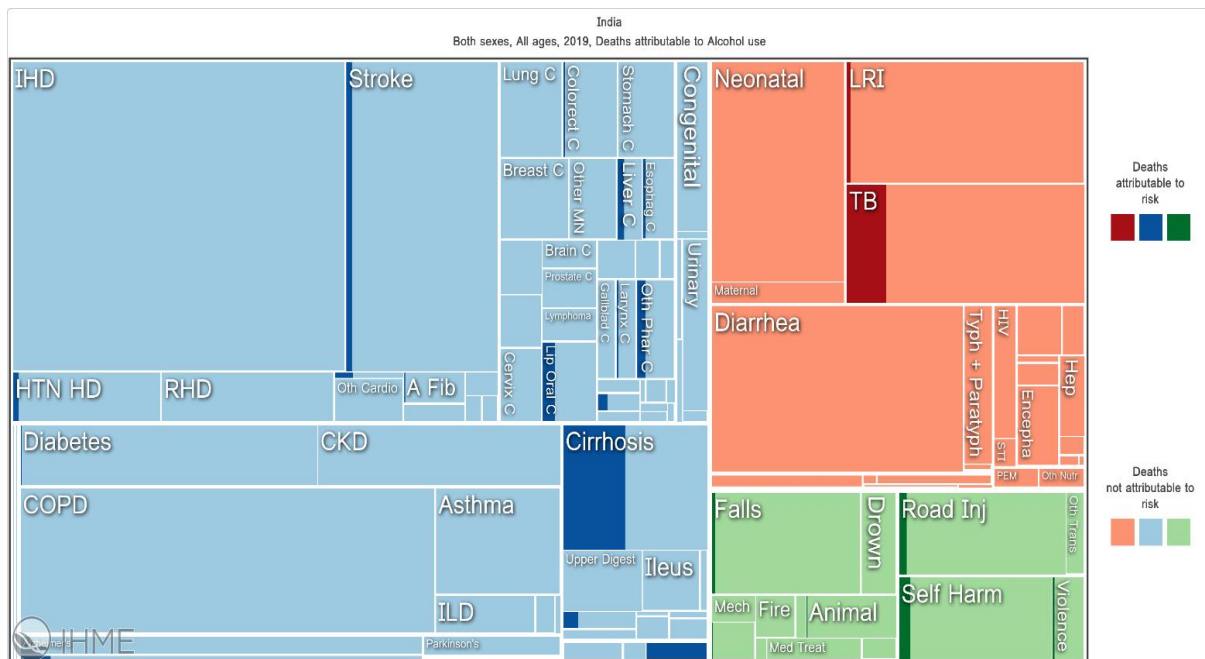
3.1 Introduction

There are numerous serious health and socio-economic dangers associated with alcoholism for both individuals and society as a whole. Excessive drinking can lead to a wide range of health problems, including liver diseases, cardiovascular conditions, pancreatitis, various cancers (such as liver, breast, and throat cancer), a weakened immune system, and mental health issues like depression and anxiety. The intoxicating effects of alcohol also significantly increase the risks of accidents and injuries. Impaired coordination, delayed reaction time, and reduced balance make individuals more vulnerable to falls, burns, drownings, and other accidents. Alcohol is a major contributing factor to road traffic accidents that results in permanent disability or fatalities.

The Global Burden of Diseases study conducted in 2016, explored the burden of diseases attributable to alcohol in India. The study found that the percentage of total alcohol-attributable deaths among females of all ages in the year 1990 was 0.42 percent and the percentage of Disability Adjusted Life Years (DALYs) was 0.66 percent. These numbers increased to 0.71 percent and 0.95 percent respectively for the year 2016. Similarly, for the males of all ages, the percentage of alcohol-attributable deaths was 2.4 percent and the percentage of the total attributable DALYs was 3.2 percent in 1990. These figures increased to 4.7 percent and 5.4 percent respectively, in 2016.

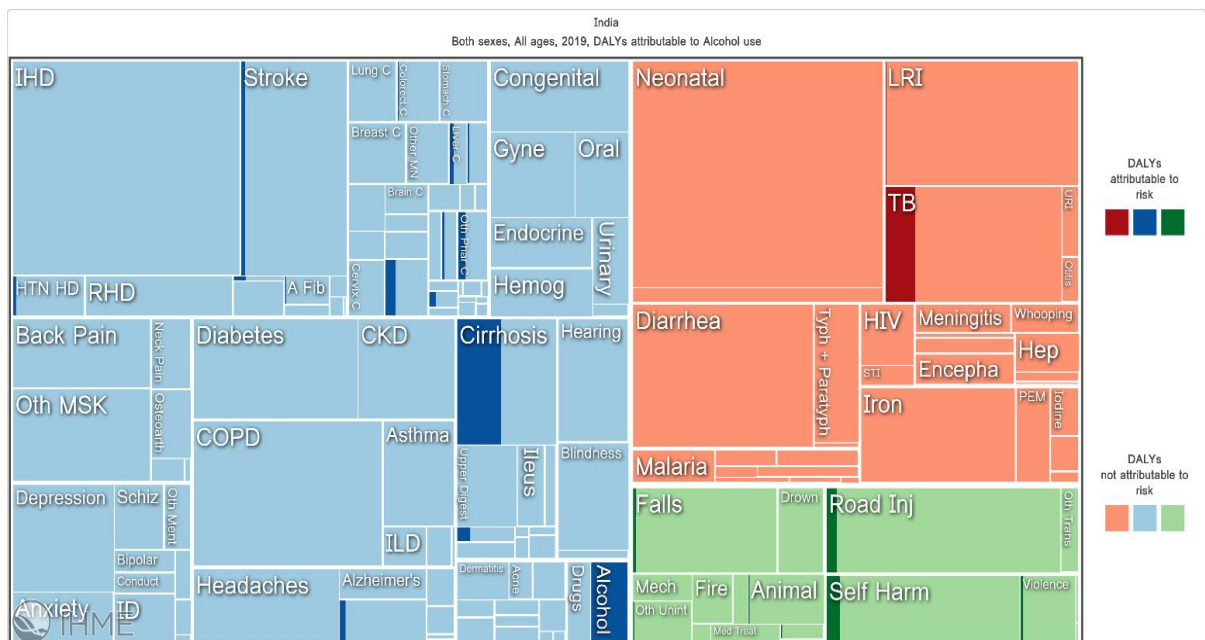
The study also assessed the deaths and DALYs directly attributable to alcohol use in India for various diseases. According to the 2019 study, the risk factor attribution for deaths attributable to alcohol use was 43.28 percent for cirrhosis and other chronic liver disease, 16.81 percent for tuberculosis (TB), 7.57 percent for self-harm, 4.74 percent for road injuries, and 3.8 percent for stroke (see Figure 1). Similarly, the figures for DALYs attributable to alcohol use were 44.9 percent for cirrhosis and chronic liver disease, 17.27 percent for TB, 7.04 percent for self-harm, 4.66 percent for road injuries and 4.41 percent for stroke (see Figure 2)

Figure 1 Both sexes, All ages, 2019, Deaths Attributable to Alcohol Use. Reprinted from ‘GBD Compare,’ by IHME, 2019, Retrieved from <https://vizhub.healthdata.org/gbd-compare/>. Copyright 2019 by Institute of Health Metrics and Evaluation



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Figure 2 Both sexes, All ages, 2019, DALYs Attributable to Alcohol Use. Reprinted from ‘GBD Compare,’ by IHME, 2019, Retrieved from <https://vizhub.healthdata.org/gbd-compare/>. Copyright 2019 by Institute of Health Metrics and Evaluation



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These health indicators, along with the issues related to alcohol prohibition policy discussed in Chapter 2, creates a compelling case for studying the prevalence of alcohol consumption based on various socio-economic and demographic characteristics within India.

Previous prevalence-based studies have largely focused at identifying groups of Indian population that was largely affected by alcohol consumption and that what policy measures that could be useful to reduce the alcohol consumption among these groups. These studies have typically estimated the prevalence based on income, education, occupation, social category, religion, sector, and location in addition to reasons to initiate drinking and frequency of drinking. One limitation of these studies is that they were often restricted to specific part of the country, such as district, region, or state. This limited scope creates a research gap when it comes to estimating country-level/state-wise prevalence of alcohol consumption by various socio-economic and demographic indicators. The objective of Section 3.2 within this chapter is to fill this specific void. In particular, the chapter examines the prevalence of alcohol consumption in various states of India using the latest available data (in the public domain) such as, the National Sample Survey Office (NSSO) round 68 and National Family Health Survey (NFHS) round 4 data. Each of these datasets also have its own limitations which will also be discussed subsequently.

The existing literature on alcohol in India has mostly focused on either descriptive statistics or econometric analysis based on means. However, considering the type of good alcohol, it is likely that the prices and income may have a differential effect based on the levels of consumption. Depending on the type of alcohol, the degree of consumption may also vary. It can be expected that lower level of alcohol consumption is associated with higher price elasticity and contrarily higher level of alcohol consumption is associated with lower price elasticity reflecting the addictive nature of the alcohol among heavy drinkers.

To analyse this possibility, Section 3.3 of this chapter conducts statistical analysis across the entire distribution of alcohol quantity consumed by the drinkers. To the best of the authors knowledge, very few studies in India (may) have presented this aspect of alcohol consumption and yet it is highly relevant, as policymakers are interested in questions regarding the impact of prices/taxes on heavy drinkers compared to light and moderate drinkers. Such an analysis also caters to an important policy question on revenue aspects of the state governments considering whether alcohol acts like a normal good across different consumption quantiles.

Therefore, this chapter addresses a critical research gap by analyzing households of alcohol consumers, taking into account that “the price and income elasticity can vary over quantiles (based on quantity of alcohol consumed).”

The analysis in the chapter is divided into two sections - Section 3.2 presents detailed descriptive analyses of the prevalence of alcohol consumption by states in India and the Section 3.3 deals with regression analyses (based on consumption quantity quantiles) for the households with alcohol consumers. Each of these two sections have been supplemented with the relevant literature (on the topic) to set the tone for the analysis. The final section (Section 3.4) of this chapter presents the discussion and conclusion.

3.2 Descriptive Study

The descriptive study presents the estimates of prevalence both at the household level and at the individual level using NSSO round 68 and NFHS round 4 data respectively. Additionally, individual level prevalence using IHDS I and II data is presented in the Appendix of this chapter. The descriptive study is based on the analysis at the state-level of India. The prevalence estimates projected for respective state (population/household) presents a detailed characteristics of alcohol consumption by various groups and sub-groups and presents a preliminary assessment about factors that are likely to influence drinking among Indian households and population.

To acquire understanding from the prior findings and to serve as a guide for anticipated results, a quick overview of the pertinent descriptive statistics literature is presented below.

3.2.1 Background Information and Justification of the Descriptive Analysis

3.2.1.1 Prohibition in Delhi

At the instance of the planning commission, the Delhi School of Social Work conducted a survey to understand the socio-economic background of the drinkers in Delhi. It was found that the age group of 30-39 was more pronounced among Country Liquor Shop Group¹⁹, Foreign Liquor Shop Group²⁰ and Men in Slums²¹. Based on educational status foreign liquor

¹⁹ Six hundred drinkers who purchased their drinks from two licenced country liquor shops on Bela road and Pusa road were interviewed.

²⁰ The Excise Commissioner’s Office provided a list of 1000 persons who purchased drinks from various licenced foreign shops in Delhi. However, only 91 persons were interviewed.

²¹ Two hundred male drinkers from slum areas of Valmikiwara, Timarpur area, Ihata-Mir-Bhikari and Delhi Gate were interviewed.

was mostly the preference of high school and college-educated individuals. Country liquor was mostly consumed by illiterates. By marital status, the majority of Country Liquor Shop Group were married with 85.17 percent whereas single share was only 9.83 percent. Similarly, for the Foreign Liquor Shop Group, the share of married was 70.25 percent and the share of single was 27.50 percent. In terms of occupation, people from private service had the largest share among drinkers whereas people from government service had the lowest share. The majority of men drinkers were the head of the family and very few women heads consumed alcohol. The smallest family size (1-3 Members) and the largest family size (10 & above) had a lower share among drinkers compared to the family size of (4-6 members) and (7-9 members). Country Liquor was mostly consumed by income group with less than Rs 500 per month and for Foreign Liquor it was mostly income group greater than Rs 500 per month. By age of initiation, it was age group 20-29 which had the largest share and by reason encouragement from a friend was found the major reason for initiation (Planning Commission, 1964)

3.2.1.2 Alcohol Consumption in Karnataka

In the year 1975-76 Institute for Social and Economic Change conducted a sample survey on the households of the state of Karnataka to measure the socio-economic impact of drinking. The study found that drinking habit was more in the rural households compared to the urban households. By religion consumption was highest in Christians, followed by Hindus and Muslims. By caste, it was the backward caste that consumed more than the forward castes. In terms of occupation, it was agricultural labourers and manual labourers that consumed more than other occupations. In the rural areas, illiterate people who drink were higher in number whereas in urban areas the consumption was more common in the technical and professional jobs. The most preferred time to drink was after work. Indian Made Liquor (IML) and Foreign Liquor (FL) was preferred by higher income group people whereas low-level income people preferred toddy and arrack. It was found that the strain of work was the dominant reason for the consumption. The per capita income was lower in drinking households compared to non-drinking households. The drinking households also showed a higher per capita borrowing (Thimmaiah, 1979)

3.2.1.3 NIMHANS study on India

The National Institute of Mental Health and Neurosciences (NIMHANS) conducted a survey with a sample of 3258 individuals to assess the burden and socio-economic impact of alcohol use in India. The sample was drawn from four different populations of rural, town,

slum and urban areas with the age group of 16 to 60 years. The study found nearly 33 percent adult population and 2 percent of women regularly consumed alcohol. Low levels of education, married, income less than Rs 6000, employed as skilled and unskilled workers and coming from middle age group had the largest share of alcohol users. The study found increasing use of alcohol in lower and middle-income segments of society. Binge drinking was reported around 40 percent and pathological drinking was reported around 25 percent (World Health Organization. Regional Office for South-East Asia, 2006)

3.2.1.4 IARD Study on five states of India

More recently International Alliance for Responsible Drinking (IARD) supported a survey on alcohol consumption. They conducted 6088 in-person interviews across the five states namely Andhra Pradesh, Kerala, Maharashtra, West Bengal and Madhya Pradesh. The survey found 39 percent of survey respondents were current drinkers of which 91 percent of current drinkers were male and 9 percent were females. The urban areas had a higher prevalence of current drinkers (45 percent) compared to rural areas (35 percent). The highest prevalence of current drinkers was found in Andhra Pradesh (47 percent) and the lowest in Maharashtra (28 percent). The per capita level of pure alcohol consumed over the past 12 months by the current drinkers in five states was 11.9 liters. Of all the age groups, the age group of 46 and 54 consumed the most alcohol (IARD, 2018)

Apart from these studies, several epidemiological surveys focused on alcohol consumption reported the extent, pattern and socio-economic aspects of alcohol consumption. NFHS, DLHS and NSSO consumption expenditure also reports the prevalence of alcohol consumption and patterns of alcohol consumption. However, these reports are general with limited information and do not provide any detailed analysis on the topic of alcohol consumption and associated socio-economic characteristics. The next section deals with the data and method which is then followed by the analysis.

3.2.2 Data and Method

The descriptive study presented in this section deals with specific questions on prevalence of alcohol consumption by various groups. One of the important groups is the states of India. Prevalence measured by this group is important as any legal decision including prohibition is pejorative of individual state in India. The other important sub-groups that has effect on alcohol consumption is household/individual's- religion, social category, income,

wealth and occupation. The estimated prevalence figures in this chapter will give a broad overview of issues about the prevalence of alcohol intake by socio-economic and demographic characteristics/factors. These estimations will eventually aid policy makers to gauge the current situation on alcohol prevalence and can further help them to take initiatives to control the excessive liquor consumption among specific social groups or characteristic group (like people who are poor/below poverty line etc.)

The secondary data source available for analyses on alcohol consumption is NSSO (National Sample Survey Office), IHDS (India Human Development Survey), NFHS (National Family Health Survey) and DLHS (District Level Household Survey). Each of these data sources has its advantages as well as limitations. The NSSO dataset provides household level data sets and is available till the year 2011-12. This data-set includes data on monthly per capita consumption expenditure allowing estimates to be presented by income groups. To gain insights at individual level NFHS data-set is useful and is available for the recent year 2015-16. Estimations using the IHDS data is not presented in the main text considering its overlapping year with NSSO Consumption Expenditure round 68 (2011-2012)²². First, we shall discuss the estimates using the NSSO data and later on we will focus on the analysis using the NFHS data.

3.2.2.1 The NSSO Data

The information collected by NSSO includes the socio-economic and demographic characteristics of the household and the expenditure on various items in the household. The survey collects both the quantity as well as the value of the product consumed. In the case of alcohol, along with quantity and value, the type of alcohol consumed is also collected. This allows estimating consumption characteristics based on prevalence, quantity and expenditure on alcohol for the country as well as for the states.

In terms of method used to estimate the prevalence, NSSO type-2²³ data on consumption expenditure round 68 is utilized. The household characteristics is obtained from block 3 and the individual characteristics is obtained from block 4. The question relating alcohol²⁴ consumption is obtained from block 5. Each block is merged to retain relevant

²² However, IHDS data has the advantage of developing a panel as most of the households interviewed in round one (2004-05) were re-interviewed in IHDS round two (2011-2012)

²³ Type 2 data provides figures based on weekly consumption thus reducing the recall bias.

²⁴ The data source also includes question on home production. However, the data has limited response making is difficult for analyses

information on socio-economic characteristics and alcohol consumption characteristics. The household who reports to consume any type of liquor/alcoholic drink is coded as 1 and the rest as 0. The prevalence is then estimated at state and sector level using the specification of sampling design and the associated sampling weight/multiplier as provided in the NSSO dataset. The Tendulkar committee reports the Monthly Per Capita Expenditure (MPCE) levels for each state allowing a household to be marked poor or non-poor based on the levels of MPCE of the household. The differentiation created by these markings is utilised for the estimation of prevalence based in poverty lines of individual states.

3.2.2.2 Limitations of the NSSO data

There are certain limitations the NSSO data faces in terms of analyzing the prevalence and demand for alcohol consumption. The most important limitation for the analysis is the non-availability of the latest round of NSSO conducted in the year 2017-18.

Apart from this major limitation, there are additional limitations based on the structure of data collected in terms of alcohol consumption. The NSSO collects data for the household which firstly limits the study only at the household level²⁵. Secondly, the NSSO excludes slum dwellers, migrant workers and households which move over the period (e.g., certain groups of tribal community) leading to lower estimates of prevalence²⁶

The data limitation also includes under-reporting in the alcohol prohibited areas due enactment of the prohibition policy. Considering the illegal nature of alcohol in the alcohol prohibited areas the households are likely to withheld the appropriate information on their characteristics of alcohol consumption. This can further be compounded by the fact, “who was interviewed in the survey (women vs men)” in the prohibited areas.

Additionally, the individual self-reports during the survey are more likely to provide better estimates considering the nature of good alcohol is. However, the NSSO surveys collect data at the household level and if the questions were answered by females, then she is less likely to know details about the drinking habits of males in the households, eventually projecting the prevalence lower than the actual estimates. The underreporting may also be

²⁵ An alternative to this is the NFHS data. However, this data source is pre-dominantly a health survey and does not include consumption expenditure.

²⁶ Considering the nature of their work and the lifestyle of these groups one may expect higher participation and consumption in these groups and non-inclusion of these groups of households is likely to underestimate the actual participation and consumption of alcohol.

caused by the stigma associated with alcohol use in some segments of Indian culture, which could result in less accurate reporting of alcohol participation and consumption levels²⁷.

Finally, the timing of the survey also becomes important as alcohol consumption during the festival months can inflate the estimates (but these are small portion of the year). Taking these factors into account we can consider the level of participation and consumption is the lower bound and not the actual levels of participation and consumption.

3.2.2.3 The NFHS Data

The NFHS/DHS collect data on reproductive health, nutrition, fertility, mortality, marriage, marriage and HIV/AIDS. The NFHS-4 sample was designed to provide estimates at the district, state and national levels. However, estimates of indicators of tobacco and alcohol consumption of adults, can be estimated at the state and national level only²⁸. The subsection on NFHS data analysis (section 3.2.4) is devoted for estimating the percentage of men and women who drinks alcohol among the particular age groups 15 to 54 and 15 to 49 at the state-level. One advantage that NFHS 4 survey has over NSSO survey is that it collects the data separately for men and women. This allows estimation at the individual level for men and women separately which was otherwise masked in the NSSO household level survey.

In terms of method used to estimate the prevalence using NFHS 4 data, the estimation strategy involves the usage of male recode file for men and individual recode file for women. The survey includes question to check if a person drinks any type of alcohol. After feeding the sample design and the associated weights²⁹ into the statistical software, the estimates for the prevalence at the state level is measured.

3.2.2.4 Limitations of the NFHS data

One significant drawback of NFHS data is its lack of information regarding the amount of alcohol consumed, as well as the absence of data on individual spending on liquor or inquiries about the prices of the alcohol consumed. Consequently, it is impossible to estimate

²⁷ The upper caste Indians and Brahmins are more likely to withheld information on their consumption characteristics compared to scheduled castes and scheduled tribes. However, modernization may have impacted the upper caste groups and some groups especially belonging to Marshal groups can be open about reporting their consumption in the first place.

²⁸ Additionally, infant and child mortality, HIV/AIDS, women empowerment and gender-based violence can be estimated at state level only.

²⁹ The weight is required to be divided by 1000000

consumption levels using any of these factors. Furthermore, the household's income is not assessed, making it impractical to conduct analyses based on income³⁰.

3.2.3 Analysis on States of India using NSSO (2011-12) Data

The pattern, extent and socio-economic characteristics of drinking in various states in India at the household level are discussed in this sub-section. Following are some important observations from the estimates.

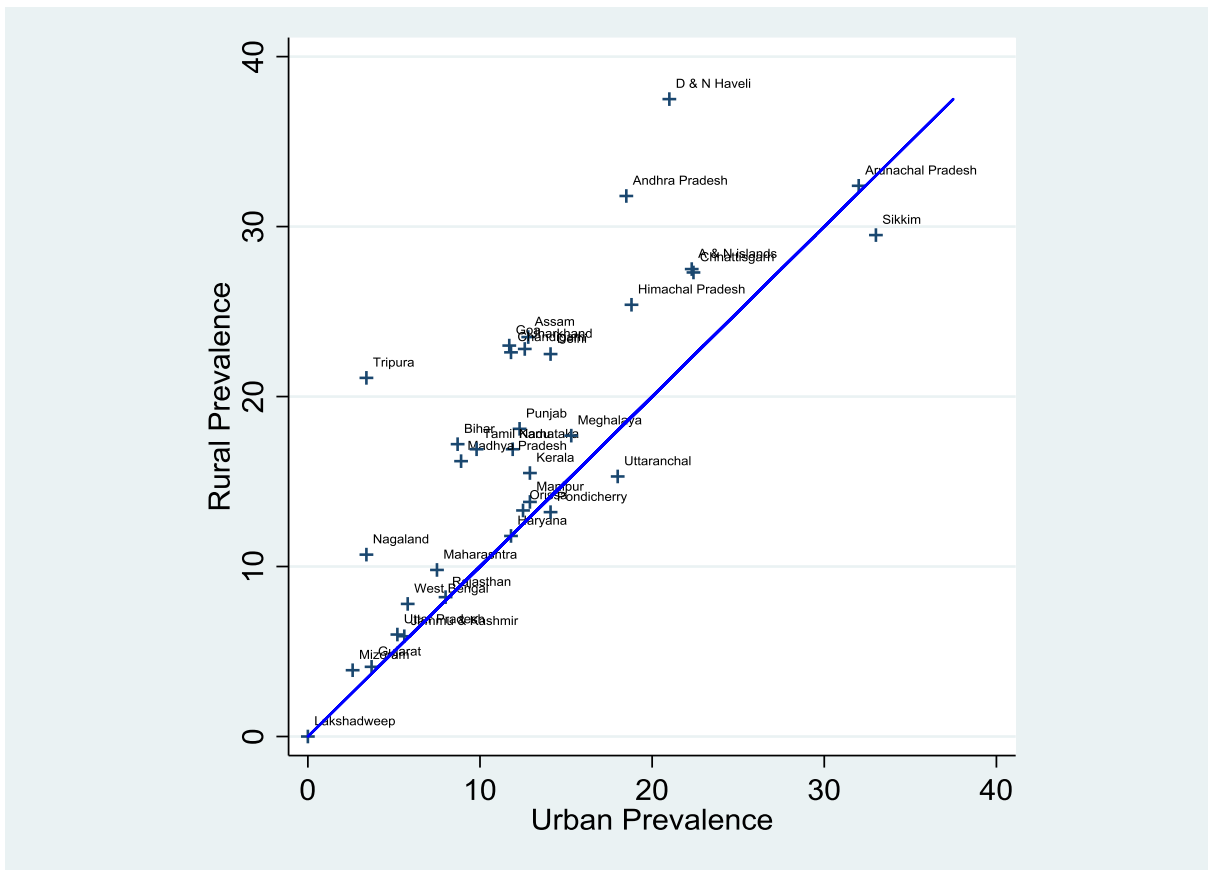
- 1) Prevalence among households is lower in liquor prohibited states of India.
- 2) Prevalence among households in Rural sector is higher than in Urban sector in most of the states of India.
- 3) Prevalence in Poor (as defined by Tendulkar's Committee report) is less than non-Poor in most states of India, this also remains true for the lowest quantile of income (which includes bottom 20 percent of households of that individual state).
- 4) Indian type liquor is more common in lowest two income Quantiles Q1 and Q2 among the drinking households.
- 5) Prevalence among scheduled tribes is observed to be highest in most states of India and by religion, followers of Islam show lower prevalence than any other religion.

In terms of prevalence based on prohibition the state of Gujarat (3.9 percent) shows lower prevalence compared to the surrounding wet states namely Maharashtra (8.73 percent), Rajasthan (8.12 percent) and Madhya Pradesh (14.27 percent). Moreover, the union territory of Lakshadweep which is under prohibition reports no prevalence of alcohol consumption (see Appendix Table 3.5.1.1). Similarly, in the alcohol prohibited state of Mizoram the (reported) prevalence is much lower than the other north-eastern states. The other prohibited state Nagaland also reports lower prevalence compared to wet north-eastern states of India (see Appendix Table 3.5.1.1). This suggests either the benefit of prohibition policy to reduce the demand for liquor or the possible under reporting in the prohibited areas or both.

In terms of prevalence among households by sector, the estimated prevalence is higher in rural sector compared to urban sector in most states of India. A few exceptions to this are states of Haryana, Sikkim and Uttaranchal. (see Figure 3)

Figure 3 Prevalence of Drinks among Households by State and Sector

³⁰ However, the NFHS survey does measure wealth index which can shed lights on prevalence by wealth.



Note: Author's estimation using unit level data on consumption expenditure from the NSSO's 68th round (type 2). Weights based on sampling design were applied to estimate the prevalence.

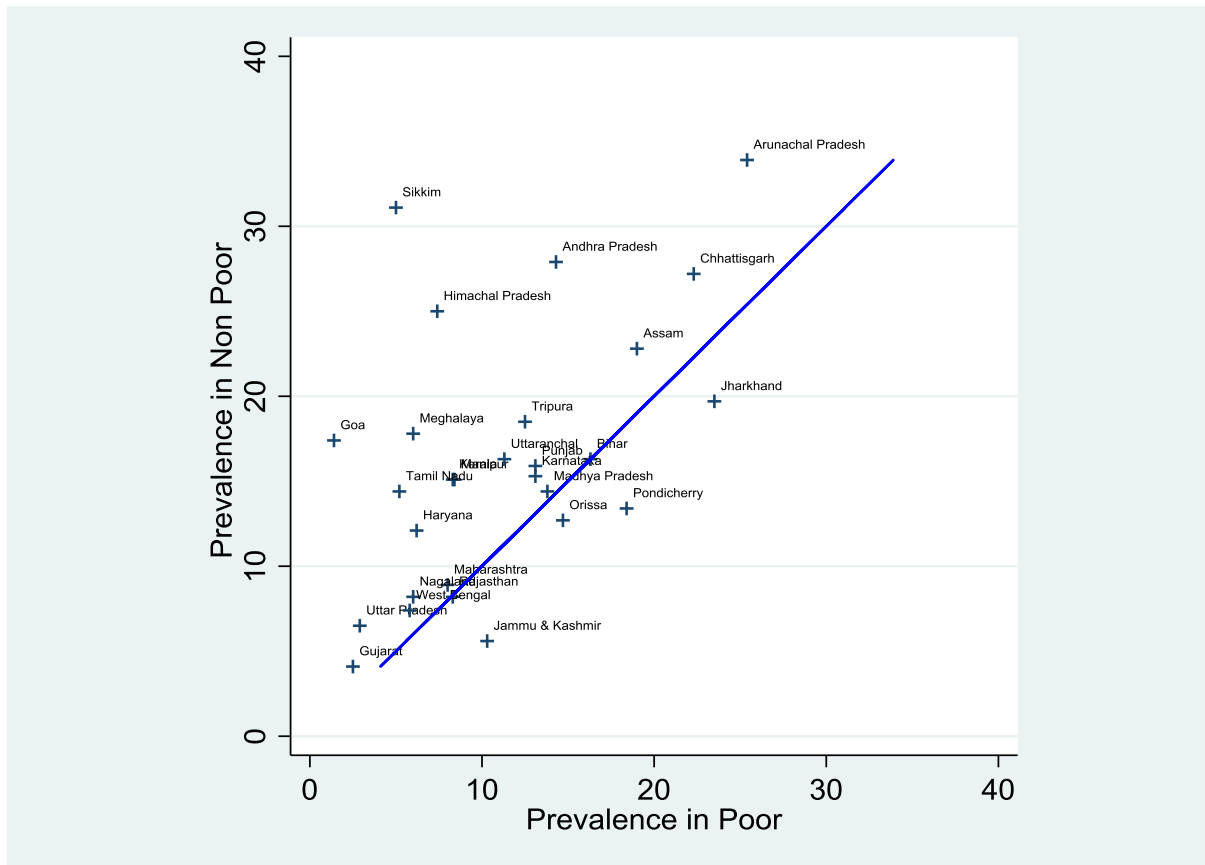
During the pre-independence period it was claimed that, “poverty is one of the major reasons for alcohol consumption” and so it is accepted even today as a general perception. However, studies on this topic are not to be found or are very limited. Hence the prevalence patterns of the poor and non-poor populations are explored. The poor household is considered to be the one whose MPCE is measured to be below the poverty line of that particular state. The estimates of poverty line are taken from of the Tendulkar Committee report estimates for the individual states³¹.

The state-wise estimates suggest the proportion of alcohol drinking households are less in poor (below poverty line) compared to non-poor (above poverty line). If we consider no amount of alcohol consumption is safe for consumption, then alcohol is more of a problem to the non-poor (above poverty line) households compared to the poor households of India. In the

³¹ The committee estimates the percentage of poor in India has reduced from 45.3 percent in 1993 to 21.9 percent in 2011-12. For the year 2011-12, the national poverty line for urban areas was Rs. 1000 per capita per month and Rs. 816 per capita per month in the rural areas using mixed reference frame.

prohibited state of Gujarat, the non-poor has more percentage of drinking households (4.1 percent) than poor households (2.5 percent). This remains true also for the rural and urban sectors of Gujarat. In the state of Nagaland as well the non-poor has more percentage of drinking households (8.2 percent) than poor household (6 percent) (see Figure 4).

Figure 4 Prevalence of Drinks among Households by States and Poverty (below and above poverty line)



Note: Author's estimation using unit level data on consumption expenditure from the NSSO's 68th round (type 2). Weights based on sampling design were applied to estimate the prevalence.

Additionally, to understand the relationship between income/expenditure with alcohol consumption in households, the monthly per capita expenditure was divided into 5 Quantiles. The percent of the household belonging to a particular Quantile which drinks is estimated at the state level. The estimated results suggest there were only three states and one union territory namely Jammu & Kashmir, Jharkhand, Orissa and Pondicherry where the percentage of dinking households belonging to the lowest Quantile Q1 is higher than any other Quantiles. This analysis further emphasizes that alcohol prevalence is found less commonly in the lowest income/expenditure Quantile than any other Quantiles (see Appendix Table 3.5.1.2)

The estimation on the percentage of Indian type liquor group (toddy and country liquor consumer households) by income Quantile suggest consumption of Indian type liquor is more common in lowest two Quantiles Q1 and Q2 among drinking households, and it goes on reducing from Quantile Q3 to Quantile Q5 at the national level. In the prohibited state of Gujarat, most of the households in the income/expenditure Quantiles Q1, Q2, Q3 and Q4 prefer Indian type liquor however the income/expenditure Quantiles Q5 household prefer the foreign type liquor (wine or beer or Indian made foreign liquor (IMFL)) (see Appendix Table 3.5.1.3). One plausible reason for higher prevalence of Indian type liquor among lower income households can be increased costs to obtain the foreign type liquor which is already much costlier than the Indian type liquor.

In terms of social category, the scheduled tribes have the largest percentage of alcohol drinking households in most states including the alcohol prohibited state of Gujarat (10.6 percent households) suggesting cultural affinity of scheduled tribes towards alcohol. The “Others” category has the largest percentage of alcohol drinking households only in the state of Goa and the National capital Delhi, this perhaps suggests acceptance of western norms and lifestyle among the households belonging to “Others” category (see Appendix Table 3.5.1.4). Among the three major religions found in India, households following Christianity is estimated to have the largest percentage of alcohol drinking households whereas households following Islam is estimated to have the smallest percentage in most of the states. This advocates the plausible impact of religion on the Indian households (see Appendix Table 3.5.1.5).

By occupation of the household head, the households that consume alcohol mostly come from occupation Group789 (craft and related trades workers, plant and machine operators and assemblers, elementary occupations) in most of the states/union territories including alcohol prohibited Gujarat, Nagaland and Mizoram (see Appendix Table 3.5.1.6). This perhaps suggests the effect of complex combination of strenuous physical effort and other socio-economic factors.

3.2.4 Analysis on States of India using NFHS (2015-16) Data

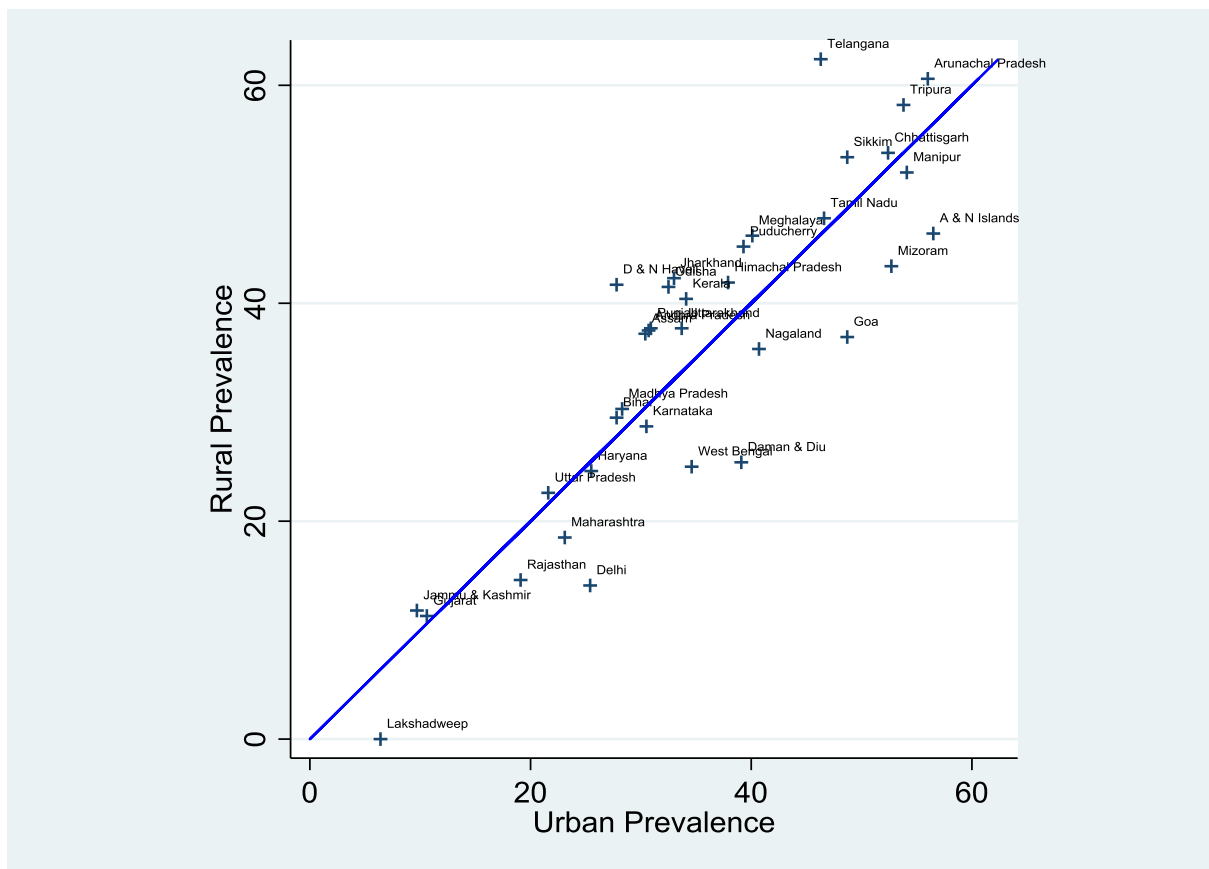
The following are a few important observations based on the estimates using unit-level NFHS 4 data.

- 1) There is a higher prevalence in men compared to women.
- 2) By personal habit among the drinkers, the share of the “everyday drinkers” is the lowest for men in the 15 to 54 age group in most of the states.

- 3) Higher educated men (age group 15 to 54) have a larger percentage of sobriety compared to less educated or no educated men.

The estimated results using NFHS 4 data suggests higher prevalence among men as compared to women (see Appendix Table 3.5.1.7 & Table 3.5.2.1). The lower prevalence among women can also be indicative of social stigma attached to women consumption of alcohol in India apart from their personal preferences. The rural and urban prevalence in men presents a balanced picture between states of India. (see Figure 5)

Figure 5 Prevalence of Drinks among Men by State and Sector

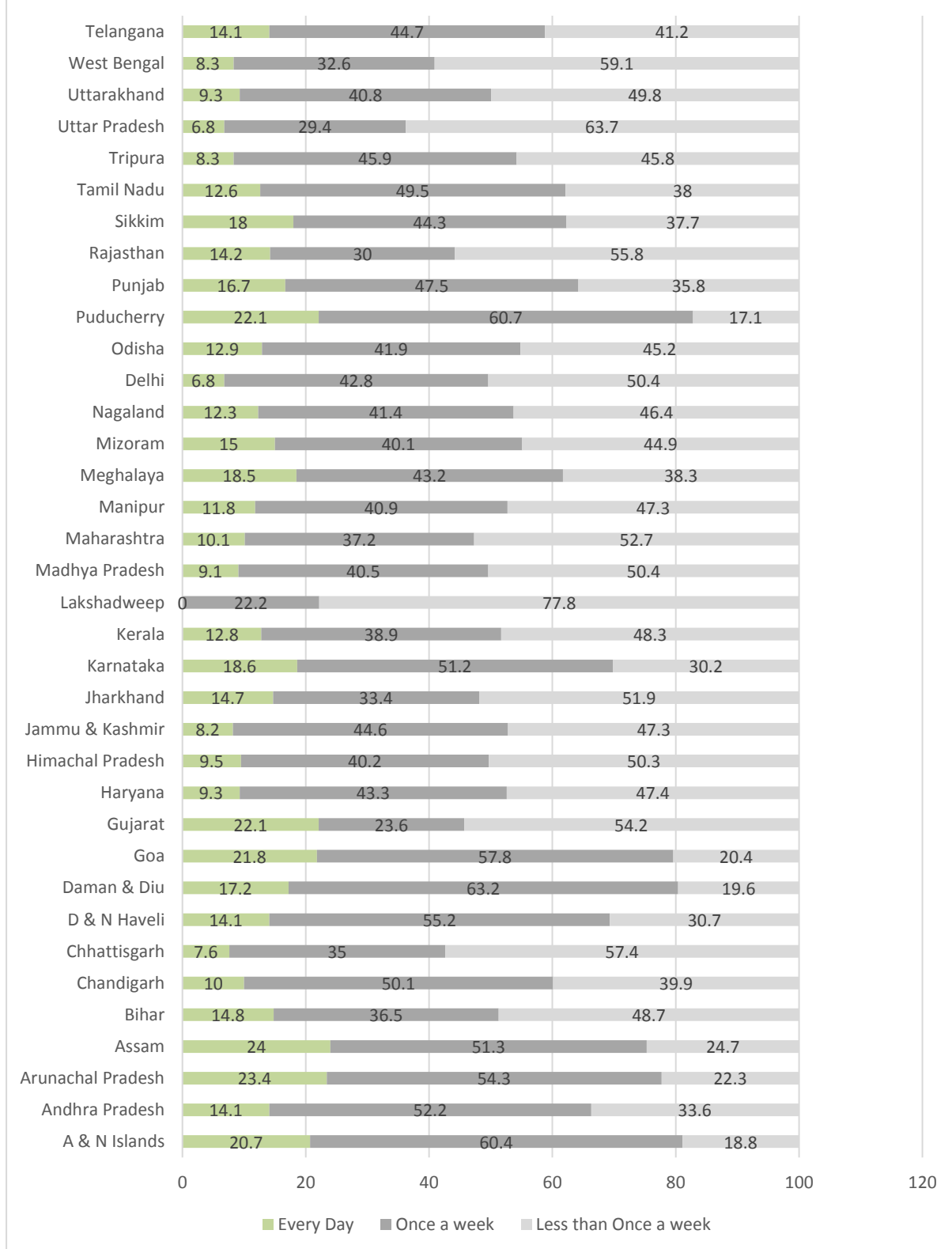


Note: Author's estimation using unit level data of NFHS 4. Weights based on sampling design were applied to estimate the prevalence

By personal habit among the drinkers, the share of the everyday drinkers is the lowest for men in the 15 to 54 age group in most of the states (see Figure 6).

Figure 6 Prevalence of Drinks among Men by Habit among Drinkers

Prevalence of Drinks among Men by Habit among Drinkers



Note: Author's estimation using unit level data of NFHS 4. Weights based on sampling design were applied to estimate the prevalence.

The general trend in most states is that higher educated men (age group 15 to 54) have a larger percentage of sobriety compared to less educated or no educated men. The estimates from the alcohol prohibited state of Gujarat suggests higher educated people prefer to remain sober, however, those who consume alcohol prefer the foreign type of liquor. This is in contradiction for men with no education as men with no education prefer to consume the Indian type of liquor over the foreign type of liquor in the state of Gujarat. Contrarily, the estimates for Nagaland suggests men prefer to consume foreign type liquor over Indian type liquor. Moreover, estimates from pre-prohibition Bihar suggest preference for Indian type of liquor goes on decreasing with higher attainment of education by men of Bihar (see Appendix Table 3.5.1.8, Table 3.5.1.9 & Table 3.5.1.10)

Religion-wise men who follow Islam are the least who consume alcohol. However, variation can be observed by individual state. In most of the states, men following Christianity has the largest percentage of drinkers (see Appendix Table 3.5.1.11). By social category men belonging to the “Other” category are mostly sober compared to any other category and men belonging to the “scheduled tribe” category have the largest share of drinkers. By preference, men belonging to the scheduled tribe category consume Indian type liquor in most of the states (see Appendix Table 3.5.1.12, Table 3.5.1.13 & Table 3.5.1.14)

There appears no clear order by wealth Quantile as in which Quantile has the largest number of sober men population. The preference of Indian liquor is mostly observed in first two wealth Quantiles- Q1 and Q2 (see Appendix Table 3.5.1.15, Table 3.5.1.16 & Table 3.5.1.17). In terms of occupation structure, the not working men are generally the lowest in the percentage of alcohol consumers in most of the states and “Skilled and Unskilled Manual Labourers” tend to have the largest share of alcoholics in most of the states (see Appendix Table 3.5.1.18)

3.2.5 Similarity in NSSO and NFHS Estimates

It is worthwhile to note similarities and contradictions observed in both the analyzed datasets. But it must be noted that the datasets are not directly comparable due to the following reasons.

1. Firstly, each dataset comes with different sample design along with different proposed objective.

2. Secondly, the NSSO data is at the household level and NFHS-4 data is at the individual level.
3. Thirdly, the estimation gets affected based on the person who responds in the interview (especially the case for NSSO data).
4. Fourthly, the fact that alcohol is considered as a vice by many may not only lead to distortion from actual figures but also add variability while comparing datasets.
5. Fifthly, for comparison of NSSO household level data with NFHS men data, we need to assume that if a household consumes alcohol, then it is most likely the male who is also the household head who consumes the liquor (this can be a plausible assumption considering women and younger children has very low prevalence in the Indian society).
6. Finally, based on type of questions asked and data analyzed, the only possible comparison that can be made is prevalence based on social category, religion and its intertwining in the state with alcohol prohibition policy.

In terms of prevalence in alcohol prohibited Gujarat, both the datasets assure that the reported prevalence in Gujarat is lower than the reported prevalence in the surrounding states of Rajasthan, Maharashtra and Madhya Pradesh. By social category it can be stated that in most states of India the reported prevalence of alcohol consumption is highest among scheduled tribe category this is closely followed by scheduled caste category with the other category having the lowest prevalence. A few contradictions to this observation is prevalence in southern states like Kerala, Karnataka and Tamil Nadu where prevalence among scheduled tribes is lower than scheduled castes. By religion the common finding is prevalence of alcohol among Muslims is lower in all the states of India when compared with Hindus. For the dry state of Gujarat, the pattern remains the same- religion-wise and category-wise (scheduled tribes shows highest prevalence and other category shows the lowest prevalence). Estimation using both the surveys also suggest that prevalence in prohibited state of Gujarat both category-wise and religion wise is lower than their counterparts in surrounding states of Maharashtra, Rajasthan and Madhya Pradesh.

After understanding the prevalence by socio-economic characteristics, we now deal with differential responses to the prices and income based on the method of quantile regressions.

3.3 Differential Response to Price and Income

The analysis of this type stems from the idea that low levels of alcohol consumption is less likely to be related to higher social costs compared to the high levels of alcohol consumption. Hence it is desirable to reduce the levels of alcohol consumption among heavy drinkers compared to the light drinkers (considering the external costs associated). The literature reviewed in the first chapter also suggests a few benefits of low and moderate drinking.

As noted earlier one way of achieving reduction in alcohol consumption is increases in taxes and hence the prices of alcoholic drinks. Formally, the theory suggests- higher the external costs and lower the price elasticity of demand, the greater the tax should be. Contrarily, for light drinkers, if the price elasticity of demand is high and the share of total alcohol consumed by them is large, then the tax associated should be low (Manning et. al., 1995). From the revenue perspective of the government the optimal tax is inversely related to price elasticity of demand, thus higher price elasticity suggests low tax (as optimal).

The literature review carried out does not suggest significant work dealing with the price elasticity of demand aspects of alcohol consumption for different levels/quantity of consumption. The lack of work in this area is likely due to alcohol studies are relatively low in the developing countries and secondly the method (like quantile regressions) requires higher computing power which could not have been possible in the earlier few decades. Moreover, Le Cook and Manning (2013) has encouraged using quantile regressions in present times citing “costs in time and effort has fallen to move beyond means”. Hence, this section tries to fill the research gap by providing an additional perspective on alcohol consumers response to prices as well as income (based on quantity consumed in a month by drinking households). This section contributes by conducting a separate analysis for the whole of India, the Southern-India and the state of Maharashtra.

3.3.1 Background Information and Justification of the Statistical Tools/Model

The quantile regression has been largely applied in empirical economics making a persuasive cause for going beyond the models for conditional mean. In labour economics important contribution has been from Chamberlain (1991) who finds a decline on the union wage premium from the first decile (15.8 percent) to negligible (0.3 percent) at upper decile. In demand analysis, Deaton (1997) studied Engel curves for food expenditure in Pakistan

where he finds that the median Engel elasticity (0.906) is similar to OLS estimate of Engel elasticity (0.909). However, the coefficient at the tenth percentile was 0.879 and that of 90th percentile was 0.94h.

One important study specific to demand of alcohol was conducted by Manning, Blumberg and Moulton in the year 1995. The study tries to explore if the price response to alcohol consumption has a constant slope and a constant elasticity, and hypothesises that demand for alcohol in heavy drinkers is less responsive compared to the light drinkers. The study makes use of a two-part model to separate the effect of decision of participation from the level of consumption. However, this method is used only for the robustness purpose. The Manning et al., (1995) study largely relies on quantile regression analysis to analyse the differential impact of prices on quantity of alcohol consumed. The study finds that both heavy and light drinkers are less price elastic than the moderate drinkers.

The study conducted by Saffer et al., (2012) used quantile regressions to estimate the differential impact of prices on quantities of past consumption. The study finds a decline in price elasticities from 10th quantile to the 90th quantile (insignificant results after 60th quantile). The study also finds, education reduces consumption and the effect of education increases as the past consumption increases. It was estimated that at 30th quantile an extra year of education reduces consumption by about 2 percent but at 80th quantile an extra year of education reduced consumption by much larger 7 percent. The income remains positive and significant from 10th to 70th quantile and decreases with increase in consumption.

In the recent times a study was conducted by Pryce et.al., (2018), using the United Kingdom data to estimate differential price and income elasticities across the drinking distribution. The price elasticity showed a falling trend with price elasticity of demand for alcohol being -0.71 for Q25 quantile and -0.18 for Q95 quantile. The income elasticity was found to be around 0.38 at 50th and 75th quantile whereas lower for 25th quantile and 95th quantile with 0.35 and 0.31 respectively.

Alternatively, Wagenaar et al., (2009) conducted a systematic review to examine the relationship of price/tax to consumption of alcohol. The study finds price/tax significantly affects heavy drinking with reported elasticity of -0.28.

3.3.2 Data and Methods

The data used in this analysis is based on the 68th round of the National Sample Survey-consumption expenditure conducted in the year 2011-12. The unique feature of the 68th round of NSSO is, there had been two types of schedule introduced which are type 1 and type 2 namely³². In the type 1 schedule the alcohol consumption related questions were asked on monthly consumption basis whereas in the type 2 schedule the same questions were asked on weekly basis. To the advantage of this research both rounds were used and type 2 round values were converted on thirty-day period basis³³. This allowed dealing with a larger sample of 167839 households for the data/regression analysis which was extremely useful in the case of analysis for the state of Maharashtra. However, it must be noted that this analysis faces with a couple of limitations. First, the NSSO does not collect original prices of different types of liquor and second the NSSO does not collect the actual income of the household as well. These constraints can be addressed by utilizing Monthly Per-capita Consumption Expenditure (MPCE) as the proxy for income and averaging the unit-values (total expenditure over total quantity of individual liquor consumed) over the villages or districts for the prices as utilized by Andrienko & Nemtsov (2005).

The dependent variable is the quantity of alcohol consumed in liters of each different type of liquor. The sample means suggests a 14 percent prevalence in the entire sample for any type of the liquor with the highest prevalence of country liquor with 7 percent. The full sample (All India) measures of around 270 ml of country liquor consumed by a household in a month which reaches to around 3.91 liters of average consumption among drinker households. The lowest average consumption among drinker household is observed in IMFL (1.78 liters) and highest in Toddy (12.32 liters) (see Appendix Table 3.5.3.1). The distribution of the dependent variables and their log transformation is presented in Appendix 3.6.4. The average prices for 1 liter of liquor at all India level is measured to be Rs 434.65 for IMFL, Rs 160.06 for country liquor, 52.15 for toddy and 137.97 for Beer for the year 2011-12.

The method used for the estimation is presented as follows.

³² This was earlier tried in the 66th consumption expenditure round of NSSO but due to extreme situation for the year 2009-10 the round was again conducted in the year 2011-12 as the 68th round.

³³ According to NSSO (2014) report on level and pattern of consumption expenditure 2011-12, Schedule Type 1 and Schedule Type 2 were canvassed in two independent samples of matching size drawn from each stratum/sub-stratum.

Koenker & Bassett (1978, 1982) proposed regression quantiles/quantile regression as an important tool (using linear programming approach) to develop a complete picture/richer characterization about the relationship between outcome variable(y) and the regressors(x) at different points in the conditional distribution of the outcome variable(y). This means that quantile regression allows to study the impact of covariates on any particular percentile of the distribution. The method allows for understanding the relationship between variables outside the mean. This method is appealing because of its semi-parametric nature, thus allowing relaxations of assumptions about parametric distribution of regression errors, making it more suitable for heteroskedastic data. The quantile regression also permits us to study both location and scale parameters of the model. Moreover, the quantile regression method is more robust to outliers and non-normal dependent variables as compared to the ordinary least square (OLS) method.

If e_i denote the model prediction error then OLS minimizes $\sum_i e_i^2$, the median regression minimizes $\sum_i |e_i|$ and quantile regression minimized the sum with asymmetric penalties for $(1-q) |e_i|$ overprediction and $q |e_i|$ for underprediction. The technique of quantile regression (linear programming approach) minimizes a weighted sum of the absolute deviations of the error term.

The q^{th} quantile regression estimator $\hat{\beta}_q$ minimizes over β_q the objective function

$$Q(\beta_q) = \sum_{i:y_i \geq x_i' \beta}^N q |y_i - x_i' \beta_q| + \sum_{i:y_i < x_i' \beta}^N (1 - q) |y_i - x_i' \beta_q|$$

where $0 < q < 1$, and we use β_q rather than β to make clear that different choices of q estimate different values of β . So, if q is greater than 0.5 (i.e. the quantile above the median) much more weight is placed on prediction for observations $y \geq x' \beta$ than for observations $y < x' \beta$. The value of q equal to 0.5 is a special case of median regression (least absolute deviation regression) that minimizes $\sum_i |y_i - x_i' \beta_{0.5}|$ (Cameron and Trivedi, 2009)

The quantile regression can also be accomplished using iterative weighted least squares. To estimate β_q for the q^{th} quantile the weights are $(q)/|r_i|$ and $(1-q)/|r_i|$ for the i^{th} residual being positive and negative respectively. Where r_i is the residual for the i^{th} observation.

Following Manning et al., (1995), quantile regression is employed at different levels of alcohol quantity consumed for those who consume and a Heckman sample selection model is used to check for robustness. The empirical specification includes price, income, education as the tier 1 (most important) predictors along with state fixed effects. The analyses are conducted based on twenty large states³⁴ of India without prohibited areas (i.e. excluding Gujarat and prohibited districts of Maharashtra namely Gadchiroli and Wardha). The analyses are conducted separately for Southern India³⁵ and the state of Maharashtra. In the analyses for state of Maharashtra the prohibited districts of Maharashtra were removed from the analyses.

The basic empirical specification for the analysis is presented as follows

$$1) \quad \ln Q_{id} = \alpha + \beta \ln X_{id} + \gamma Z_{id} + \ln P_{id} + \rho_r + \varepsilon_{id}$$

Where Q is a measure of alcohol quantity consumed by a household, X is monthly per-capita expenditure of a household, P is the price of alcohol, Z is a vector of household characteristics for household i in district d . Variable ρ is state/region dummy. The household characteristics include variables household size, gender of household head, education, follower of Islam, owns any land, sector and social category of a household.

The extended empirical specification for the analysis is presented as follows

$$2) \quad \ln Q_{id} = \alpha + \beta \ln X_{id} + \gamma Z_{id} + \ln P_{id} + \ln C_{id} + \rho_r + \varepsilon_{id}$$

The extended specification additionally includes prices of the possible complements and substitutes of the consumed alcoholic drink specified by C in the model. It must be noted that the estimated magnitudes of cross-price elasticities may not be similar considering the variation in sample size (i.e., drinker only sample) for each regression analysis. For e.g., the drinker households consuming country liquor at all-India level is 7 percent of the sample size whereas it is just two percent for beer and toddy each. Hence, while estimating the cross-price elasticities for country liquor drinkers we use 7 percent of the sample whereas we use only 2 percent of the sample while estimating cross price elasticities for beer or toddy drinkers.

³⁴ Large states include Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, and West Bengal. The total number of observations become 174,693 households.

³⁵ Southern India refers to states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu.

The rationale for variables in the empirical specification is based on the existing literature which suggest inclusion of

1. Social categorization SC-ST, since alcohol usage is a component of tribal tradition and Scheduled Caste does not view drinking as a vice;
2. Monthly per capita consumption expenditure (MPCE) (proxy for income) as income can affect both prevalence and quantity of alcohol consumed;
3. Islam, which forbids the consumption of alcohol;
4. Education, which can lower the prevalence and intensity of the consumption of addictive items. However, in our situation, we include the education of the household head into account due to NSSO's data collection restrictions. Higher education is predicted to have an impact on a household head's personal consumption as well as the participation and consumption of other family members (particularly in a nuclear family setting);
5. Owning land which may affect liquor consumption ambiguously (as it represents wealth for large farmers and for small, medium and marginal farmers peasants can consume addictive goods due to nature of their work);
6. Gender of household head is included, as women themselves have lower prevalence and this shall also include the cases of households with female head and separation from spouse (due to various reasons including death of spouse) and
7. Household size as it positively affects probability of participation as well as levels of consumption (i.e., with increase of household size). The definition of each of the independent variable is presented in Appendix 3.6.5.

The following section presents the estimated results for India, Southern India and Maharashtra separately.

3.3.3 Results

The results of quantile regressions for quantiles³⁶ 10, 25, 50, 75, and 90 is presented below using the basic specification. The results based on extended specification is presented in appendix for comparative purpose. First, the results for All India (major states excluding prohibited area) by liquor type- Country Liquor, Indian made foreign liquor (IMFL), Toddy and Beer is presented. This is followed by results for South India and finally results of Maharashtra is presented as a special case. Additionally, the generalized result based on ethanol content and basic specification is estimated for Indian type of liquor and foreign type of liquor

³⁶ The quantile 10, 25, 50, 75, and 90 is denoted with light, light to moderate, moderate, moderate to heavy and heavy levels of drinkers respectively. The convention is used for reference only.

separately. These results are presented in Appendix 3.6.8 and are indicative only. It can be noted that these results do not follow the similar trend over price elasticities for any of the individual liquor types³⁷.

3.3.3.1 Results (All India)

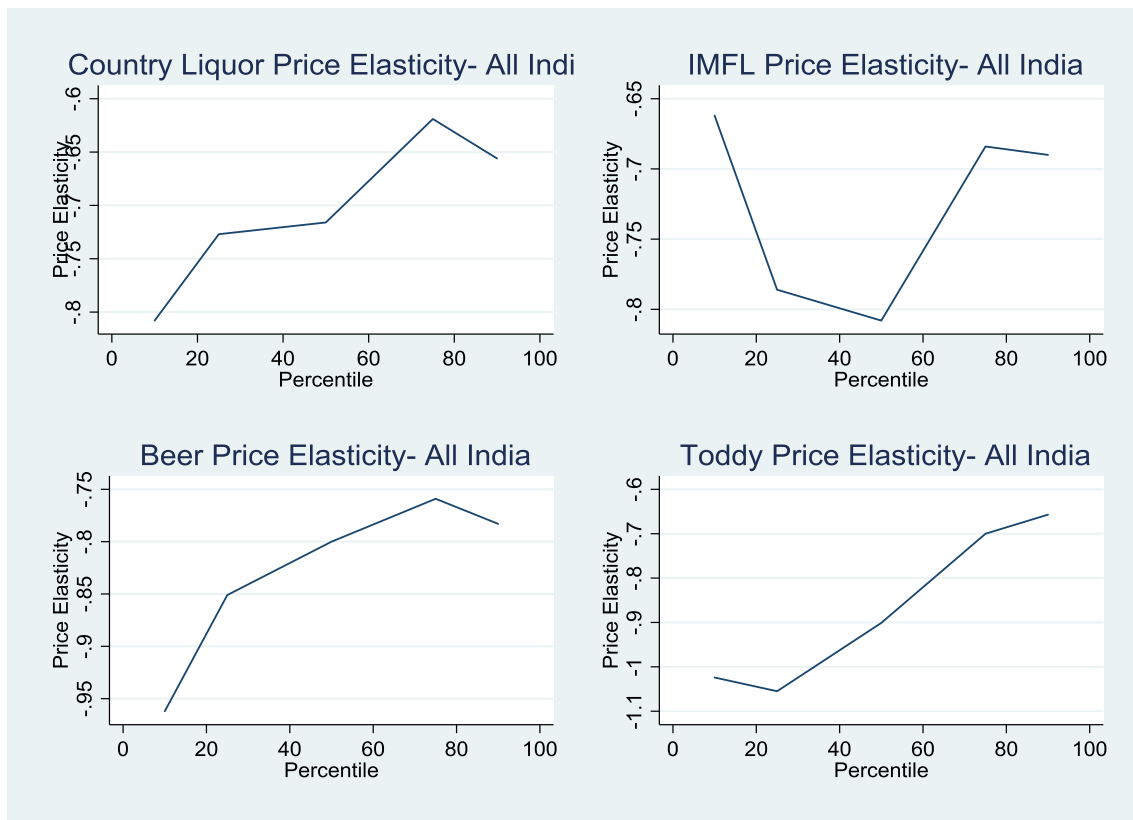
The findings based on basic model imply that individual pricing is significant and reduce consumption of each type of alcoholic beverage. Along with being statistically significant, income increases cause a rise in alcohol quantity consumed. Every extra household member increases quantity of alcohol consumed and compared to households where the household head is illiterate, those with higher levels of education have lower levels of alcohol consumption (see Appendix Table 3.6.1.1 - Table 3.6.1.4)

The price elasticity of demand for country liquor, toddy and beer shows higher elasticity for lower quantiles and lower elasticity for higher quantiles. Contrarily, the price elasticity of IMFL shows “U” shaped structure with lower price elasticity for lowest Q10 and highest Q90 quantile with higher price elasticity for Q25 and Q50 (see Figure 7). In terms of income elasticity, we observe increase in income elasticity with rise in income quantiles. (see Figure 8).

The coefficient on education levels suggest positive impact of education for controlling quantity of liquor consumption. In particular, the coefficients of Diploma and Certificate level education is estimated to be higher among moderate and heavy drinkers compared to the rest of the education levels including Graduate and Above Graduate level of education level.

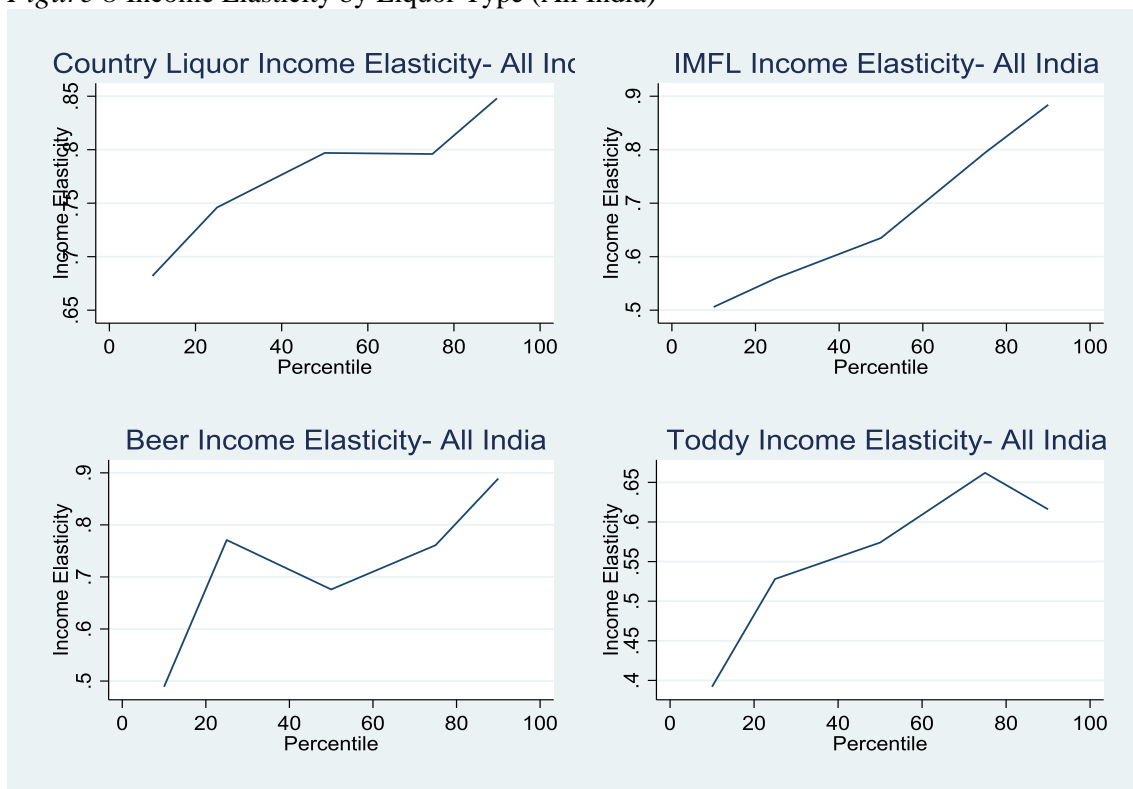
³⁷ The reason for that is likely to be 1) estimation based on ethanol (and not individual liquor), and prices based on proportion of consumption. i.e., in this case price elasticity is measured for toddy drinker ethanol content with country liquor drinker ethanol content and not just toddy drinker ethanol content. Some deviations can also be observed due to increase in sample size compared to individual liquor.

Figure 7 Price Elasticity by Liquor Type (All India)



Note: Author's estimation using quantile regressions on NSSO data

Figure 8 Income Elasticity by Liquor Type (All India)



Note: Author's estimation using quantile regressions on NSSO data

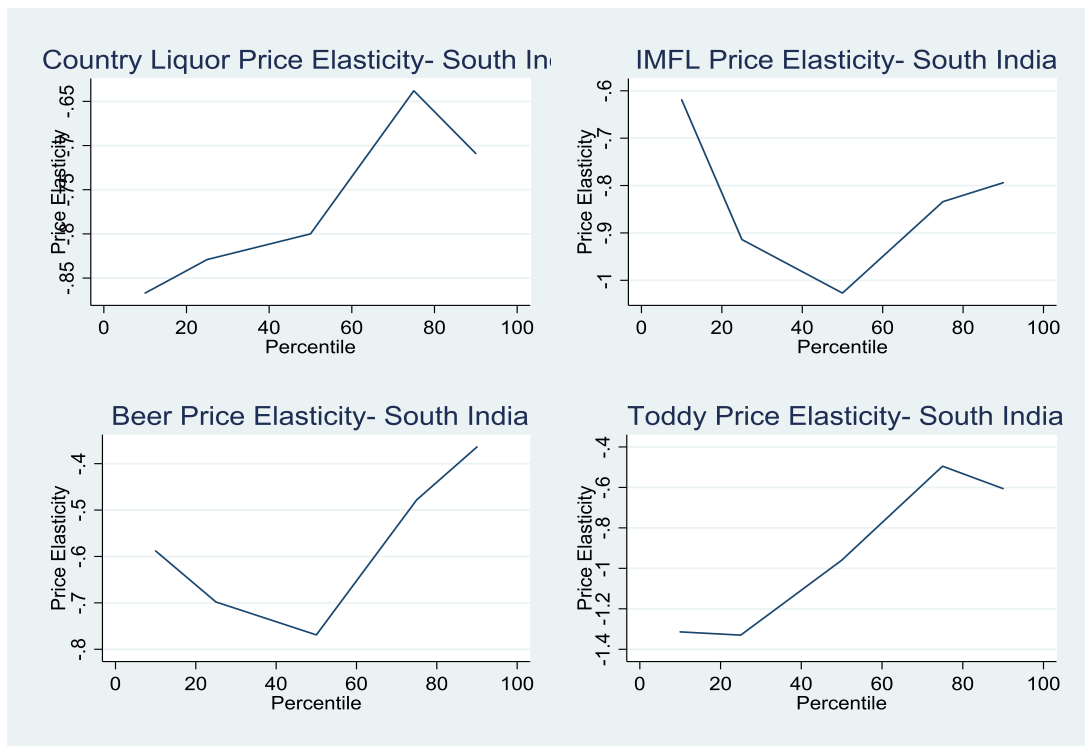
The results for price and income elasticity using extended specification shows similar trend for price and income elasticities (see Appendix Table 3.6.7.1 – Table 3.6.7.4 & Fig 3.6.9.3)

3.3.3.2 Results (South India)

The general findings correspond to the findings from All India. According to the results, pricing is significant and lowers consumption of each alcoholic beverage type. Income rises also result in a statistically significant increase in the amount of alcohol drunk. Compared to households where the household head is illiterate, those with greater levels of education had lower levels of alcohol intake in general, and every additional household member increase alcohol consumption in quantity (see Appendix Table 3.6.6.5 – Table 3.6.6.8)

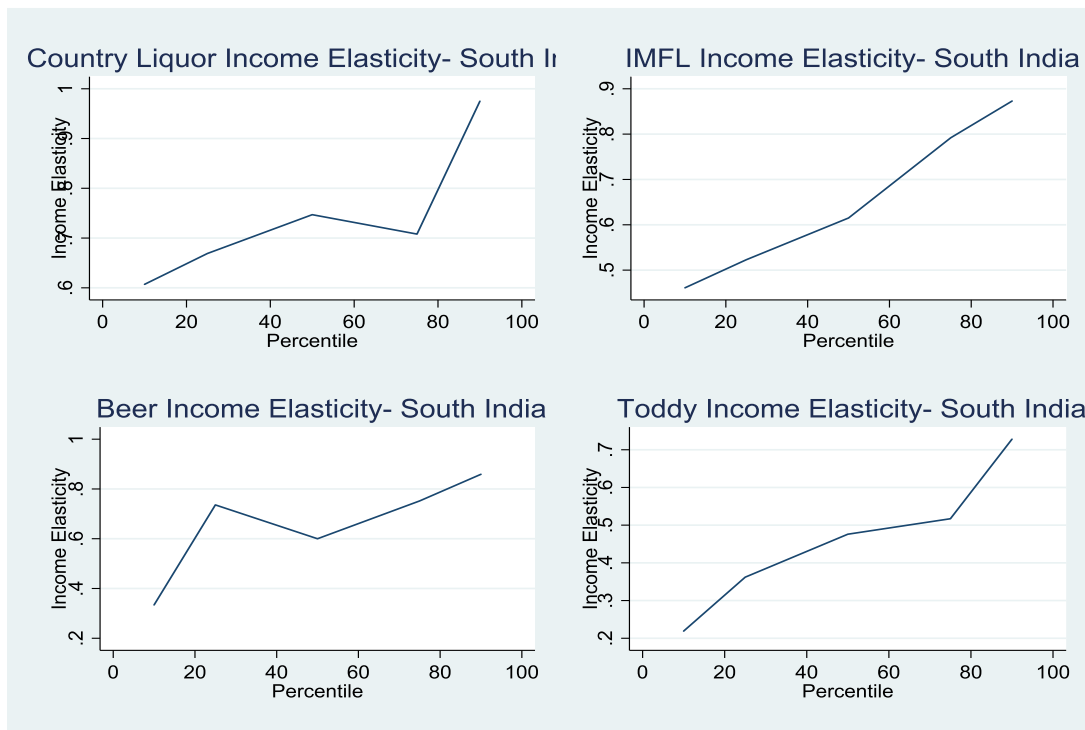
The price elasticity follows “U” shaped pattern over the quantiles suggesting higher price responsiveness in quantile Q50 for IMFL and Beer. The country liquor and toddy show lower price elasticity for higher quantiles Q75 and Q90 compared to the lower quantiles. This suggests that effect of prices is lower for those consuming higher levels of country liquor than those consuming lower levels. Alternatively, heavy drinkers (q90) can be considered as less price elastic/sensitive (see Figure 9). The income is found to be monotonously increasing over the increases in quantiles (see Figure 10)

Figure 9 Price Elasticity by Liquor Type (South India)



Note: Author's estimation using quantile regressions on NSSO data

Figure 10 Income Elasticity by Liquor Type (South India)



Note: Author's estimation using quantile regressions on NSSO data

The results for price and income elasticity using extended specification shows similar trend for both price and income elasticities (see Appendix Table 3.6.7.5 – Table 3.6.7.8 & Fig 3.6.9.4)

3.3.3.3 Results (Maharashtra)

For the state of Maharashtra, the estimates of only the middle quantiles (Q25, Q50 and Q75) were feasible due to smaller sample size of drinker household population. Moreover, the estimates for toddy were not possible.

The overall conclusions for country liquor in Maharashtra are consistent with the findings from All India and Southern India. The results suggest that individual pricing is important and lowers consumption of each alcoholic beverage type. Increases in income result in an increase in the amount of alcohol drunk and are statistically significant. Compared to homes where the household head is illiterate, household with greater levels of education had lower levels of alcohol intake overall, and every additional household member increases alcohol consumption. However, these findings are not consistent with other forms of liquor namely IMFL and Beer (see Appendix Table 3.6.6.9 – Table 3.6.6.11)

For country liquor quantile Q50 shows the lowest price elasticity whereas quantile Q25 and Q75 shows higher price elasticity. The IMFL price elasticity is highest for higher quantile Q75, and the beer price elasticity is highest for lower quantile Q25 (see Fig 3.6.9.1). The income elasticity is not observed to be monotonously increasing between the three estimated quantiles rather it is highest for lower quantile Q25 for IMFL and middle quantile Q50 for Beer (see Fig 3.6.9.2)

3.3.3.4 Robustness

As a test for robustness for individual type of liquor, the extended specification presents similar results to basic specification. Additionally, a Heckman sample selection output for consumption based of 4 different model specification suggests estimates in the similar range as estimated by quantile regressions. These results are presented in the Appendix Section 3.6.10 to Section 3.6.12.

3.4 Discussion and Conclusion

The descriptive analysis presented in Section 3.2 of this chapter provides a bird's eye view on alcohol consumption pattern by states of India based on various socio-economic and

demographic characteristics. However, it will be out of the scope of this chapter to point the individual socio-economic, political and cultural factors explaining the variation in alcohol consumption in various states and union territories of India. So, the discussion is limited to generalized outcomes based on the data analysis.

One of the common findings in several states of India along with prohibited states is- alcohol drinkers among tribal and scheduled castes is higher than other social categories in India (using both NSSO and NFHS data) and the men belonging to the occupation “agricultural labourer”, “service” and “skilled and unskilled manual labourers” (using NFHS data) often has a higher proportion of drinkers in India compared to other occupations³⁸.

This can be understood based on the following previous research and their associated findings.

According to a study on south Gujarat for peasant and tribal, the tribal religion accorded great honour to spirituous drinks. The sanction provided by religion allowed drinking of Daru (Indian liquor) and toddy without any guilt among tribes and low castes states Hardiman (1985). Additionally, a study by Chowdhury et.al., (2005) based on the culture in Sundarban Delta at West Bengal also put light on occupation and cultural aspects of drinking among tribal and low caste labourers³⁹. Moreover, a study from Banaras project low caste/class boatmen falling into the habit of alcohol due to poverty, cultural and occupational reasons (Doran, 2010). From the occupation perspective studies show occupations that require extensive manual labour prefer alcohol as a method of enjoyment and relaxation. Even the peasants during colonial India are noted to prefer toddy as a source of nourishment along with relaxation and entertainment. Hardiman (1985) notes, in summer with food scarcity- toddy has also acted as food for poor peasants.

Taking the above mentioned factors into consideration we can expect not only that tribal and low caste will have a larger proportion of drinkers but also the quantity of alcohol consumed would be large compared to other social categories. Secondly, occupation requiring strenuous physical labour would participate/consume higher level of alcohol compared to other occupation groups.

³⁸ Parallels are also observed with NSSO data with slightly different grouping than NFHS data.

³⁹ The study notes the tribal/Adivasis make homemade rice beer and chullu (country liquor) and often serve it as payment in transactions. The study also mentions poor economy and lack of job opportunities frustrate youngsters leading them to depression opening doors for alcohol consumption (Chowdhury. et.al., 2005).

One interesting observation based on the poverty and wealth Quantile is, men (using NFHS data) from the poorest wealth Quantile have a larger proportion of drinkers than other categories in major states of India but this observation does not correspond with household-level analysis from NSSO data. One possible reason for this may be women keeping the household budget (as suggested by an NSSO official) are less aware of male consumption habit. Secondly, women keeping the household budget prefer to withhold such information considering drinking is a vice and lastly in the prohibited states drinking is considered illegal, contrarily when asked at the individual level to a drinker male they may not prefer to withhold information at the similar level and the possibility of himself not knowing his drinking habit is obviously nil.

The higher educated people are observed to have a lower proportion of alcohol consumers than uneducated ones. This phenomenon can partly be explained by the role of education in society as educated people are more likely to know the ill effects of liquor consumption or excessive liquor consumption. Moreover, education can lead to escape from the poverty trap, which shall lead to a reduction in average anxiety levels among educated people compared to the uneducated ones. The lower stress/anxiety levels can be considered as an important reason why alcohol drinkers are less concentrated among educated people and is clearly observed in the estimated data. Secondly, the impact of westernization is visible in professional and technical workers at some places like Delhi and the state of Karnataka. Several studies pointed out the foreign type (Beer, Whiskey, Vodka, Wine) of alcohol consumption is on the rise in India which apparently is found to be true in our data analysis as well. Foreign type of liquor is also found to be favoured by men with higher education and men having technical and professional jobs, suggesting higher expenditure (as foreign type liquor is costlier than Indian type liquor) to be linked with increases in income.

By religion, Islam (at all-India level) has shown the largest proportion of the sober population. This result can largely be attributed to orthodoxy among the population group, considering personal preferences would not be very different among religious groups.

The rural sector has a larger proportion of drinkers/households than urban sectors (especially using NSSO data). This can possibly be attributed to lower-income and reliance on agriculture⁴⁰.

⁴⁰ The manual and unskilled labour, agricultural labour is taxing on the body this suggests the need for relaxation after heavy physical work among men of such occupation.

Women have a very small proportion of drinkers in all the states of India. This is encouraging; however, this may also reflect the existence of conservative and orthodox society in India.

The states of North-East show a different picture on several aspects when compared with the rest of India. The people of the North-East mostly follow tribal religion. They are both culturally and social-economically different than majority population of India. This possibly leads to different findings among people of the North-East. From a prohibition point of view, we can observe that prohibition is not successful in stopping alcohol consumption in both Nagaland and Mizoram (pre-2014).

Union Territory of Lakshadweep is the only place where prohibition appears to be working but this may be attributed to religious orthodoxy practices by Muslims as 96.58 percent (2011 census) population in Lakshadweep practice Islam.

The findings on price elasticity, income elasticity and other control variables in quantile regressions estimated in Section 3.3 should be taken into account considering the weakness of the available data (as mentioned in the section 3.2.2) along with non-availability actual price and income data.

The findings pertaining to price elasticities at the national level in India, indicate a consistent pattern. This pattern reveals that heavy drinking households generally exhibit lower price elasticity when compared to both moderate and light drinking households across all types of liquor, except in the case of Indian Made Foreign Liquor. In this exception, moderate drinking households are more responsive to price changes compared to both heavy and light drinking households on a nationwide scale. The findings suggest taxes/prices are vital for reduction in alcohol consumption among drinkers and more so for light and moderate drinkers and secondly, for Indian made foreign liquor the taxes/prices are more responsive to moderate drinkers. The findings also suggest, heavier taxes on alcohol is likely to generate substantial revenues for the state governments if designed properly (considering low price elasticity of heavy drinker) and based on the types of drink. Unfortunately, the heavy drinkers remain less price elastic and may not lead to large reductions as would have been expected from alcohol policy. The Heckman sample selection model using full specification for drinker households suggests the price elasticity is highest for beer (-0.83) followed by toddy (-0.77), country liquor (-0.71) and IMFL (0.69) respectively (see Appendix 3.6.10)

The analyses of price elasticities for South India follows a similar trend at the national level for the country liquor. However, the price elasticity for moderate drinking households is higher than for both light and heavy drinking households for IMFL and Beer suggesting higher responsiveness to the prices for foreign type liquor. Higher prices/taxes are thus important instruments for controlling moderate drinking along with generation of large revenues (based on low price elasticity estimated for country liquor) for the state governments in South Indian region. The Heckman sample selection model using full specification for drinker households suggests the price elasticity is highest for country liquor (-0.78) followed by IMFL (-0.77), toddy (-0.72), and beer (0.66) (see Appendix 3.6.11)

The analyses of price elasticities for the state of Maharashtra suggests high price elasticity for light drinking households of Beer and monotonously decreasing price elasticity with increasing consumption quantiles. Thus, heavy Beer drinking households are least responsive to price/tax, suggesting reduction in consumption can be obtained (via increased price/tax) among light and moderate drinkers⁴¹. Contrarily, heavy drinking households of Maharashtra are highly responsive to prices of country liquor and IMFL suggesting an important policy instrument to reduce IMFL and Country Liquor consumption. The Heckman sample selection model using full specification for drinker households suggests the price elasticity is highest for Country Liquor (-0.9) followed by Beer (-0.71) and IMFL (-0.60) (see Appendix 3.6.12).

The general pattern of income elasticity is monotonous increase with increase in quantity (consumed) quantiles for each type of liquor. Secondly, the range for income elasticity falls between (positive) 0.2 and 1. This suggest each type of liquor is a normal good. The monotonous rise in elasticity over consumption quantiles suggests, the more alcohol people consume, the more likely they are to increase their consumption as their income rises. This suggest that the wealthier household who consume alcohol may allocate a larger expenditure on alcohol compared to those with lower income households.

The positive income elasticities along with increasing responsiveness to income as consumption increases have multiple implications on government tax revenue. First, it suggests that alcohol is a stable source of tax revenue. Second, the rise in income may lead to increase in tax revenue from alcohol. Third, given the estimated values of income elasticities the

⁴¹ The lower price elasticity among heavy Beer drinkers also suggests collection of larger revenues by the state government due to low responsiveness of heavy Beer drinkers in Maharashtra.

government may consider progressive taxation on alcohol to capture larger share of income from higher quantile consumers. Fourth, from budgetary considerations point of view- the government must take into account the possible social and medical consequences of alcohol usage, particularly for heavy drinkers. Increased consumption, especially at higher quantiles, might result in health problems and higher healthcare expenditures, which could partially offset the increases in tax income.

The level of education also shows a significant and negative impact on quantity alcohol consumption among drinkers. Specifically, at all India level for Country liquor and IMFL the effect of Diploma and Certificate level education shows larger negative impact (compared to other education levels including Graduation and above Graduations levels) amongst higher quantiles of alcohol consumption. This probably highlights the importance of skill based education.

In conclusion the chapter shows various socio-economic and demographic factors that are strongly associated with alcohol consumption in various states of India along with econometric analysis specifically pointing out towards the roles of pricing and education especially Diploma and Certificate level education in controlling the quantity of liquor consumption among drinkers. The income elasticity also points towards larger tax revenue collections and utility of progressive taxation on alcohol to capture larger share of income from higher quantile consumers.

3.5 Appendix

3.5.1 Tables on Descriptive Statistics

Table 3.5.1.1: Prevalence of alcohol consumption by State and Sector

State	Rural	Urban	Total
A & N islands	27.5	22.3	25.4
Andhra Pradesh	31.8	18.5	27.4
Arunachal Pradesh	32.4	32	32.3
Assam	23.5	12.8	22.2
Bihar	17.2	8.7	16.3
Chandigarh	22.6	11.8	12.7
Chhattisgarh	27.3	22.4	26.1
D & N Haveli	37.5	21	29.7
Daman & Diu	73.1	39.5	64
Delhi	22.5	14.1	14.7
Goa	23	11.7	17.2
Gujarat	4.1	3.7	3.9
Haryana	11.8	11.8	11.8
Himachal Pradesh	25.4	18.8	24.4
Jammu & Kashmir	5.9	5.6	5.9
Jharkhand	22.8	12.6	20.5
Karnataka	16.9	11.9	15
Kerala	15.5	12.9	14.8
Lakshadweep	0	0	0
Madhya Pradesh	16.2	8.9	14.3
Maharashtra	9.8	7.5	8.7
Manipur	13.8	12.9	13.5
Meghalaya	17.7	15.3	17.2
Mizoram	3.9	2.6	3.3
Nagaland	10.7	3.4	8
Orissa	13.3	12.5	13.1
Pondicherry	13.2	14.1	13.8
Punjab	18.1	12.3	15.8
Rajasthan	8.2	8	8.1
Sikkim	29.5	33	30.3
Tamil Nadu	16.9	9.8	13.6
Tripura	21.1	3.4	18
Uttar Pradesh	6	5.2	5.8
Uttaranchal	15.3	18	16
West Bengal	7.8	5.8	7.2

Note: Author's estimation using unit level data on consumption expenditure from the NSSO's 68th round (type 2). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.2 Percent Household Drinks by States and Income Quantiles

State	Percent Household Drinks by Income Quantiles				
	Q1 Percent HH Drinks	Q2 Percent HH Drinks	Q3 Percent HH Drinks	Q4 Percent HH Drinks	Q5 Percent HH Drinks
A & N islands	0	0	16.5	29.7	26.3
Andhra Pradesh	20.2	27.4	30.4	30.2	22.9
Arunachal Pradesh	24.8	27.2	21	41.8	40.3
Assam	21.4	25.6	22.8	19	16.2
Bihar	13.6	22.3	13.3	13.7	14.2
Chandigarh	0	29.6	13.5	13.7	10.3
Chhattisgarh	22	32.1	35.3	28.7	12.3
D & N Haveli	30.2	47.6	34.7	38.1	6.1
Daman & Diu	29.8	20.1	61.8	41.8	85.7
Delhi	9.4	19.1	13.7	17.8	13.5
Goa	1.5	0	17.4	14	19.9
Gujarat	3	5.8	2	7.3	1
Haryana	6.8	8.2	15.8	12.1	11.3
Himachal Pradesh	7.5	19.3	25.3	30	22.4
Jammu & Kashmir	9.4	6.4	3.8	7	5.1
Jharkhand	24.5	23	19.6	8.1	10.1
Karnataka	11.3	16	15.5	17.3	13.8
Kerala	9	15.5	14.3	14.9	15.2
Lakshadweep	0	0	0	0	0
Madhya Pradesh	15.5	16.1	11.3	14.3	10.9
Maharashtra	7.7	11.1	10	7.6	7.9
Manipur	7.6	10.1	13.3	14.8	33.9
Meghalaya	8.5	8.9	16	22	29.8
Mizoram	0	1.8	5.7	2	5.4
Nagaland	0	6.3	5.5	7.4	11.8
Orissa	14.5	14.2	11.9	9.8	6.1
Pondicherry	25.6	17.8	12.9	17.3	10.9
Punjab	17.5	12.5	13	14	19.2
Rajasthan	7.6	6.9	9.5	9.1	6.5
Sikkim	3.5	27.5	24	37.8	36.7

Tamil Nadu	6.9	11	14.2	15.7	15.1
Tripura	15.6	23.4	20.5	13	9.9
Uttar Pradesh	3.9	6.2	7.7	7	7.1
Uttaranchal	16.2	9.7	15.2	16.4	22.2
West Bengal	6.6	6.1	9.3	7.4	7.1

Note: Authors estimation using NSSO 68th round of Consumption Expenditure Data; # represents output omitted due to small sample in the group (n<25) Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.3 Percent Household Drinks Indian/Local Liquor in Drinking

Household by States and Income Quantile

State	Percent Household Drinks Indian/Local Liquor among Drinkers by Income Quantile				
	Q1 Toddy or Country	Q2 Toddy or Country	Q3 Toddy or Country	Q4 Toddy or Country	Q5 Toddy or Country
A & N islands	#	#	55.4	50	29.5
Andhra Pradesh	84.7	65.5	59.4	49.1	18.8
Arunachal Pradesh	64.1	65.2	60.9	44.5	40
Assam	97.7	88.5	85.4	82.3	40.1
Bihar	96.6	90.9	89.3	71.7	67.1
Chandigarh	100	15.1	32.5	63.5	19.2
Chhattisgarh	90.8	79	74.4	42.9	39.5
D & N Haveli	98.4	92.5	51.7	24.3	0
Daman & Diu	48.9	#	0.3	42.4	13.5
Delhi	100	96.8	51.8	32.6	39.2
Goa	100	100	59.7	43.2	35.1
Gujarat	99.1	88.7	83.3	95	48.6
Haryana	100	100	89.5	83.7	46.1
Himachal Pradesh	100	89.4	82.1	76.6	31.7
Jammu & Kashmir	56.9	100	90.6	85.1	72.4
Jharkhand	98.4	91	97.9	73.5	53
Karnataka	21.2	12.8	18	15.9	8.3
Kerala	39.1	45.5	32	20.6	17.9
Madhya Pradesh	96	95.1	90.6	68	40
Maharashtra	95.7	99.4	87.8	78.5	51.4

Manipur	100	100	95.9	95.4	82.7
Meghalaya	94.1	84	68.1	59.3	11.4
Mizoram	#	100	100	100	86
Nagaland	#	100	88.3	69.3	32.4
Orissa	91	84.2	65.6	45.5	14.9
Pondicherry	71.3	78.3	63.9	53.9	23.6
Punjab	45	96.5	92.1	75.5	55.2
Rajasthan	99.3	95.3	75	62.9	44.1
Sikkim	5.8	11.5	2.4	5.4	0
Tamil Nadu	39.6	9.7	6.2	7.1	3.3
Tripura	100	100	98.3	95.3	76.9
Uttar Pradesh	92.3	91.7	94.6	72.8	60.7
Uttaranchal	95.4	65	75.1	41.7	19.6
West Bengal	99.8	93.8	91.8	66	32.3

Note: Authors estimation using NSSO 68th round of Consumption Expenditure Data; # represents output omitted due to small sample in the group (n<10). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.4 Percent Household Drinks by States and Social Category

State	Percent Household Drinks by Social Category			
	ST	SC	OBC	Others
A & N Islands	58.8	#	10.5	25.1
Andhra Pradesh	56.1	28.4	28.5	16.5
Arunachal Pradesh	38.5	15.6	#	23.9
Assam	47.4	14.2	33.5	8.8
Bihar	41.2	27.8	15.1	6.5
Chandigarh	#	26.8	13.9	7.2
Chhattisgarh	33.2	26.8	23.1	12.4
D & N Haveli	39.8	#	22.7	17.8
Daman & Diu	#	#	76.7	52.1
Delhi	#	12.7	12.5	16.1
Goa	#	#	2	18.7
Gujarat	10.6	1.2	4.9	0.3
Haryana	#	15.5	12.4	10.1
Himachal Pradesh	49.4	22.3	32.7	19.3
Jammu & Kashmir	7.7	11.4	1.9	5.4
Jharkhand	33.7	28	12.9	9.3
Karnataka	19.7	27	14.1	8.7
Kerala	26.3	27.9	13.5	12.5

Lakshadweep	0	0	0	0
Madhya Pradesh	30.6	14.7	8.5	7.6
Maharashtra	19	12.9	9	4.8
Manipur	12.6	32.7	13.6	6.4
Meghalaya	17.6	#	#	13
Mizoram	3.5	#	#	#
Nagaland	8.5	#	#	#
Orissa	24.8	17.1	8.7	4.4
Pondicherry	#	32.9	10.8	12.1
Punjab	#	17.9	16.9	13.5
Rajasthan	17	10.3	6.1	4
Sikkim	43.1	41.7	21	12.1
Tamil Nadu	20.5	22.8	11.3	5.2
Tripura	40.5	4.8	5.6	4.9
Uttar Pradesh	8.7	10.3	5	2.8
Uttaranchal	34.5	18.3	11.9	15.4
West Bengal	34.8	8.4	9.5	3.7

Note: Authors estimation using NSSO 68th round of Consumption Expenditure Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.5 Percent Household Drinks by States and Religion

State	Percent Household Drinks by Religion		
	Hinduism	Islam	Christianity
A & N Islands	21.4	3.3	56.3
Andhra Pradesh	28.5	16.3	24.3
Arunachal Pradesh	20.5	#	23.3
Assam	29.1	0.5	66.9
Bihar	17.9	5.7	#
Chandigarh	11	#	#
Chhattisgarh	25.6	22.4	57
D & N Haveli	28.9	#	#
Daman & Diu	66.4	#	#
Delhi	14.9	4	#
Goa	12	#	27.7
Gujarat	4.2	0.2	#
Haryana	12.3	4.9	#
Himachal Pradesh	24.3	#	#

Jammu & Kashmir	12.3	0.4	#
Jharkhand	21.9	7.7	24.7
Karnataka	15.5	9.9	19.4
Kerala	19.1	2.5	17.1
Lakshadweep	#	0	#
Madhya Pradesh	15	4.7	#
Maharashtra	9	5.1	7.5
Manipur	15.6	3.7	12.6
Meghalaya	22.6	#	16.8
Mizoram	#	#	2.2
Nagaland	#	#	8.4
Orissa	13.1	11.9	14.5
Pondicherry	13.3	#	18
Punjab	11.7	2.7	#
Rajasthan	8.5	5.9	#
Sikkim	24.9	#	35.9
Tamil Nadu	13.9	5.2	16.8
Tripura	18.5	4.1	28.3
Uttar Pradesh	6.8	1.7	#
Uttaranchal	17.5	4.2	#
West Bengal	8.9	0.9	#

Note: Authors estimation using NSSO 68th round of Consumption Expenditure Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.6 Percent Household Drinks by States and Occupation of Household

Head

State	Percent Household Drinks by Household Head Occupation				
	Group789	Group12	Group34	Group5	Group6
A & N islands	24.7	23.4	14.1	26.4	40.6
Andhra Pradesh	33.2	19.3	16.5	20.1	33.9
Arunachal Pradesh	32.7	36.9	42.6	23.1	33.1
Assam	32.7	13.4	18.3	16.5	20.8
Bihar	23	18.9	3.3	7.3	13.2
Chandigarh	25.7	12.7	0	11.4	0
Chhattisgarh	26.6	11.5	14.3	23.9	32.8
D & N Haveli	27.1	19.4	34.8	23.9	65.5
Daman & Diu	68.1	19.5	48.2	63.2	89.8
Delhi	20.2	15.4	6.3	11	0

Goa	27.8	13.7	11.1	7.2	6
Gujarat	6.2	1.2	1.5	1.1	2.8
Haryana	14.4	9.6	13.5	9.2	11.9
Himachal Pradesh	29.9	16.1	25.7	22.8	25.3
Jammu & Kashmir	6.7	5.3	4.2	4.1	7.4
Jharkhand	26.2	7.9	8.1	13.4	25.9
Karnataka	20.6	9.6	7.8	13.4	15.8
Kerala	21.7	9.1	8.7	14.4	16.8
Lakshadweep	0	0	0	0	0
Madhya Pradesh	18.2	7.6	8.5	11	13.6
Maharashtra	11.4	4.9	4.3	7.8	11.3
Manipur	18	11	12.7	14.5	12.3
Meghalaya	19.4	22.9	14.6	24.2	13.8
Mizoram	3.2	3	1.3	5.2	3.7
Nagaland	10.9	8.8	7.7	7.3	7.9
Orissa	16.1	6.2	5.9	11.7	14.4
Pondicherry	20	7.1	12.1	10	35.3
Punjab	16.9	13.4	10.8	17.3	20.5
Rajasthan	12	5.9	3.1	5.5	7.5
Sikkim	40.7	37.1	32.1	30.3	26.8
Tamil Nadu	18.4	10.4	7.9	10.9	9.6
Tripura	22.7	7.1	8.2	15.7	24.9
Uttar Pradesh	7.3	5.7	5	5.7	5.2
Uttaranchal	18.9	18.9	19.2	12.7	12.6
West Bengal	9.3	7.8	4.5	3.7	5.5

Note: Authors estimation using NSSO 68th round of Consumption Expenditure Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Group12 denotes legislators, senior officials, managers, professionals

Group34 denotes technicians, associate professionals, clerks

Group5 denotes service workers and shop & market sales workers

Group6 denotes skilled agricultural and fishery workers

Group789 denotes craft and related trades workers, plant and machine operators and assemblers, elementary occupations

Table 3.5.1.7 Percent Men Drinks by States and Sector

State	Percent Men Drinks by Sector			
	Urban	Rural	Total(15-54)	Total(15-49)

Andaman & Nicobar islands	56.5	46.4	50.5	51.7
Andhra Pradesh	30.7	37.5	35.2	34.9
Arunachal Pradesh	56.0	60.6	59.4	59.0
Assam	30.4	37.2	36.0	35.6
Bihar	27.8	29.5	29.2	28.9
Chandigarh	35.0	88.9	39.4	39.3
Chhattisgarh	52.4	53.8	53.4	52.7
Dadra & Nagar Haveli	27.8	41.7	34.2	33.8
Daman & Diu	39.1	25.4	35.8	35.8
Goa	48.7	36.9	44.3	44.7
Gujarat	10.6	11.3	11.0	11.1
Haryana	25.5	24.6	25.0	24.5
Himachal Pradesh	37.9	41.9	41.2	39.7
Jammu & Kashmir	9.7	11.8	11.1	10.5
Jharkhand	33.0	42.3	39.5	39.3
Karnataka	30.5	28.7	29.5	29.2
Kerala	34.1	40.4	37.4	37.0
Lakshadweep	6.4	0.0	4.9	5.4
Madhya Pradesh	28.3	30.3	29.6	29.6
Maharashtra	23.1	18.5	20.8	20.5
Manipur	54.1	52.0	52.8	52.6
Meghalaya	40.1	46.2	44.9	44.6
Mizoram	52.7	43.4	49.2	49.5
Nagaland	40.7	35.8	37.7	38.8
Delhi	25.4	14.1	25.2	24.7
Odisha	32.5	41.5	39.5	39.3
Puducherry	39.3	45.2	41.2	41.0
Punjab	30.9	37.7	35.0	34.0
Rajasthan	19.1	14.6	15.9	15.9
Sikkim	48.7	53.4	51.4	51.2
Tamil Nadu	46.6	47.8	47.2	46.7
Tripura	53.8	58.2	56.8	57.6
Uttar Pradesh	21.6	22.6	22.3	22.1
Uttarakhand	33.7	37.7	36.1	35.2
West Bengal	34.6	25.0	28.2	28.7
Telangana	46.3	62.4	54.6	53.8

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.8 Percent Men Non-drinkers between 15-54 age by States and

Education Category

State	Percent Men (15-54) Non-drinkers by Education Category			
	No Education	Primary Education	Secondary Education	Higher Education
Andaman & Nicobar	53.8	33.0	51.6	56.7
Andhra Pradesh	44.6	57.7	68.6	80.5
Arunachal Pradesh	39.0	36.8	43.1	36.0
Assam	60.2	62.3	64.4	69.8
Bihar	59.4	63.0	75.7	78.1
Chandigarh	55.4	62.2	62.5	58.6
Chhattisgarh	26.6	35.6	52.2	56.1
Dadra & Nagar Haveli	55.4	39.7	74.2	66.2
Daman & Diu	55.2	59.7	64.1	72.5
Goa	39.4	49.9	58.6	50.7
Gujarat	79.7	83.7	90.3	93.1
Haryana	60.9	66.5	78.0	75.1
Himachal Pradesh	49.4	40.5	60.6	61.5
Jammu & Kashmir	89.0	81.9	89.0	91.0
Jharkhand	41.1	51.5	64.9	77.9
Karnataka	63.8	63.8	72.8	72.1
Kerala	44.6	54.8	61.5	67.7
Lakshadweep	0.0	89.2	96.1	95.6
Madhya Pradesh	57.7	62.2	75.0	76.4
Maharashtra	74.5	71.2	79.5	83.5
Manipur	44.9	39.9	49.6	43.2
Meghalaya	41.5	52.5	60.5	57.8
Mizoram	44.4	49.6	50.8	53.3
Nagaland	64.3	59.3	63.0	60.4
Delhi	66.1	72.4	74.6	79.3
Odisha	43.2	46.7	64.8	77.2
Puducherry	29.9	55.7	58.4	69.3
Punjab	51.9	56.4	67.6	68.6
Rajasthan	79.0	77.6	85.3	88.7
Sikkim	52.1	38.9	51.7	47.0
Tamil Nadu	44.9	42.8	53.8	58.3
Tripura	33.0	35.9	44.2	52.5
Uttar Pradesh	69.8	73.5	79.3	83.5
Uttarakhand	56.7	69.2	62.5	68.3
West Bengal	64.2	70.7	73.4	76.3
Telangana	33.5	28.8	47.8	58.3

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group ($n < 25$). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.9 Percent Men Drinkers of Indian/Local Alcohol between 15-54 Age by States and Education

State	Percent Men (15-54) Drinks Indian/Local Alcohol by Education			
	No Education	Primary Education	Secondary Education	Higher Education
Andaman & Nicobar	20.3	4.1	7.0	2.5
Andhra Pradesh	7.2	5.1	2.2	0.3
Arunachal Pradesh	16.8	19.4	8.3	7.6
Assam	24.7	17.6	12.4	5.0
Bihar	18.8	11.8	5.4	2.7
Chandigarh	5.5	0.0	8.1	16.2
Chhattisgarh	58.3	44.7	23.3	7.0
Dadra & Nagar Haveli	19.7	11.6	2.7	0.0
Daman & Diu	17.2	0.0	2.1	0.0
Goa	14.6	9.0	1.7	0.0
Gujarat	11.5	7.4	1.9	0.3
Haryana	14.7	9.0	4.3	1.0
Himachal Pradesh	19.0	18.9	6.2	5.4
Jammu & Kashmir	4.3	7.5	2.5	0.8
Jharkhand	41.0	30.9	14.2	2.8
Karnataka	3.4	1.5	1.5	1.0
Kerala	4.7	3.2	2.0	0.5
Lakshadweep	0.0	0.0	0.0	0.0
Madhya Pradesh	28.1	21.5	9.0	2.5
Maharashtra	16.9	10.8	4.2	0.3
Manipur	44.8	44.9	28.7	27.8
Meghalaya	24.2	11.1	6.6	1.7
Mizoram	35.3	19.7	10.8	2.2
Nagaland	4.2	10.6	5.4	3.6
Delhi	9.9	3.6	1.5	1.6
Odisha	36.0	20.8	6.9	0.8
Puducherry	0.0	6.4	0.2	0.6
Punjab	25.0	19.9	10.3	4.9
Rajasthan	8.6	6.6	2.7	0.2
Sikkim	7.9	6.3	2.0	0.0
Tamil Nadu	2.3	3.0	0.8	1.0
Tripura	58.7	37.0	21.2	8.2
Uttar Pradesh	15.5	11.2	5.7	1.4

Uttarakhand	15.8	7.7	3.5	1.4
West Bengal	19.9	12.1	5.6	0.1
Telangana	19.0	13.4	6.4	2.2

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.10 Percent Men Drinkers of Foreign Type Liquor between 15-54 Age by States and Education

State	Percent Men (15-54) Drink Foreign Type Liquor by Education			
	No	Primary	Secondary	Higher
Andhra Pradesh	48.2	37.2	29.2	19.2
Arunachal Pradesh	44.3	43.8	48.6	56.4
Assam	15.1	20.1	23.1	25.1
Bihar	21.8	25.2	18.9	19.3
Chandigarh	39.1	37.8	29.4	25.2
Chhattisgarh	15.1	19.6	24.6	36.9
Dadra & Nagar Haveli	25.0	48.7	23.1	33.8
Daman & Diu	27.6	40.3	33.8	27.5
Goa	46.0	41.1	39.7	49.3
Gujarat	8.8	8.8	7.8	6.6
Haryana	24.4	24.6	17.7	23.9
Himachal Pradesh	31.6	40.6	33.1	33.1
Jammu & Kashmir	6.7	10.5	8.6	8.2
Jharkhand	17.9	17.7	20.9	19.3
Karnataka	32.8	34.7	25.7	26.9
Kerala	50.7	42.0	36.5	31.8
Lakshadweep	100.0	10.8	3.9	4.4
Madhya Pradesh	14.2	16.3	16.0	21.1
Maharashtra	8.6	17.9	16.3	16.2
Manipur	10.3	15.2	21.7	29.1
Meghalaya	34.3	36.3	32.9	40.5
Mizoram	20.3	30.7	38.5	44.4
Nagaland	31.5	30.2	31.5	36.1
Delhi	23.9	24.0	23.9	19.1
Odisha	20.7	32.4	28.3	22.0
Puducherry	70.1	37.9	41.4	30.2
Punjab	23.2	23.7	22.1	26.5
Rajasthan	12.4	15.8	12.0	11.1
Sikkim	40.0	54.8	46.3	53.0
Tamil Nadu	52.8	54.3	45.4	40.7
Tripura	8.3	27.1	34.6	39.3

Uttar Pradesh	14.6	15.3	15.0	15.2
Uttarakhand	27.6	23.2	34.0	30.4
West Bengal	15.9	17.2	20.9	23.5
Telangana	47.6	57.7	45.8	39.5

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.11 Percentage Male Drinkers between age 15-54 by States and Religion

State	Percentage Male Drinks (15-54) by Religion		
	Hinduism	Islam	Christianity
Andaman & Nicobar Islands	49.1	27.1	63.4
Andhra Pradesh	36.2	25.4	36.2
Arunachal Pradesh	66.2	30.4	53.1
Assam	49.3	3.3	57.6
Bihar	31.9	13.8	#
Chandigarh	40.6	22.6	#
Chhattisgarh	54.1	21.7	60.8
Dadra & Nagar Haveli	35.5	14.3	#
Daman & Diu	37.3	17.0	#
Goa	41.5	42.4	58.0
Gujarat	11.6	2.3	8.7
Haryana	26.0	12.0	#
Himachal Pradesh	41.7	17.5	#
Jammu & Kashmir	35.5	0.3	#
Jharkhand	41.7	13.6	45.4
Karnataka	30.4	24.3	33.9
Kerala	48.0	10.1	46.4
Lakshadweep	65.0	1.7	#
Madhya Pradesh	30.8	10.1	55.5
Maharashtra	21.3	12.2	27.0
Manipur	61.1	11.9	53.4
Meghalaya	50.6	9.6	45.9
Mizoram	29.5	3.0	48.7
Nagaland	48.2	13.6	37.9
Delhi	28.3	12.4	#
Odisha	39.8	16.1	41.4
Puducherry	42.1	23.1	30.9
Punjab	33.2	22.8	32.5
Rajasthan	16.5	8.3	#

Sikkim	49.3	19.7	38.0
Tamil Nadu	47.7	38.5	44.4
Tripura	58.5	34.1	72.4
Uttar Pradesh	25.8	6.7	#
Uttarakhand	40.9	3.5	#
West Bengal	34.6	8.8	50.4
Telangana	56.5	43.0	47.7

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.12 Percent non-drinking Male between 15-54 age by States and Social

Category

State	Percent non-drinking Male (15-54) by Social Category			
	SC	ST	OBC	Others
Andaman & Nicobar islands	62.8	32.1	54.3	44.6
Andhra Pradesh	58.9	50.0	65.7	70.8
Arunachal Pradesh	47.7	39.1	38.5	39.1
Assam	56.9	28.7	49.1	81.3
Bihar	60.0	61.7	72.0	77.9
Chandigarh	54.8	#	70.7	59.1
Chhattisgarh	43.4	39.1	49.6	61.0
Dadra & Nagar Haveli	66.1	58.4	65.2	79.0
Daman & Diu	53.5	56.5	64.7	69.1
Goa	46.8	52.7	61.4	61.2
Gujarat	91.6	78.9	89.6	92.2
Haryana	71.8	#	75.8	76.6
Himachal Pradesh	59.1	54.6	52.7	61.0
Jammu & Kashmir	64.9	94.7	84.6	77.5
Jharkhand	51.6	43.1	68.5	75.9
Karnataka	63.0	77.1	72.6	76.2
Kerala	36.4	50.2	63.9	63.1
Lakshadweep	#	98.7	90.8	#
Madhya Pradesh	62.8	55.5	75.6	82.1
Maharashtra	74.1	79.8	80.3	79.9
Manipur	38.7	45.0	58.0	41.3
Meghalaya	62.5	51.9	#	#
Mizoram	71.7	50.4	#	#
Nagaland	58.7	62.0	#	#
Delhi	71.6	#	70.4	80.6

Odisha	53.4	42.1	69.4	71.8
Puducherry	49.5	#	61.2	49.2
Punjab	59.9	#	66.9	68.3
Rajasthan	74.6	81.9	88.2	86.6
Sikkim	36.4	46.4	45.9	59.4
Tamil Nadu	46.9	49.2	55.2	68.7
Tripura	41.6	30.6	51.6	55.8
Uttar Pradesh	68.3	61.0	79.3	85.9
Uttarakhand	55.9	46.5	73.6	62.2
West Bengal	65.2	41.3	77.3	77.5
Telangana	41.7	44.5	45.9	48.3

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.13 Percent Indian Type Drinker Male between 15-54 by States and

Social Category

State	Percent Indian Type Drinker Male (15-54) by Social Category			
	SC	ST	OBC	Others
Andaman & Nicobar islands	0.4	65.1	2.6	3.8
Andhra Pradesh	4.3	12.0	2.8	0.9
Arunachal Pradesh	9.2	12.4	9.4	8.0
Assam	12.5	34.0	22.9	4.3
Bihar	16.5	11.0	8.0	4.1
Chandigarh	5.8	#	11.4	11.5
Chhattisgarh	28.0	45.2	23.7	8.8
Dadra & Nagar Haveli	5.7	9.4	0.0	2.2
Daman & Diu	2.5	5.0	3.7	0.0
Goa	4.3	8.6	1.7	0.8
Gujarat	3.3	8.9	2.7	1.4
Haryana	9.7	#	3.3	3.1
Himachal Pradesh	9.3	11.3	3.9	7.4
Jammu & Kashmir	11.4	0.3	5.3	4.6
Jharkhand	23.5	38.4	12.1	4.4
Karnataka	1.9	1.5	1.8	1.8
Kerala	6.0	1.7	1.6	1.0
Lakshadweep	#	0.0	0.0	#
Madhya Pradesh	17.0	27.3	9.2	3.5
Maharashtra	7.5	12.4	4.6	2.9
Manipur	41.5	30.6	18.4	35.3
Meghalaya	2.2	11.0	#	#

Mizoram	6.4	11.2	#	#
Nagaland	5.8	6.0	#	#
Delhi	3.4	#	2.4	1.7
Odisha	13.2	31.0	5.1	2.2
Puducherry	0.0	#	1.0	0.0
Punjab	15.8	#	11.2	8.7
Rajasthan	7.1	6.4	2.0	1.1
Sikkim	2.2	5.4	1.8	0.0
Tamil Nadu	1.6	3.0	1.1	0.0
Tripura	22.0	43.8	19.0	10.9
Uttar Pradesh	13.1	20.9	6.4	2.0
Uttarakhand	7.8	21.0	3.1	2.7
West Bengal	13.2	36.5	4.7	3.3
Telangana	13.2	10.2	8.2	3.5

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.14 Percent Foreign Type Drinker Male between 15-54 age by States and

Social Category

State	Percent Foreign Type Drinker Male(15-54) by Social Category			
	SC	ST	OBC	Others
Andaman & Nicobar islands	36.8	2.8	43.1	51.5
Andhra Pradesh	36.8	38.1	31.5	28.4
Arunachal Pradesh	43.1	48.5	52.2	52.9
Assam	30.6	37.3	28.0	14.4
Bihar	23.5	27.3	20.1	18.0
Chandigarh	39.5	#	17.9	29.4
Chhattisgarh	28.6	15.7	26.7	30.2
Dadra & Nagar Haveli	28.2	32.2	34.8	18.9
Daman & Diu	44.1	38.5	31.6	30.9
Goa	49.0	38.7	36.9	38.0
Gujarat	5.1	12.2	7.6	6.4
Haryana	18.6	#	20.9	20.2
Himachal Pradesh	31.6	34.1	43.4	31.7
Jammu & Kashmir	23.8	5.0	10.1	17.9
Jharkhand	24.9	18.5	19.4	19.7
Karnataka	35.1	21.4	25.6	22.0
Kerala	57.6	48.2	34.6	35.9

Lakshadweep	#	1.3	9.2	#
Madhya Pradesh	20.2	17.2	15.2	14.3
Maharashtra	18.4	7.9	15.1	17.2
Manipur	19.7	24.4	23.6	23.3
Meghalaya	35.3	37.1	#	#
Mizoram	21.9	38.3	#	#
Nagaland	35.5	32.1	#	#
Delhi	25.1	#	27.1	17.6
Odisha	33.5	27.0	25.5	26.0
Puducherry	50.5	#	37.8	50.8
Punjab	24.3	#	21.9	23.0
Rajasthan	18.3	11.7	9.8	12.3
Sikkim	61.3	48.2	52.3	40.6
Tamil Nadu	51.4	47.8	43.8	31.3
Tripura	36.4	25.6	29.4	33.3
Uttar Pradesh	18.6	18.1	14.3	12.1
Uttarakhand	36.3	32.5	23.2	35.1
West Bengal	21.6	22.2	18.1	19.3
Telangana	45.1	45.4	45.9	48.2

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group (n<25). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.15 Percentage non-drinking Male between 15-54 age by States and

Wealth Quantile

State	Percentage non-drinking Male (15-54) by Wealth Quantile				
	poorest	poorer	middle	richer	richest
Andaman & Nicobar islands	48.4	44.6	43.5	56.2	55.3
Andhra Pradesh	53.2	59.7	64.0	69.2	73.8
Arunachal Pradesh	37.0	36.2	40.4	42.5	45.5
Assam	53.4	62.3	64.3	67.1	69.0
Bihar	60.9	66.5	71.6	74.6	74.9
Chandigarh	50.3	80.2	72.9	47.2	49.6
Chhattisgarh	35.8	43.2	45.6	49.8	55.0
Dadra & Nagar Haveli	51.7	67.0	64.2	69.7	73.9
Daman & Diu	57.6	59.5	73.7	70.4	72.2
Goa	51.9	50.0	57.9	62.4	56.5
Gujarat	83.3	87.0	89.4	90.5	93.2
Haryana	72.8	76.0	77.3	74.7	74.1

Himachal Pradesh	54.4	60.7	54.6	59.0	63.7
Jammu & Kashmir	90.9	90.5	91.9	88.9	82.3
Jharkhand	41.6	56.0	61.6	62.9	74.3
Karnataka	66.9	72.6	70.5	71.7	70.2
Kerala	52.7	57.7	62.3	69.9	72.0
Lakshadweep	79.7	100.0	100.0	94.7	94.2
Madhya Pradesh	60.5	65.5	72.2	73.9	76.6
Maharashtra	78.0	81.2	79.8	77.6	79.1
Manipur	48.2	50.5	48.3	46.9	41.2
Meghalaya	45.6	50.6	60.1	61.2	55.6
Mizoram	52.9	47.6	54.2	49.3	50.9
Nagaland	64.1	66.6	66.0	55.6	59.8
Delhi	67.4	68.0	73.5	84.9	80.4
Odisha	42.9	53.0	59.8	65.4	73.1
Puducherry	51.9	43.6	68.6	60.3	78.6
Punjab	54.1	65.3	66.0	72.8	67.5
Rajasthan	82.9	84.8	83.2	83.9	85.5
Sikkim	47.9	46.0	46.6	51.2	50.2
Tamil Nadu	46.0	50.1	53.5	55.7	56.9
Tripura	37.3	39.2	46.8	41.2	48.8
Uttar Pradesh	70.4	74.6	78.2	81.0	81.4
Uttarakhand	63.3	67.3	57.9	60.9	71.0
West Bengal	66.1	74.6	72.7	72.9	72.0
Telangana	40.8	36.3	36.2	54.6	60.0

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group ($n < 25$). Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.16 Percentage Indian Type Drinker Male between 15-54 age by States and Wealth Quantile

State	Percentage Indian Type Drinker Male (15-54) by Wealth Quantile				
	poorest	poorer	middle	richer	richest
Andaman & Nicobar islands	8.7	10.2	6.6	4.8	0.6
Andhra Pradesh	8.4	4.5	2.6	1.8	0.2
Arunachal Pradesh	23.0	15.6	9.7	8.6	2.8
Assam	25.4	22.7	15.0	10.3	4.1
Bihar	15.7	13.5	8.9	7.1	3.8
Chandigarh	9.3	3.9	3.4	16.8	17.2
Chhattisgarh	54.8	41.4	30.7	21.9	7.4
Dadra & Nagar Haveli	16.8	11.1	1.7	2.6	0.0

Daman & Diu	5.1	1.4	1.1	1.1	0.0
Goa	6.8	2.3	1.8	0.0	0.6
Gujarat	9.5	4.7	2.0	0.8	0.5
Haryana	9.1	6.5	3.9	4.1	1.5
Himachal Pradesh	12.6	8.3	8.4	5.6	3.6
Jammu & Kashmir	2.3	2.7	2.6	3.0	3.0
Jharkhand	43.5	26.5	18.2	13.4	4.4
Karnataka	4.1	2.7	1.2	0.7	0.0
Kerala	3.7	1.8	2.3	0.5	0.0
Lakshadweep	0.0	0.0	0.0	0.0	0.0
Madhya Pradesh	25.6	19.9	12.4	9.3	2.9
Maharashtra	12.8	6.1	3.1	2.2	1.7
Manipur	39.8	32.5	29.7	26.4	24.0
Meghalaya	20.0	17.3	7.0	6.0	3.1
Mizoram	30.1	12.7	7.6	10.2	2.6
Nagaland	7.0	7.5	4.9	4.7	5.2
Delhi	5.5	3.6	1.3	0.1	0.5
Odisha	34.6	18.9	11.4	4.9	1.1
Puducherry	0.0	0.0	0.6	2.4	0.9
Punjab	23.8	13.3	8.7	6.3	6.1
Rajasthan	6.3	4.2	3.7	2.8	1.6
Sikkim	7.8	5.2	2.1	0.9	0.0
Tamil Nadu	1.7	1.6	0.9	1.4	0.6
Tripura	41.6	30.7	21.5	23.8	10.5
Uttar Pradesh	16.0	11.0	6.8	4.3	1.9
Uttarakhand	11.4	7.0	3.8	2.3	0.4
West Bengal	21.1	10.4	6.7	5.7	0.6
Telangana	19.1	9.6	11.5	3.3	1.8

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group. Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.17 Percentage Foreign Type Drinker Male between 15-54 age by States and Wealth Quantile

State	Percentage Foreign Type Drinker Male (15-54) by Wealth Quantile				
	poorest	poorer	middle	richer	richest
Andaman & Nicobar islands	42.9	45.2	49.9	38.9	44.1
Andhra Pradesh	38.4	35.8	33.4	29.0	25.9
Arunachal Pradesh	40.1	48.3	49.9	48.9	51.7
Assam	21.3	15.1	20.7	22.6	26.9

Bihar	23.4	20.0	19.4	18.3	21.3
Chandigarh	40.3	16.0	23.7	35.9	33.3
Chhattisgarh	9.4	15.5	23.7	28.3	37.6
Dadra & Nagar Haveli	31.5	21.9	34.0	27.7	26.1
Daman & Diu	37.4	39.1	25.2	28.5	27.8
Goa	41.3	47.7	40.3	37.6	43.0
Gujarat	7.2	8.3	8.6	8.6	6.3
Haryana	18.1	17.5	18.8	21.2	24.4
Himachal Pradesh	33.0	31.0	37.0	35.4	32.6
Jammu & Kashmir	6.7	6.7	5.5	8.1	14.7
Jharkhand	14.9	17.5	20.2	23.6	21.3
Karnataka	29.0	24.7	28.3	27.6	29.8
Kerala	43.5	40.6	35.4	29.6	28.0
Lakshadweep	20.3	0.0	0.0	5.3	5.8
Madhya Pradesh	13.9	14.5	15.4	16.8	20.5
Maharashtra	9.2	12.8	17.1	20.1	19.2
Manipur	12.0	17.0	22.1	26.6	34.8
Meghalaya	34.4	32.1	32.9	32.7	41.3
Mizoram	17.0	39.7	38.2	40.5	46.6
Nagaland	28.8	25.9	29.1	39.6	35.1
Delhi	27.1	28.4	25.2	15.0	19.1
Odisha	22.5	28.1	28.7	29.6	25.8
Puducherry	48.1	56.4	30.8	37.3	20.5
Punjab	22.1	21.4	25.3	21.0	26.3
Rajasthan	10.8	11.1	13.2	13.4	12.9
Sikkim	44.3	48.8	51.3	47.9	49.8
Tamil Nadu	52.2	48.3	45.6	42.9	42.5
Tripura	21.1	30.1	31.7	35.1	40.7
Uttar Pradesh	13.5	14.4	14.9	14.7	16.7
Uttarakhand	25.3	25.7	38.2	36.8	28.6
West Bengal	12.8	15.0	20.5	21.5	27.4
Telangana	40.1	54.1	52.3	42.1	38.2

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group. Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.1.18 Percent Male Drinker between 15-54 age by States and Occupation

State	Percent Male (15-54) Drinker by Occupation
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	Not Working	Professional /Technical	Clerical	Sales	Agricultural	Services	Skilled & Unskilled Manual
Andaman & Nicobar islands	20.4	56.7	50.3	29.1	51.7	57.1	64.7
Andhra Pradesh	16.3	22.6	27.3	35.0	40.2	49.2	44.0
Arunachal Pradesh	45.2	58.3	43.2	61.8	65.1	66.1	74.1
Assam	18.8	29.0	48.2	31.3	40.7	36.0	45.6
Bihar	14.0	22.8	40.4	30.0	33.6	30.7	45.0
Chandigarh	0.0	71.8	57.5	52.0		33.2	56.7
Chhattisgarh	22.4	52.2	53.0	45.0	59.8	57.8	65.8
Dadra & Nagar Haveli	21.4	43.7	49.4	28.0	51.4	46.0	31.8
Daman & Diu	21.3	16.8	0.0	13.5	42.8	34.4	43.5
Goa	23.7	42.1	55.6	45.8	41.5	49.1	57.7
Gujarat	5.5	8.7	13.2	8.1	12.4	13.3	13.6
Haryana	9.6	28.0	28.2	25.8	29.2	38.2	30.5
Himachal Pradesh	17.1	49.0	47.3	44.5	47.8	60.3	52.3
Jammu & Kashmir	5.1	9.7	17.2	14.7	6.5	15.5	17.0
Jharkhand	13.4	20.8	33.5	36.3	48.7	44.3	50.1
Karnataka	10.8	40.2	26.0	33.1	29.9	38.1	37.6
Kerala	17.8	29.0	46.5	30.2	46.5	48.7	53.4
Lakshadweep	0.0	0.0	0.0	13.0	0.0	9.2	14.8
Madhya Pradesh	15.2	29.3	34.6	28.6	31.8	31.0	38.8
Maharashtra	8.3	20.4	22.6	25.3	20.5	20.8	30.7
Manipur	29.3	63.0	55.5	58.2	56.6	67.8	61.7
Meghalaya	25.0	35.0	41.8	49.8	49.9	56.3	57.2
Mizoram	41.9	19.2	49.6	68.4	50.0	64.0	53.9
Nagaland	31.4	38.1	48.3	32.7	34.7	36.7	56.0
Delhi	15.3	37.6	25.3	29.0	23.9	33.4	29.7
Odisha	25.6	21.4	35.7	32.5	44.9	39.7	54.5

Puducherry	19.8	27.0	44.2	35.6	45.8	54.6	53.7
Punjab	9.0	30.0	42.0	31.9	44.8	34.5	45.1
Rajasthan	7.3	15.6	13.8	14.5	16.6	23.3	21.5
Sikkim	31.5	51.9	49.5	56.5	57.1	50.3	68.7
Tamil Nadu	26.8	44.6	52.6	49.5	53.0	55.8	59.5
Tripura	40.9	38.3	#	66.6	62.0	56.5	65.9
Uttar Pradesh	10.2	20.9	30.6	23.3	24.5	31.9	27.4
Uttarakhand	16.5	30.9	61.6	40.1	43.2	51.3	43.6
West Bengal	15.0	22.6	30.4	27.9	29.5	33.6	35.0
Telangana	29.0	28.6	61.1	53.6	67.3	62.5	67.3

Note: Authors estimation using National Family Health Survey-4 Data; # represents output omitted due to small sample in the group ($n < 25$). Weights based on sampling design were applied to estimate the prevalence.

3.5.2 Prevalence in Women (15-49) Age

Table 3.5.2.1 by States and Sector of India

State/UT	Prevalence (percent)		
	Total	Rural	Urban
Andaman and Nicobar Islands	2.5	3.5	1.2
Andhra Pradesh	0.4	0.6	0.0
Arunachal Pradesh	26.3	27.8	22.3
Assam	6.9	7.7	2.9
Bihar	0.2	0.2	0.2
Chandigarh	0.5	0.0	0.6
Chhattisgarh	5.0	6.2	1.4
Dadra and nagar haveli	0.0	0.0	0.0
Daman and diu	1.4	0.3	1.9
Goa	4.2	4.4	4.1
Gujarat	0.3	0.4	0.1
Haryana	0.1	0.0	0.2
Himachal pradesh	0.3	0.3	0.5
Jammu and kashmir	0.1	0.1	0.2
Jharkhand	4.1	5.5	0.6
Karnataka	1.0	0.5	1.6
Kerala	1.6	0.9	2.3
Lakshadweep	0.0	0.0	0.0
Madhya pradesh	1.6	2.1	0.6
Maharashtra	0.2	0.2	0.2
Manipur	6.1	6.1	6.2
Meghalaya	2.1	1.8	3.0
Mizoram	4.9	2.3	6.7
Nagaland	3.3	2.4	4.7
Delhi	0.6	0.0	0.6
Odisha	2.4	2.6	1.3
Puducherry	0.6	0.7	0.5
Punjab	0.1	0.0	0.1
Rajasthan	0.1	0.1	0.1
Sikkim	23.0	23.1	22.7
Tamil Nadu	0.4	0.3	0.5
Tripura	4.8	6.7	0.4
Uttar Pradesh	0.1	0.2	0.1
Uttarakhand	0.3	0.2	0.5
West Bengal	0.8	0.9	0.7
Telangana	8.7	14.3	2.7

Note: Authors estimation using National Family Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.2.2 by Religion

Religion	Prevalence(percent)
Hindu	1.3
Muslim	0.1
Christian	4.0
Sikh	0.1
Buddhist/Neo-Buddhist	1.4
Jain	0.2
Jewish	0.0
Parsi/Zoroastrian	0.0
No Religion	8.5
other	11.7

Note: Authors estimation using National Family Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.2.3 by Social Category

Social Category	Prevalence(percent)
Caste	0.8
Tribe	7.2
No Caste/Tribe	0.7
Don't know	0.9

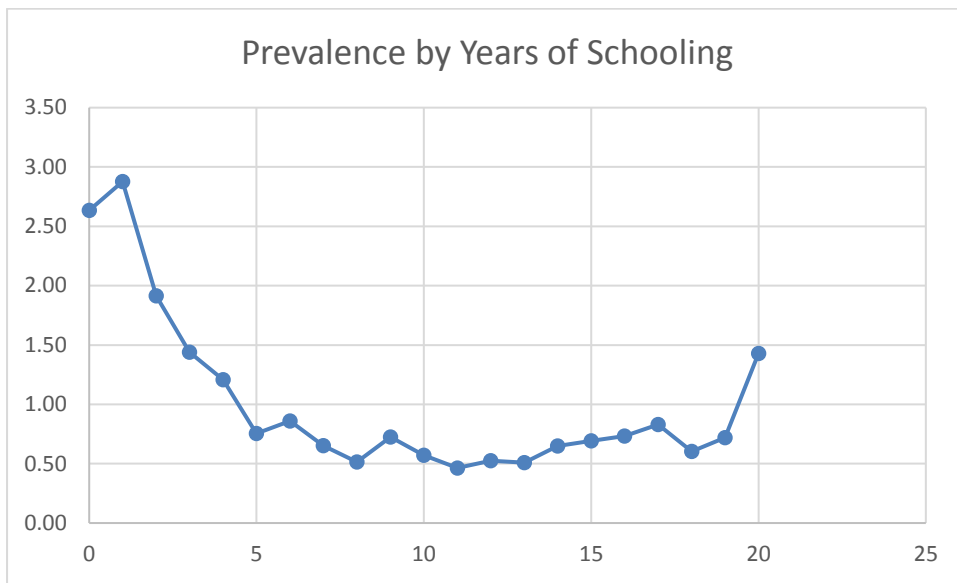
Note: Authors estimation using National Family Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Table 3.5.2.4 by Wealth Index

Wealth Index	Prevalence(percent)
Poorest	2.9
Poorer	1.4
Middle	1.0
Richer	0.6
Richest	0.6

Note: Authors estimation using National Family Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Fig 3.5.2.1 by Years of Schooling



x-axis denotes years of schooling; y-axis denotes years in percentages

Note: Authors estimation using National Family Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

3.5.3 Prevalence among Men and Women using IHDS I (2004-05) and IHDS II

(2011-12)

The estimation suggests the prevalence of daily drinkers has fallen for men by 1.5 percent and for women by 0.1 percent between years 2004-05 and 2011-12 among age group of 25 to 59.

The estimation also suggests the prevalence of daily drinkers has fallen for men by 1.1 percent and for women by 0.1 percent between years 2004-05 and 2011-12 among age group of 15 to 59.

Contrarily the prevalence of daily drinkers is on rise in the alcohol prohibited state of Gujarat.

Table 3.5.3.1 Prevalence among Men (25-59 yrs) and Percentage Change in Daily

Drinkers between 2004-05 and 2011-12

State	Percent Sometimes 2004-05	Percent Sometimes 2011-12	Percent Rarely 2011-12	Percent Daily 2004-05	Percent Daily 2011-12	Percent Change Daily (2011-12) - (2004-05)
Jammu & Kashmir	4.6	11.1	1.1	0.6	2.0	1.3
Himachal Pradesh	31.3	33.4	2.9	2.1	2.6	0.5
Punjab	21.2	21.3	3.3	3.2	5.3	2.1
Chandigarh	17.6	16.7	4.8	1.1	2.4	1.3
Uttarakhand	15.6	29.7	5.1	3.9	6.1	2.2
Haryana	16.5	13.9	2.7	2.8	5.8	2.9
Delhi	12.2	13.8	1.8	1.4	3.9	2.5
Rajasthan	9.9	12.7	1.7	3.4	3.3	0.0
Uttar Pradesh	9.9	13.1	5.2	2.8	2.7	-0.1
Bihar	6.5	22.6	4.0	23.1	6.5	-16.5
Sikkim	68.0	27.0	0.5	0.0	18.7	18.7
Arunachal Pradesh	55.9	6.3	13.7	7.1	20.8	13.7
Nagaland	43.1	16.8	3.5	5.0	0.8	-4.2
Manipur	2.3	12.6	0.0	0.0	0.0	0.0
Mizoram	2.8	21.4	22.1	1.8	0.0	-1.8
Tripura	36.4	17.2	16.5	5.3	4.5	-0.8
Meghalaya	13.7	6.7	10.7	5.4	1.2	-4.2
Assam	18.5	13.2	11.1	4.2	3.7	-0.5
West Bengal	12.6	7.8	4.7	4.0	2.4	-1.6
Jharkhand	16.2	21.5	2.5	4.1	6.2	2.1
Orissa	14.9	10.3	9.1	6.0	5.9	-0.1
Chhatisgarh	34.3	40.4	3.1	2.9	3.1	0.2

Madhya Pradesh	10.0	16.2	3.5	1.6	2.6	1.0
Gujarat	9.7	2.2	0.9	3.0	3.9	0.9
Daman & Diu	10.9	6.0	0.0	9.3	21.9	12.6
Dadra Nagar Haveli	3.2	9.1	0.9	23.2	7.3	-15.9
Maharashtra	10.5	8.1	3.6	6.1	2.7	-3.4
Andhra Pradesh	22.4	20.1	2.0	13.0	10.1	-2.9
Karnataka	3.9	7.1	2.4	6.9	6.0	-0.9
Goa	8.4	6.1	1.2	5.5	11.3	5.7
Kerala	11.2	9.8	6.5	3.8	3.2	-0.5
Tamil Nadu	13.0	12.5	2.8	6.3	5.2	-1.1
Pondicherry	13.0	0.4	0.3	3.4	4.5	1.1
All India	13.1	13.7	3.9	5.9	4.4	-1.5

Note: Authors estimation using IHDS I and IHDS II data sets and application of sampling weights.

Table 3.5.3.2 Prevalence among Women (25-59 yrs) and Percentage Change in Daily Drinkers between 2004-05 and 2011-12

State	Percent Sometimes	Percent Sometimes	Percent Rarely	Percent Daily	Percent Daily	Percent Change Daily
	2004-05	2011-12	2011-12	2004-05	2011-12	(2011-12) - (2004-05)
Jammu & Kashmir	0.1	0.1	0.0	0.0	0.0	0.0
Himachal Pradesh	0.5	0.1	0.0	0.0	0.1	0.1
Punjab	0.0	0.1	0.0	0.0	0.0	0.0
Chandigarh	0.0	0.0	0.0	0.0	0.0	0.0
Uttarakhand	0.1	0.0	0.0	0.0	0.0	0.0
Haryana	0.3	0.1	0.0	0.0	0.0	0.0
Delhi	0.2	0.3	0.0	0.1	0.0	-0.1
Rajasthan	0.1	0.0	0.1	0.0	0.0	0.0
Uttar Pradesh	0.1	0.1	0.1	0.0	0.0	0.0
Bihar	0.0	0.0	0.1	0.7	0.0	-0.7
Sikkim	7.4	6.3	2.1	0.0	2.6	2.6
Arunachal Pradesh	17.1	1.3	2.5	0.0	1.5	1.5
Nagaland	0.0	0.0	0.0	0.0	0.0	0.0
Manipur	0.0	0.0	0.0	0.0	0.0	0.0
Mizoram	0.0	0.0	0.0	0.0	0.0	0.0
Tripura	16.1	0.8	0.9	0.8	0.4	-0.4

Meghalaya	2.1	0.6	0.0	0.0	0.0	0.0
Assam	0.1	0.3	0.7	0.0	0.2	0.2
West Bengal	0.9	0.4	0.1	0.8	0.1	-0.7
Jharkhand	4.2	3.8	0.0	0.6	0.5	-0.1
Orissa	3.3	1.0	1.5	1.4	0.7	-0.6
Chhatishgarh	1.6	3.1	0.1	0.4	0.2	-0.2
Madhya Pradesh	0.2	0.2	0.1	0.0	0.1	0.0
Gujarat	0.1	0.0	0.0	0.0	0.2	0.2
Daman & Diu	0.0	2.0	0.0	0.0	2.0	2.0
Dadra Nagar Haveli	1.4	3.9	0.0	0.0	0.9	0.9
Maharashtra	0.3	0.0	0.0	0.2	0.1	-0.1
Andhra Pradesh	2.5	0.6	0.0	0.5	0.9	0.3
Karnataka	0.1	0.2	0.1	0.4	0.3	-0.1
Goa	0.0	0.0	0.0	0.0	0.0	0.0
Kerala	0.0	0.0	0.0	0.0	0.0	0.0
Tamil Nadu	0.2	0.0	0.1	0.2	0.1	-0.1
Pondicherry	0.0	0.0	0.0	0.0	0.0	0.0
All India	0.8	0.4	0.1	0.3	0.2	-0.1

Note: Authors estimation using IHDS I and IHDS II data sets and application of sampling weights.

Table 3.5.3.3 Prevalence among Men (15-59 yrs) and Percentage Change in Daily

Drinkers between 2004-05 and 2011-12

State	Percent Sometimes 2004-05	Percent Sometimes 2011-12	Percent Rarely 2011-12	Percent Daily 2004-05	Percent Daily 2011-12	Percent Change Daily (2011-12) - (2004-05)
Jammu & Kashmir	2.9	7.8	0.7	0.4	1.6	1.2
Himachal Pradesh	22.3	24.2	2.1	1.5	1.9	0.4
Punjab	14.9	14.4	2.4	2.2	3.5	1.4
Chandigarh	12.6	13.1	3.3	0.8	1.6	0.9
Uttarakhand	10.1	19.6	3.5	2.4	3.9	1.5
Haryana	11.1	9.7	2.0	2.0	3.9	1.9
Delhi	8.1	9.4	1.4	0.9	2.7	1.8
Rajasthan	6.9	9.2	1.3	2.3	2.2	0.0
Uttar Pradesh	7.1	9.1	3.9	1.9	1.7	-0.2
Bihar	5.2	16.0	2.9	17.7	4.5	-13.2
Sikkim	47.8	20.8	0.6	0.0	14.2	14.2

Arunachal Pradesh	37.2	4.8	10.3	4.6	14.6	9.9
Nagaland	29.2	11.8	2.5	3.3	0.6	-2.7
Manipur	1.6	9.8	0.0	0.0	0.0	0.0
Mizoram	3.2	16.8	17.4	1.9	0.0	-1.9
Tripura	29.6	13.6	12.8	4.6	3.5	-1.0
Meghalaya	8.5	4.8	7.5	3.2	0.8	-2.5
Assam	13.2	9.6	9.1	3.1	3.0	-0.1
West Bengal	9.4	6.2	4.0	3.1	1.7	-1.4
Jharkhand	12.5	16.1	2.6	2.9	4.5	1.6
Orissa	11.2	7.9	7.3	4.5	4.5	0.0
Chhatisgarh	25.0	31.4	2.8	2.1	2.5	0.4
Madhya Pradesh	7.1	12.1	2.5	1.1	1.8	0.7
Gujarat	7.5	1.5	0.8	2.3	2.8	0.5
Daman & Diu	8.1	4.5	0.0	6.1	16.3	10.2
Dadra Nagar Haveli	3.2	6.8	0.7	16.8	5.9	-11.0
Maharashtra	7.7	5.7	2.5	4.3	1.9	-2.4
Andhra Pradesh	16.5	14.7	1.5	9.3	7.1	-2.2
Karnataka	2.8	5.3	1.8	4.8	4.3	-0.4
Goa	6.6	5.2	1.1	4.3	9.5	5.2
Kerala	8.4	7.6	5.3	2.8	2.5	-0.3
Tamil Nadu	9.9	9.7	2.1	4.5	3.9	-0.6
Pondicherry	9.6	0.3	0.2	2.5	3.3	0.8
All India	9.5	10.1	3.0	4.3	3.2	-1.1

Note: Authors estimation using IHDS I and IHDS II data sets and application of sampling weights.

Table 3.5.3.4 Prevalence among Women (15-59 yrs) and Percentage Change in Daily Drinkers between 2004-05 and 2011-12

State	Percent Sometimes 2004-05	Percent Sometimes 2011-12	Percent Rarely 2011-12	Percent Daily 2004-05	Percent Daily 2011-12	Percent Change Daily (2011-12) - (2004-05)
Jammu & Kashmir	0.1	0.1	0.0	0.0	0.0	0.0
Himachal Pradesh	0.3	0.1	0.0	0.0	0.0	0.0
Punjab	0.0	0.0	0.0	0.0	0.0	0.0
Chandigarh	0.0	0.0	0.0	0.0	0.0	0.0
Uttarakhand	0.1	0.0	0.0	0.0	0.0	0.0

Haryana	0.2	0.1	0.0	0.0	0.0	0.0
Delhi	0.2	0.3	0.0	0.1	0.0	-0.1
Rajasthan	0.1	0.0	0.1	0.1	0.0	-0.1
Uttar Pradesh	0.1	0.1	0.1	0.0	0.0	0.0
Bihar	0.0	0.0	0.1	0.5	0.1	-0.4
Sikkim	5.2	4.7	1.8	0.0	1.9	1.9
Arunachal Pradesh	10.3	0.9	1.8	0.0	1.1	1.1
Nagaland	0.0	0.0	0.0	0.0	0.0	0.0
Manipur	0.0	0.0	0.0	0.0	0.0	0.0
Mizoram	0.0	0.0	0.0	0.0	0.0	0.0
Tripura	12.4	0.6	0.7	0.5	0.3	-0.3
Meghalaya	1.3	0.4	0.0	0.0	0.0	0.0
Assam	0.3	0.2	0.5	0.0	0.1	0.1
West Bengal	0.7	0.3	0.1	0.6	0.0	-0.6
Jharkhand	2.8	2.6	0.0	0.4	0.3	-0.1
Orissa	2.6	0.7	1.1	1.0	0.5	-0.5
Chhatishgarh	1.4	2.2	0.1	0.3	0.2	-0.1
Madhya Pradesh	0.1	0.1	0.0	0.0	0.1	0.1
Gujarat	0.1	0.0	0.0	0.0	0.1	0.1
Daman & Diu	0.0	1.4	0.0	0.0	1.4	1.4
Dadra Nagar Haveli	0.9	2.9	0.0	0.0	0.7	0.7
Maharashtra	0.2	0.0	0.0	0.2	0.1	-0.1
Andhra Pradesh	1.9	0.5	0.0	0.4	0.7	0.3
Karnataka	0.1	0.1	0.1	0.2	0.2	0.0
Goa	0.0	0.0	0.0	0.0	0.0	0.0
Kerala	0.0	0.0	0.0	0.0	0.0	0.0
Tamil Nadu	0.1	0.1	0.0	0.1	0.1	-0.1
Pondicherry	0.0	0.0	0.0	0.0	0.0	0.0
All India	0.6	0.3	0.1	0.2	0.1	-0.1

Note: Authors estimation using IHDS I and IHDS II data sets and application of sampling weights.

3.5.3 Sample Statistics (for Quantile Regressions)

Table 3.5.3.1 India excluding Prohibited Areas

Full Sample	Observations	Prevalence (%)
Ethanol/Alcohol	167839	14
Country Liquor	167839	07
IMFL	167839	05
Beer	167839	02
Toddy	167839	02
		Average Consumption
Full Sample	Observations	Quantity(liters/month)
Ethanol/Alcohol	167839	0.17
Country Liquor	167839	0.27
IMFL	167839	0.09
Beer	167839	0.06
Toddy	167839	0.19
		Average Consumption
Drinkers Only Sample	Observations	Quantity(liters/month)
Country Liquor	11811	3.91
IMFL	8230	1.78
Beer	2759	3.86
Toddy	2590	12.32

Note: Authors estimation using NSSO data set

Table 3.5.3.2 Only South India

Full Sample	Observations	Prevalence
Ethanol/Alcohol	44143	0.19
Country Liquor	44143	0.02
IMFL	44143	0.11
Beer	44143	0.03
Toddy	44143	0.03
		Average Consumption
Full Sample	Observations	Quantity(liters/month)
Ethanol/Alcohol	44143	0.15
Country Liquor	44143	0.10
IMFL	44143	0.19
Beer	44143	0.12
Toddy	44143	0.51

		Average Consumption
Drinkers Only Sample	Observations	Quantity(liters/month)
Country Liquor	1052	4.23
IMFL	5021	1.65
Beer	1428	3.75
Toddy	1420	15.72

Note: Authors estimation using NSSO data set

Table 3.5.3.3 Only Maharashtra

Full Sample	Observations	Prevalence
Ethanol/Alcohol	15623	0.09
Country Liquor	15623	0.06
IMFL	15623	0.01
Beer	15623	0.01
Toddy	15623	0.00
		Average Consumption
Full Sample	Observations	Quantity(liters/month)
Ethanol/Alcohol	15623	0.09
Country Liquor	15623	0.18
IMFL	15623	0.02
Beer	15623	0.06
Toddy	15623	0.01
		Average Consumption
Drinkers Only Sample	Observations	Quantity(liters/month)
Country Liquor	950	3.00
IMFL	204	1.55
Beer	234	4.03
Toddy	37	5.24

Note: Authors estimation using NSSO data set

Table 3.5.3.4 Independent/Explanatory variable (full sample)

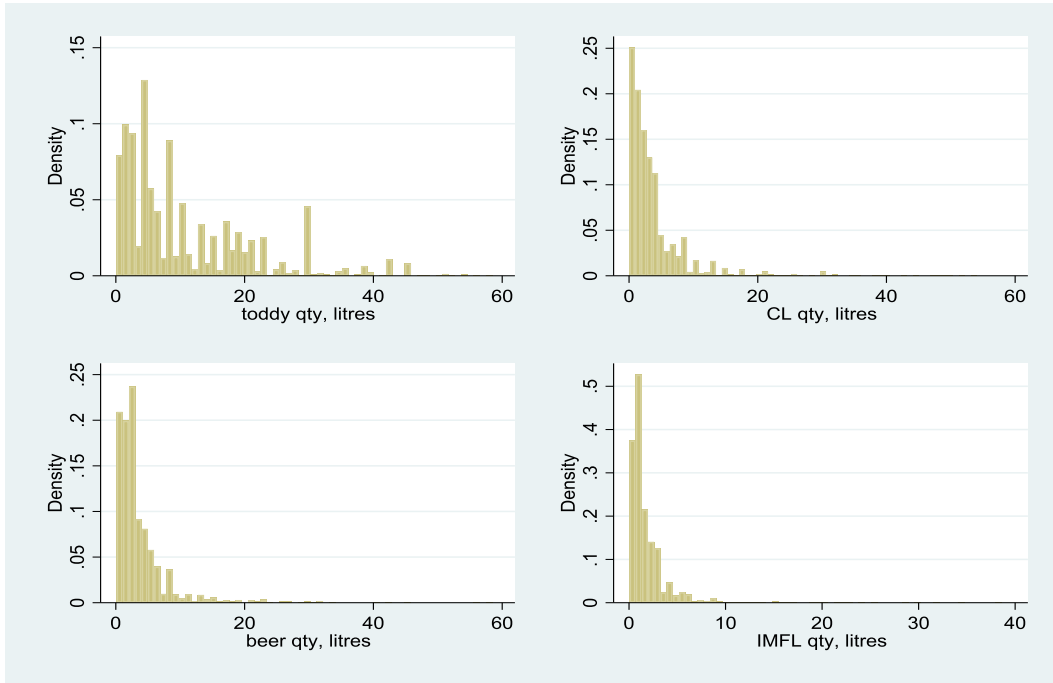
Variable	Observations	Mean
Monthly Per Capita Ex (MPCE) (2011-12) in Rs	167,839	2111.42
SC/ST dummy (0- not SC/ST, 1- is SC/ST)	167,839	0.25
Islam dummy (0- not Islam, 1- is Islam)	167,839	0.14

Household Size	167,839	4.57
Sex (1-Female, 2-Male)	167,839	1.12
Sector (1-Rural, 2-Urban)	167,839	1.40
Whether own land dummy (1- Yes, 2- No)	167,827	1.13
Education Levels (1 to 13)	167,823	6.23
MLDA18 (1- legal age 18, 0- otherwise)	167,839	0.16
MLDA25 (1- legal age 25, 0- otherwise)	167,839	0.16

Note: Authors estimation using NSSO data set

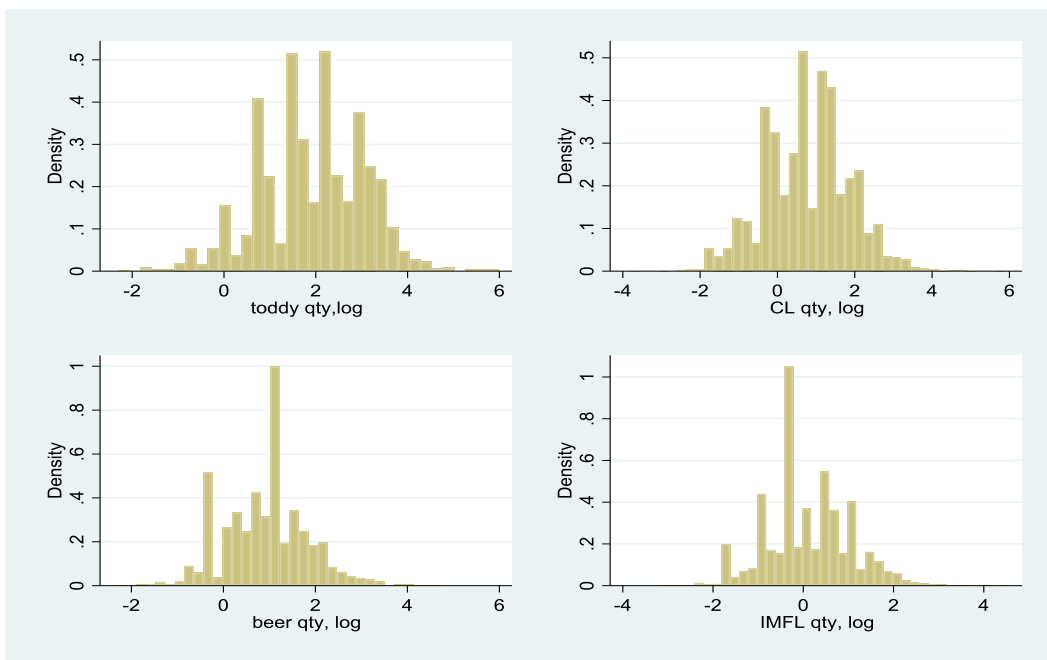
3.6.4 Graphical Overview (Histograms) of Dependent Variables

Fig 3.6.4.1 Quantity of Individual Liquor Consumed by Drinking Households (All India)



Note: Authors depiction using NSSO data set

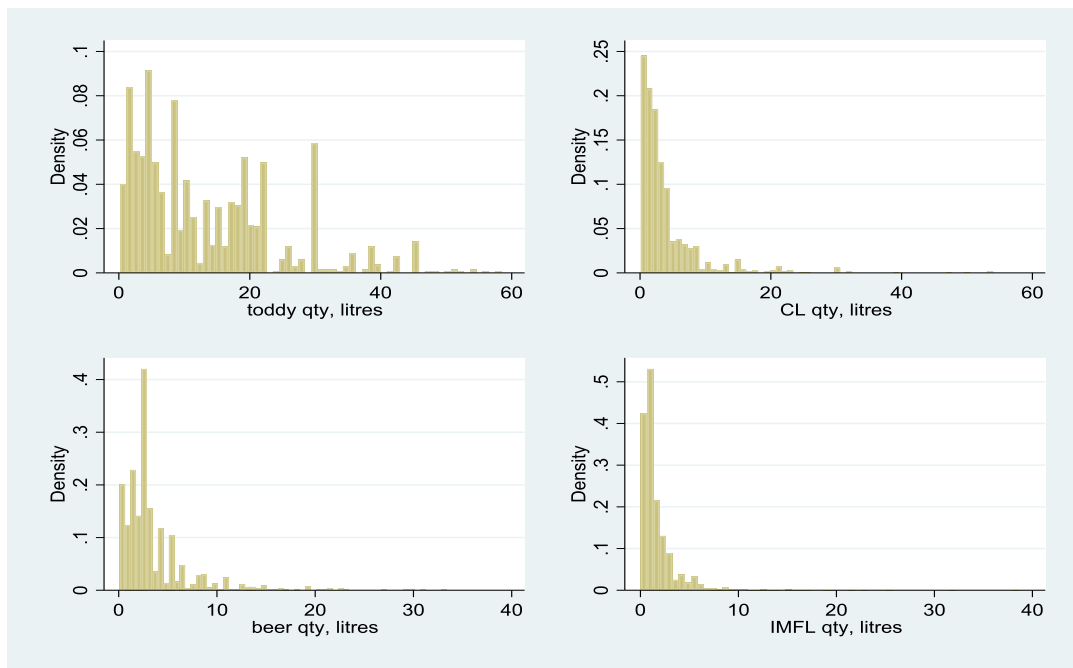
Fig 3.6.4.2 Log Transformed Distribution of Dependent Variables (All India)



Note: Authors depiction using NSSO data set

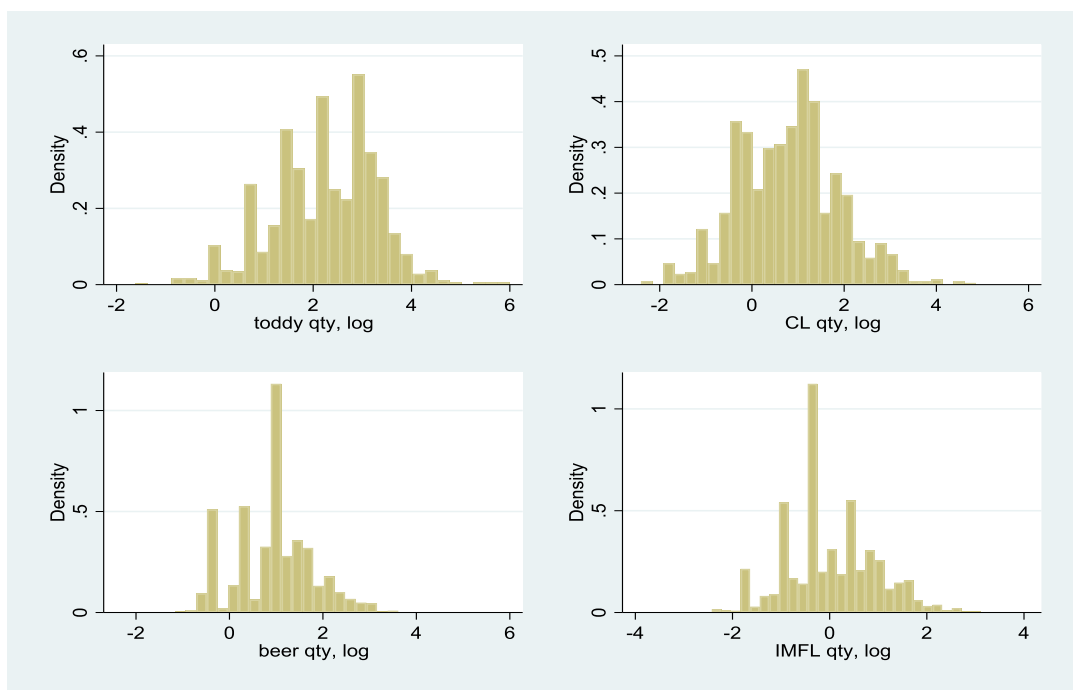
Fig 3.6.4.3 Quantity of Individual Liquor Consumed by Drinking Households

(South India)



Note: Authors depiction using NSSO data set

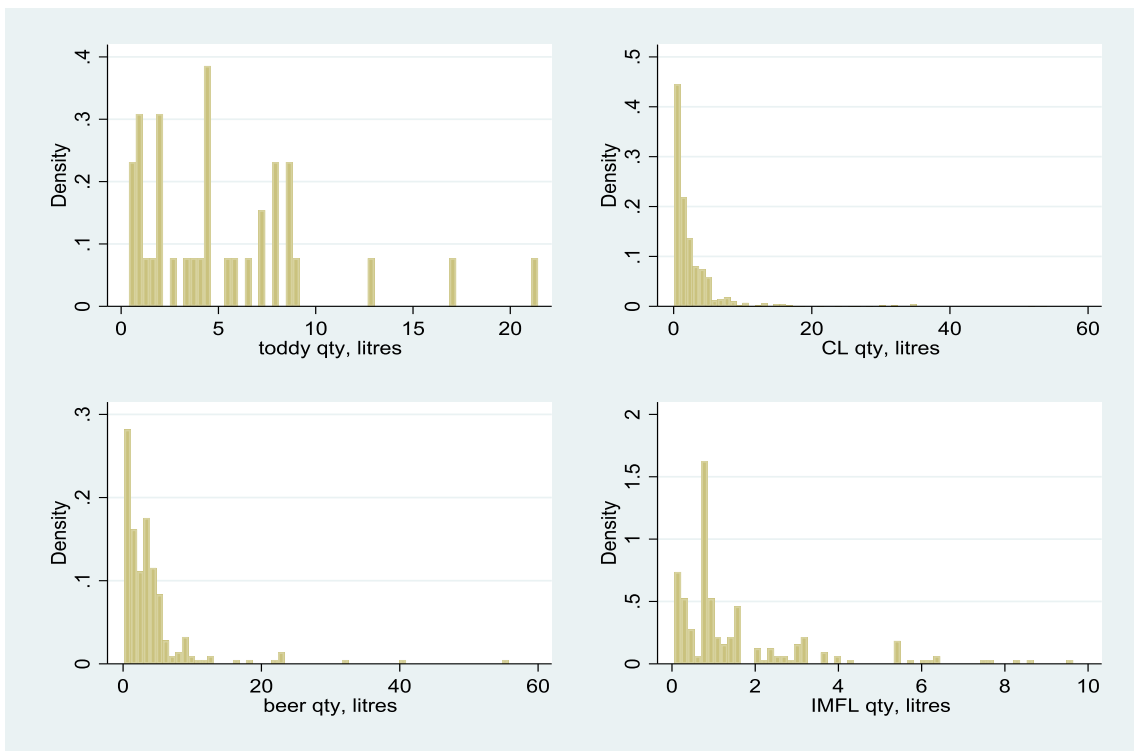
Fig 3.6.4.4 Log Transformed Distribution of Dependent Variables (South India)



Note: Authors depiction using NSSO data set

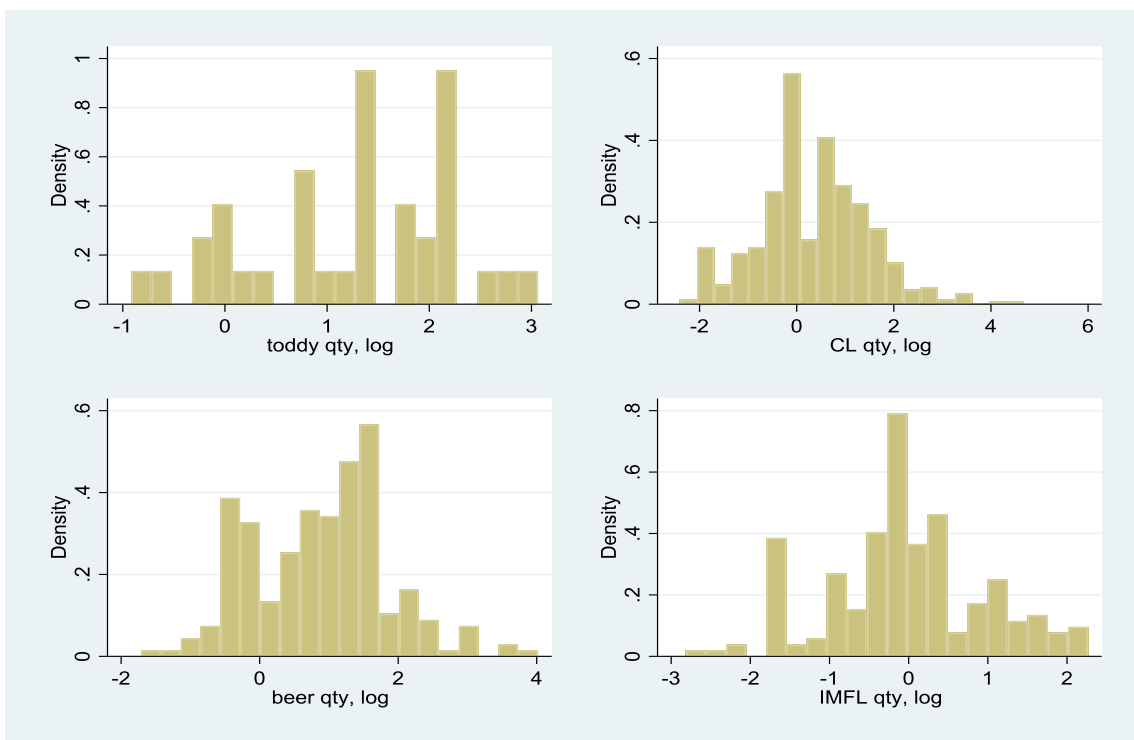
Fig 3.6.4.5 Quantity of Individual Liquor Consumed by Drinking Households

(Maharashtra)



Note: Authors depiction using NSSO data set

Fig 3.6.4.6 Log Transformed Distribution of Dependent Variables (Maharashtra)



Note: Authors depiction using NSSO data set

3.6.5 Definition of Independent Variables

Independent Variables	Description
Country Liquor Price, log	Log value of Country Liquor price
IMFL price, log	Log value of Indian Made Foreign Liquor price
Toddy price, log	Log value of Toddy price
Beer price, log	Log value of Beer price
MPCE, log	Log value of monthly per capita consumption expenditure of a household
SC/ST dummy	Dummy for Scheduled Caste or Scheduled Tribe household (1- SC/ST, 0- Non SC/ST)
Islam dummy	Dummy for Islam follower household (1- SC/ST, 0- Non SC/ST)
Household Size, log	Log value of the household size
Female dummy	Dummy representing female household head (base category Male household head)
Urban dummy	Dummy representing urban household (base category Rural household)
No-Land dummy	Dummy representing household with no land (base category holds land)
EGS/NFEC/AEC dummy	Education dummy of household head with non formal education (base category illiterate) (Education Guarantee Scheme/ Non Formal Education Courses/ Adult Education Centers)
TLC dummy	Education dummy of household head with non formal education (base category illiterate) (Total Literacy Campaign)
Other NonFormal dummy	Education dummy of household head with Other non formal education (base category illiterate)
Below Primary dummy	Education dummy of household head with below primary education (base category illiterate)
Primary dummy	Education dummy of household head with primary education (base category illiterate)
Middle dummy	Education dummy of household head with middle level education (base category illiterate)
Secondary dummy	Education dummy of household head with secondary education (base category illiterate)
Higher-secondary dummy	Education dummy of household head with higher secondary education

	(base category illiterate)
Diploma/Certif dummy	Education dummy of household head with diploma or certificate level education
	(base category illiterate)
Graduate dummy	Education dummy of household head with graduate level of education
	(base category illiterate)
PG & Above dummy	Education dummy of household head with post-graduate or above level of education
	(base category illiterate)
Cigarette price, log	Log value of Cigarette price
Bidi price, log	Log value of Cigarette price
Tobacco price, log	Log value of Tobacco price
MLDA 18 DUMMY	Dummy representing state with minimum legal drinking age of 18 (base 21 years age)
MLDA 25 DUMMY	Dummy representing state with minimum legal drinking age of 25 (base 21 years age)

3.6.6 Result Tables on Quantile Regressions (Basic Specification)

Table 3.6.6.1 Quantile Regression at all-India level excluding prohibited areas for

Country Liquor

	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Country Liquor price, log	-0.808*** (0.0383)	-0.727*** (0.0343)	-0.716*** (0.0237)	-0.619*** (0.0266)	-0.656*** (0.0306)
MPCE, log	0.682*** (0.0290)	0.746*** (0.0305)	0.797*** (0.0281)	0.796*** (0.0275)	0.848*** (0.0305)
SC/ST dummy	0.0409 (0.0304)	0.0932*** (0.0188)	0.158*** (0.0177)	0.149*** (0.0193)	0.102*** (0.0257)
Islam dummy	-0.310*** (0.103)	-0.186** (0.0902)	-0.255*** (0.0681)	-0.175*** (0.0559)	-0.214** (0.0979)
Household Size, log	0.360*** (0.0362)	0.375*** (0.0313)	0.425*** (0.0264)	0.404*** (0.0228)	0.447*** (0.0259)
Female dummy	0.0812 (0.0595)	0.0129 (0.0640)	0.0136 (0.0502)	-0.0644 (0.0500)	0.0886 (0.0980)
Urban dummy	0.123*** (0.0438)	0.0468* (0.0281)	0.0473 (0.0318)	0.0884*** (0.0242)	0.0361 (0.0498)
No Land dummy	0.0175 (0.0546)	0.0305 (0.0503)	0.0457 (0.0290)	0.0300 (0.0403)	0.0507 (0.0450)
EGS/NFEC/AEC dummy	-0.0386 (0.231)	0.145 (0.296)	0.112 (0.178)	0.171 (0.135)	-0.170 (0.106)
TLC dummy	0.0991 (0.352)	0.0768 (0.369)	-0.215 (0.333)	-0.419 (0.980)	-0.274 (1.404)
Other NonFormal dummy	0.0311 (0.166)	-0.106 (0.100)	-0.193** (0.0860)	-0.206 (0.199)	-0.0879 (0.275)
Below Primary dummy	-0.0400 (0.0445)	-0.145*** (0.0404)	-0.109*** (0.0292)	-0.0949* (0.0488)	-0.0615 (0.0411)
Primary dummy	-0.0432 (0.0499)	-0.115*** (0.0393)	-0.0848*** (0.0308)	-0.0939*** (0.0312)	-0.111*** (0.0289)
Middle dummy	-0.195*** (0.0569)	-0.217*** (0.0441)	-0.190*** (0.0413)	-0.193*** (0.0376)	-0.207*** (0.0339)
Secondary dummy	-0.246*** (0.0556)	-0.292*** (0.0376)	-0.272*** (0.0311)	-0.285*** (0.0514)	-0.214*** (0.0645)
Higher-secondary dummy	-0.450*** (0.0834)	-0.388*** (0.0529)	-0.362*** (0.0389)	-0.399*** (0.0444)	-0.337*** (0.0667)
Diploma/Certif dummy	-0.463 (0.394)	-0.450*** (0.132)	-0.778*** (0.104)	-0.777*** (0.223)	-0.563*** (0.175)
Graduate dummy	-0.547*** (0.131)	-0.478*** (0.0651)	-0.515*** (0.0511)	-0.499*** (0.0910)	-0.523*** (0.0942)
PG & Above dummy	-0.325 (0.210)	-0.442** (0.210)	-0.496*** (0.159)	-0.356*** (0.118)	-0.542*** (0.0941)
MLDA 18 dummy	0.577*** (0.0962)	0.314** (0.151)	0.429*** (0.0916)	0.386*** (0.127)	0.350 (0.299)
MLDA 25 dummy	-0.0351	0.0624	0.113	0.297***	0.283
Constant	-2.211***	-2.507***	-2.483***	-2.400***	-2.011***

	(0.347)	(0.344)	(0.299)	(0.285)	(0.334)
Observations	11,810	11,810	11,810	11,810	11,810

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.2 Quantile Regression at all-India level excluding prohibited areas for

IMFL

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
IMFL price, log	-0.662*** (0.0694)	-0.786*** (0.0467)	-0.808*** (0.0306)	-0.684*** (0.0442)	-0.690*** (0.0624)
MPCE, log	0.506*** (0.0337)	0.560*** (0.0381)	0.635*** (0.0383)	0.795*** (0.0420)	0.884*** (0.0376)
SC/ST dummy	0.103*** (0.0332)	0.0692* (0.0407)	0.111*** (0.0310)	0.137*** (0.0304)	0.166*** (0.0361)
Islam dummy	0.0564 (0.102)	0.0691 (0.0719)	0.124** (0.0531)	0.0908 (0.0727)	0.114 (0.114)
Household Size, log	0.330*** (0.0500)	0.301*** (0.0314)	0.379*** (0.0272)	0.459*** (0.0326)	0.509*** (0.0294)
Female dummy	-0.133 (0.106)	0.0142 (0.0797)	0.0457 (0.0540)	-0.0349 (0.0572)	-0.0604 (0.0740)
Urban dummy	0.00429 (0.0514)	0.0375 (0.0364)	0.0128 (0.0240)	-0.0291 (0.0296)	-0.0348 (0.0453)
No Land dummy	-0.0248 (0.0468)	-0.0500 (0.0329)	-0.0273 (0.0361)	-0.0116 (0.0400)	-0.0891* (0.0484)
EGS/NFEC/AEC dummy	-0.153 (0.195)	-0.208 (0.425)	0.168 (0.493)	0.0940 (0.308)	-0.0824 (0.247)
TLC dummy	-0.349 (0.818)	-1.069 (0.884)	-0.351 (1.210)	1.077 (1.270)	0.526 (1.301)
Other NonFormal dummy	-0.167 (0.408)	0.444 (0.465)	-0.0138 (0.197)	-0.388* (0.209)	-0.570*** (0.172)
Below Primary dummy	-0.0859 (0.0644)	-0.140** (0.0554)	-0.102*** (0.0348)	-0.136** (0.0546)	-0.208*** (0.0644)
Primary dummy	-0.118** (0.0598)	-0.125*** (0.0387)	-0.146*** (0.0426)	-0.143*** (0.0498)	-0.135*** (0.0471)
Middle dummy	-0.0378 (0.0541)	-0.114** (0.0449)	-0.148*** (0.0344)	-0.209*** (0.0515)	-0.141*** (0.0451)
Secondary dummy	-0.185*** (0.0593)	-0.258*** (0.0400)	-0.260*** (0.0306)	-0.351*** (0.0542)	-0.383*** (0.0509)
Higher-secondary dummy	-0.0984** (0.0480)	-0.222*** (0.0608)	-0.288*** (0.0333)	-0.343*** (0.0658)	-0.500*** (0.0656)
Diploma/Certif dummy	-0.0435 (0.115)	-0.233** (0.101)	-0.415*** (0.0705)	-0.623*** (0.164)	-0.681*** (0.125)
Graduate dummy	-0.139 (0.0858)	-0.373*** (0.0708)	-0.362*** (0.0720)	-0.442*** (0.0833)	-0.490*** (0.0698)
PG & Above dummy	-0.159** (0.0641)	-0.355*** (0.0784)	-0.436*** (0.0738)	-0.594*** (0.0913)	-0.675*** (0.0836)
MLDA 18 dummy	0.541* (0.261)	0.177 (0.101)	0.0898 (0.0738)	0.0347 (0.0913)	-0.00150 (0.0836)

	(0.300)	(0.123)	(0.278)	(0.135)	(0.174)
MLDA 25 dummy	0.201	0.240	0.238	-0.0615	0.0624
	(0.283)	(0.154)	(0.282)	(0.159)	(0.221)
Constant	-1.839***	-0.507*	-0.431	-1.796***	-1.907***
	(0.659)	(0.296)	(0.415)	(0.323)	(0.548)
Observations	8,229	8,229	8,229	8,229	8,229

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.3 Quantile Regression at all-India level excluding prohibited areas for

Toddy

	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Toddy price, log	-1.024***	-1.055***	-0.901***	-0.700***	-0.657***
	(0.0757)	(0.0670)	(0.0409)	(0.0579)	(0.117)
MPCE, log	0.392***	0.528***	0.574***	0.662***	0.616***
	(0.0721)	(0.0777)	(0.0707)	(0.0671)	(0.123)
SC/ST dummy	-0.0706	0.0776	0.0728*	0.119***	0.104
	(0.0790)	(0.0712)	(0.0415)	(0.0293)	(0.0730)
Islam dummy	-0.191	0.175	0.130	-5.87e-05	-0.0283
	(0.218)	(0.139)	(0.0950)	(0.107)	(0.166)
Household Size, log	0.271***	0.252***	0.255***	0.290***	0.233***
	(0.0615)	(0.0898)	(0.0472)	(0.0486)	(0.0760)
Female dummy	-0.391***	-0.212**	-0.284***	-0.143	-0.173
	(0.147)	(0.101)	(0.108)	(0.101)	(0.153)
Urban dummy	0.0748	0.0305	-0.0632	-0.0367	-0.0708
	(0.112)	(0.0624)	(0.0553)	(0.0444)	(0.0937)
No Land dummy	-0.135	-0.0432	-0.103	-0.0646	-0.0779
	(0.136)	(0.136)	(0.0731)	(0.0906)	(0.160)
EGS/NFEC/AEC dummy	0.185	-0.0841	-0.0896	-0.149	-0.107
	(0.346)	(0.474)	(0.419)	(0.289)	(0.285)
TLC dummy	-0.595*	-1.207***	-1.153***	-1.423**	-1.855***
	(0.347)	(0.286)	(0.415)	(0.582)	(0.671)
Other NonFormal dummy	0.183	0.263	0.430*	0.655	0.513
	(0.302)	(0.325)	(0.245)	(0.562)	(0.819)
Below Primary dummy	-0.281**	-0.0837	-0.204***	-0.211***	-0.273***
	(0.116)	(0.0775)	(0.0576)	(0.0708)	(0.0965)
Primary dummy	-0.0343	0.0191	-0.0973	-0.0484	-0.0682
	(0.0867)	(0.0714)	(0.0750)	(0.0718)	(0.171)
Middle dummy	-0.205***	-0.233***	-0.168**	-0.187**	-0.158
	(0.0700)	(0.0732)	(0.0680)	(0.0849)	(0.118)
Secondary dummy	-0.0669	-0.135	-0.143*	-0.138*	-0.190*
	(0.0924)	(0.0863)	(0.0813)	(0.0790)	(0.0983)
Higher-secondary dummy	-0.141	-0.150	-0.260	-0.0711	0.150
	(0.159)	(0.148)	(0.210)	(0.196)	(0.470)
Diploma/Certif dummy	-2.925**	-0.618	-1.218	-0.701	-0.691
	(1.259)	(1.186)	(0.838)	(0.561)	(0.421)
Graduate dummy	-0.286*	-0.333**	-0.466***	-0.557***	-0.387**

	(0.160)	(0.151)	(0.130)	(0.212)	(0.162)
PG & Above dummy	-0.908	-1.175***	-0.865	-0.484	-0.772
	(0.695)	(0.414)	(0.601)	(0.807)	(1.014)
MLDA 18 dummy	1.429	0.760	-0.308	-0.00165	0.502
	(0.889)	(0.829)	(0.752)	(0.379)	(0.796)
MLDA 25 dummy	0.452	0.281	-0.176	-0.251	-0.103
	(0.753)	(0.829)	(0.470)	(0.310)	(0.349)
Constant	0.274	0.102	0.708	-0.300	-0.0447
	(1.135)	(1.229)	(0.906)	(0.699)	(1.017)
Observations	2,586	2,586	2,586	2,586	2,586

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.4 Quantile Regression at all-India level excluding prohibited areas for

Beer

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Beer price, log	-0.962***	-0.851***	-0.800***	-0.759***	-0.783***
	(0.0903)	(0.0714)	(0.0639)	(0.0792)	(0.129)
MPCE, log	0.489***	0.771***	0.676***	0.761***	0.889***
	(0.0736)	(0.0651)	(0.0508)	(0.0455)	(0.0756)
SC/ST dummy	0.00717	0.0118	0.0752*	0.00969	-0.00262
	(0.0493)	(0.0515)	(0.0418)	(0.0537)	(0.0893)
Islam dummy	-0.0296	0.0522	-0.00312	-0.0383	-0.103
	(0.129)	(0.0988)	(0.0976)	(0.0726)	(0.131)
Household Size, log	0.313***	0.448***	0.405***	0.481***	0.538***
	(0.0848)	(0.0754)	(0.0608)	(0.0477)	(0.0594)
Female dummy	-0.159	-0.124	0.0654	-0.0691	-0.310
	(0.151)	(0.173)	(0.111)	(0.110)	(0.189)
Urban dummy	0.0388	-0.00583	-0.0121	-0.0217	-0.0148
	(0.0588)	(0.0551)	(0.0488)	(0.0338)	(0.0880)
No Land dummy	-0.0355	-0.0223	-0.0630	-0.00881	-0.0258
	(0.0629)	(0.0605)	(0.0641)	(0.0590)	(0.0799)
EGS/NFEC/AEC dummy	0.377	-0.0695	0.106	-0.404	-0.810**
	(0.331)	(0.417)	(0.319)	(0.481)	(0.399)
TLC dummy	-0.778***	-0.992***	-1.681***	-2.252***	-2.840***
	(0.128)	(0.133)	(0.105)	(0.0875)	(0.256)
Other NonFormal dummy	-0.243	-0.438	-0.266	-0.0750	-0.980***
	(0.488)	(0.385)	(0.349)	(0.292)	(0.255)
Below Primary dummy	0.0353	-0.151	-0.0570	-0.0620	-0.270
	(0.0981)	(0.109)	(0.0647)	(0.0845)	(0.212)
Primary dummy	0.0661	0.0107	-0.0416	-0.0518	-0.161
	(0.0604)	(0.111)	(0.0579)	(0.0783)	(0.188)
Middle dummy	0.00826	-0.0303	-0.0562	-0.129	-0.313**
	(0.0975)	(0.0988)	(0.0638)	(0.0803)	(0.147)
Secondary dummy	0.0292	-0.0902	-0.0340	-0.183**	-0.519***
	(0.0966)	(0.111)	(0.0557)	(0.0755)	(0.143)
Higher-secondary dummy	0.114	0.0212	-0.0653	-0.111	-0.495***

	(0.131)	(0.139)	(0.0834)	(0.0873)	(0.172)
Diploma/Certif dummy	-0.0493	-0.395***	-0.258	-0.330***	-0.0282
	(0.192)	(0.141)	(0.202)	(0.0751)	(0.444)
Graduate dummy	-0.0424	-0.224*	-0.221***	-0.242***	-0.614***
	(0.122)	(0.115)	(0.0779)	(0.0759)	(0.136)
PG & Above dummy	-0.00819	-0.308**	-0.253***	-0.511***	-0.938***
	(0.166)	(0.145)	(0.0891)	(0.0907)	(0.171)
MLDA 18 dummy	0.335	0.255	0.147	0.250	0.408
	(0.365)	(0.287)	(0.157)	(0.159)	(0.288)
MLDA 25 dummy	0.159	0.0471	0.108	0.268	0.425*
	(0.363)	(0.318)	(0.143)	(0.167)	(0.251)
Constant	0.128	-2.142***	-1.010*	-1.538***	-1.919*
	(0.770)	(0.650)	(0.572)	(0.535)	(1.067)
Observations	2,759	2,759	2,759	2,759	2,759

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.5 Quantile Regression on South-India for Country Liquor

	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Country Liquor price, log	-0.867***	-0.829***	-0.800***	-0.638***	-0.709***
	(0.106)	(0.0920)	(0.0682)	(0.105)	(0.133)
MPCE, log	0.607***	0.669***	0.747***	0.708***	0.975***
	(0.131)	(0.120)	(0.104)	(0.126)	(0.153)
SC/ST dummy	0.185*	0.0910	0.0964	0.141	0.0802
	(0.105)	(0.0829)	(0.107)	(0.0905)	(0.145)
Islam dummy	0.155	0.190	-0.124	0.0484	-0.0897
	(0.208)	(0.174)	(0.136)	(0.276)	(0.280)
Household Size, log	0.563***	0.492***	0.453***	0.326***	0.514***
	(0.107)	(0.154)	(0.107)	(0.0912)	(0.132)
Female dummy	0.0492	0.115	-0.0855	-0.311**	-0.568***
	(0.197)	(0.130)	(0.148)	(0.157)	(0.195)
Urban dummy	0.102	0.0101	-0.0139	-0.00338	-0.0850
	(0.122)	(0.0789)	(0.103)	(0.105)	(0.137)
No Land dummy	-0.0485	-0.0662	0.0416	-0.0233	-0.0117
	(0.178)	(0.107)	(0.123)	(0.0993)	(0.175)
TLC dummy	0.555	-0.122	-0.456	-0.504**	-0.703***
	(0.403)	(0.365)	(0.334)	(0.223)	(0.240)
Other NonFormal dummy	0.713***	0.0172	-0.229	-1.168***	-1.596***
	(0.234)	(0.308)	(0.294)	(0.231)	(0.233)
Below Primary dummy	0.208	0.0486	-0.0475	-0.203	0.0147
	(0.146)	(0.122)	(0.123)	(0.172)	(0.218)
Primary dummy	0.111	-0.130	-0.234***	-0.476***	-0.396**
	(0.187)	(0.147)	(0.0827)	(0.0957)	(0.163)
Middle dummy	-0.00642	-0.280***	-0.321***	-0.583***	-0.600***
	(0.106)	(0.108)	(0.0831)	(0.118)	(0.213)
Secondary dummy	-0.237	-0.342***	-0.376***	-0.609***	-0.598**
	(0.219)	(0.113)	(0.127)	(0.141)	(0.275)
Higher-secondary dummy	-0.202	-0.358*	-0.320	-0.551	-0.668**

	(0.280)	(0.184)	(0.326)	(0.420)	(0.305)
Diploma/Certif dummy	0.439	-0.203	-0.270	-0.892*	-0.957
	(0.488)	(0.441)	(0.555)	(0.481)	(0.584)
Graduate dummy	-0.230	-0.566**	-0.790**	-0.921**	-1.137**
	(0.357)	(0.284)	(0.332)	(0.380)	(0.523)
PG & Above dummy	0.793	1.302**	0.499	-0.232	-0.627**
	(0.712)	(0.628)	(0.464)	(0.310)	(0.251)
MLDA 18 dummy	0.165	0.0221	-0.135	-0.253**	-0.0545
	(0.155)	(0.111)	(0.121)	(0.113)	(0.162)
Constant	-1.441	-1.206	-1.113	-0.696	-2.012
	(0.969)	(1.025)	(0.692)	(0.802)	(1.301)
Observations	1,052	1,052	1,052	1,052	1,052

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.6 Quantile Regression on South-India for IMFL

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
IMFL price, log	-0.619***	-0.914***	-1.027***	-0.834***	-0.794***
	(0.214)	(0.107)	(0.108)	(0.0922)	(0.127)
MPCE, log	0.461***	0.523***	0.615***	0.792***	0.873***
	(0.0582)	(0.0292)	(0.0292)	(0.0415)	(0.0418)
SC/ST dummy	0.181***	0.164***	0.118***	0.147***	0.187***
	(0.0478)	(0.0358)	(0.0383)	(0.0457)	(0.0566)
Islam dummy	0.00797	0.0886	0.117**	0.131	0.255**
	(0.0637)	(0.0767)	(0.0595)	(0.102)	(0.124)
Household Size, log	0.293***	0.364***	0.410***	0.478***	0.533***
	(0.0634)	(0.0558)	(0.0446)	(0.0505)	(0.0476)
Female dummy	-0.212	0.0268	0.00482	-0.0723	-0.00899
	(0.159)	(0.0869)	(0.0803)	(0.0783)	(0.125)
Urban dummy	0.0307	0.0570*	-0.0115	-0.0205	-0.0259
	(0.0502)	(0.0324)	(0.0332)	(0.0443)	(0.0440)
No Land dummy	-0.0109	-0.0290	-0.0219	-0.0713	-0.109**
	(0.0643)	(0.0524)	(0.0374)	(0.0577)	(0.0481)
EGS/NFEC/AEC dummy	0.00261	0.262	0.242	0.00332	-0.522
	(0.372)	(0.458)	(0.500)	(0.509)	(0.446)
TLC dummy	-0.326	-1.084	1.438	1.008	0.400
	(1.589)	(1.502)	(1.651)	(1.695)	(1.728)
Other NonFormal dummy	0.197	0.493	0.0518	-0.122	-0.620***
	(0.444)	(0.418)	(0.117)	(0.204)	(0.148)
Below Primary dummy	-0.0632	-0.0712	-0.0895**	-0.0928	-0.234***
	(0.0688)	(0.0931)	(0.0440)	(0.0574)	(0.0866)
Primary dummy	-0.116**	-0.109*	-0.133**	-0.171***	-0.172***
	(0.0581)	(0.0563)	(0.0524)	(0.0567)	(0.0541)
Middle dummy	-0.0745	-0.134***	-0.169***	-0.195***	-0.127**
	(0.0671)	(0.0444)	(0.0420)	(0.0601)	(0.0529)
Secondary dummy	-0.221***	-0.298***	-0.315***	-0.431***	-0.462***
	(0.0759)	(0.0637)	(0.0360)	(0.0572)	(0.0838)
Higher-secondary dummy	-0.209	-0.335***	-0.390***	-0.465***	-0.500***

	(0.136)	(0.109)	(0.0664)	(0.0923)	(0.0735)
Diploma/Certif dummy	-0.0325	-0.304**	-0.451***	-0.637***	-0.665***
	(0.155)	(0.119)	(0.0766)	(0.158)	(0.152)
Graduate dummy	-0.310***	-0.524***	-0.607***	-0.668***	-0.689***
	(0.107)	(0.0811)	(0.0890)	(0.0873)	(0.0847)
PG & Above dummy	-0.250**	-0.431***	-0.550***	-0.869***	-0.799***
	(0.112)	(0.0884)	(0.0712)	(0.0895)	(0.277)
MLDA 18 dummy	-0.0628	-0.103	-0.100*	-0.0402	-0.0891
	(0.0961)	(0.0757)	(0.0598)	(0.0612)	(0.0890)
Constant	-1.144	0.686	1.224*	-0.806	-1.144
	(1.497)	(0.746)	(0.721)	(0.733)	(0.780)
Observations	5,021	5,021	5,021	5,021	5,021

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.7 Quantile Regression on South-India for Toddy

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Toddy price, log	-1.314***	-1.330***	-0.960***	-0.495***	-0.606***
	(0.171)	(0.104)	(0.115)	(0.104)	(0.145)
MPCE, log	0.219**	0.362***	0.476***	0.517***	0.728***
	(0.103)	(0.0728)	(0.106)	(0.0839)	(0.117)
SC/ST dummy	0.0104	-0.0441	0.000771	-0.0160	0.0262
	(0.100)	(0.0536)	(0.0804)	(0.0629)	(0.0584)
Islam dummy	0.0884	0.443**	0.272*	0.145	0.142
	(0.373)	(0.221)	(0.146)	(0.0954)	(0.127)
Household Size, log	0.160	0.120**	0.225**	0.215***	0.200***
	(0.124)	(0.0591)	(0.103)	(0.0509)	(0.0699)
Female dummy	-0.247	-0.223*	-0.305	-0.0712	-0.207
	(0.286)	(0.121)	(0.219)	(0.0874)	(0.151)
Urban dummy	0.0616	0.227**	0.00638	-0.0403	-0.0258
	(0.138)	(0.102)	(0.0980)	(0.0886)	(0.122)
No Land dummy	-0.252*	-0.202	-0.136	-0.104	-0.222*
	(0.141)	(0.161)	(0.141)	(0.0995)	(0.120)
EGS/NFEC/AEC dummy	0.300	-0.171	-0.000181	-0.0382	-0.430
	(0.296)	(0.418)	(0.592)	(0.659)	(0.460)
TLC dummy	-0.469	-1.070***	-1.790***	-2.696***	-3.237***
	(0.328)	(0.108)	(0.261)	(0.100)	(0.201)
Other NonFormal dummy	1.506***	0.756***	0.508***	0.267**	-0.344**
	(0.247)	(0.181)	(0.195)	(0.118)	(0.147)
Below Primary dummy	-0.0824	-0.0615	-0.140*	-0.0856	-0.166*
	(0.221)	(0.0973)	(0.0733)	(0.0933)	(0.0936)
Primary dummy	0.179	-0.0619	-0.136	-0.00274	0.142
	(0.137)	(0.0777)	(0.152)	(0.103)	(0.233)
Middle dummy	-0.0138	-0.182	-0.187	-0.142*	-0.261**
	(0.107)	(0.116)	(0.152)	(0.0840)	(0.106)
Secondary dummy	0.207**	0.00747	-0.112	-0.0622	-0.0837
	(0.0983)	(0.107)	(0.112)	(0.0803)	(0.103)
Higher-secondary dummy	0.362	0.232	0.00901	0.00930	-0.0126

	(0.293)	(0.213)	(0.154)	(0.177)	(0.397)
Diploma/Certif dummy	-2.454**	-1.742	-1.165	-0.501	-0.819***
	(1.148)	(1.132)	(0.899)	(0.470)	(0.286)
Graduate dummy	-0.447***	-0.676***	-0.981***	-1.076**	-0.460
	(0.130)	(0.217)	(0.261)	(0.468)	(0.485)
PG & Above dummy	-1.271***	-1.419*	-1.911*	-0.322	-0.795
	(0.320)	(0.752)	(1.080)	(1.121)	(0.880)
MLDA 18 dummy	0.799*	0.363*	-0.297	-0.357	-0.232
	(0.447)	(0.188)	(0.494)	(0.415)	(0.689)
Constant	3.143***	2.786***	1.561*	0.469	-0.302
	(0.876)	(0.600)	(0.895)	(0.683)	(0.606)
Observations	1,420	1,420	1,420	1,420	1,420

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.8 Quantile Regression on South-India for Beer

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Beer price, log	-0.588***	-0.698***	-0.769***	-0.478**	-0.364
	(0.226)	(0.176)	(0.191)	(0.189)	(0.223)
MPCE, log	0.334***	0.736***	0.600***	0.752***	0.859***
	(0.108)	(0.0734)	(0.0698)	(0.0684)	(0.0903)
SC/ST dummy	0.0615	0.141	0.130**	0.114**	0.136
	(0.0856)	(0.103)	(0.0511)	(0.0523)	(0.0977)
Islam dummy	-0.121	0.0247	-0.0899	-0.0884	-0.171
	(0.120)	(0.126)	(0.110)	(0.0905)	(0.129)
Household Size, log	0.113	0.387***	0.339***	0.508***	0.525***
	(0.0749)	(0.0599)	(0.0579)	(0.0629)	(0.0895)
Female dummy	-0.157	0.164	0.0879	0.0301	-0.143
	(0.122)	(0.307)	(0.166)	(0.115)	(0.167)
Urban dummy	-0.0181	-0.126	-0.0983*	-0.0652	-0.158
	(0.0887)	(0.0808)	(0.0569)	(0.0520)	(0.112)
No Land dummy	-0.0129	-0.0348	0.0177	0.121	0.00700
	(0.0920)	(0.0986)	(0.0545)	(0.0829)	(0.132)
EGS/NFEC/AEC dummy	0.607	-0.0415	0.114	-0.485***	-0.890***
	(0.433)	(0.453)	(0.304)	(0.141)	(0.262)
Other NonFormal dummy	0.679***	0.363**	-0.195*	-0.710***	-1.149***
	(0.135)	(0.156)	(0.114)	(0.0801)	(0.204)
Below Primary dummy	-0.0824	-0.119	-0.0715	-0.170*	-0.113
	(0.112)	(0.168)	(0.117)	(0.102)	(0.198)
Primary dummy	0.0974	0.149	0.0178	-0.0514	0.0633
	(0.110)	(0.126)	(0.0743)	(0.116)	(0.236)
Middle dummy	-0.116	0.0286	-0.0103	-0.144	-0.188
	(0.110)	(0.131)	(0.0914)	(0.0881)	(0.138)
Secondary dummy	-0.0434	-0.0718	-0.0255	-0.222**	-0.316**
	(0.0947)	(0.161)	(0.0744)	(0.0980)	(0.147)
Higher-secondary dummy	0.0176	0.157	-0.00147	-0.107	-0.139
	(0.129)	(0.148)	(0.106)	(0.115)	(0.169)
Diploma/Certif dummy	-0.363	-0.177	0.126	-0.225	0.510**

	(0.428)	(0.367)	(0.208)	(0.470)	(0.256)
Graduate dummy	0.00876	-0.140	-0.179	-0.352***	-0.447**
	(0.130)	(0.183)	(0.132)	(0.120)	(0.208)
PG & Above dummy	-0.115	-0.179	-0.168	-0.510***	-0.814***
	(0.364)	(0.282)	(0.109)	(0.121)	(0.175)
MLDA 18 dummy	0.266**	-0.0122	-0.0790	-0.0285	-0.0521
	(0.118)	(0.0896)	(0.0573)	(0.0594)	(0.116)
Constant	-0.0828	-2.272**	-0.249	-2.614**	-3.423**
	(0.986)	(0.933)	(1.037)	(1.147)	(1.374)
Observations	1,428	1,428	1,428	1,428	1,428

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.9 Quantile Regression on Maharashtra for Country Liquor

VARIABLES	(1) q25	(2) q50	(3) q75
Country Liquor price, log	-0.935***	-0.701*	-0.952***
	(0.272)	(0.382)	(0.350)
MPCE, log	0.784***	0.785***	0.966***
	(0.159)	(0.147)	(0.123)
SC/ST dummy	0.149	0.100	0.155
	(0.111)	(0.120)	(0.115)
Islam dummy	0.0478	-0.0942	-0.220
	(0.172)	(0.212)	(0.230)
Household Size, log	0.336**	0.429***	0.622***
	(0.146)	(0.113)	(0.112)
Female dummy	-0.0698	0.0454	-0.192
	(0.392)	(0.253)	(0.495)
Urban dummy	0.115	0.0211	0.0929
	(0.108)	(0.110)	(0.127)
No Land dummy	0.121	0.156	-0.0449
	(0.130)	(0.124)	(0.157)
TLC dummy	3.940***	3.282***	2.536***
	(0.133)	(0.123)	(0.100)
Other NonFormal dummy	0.0727	0.179	0.577
	(0.360)	(0.781)	(0.710)
Below Primary dummy	-0.332***	-0.0870	-0.281*
	(0.127)	(0.158)	(0.153)
Primary dummy	-0.166	-0.249**	-0.190
	(0.126)	(0.112)	(0.155)
Middle dummy	-0.397***	-0.263***	-0.213
	(0.107)	(0.101)	(0.168)
Secondary dummy	-0.619***	-0.367**	-0.407**
	(0.226)	(0.147)	(0.161)
Higher-secondary dummy	-0.573***	-0.471***	-0.232
	(0.199)	(0.166)	(0.296)
Diploma/Certif dummy	-0.724	-0.732	-0.0947
	(0.793)	(0.574)	(1.006)
Graduate dummy	-0.379	-0.166	-0.498

	(0.417)	(0.455)	(0.374)
PG & Above dummy	-0.429**	-0.892***	-1.643***
	(0.198)	(0.201)	(0.215)
Constant	-1.339	-1.959	-1.726
	(2.148)	(1.701)	(1.973)
Observations	950	950	950

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.10 Quantile Regression on Maharashtra for IMFL

VARIABLES	(1) q25	(2) q50	(3) q75
IMFL price, log	-0.461	-0.636*	-0.870*
	(0.367)	(0.369)	(0.457)
MPCE, log	0.715***	0.531***	0.415
	(0.151)	(0.159)	(0.251)
SC/ST dummy	-0.152	0.0364	0.181
	(0.246)	(0.206)	(0.327)
Islam dummy	0.449	0.127	-0.443
	(0.373)	(0.414)	(0.536)
Household Size, log	0.193	0.238	0.261
	(0.255)	(0.243)	(0.345)
Female dummy	-0.645	-0.423	0.270
	(0.717)	(0.773)	(0.874)
Urban dummy	-0.217	0.279	0.358
	(0.327)	(0.186)	(0.242)
Below Primary dummy	-0.0675	-0.325	-0.314
	(0.741)	(0.547)	(0.431)
Primary dummy	0.265	-0.132	0.333
	(0.498)	(0.600)	(0.644)
Middle dummy	0.103	-0.103	0.315
	(0.466)	(0.412)	(0.415)
Secondary dummy	-0.439	-0.525	-0.227
	(0.543)	(0.459)	(0.392)
Higher-secondary dummy	-0.170	-0.406	0.257
	(0.532)	(0.457)	(0.475)
Diploma/Certif dummy	1.260*	0.422	0.676
	(0.655)	(0.399)	(0.485)
Graduate dummy	0.189	-0.490	0.305
	(0.535)	(0.501)	(0.559)
PG & Above dummy	-0.807	-0.425	0.0306
	(0.580)	(0.434)	(0.637)
Constant	-3.401	-0.572	1.962
	(3.026)	(3.216)	(3.549)
Observations	204	204	204

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.6.11 Quantile Regression on Maharashtra for Beer

VARIABLES	(1) q25	(2) q50	(3) q75
Beer price, log	-1.045*** (0.359)	-0.713** (0.304)	-0.305 (0.436)
MPCE, log	0.869*** (0.201)	1.009*** (0.226)	0.883*** (0.244)
SC/ST dummy	-0.222 (0.285)	0.0767 (0.262)	0.0967 (0.175)
Islam dummy	0.436 (0.337)	0.492 (0.306)	0.551 (0.384)
Household Size, log	0.710*** (0.168)	0.619*** (0.230)	0.611*** (0.197)
Female dummy	-0.594 (0.758)	-0.0752 (0.487)	-0.628 (0.395)
Urban dummy	0.199 (0.272)	0.123 (0.196)	-0.111 (0.207)
No Land dummy	0.0619 (0.183)	0.105 (0.190)	0.0423 (0.211)
Below Primary dummy	0.784 (0.538)	0.574 (0.507)	0.263 (0.512)
Primary dummy	0.682*** (0.201)	0.274 (0.579)	-0.0568 (0.550)
Middle dummy	0.613* (0.336)	0.123 (0.484)	-0.301 (0.428)
Secondary dummy	0.378 (0.326)	0.173 (0.524)	-0.317 (0.539)
Higher-secondary dummy	0.925** (0.442)	0.475 (0.530)	-0.0696 (0.531)
Diploma/Certif dummy	0.326 (0.683)	0.559 (1.085)	-0.302 (0.792)
Graduate dummy	0.199 (0.337)	-0.0519 (0.538)	-0.342 (0.552)
PG & Above dummy	0.430 (0.340)	0.130 (0.535)	-0.0696 (0.585)
Constant	-3.026 (2.671)	-4.798* (2.775)	-4.603 (3.059)
Observations	234	234	234

Note: Standard errors in parentheses and Fixed effects and constant omitted

**** p<0.01, ** p<0.05, * p<0.1*

3.6.7 Result Tables on Quantile Regressions (Extended Specification)

Table 3.6.7.1 Quantile Regression at all-India level excluding prohibited areas for

Country Liquor

All India- Country Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Country Liquor Price, log	-0.866*** (0.0440)	-0.733*** (0.0484)	-0.722*** (0.0421)	-0.649*** (0.0328)	-0.635*** (0.0372)
MPCE, log	0.683*** (0.0515)	0.712*** (0.0392)	0.795*** (0.0256)	0.840*** (0.0366)	0.874*** (0.0338)
SC/ST DUMMY	0.0559** (0.0278)	0.0835*** (0.0288)	0.162*** (0.0217)	0.152*** (0.0263)	0.118*** (0.0240)
Islam dummy	-0.353*** (0.122)	-0.249*** (0.0670)	-0.275*** (0.0399)	-0.194*** (0.0727)	-0.314*** (0.0958)
Household Size, log	0.380*** (0.0362)	0.378*** (0.0351)	0.415*** (0.0213)	0.405*** (0.0369)	0.467*** (0.0287)
Female dummy	0.0539 (0.0896)	0.00417 (0.0801)	0.00394 (0.0699)	-0.107 (0.0691)	-0.0302 (0.0792)
Urban dummy	0.146*** (0.0440)	0.0603* (0.0321)	0.0535* (0.0324)	0.0667* (0.0370)	-0.0103 (0.0687)
No-Land dummy	0.0651 (0.0587)	0.111** (0.0561)	0.0845** (0.0393)	0.0701 (0.0484)	0.181*** (0.0462)
EGS/NFEC/AEC dummy	-0.0330 (0.484)	0.358 (0.294)	0.112 (0.149)	0.0435 (0.125)	-0.0399 (0.193)
TLC dummy	0.415* (0.215)	0.121 (0.256)	-0.254 (0.479)	0.147 (0.714)	-0.325 (1.261)
Other NonFormal dummy	0.377 (0.281)	0.100 (0.176)	-0.190* (0.106)	-0.268 (0.186)	0.0775 (0.341)
Below Primary dummy	-0.0244 (0.0495)	-0.114** (0.0504)	-0.0900** (0.0386)	-0.0915* (0.0501)	-0.0719 (0.0451)
Primary dummy	-0.0210 (0.0475)	-0.0982*** (0.0379)	-0.103*** (0.0371)	-0.117*** (0.0340)	-0.144*** (0.0526)
Middle dummy	-0.234*** (0.0644)	-0.229*** (0.0419)	-0.186*** (0.0453)	-0.201*** (0.0376)	-0.234*** (0.0443)
Secondary dummy	-0.337*** (0.0616)	-0.302*** (0.0508)	-0.264*** (0.0395)	-0.309*** (0.0422)	-0.251*** (0.0641)
Higher-secondary dummy	-0.412*** (0.0890)	-0.353*** (0.0708)	-0.334*** (0.0582)	-0.363*** (0.0756)	-0.348*** (0.0974)
Diploma/Certif dummy	0.00895 (0.220)	-0.443*** (0.0909)	-0.800*** (0.112)	-0.541 (0.361)	-0.458 (0.344)
Graduate dummy	-0.619*** (0.193)	-0.537*** (0.0940)	-0.499*** (0.0621)	-0.496*** (0.0993)	-0.384*** (0.137)
PG & Above dummy	-0.332 (0.214)	-0.426* (0.254)	-0.292 (0.370)	-0.275* (0.154)	-0.562*** (0.0709)
Cigarette price, log	0.174** (0.0787)	0.0756 (0.0683)	0.0730* (0.0389)	0.0505 (0.0722)	0.124** (0.0530)
Bidi price, log	-0.0356 (0.0973)	0.0528 (0.0645)	0.0506 (0.0602)	0.0728 (0.0563)	-0.0320 (0.0626)
Tobacco price, log	0.0596	0.0468	0.0194	-0.0203	-0.0467**

	(0.0378)	(0.0379)	(0.0187)	(0.0215)	(0.0215)
IMFL price, log	0.0373	0.0827*	0.0806**	0.125***	0.145***
	(0.0553)	(0.0436)	(0.0318)	(0.0247)	(0.0399)
Beer price, log	-0.120***	-0.0996***	-0.0487**	-0.00569	0.0515
	(0.0450)	(0.0290)	(0.0230)	(0.0275)	(0.0325)
Toddy price, log	0.0384	0.0326	0.0122	0.0274	0.0143
	(0.0371)	(0.0327)	(0.0275)	(0.0424)	(0.0471)
MLDA 18 DUMMY	0.876***	0.714***	0.529***	0.408***	0.452*
	(0.134)	(0.143)	(0.0876)	(0.101)	(0.231)
MLDA 25 DUMMY	0.200**	0.293***	0.144**	0.300***	0.368*
	(0.0994)	(0.107)	(0.0570)	(0.0712)	(0.205)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.2 Quantile Regression at all-India level excluding prohibited areas for

IMFL

All India- IMFL	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
IMFL price, log	-0.735***	-0.757***	-0.763***	-0.659***	-0.631***
	(0.0831)	(0.0777)	(0.0697)	(0.0712)	(0.0485)
MPCE, log	0.561***	0.583***	0.627***	0.801***	0.885***
	(0.0436)	(0.0315)	(0.0485)	(0.0440)	(0.0419)
SC/ST DUMMY	0.103**	0.0926***	0.0972***	0.133***	0.127**
	(0.0475)	(0.0317)	(0.0242)	(0.0334)	(0.0546)
Islam dummy	-0.00668	-0.0361	0.100*	0.0836	0.198*
	(0.0703)	(0.0947)	(0.0566)	(0.0601)	(0.104)
Household Size, log	0.346***	0.335***	0.370***	0.443***	0.498***
	(0.0523)	(0.0286)	(0.0373)	(0.0416)	(0.0517)
Female dummy	0.0155	-0.00382	0.0846	-0.0181	-0.0493
	(0.137)	(0.102)	(0.0836)	(0.105)	(0.115)
Urban dummy	-0.0742	-0.0840**	-0.0799*	-0.130***	-0.0814*
	(0.0653)	(0.0367)	(0.0457)	(0.0433)	(0.0472)
No-Land dummy	-0.00865	0.0207	-0.00530	-0.00664	-0.0874*
	(0.0536)	(0.0432)	(0.0378)	(0.0433)	(0.0500)
EGS/NFEC/AEC dummy	-0.273	0.492	0.235	0.0882	-0.190
	(0.357)	(0.814)	(0.509)	(0.293)	(0.360)
TLC dummy	-0.552***	-1.104***	-1.760***	-2.424***	-2.935***
	(0.140)	(0.102)	(0.102)	(0.0859)	(0.0955)
Other NonFormal dummy	-0.183	-0.569	-0.129	-0.327	-0.581
	(0.353)	(0.562)	(0.365)	(0.422)	(0.427)
Below Primary dummy	-0.135	-0.210***	-0.0848*	-0.179***	-0.201***
	(0.0831)	(0.0511)	(0.0439)	(0.0551)	(0.0663)
Primary dummy	-0.150***	-0.171***	-0.128*	-0.115	-0.108
	(0.0576)	(0.0477)	(0.0671)	(0.0915)	(0.0667)
Middle dummy	-0.0301	-0.161***	-0.130***	-0.163**	-0.0898
	(0.0748)	(0.0514)	(0.0492)	(0.0726)	(0.0834)
Secondary dummy	-0.165**	-0.207***	-0.224***	-0.374***	-0.376***
	(0.0788)	(0.0457)	(0.0472)	(0.0535)	(0.0716)
Higher-secondary dummy	-0.0856	-0.247***	-0.217***	-0.312***	-0.475***

	(0.0725)	(0.0614)	(0.0680)	(0.0713)	(0.0917)
Diploma/Certif dummy	-0.251	-0.393***	-0.427***	-0.607***	-0.604***
	(0.163)	(0.0889)	(0.103)	(0.163)	(0.122)
Graduate dummy	-0.191**	-0.432***	-0.333***	-0.419***	-0.507***
	(0.0950)	(0.0630)	(0.0970)	(0.0827)	(0.0907)
PG & Above dummy	-0.247**	-0.397***	-0.423***	-0.707***	-0.806***
	(0.0963)	(0.0808)	(0.0724)	(0.0852)	(0.132)
Cigarette price, log	0.0924	0.0956	-0.0139	-0.157*	-0.185**
	(0.0806)	(0.0603)	(0.0887)	(0.0833)	(0.0923)
Bidi price, log	-0.0774	-0.0809	0.00700	0.0117	0.0396
	(0.0835)	(0.0820)	(0.0656)	(0.0840)	(0.0766)
Tobacco price, log	0.0143	-0.00877	0.0147	0.00175	-0.0138
	(0.0358)	(0.0265)	(0.0218)	(0.0271)	(0.0279)
Country Liquor Price, log	-0.0456	0.0205	0.0592**	0.0706**	0.0456
	(0.0487)	(0.0322)	(0.0263)	(0.0279)	(0.0523)
Beer price, log	-0.0180	-0.0189	-0.0148	-0.0303	0.0477
	(0.0469)	(0.0448)	(0.0375)	(0.0480)	(0.0624)
Toddy price, log	0.0601	0.0982**	0.0682**	0.189***	0.173***
	(0.0489)	(0.0405)	(0.0274)	(0.0379)	(0.0517)
MLDA 18 DUMMY	0.334	0.365**	0.262	0.462**	0.303
	(0.291)	(0.173)	(0.259)	(0.227)	(0.217)
MLDA 25 DUMMY	-0.179	0.239	0.244	0.137	0.336
	(0.288)	(0.232)	(0.286)	(0.203)	(0.213)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.3 Quantile Regression at all-India level excluding prohibited areas for

Toddy

All India- Toddy	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Toddy price, log	-0.943***	-0.979***	-0.893***	-0.717***	-0.658***
	(0.0754)	(0.0797)	(0.0640)	(0.0663)	(0.0848)
MPCE, log	0.407***	0.535***	0.562***	0.660***	0.632***
	(0.0771)	(0.0615)	(0.0584)	(0.0829)	(0.120)
SC/ST DUMMY	-0.00719	0.0930	0.0788	0.107*	0.0543
	(0.0793)	(0.0833)	(0.0626)	(0.0570)	(0.0649)
Islam dummy	-0.0631	0.170	0.146	0.0209	-0.0269
	(0.210)	(0.172)	(0.111)	(0.0981)	(0.146)
Household Size, log	0.269***	0.278***	0.230***	0.297***	0.222***
	(0.0934)	(0.0830)	(0.0744)	(0.0670)	(0.0714)
Female dummy	-0.333*	-0.340***	-0.248***	-0.142	-0.223**
	(0.183)	(0.0992)	(0.0826)	(0.114)	(0.109)
Urban dummy	-0.00330	-0.0348	0.0233	0.000497	-0.00929
	(0.102)	(0.0947)	(0.0793)	(0.0611)	(0.128)
No-Land dummy	-0.0786	0.0534	-0.0531	-0.0611	-0.120
	(0.184)	(0.167)	(0.109)	(0.101)	(0.182)
EGS/NFEC/AEC dummy	0.197	-0.297	-0.0867	-0.119	-0.0960
	(0.140)	(0.426)	(0.501)	(0.212)	(0.181)
TLC dummy	-0.538**	-0.946***	-0.848	-1.181	-1.518**

	(0.255)	(0.180)	(0.531)	(0.737)	(0.720)
Other NonFormal dummy	0.305	0.274	0.329	0.639	0.482
	(0.331)	(0.380)	(0.263)	(0.777)	(0.848)
Below Primary dummy	-0.203	-0.119	-0.192**	-0.220**	-0.237*
	(0.178)	(0.102)	(0.0940)	(0.0867)	(0.138)
Primary dummy	0.00585	0.00940	-0.0839*	-0.123*	-0.0393
	(0.132)	(0.115)	(0.0472)	(0.0644)	(0.137)
Middle dummy	-0.126	-0.273***	-0.199**	-0.185*	-0.185*
	(0.112)	(0.0823)	(0.0811)	(0.0997)	(0.103)
Secondary dummy	-0.00191	-0.0801	-0.145**	-0.160**	-0.109
	(0.126)	(0.0763)	(0.0660)	(0.0674)	(0.137)
Higher-secondary dummy	-0.135	-0.145	-0.182	-0.0874	0.206
	(0.149)	(0.128)	(0.157)	(0.139)	(0.168)
Diploma/Certif dummy	-2.774***	-0.773	-1.136	-0.560	-0.649**
	(1.037)	(0.966)	(0.927)	(0.489)	(0.255)
Graduate dummy	-0.203	-0.401*	-0.345*	-0.563***	-0.486***
	(0.214)	(0.215)	(0.180)	(0.148)	(0.181)
PG & Above dummy	-1.813***	-1.194***	-0.902**	-0.489	-0.845
	(0.529)	(0.394)	(0.432)	(0.768)	(0.980)
Cigarette price, log	0.0490	-0.278**	-0.305**	-0.203	-0.269
	(0.134)	(0.138)	(0.138)	(0.150)	(0.232)
Bidi price, log	-0.0724	0.0473	0.200*	0.239***	0.356**
	(0.235)	(0.141)	(0.117)	(0.0813)	(0.142)
Tobacco price, log	0.204**	0.251***	0.268***	0.147**	0.180***
	(0.0843)	(0.0578)	(0.0678)	(0.0636)	(0.0670)
IMFL price, log	0.132	0.0428	0.186***	0.188**	0.192
	(0.170)	(0.0836)	(0.0719)	(0.0897)	(0.185)
Country Liquor Price, log	0.175***	0.187***	0.0184	-0.0318	0.0335
	(0.0661)	(0.0538)	(0.0331)	(0.0346)	(0.0373)
Beer price, log	-0.0321	0.0601	0.0655	0.0949	0.0797
	(0.120)	(0.131)	(0.0769)	(0.0996)	(0.227)
MLDA 18 DUMMY	1.820**	0.00698	0.115	0.533	0.765
	(0.762)	(0.847)	(0.380)	(0.579)	(0.685)
MLDA 25 DUMMY	0.641	-0.710	0.0962	-0.0742	-0.0910
	(0.834)	(1.036)	(0.421)	(0.277)	(0.459)

Note: Standard errors in parentheses and Fixed effects and constant omitted
*** p<0.01, ** p<0.05, * p<0.1

Table 3.6.7.4 Quantile Regression at all-India level excluding prohibited areas for

Beer

All India- Beer	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Beer price, log	-1.000***	-0.865***	-0.901***	-0.786***	-0.689***
	(0.1000)	(0.101)	(0.0844)	(0.0873)	(0.147)
MPCE, log	0.471***	0.770***	0.752***	0.762***	0.858***
	(0.0787)	(0.0732)	(0.0701)	(0.0546)	(0.0684)
SC/ST DUMMY	-0.0170	-0.0388	0.0572	0.0198	-0.00187
	(0.0534)	(0.0519)	(0.0585)	(0.0649)	(0.0685)

Islam dummy	-0.0318	0.00223	0.00794	-0.0336	0.0293
	(0.112)	(0.155)	(0.0755)	(0.0846)	(0.161)
Household Size, log	0.264***	0.405***	0.478***	0.498***	0.596***
	(0.0896)	(0.0561)	(0.0672)	(0.0671)	(0.0728)
Female dummy	-0.128	-0.111	0.0763	-0.0452	-0.167
	(0.131)	(0.275)	(0.108)	(0.168)	(0.208)
Urban dummy	0.0261	-0.0332	0.00680	0.00103	-0.0936
	(0.0516)	(0.0885)	(0.0574)	(0.0627)	(0.105)
No-Land dummy	-0.100	-0.0970	-0.0920	-0.0942	-0.0155
	(0.0784)	(0.0846)	(0.0674)	(0.0762)	(0.107)
EGS/NFEC/AEC dummy	0.573	-0.0712	0.153	-0.340	-0.810*
	(0.488)	(0.460)	(0.444)	(0.537)	(0.433)
TLC dummy	-0.588***	-0.959***	-1.546***	-2.200***	-2.457***
	(0.126)	(0.225)	(0.169)	(0.156)	(0.199)
Other NonFormal dummy	-0.0710	-0.773***	-1.238***	-1.671***	-2.246***
	(0.258)	(0.281)	(0.190)	(0.207)	(0.323)
Below Primary dummy	0.0183	-0.196	-0.0716	-0.0576	-0.101
	(0.119)	(0.219)	(0.126)	(0.107)	(0.136)
Primary dummy	0.0746	-0.00615	-0.0559	-0.133*	0.117
	(0.0993)	(0.159)	(0.0561)	(0.0782)	(0.146)
Middle dummy	0.0393	-0.0680	-0.0901	-0.148*	-0.119
	(0.0922)	(0.193)	(0.0659)	(0.0799)	(0.139)
Secondary dummy	0.0249	-0.185	-0.0483	-0.168*	-0.316***
	(0.123)	(0.166)	(0.0749)	(0.0924)	(0.118)
Higher-secondary dummy	0.0472	-0.0712	-0.0689	-0.154	-0.273**
	(0.105)	(0.189)	(0.0725)	(0.113)	(0.120)
Diploma/Certif dummy	0.407	-0.167	-0.000297	-0.342*	0.441
	(0.280)	(0.208)	(0.147)	(0.185)	(0.493)
Graduate dummy	-0.0358	-0.292	-0.247***	-0.288**	-0.365**
	(0.109)	(0.201)	(0.0823)	(0.146)	(0.165)
PG & Above dummy	-0.0269	-0.103	-0.203**	-0.491***	-0.597***
	(0.162)	(0.161)	(0.0806)	(0.110)	(0.213)
Cigarette price, log	-0.0352	0.0942	0.0619	0.0915	-0.0263
	(0.170)	(0.139)	(0.172)	(0.246)	(0.338)
Bidi price, log	-0.0590	0.0637	0.0335	0.0528	0.302
	(0.0901)	(0.174)	(0.102)	(0.139)	(0.218)
Tobacco price, log	-0.0258	-0.0533	-0.0130	-0.0274	-0.0233
	(0.0413)	(0.0552)	(0.0496)	(0.0452)	(0.0564)
IMFL price, log	0.0819	0.0156	0.196**	0.0960	0.324**
	(0.0995)	(0.127)	(0.0849)	(0.0975)	(0.144)
Country Liquor Price, log	0.104*	-0.0182	-0.0961***	-0.0604	0.00144
	(0.0602)	(0.0736)	(0.0253)	(0.0515)	(0.0865)
Toddy price, log	0.0628	-0.0855	-0.0621	-0.0734	-0.0722
	(0.0813)	(0.0546)	(0.0471)	(0.0576)	(0.113)
MLDA 18 DUMMY	0.329	-0.0446	0.221	0.385	0.355
	(0.584)	(0.224)	(0.207)	(0.261)	(0.341)
MLDA 25 DUMMY	0.100	-0.226	0.142	0.456**	0.253

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.5 Quantile Regression on South-India for Country Liquor

South- Country Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Country Liquor Price, log	-0.807*** (0.117)	-0.839*** (0.0935)	-0.754*** (0.107)	-0.576*** (0.0911)	-0.573*** (0.143)
MPCE, log	0.506** (0.197)	0.757*** (0.110)	0.753*** (0.0996)	0.636*** (0.137)	0.844*** (0.147)
SC/ST DUMMY	0.117 (0.139)	0.120 (0.0950)	0.133 (0.100)	0.114 (0.0864)	-0.00978 (0.138)
Islam dummy	0.340* (0.200)	0.128 (0.183)	0.0975 (0.193)	0.246 (0.205)	-0.106 (0.175)
Household Size, log	0.452*** (0.113)	0.522*** (0.122)	0.456*** (0.0853)	0.312*** (0.0944)	0.445*** (0.123)
Female dummy	0.0382 (0.221)	0.0213 (0.182)	-0.105 (0.139)	-0.449*** (0.138)	-0.749*** (0.188)
Urban dummy	0.230 (0.172)	0.118 (0.0922)	-0.0754 (0.179)	-0.148 (0.144)	-0.127 (0.141)
No-Land dummy	-0.174 (0.266)	-0.0532 (0.206)	0.173 (0.169)	0.0904 (0.166)	0.170 (0.294)
TLC dummy	0.327 (0.564)	-0.381 (0.646)	-0.510 (0.542)	-0.0456 (0.446)	-0.424 (0.470)
Other NonFormal dummy	0.581* (0.341)	-0.188 (0.204)	-0.433 (0.300)	-1.290*** (0.376)	-1.560*** (0.374)
Below Primary dummy	0.262 (0.176)	-0.0342 (0.135)	-0.0655 (0.121)	-0.0982 (0.0729)	0.109 (0.169)
Primary dummy	0.0547 (0.184)	-0.265* (0.145)	-0.326** (0.151)	-0.508*** (0.160)	-0.490** (0.210)
Middle dummy	-0.102 (0.226)	-0.401*** (0.154)	-0.302*** (0.110)	-0.590*** (0.141)	-0.793*** (0.217)
Secondary dummy	-0.379 (0.243)	-0.409** (0.166)	-0.469*** (0.147)	-0.389** (0.172)	-0.475 (0.362)
Higher-secondary dummy	-0.343 (0.278)	-0.738** (0.335)	-0.467* (0.283)	-0.492* (0.298)	-0.815*** (0.200)
Diploma/Certif dummy	0.336 (0.953)	-0.501 (0.875)	-1.111 (0.762)	-0.449 (0.720)	-1.114 (0.741)
Graduate dummy	-0.265 (0.300)	-0.800*** (0.266)	-0.888*** (0.284)	-0.832*** (0.314)	-1.113*** (0.378)
PG & Above dummy	0.963 (0.662)	0.979** (0.495)	0.568 (0.512)	0.0960 (0.395)	-0.803** (0.316)
Bidi price, log	-0.0424 (0.375)	-0.160 (0.184)	-0.192 (0.195)	-0.182 (0.230)	0.444* (0.270)
Tobacco price, log	0.106 (0.119)	0.157 (0.0977)	0.0781 (0.0954)	-0.0278 (0.0739)	0.123 (0.117)
IMFL price, log	0.111 (0.275)	0.259 (0.162)	0.299 (0.244)	0.310 (0.280)	0.859*** (0.273)
Beer price, log	0.0385 (0.212)	-0.134 (0.195)	-0.168 (0.211)	-0.197 (0.139)	0.0866 (0.203)
Toddy price, log	0.107 (0.0990)	0.0351 (0.0638)	-0.130* (0.0780)	-0.253*** (0.0876)	-0.149 (0.103)

MLDA 18 DUMMY	0.436	0.311	0.226	0.0281	0.468
	(0.319)	(0.215)	(0.157)	(0.259)	(0.292)

Note: Standard errors in parentheses and Fixed effects and constant omitted
*** p<0.01, ** p<0.05, * p<0.1

Table 3.6.7.6 Quantile Regression on South-India for IMFL

South- IMFL	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
IMFL price, log	-0.876***	-0.791***	-1.054***	-0.851***	-0.654***
	(0.195)	(0.118)	(0.119)	(0.109)	(0.175)
MPCE, log	0.481***	0.519***	0.576***	0.775***	0.863***
	(0.0568)	(0.0388)	(0.0648)	(0.0930)	(0.0527)
SC/ST DUMMY	0.168*	0.153***	0.0641	0.0794	0.0731
	(0.0908)	(0.0575)	(0.0567)	(0.0545)	(0.0673)
Islam dummy	0.0148	0.0437	0.110	0.148*	0.165
	(0.140)	(0.110)	(0.0793)	(0.0771)	(0.134)
Household Size, log	0.313***	0.325***	0.410***	0.411***	0.538***
	(0.0667)	(0.0491)	(0.0426)	(0.0529)	(0.0482)
Female dummy	-0.121	-0.00129	0.0759	-0.0299	-0.0712
	(0.204)	(0.107)	(0.0751)	(0.0752)	(0.179)
Urban dummy	0.0721	-0.0346	-0.112**	-0.134**	-0.134*
	(0.0884)	(0.0541)	(0.0441)	(0.0533)	(0.0688)
No-Land dummy	0.0362	0.0342	-0.0110	-0.0671	-0.0987
	(0.0726)	(0.0365)	(0.0442)	(0.0569)	(0.0851)
EGS/NFEC/AEC dummy	0.971***	0.843***	0.269	0.0323	-0.552
	(0.326)	(0.322)	(0.353)	(0.377)	(0.340)
TLC dummy	-0.483***	-1.126***	-1.827***	-2.404***	-2.893***
	(0.177)	(0.0941)	(0.0780)	(0.0790)	(0.169)
Other NonFormal dummy	0.0488	0.422	-0.117	-0.294	-0.581
	(0.592)	(0.563)	(0.398)	(0.500)	(0.538)
Below Primary dummy	-0.116	-0.167*	-0.0747	-0.135	-0.196*
	(0.0922)	(0.0856)	(0.0628)	(0.0821)	(0.114)
Primary dummy	-0.225**	-0.137	-0.147**	-0.121	-0.126
	(0.107)	(0.0950)	(0.0711)	(0.0968)	(0.124)
Middle dummy	-0.0950	-0.193***	-0.157***	-0.169*	-0.0510
	(0.105)	(0.0746)	(0.0598)	(0.101)	(0.105)
Secondary dummy	-0.258***	-0.270***	-0.301***	-0.476***	-0.448***
	(0.0594)	(0.0599)	(0.0446)	(0.0805)	(0.0893)
Higher-secondary dummy	-0.205	-0.333***	-0.385***	-0.467***	-0.555***
	(0.166)	(0.108)	(0.0794)	(0.0987)	(0.139)
Diploma/Certif dummy	-0.293*	-0.498***	-0.467***	-0.676***	-0.722***
	(0.152)	(0.121)	(0.102)	(0.227)	(0.178)
Graduate dummy	-0.397**	-0.487***	-0.575***	-0.677***	-0.669***
	(0.158)	(0.0828)	(0.0936)	(0.162)	(0.150)
PG & Above dummy	-0.339	-0.371**	-0.570***	-1.003***	-1.065***
	(0.215)	(0.175)	(0.105)	(0.119)	(0.237)
Bidi price, log	-0.141	-0.151	-0.0733	0.167	0.393**
	(0.128)	(0.134)	(0.110)	(0.133)	(0.184)
Tobacco price, log	0.0562	-0.00264	0.00875	-0.0272	-0.0254
	(0.0389)	(0.0360)	(0.0330)	(0.0293)	(0.0351)

Country Liquor Price, log	-0.0819	0.0168	0.0253	0.0775*	0.106
	(0.0652)	(0.0448)	(0.0438)	(0.0417)	(0.0781)
Beer price, log	-0.178**	-0.107*	-0.0147	-0.0118	0.0387
	(0.0797)	(0.0565)	(0.0359)	(0.0630)	(0.0623)
Toddy price, log	0.0803	0.0850	0.113**	0.284***	0.277***
	(0.0637)	(0.0759)	(0.0471)	(0.0493)	(0.0597)
MLDA 18 DUMMY	-0.0193	0.00998	-0.134	-0.0964	-0.187**
	(0.176)	(0.0910)	(0.0934)	(0.0917)	(0.0891)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.7 Quantile Regression on South-India for Toddy

South-Toddy	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Toddy price, log	-0.732***	-0.988***	-0.936***	-0.484***	-0.690***
	(0.225)	(0.194)	(0.153)	(0.148)	(0.161)
MPCE, log	0.256**	0.272***	0.419***	0.484***	0.769***
	(0.103)	(0.0950)	(0.111)	(0.129)	(0.173)
SC/ST DUMMY	0.0611	-0.0264	0.0416	0.0169	0.0457
	(0.109)	(0.0833)	(0.0765)	(0.0493)	(0.0935)
Islam dummy	0.159	0.399**	0.197	0.162*	0.191
	(0.354)	(0.157)	(0.136)	(0.0894)	(0.174)
Household Size, log	0.182**	0.0796	0.178***	0.183**	0.229***
	(0.0896)	(0.0862)	(0.0632)	(0.0865)	(0.0755)
Female dummy	-0.208	-0.299**	-0.205	-0.0428	-0.228*
	(0.244)	(0.128)	(0.200)	(0.124)	(0.136)
Urban dummy	-0.144	0.218*	0.126	0.00136	-0.0436
	(0.140)	(0.111)	(0.0865)	(0.114)	(0.136)
No-Land dummy	-0.222	-0.166	-0.135	-0.0248	-0.219
	(0.195)	(0.154)	(0.144)	(0.105)	(0.178)
EGS/NFEC/AEC dummy	0.0438	-0.306	0.168	0.0125	-0.379**
	(0.309)	(0.595)	(0.537)	(0.314)	(0.182)
TLC dummy	-0.653***	-0.940***	-1.623***	-2.591***	-3.135***
	(0.238)	(0.145)	(0.241)	(0.164)	(0.173)
Other NonFormal dummy	1.501***	0.837***	0.498***	0.372**	-0.310
	(0.223)	(0.215)	(0.143)	(0.147)	(0.203)
Below Primary dummy	-0.0853	-0.0662	-0.0838	-0.0763	-0.134
	(0.158)	(0.0756)	(0.101)	(0.121)	(0.116)
Primary dummy	0.0553	-0.0608	-0.0483	0.0143	0.137
	(0.127)	(0.114)	(0.117)	(0.0863)	(0.193)
Middle dummy	-0.116	-0.171	-0.172	-0.0929	-0.244**
	(0.105)	(0.129)	(0.135)	(0.101)	(0.0962)
Secondary dummy	0.136	0.0257	-0.0985	-0.0774	-0.157
	(0.101)	(0.104)	(0.115)	(0.0907)	(0.154)
Higher-secondary dummy	0.198	0.185	0.0748	0.0962	-0.000660
	(0.269)	(0.183)	(0.152)	(0.240)	(0.668)
Diploma/Certif dummy	-2.151	-1.506	-1.163	-0.458	-0.779
	(1.340)	(1.318)	(1.295)	(1.479)	(1.496)
Graduate dummy	-0.381**	-0.613*	-0.813**	-0.878**	-0.425
	(0.190)	(0.316)	(0.344)	(0.359)	(0.470)

PG & Above dummy	-1.554***	-1.299	-1.761	-0.403	-0.853
	(0.505)	(0.927)	(1.228)	(0.972)	(0.534)
Bidi price, log	-0.781***	-0.223	0.573***	0.318	0.389*
	(0.215)	(0.210)	(0.190)	(0.206)	(0.208)
Tobacco price, log	0.146	0.263***	0.334***	0.154*	0.0624
	(0.112)	(0.0960)	(0.0707)	(0.0866)	(0.0847)
IMFL price, log	-0.103	-0.00321	0.141	0.168	-0.342
	(0.220)	(0.230)	(0.287)	(0.218)	(0.318)
Country Liquor Price, log	0.209***	0.0538	0.0206	0.0145	0.0215
	(0.0757)	(0.0739)	(0.0450)	(0.0392)	(0.0554)
Beer price, log	-0.186	-0.0816	-0.0881	-0.0903	-0.209
	(0.227)	(0.135)	(0.178)	(0.194)	(0.234)
MLDA 18 DUMMY	0.0101	0.236	-0.126	-0.0783	-0.433
	(0.547)	(0.463)	(0.435)	(0.469)	(0.300)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.8 Quantile Regression on South-India for Beer

South- Beer	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Beer price, log	-0.471	-0.806**	-0.837***	-0.469**	-0.304
	(0.349)	(0.315)	(0.297)	(0.206)	(0.231)
MPCE, log	0.270**	0.853***	0.643***	0.743***	0.832***
	(0.122)	(0.136)	(0.0815)	(0.0943)	(0.114)
SC/ST DUMMY	0.121	0.179	0.146**	0.0816	0.230***
	(0.118)	(0.114)	(0.0672)	(0.0845)	(0.0872)
Islam dummy	-0.0473	-0.0283	-0.0438	-0.0899	0.0559
	(0.178)	(0.157)	(0.122)	(0.0885)	(0.176)
Household Size, log	0.0140	0.426***	0.380***	0.500***	0.507***
	(0.134)	(0.138)	(0.0954)	(0.0973)	(0.0981)
Female dummy	-0.114	-0.319	0.0286	0.0913	-0.0416
	(0.191)	(0.353)	(0.139)	(0.126)	(0.217)
Urban dummy	0.0608	-0.135	0.0213	-0.0850	-0.197
	(0.100)	(0.111)	(0.0738)	(0.0981)	(0.121)
No-Land dummy	-0.0989	-0.118	-0.0590	0.139	-0.0330
	(0.103)	(0.115)	(0.0821)	(0.0947)	(0.0975)
EGS/NFEC/AEC dummy	0.791*	0.0708	0.154	-0.427	-0.624
	(0.405)	(0.702)	(0.391)	(0.267)	(0.402)
Below Primary dummy	-0.0341	-0.0962	-0.205	-0.141	-0.0730
	(0.160)	(0.213)	(0.126)	(0.114)	(0.212)
Primary dummy	0.0107	0.263	-0.0220	0.0229	0.224
	(0.195)	(0.219)	(0.101)	(0.196)	(0.306)
Middle dummy	-0.0649	0.173	-0.0572	-0.0454	-0.0294
	(0.140)	(0.261)	(0.121)	(0.155)	(0.183)
Secondary dummy	-0.0629	-0.0364	-0.0513	-0.117	-0.153
	(0.114)	(0.222)	(0.0676)	(0.0988)	(0.138)
Higher-secondary dummy	0.154	0.261	0.0129	-0.0287	0.0239
	(0.224)	(0.250)	(0.101)	(0.190)	(0.265)
Diploma/Certif dummy	0.542	0.278	0.0966	-0.101	0.708
	(0.471)	(0.421)	(0.333)	(0.566)	(0.553)

Graduate dummy	-0.00123	-0.143	-0.269***	-0.205	-0.321*
	(0.120)	(0.240)	(0.0992)	(0.154)	(0.175)
PG & Above dummy	-0.314	-0.0601	-0.262*	-0.594***	-0.587**
	(0.467)	(0.403)	(0.152)	(0.150)	(0.238)
Bidi price, log	0.0275	0.104	0.133	0.208	-0.111
	(0.248)	(0.346)	(0.168)	(0.269)	(0.384)
Tobacco price, log	0.0594	0.113	0.0327	0.0188	-0.0996
	(0.101)	(0.104)	(0.0491)	(0.0514)	(0.0783)
IMFL price, log	0.111	0.235	0.428***	0.198	0.253
	(0.236)	(0.327)	(0.115)	(0.214)	(0.198)
Country Liquor Price, log	-0.0104	0.0386	-0.116**	-0.0547	-0.0483
	(0.0640)	(0.0919)	(0.0547)	(0.0699)	(0.0976)
Toddy price, log	-0.0358	-0.0358	0.00855	0.0906	0.190
	(0.120)	(0.137)	(0.0581)	(0.115)	(0.182)
MLDA 18 DUMMY	0.337	0.223	0.182*	0.0367	-0.115
	(0.216)	(0.291)	(0.106)	(0.113)	(0.146)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.9 Quantile Regression on Maharashtra for Country Liquor

Maharashtra- Country Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Country Liquor Price, log	-0.262	-0.742***	-0.497**	-0.996**	-1.455**
	(0.436)	(0.285)	(0.247)	(0.493)	(0.730)
MPCE, log	0.629***	0.775***	0.801***	0.879***	0.808***
	(0.147)	(0.107)	(0.146)	(0.172)	(0.183)
SC/ST DUMMY	-0.0108	0.170	0.0441	0.00126	0.0350
	(0.120)	(0.110)	(0.0861)	(0.0971)	(0.119)
Islam dummy	0.160	0.0989	-0.127	-0.290	-0.346
	(0.203)	(0.189)	(0.208)	(0.204)	(0.214)
Household Size, log	0.364*	0.410***	0.487***	0.561***	0.414***
	(0.191)	(0.102)	(0.0846)	(0.129)	(0.145)
Female dummy	-0.0298	-0.0153	-0.179	-0.0980	0.577
	(0.401)	(0.355)	(0.378)	(0.511)	(0.881)
Urban dummy	0.287**	0.0737	0.0404	0.0304	-0.0306
	(0.125)	(0.117)	(0.117)	(0.208)	(0.272)
No-Land dummy	0.0197	0.0527	0.192	0.0458	0.0704
	(0.247)	(0.160)	(0.136)	(0.146)	(0.248)
TLC dummy	4.531***	3.932***	3.162***	2.441***	1.905***
	(0.196)	(0.267)	(0.185)	(0.190)	(0.241)
Other NonFormal dummy	1.172**	0.300	0.0771	0.469	0.843
	(0.498)	(0.469)	(0.586)	(0.623)	(0.659)
Below Primary dummy	-0.345	-0.299	-0.103	-0.274	0.0456
	(0.219)	(0.183)	(0.172)	(0.176)	(0.174)
Primary dummy	-0.150	-0.142	-0.230	-0.161	-0.170
	(0.170)	(0.165)	(0.145)	(0.164)	(0.253)
Middle dummy	-0.338**	-0.333***	-0.272*	-0.0203	0.0147
	(0.146)	(0.0888)	(0.147)	(0.106)	(0.213)
Secondary dummy	-0.455**	-0.446	-0.343***	-0.340***	-0.286
	(0.179)	(0.284)	(0.128)	(0.128)	(0.254)

Higher-secondary dummy	-0.0845	-0.213	-0.301	-0.327**	-0.257
	(0.243)	(0.210)	(0.196)	(0.159)	(0.240)
Diploma/Certif dummy	-0.00748	-0.439	-0.672	0.414	0.271
	(0.475)	(0.529)	(0.827)	(1.091)	(0.515)
Graduate dummy	-0.458	-0.639	-0.248	-0.525***	-0.758***
	(0.372)	(0.541)	(0.332)	(0.162)	(0.219)
PG & Above dummy	0.122	-0.412	-1.097***	-1.719***	-1.810***
	(0.264)	(0.296)	(0.205)	(0.247)	(0.335)
Cigarette price, log	0.130	0.135	-0.0384	-0.203	-0.509
	(0.208)	(0.182)	(0.200)	(0.312)	(0.368)
Bidi price, log	0.169	-0.0410	0.447**	0.273	-0.0816
	(0.369)	(0.345)	(0.227)	(0.379)	(0.653)
Tobacco price, log	0.173	0.288	0.152	0.0783	-0.0766
	(0.218)	(0.182)	(0.0973)	(0.205)	(0.180)
IMFL price, log	-0.141	-0.169	-0.0891	0.286	-0.0438
	(0.224)	(0.233)	(0.171)	(0.244)	(0.296)
Beer price, log	-0.145	-0.365	-0.267	-0.0250	-0.623*
	(0.306)	(0.267)	(0.165)	(0.243)	(0.349)
Toddy price, log	-0.0706	0.125	0.207*	0.204	-0.00715
	(0.116)	(0.123)	(0.114)	(0.182)	(0.234)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.10 Quantile Regression on Maharashtra for IMFL

Maharashtra- IMFL	(1)	(2)	(3)
VARIABLES	q25	q50	q75
IMFL price, log	-0.434	-0.781*	-0.857***
	(0.477)	(0.467)	(0.324)
MPCE, log	0.587*	0.459*	0.434
	(0.299)	(0.252)	(0.321)
SC/ST DUMMY	-0.119	-0.0414	-0.0468
	(0.304)	(0.310)	(0.447)
Islam dummy	0.525	0.183	-0.466
	(0.695)	(0.686)	(0.965)
Household Size, log	0.0970	0.184	0.469*
	(0.407)	(0.353)	(0.264)
Female dummy	-0.794	-0.323	0.389
	(1.009)	(0.898)	(0.873)
Urban dummy	-0.145	0.0905	0.222
	(0.366)	(0.424)	(0.385)
No-Land dummy	-0.0353	0.0221	0.269
	(0.374)	(0.518)	(0.377)
Below Primary dummy	-0.289	-0.399	-0.188
	(0.946)	(0.628)	(0.563)
Primary dummy	0.272	-0.171	0.383
	(0.388)	(0.444)	(0.612)
Middle dummy	0.312	-0.0541	0.679
	(0.409)	(0.452)	(0.467)
Secondary dummy	-0.600	-0.513	0.0327
	(0.471)	(0.548)	(0.522)

Higher-secondary dummy	-0.254	-0.417	0.481
	(0.498)	(0.399)	(0.400)
Diploma/Certif dummy	1.712**	0.846	0.823
	(0.829)	(0.768)	(1.118)
Graduate dummy	0.280	0.0420	0.657
	(0.544)	(0.482)	(0.632)
PG & Above dummy	-0.630	-0.939	0.0333
	(0.695)	(0.753)	(0.734)
Cigarette price, log	-0.634	-0.634	-0.106
	(0.429)	(0.548)	(0.618)
Bidi price, log	0.0907	0.146	-0.00946
	(0.692)	(0.723)	(0.731)
Tobacco price, log	0.0352	0.558	0.600
	(0.495)	(0.519)	(0.663)
Country Liquor Price, log	0.649	0.154	-0.256
	(0.873)	(0.816)	(0.634)
Beer price, log	0.525	0.385	0.128
	(0.568)	(0.570)	(0.668)
Toddy price, log	0.140	0.166	-0.0298
	(0.325)	(0.332)	(0.329)

Note: Standard errors in parentheses and Fixed effects and constant omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.7.11 Quantile Regression on Maharashtra for Beer

Maharashtra- Beer	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Beer price, log	-1.252***	-1.001**	-0.476	-0.258	-0.129
	(0.335)	(0.451)	(0.349)	(0.455)	(0.623)
MPCE, log	0.907***	0.960***	1.152***	1.006***	0.949**
	(0.195)	(0.211)	(0.196)	(0.184)	(0.384)
SC/ST DUMMY	-0.214	-0.0447	0.0832	0.191	0.0637
	(0.196)	(0.265)	(0.281)	(0.298)	(0.317)
Islam dummy	0.575	0.692**	0.534	0.522	0.387
	(0.354)	(0.325)	(0.370)	(0.369)	(0.408)
Household Size, log	0.752***	0.748***	0.709***	0.845***	0.936***
	(0.174)	(0.251)	(0.157)	(0.200)	(0.250)
Female dummy	-0.646	-0.391	-0.106	-0.281	-0.166
	(0.518)	(0.679)	(0.543)	(0.665)	(0.670)
Urban dummy	-0.277	-0.231	-0.106	-0.180	-0.154
	(0.244)	(0.281)	(0.184)	(0.152)	(0.380)
No-Land dummy	0.0952	0.201	0.0407	0.0717	0.191
	(0.180)	(0.243)	(0.224)	(0.235)	(0.301)
Below Primary dummy	0.897**	1.034	0.707	0.430	0.524
	(0.404)	(0.636)	(0.723)	(0.688)	(0.518)
Primary dummy	0.832**	0.762	0.532	0.404	0.719
	(0.377)	(0.487)	(0.564)	(0.627)	(0.525)
Middle dummy	0.649**	0.632*	0.440	0.198	0.692
	(0.323)	(0.378)	(0.617)	(0.720)	(0.626)
Secondary dummy	0.460	0.540	0.439	-0.0157	0.298
	(0.367)	(0.382)	(0.538)	(0.593)	(0.430)

Higher-secondary dummy	0.826**	1.216***	0.786	0.327	1.222*
	(0.381)	(0.452)	(0.536)	(0.718)	(0.640)
Diploma/Certif dummy	0.422	0.953	0.762	0.136	0.188
	(0.487)	(0.709)	(0.749)	(0.876)	(0.613)
Graduate dummy	0.188	0.340	0.121	-0.101	0.314
	(0.354)	(0.461)	(0.672)	(0.708)	(0.532)
PG & Above dummy	0.763*	0.635	0.366	0.351	0.730
	(0.444)	(0.508)	(0.602)	(0.795)	(0.649)
Cigarette price, log	0.487	0.592	0.435	0.817	0.419
	(0.521)	(0.414)	(0.451)	(0.502)	(0.627)
Bidi price, log	0.734*	0.452	0.575	0.395	1.415
	(0.392)	(0.453)	(0.482)	(0.771)	(0.886)
Tobacco price, log	0.0471	0.0445	0.299	0.333	0.514
	(0.196)	(0.293)	(0.267)	(0.227)	(0.326)
IMFL price, log	0.444	0.313	-0.526	-0.731	-1.644**
	(0.505)	(0.678)	(0.601)	(0.628)	(0.697)

Note: Standard errors in parentheses and Fixed effects and constant omitted

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

3.6.8 Results on Indian and Foreign Liquor

Additionally, estimation on price and income elasticities based on ethanol content in Indian and foreign type of liquor shows significant effect of prices and income on quantity of ethanol consumed by drinking households. The price elasticity of foreign liquor based on ethanol content shows lower price elasticities for lower quantiles and higher for the higher quantiles of ethanol quantity distribution. The similar trend for Indian liquor and Foreign liquor is observed in South India. The price elasticity for foreign liquor based on ethanol content shows lower elasticity for moderate level of drinker households than both low(Q10) and high(Q90) levels of drinking households whereas for Indian liquor it follows similar trend of price elasticity of southern India with lower price elasticity for lower quantiles and higher for higher quantiles. The income shows monotonously increasing trend with increases in quantiles overall (except for foreign liquor in Maharashtra)

Table 3.6.8.1 *Quantile Regression at all-India level excluding prohibited areas for Indian Type Liquor based on Ethanol Content*

All India- Indian Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Indian Liquor price	-0.431*** (0.0673)	-0.488*** (0.0509)	-0.549*** (0.0426)	-0.429*** (0.0371)	-0.49*** (0.0417)
MPCE, log	0.657*** (0.0540)	0.756*** (0.0376)	0.778*** (0.0342)	0.783*** (0.0464)	0.826*** (0.0431)
SC/ST DUMMY	0.0141 (0.0414)	0.0795** (0.0309)	0.147*** (0.0246)	0.163*** (0.0388)	0.142*** (0.0410)
Islam dummy	-0.325*** (0.0919)	-0.277*** (0.0910)	-0.195*** (0.0630)	-0.157** (0.0782)	-0.162* (0.0868)
Household Size, log	0.377*** (0.0365)	0.396*** (0.0352)	0.419*** (0.0222)	0.396*** (0.0321)	0.436*** (0.0367)
Female dummy	-0.152* (0.0894)	-0.128** (0.0560)	-0.103* (0.0609)	-0.109* (0.0613)	-0.105 (0.0658)
Urban dummy	0.114** (0.0573)	0.0758* (0.0394)	0.0929*** (0.0276)	0.0887*** (0.0303)	0.0512 (0.0369)
No-Land dummy	0.106* (0.0547)	0.0833** (0.0373)	0.112*** (0.0255)	0.0431 (0.0409)	0.182*** (0.0496)
Constant	-5.179*** (0.425)	-5.033*** (0.424)	-4.296*** (0.397)	-4.324*** (0.396)	-3.859*** (0.457)
Observations	12,402	12,402	12,402	12,402	12,402

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted

**** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

Table 3.6.8.2 Quantile Regression at all-India level excluding prohibited areas for Foreign Type Liquor based on Ethanol Content

All India- Foreign Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Foreign Liquor price	-0.121 (0.105)	-0.366*** (0.0587)	-0.572*** (0.0677)	-0.659*** (0.0690)	-0.63*** (0.0653)
MPCE, log	0.629*** (0.0351)	0.638*** (0.0293)	0.660*** (0.0322)	0.828*** (0.0272)	0.921*** (0.0348)
SC/ST DUMMY	0.125*** (0.0373)	0.117*** (0.0165)	0.0899*** (0.0206)	0.125*** (0.0347)	0.162*** (0.0288)
Islam dummy	-0.0299 (0.0978)	0.00992 (0.0512)	0.00429 (0.0377)	-0.0125 (0.0715)	-0.0190 (0.0762)
Household Size, log	0.389*** (0.0375)	0.369*** (0.0252)	0.409*** (0.0198)	0.483*** (0.0219)	0.536*** (0.0296)
Female dummy	-0.147 (0.107)	-0.0298 (0.0844)	-0.0684 (0.0468)	-0.114** (0.0485)	-0.0457 (0.0759)
Urban dummy	-0.0760** (0.0310)	-0.0337 (0.0283)	-0.0230 (0.0220)	-0.0513 (0.0323)	-0.0288 (0.0374)
No-Land dummy	-0.114*** (0.0401)	-0.119*** (0.0357)	-0.0774*** (0.0238)	-0.0501* (0.0294)	-0.107** (0.0466)
Constant	-6.858*** (0.632)	-4.979*** (0.356)	-3.435*** (0.360)	-3.423*** (0.459)	-3.706*** (0.414)
Observations	10,671	10,671	10,671	10,671	10,671

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.8.3 Quantile Regression at South India level for Indian Type Liquor based on Ethanol Content

South India- Indian Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Indian Liquor price, log	-0.0784 (0.0984)	-0.238*** (0.0491)	-0.277*** (0.0629)	-0.305*** (0.0558)	-0.384*** (0.0556)
MPCE, log	0.317*** (0.111)	0.510*** (0.125)	0.618*** (0.0901)	0.604*** (0.0794)	0.801*** (0.100)
SC/ST DUMMY	-0.0909 (0.0818)	-0.00268 (0.0714)	0.0469 (0.0647)	0.0846* (0.0470)	0.163* (0.0862)
Islam dummy	0.262 (0.207)	0.290*** (0.111)	0.255** (0.110)	0.154* (0.0879)	0.304** (0.146)
Household Size, log	0.307** (0.134)	0.366*** (0.0919)	0.409*** (0.0843)	0.330*** (0.0697)	0.375*** (0.0660)
Female dummy	-0.333 (0.205)	-0.295*** (0.108)	-0.198* (0.115)	-0.193 (0.124)	-0.250** (0.121)
Urban dummy	-0.118 (0.118)	-0.0670 (0.0600)	-0.0405 (0.108)	-0.138 (0.0983)	-0.145* (0.0762)
No-Land dummy	-0.123	-0.154	-0.186	-0.0733	0.0233

	-3.850***	-4.127***	-4.079***	-3.132***	-3.794***
Constant	(0.778)	(1.004)	(0.687)	(0.577)	(0.794)
Observations	2,247	2,247	2,247	2,247	2,247

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.8.4 Quantile Regression at South India level for Foreign Type Liquor

based on Ethanol Content

South India- Foreign Liquor	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Foreign Liquor price, log	-0.140 (0.125)	-0.332** (0.134)	-0.642*** (0.117)	-0.726*** (0.121)	-0.753*** (0.154)
MPCE, log	0.572*** (0.0442)	0.573*** (0.0264)	0.601*** (0.0285)	0.803*** (0.0341)	0.840*** (0.0448)
SC/ST DUMMY	0.198*** (0.0399)	0.180*** (0.0347)	0.142*** (0.0381)	0.170*** (0.0476)	0.148** (0.0623)
Islam dummy	-0.0312 (0.124)	-0.0197 (0.101)	-0.00283 (0.0766)	0.0356 (0.0982)	0.0119 (0.105)
Household Size, log	0.348*** (0.0580)	0.342*** (0.0500)	0.422*** (0.0364)	0.528*** (0.0305)	0.532*** (0.0513)
Female dummy	-0.156 (0.108)	-0.00923 (0.0942)	-0.0509 (0.0667)	-0.0994** (0.0501)	-0.103 (0.124)
Urban dummy	-0.101** (0.0434)	-0.0118 (0.0273)	-0.0218 (0.0272)	-0.0654* (0.0370)	-0.0595* (0.0340)
No-Land dummy	-0.0267 (0.0960)	-0.0324 (0.0468)	-0.0270 (0.0368)	-0.0581 (0.0580)	-0.110* (0.0660)
Constant	-6.133*** (0.829)	-4.454*** (0.824)	-2.302*** (0.679)	-2.805*** (0.690)	-2.310** (1.057)
Observations	6,282	6,282	6,282	6,282	6,282

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.8.5 Quantile Regression at Maharashtra level excluding prohibited areas

for Indian Type Liquor based on Ethanol Content

	(1)	(2)	(3)	(4)	(5)
VARIABLES	q10	q25	q50	q75	q90
Indian Liquor price, log	-0.438 (0.347)	-0.843*** (0.244)	-0.668** (0.329)	-1.165** (0.473)	-1.104*** (0.406)
MPCE, log	0.638*** (0.122)	0.884*** (0.107)	0.779*** (0.139)	0.968*** (0.147)	0.836*** (0.175)
SC/ST DUMMY	-0.0719 (0.184)	0.0590 (0.155)	0.0414 (0.0935)	0.120 (0.103)	0.00954 (0.149)
Islam dummy	0.125 (0.412)	-0.0161 (0.170)	-0.0867 (0.198)	-0.206 (0.161)	-0.359 (0.290)

Household Size, log	0.324***	0.319**	0.399***	0.614***	0.444***
	(0.0859)	(0.126)	(0.123)	(0.113)	(0.144)
Female dummy	0.0947	0.0850	0.165	-0.00257	0.582
	(0.425)	(0.425)	(0.349)	(0.385)	(0.777)
Urban dummy	0.339*	0.123	0.0241	-0.00130	-0.0383
	(0.201)	(0.126)	(0.163)	(0.180)	(0.187)
No-Land dummy	-4.432**	-3.410**	-2.976*	-1.456	0.124
	(2.132)	(1.406)	(1.653)	(2.599)	(2.205)
Constant					
	876	876	876	876	876

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

**Table 3.6.8.6 Quantile Regression at Maharashtra level excluding prohibited areas
for Foreign Type Liquor based on Ethanol Content**

VARIABLES	(1) q10	(2) q25	(3) q50	(4) q75	(5) q90
Foreign Liquor price, log	-0.857**	-0.619	-0.510	-0.531	-1.172
	(0.346)	(0.428)	(0.553)	(0.446)	(0.712)
MPCE, log	0.755***	0.928***	0.899***	0.744***	0.949** *
	(0.181)	(0.110)	(0.144)	(0.147)	(0.268)
SC/ST DUMMY	-0.0807	-0.124	-0.127	0.154	0.253
	(0.216)	(0.128)	(0.141)	(0.179)	(0.219)
Islam dummy	0.783***	0.353	0.0316	-0.0147	-0.511
	(0.232)	(0.223)	(0.291)	(0.279)	(0.319)
Household Size, log	0.663***	0.785***	0.474***	0.431***	0.617**
	(0.189)	(0.205)	(0.161)	(0.140)	(0.305)
Female dummy	-0.820	-0.559	-0.524	-0.611	0.425
	(0.533)	(0.469)	(0.714)	(0.784)	(0.468)
Urban dummy	-0.0579	-0.0612	0.0670	0.0675	0.196
	(0.211)	(0.166)	(0.142)	(0.156)	(0.302)
No-Land dummy	-5.073**	-7.456***	-6.563**	-4.267	-2.382
	(2.492)	(2.442)	(3.126)	(2.825)	(5.191)
Constant					
	435	435	435	435	435

Note: Standard errors in parentheses and Fixed effects, Education dummies omitted
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Fig 3.6.8.7 Price Elasticity of Ethanol by Indian and Foreign Type Liquor at all-

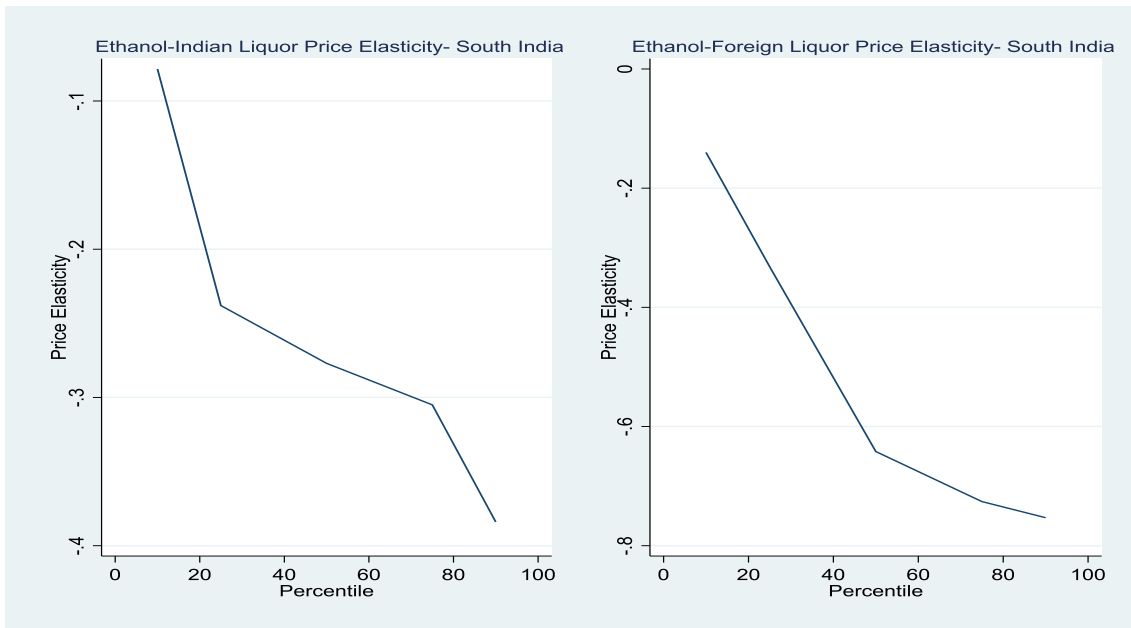
India Level



Note: Author's depiction using Quantile Regressions on NSSO data and insignificant value at 10th percentile for Foreign Liquor

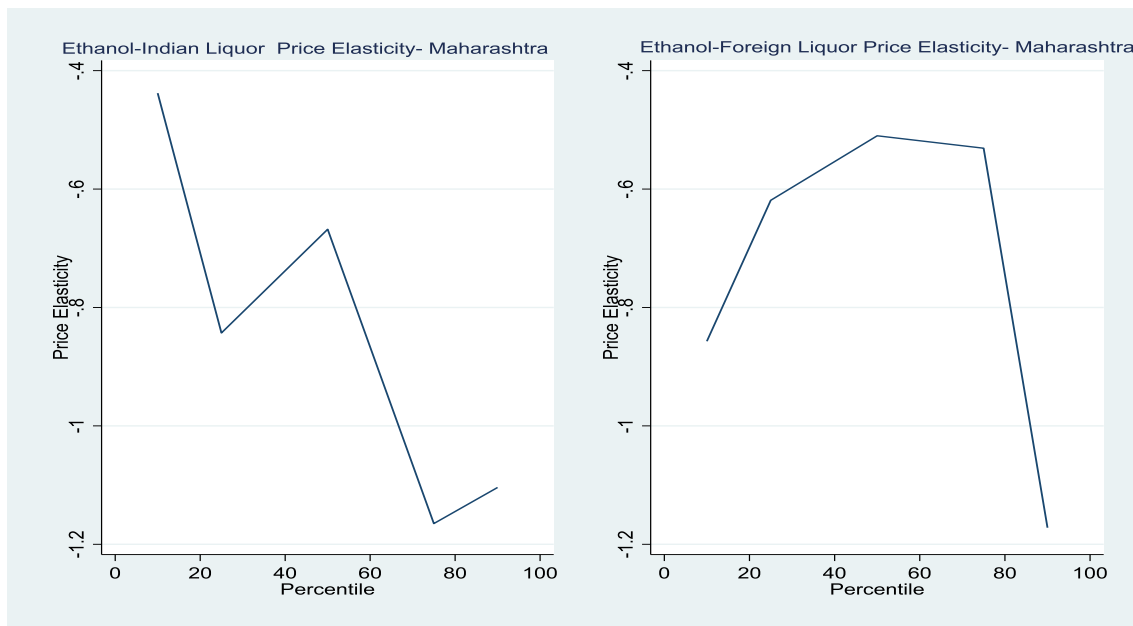
Fig 3.6.8.8 Price Elasticity of Ethanol by Indian and Foreign Type Liquor at South

India Level



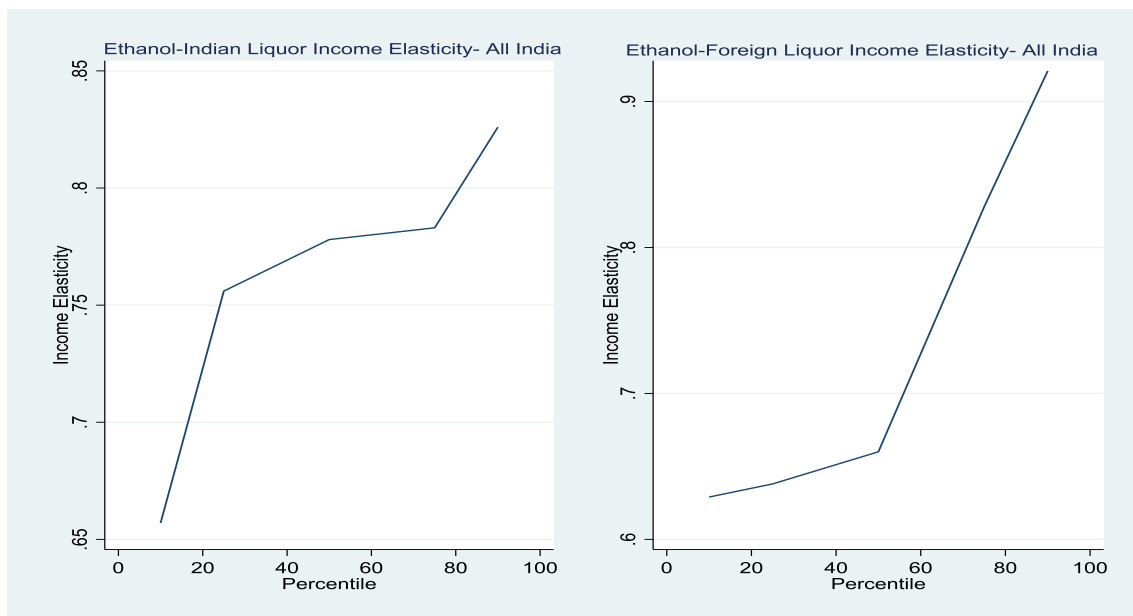
Note: Author's depiction using Quantile Regressions on NSSO data and insignificant value at 10th percentile for both Indian and Foreign Liquor

Fig 3.6.8.9 Price Elasticity of Ethanol by Indian and Foreign Type Liquor at all-Maharashtra Level



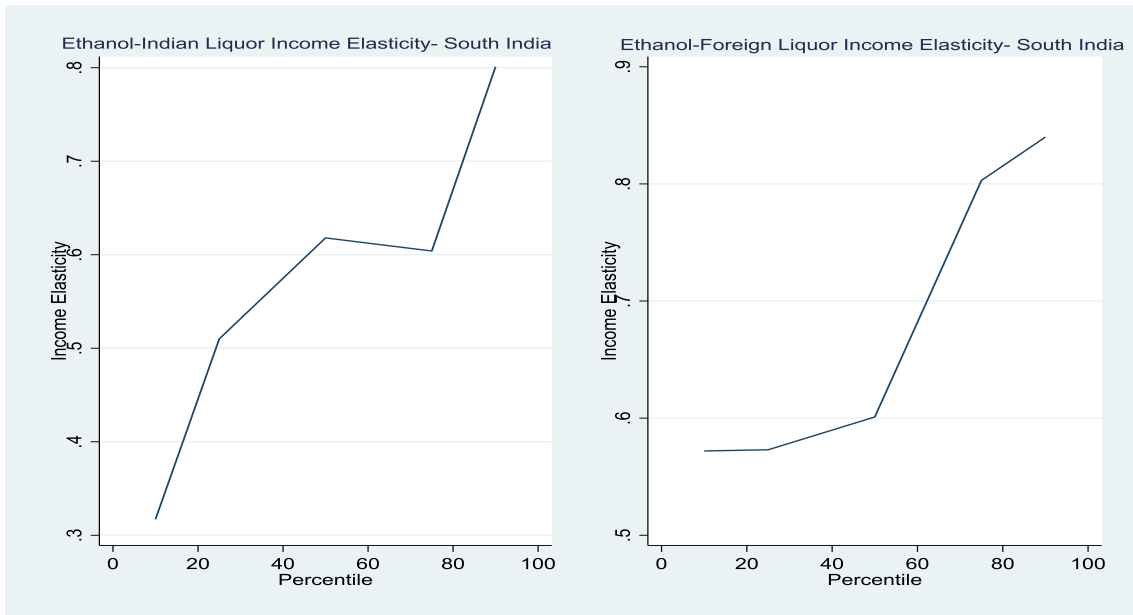
Note: Author's depiction using Quantile Regressions on NSSO data and insignificant values in 10th percentile for Indian Liquor and significant values only in 10th percentile for Foreign Liquor

Fig 3.6.8.10 Income Elasticity of Ethanol by Indian and Foreign Type Liquor at all-India Level



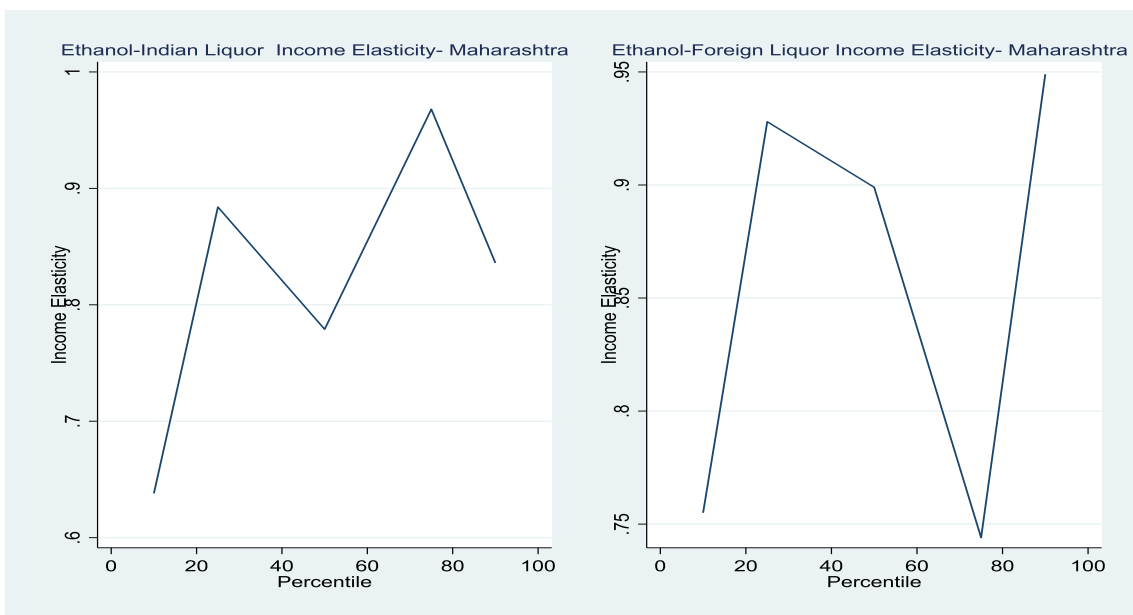
Note: Author's depiction using Quantile Regressions on NSSO data

Fig 3.6.8.11 Price Elasticity of Ethanol by Indian and Foreign Type Liquor at South India Level



Note: Author's depiction using Quantile Regressions on NSSO data

Fig 3.6.8.12 Price Elasticity of Ethanol by Indian and Foreign Type Liquor at Maharashtra Level



Note: Author's depiction using Quantile Regressions on NSSO data

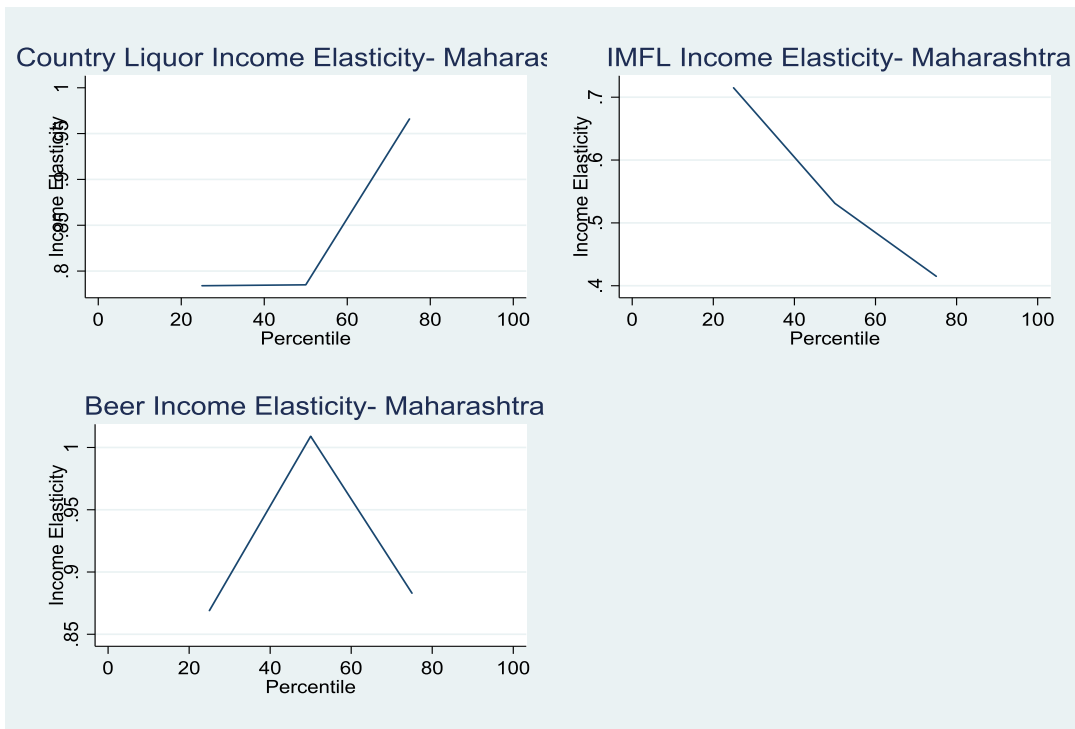
3.6.9 Results: Price Elasticity Graphical Overview

Fig 3.6.9.1 Price Elasticity by Liquor Types in Maharashtra



Note: Author's depiction using Quantile Regressions on NSSO data

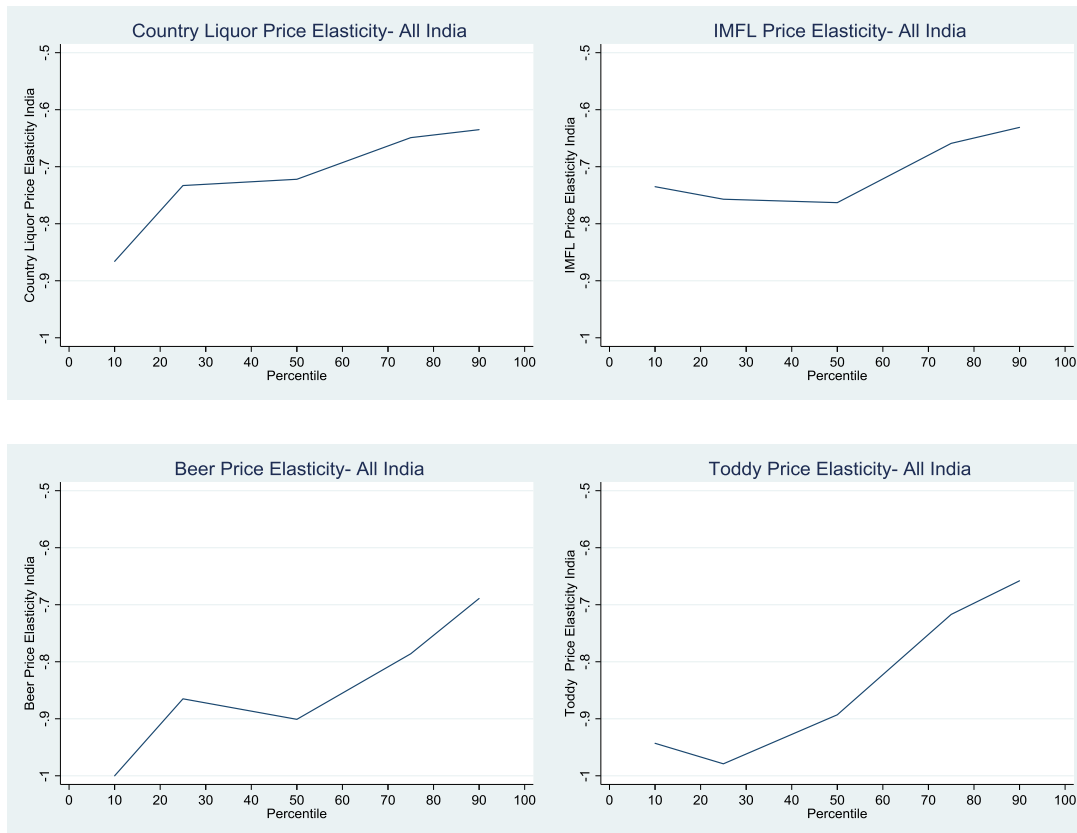
Fig 3.6.9.2 Income Elasticity by Liquor Types in Maharashtra



Note: Author's depiction using Quantile Regressions on NSSO data

Fig 3.6.9.3 Price Elasticity by Liquor Types at all-India Level using Extended

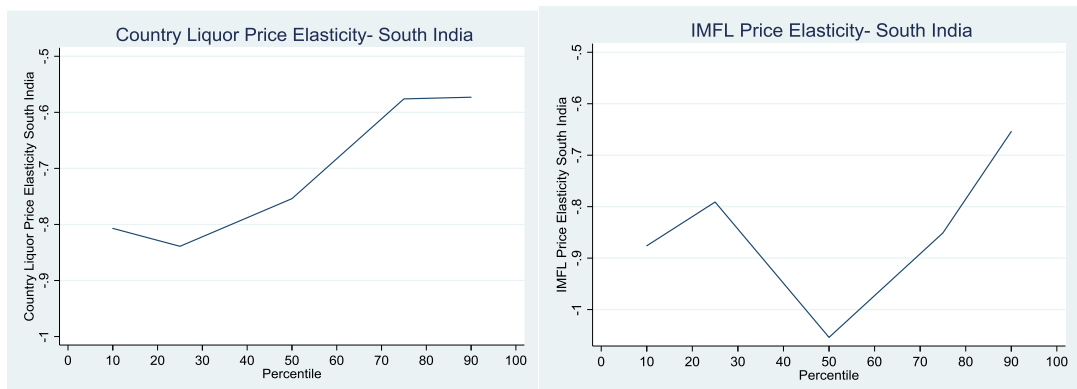
Specification

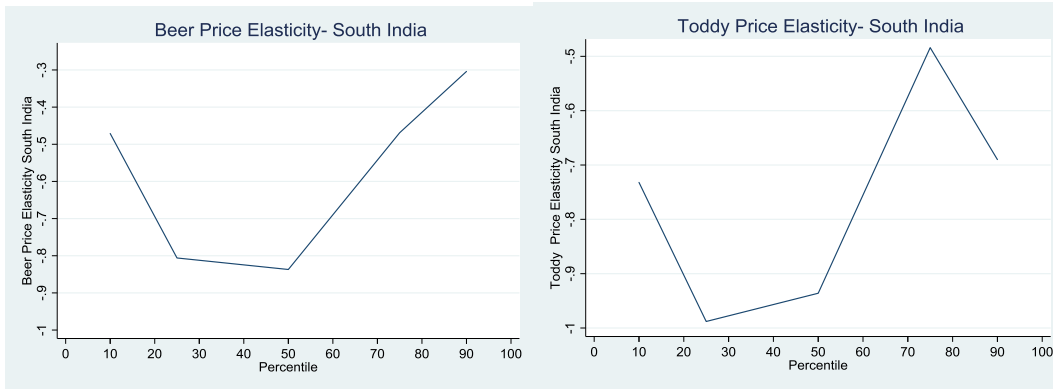


Note: Author's depiction using *Quantile Regressions on NSSO data*

Fig 3.6.9.4 Price Elasticity by Liquor Types at South India Level using Extended

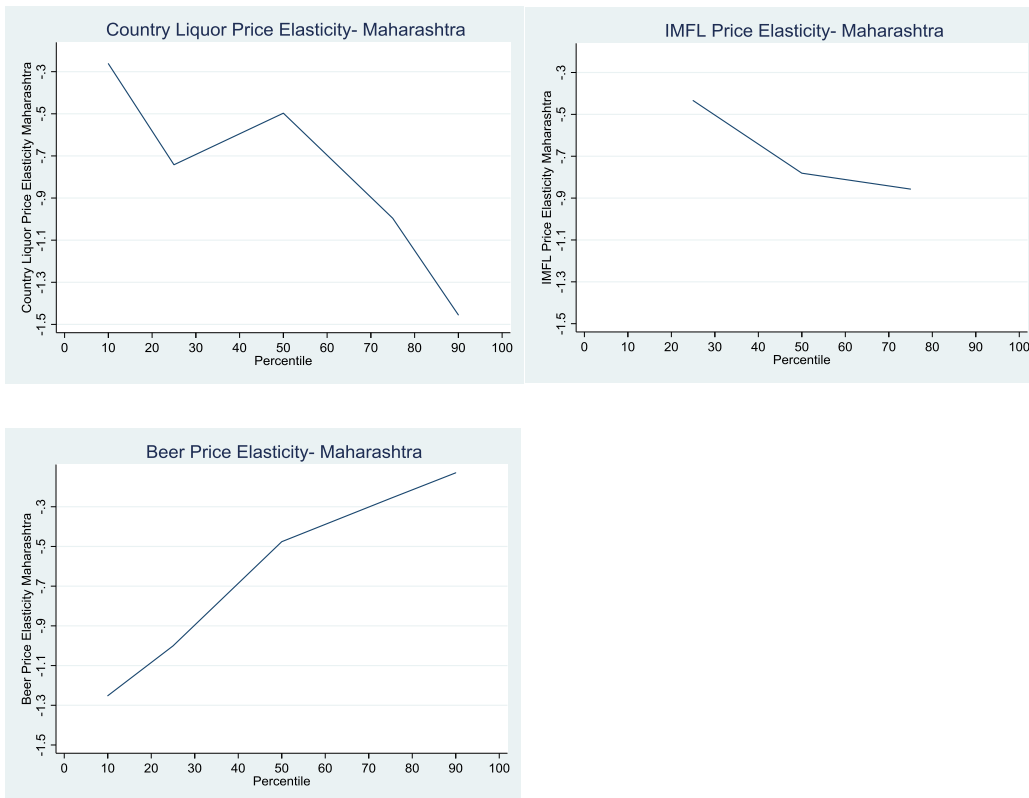
Specification





Note: Author's depiction using Quantile Regressions on NSSO data

Fig 3.6.9.5 Price Elasticity by Liquor Types at Maharashtra Level using Extended Specification



Note: Author's depiction using Quantile Regressions on NSSO data

3.6.10 Robustness/Reduced Form: All India (excluding prohibited areas)

Model 1 includes own price, monthly per capita expenditure of a household and minimum legal drinking age of 18.

Model 2 additionally includes household characteristics variables along with fixed effects.

Model 3 additionally includes prices of non-alcoholic complements/substitutes.

Model 4 is the full model which additionally includes prices of other alcoholic drinks.

Table 3.6.10.1 All India- Country Liquor

Country Liquor	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Country Liquor Price, log	-0.688*** (0.0188)	-0.706*** (0.0420)	-0.709*** (0.0419)	-0.737*** (0.0409)
MPCE, log	0.852*** (0.0313)	0.741*** (0.0267)	0.741*** (0.0267)	0.784*** (0.0296)
MLDA 18 DUMMY	-0.0421 (0.0376)	0.365*** (0.131)	0.397*** (0.136)	0.477*** (0.129)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.10.2 All India- IMFL

IMFL	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
IMFL price, log	-0.725*** (0.0419)	-0.714*** (0.0519)	-0.691*** (0.0545)	-0.679*** (0.0613)
MPCE, log	0.258*** (0.0288)	0.915*** (0.0774)	0.356*** (0.0413)	0.346*** (0.0438)
MLDA 18 DUMMY	0.0143 (0.0379)	0.582*** (0.199)	-0.392* (0.214)	-0.250 (0.271)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.10.3 All India- Beer

Beer	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Beer price, log	-0.718*** (0.0637)	-0.826*** (0.0735)	-0.829*** (0.0744)	-0.843*** (0.0856)
MPCE, log	0.163*** (0.0376)	1.075*** (0.0685)	1.072*** (0.0688)	1.073*** (0.0807)
MLDA 18 DUMMY	-0.00527	0.814***	0.825***	0.666**

	(0.0529)	(0.220)	(0.224)	(0.295)
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Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.10.4 All India- Toddy

Toddy	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Toddy price, log	-0.879*** (0.0474)	-0.801*** (0.104)	-0.771*** (0.103)	-0.798*** (0.108)
MPCE, log	0.669*** (0.109)	0.720*** (0.0985)	0.732*** (0.0951)	0.740*** (0.0945)
MLDA 18 DUMMY	0.314 (0.269)	1.387* (0.746)	1.815** (0.807)	1.755** (0.830)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.6.11 Robustness/Reduced Form: South India

Model 1 includes own price, monthly per capita expenditure and.

Model 2 additionally includes household characteristics variables along with fixed effects.

Model 3 additionally includes prices of non-alcoholic complements/substitutes along with fixed effects.

Model 4 is the full model which additionally includes prices of other alcoholic drinks along with fixed effects.

Table 3.6.11.1 South India- Country Liquor

Country Liquor	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Country Liquor Price, log	-0.785*** (0.0654)	-0.765*** (0.0735)	-0.778*** (0.0728)	-0.707*** (0.0875)
MPCE, log	0.729*** (0.0918)	0.696*** (0.0928)	0.703*** (0.0921)	0.658*** (0.0946)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.11.2 South India- IMFL

IMFL	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
IMFL price, log	-0.812*** (0.0833)	-0.811*** (0.101)	-0.774*** (0.105)	-0.729*** (0.135)
MPCE, log	0.334*** (0.0294)	0.882*** (0.0432)	0.422*** (0.0497)	0.420*** (0.0514)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.11.3 South India- Beer

Beer	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 1	Model 1	Model 1
Beer price, log	-0.647*** (0.127)	-0.646*** (0.152)	-0.658*** (0.155)	-0.588*** (0.182)
MPCE, log	0.273*** (0.0452)	0.869*** (0.0876)	0.862*** (0.0868)	0.851*** (0.106)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.6.11.4 South India- Toddy

Toddy	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 1	Model 1	Model 1
Toddy price, log	-0.886***	-0.721***	-0.716***	-0.677***
	(0.0708)	(0.154)	(0.150)	(0.164)
MPCE, log	0.475***	0.627***	0.642***	0.635***
	(0.167)	(0.139)	(0.128)	(0.129)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.6.12 Robustness/Reduced Form: Maharashtra

Model 1 includes own price, monthly per capita expenditure and.

Model 2 additionally includes household characteristics variables along with fixed effects.

Model 3 additionally includes prices of non-alcoholic complements/substitutes along with fixed effects.

Model 4 is the full model which additionally includes prices of other alcoholic drinks along with fixed effects.

3.6.12.1 Maharashtra- Country Liquor

Country liquor	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Country Liquor Price, log	-0.671*** (0.257)	-1.073*** (0.393)	-0.902** (0.413)	-0.849*** (0.325)
MPCE, log	0.841*** (0.117)	0.789*** (0.102)	0.801*** (0.101)	0.778*** (0.113)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.6.12.2 Maharashtra-IMFL

IMFL	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
IMFL price, log	-0.845*** (0.216)	-0.551** (0.250)	-0.600** (0.247)	-0.617** (0.246)
MPCE, log	-0.128 (0.158)	0.708* (0.380)	0.670* (0.405)	0.583 (0.595)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.6.12.3 Maharashtra- Beer

Beer	(1)	(2)	(3)	(4)
VARIABLES	Model 1	Model 2	Model 3	Model 4
Beer price, log	-0.767*** (0.245)	-0.848*** (0.243)	-0.708*** (0.258)	-0.642 (0.629)
MPCE, log	0.186 (0.127)	0.937*** (0.137)	0.939*** (0.152)	0.929*** (0.170)

Note: Standard errors in parentheses and other control variables omitted in Model 2, 3 and 4
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Chapter 4: Alcohol Consumption, Prohibition and Revenue in Maharashtra

4.1 Introduction

In Maharashtra, the erstwhile Bombay state (under the British raj), the first move in the direction of prohibition came in 1921 when the legislative council accepted Dr Dadachandji's resolution recommending total prohibition⁴². However, the total prohibition was introduced in the state only Post-independence through the Bombay Prohibition Act (1949). Over the years of experiment, it was realized that the complete prohibition was not a feasible solution to alcohol problems in Maharashtra and the move to lift total prohibition was first introduced in year 1963 citing problems due to illicit distillers, bootleggers, and traffickers. However, the state-wide prohibition was lifted in 1972 with some modifications (Daniyal, 2015), and since then, the state of Maharashtra has refrained from reinstating statewide prohibition. Currently, prohibition remains in effect in the districts of Wardha and Gadchiroli⁴³.

In April 2015, the state government of Maharashtra banned the sale and consumption of liquor in the Chandrapur district. Contrarily, the present (2021) guardian minister of Chandrapur claimed severe problems on health (of general public) and administration (district and state) due to prohibition policy and hence on May 2021, the state cabinet of Maharashtra lifted the liquor ban citing it as a 'complete failure'⁴⁴ (Ali, 2021)⁴⁵. The lifting of prohibition in the Chandrapur district escalated the probability of lifting the prohibition from other alcohol prohibited districts. Countering such a possibility, social and health activists like Abhay and

⁴² In 1925, the Government of Bombay took the first step in adopting the idea of total prohibition. The initial steps taken were local options and rationing. When Congress assumed office for the first time in 1937, the then Excise Minister, Dr. Gilder, declared an ambitious prohibition plan to be completed within three years. This led to the introduction of prohibition in the industrial area of Ahmedabad city, Bardoli taluka of the Surat district, two talukas of Broach and Kanara districts each, three talukas of Ahmednagar districts. It was followed by prohibition in the town and Island of Bombay and Bombay suburban district. However, the prohibition could not sustain its original form as the validity of the notification issued under section 14-B of the Bombay Abkari Act was challenged. This, in turn, allowed restrictions on the use of country liquor, but the restriction on foreign liquor became inoperative. As the Congress ministry resigned office at the outbreak of World War II, the implementation program of prohibition got a further setback. When Congress again assumed office, the Government of Bombay again decided to introduce total prohibition in gradual stages within four years. The policy measure taken was cut in the sale of intoxicants by 25 percent, progressive reduction in the number of shops, reduction in the strength of liquor in case of country liquor, progressive reduction in the limits of possession of potable foreign liquor and drugs, increase in the rate of excise duty, the penalty for drinking denatured spirits and enhancement of punishment for excise offences. The policy of gradual prohibition eventually culminated in total prohibition in the year 1950, except for foreign liquor. Opium and hemp drugs were allowed to use under permits.

⁴³ Wardha remains dry since 1950. Prohibition in Gadchiroli came into force in 1993 due to a six-year public movement and resolution by 600 villages. The Chandrapur prohibition was removed in the year 2021.

⁴⁴ The guardian minister claimed illegal and spurious liquor has become rampant, the crime rate has increased, state revenue has fallen, tourism and industries are affected badly.

⁴⁵ <https://timesofindia.indiatimes.com/city/nagpur/state-lifts-chanda-liquor-ban-due-to-its-complete-failure/articleshow/83017669.cms>

Rani Bang and Prakash Amte have made their objections against the lifting of the alcohol ban, especially from the Gadchiroli district (Deshpande, 2020)⁴⁶. Bang, the founder of Society for Education Action and Research in Community Health (SEARCH), a Non- Governmental Organisation (NGO) claimed (based on their survey), that prohibition has resulted in the reduction of 70 percent of alcohol consumption and savings of Rs 80 crores for the tribals every year (Bose, 2021)⁴⁷. Bang further claimed that illegal alcohol sale is very low in the Gadchiroli district (Deshpande, 2020).

Contradictory opinions on prohibition policy had been mentioned in the second National Commission on Alcohol Prohibition (1964) (for Maharashtra state). To cite a few key-informant's opinions -

- ❖ Prof. Gadgil (Poona) said, *'In none of the villages surveyed, there was the absence of liquor and liquor was consumed whether distilled or smuggled. In tribal areas, the generality of adult males drink. Females used to drink before, and they continue'* (Planning Commission, 1964, p. 572).
- ❖ Dr Gilder (Bombay) stated, *'Illicit distillation is on a very large scale. It was in existence even before prohibition. Nonetheless, it is rampant today'* (Planning Commission, 1964, p. 567).
- ❖ Prof. Kaikobad & Dr Gore (TISS Bombay) believed, *'Prohibition in Bombay is not a success...Prohibition in Maharashtra may also first be scrapped and then enforced through a phased program'* (Planning Commission, 1964, p. 562).
- ❖ Rector of Bombay University stated, *'A section of college students who take alcoholic beverages is more in evidence now than before'* (Planning Commission, 1964, p. 567).
- ❖ Advocate Gogate believed, *'Rampant corruption has entered the police and the panchas...Illicit distillation has now become a profession and a cottage industry...Crime, in general, has also grown as a result of illicit distillation'* (Planning Commission, 1964, p. 571).
- ❖ A few believed that illicit distillation was not extensive, and improved results can be obtained with a more extensive staff.

⁴⁶ <https://indianexpress.com/article/india/social-activists-write-to-cm-against-efforts-to-lift-prohibition-in-gadchiroli-6720022>

⁴⁷ <https://timesofindia.indiatimes.com/city/nagpur/lifting-of-chanda-liquor-percent20ban-prompts-similar-debate-in-gchiroli/articleshow/83097730.cms>

Considering the present situation and the associated varying viewpoints, the effectiveness of prohibition policy becomes questionable and needs further research at the district level.

Additionally, The Global Burden of Disease (2016) study measured the death rates and DALYs for individual causes in states of India. According to the study, Maharashtra had significantly higher death rates than national mean on Ischaemic heart disease, Stroke, Chronic kidney disease, Falls, Alzheimer disease, and not significantly different than national mean for Chronic obstructive pulmonary disease (COPD), Tuberculosis, Diabetes, Suicide, Hypertensive heart disease, HIV/AIDS, Meningitis, Drowning. Similarly, the DALYs rate of leading individual cause suggests Maharashtra has significantly higher rates than national mean on, Ischaemic heart disease, Sense organ diseases, Migraine, Chronic kidney disease, Depressive disorders, anxiety disorders and not significantly different rates from national mean on Chronic obstructive pulmonary disease, Stroke, Preterm birth complications, Road injuries, Self-harm, Falls, HIV/AIDS and Drowning. Alcohol is an important risk factor to each of these diseases. Moreover, the study separately measured DALYs rate attributable to risk factor- Alcohol and Drug-use to be 1487, which is also larger than the national mean 1260 (although not significantly different) making the study of prevalence of alcohol consumption in Maharashtra vital.

Apart from prohibition, socio-economic and health considerations another important aspect in prohibition policy is state government revenue. From the revenue perspective excise revenue collected from alcohol makes up to 8 percent of the total state's own tax revenue making alcohol revenue an extremely important source of revenue for the state government.

It is a foregone conclusion that a law like prohibition would significantly hamper the revenue prospects of any government enforcing it (Planning Commission, 1964). As alcohol-based excise revenue comes under the state list in India, a district-level prohibition would keep states devoid of their necessary financial resources to carry on critical developmental works if the district's contribution to the state's excise revenue is substantial. The early attempts of prohibition in India showed that the effort in recovering the lost share of revenue by state governments had been mixed.

In the replies to the general questionnaire issued by Prohibition Enquiry Committee (1954), the Government of Bombay stated, '*...The loss of excise revenue has been made up by receipts under sales tax which was imposed simultaneously with the Government decision to introduce prohibition by gradual stages in the State...*' (Planning Commission, 1954, p. 96).

In contradiction, the Government of Mysore stated, '*...Taxation in the state has already reached its peak, and an increase in the existing rates will act as a hardship to the general public. The central government shall devise measures for balancing the budget of the state consequent upon the introduction of prohibition throughout the state...*' (Planning Commission, 1954, p. 154).

The Government of Patiala and East Punjab States Union (PEPSU) stated, '*...introduction of prohibition is bound to dislocate finances which are badly required for development plans. Fresh taxes, even if introduced, may not fill up the gap caused by loss of excise revenue...*' (Planning Commission, 1954, p. 158).

In the present time, the goods and service tax (GST) since July 2017 has replaced a host of indirect taxes levied by state governments subsuming State VAT, Luxury Tax, Entry Tax, Entertainment and Amusement Tax (except when levied by the local bodies), Taxes on advertisements, Taxes on lotteries, Betting and Gambling, State Surcharges, and Cesses. This leads to an excessive burden on state governments to recover any lost share of state revenue due to prohibition.

Lastly, there are large regional economic inequalities observed in the state of Maharashtra particularly when the comparison is made with the western region of Maharashtra which comprises of districts - Mumbai, Mumbai Suburbs, Thane, Nashik and Pune. These economic inequalities could have been one of the major reasons for the introduction of prohibition in the districts of Gadchiroli and Chandrapur. Taking this into account, the analysis on alcohol consumption based on poverty and the inter-district variation becomes vital.

Building upon this foundation, this chapter delves into the following topics/objectives. a) Estimate prevalence of alcohol consumption in Maharashtra and its districts, b) Examine the implications of prohibition for alcohol consumption in Maharashtra and c) Examine the implications of prohibition for government revenues.

The present chapter is divided into five significant sections. Section 4.2 presents background information and justification of the descriptive analysis. Section 4.3 deals with the descriptive analyses i.e. understanding the prevalence at the district level. Section 4.4 deals with the analyses on- the effect of prohibition, prices, income, socio-economic and demographic factors on alcohol consumption. Section 4.5 discusses the effect of prohibition on state revenues and lastly, Section 4.6 presents the conclusion of this chapter.

4.2 Background Information and Justification of the Descriptive Analysis

A crucial study to analyze consumption patterns in the select region (Urban Vidarbha and Marathwada) of Maharashtra was conducted by Punekar and Ramchandran in 1962. The study found there were 27.24 percent and 20.45 percent of drinker families in Urban Vidarbha and Marathwada, respectively. The average family size of the drinker family was larger than non-drinker family. The literacy rate was higher among the non-drinkers of the drinker's families than the drinkers of the same families. In terms of frequency, nearly four-fifth of the consumers drink at least once a month; by causes around one-fourth drink for pleasure and one-fifth for fatigue. Income affected negatively on prevalence and in terms of occupation and towns, the largest share of regular drinkers came from occupation Group IV (the group of self-employed, administrative employees and professionals like business people, brokers, contractors, hotel-owners, doctors, lawyers, landlords, etc.) (Punekar and Ramchandran 1962).

In terms of prohibition policy, as presented earlier in chapter 2, in the recent years the studies were conducted at the national level suggesting reduced alcohol consumption due to prohibition. The Rahman (2004) study claims the reduction is due to supply-side shock and Mahal (2001) study shows reduction in alcohol consumption in Gujarat due to prohibition however he noted education can bring larger benefits.

In terms of illicit liquor, the study titled 'Patterns & Consequences of Alcohol Misuse in India - an epidemiological survey 2012' elaborates on the easy availability of alcohol in Surat (District in alcohol prohibited Gujarat State). According to this study, Indian Made Foreign Liquor (IMFL) is smuggled from the union territory Diu and the neighbouring states like Maharashtra, Rajasthan, Madhya Pradesh, and illicit country liquor (desi-daru) is readily available from provision stores, home shops, and pan shops (Benegal, 2012).

In the recent prevalence based study, International Alliance for Responsible Drinking (IARD) conducted 6088 in-person interviews across the five states, namely Andhra Pradesh, Kerala, Maharashtra, West Bengal, and Madhya Pradesh. The survey found that 39 percent of survey respondents were current drinkers, of which 91 percent of current drinkers were male and 9 percent were women. Contrary to previous studies, the urban areas had a higher prevalence of current drinkers (45 percent) than rural areas (35 percent). The highest prevalence of current drinkers was found in Andhra Pradesh (47 percent) and the lowest in Maharashtra (28 percent). The per capita level of pure alcohol consumed over the past 12 months by the current drinkers

in five states was 11.9 liters. Of all the age groups, 46 – 54 years consumed the most alcohol (International Alliance for Responsible Drinking [IARD], 2018)⁴⁸.

4.3 Descriptive Analysis

4.3.1 Data & Methods

The data used to understand the alcohol consumption pattern in Maharashtra is the District Level Household Survey 4 (DLHS 4) (2012-2013), DHS/NFHS 4 (2015-16) and NSSO central rounds (61, 66, 68) ranging from period 2004-2012.

The DLHS 4 is one of the most extensive demographic surveys in India. It was initiated by the Ministry of Health and Family Welfare, Government of India, to provide district-level estimates on various health indicators⁴⁹. The DLHS 4 (2012-2013) includes socio-economic characteristics of the household and the question on personal habits⁵⁰ of for 15 plus age population.

The DLHS data has a few limitations. Most importantly, it does not collect data on the quantity consumed and value of alcohol consumption. Secondly, it does not collect the price data. The other limitation of DLHS survey data is; it does not collect the type of alcoholic beverage consumed. This restricts analyses on alcohol consumption by type. To add to these data limitations, this DLHS 4 remains restricted to analyze data pre-Chandrapur district prohibition⁵¹.

As an alternative, this chapter relies on NFHS 4 data to check alcohol consumption in the Chandrapur post-prohibition. The DHS/NFHS 4 does not encourage estimating population estimates at the district level nor provides the district weights. Hence, this chapter only provides simple means on alcohol consumption post-prohibition in Chandrapur district, assuming that simple means can provide a comparable figure on the prevalence of alcohol consumption.

⁴⁸ <https://www.iard.org/science-resources/detail/Unrecorded-Alcohol-in-India-Results-of-a-Populatio>.

⁴⁹ The DLHS 4 conducted the fieldwork in Maharashtra, gathering information from 52,883 households. The DLHS 4 (2012-13) is also a much larger survey compared to other surveys hence allowing for district level estimates. DLHS 4 survey adopts a multi-stage stratified sampling approach and provides weights to estimate the population at the district level. Hence, I use DLHS-4 unit level data for majority of estimation based on prevalence and socio-economic characteristics

⁵⁰ Includes if a person never drinks, and if a person is a usual drinker, occasional drinker, or ex-drinker

⁵¹ The DLHS was discontinued and was replaced by NFHS post 2012-13

The third data-set included for the study at district level is National Sample Survey Office (NSSO) data⁵² of rounds 61(2004-05), 66t1 and 66t2 (2009-10), 68t1 and 68t2 (2011-12). The data is pooled over the period and simple means are estimated.

As mentioned in the previous chapter, the benefit of NSSO data set is it provides monthly per capita expenditure of households allowing us to measure the prevalence of alcohol consumption amongst poor (as specified by Tendulkar report) and non-poor at district level. One of the common limitation in all the three data sets is many households in India consider alcohol consumption a vice leading to under-reporting on prevalence. The other essential concern of under-reporting comes from prohibited districts of Wardha, Gadchiroli, and Chandrapur. From the state government revenue perspective the data used were annual financial statements of Maharashtra from year 2011 to 2015.

4.3.2 Results

Following Punekar and Ramchandran (1962), Thimmiah (1979), Mahal (2001) we select socio-economic characteristics that influence alcohol consumption and measure their prevalence by individual districts.

Following are few of the key findings from descriptive analysis

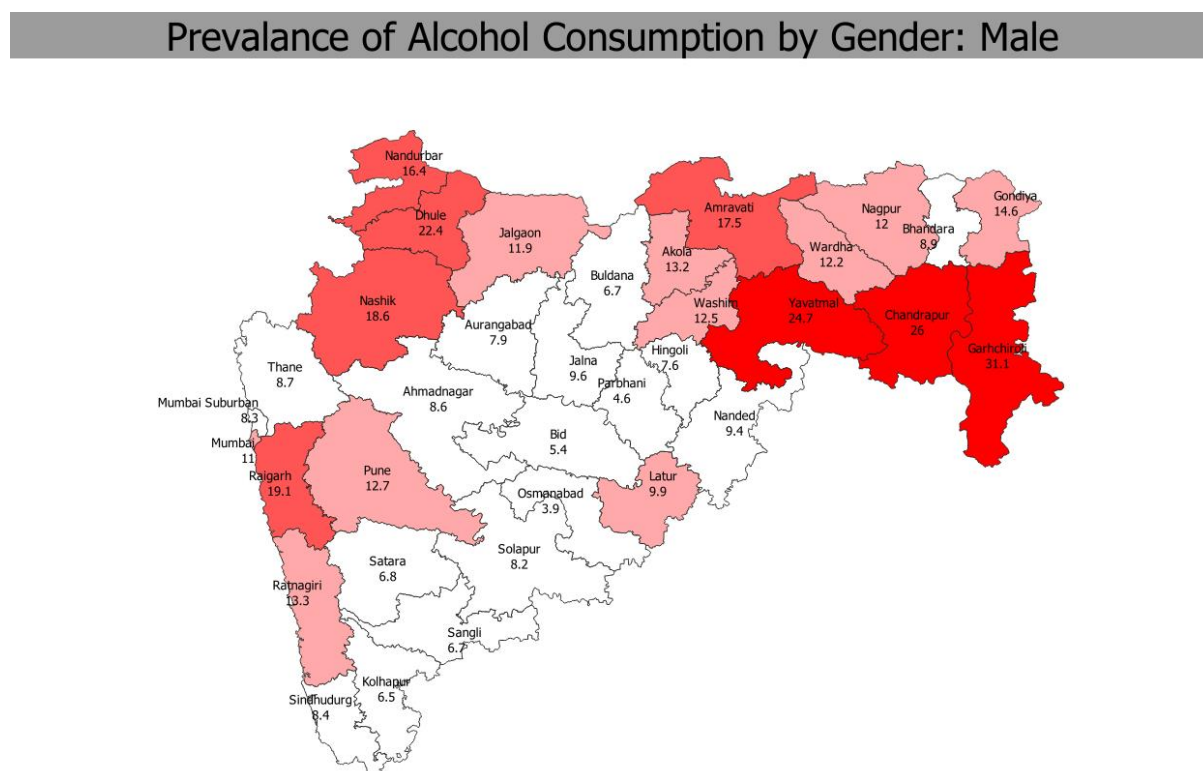
- 1) The prevalence among the alcohol prohibited districts is among the highest. This remains true even after several years of prohibition at place in Gadchiroli and Wardha districts
- 2) The population estimates using DLHS 4 suggests: the male and female participation is among the highest in the prohibited district of Gadchiroli. Moreover, the usual male drinkers are highest in alcohol prohibited district Gadchiroli.
- 3) Drinking alcohol is most commonly found in the Buddhist male population in Maharashtra followed by Muslim male population.
- 4) By social category, scheduled tribes have the most significant percentage of male drinkers. By years of schooling, 12 years and above has the highest proportion of non-drinkers and by occupation the proportion of non-drinker is highest in occupation Group12 (legislators, senior officials, managers, professionals)
- 5) Estimation based on poverty line suggests highest prevalence among households below poverty line in the prohibited district of Gadchiroli.

⁵² The National Sample Survey data present alcohol consumption data and monthly per capita expenditure data in separate modules of each round. Hence this data was required to be merged and then appended over all the different rounds. Secondly, for the type t2 data measure the prevalence over a week and t1 data which measure the prevalence over the month. The possible difference is expected to be minor and hence neglected.

4.3.2.1 Prevalence Estimates using DLHS 4, NFHS 4 and NSSO Survey

The analysis conducted using DLHS 4 data suggests women’s participation in alcohol consumption is much lower than males in all the districts of Maharashtra. Only 0.5 percent of women consume alcohol compared to men, which stands at 12.5 percent in Maharashtra (see Figure 11) for men. The prevalence among women is presented in Table 4.7.1.

Figure 11 Prevalence of Alcohol Consumption in Men, Maharashtra



Note: Authors depiction using DLHS 4 unit-level data and associated sampling weights

The NFHS 4 collected 4811 data samples of men from Maharashtra in 2015. The number of samples from Chandrapur, Wardha and Gadchiroli were 142, 134 and 153, respectively, and the month of the collection was the eighth and ninth month of the calendar year 2015. As the prohibition in Chandrapur was enacted in April 2015, the sample data can develop insights into the situation of alcohol consumption immediately after the enactment of prohibition in the Chandrapur district.

From the data the prevalence of alcohol in Chandrapur district for men accounts for 24 percent. In the prohibited district of Wardha and Gadchiroli it was 35 percent, and 30 percent respectively. Of 34 men who reported drinking in Chandrapur, one reported drinking tadi-madi,

6 reported drinking country liquor, 17 reported drinking Beer, seven reported drinking wine, and 16 reported consuming hard liquor. The sample statistics suggest that Foreign type liquor (Beer, Wine, Hard Liquor) has a more considerable prevalence than Indian type liquor (Tadi-Madi, Country, Local) in the Chandrapur district. Similar is the case with Wardha district, where the prevalence of Foreign type liquor is more than Indian type liquor. Gadchiroli shows a contradictory picture where the Indian type of liquor is more prevalent than the Foreign type of liquor. Table 3 provides district-wise estimates of prevalence of alcohol consumption using NFHS 4 data set (see Table 3)

Table 3 Prevalence based on DLHS 4, NFHS 4 and NSSO Surveys

District	Prevalence Men (%) - DLHS 4	District	Prevalence Men (%) - NFHS 4	District	Prevalence Household (%) - NSSO (2004-12)
Gadchiroli	31.1	Wardha	35.1	Gondiya	22.7
Chandrapur	26.0	Nagpur	32.1	Bhandara	22.0
Yavatmal	24.7	Gadchiroli	29.4	Gadchiroli	19.9
Dhule	22.4	Raigarh	28.7	Chandrapur	18.6
Raigarh	19.1	Gondiya	26.6	Nagpur	18.2
Nashik	18.6	Mumbai	25.4	Nandurbar	15.2
Amravati	17.5	Bhandara	25.4	Washim	13.9
Nandurbar	16.4	Pune	25.0	Wardha	12.3
Gondiya	14.6	Chandrapur	23.9	Yavatmal	11.4
Ratnagiri	13.3	Washim	23.4	Dhule	10.8
Akola	13.2	Mumbai (Sub)	23.4	Ahmadnagar	10.4
Pune	12.7	Solapur	23.1	Hingoli	9.7
Washim	12.5	Yavatmal	22.8	Nashik	9.4
Wardha	12.2	Jalgaon	22.7	Latur	9.4
Nagpur	12.0	Amravati	22.2	Nanded	9.3
Jalgaon	11.9	Buldana	22.0	Thane	8.9
Mumbai	11.0	Dhule	21.8	Jalgaon	8.9
Latur	9.9	Ratnagiri	21.8	Pune	8.5
Jalna	9.6	Nandurbar	20.7	Buldana	8.4
Nanded	9.4	Kolhapur	20.7	Amravati	7.6
Bhandara	8.9	Latur	20.1	Solapur	7.5
Thane	8.7	Osmanabad	19.7	Aurangabad	7.2
Ahmadnagar	8.6	Thane	17.6	Mumbai (Sub)	7.2
Sindhudurg	8.4	Parbhani	17.1	Raigarh	6.9
Mumbai (Sub)	8.3	Bid	16.3	Ratnagiri	6.7
Solapur	8.2	Nanded	15.9	Parbhani	6.5

Aurangabad	7.9	Hingoli	15.9	Jalna	6.4
Hingoli	7.6	Jalna	15.6	Satara	5.9
Satara	6.8	Sangli	15.4	Osmanabad	5.7
Buldana	6.7	Satara	13.8	Akola	5.2
Sangli	6.7	Ahmadnagar	12.9	Kolhapur	5.0
Kolhapur	6.5	Aurangabad	11.4	Bid	4.9
Bid	5.4	Akola	10.8	Sindhudurg	4.6
Parbhani	4.6	Nashik	9.5	Sangli	3.4
Osmanabad	3.9	Sindhudurg	7.0		

Note: Authors estimates based on unit level data, sampling weights applied only for DLHS 4 survey

The NSSO data utilized to measure the prevalence of alcohol in households by districts over the period 2004-12 points out 20 percent of prevalence in Gadchiroli district and 12.3 percent of prevalence in Wardha district (see Table 3).

The population estimates measured separately using sampling weights for each round of NSSO measured 44.7 percent in 2004-05, 24.8 percent (round 66t1) and 19.2 percent (round 66t2) in 2009-10, 6.2 percent (round 68t1) and 9.1 percent (round 68t2) in 2011-12 for Gadchiroli district. For the Wardha district prevalence estimated are 15.9 percent in 2004-05, 14.2 (round 66t1) and 16.1 (round 66t2) in 2009-10, and 7.9(round 68t1) and 13.5 (round 68t2) in 2011-12⁵³.

4.3.2.2 Detailed Prevalence Estimates using DLHS 4 Survey

Considering DLHS 4 survey is the most representative and allows estimation at the district level for entire population (using sampling weights), the detailed prevalence estimates is presented below.

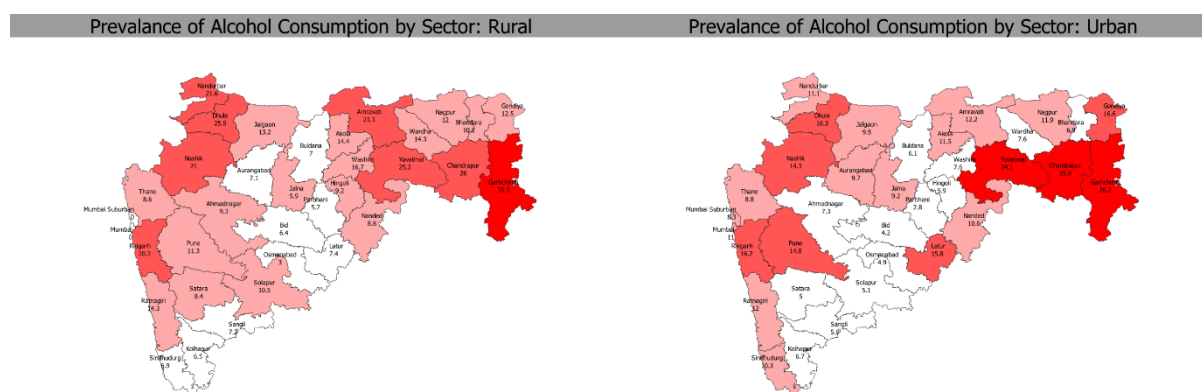
The number of male drinkers is found to be lowest in the districts of Osmanabad (4 percent), Parbhani (4.6 percent), and Bid (5.4 percent), whereas it is found highest in the districts of Gadchiroli (31 percent), Chandrapur (26 percent) and Yavatmal (24.6 percent). The male and female participation is among the highest in the prohibited district of Gadchiroli, with male participation at 31.1 percent and female participation at 1.7 percent. Male participation in

⁵³ The Maharashtra State-NSSO data was also analysed, however it showed contrary results (suggesting zero or very low prevalence in alcohol prohibited districts) compared to DLHS 4, NFHS 4 and Center NSSO dataset.

the other prohibited district, Wardha ranks 14th (highest to lowest prevalence) among all the thirty-five districts in Maharashtra, with a male percentage at 12.2 percent.

By sector rural and urban, the percentage of male drinkers is higher in a rural area compared to urban areas only except for a few districts⁵⁴. In districts under prohibition, the sector-wise male participation is 14.3 percent in rural and 7.6 percent in urban for Wardha district and 35.5 percent rural and 26.2 percent urban for Gadchiroli district.

Figure 12 Alcohol Prevalence by Sector in Males, Maharashtra



Note: Authors depiction using DLHS 4 unit-level data and associated sampling weights

The usual male drinkers are highest in prohibited district Gadchiroli with 8.8 percent, followed by Amravati with 8.1 percent. The share of usual drinkers stands at 5.3 in the prohibited district of Wardha. The share of occasional drinkers is highest in the prohibited district Gadchiroli (22.3 percent), followed by Chandrapur (20.7 percent) and Yavatmal (19 percent). The share of occasional drinkers in the prohibited district of Wardha is 6.9 percent. The share of occasional drinker males is generally higher than usual drinkers in most of the districts. The following table shows the top 5 districts in alcohol consumption Personal habit.

Table 4 Top 5 Districts of Maharashtra by Habit based on Prevalence

District	Usual Drinker	District	Occasional Drinker
Gadchiroli	8.8	Gadchiroli	22.3
Amravati	8.1	Chandrapur	20.7

⁵⁴ Namely Gondiya, Nanded, Aurangabad, Thane, Pune, Latur, Osmanabad, Sindhudurg and Kolhapur district

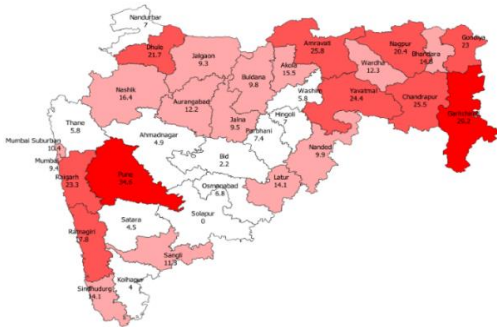
Dhule	7	Yavatmal	19
Washim	6.3	Dhule	15.5
Gondiya	6.3	Raigarh	15.3

Note: Authors estimation using DLHS 4 unit-level data and associated sampling weights

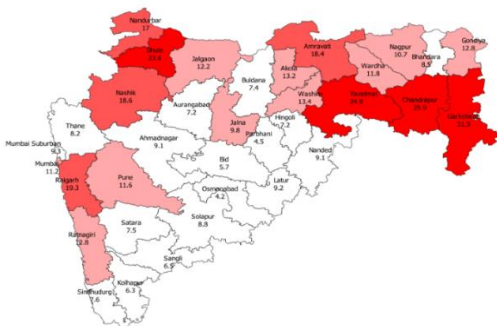
Drinking alcohol is most commonly found in the Buddhist male population in Maharashtra. Out of 35 districts, 16 districts have the largest proportion of the Buddhist male population involved in alcohol consumption. It is followed by Muslim males with the highest proportion in 10 districts of Maharashtra and Hindu males tops in 9 districts in Maharashtra. In the alcohol prohibited districts of Gadchiroli, Hindu males have the highest proportion of drinkers with 31.5 percent, and in the Wardha district, Muslim males have the highest proportion of drinkers with 14.5 percent. (see Figure 13)

Figure 13 Prevalence of Alcohol Consumption by Religion

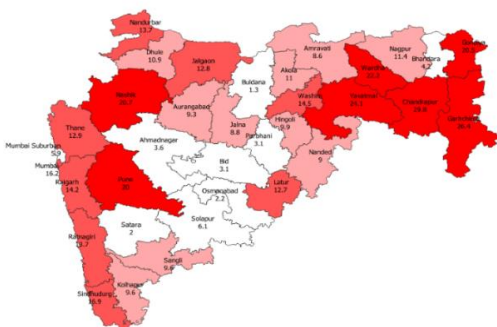
Prevalence of Alcohol Consumption by Religion: Buddhism



Prevalence of Alcohol Consumption by Religion: Hindu



Prevalence of Alcohol Consumption by Religion: Islam



Note: Authors depiction using DLHS 4 unit-level data and associated sampling weights

By social category, scheduled tribes have the most significant percentage of male drinkers. There are 16 districts in Maharashtra where scheduled tribes have the largest percentage of male drinkers, followed by the Schedule Caste (SC) category (10 districts), Other category (8 districts), and Other Backward Classes (OBC) category (2 districts). In the alcohol prohibited district of Gadchiroli, the estimated number of male drinkers is highest for ST at 42.1 percent and lowest for Other at 23.1 percent, and for Wardha, the estimated number of male drinkers is highest for ST at 18.2 percent and lowest for Other at 8 percent. Table 40 shows the top 5 districts in alcohol consumption by religion and social category.

Table 5 Top 5 Districts of Maharashtra Social Category based on Prevalence

District	SC	District	ST	District	OBC	District	Other
Yavatmal	29.9	Gadchiroli	42.1	Gadchiroli	25.8	Chandrapur	26.8
Chandrapur	29.5	Raigarh	41.1	Yavatmal	22.4	Dhule	25.7
Gadchiroli	27.2	Dhule	34.9	Chandrapur	22.2	Gadchiroli	23.1
Amravati	26.4	Yavatmal	34.5	Ratnagiri	17	Raigarh	18
Pune	23.4	Chandrapur	32.8	Raigarh	16.4	Yavatmal	16.6

Note: Authors estimation using unit-level DLHS 4 data and associated sampling weights

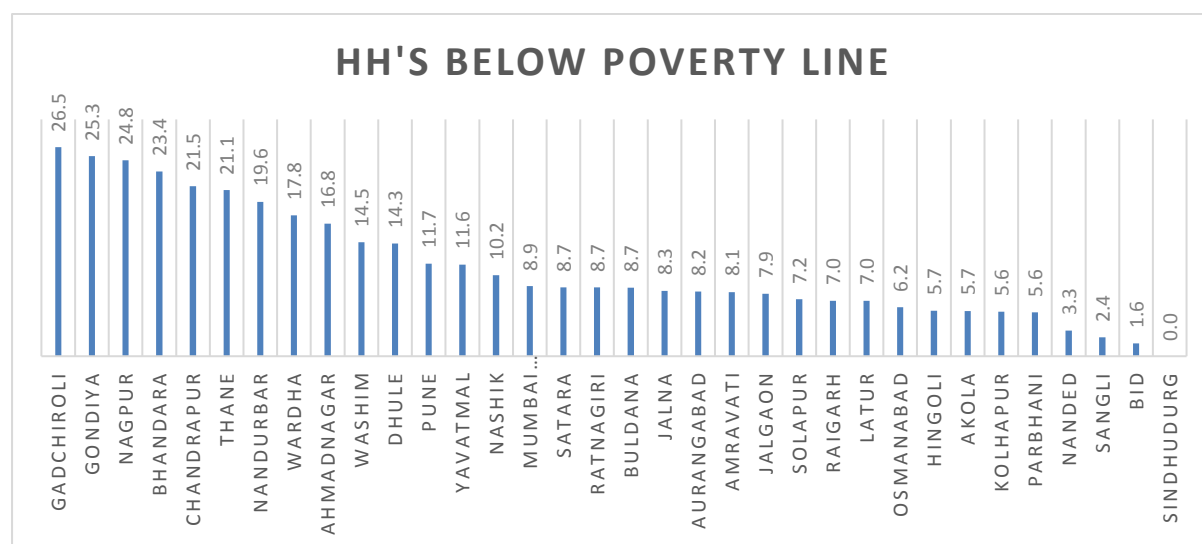
Education of 12 years and above has the highest proportion of non-drinkers followed by 10 & 11 years of education, 5-9 years of education, and 0-4 years of education in all the districts barring a few. In the alcohol prohibited district of Gadchiroli, education of 12 years and above has 77.1 percent of non-drinker males, and education of zero to four years has 43.7 percent, non-drinker males. Similarly, for alcohol prohibited district Wardha education of 12 years and above has 88.5 percent of non-drinker males and education of zero to four years has 77.5 percent, non-drinker males (see Appendix Table 4.7.2.1)

The estimation based on occupation suggests the proportion of non-drinker is highest in occupation Group 12 (legislators, senior officials, managers, professionals) and least in Group 6 (skilled agricultural and fishery workers) and Group 789 (craft and related trades workers, plant and machine operators and assemblers, elementary occupations). However, in the prohibited district of Wardha, non-drinkers are primarily concentrated in occupation Group 5 (service workers and shop & market sales workers) with 89 percent and lowest among occupation Group 6 (skilled agricultural and fishery workers). In the prohibited district of Gadchiroli, non-drinkers are primarily concentrated in occupation Group 34 (technicians, associate professionals, clerks) with 66.1 percent and lowest among occupation Group 6 (skilled agricultural and fishery workers). The following graph shows the top 5 districts in alcohol consumption by occupation group. (see Appendix Table 4.7.2.2)

4.3.2.3 Estimates by Poverty Line

The estimates using poverty line projected using Tendulkar committee report⁵⁵ suggests highest prevalence among households below poverty line in the prohibited district of Gadchiroli (26.49 percent) followed by Gondiya (25.34 percent) and Nagpur (24.81 percent) respectively. The prohibited district of Wardha also points out high prevalence among poor households. Figure 14 and Figure 15 provides district wise prevalence based on Households below and above poverty lines. Analysis by sector shows prevalence of 13.96 percent in rural sector and 12.56 percent in urban sector among poor households whereas among the households above poverty line, the prevalence account for 10.32 percent (lower than poor households) in rural sector and 8.69 percent (lower than poor households) in urban sector respectively.

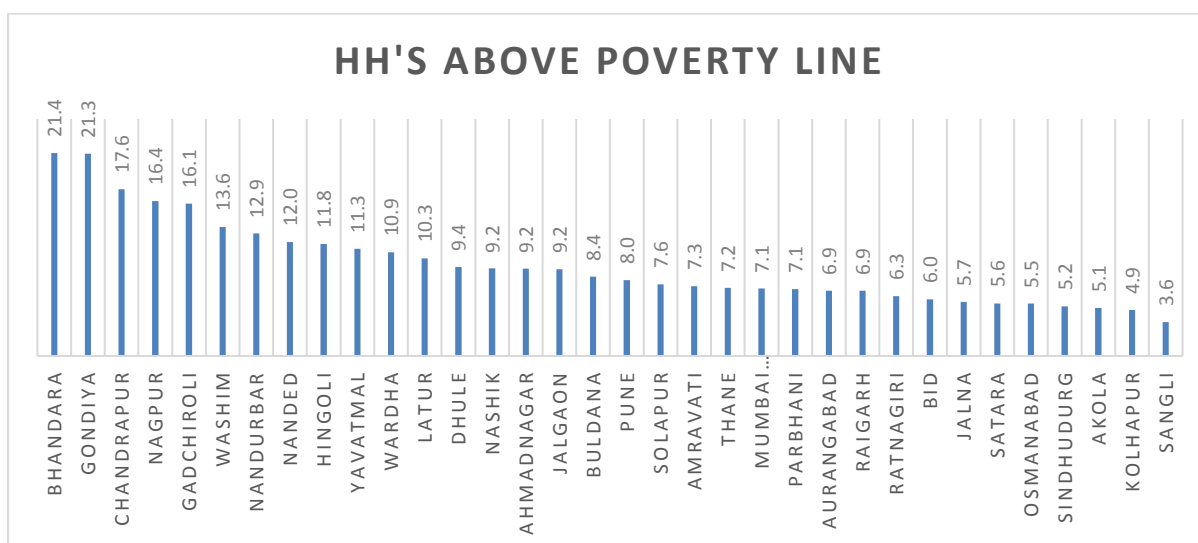
Figure 14 Prevalence estimation based on Households below Poverty Line



Note: Authors estimation using unit-level NSSO (2004-2012) data

Figure 15 Prevalence estimation based on Households above Poverty Line

⁵⁵ While considering these data-sets the values on consumption expenditure were adjusted using CPI index of agriculture labour for rural areas and Industrial worker for urban areas.



Note: Author's estimation using unit-level NSSO (2004-2012) data

4.4 Effect of Prohibition, Price, and Income

According to studies on alcohol, the effect of higher prices can be ambiguous. One may consider higher prices of alcohol should reduce alcohol consumption⁵⁶. However, higher costs of alcohol may induce substitution towards a cheaper variety of alcohol and sometimes even illegal liquor. The effect of prohibition is even grimmer. Prohibition can create a supply shock providing an incentive to illicit distillers, bootleggers, and traffickers to get operational in a high-profit market of untaxed alcohol, providing a super-normal profit (Planning Commission, 1954). Prohibition is also likely to lead to an increase in prices of illegally available liquor, which may reduce both participation and consumption of alcohol. The other consideration is alcohol is a habit-forming good, thus leading to stable demand for a particular category. In this case, the effect of prices can be negligible.

The effect of income is also not apparent. A study by World Health Organization (WHO) on aggregate country panel shows positive dependence of alcohol on GDP per capita. In contrast, alcohol consumption in higher-income countries has gradually declined over the past few decades. The risk of being a drinker and the level of consumption is also related to the

⁵⁶ Studies from High Income Countries (HIC) suggests inverse relationship between price and alcohol consumption. According to the study by Elder et. al. (2010) and Wagenaar et.al (2009) price elasticities are highest for spirits (-0.80) followed by wine (-0.69) and beer (-0.46). A review study by Sornpaisarn et.al. (2013) observes price elasticity of -0.79 for other alcoholic beverages and -0.5 for beer Low and Middle Income Countries (LMIC)

dynamics of income of an individual/household and relative prices of alcohol, such that higher disposable income allows shifting to better-quality alcohol, and relatively lower costs of alcohol may lead to higher availability of alcohol. A traditional alcohol consumption income curve is considered either U or J shaped⁵⁷.

As reviewed in chapter 2, except for the study by Musgrave and Stern (1986) all the remaining studies are subject to a national level study providing a generalized outcome. However, the state of Maharashtra comes with its own unique socio-economic characteristics, culture, history and political dynamics. It is likely that a few of the findings may diverge from national level findings. In the forthcoming section, we will delve into the data and methodology employed to explore these differences.

4.4.1 Data and Methods

The data-set included for a micro-econometric analysis comes from NSSO rounds 61, 66 and 68. Contrary to NFHS and DLHS data, the NSSO data includes crucial variables like quantity of alcohol consumed (by a household) for different liquor types and the expenditure incurred on the same. This further allows estimation of unit values. Henceforth only the NSSO data is used as it facilitates elaborate analysis on the topic of alcohol consumption and alcohol prohibition.

To present details on data used, the household characteristics is obtained from block 3 and the individual characteristics is obtained from block 4. The question relating alcohol⁵⁸ consumption is obtained from block 5. The type 2⁵⁹ data from 66th and 68th round is also utilized for the analyses.

The NSSO data is largely regarded as a rich and a reliable source of data on Indian household consumption expenditure. However, there are certain limitations the NSSO data faces in terms of analyzing the demand for alcohol consumption (see Section 3.2.2.2). Considering the limitations using NSSO data we can consider the level of participation and consumption is the lower bound and not the actual levels of participation and consumption.

⁵⁷ One category of drinker is likely to have higher consumption by income than other.

⁵⁸ The data source also includes question on home production. However, the data has limited response making is difficult for analyses

⁵⁹ In the analyses we neglect the minor changes due to recall effect and convert the data in to monthly response.

There are three important types of economic model for the demand⁶⁰ of addictive goods namely a conventional demand model, myopic addiction model (Cook and Moore, 1995) and a rational addiction model (Becker and Murphy, 1988). A conventional addiction model is a static demand model wherein the quantity demanded in a period is determined by explanatory variables of the same period. Thus the optimization problem becomes maximization $U_t = U(C_t, Y_t)$ under the budget constraint, $P_t C_t + Y_t = I_t$ where U denotes utility, C denotes consumption, Y denotes composite good, t denotes the time, P denotes the price and I denotes the income. The myopic addiction demand model which means “short-sighted” is a dynamic model of demand such that it takes into account the quantity demanded in the previous period. In that case the optimization problem becomes maximization $U_t = U(C_t, C_{t-1}, Y_t)$ under the budget constraint, $P_t C_t + Y_t = I_t$. The rational addiction model is also a dynamic model of demand such that it fully reflects the addictive effect. The rational addictive model includes the effect of both past and future consumption. In that case the consumer maximizes the discounted sum of utilities: $U = \sum_{t=0}^{\infty} \beta^t (C_t, C_{t-1}, Y_t)$ where β is a discount factor. The budget constraint with the present value of income becomes $\sum_{t=0}^{\infty} \beta^t (P_t C_t + Y_t) = I$.

Considering the type of data that is available, the only possible economic model of demand we can approach for is the static / conventional demand model for addictive goods. This however introduces a bias on the estimates of effect of prohibition and price elasticity suggesting the estimates to be considered as a lower bound.

As mentioned earlier the problem of misreporting and a larger sample with no alcohol consumption (zeros) does not allow the use of ordinary least squares as the unbiased and consistent estimating model. A standard method for such type of data is to use a double hurdle model. The double hurdle model refers to estimation of participation in the first stage and estimation of consumption (non-corner solution) in the second. The three alternatives for the double hurdle model are use of Probit model in the first stage and OLS in the second. This is a complete first hurdle dominance model. The second alternative is use of Tobit model. The Tobit model is the standard model for the censored data. In this model an inverse mills ratio is

⁶⁰ A demand analysis can be studied by two methods. One is by using the aggregate time series method and the other by using a cross-sectional method. One of the advantages of using a cross-sectional method over an aggregate time series method is it offers insights into various socio-economic characteristics of an individual/household. Contrarily, an aggregate time series method masks the differences in number of drinkers and quantity/number of drinks an average drinker individual/household consumes. Moreover, an aggregate time series approach fails to report changes in behavior like reduction in amounts of ethanol/pure alcohol consumed and shifts from one type of liquor to the other.

included along with other explanatory variables like income and household characteristics. The third alternative to use is the Heckman sample selection model. This model is a first hurdle dominance model and allow a separate equation for both a participation and consumption. In the two-step model the first step of this model is a participation equation which is estimated by Probit model whereas the second step of this model is OLS model for consumption including an inverse mills ratio, of which mills ratio is obtained from participation equation. It must be noted that if errors in participation and consumption equations are uncorrelated ($\rho = 0$) it will be safe to apply OLS to get unbiased estimates and one can ignore the endogenous selection effects. Moreover, to identify the participation equation at least one additional variable must be included in the consumption equation- preferably continuous. An alternative to a two-step Heckman model is a maximum likelihood method of estimating Heckman selection model using log-likelihood function.

4.4.2 Econometric specification and variables

As stated earlier we follow a conventional/ static demand model of demand which is specified as follows:

$$1) \ln Q_{iat} = \alpha + \beta \ln X_{iat} + \gamma \ln Z_{iat} + \ln P_{iat} + \ln B_{iat} + \ln E_{iat} + \rho_r + \delta_t + \varepsilon_{iat}$$

Where Q is a measure of alcohol consumption, X is monthly per capita expenditure of a household, P is the price of alcohol its complements and substitutes, B is the dummy policy of total prohibition, E is a proxy for enforcement and Z is a vector of household characteristics for household i in district d at time t . Variables ρ and δ are region and year dummies. Since the prohibition does not change over the time we include additional variables specific to district like percent agriculture labourer, and percent of urbanization at the individual districts in order to avoid the fixed effect problem like culture. The household characteristics include variables household size, gender of household head, education, follower of Islam, owns any land, sector, occupation and social category of a household. For complements of substitutes we include prices of leaf tobacco and finished pan. To account for the degree of enforcement we include number of police strength per lakh population/police per capita at each district.

The inclusion of price variable marks larger difficulty at the state level than the national level as it largely lacks the variations required for meaningful analyses. The only possible variation that can be induced could be the variation between prohibited districts and non-prohibited districts- considering the price related to the sales of alcohol is largely affected by

cost of penalties associated with the illegal nature of sale of alcohol. Secondly, the prices of various types of liquor is not available in the public domain. To overcome these problems and to induce price variation we measure the average price at a particular site using the information of household expenditures of individual type of drinks. Next, we calculate each individual price of pure-alcohol⁶¹ using the structure of consumption and average price estimated at the site. To avoid the problems of bias due to zeros the households that did not drink were assigned the values of prices at their respective site. The average prices of possible complements and/or substitutes were constructed in the similar way⁶². The other way to account for the prices faced by the households was collection of data of prices during a survey. A survey was recently conducted and the prices of most popular drink for each individual category was collected from sellers and regular drinkers from prohibited and non-prohibited districts of Maharashtra for the years 2004-05, 2009-10 and 2011-12 corresponding to the years of NSSO rounds. A weighted average based on structure of drinking was then computed at the district level. However, this method induces a recall bias and hence used only for the robustness check. Moreover, due to a significant variation on the types of drinks within each category and its alcohol by volume content the first method is likely to provide better estimation results. One caveat of this method however is self- reporting with lower quantity can result in systematic overestimation of average prices. On the question of price being endogenous, literature suggests using a two-part model or a two stage least square estimation model with instrumental variable can take this into account. Finally, one alternative for price data can be the tax data however this data could not be collected and can be considered for future improvement.

The other important variable included are monthly per capita income(MPCE) (proxy for income), social category SC-ST (literature suggests alcohol consumption is a part of tribal culture and Scheduled Caste also do not consider drinking as a vice), Religion- Islam (Islam prohibits alcohol consumption), Occupation dummy (Occupation was recoded in three different groups using NCO codes), Education (literature suggests education to reduce both prevalence and level of consumption of addictive goods), Land owner(dummy for peasant group as literature suggests peasants are more likely to consume addictive goods due to nature of their work) Gender (Women are less likely to drink as compared to men both in Indian as well as International context), Household size (likely to increase both probability of participation and levels consumption with increase of household size), Police Strength per

⁶¹ Pure-alcohol is estimated using alcohol by volume of each individual type of drink.

⁶² This method is also used previously by Andrienko and Nemstov (2005)

lakhs population (a proxy for law enforcement, also used to satisfy the identifying condition of Heckman model. Police Strength per lakhs population was included in the participation equation and not included in the consumption equation. The rationale being enforcement largely affects the participation, and quantity of consumption subject to participation is largely a drinker characteristic), and prices of leaf tobacco and pan (possible complements and/substitutes). The standard errors are clustered over first stage units. Variable MPCE was converted to the real prices using the consumer price indices also the prices of addictive goods were brought into real values corresponding to the year 2004-05. To account for non-normality a log transformation was applied (see Appendix 4.7.3).

4.4.3 Results

The descriptive statistics presenting a brief overview of data is presented in Section 4.7.1 and 4.7.2. This is supplemented with the results of econometric analyses by different types of liquor and groups of SC/ST population and poor population (see Appendix Table 4.7.6.1 to Table 4.7.6.6).

We find significant and negative results due to prohibition policy suggesting a fall in consumption of pure alcohol (18 percent). Observing the channels based on the individual type of liquor, we observe a fall in country liquor consumption (21 percent) and a rise in beer consumption (by 84 percent) which is surprising. The Indian-made foreign liquor is associated with a positive sign suggesting a rise in consumption (at 11.6 percent significance level) by 22.6 percent. In terms of participation, prohibition reduces only beer participation at significant levels. By channels based on different liquor types, we observe a fall in the budget share of country liquor (22 percent) but rise in the budget share (104 percent compared to unprohibited districts, e.g., 2 percent budget share increased to 4.08 percent budget share of alcohol) of Beer and a rise in the budget share of IMFL (23.7 percent) if we relax the condition of significance level at 24 percent.

The demand elasticity of income is 0.49 for pure alcohol for consumers, and the participation is also more likely to increase with income. By liquor types, the demand elasticity of income is highest for country liquor (0.78), followed by Beer (0.36); however, the demand elasticity of income for IMFL could not be significantly established but is likely to be positive with income. The pure alcohol budget share elasticity of income is -0.26. In terms of

participation, rise in income is likely to rise participation. This can be significantly established for foreign liquor and Beer but not for country liquor (not significant but positive).

We observe a rise in consumption levels (4.1 percent for a 10 percent increase in household size), an increase in the likelihood of participation, and an increase in budget shares (3.6 percent for a 10 percent rise in household size) for pure alcohol. The possibility of participation increases by liquor type for foreign liquor, followed by Beer, and then by country liquor. By liquor types highest rise is observed for country liquor (3.9 percent for 10 percent rise), followed by Beer (2.6 percent for 10 percent rise). For consumption subject to participation, we observe the highest rise in country liquor quantity (4.4 percent for a rise in 10 percent) followed by beer quantity (3 percent for a rise in 10 percent)

By gender of a household head, a female household head is more likely to reduce participation in households, especially for country liquor. The consumption quantity of pure alcohol associated with the female household head is also negative (reduction by 26 percent), but the share of the budget (46 percent) is higher for female-headed households compared to male-headed households.

Education of household head is significant and leads to lower participation and quantity of alcohol consumed (6 percent fall for every additional year of education) however, the budget share increases (2.5 percent). The education variable appears insignificant for consumption of Beer and IMFL but shows a reduction (1.6 percent for every additional level of education). Every additional level of education also leads to a fall in the budget share of Beer (3.1 percent).

Compared to other faiths, households belonging to the Islam faith are less likely to participate but consume a higher quantity of pure alcohol (19.8 percent higher than other religious households) and have a higher budget share (38.4 percent) compared to other religious households. By liquor type, followers of the Islam religion are least likely to participate in IMFL.

Compared to non-SC & ST category group SC & ST category group is more likely to participate and consume higher amounts of pure alcohol (10.1 percent); however, their budget shares of pure alcohol (24.8 percent) are lower than that of non-SC & ST category group. The SC and ST category group are more likely to participate in country liquor than the non-SC and ST category group. The budget share of country liquor and Beer is lower by 18.3 percent and 23.3 percent compared to other households.

Owning a land leads to higher participation and a higher quantity (11.6 percent) of alcohol compared to non-owners. Landowners also show a lower budget share for Beer (18.6 percent) compared to non-owners. In rural and urban sectors, we do not observe any significant results.

In terms of price elasticity of demand, the country liquor's own price elasticity is -0.86, and the cross-price elasticity with IMFL is -0.08. The own-price elasticity of IMFL is -0.82, and the own-price elasticity of Beer is -0.66⁶³. The price elasticity of demand for pure alcohol based on country liquor prices is -0.4, and IMFL prices are -0.16. We observe an increase in finished pan prices corresponding to increased participation of pure alcohol. Increasing pan finished prices increases participation in Beer, the highest followed by IMFL and then by country liquor.

A separate regression for households belonging to the SC & ST category for pure alcohol suggests non-significant results on alcohol prohibition on participation and demand; however, the budget share shows a fall (larger than the overall household population by 32.6 percent) which is significantly established. The income elasticity of demand/consumption quantity of alcohol for SC & ST households subject to participation is as high as 0.81. The income elasticity of participation of SC & ST households is at similar levels to overall household populations. The SC and ST household category group is more likely to participate than overall households. The increase in household size leads to a rise of the budget share of alcohol by 60 percent. The participation, consumption quantity, and budget share of SC/ST households have larger increases than the overall population with respect to rising household size. A female-headed household shows a larger fall both in participation and consumption levels compared to overall households. Education is significant and shows a similar level of fall in the likelihood of participation as compared to the overall household population. Every additional level of education leads to a 10.7 percent fall in alcohol quantity consumed, contrary to only 6 percent fall for overall population households. Islam followers from the SC/ST category shows a larger fall in participation compared to the overall Islam household population. The price elasticity of demand for pure alcohol based on the prices of country liquor is 0.36, which is lesser than for the overall household population. However, IMFL prices it is slightly larger at 0.175 (compared with 0.16 overall).

⁶³ The price elasticity obtained are comparable with price elasticities of low and middle income countries as found by Sornpaisarn et.al. (2013).

For the household population below the median MPCE (referred to as Poor), we observe a fall in demand for pure alcohol of a larger magnitude (27.5 percent) than the overall household population (18 percent). We also observe a fall in the budget share of alcohol (by 23 percent). The income elasticity of demand for the poor is 0.76 (larger than the overall population) for those who consume, whereas the participation is around the same levels as the overall population. The income elasticity for the poor is 0.76, which is larger than overall households (0.495). The larger households are more likely to participate; consumption and budget shares increase with an increase in household size. Female-headed households are less likely to participate. Education is significant and leads 2.3 percent fall with every level increase in education; however, this is lower than the general fall of 6 percent of pure alcohol with every additional level of education. The followers of Islam faiths belonging to the poor category show a similar fall in the likelihood of participation as that of overall Islam follower households. For the poor owning a land suggests a higher likelihood of participation as compared to the overall population. The price elasticity of demand for pure alcohol for the poor based on country prices is 0.46, which is larger compared to the overall population. However, the price elasticity for the poor based on IMFL prices is lower (0.08) for consumption compared to overall population households (0.16).

To check the robustness of the findings, additional variables were included, including a dummy for different religions, age, and age squared of household head, and the dummy for marital status. It was found that there appears to be no change in coefficients and significance in the participation equation. Moreover, in terms of the prohibition variable, we observe some change in significance in the consumption equation; however, the magnitude/coefficient does not change by much. If we allow up to a twenty percent level of significance, then we can consider the prohibition variable is robust as well, given the inclusion or reduction of econometric specification. Additionally, we run the empirical specification using the original prices as recalled by sellers and regular drinkers. Using this method, also we find the prohibition variable as negative and significant however magnitude now is much larger both for participation and consumption^{64 65}.

⁶⁴ The only source of variation in prices was between prohibited and non-prohibited districts and their values over time.

⁶⁵ The other method is to do a unit value analysis and compare the results (Deaton, 1997). This is presently not completed.

4.5 Effect on State Revenue

The state revenue perspective is largely important as taxation of alcohol falls under the prerogative of states. A jolt from the revenue considerations of the states comes with the recent enactment of the Goods and Service Tax (GST) Act (2017), wherein states subsumed a large number of their revenue sources under the central government, creating a vertical imbalance in the federal structure. The Act, like GST, makes states highly reliant on state excise revenue as a significant source of state's own tax revenue source post-2017, considering the delays in GST transfers. It can be observed the state excise tax revenue accounts for nearly 8 percent of the state's own tax revenue in the year 2021-22 and is only next to Stamps and Registration fees. (See Table 6)

Table 6 Share of State Excise in State's Own Tax Revenue vis-à-vis Other Sources

Year	Professions, Trades, Callings and Employment	Land Revenue	Stamps and Registration fees	State Excise	Taxes on Vehicles	Taxes and Duties on Electricity	SGST
2017 - 18	1.3	1.3	15.4	7.8	5.0	4.3	31.3
2018 - 19	1.4	1.1	15.2	8.1	4.6	5.4	44.2
2019 - 20	1.3	1.1	15.2	8.2	4.5	5.1	43.7
2020 - 21	1.1	1.8	13.3	8.5	4.2	4.2	47.6
2021 - 22	1.0	1.6	13.1	8.0	4.1	4.3	48.4

Note: Authors calculation using Annual Financial Statements of Maharashtra

As noted earlier, there are three districts with prohibition in the state of Maharashtra. As the Wardha district remains dry since 1950 and Gadchiroli since 1993, we neglect the revenue aspects of Wardha and Gadchiroli and concentrate on the most recent prohibition in the Chandrapur district. It must be noted that the district share of excise revenue is not available in the public domain, and the district level data from the district treasury office does not include payments through GRAS (Government Receipt Accounting System). Hence, we resort our analysis to the state-level tax revenue collection and check if there is a substantial change in revenue collections.

The prohibition in Chandrapur district in the year 2015 shows the following results (See Table 7). The States Own Tax Revenue (SOTR) in 2015 has increased by 11,544.22 crores, and the excise revenue has increased by 1,072 crores even after the enactment of prohibition in the Chandrapur district. This difference shows that the impact of prohibition on the state revenue was not substantial. However, we can observe some impact as the difference in excise revenue in 2015 is lesser than the difference in 2014. A minute fall becomes evident when we observe the fall in the share of excise revenue in the States Own Tax Revenue, which accounts for 9.85 percent in 2015 from 9.91 percent in 2014. The difference of -0.06 percent is contradictory compared to increases in 2013 and 2014. Even after controlling for inflation, the excise revenue per capita at constant prices (2011-12) shows an increase of 38.79 Rs (i.e. a rise from 844.27 in 2014 to 883.06). However, this rise is smaller than the rise in 2014. The more significant conclusion that pictures out is that the excise revenue lost due to Chandrapur prohibition is probably not substantial, or the state government could recover from the losses using other sources of revenue (including grants from the centre) or both.

Table 7 Share of Excise Revenue over Years

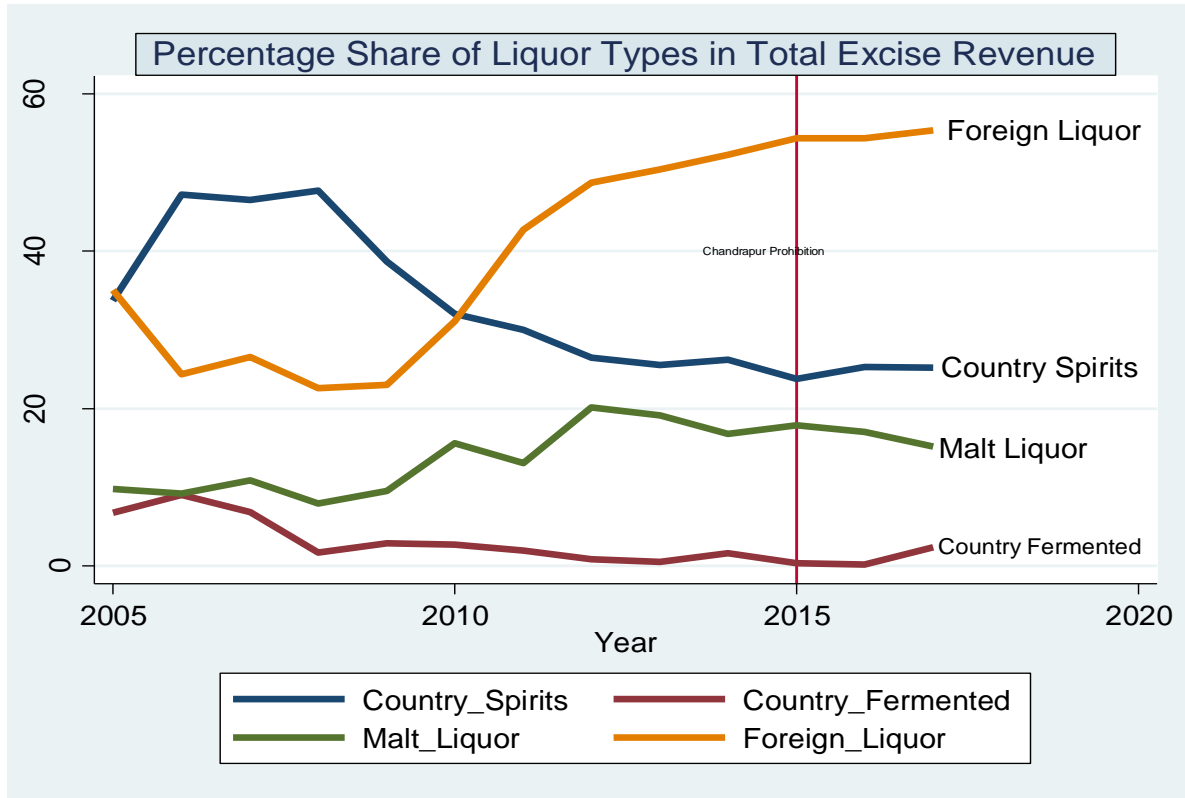
Year	SOTR (Rs Lakh)	Diff	Excise Revenue (Rs Lakh)	Diff	Share Excise SOTR	Diff	Share Excise NSDP	Diff	Excise Revenue PC Const Prices	Diff
2011	8760846	#	860547	#	9.82	#	0.76	#	760.77	#
2012	10344852	1584006	929711	69164	8.99	-0.83	0.73	-0.03	754.17	-6.6
2013	10859800	514948	1010112	80401	9.3	0.31	0.7	-0.03	764.16	9.99
2014	11506389	646589	1139708	129596	9.91	0.61	0.73	0.03	844.27	80.11
2015	12660811	1154422	1246956	107248	9.85	-0.06	0.72	-0.01	883.06	38.79

Note: Authors calculation using Annual Financial Statements of Maharashtra

The composition of excise revenue provides additional information on the type of liquor generating the revenue for the state government. It can also be considered a proxy on the preference of a particular type of alcoholic drink with caution that tax rates have remained constant over time. The data suggests that the share of alcoholic drinks in excise revenue has been more than 95 percent since 2012, and in 2017 it was as high as 98 percent. The trend from 2005 to 2017 suggests an increasing share of foreign liquor and decreasing share of Country Spirits. With the assumption that tax rates have not changed by much over time and across types of liquor, it can be stated that people have shifted towards Foreign Liquors and Malt

Liquor from Country Liquor and Country Fermented Liquor. This may be due to surrogate advertising, urban culture, and demographic shift, with younger people preferring Foreign and Malt liquor (See Figure 12)

Figure 16 Percentage Share of Liquor Types in Total Excise Revenue in Maharashtra State



Note: Authors depiction using Annual Financial Statements of Maharashtra

4.6 Discussion & Conclusion

The literature suggests that alcohol consumption is influenced by a complex interplay of socio-economic, political, cultural, personal, and psychological factors. Mandelbaum (1965) describes alcohol as a cultural artifact, emphasizing that culture defines various aspects of alcohol consumption, including the type of drink, quantity, rate of intake, accompanying rituals, timing, location, age, and gender. Heath (2001) highlights the importance of understanding cultural history to comprehend local meanings, values, and norms related to substance abuse. Doran (2010) further acknowledges that culture, political economy, values, social class, caste, gender, and occupation all play significant roles in shaping alcohol consumption patterns. Therefore, to form an accurate assessment of the prevalence and extent of alcohol consumption in Maharashtra, one must consider these multifaceted factors.

An analysis based on gender reveals that women's alcohol consumption is consistently lower than that of their male counterparts across every district in Maharashtra. Hypothesis testing, conducted using "t tests" (see Appendix 4.7.7), confirms that the percentage of male drinkers in Maharashtra is greater than the percentage of female drinkers. This pattern is consistent globally and can be attributed to cultural and socio-economic factors. The World Health Organization (WHO, 2005) identifies four primary reasons for the gender gap in alcohol consumption: Power, Sex, Risks, and Responsibilities. From a power perspective, alcohol consumption is often associated with notions of superiority and masculinity among men. From a sexual perspective, men may believe that alcohol enhances sexual performance and enjoyment, while women may limit their drinking due to increased vulnerability to male sexual aggression. In terms of risk-taking behavior, men tend to be more willing to take risks than women. Finally, from a responsibilities perspective, men may use heavy drinking as a means to evade their responsibilities, whereas women's domestic responsibilities may limit their alcohol consumption (WHO, 2005). Another reason for the significant gender gap in drinking prevalence may be under-reporting by female respondents, driven by the social stigma attached to female alcohol consumption in Indian society.

Notably, there are deviations in district rankings within Maharashtra. For example, Mumbai ranks 17th in terms of the percentage of male consumption but ranks 6th in terms of female consumption. Similarly, the Thane district ranks 22nd in male consumption but 9th in female consumption. Gender-related factors such as increased autonomy and opportunities for women to engage in traditionally male roles likely contribute to these variations (WHO, 2005). In contrast, Gadchiroli, a district where prohibition is enforced, exhibits the highest level of male consumers and the second-highest level of female consumers. The prevalence of alcohol consumption and hypothesis testing in both the state level and the Vidarbha region confirm weak enforcement of the prohibition policy in this district. A plausible explanation for the higher percentage of female consumption may be the tribal culture in which women can drink without significant societal guilt, in contrast to the roles of women in Hindu and Muslim societies as stated by Hardiman (1985). The rejection of the null hypothesis and acceptance of the alternative hypothesis, which suggests that the percentage of female drinkers in prohibited districts of Vidarbha is greater than in non-prohibited districts, aligns with this explanation.

Overall, the general findings in several districts of Maharashtra align with those observed at the national level in Chapter 3. It is estimated that alcohol consumption is higher among tribal and scheduled caste populations than among other social categories, a pattern

supported by hypothesis testing ("t tests"). Occupations in Group 6 (skilled agricultural and fishery workers) and Group 789 (craft and related trades workers, plant and machine operators, and assemblers, elementary occupations) are associated with a higher proportion of drinkers among men, as confirmed by hypothesis testing. Higher levels of education are associated with a lower proportion of alcohol consumers, as also confirmed by hypothesis testing.

In general, the rural sector has a higher proportion of male drinkers compared to the urban sector, with some exceptions. Hypothesis testing further confirms that the percentage of rural drinkers is greater than the percentage of urban drinkers in Maharashtra. This difference can be attributed to the concentration of heavy labor and agricultural activities in rural areas, along with factors such as a higher proportion of tribal populations, lower income levels, limited access to education, increased anxiety and boredom, and a lack of job opportunities in rural regions.

Hypothesis testing was extensively conducted based on the level of education of men at the district level. The results confirm that higher education significantly reduces the prevalence of alcohol consumption. This finding is consistent with the observations in Chapter 3. The lower proportion of alcohol consumers among males with 12 or more years of education can be explained by education's role in increasing awareness about the harmful effects of excessive drinking, providing employment opportunities, and promoting the productive use of the human mind. It is also possible that a higher proportion of individuals with 12 or more years of education belong to social and religious categories that discourage alcohol consumption, contributing to a larger sober population in this education group.

Analyzing alcohol consumption based on poverty lines reveals that alcohol is a more significant issue among the poor than among those above the poverty line. Hypothesis testing confirms that the percentage of households with drinkers below the poverty line is greater than the percentage of households with drinkers above the poverty line in Maharashtra. This difference in prevalence is substantial, with a mean difference in alcohol consumption prevalence between households below and above the poverty line of 1.67 for Maharashtra as a whole. In prohibited districts like Gadchiroli and Wardha, this difference is even more pronounced, with mean differences of 10.39 and 6.89, respectively. These findings suggest that alcohol consumption is a more significant problem among the poor, even in districts where prohibition is enforced.

Regarding the impact of the prohibition policy on alcohol demand/quantity consumed, econometric analysis indicates that a decrease in demand/quantity suggests the influence of supply shocks. However, considering the descriptive statistics of prevalence and the insignificant results in econometric analyses for participation, it can be inferred that the prohibition policy has not been highly successful in reducing alcohol participation at the district-level, except in the case of beer.

Considering a fall in the quantity of country liquor with a corresponding rise in the quantity of IMFL and Beer creates a larger question on the efficiency of alcohol prohibition policy at the district level. The prohibition policy is largely creating a supply shock for country liquor, but IMFL and Beer are supposed to be making their way into the district (by illegal means). Secondly, increases in the budget share of Beer and IMFL (under relaxed significance testing levels) and negative sign associated with the prohibition coefficient in the participation equation suggests a possibility of selling these products at increased prices. This finding has larger support in the literature and is also supported by a primary survey conducted in the dry Gadchiroli district⁶⁶ details of which is presented in the Chapter 6. The observation that police per capita- a proxy for enforcement is not significant and is associated with positive sign for each type of alcohol (except for toddy (not shown) where it is significant at less than 1 percent level and negative) also raises a question on enforcement efficiency- such that enforcement is largely affecting the illegal toddy sellers whereas IMFL sellers and Beer sellers are most likely able to avoid the enforcement of prohibition policy. The analyses thus point towards the possible likelihood of corruption in prohibited districts of Maharashtra.

The demand elasticity of income suggests the increase in income will lead to increased consumption. This also has the tax implication of collecting larger revenues by the state government. As the alcohol budget share falls with rises in income, we observe non-proportional rise in alcohol expenditure with the increase in income.

An increase in participation, consumption, and budget shares with household size clearly define the economics of scale operating at the household levels, suggesting that the larger the household size, the larger the probability of having a drinker and increased quantity of alcohol consumption and budget shares.

⁶⁶ One reason why IMFL is preferable is due to its ethanol content by volume compared to other drinks along with higher profits.

The fact that education consistently leads to a fall in participation along with the quantity of consumption (conditioned on participation) for the poor and group of SC and ST should be given much higher consideration than any other policy instruments. Mahal (2001) also came up with a similar suggestion when dealing with prohibition in Gujarat.

The rise in own prices of liquor has shown a consistent fall in demand for alcohol, suggesting an important mechanism to control liquor consumption along with increases in revenue of the state (as price elasticity is less than 1). As increases in the prices of IMFL leads to a fall in consumption quantity of country liquor, we can consider that country liquor and IMFL are complements.

In conclusion, the econometric analysis suggests that the prohibition policy has not been entirely successful at the district level. Instead, the analysis highlights the importance of increased education as an effective means to control alcohol consumption. Higher income levels and increased prices of alcohol also lead to higher excise revenue for the government. Increased education, specifically, plays a pivotal role in reducing alcohol prevalence, quantity consumed, household budget allocation to alcohol (with less-than-proportional increases), and tax revenue. Therefore, policymakers should prioritize education as a means to address the alcohol problem effectively. Additionally, the government can rely on increasing taxes and eliminating extreme measures like prohibition to generate revenue while supporting the government's efforts to reduce alcohol consumption.

The trends in revenue, showing a shift towards foreign liquor in Maharashtra, can be attributed to factors such as urbanization, favorable demographics, changing social norms, rising disposable income, increased accessibility and availability of alcohol, relaxed international trade regulations, and innovative marketing and promotion strategies (Public Health Foundation of India [PHFI], 2013). However, this shift can have adverse effects on individuals engaged in traditional liquor production. When individuals from lower-income backgrounds purchase commercial liquor brands, it can strain their family's finances, depriving other family members of essential necessities (WHO, 2018).

While district-level prohibition policies may lead to a decline in state government revenue, this decline is not substantial, as seen in the case of Chandrapur. The revenue gap can be compensated for using other tax resources and central government grants. However, more importantly, if alcohol consumption remains significant despite the enforcement of prohibition,

as observed in Gadchiroli, Wardha, and Chandrapur, it raises questions about the political motivations behind such policies. This situation creates a double burden for the government, as valuable financial resources that could be used for development purposes are diverted towards bootleggers, smugglers, and illicit distillers. On the other hand, the poor population obtains substandard liquor at much higher prices, reducing their disposable income for basic necessities. Consumption of substandard liquor can also lead to increased mortality, depriving low-income families of their breadwinners. In this context, it may be more practical for governing bodies to explore alternative methods to reduce alcohol consumption, especially when the effectiveness of prohibition is weak, enforcement is challenging, the state is burdened with debt, and resources for generating new revenue are limited. A comprehensive cost-benefit analysis, considering factors such as consumption, mortality, crime rates, state revenue, income levels, budget allocations, culture, demographics, education and healthcare facilities, and occupational structures, should be conducted to develop a holistic solution to the alcohol problem at the district level.

4.7 Appendix

4.7.1 Prevalence among Women (age 15+ years) in Maharashtra

Table 4.7.1.1 Prevalence by Districts

District	Prevalence(percent)
Nandurbar	1.7
Dhule	1.4
Jalgaon	0.2
Buldana	1.2
Akola	0.4
Washim	0.2
Amravati	0.4
Wardha	0.4
Nagpur	0.3
Bhandara	0.5
Gondiya	0.2
Gadchiroli	1.6
Chandrapur	0.5
Yavatmal	0.4
Nanded	0.5
Hingoli	0.7
Parbhani	0.4
Jalna	0.1
Aurangabad	0.1
Nashik	1.5
Thane	0.8
Mumbai (Suburban)	0.2
Mumbai	1.2
Raigarh	0.6
Pune	0.7
Ahmadnagar	0.2
Bid	0.0
Latur	0.5
Osmanabad	0.9
Solapur	0.1
Satara	0.2
Ratnagiri	0.8
Sindhudurg	0.3
Kolhapur	0.3
Sangli	0.2
Total	0.5

Note: Authors estimation using District Level Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Table 4.7.1.2 Prevalence by Social Category

Social Category	Prevalence(percent)
SC	0.39
ST	1.38
OBC	0.47
Other	0.41
Total	0.57

Note: Authors estimation using District Level Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Table 4.7.1.3 Prevalence by Religion

Religion	Prevalence(percent)
Hindu	0.59
Muslim	0.39
Christian	0.31
Buddhist	0.31

Note: Authors estimation using District Level Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

4.7.2 Prevalence among Men (age 15+ years) in Maharashtra

Table 4.7.2.1 Percent Non-drinker Men by Education Groups in Years of Schooling

District	0-4	5-9	10 & 11	12 & Above
Nandurbar	66.2	80.8	84.4	87.8
Dhule	65.6	76.3	77.2	81.7
Jalgaon	76.3	84.1	90.2	92.8
Buldana	78.5	79.1	82.3	85.4
Akola	73.5	83.9	88.9	89.0
Washim	79.4	86.1	87.1	92.3
Amravati	68.6	73.8	80.5	84.0
Wardha	77.5	78.0	85.4	88.5
Nagpur	74.9	79.2	83.8	83.3
Bhandara	71.9	70.2	77.7	81.2
Gondiya	73.2	73.5	71.0	77.1
Gadchiroli	43.7	67.9	69.0	73.5
Chandrapur	55.1	62.5	74.8	75.1
Yavatmal	63.5	71.0	73.6	80.1
Nanded	79.7	83.0	83.8	85.4
Hingoli	79.7	82.3	85.8	87.3
Parbhani	88.7	93.3	92.7	95.3
Jalna	83.8	85.4	89.3	89.9
Aurangabad	79.6	84.2	88.9	92.4
Nashik	64.5	73.1	85.7	89.8
Thane	79.1	81.3	88.0	88.8
Mumbai (Suburban)	79.2	83.4	83.7	88.7
Mumbai	80.0	71.0	83.4	83.9
Raigarh	66.5	75.3	84.1	87.1
Pune	78.6	84.2	83.3	87.4
Ahmadnagar	82.2	83.4	91.8	92.3
Bid	88.3	87.5	83.7	91.4
Latur	71.3	74.0	79.9	75.3
Osmanabad	87.8	87.7	95.0	95.1
Solapur	78.1	85.0	92.0	94.2
Satara	78.8	86.6	87.1	92.2
Ratnagiri	72.8	81.0	85.7	87.8
Sindhudurg	83.0	90.0	86.5	90.1
Kolhapur	82.4	89.2	90.6	92.2
Sangli	86.8	87.1	92.7	93.9

Note: Authors estimates based on unit level data, sampling weights applied only for DLHS 4 survey

Table 4.7.2.2 Percent Non-drinker Men by Occupation Groups

District	Group 789	Group 12	Group 34	Group 5	Group 6
Nandurbar	73.0	86.9	79.2	86.9	68.0
Dhule	69.3	72.5	75.8	75.4	61.8
Jalgaon	81.4	86.8	81.4	89.2	78.6
Buldana	78.1	94.4	82.1	86.0	75.8
Akola	80.0	84.0	85.2	86.0	79.8
Washim	79.7	83.5	84.6	83.4	82.8
Amravati	71.4	88.0	81.2	84.6	70.7
Wardha	81.4	80.8	82.8	89.0	76.0
Nagpur	73.3	77.0	80.3	71.4	76.0
Bhandara	51.6	88.6	81.1	77.0	78.2
Gondiya	63.0	82.1	75.0	63.8	71.2
Gadchiroli	56.7	61.0	66.1	61.8	50.3
Chandrapur	59.9	80.9	67.2	62.1	59.0
Yavatmal	64.1	80.2	68.3	61.3	67.2
Nanded	79.4	85.5	72.9	80.3	78.3
Hingoli	75.3	100.0	62.9	79.4	82.6
Parbhani	90.4	100.0	96.4	94.3	87.6
Jalna	86.5	86.5	90.6	90.0	77.3
Aurangabad	76.8	88.0	82.2	86.2	87.1
Nashik	75.7	90.3	83.2	82.2	61.7
Thane	82.1	89.5	82.7	79.8	74.5
Mumbai (Suburban)	79.1	76.8	75.5	79.4	69.6
Mumbai	77.3	82.4	83.9	76.8	79.4
Raigarh	74.5	91.9	84.1	75.3	64.6
Pune	74.2	76.4	79.4	80.3	86.0
Ahmadnagar	86.7	88.6	84.3	84.3	84.1
Bid	75.1	89.3	80.0	88.6	86.2
Latur	72.3	82.7	55.1	63.6	76.4
Osmanabad	94.1	100.0	96.4	90.3	90.0
Solapur	84.9	90.9	90.5	90.8	82.3
Satara	83.3	85.5	87.0	88.7	80.1
Ratnagiri	80.1	76.0	82.9	79.3	73.5
Sindhudurg	79.7	91.6	87.2	87.8	87.0
Kolhapur	88.6	89.4	80.3	88.4	84.3
Sangli	88.1	97.1	91.8	90.8	88.9

Note: Authors estimation using District Level Health Survey-4 Data. Weights based on sampling design were applied to estimate the prevalence.

Group12 denotes legislators, senior officials, managers, professionals; Group34 denotes technicians, associate professionals, clerks; Group5 denotes service workers and shop & market sales workers; Group6 denotes skilled agricultural and fishery workers; Group789 denotes craft and related trades workers, plant and machine operators and assemblers, elementary occupations

4.7.3 The Heckman Specification

The Heckman selection model assumes that there exists an underlying regression relationship,

$$y_j = \mathbf{x}_j\beta + u_{1j} \text{ regression equation}$$

The dependent variable, however, is not always observed. Rather, the dependent variable for observation j is observed if

$$\mathbf{z}_j\gamma + u_{2j} > 0 \quad \text{selection equation}$$

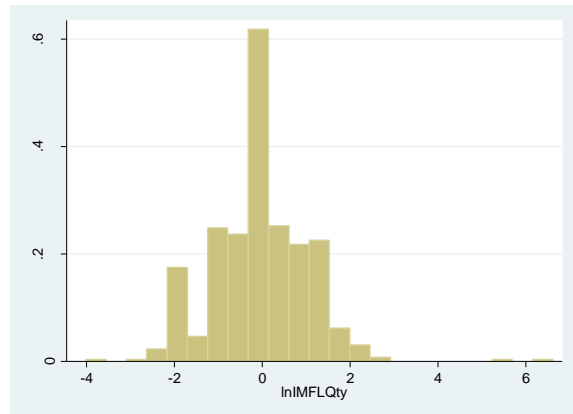
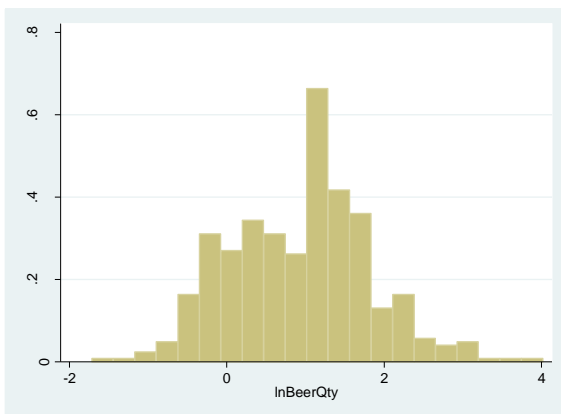
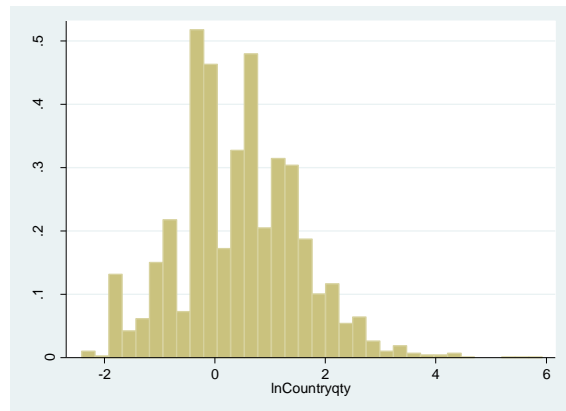
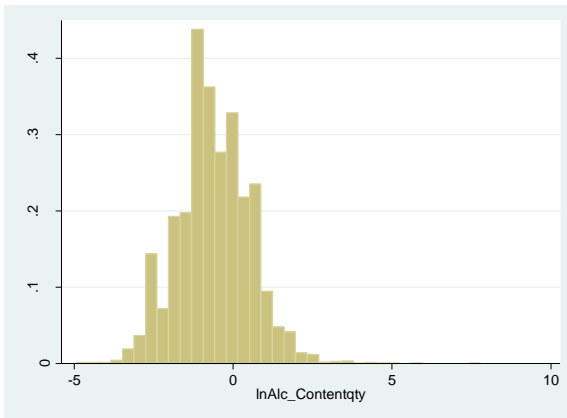
where

$$\begin{aligned} u_1 &\sim N(0, \sigma) \\ u_2 &\sim N(0, 1) \\ \text{corr}(u_1, u_2) &= \rho \end{aligned}$$

When $\rho \neq 0$, standard regression techniques applied to the first equation yield biased results. Heckman provides consistent, asymptotically efficient estimates for all the parameters in such models.

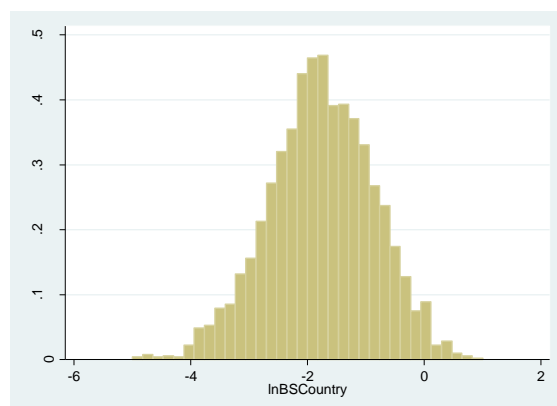
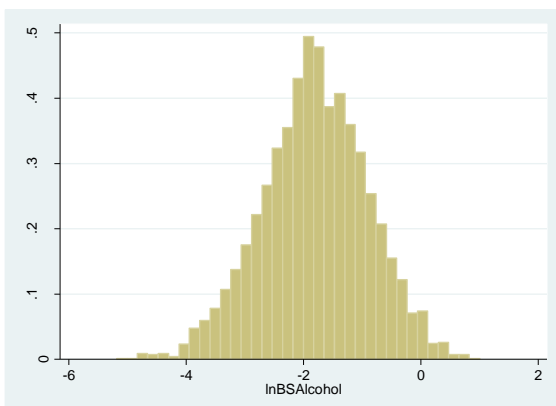
4.7.4 The Dependent Variables

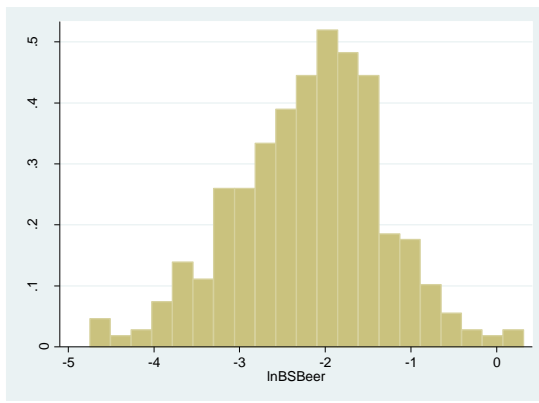
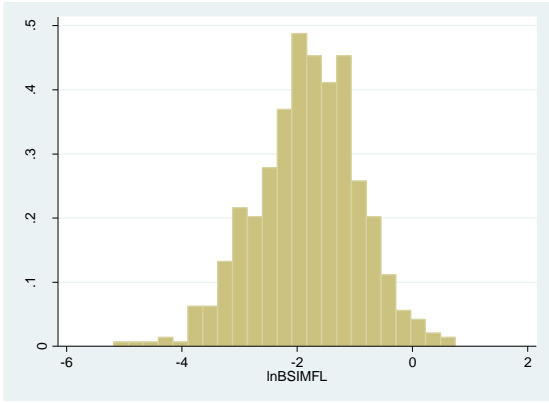
4.7.4.1 By Quantity



Note: Author's depiction using NSSO data

4.7.4.2 By Budget Shares





Note: Author's depiction using NSSO data

4.7.5 Sample Statistics of Dependent and Explanatory Variables

Variable	Observations	Mean
Alcohol (0-No Drinks, 1- Drinks)	42,078	0.093
Country Liq (0-No Drinks, 1- Drinks)	42,078	0.066
Beer (0-No Drinks, 1- Drinks)	42,078	0.011
IMFL (0-No Drinks, 1- Drinks)	42,078	0.013
Alcohol, qty in Liters per Month	3,899	1.865
Country, qty in Liters per Month	2,792	3.269
Beer,qty in Liters per Month	447	3.848
IMFL, qty in Liters per Month	556	3.181
Budget Share Alcohol, Overall	42,078	0.022
Budget Share Country Liq, Overall	42,078	0.017
Budget Share Beer, Overall	42,078	0.002
Budget Share IMFL, Overall	42,078	0.003
Budget Share Alcohol, Drinkers	3,899	0.243
Budget Share Country Liq, Drinkers	2,792	0.254
Budget Share Beer, Drinkers	447	0.161
Budget Share IMFL, Drinkers	556	0.236
Prohibition, dummy (0- No, 1-Yes)	42,078	0.027
Monthly Per Capita Consumption Ex (2004-05 prices)	42,078	1209.762
Household Size	42,078	4.535
Sex (1- Female, 2- Male)	42,078	1.094
Education	42,077	6.507
Islam, dummy (0- No, 1-Yes)	42,078	0.102
SC/ST, dummy (0- No, 1-Yes)	42,078	0.220
Owens Land, dummy (1- Yes, 2- No)	42,075	1.168
Sector (1-Rural,2- Urban)	42,078	1.499
Country Liquor Price (2004-05 prices)	42,078	86.067
IMFL Price (2004-05 prices)	42,078	243.841
Beer Price (2004-05 prices)	42,078	58.897
Toddy Price (2004-05 prices)	42,078	9.234
Leaf Tobacco Prices (2004-05 prices)	42,078	0.221
Pan Prices (2004-05 prices)	42,078	2.088
Police Per Lakh Population (Police per capita)	42,078	122.522
Urban Percent	42078	42.899
Agriculture Labour Percent	42078	27.147

Note: Author's estimation using NSSO data

4.7.6 Results for Econometric Specification

Table 4.7.6.1 Econometric analysis on Ethanol/Pure alcohol participation, consumption and budget shares using Heckman sample selection method

VARIABLES	Pure Alcohol Consumption(qty)(log)	Pure Alcohol Participation	Budget Share (log)	Pure Alcohol Participation
Prohibition	-0.180*	-0.007	-0.140	-0.025
	(0.092)	(0.056)	(0.115)	(0.084)
MPCE, log	0.495*	0.234***	-0.260***	0.239***
	(0.300)	(0.019)	(0.046)	(0.024)
Household Size, log	0.409	0.227***	0.360***	0.229***
	(0.295)	(0.020)	(0.042)	(0.022)
Gender	-0.262	-0.757***	0.468***	-0.755***
	(0.998)	(0.045)	(0.105)	(0.049)
Education	-0.060	-0.061***	0.025***	-0.061***
	(0.078)	(0.003)	(0.008)	(0.004)
Islam	0.198	-0.460***	0.384***	-0.464***
	(0.624)	(0.040)	(0.081)	(0.052)
SC/ST	0.101	0.391***	-0.284***	0.392***
	(0.496)	(0.021)	(0.047)	(0.026)
Owns Land	0.116	0.060**	0.021	0.060*
	(0.092)	(0.026)	(0.048)	(0.031)
Sector	-0.063	0.006	0.055	0.004
	(0.045)	(0.023)	(0.049)	(0.034)
Country Prices, log	-0.400***	-0.031	0.169**	-0.032
	(0.083)	(0.039)	(0.083)	(0.063)
IMFL Prices, log	-0.160***	-0.032*	-0.035	-0.033
	(0.056)	(0.019)	(0.039)	(0.025)

Beer Prices, log	-0.074	0.126***	-0.026	0.127***
	(0.171)	(0.026)	(0.056)	(0.037)
Leaf Tobacco Prices, log	0.039	0.003	0.013	0.003
	(0.027)	(0.015)	(0.026)	(0.021)
Pan (finished) Prices	-0.009	0.277***	-0.159*	0.277***
	(0.364)	(0.038)	(0.085)	(0.051)
Police Per Capita, log		-0.018		0.031
		(0.040)		(0.056)
Constant	-1.617	-3.457***	0.711	-3.693***
	(5.686)	(0.295)	(0.618)	(0.406)
Observations	42,074	42,074	42,074	42,074

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4.7.6.2 Econometric analysis on Country Liquor participation, consumption and budget shares using Heckman sample selection method

VARIABLE S	Country Liquor Consumption (log)	Country Liquor Participation	Budget Share Country Liquor (log)	Country Liquor Participation
Prohibition	-0.210**	-0.045	-0.221*	-0.043
	(0.101)	(0.091)	(0.120)	(0.092)
MPCE, log	0.783***	0.015	-0.119**	0.018
	(0.054)	(0.024)	(0.051)	(0.024)
Household Size, log	0.447***	0.173***	0.390***	0.173***
	(0.050)	(0.025)	(0.049)	(0.024)
Gender	0.066	-0.849***	0.291*	-0.848***
	(0.123)	(0.058)	(0.164)	(0.058)

Education	-0.016*	-0.079***	0.016	-0.079***
	(0.009)	(0.004)	(0.014)	(0.004)
Islam	0.188**	-0.366***	0.251***	-0.368***
	(0.086)	(0.058)	(0.090)	(0.058)
SC/ST	0.033	0.363***	-0.183***	0.363***
	(0.046)	(0.028)	(0.066)	(0.028)
Owens Land	0.055	0.108***	0.024	0.108***
	(0.060)	(0.034)	(0.055)	(0.034)
Sector	0.082	-0.048	0.104**	-0.048
	(0.053)	(0.036)	(0.050)	(0.036)
Country Prices, log	-0.861***	0.069	0.120	0.068
	(0.101)	(0.062)	(0.089)	(0.062)
IMFL Prices, log	-0.083*	-0.037	-0.070*	-0.038
	(0.043)	(0.027)	(0.041)	(0.027)
Beer Prices, log	0.092	0.061	0.018	0.060
	(0.071)	(0.039)	(0.058)	(0.039)
Leaf Tobacco Prices, log	0.032	0.027	0.009	0.026
	(0.032)	(0.023)	(0.029)	(0.022)
Pan (finished) Prices	-0.036	0.275***	-0.138	0.275***
	(0.096)	(0.055)	(0.091)	(0.055)
Police Per Capita, log		0.097		0.105
		(0.073)		(0.065)
Constant	-0.974	-2.745***	-0.218	-2.792***
	(0.688)	(0.472)	(0.697)	(0.453)
Observations	42,074	42,074	42,074	42,074

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4.7.6.3 Econometric analysis on IMFL participation, consumption and budget shares using Heckman sample selection method

VARIABLES	IMFL Consumption (log)	IMFL Participation	Budget Share IMFL (log)	IMFL Participation
Prohibition	0.227 (0.144)	-0.013 (0.152)	0.237 (0.202)	-0.018 (0.143)
MPCE, log	0.348 (0.323)	0.548*** (0.031)	-0.970*** (0.114)	0.551*** (0.031)
Household Size, log	0.295 (0.193)	0.300*** (0.044)	0.093 (0.099)	0.299*** (0.044)
Gender	0.315 (0.353)	-0.405*** (0.098)	0.699*** (0.242)	-0.405*** (0.098)
Education	-0.003 (0.018)	0.001 (0.007)	-0.002 (0.017)	0.001 (0.007)
Islam	0.161 (0.424)	-0.565*** (0.116)	0.407 (0.259)	-0.571*** (0.115)
SC/ST	-0.045 (0.111)	0.123*** (0.048)	-0.136 (0.098)	0.122** (0.047)
Owns Land	0.145 (0.139)	0.002 (0.058)	0.028 (0.121)	0.001 (0.058)
Sector	-0.072 (0.160)	0.175*** (0.055)	-0.275** (0.123)	0.176*** (0.055)
Country Prices, log	-0.209 (0.220)	0.036 (0.107)	-0.100 (0.192)	0.036 (0.107)
IMFL Prices, log	-0.828***	-0.028	0.082	-0.032

	(0.173)	(0.043)	(0.124)	(0.043)
Beer Prices, log	0.036	0.097	0.009	0.094
	(0.170)	(0.067)	(0.170)	(0.067)
Leaf Tobacco Prices, log	0.067	-0.042	0.074	-0.043
	(0.085)	(0.036)	(0.055)	(0.035)
Pan (finished) Prices	0.072	0.372***	-0.280	0.372***
	(0.302)	(0.101)	(0.245)	(0.100)
Police Per Capita, log		0.024		0.027
		(0.108)		(0.079)
Constant	2.834	-7.600***	8.832***	-7.604***
	(4.309)	(0.727)	(1.829)	(0.687)
Observations	42,074	42,074	42,074	42,074

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4.7.6.4 Econometric analysis on Beer participation, consumption and budget shares using Heckman sample selection method

VARIABLES	Beer Consumption (log)	Beer Participation	Beer Budget Share (log)	Beer Participation
Prohibition	0.848***	-0.738***	1.047***	-0.744***
	(0.264)	(0.242)	(0.293)	(0.241)
MPCE, log	0.363***	0.483***	-0.743***	0.487***
	(0.132)	(0.035)	(0.124)	(0.035)
Household Size, log	0.302**	0.203***	0.263**	0.205***
	(0.118)	(0.041)	(0.116)	(0.041)
Gender	-0.206	-0.293***	-0.151	-0.292***
	(0.221)	(0.091)	(0.218)	(0.091)

Education	-0.026	-0.004	-0.031*	-0.004
	(0.018)	(0.007)	(0.017)	(0.007)
Islam	0.262	-0.367***	0.357	-0.368***
	(0.267)	(0.101)	(0.240)	(0.101)
SC/ST	-0.206*	0.130***	-0.233**	0.130***
	(0.117)	(0.049)	(0.109)	(0.049)
Owens Land	-0.140	0.088	-0.186*	0.090
	(0.105)	(0.055)	(0.111)	(0.055)
Sector	-0.106	0.135**	-0.136	0.133**
	(0.131)	(0.064)	(0.127)	(0.064)
Country Prices, log	0.140	-0.016	0.105	-0.017
	(0.185)	(0.102)	(0.190)	(0.101)
IMFL Prices, log	0.036	0.001	0.041	0.000
	(0.120)	(0.058)	(0.122)	(0.058)
Beer Prices, log	-0.655***	0.016	0.288**	0.016
	(0.141)	(0.077)	(0.142)	(0.077)
Leaf Tobacco Prices, log	0.084	0.041	0.059	0.042
	(0.055)	(0.039)	(0.061)	(0.039)
Pan (finished) Prices	-0.319	0.445***	-0.462*	0.442***
	(0.255)	(0.131)	(0.250)	(0.130)
Police Per Capita, log		0.090		0.096
		(0.104)		(0.094)
Constant	2.829	-6.844***	5.082***	-6.894***
	(1.978)	(0.726)	(1.701)	(0.708)
Observations	42,074	42,074	42,074	42,074

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4.7.6.5 Econometric Analysis on Ethanol/Pure alcohol participation, consumption and budget shares using Heckman sample selection method on SC-ST group

VARIABLES	SC ST group	SC ST group	SC ST group	SC ST group
	Pure-Alcohol Consumption(qty)(log)	Alcohol Participation	Budget-Share Alcohol (log)	Alcohol Participation
Prohibition	-0.091	0.091	-0.326*	0.086
	(0.195)	(0.110)	(0.176)	(0.115)
MPCE, log	0.815***	0.240***	-0.062	0.239***
	(0.091)	(0.049)	(0.092)	(0.050)
Household Size, log	0.855***	0.373***	0.601***	0.378***
	(0.104)	(0.041)	(0.120)	(0.041)
Gender	-1.369***	-0.857***	-0.154	-0.854***
	(0.210)	(0.079)	(0.285)	(0.080)
Education	-0.107***	-0.063***	-0.024	-0.064***
	(0.018)	(0.006)	(0.021)	(0.006)
Islam	-0.546	-0.677***	-0.066	-0.682***
	(0.637)	(0.246)	(0.432)	(0.247)
Owens Land	0.089	0.050	0.081	0.048
	(0.105)	(0.053)	(0.071)	(0.053)
Sector	-0.050	0.015	0.062	0.009
	(0.100)	(0.055)	(0.065)	(0.056)
Country Prices, log	-0.357*	-0.164	0.195	-0.153
	(0.186)	(0.105)	(0.121)	(0.107)
IMFL Prices, log	-0.175**	-0.032	-0.020	-0.032
	(0.078)	(0.043)	(0.056)	(0.044)
Beer Prices, log	0.062	0.243***	0.055	0.234***

	(0.129)	(0.061)	(0.092)	(0.062)
Leaf Tobacco Prices, log	-0.032	0.002	0.002	0.006
	(0.061)	(0.042)	(0.036)	(0.042)
Pan (finished) Prices	0.337*	0.245***	0.071	0.258***
	(0.179)	(0.087)	(0.130)	(0.087)
Police Per Capita, log		-0.111		-0.090
		(0.081)		(0.102)
Constant	-7.300***	-3.118***	-3.300**	-3.203***
	(1.419)	(0.668)	(1.346)	(0.731)
Observations	9,253	9,253	9,253	9,253

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4.7.6.6 Econometric Analysis on Ethanol/Pure alcohol participation, consumption and budget shares using Heckman sample selection method on poor households.

Poor Households				
VARIABLES	Pure-Alcohol Consumption(qty)(log)	alcohol	Budget-Share Alcohol (log)	alcohol
Prohibition	-0.275**	0.065	-0.237*	0.073
	(0.130)	(0.103)	(0.142)	(0.103)
MPCE, log	0.766***	0.258***	-0.114	0.260***
	(0.098)	(0.063)	(0.086)	(0.064)
Household Size, log	0.496***	0.301***	0.460***	0.301***
	(0.070)	(0.032)	(0.062)	(0.032)
Gender	-0.106	-0.696***	0.322**	-0.694***

	(0.142)	(0.065)	(0.141)	(0.065)
Education	-0.023**	-0.057***	0.016	-0.057***
	(0.011)	(0.005)	(0.011)	(0.005)
Islam	-0.020	-0.456***	0.275**	-0.457***
	(0.136)	(0.071)	(0.109)	(0.071)
SC/ST	0.016	0.423***	-0.217***	0.426***
	(0.063)	(0.033)	(0.071)	(0.033)
Owns Land	0.105	0.135***	-0.006	0.134***
	(0.079)	(0.045)	(0.066)	(0.045)
Sector	0.002	0.010	0.022	0.011
	(0.067)	(0.043)	(0.059)	(0.043)
Country Prices, log	-0.462***	-0.062	0.222**	-0.060
	(0.135)	(0.083)	(0.099)	(0.083)
IMFL Prices, log	-0.088*	-0.057*	-0.020	-0.058*
	(0.052)	(0.031)	(0.045)	(0.031)
Beer Prices, log	0.021	0.153***	0.038	0.153***
	(0.093)	(0.046)	(0.068)	(0.045)
Leaf Tobacco Prices, log	0.015	-0.001	0.008	-0.002
	(0.041)	(0.030)	(0.036)	(0.030)
Pan (finished) Prices	0.018	0.281***	-0.085	0.280***
	(0.116)	(0.063)	(0.094)	(0.063)
Police Per Capita, log		-0.036		-0.030
		(0.093)		(0.080)
Constant	-3.534***	-3.563***	-1.245	-3.608***
	(1.054)	(0.681)	(0.879)	(0.644)
Observations	21,036	21,036	21,036	21,036

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.7.7 Hypothesis Testing using NSSO, DLHS and NFHS Datasets

Dataset	Test	H0: Null Hypothesis, H1: Alternate Hypothesis and Conclusion	P-value
		Gender	
DLHS 4	one tailed t test	H0: Percentage of Male drinker equals or lesser than Percentage of Female drinkers	0.000
		H1: Percentage of Male drinkers is greater than Percentage of Female drinkers	
		Conclusion: Percentage of Male drinkers is greater than Percentage of Female drinkers	
		Religion	
DLHS 4	two tailed t test	H0: Percentage of Hindu drinkers is not significantly different from Percentage of Muslim drinkers	0.89
		H1: Percentage of Hindu drinkers is significantly different from Percentage of Muslim drinkers	
		Conclusion: Failed to reject the Null; Percentage of Hindu drinkers is not significantly different from Percentage of Muslim drinkers	
DLHS 4	two tailed t test	H0: Percentage of Hindu drinkers is not significantly different from Percentage of Buddhist drinkers	0.21
		H1: Percentage of Hindu drinkers is significantly different from Percentage of Buddhist drinkers	
		Conclusion: Failed to reject the Null; Percentage of Hindu drinkers is not significantly different from Percentage of Buddhist drinkers	
		Social Category	
DLHS 4	one tailed t test	H0: Percentage of Scheduled Caste(SC) drinker is equal or lesser than Percentage of Other category drinkers	0.078
		H1: Percentage of Scheduled Caste(SC) drinkers is greater than Percentage of Other category drinkers	
		Conclusion: Percentage of Scheduled Caste(SC) drinkers is greater than Percentage of Other category drinkers	
DLHS 4	one tailed t test	H0: Percentage of Scheduled Tribe(ST) drinker is equal or lesser than Percentage of Other category drinkers	0.004
		H1: Percentage of Scheduled Tribe(ST) drinkers is greater than Percentage of Other category drinkers	
		Conclusion: Percentage of Scheduled Tribe(ST) drinkers is greater than Percentage of Other category drinkers	
		Sector	
DLHS 4	one tailed t test	H0: Percentage of Rural drinkers is lesser than or equal to percentage of Urban drinkers	0.003

		H1: Percentage of Rural drinkers is greater than percentage of Urban drinkers	
		Conclusion: Percentage of Rural drinkers is greater than percentage of Urban drinkers	
		Occupation	
DLHS 4	one tailed t test	H0: Occupation Group789 has greater or equal percentage of non-drinkers than occupation Group12	0.0000
		H1: Occupation Group789 has lesser percentage of non-drinkers than occupation Group12	
		Conclusion: Occupation Group789 has lesser percentage of non-drinkers than occupation Group12	
DLHS 4	one tailed t test	H0: Occupation Group789 has greater or equal percentage of non-drinkers than occupation Group34	0.003
		H1: Occupation Group789 has lesser percentage of non-drinkers than occupation Group34	
		Conclusion: Occupation Group789 has lesser percentage of non-drinkers than occupation Group34	
DLHS 4	one tailed t test	H0: Occupation Group789 has greater or equal percentage of non-drinkers than occupation Group5	0.002
		H1: Occupation Group789 has lesser percentage of non-drinkers than occupation Group5	
		Conclusion: Occupation Group789 has lesser percentage of non-drinkers than occupation Group5	
DLHS 4	two tailed t test	H0: Percentage of non-drinkers occupation Group789 is not significantly different from non-drinkers of occupation Group6	0.82
		H1: Percentage of non-drinkers occupation Group789 is significantly different from non-drinkers of occupation Group6	
		Conclusion: Failed to reject the Null; Percentage of non-drinkers occupation Group789 is not significantly different from non-drinkers of occupation Group6	
		Education	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education above 12years is lesser than or equal to percentage of non-drinkers with education 0 to 4 years	0.000
		H1: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 0 to 4 years	
		Conclusion: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 0 to 4 years	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education above 12years is lesser than or equal to percentage of non-drinkers with education 5 to 9 years	0.000
		H1: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 5 to 9 years	

		Conclusion: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 5 to 9 years	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education above 12years is lesser than or equal to percentage of non-drinkers with education 10 to 11 years	0.000
		H1: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 10 to 11 years	
		Conclusion: Percentage of non-drinkers with education above 12years is greater than percentage of non-drinkers with education 10 to 11 years	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education 10 to 11 years is lesser than or equal to percentage of non-drinkers with education 0 to 4 years	0.000
		H1: Percentage of non-drinkers with education 10 to 11 years is greater than percentage of non-drinkers with education 0 to 4 years	
		Conclusion: Percentage of non-drinkers with education 10 to 11 years is greater than percentage of non-drinkers with education 0 to 4 years	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education 10 to 11 years is lesser than or equal to percentage of non-drinkers with education 5 to 9 years	0.000
		H1: Percentage of non-drinkers with education 10 to 11 years is greater than percentage of non-drinkers with education 5 to 9 years	
		Conclusion: Percentage of non-drinkers with education 10 to 11 years is greater than percentage of non-drinkers with education 5 to 9 years	
DLHS 4	one tailed t test	H0: Percentage of non-drinkers with education 5 to 9 years is lesser than or equal to percentage of non-drinkers with education 0 to 4 years	0.000
		H1: Percentage of non-drinkers with education 5 to 9 years is greater than percentage of non-drinkers with education 0 to 4 years	
		Conclusion: Percentage of non-drinkers with education 5 to 9 years is greater than percentage of non-drinkers with education 0 to 4 years	
		Below Poverty Line	
NSSO	one tailed t test	H0: Percentage of drinker households below poverty line is lesser than or equal to percentage of drinker households above poverty line	0.02
		H1: Percentage of drinker households below poverty line is greater than percentage of drinker households above poverty line	

		Conclusion: Percentage of drinker households below poverty line is greater than percentage of drinker households above poverty line	
		Prohibition Maharashtra	
DLHS 4	one tailed t test	H0: Percentage of male drinkers in prohibited districts is smaller than or equal to percentage of male drinkers in non-prohibited district	0.014
		H1: Percentage of male drinkers in prohibited districts is larger than percentage of male drinkers in non-prohibited district	
		Conclusion: Percentage of male drinkers in prohibited districts is larger than percentage of male drinkers in non-prohibited district	
DLHS 4	one tailed t test	H0: Percentage of female drinkers in prohibited districts is smaller than or equal to percentage of female drinkers in non-prohibited district	0.05
		H1: Percentage of female drinkers in prohibited districts is larger than percentage of female drinkers in non-prohibited district	
		Conclusion: Percentage of female drinkers in prohibited districts is larger than percentage of female drinkers in non-prohibited district	
NFHS 4	one tailed t test	H0: Percentage of male drinkers in prohibited districts is smaller than or equal to percentage of male drinkers in non-prohibited district	0.003
		H1: Percentage of male drinkers in prohibited districts is larger than percentage of male drinkers in non-prohibited district	
		Conclusion: Percentage of male drinkers in prohibited districts is larger than percentage of male drinkers in non-prohibited district	
NSSO	one tailed t test	H0: Percentage of drinker households in prohibited districts is smaller than or equal to percentage of drinker households in non-prohibited district	0.039
		H1: Percentage of drinker households in prohibited districts is greater than percentage of drinker households in non-prohibited district	
		Conclusion: Percentage of drinker households in prohibited districts is greater than percentage of drinker households in non-prohibited district	
		Prohibition Vidarbha	
NSSO	two tailed t test	H0: Percentage of drinker households in prohibited districts of Vidarbha is not significantly different from percentage of drinker households in non-prohibited districts of Vidarbha	0.71
		H1: Percentage of drinker households in prohibited districts of Vidarbha is significantly different from percentage of drinker households in non-prohibited districts of Vidarbha	
		Conclusion: Failed to reject the Null; Percentage of drinker households in prohibited districts of Vidarbha is not	

		significantly different from percentage of drinker households in non-prohibited districts of Vidarbha	
NFHS 4	two tailed t test	H0: Percentage of drinker men in prohibited districts of Vidarbha is not significantly different from percentage of drinker men in non-prohibited districts of Vidarbha	0.14
		H1: Percentage of drinker men in prohibited districts of Vidarbha is significantly different from percentage of drinker men in non-prohibited districts of Vidarbha	
		Conclusion: Failed to reject the Null; Percentage of drinker households in prohibited districts of Vidarbha is not significantly different from percentage of drinker households in non-prohibited districts of Vidarbha	
DLHS 4	two tailed t test	H0: Percentage of drinker men in prohibited districts of Vidarbha is not significantly different from percentage of drinker men in non-prohibited districts of Vidarbha	0.3
		H1: Percentage of drinker men in prohibited districts of Vidarbha is significantly different from percentage of drinker men in non-prohibited districts of Vidarbha	
		Conclusion: Failed to reject the Null; Percentage of drinker men in prohibited districts of Vidarbha is not significantly different from percentage of drinker men in non-prohibited districts of Vidarbha	
DLHS 4	one tailed t test	H0: Percentage of female drinkers in prohibited districts of Vidarbha is smaller than or equal to percentage of female drinkers in non-prohibited district of Vidarbha	0.03
		H1: Percentage of female drinkers in prohibited districts is larger than percentage of female drinkers in non-prohibited district	
		Conclusion: Percentage of female drinkers in prohibited districts of Vidarbha is larger than percentage of female drinkers in non-prohibited district of Vidarbha	

Chapter 5: Financial Losses and Gains due to Prohibition

5.1 Introduction

It is a foregone conclusion that prohibition policy would lead to large losses in the state's excise revenue⁶⁷ (which happens to be one of the major sources of the state's own tax revenue). However, the case for prohibition rests on the assumption that the losses in the state's revenue will be offset by gains in the community as the money saved on alcohol is expected to be diverted towards fruitful pursuits.

Prohibition can be a viable option considering the tax paid on liquor is only a part/share of the total price paid for liquor; thus, when the prohibition is at place, the savings of the community (considering no consumption of liquor due to prohibition policy) must be larger than tax collected by the government. The savings thus obtained can be diverted by households for important necessities of life and the family needs. Moreover, it can also be assumed that much of the revenue loss of state government due to prohibition policy may be recovered from other sources of revenue especially if prohibition results in productivity gains.

Digging on to the past, in reply to the prohibition enquiry committee in the year 1954, many states claimed- losses in the revenue can be squared off from alternative taxes, such as- sales tax, agriculture income tax, entertainment tax etc. (See Chapter 2, Appendices 2.7.1). The belief was- as community is likely to divert its expenditure towards food, clothing, entertainment etc. the state government is likely see higher collection in tax revenue from these sources. However, such an expectation comes with the following caveat.

The majority of the anticipated gains won't materialise if people/communities in prohibited areas turn to contraband/illicit/illegal/home-produced alcohol instead of diverting their spending towards productive patterns of expenditure. In that case, the state government is subject to allocate more resources towards enforcement of the prohibition policy. The situation may get further aggravated if corrupt practices develops in enforcement officials. In such a case, the state not only remains devoid of a large source of tax revenue but also spends heavily on enforcement with almost negligible benefit or even losses at the community level.

⁶⁷ The state excise revenue largely consist of revenue from liquor along with a small share of revenue from opium, hems, drugs, medicated wines, denatured spirits etc.

The initial attempts at prohibition in India revealed mixed results in terms of the state government's efforts to recover the lost revenue. The following responses by the planning commission in the year 1954 provides sufficient insight on this:

The Government of Bombay stated, '*...The loss of excise revenue has been made up by receipts under sales tax which was imposed simultaneously with the Government decision to introduce prohibition by gradual stages in the State...*' (Planning Commission, 1954, p. 96).

In contradiction, the Government of Mysore stated, '*...Taxation in the state has already reached its peak, and an increase in the existing rates will act as a hardship to the general public. The central government shall devise measures for balancing the budget of the state consequent upon the introduction of prohibition throughout the state...*' (Planning Commission, 1954, p. 154).

The Government of Patiala and East Punjab States Union (PEPSU) stated, '*...introduction of prohibition is bound to dislocate finances which are badly required for development plans. Fresh taxes, even if introduced, may not fill up the gap caused by loss of excise revenue...*' (Planning Commission, 1954, p. 158).

Furthermore, in the present day, the Goods and Service Tax (GST) implemented since July 2017, has replaced a range of indirect taxes previously levied by state governments subsuming State VAT, Luxury Tax, Entry Tax, Entertainment and Amusement Tax (except when imposed by the local bodies), Taxes on advertisements, Taxes on lotteries, betting and gambling, State Surcharges, and Cesses. This may lead to additional burden on state governments when trying to recover any lost share of state revenue due to prohibition.

Based on this premise, this chapter tries to uncover the situation regarding financial losses incurred by the state government and changes in budget allocation by household for fruitful or productive purposes.

The key issues that will be investigated in this chapter are a) The extent of financial losses borne by the state as a result of enactmending the prohibition policy. b) The impact of prohibition policy on the household expenditures for various goods and services.

It must be noted that measuring losses to the state due enforcement is a difficult task. The major source of expenditure related to enforcement arises from maintenance of police force,

prohibition department, jails and courts of law. Another, albeit minor, expenditure source is related to chemical analyst. The challenge in measuring accurate estimates for prohibition enforcement lies in the fact that each of these departments is engaged in activities other than prohibition enforcement. For example, the police have to handle various types of crime in addition to prohibition offences; jails have to manage both types of prisoners- prohibition and non-prohibition offenders, and similar is the case for the courts. Due to their multifaceted roles and functions, it is challenging to measure expenditure on enforcement considering the utilization of resources both in time and money. Therefore, this aspect is best excluded from the scope of this chapter but is recommended for future research in this area. The next section discusses the methodology used for the analysis in this chapter.

5.2 Data

The data used for analysis of state excise for states of Andhra Pradesh, Haryana and Bihar is the “Account” principally sourced from Reserve Bank of India (RBI) annual studies on state finances. The RBI tabulates the time series data using on Annual Financial Statement⁶⁸ of individual states. The data on household expenditures are- all the National Sample Survey Rounds on consumption expenditure from the year 1983 to 1997 i.e., from the round 38 (Jan-Dec 1983) onwards to round 53 (Jan- Dec 1997). These also include three quinquennial rounds (round 38 (Jan-Dec 1983), round 43(July 1987- June 1988), round 50(July 93-June 94)). Some of the data used comes from the Census of India (used for construction of counter-factual) in this study.

The tax revenue of the state comprises of 1) State’s Own Tax Revenue (SOTR) and 2) Share in Central Taxes of which State’s own tax revenue comes from three major components namely 1) Taxes on Income, 2) Taxes on Property and Capital Transaction, 3) Taxes on Commodities and Services. The State Excise makes up for a large portion of revenue source in the group of Taxes on Commodities and Services along with Sales Tax (pre-GST). The Tables 5.7.1.1 – Table 5.7.1.3 presented in Appendix shows importance of various sources of revenues

⁶⁸ A statement of the estimated receipts and expenditures of a State (Budget) for each fiscal year is laid before the respective state assembly under Article 202 of the Indian Constitution. This statement includes state government efforts in resource mobilisation through various taxes, their part of Central taxes, and other types of resource mobilisation such as market borrowings, loans from various institutions and also from the Centre, grants-in-aid from the Centre, and so on. Expenditures are resources spent by state governments in accordance with their objectives and priorities. This is known as the "Annual Financial Statement" or "State Budget."

for the selected states for year 2000-01 to 2014-15⁶⁹, Appendix 5.7.2 shows the importance of various types of liquor in State Excise.

Coming to the NSSO surveys, various reference periods were utilised in the surveys, which were carried out every five years between 1972 and 1994, to gather data on respondents' consumption patterns. For all budget items, the reference period was initially "last month" or "last 30 days". An extra reference period of "last 365 days" was used for some classes of commodities, such as apparel, footwear, and durable goods, beginning with the 32nd cycle in 1977–1978. This adjustment was made in an effort to take seasonal and transient factors that can affect purchasing patterns into account. In the 50th round, the extended reference period also covered costs for education and healthcare. It's crucial to remember that the primary estimations were created primarily utilising information gathered within the "last 30 days" reference period (NSSO Expert Group, 2003)

Furthermore, canvassing was done using the "last week" and "last month" reference periods for the yearly, thin sample consumer expenditure inquiries carried out during NSS rounds 51 through 54, from July 1994 to June 1998. Two half-samples from the total sample of households were used in each of these rounds to survey two different types of schedules. For all budget items in schedule type 1, the reference period was the "last 30 days," but for schedule type 2, the reference periods were the "last 7 days" for food, "paan," tobacco, and intoxicants; the "last 30 days" for fuel and light; the "last 365 days" for clothing, footwear, durable goods, education, and medical (institutional); and the "last 365 days" for all other items (NSSO Expert Group, 2003)

According to the NSSO report on the choice of reference period for consumption data, week-based estimates for food, paan, cigarettes, and intoxicants were typically roughly 30% higher than month-based estimates (NSSO, 2000). In the NSS's 55th round, which was performed in 1998–1999, two separate reference periods—the "last 7 days" and the "last 30 days"—were used to collect information on each sample household's use of food, paan, cigarettes, and intoxicants. The reference periods for the remaining budgetary items were the same as those in schedule type 2 of rounds 51 through 54 (NSSO Expert Group, 2003)

⁶⁹ The years are selected as non-prohibited years for all the states of Andhra Pradesh, Bihar and Haryana. Also note Telangana is separated out from Andhra Pradesh in the year 2014.

5.2 Method

The method utilized is synthetic control method to estimate the losses in revenue and impact on budget shares of the households. This method was originally proposed by (Abadie & Gardeazabal, 2003) to investigate the economic effects of conflict in the Basque country. Since then the method has become increasingly popular for comparative studies in social sciences. Athey and Imbens (2017) even states that the synthetic control method is “arguably the most important innovation in policy evaluation literature in the last fifteen years”. The method has recently gained popularity after being developed and has been applied to a variety of issues, including taxation policy (Abadie et al., 2010), drug laws, industry regulation (Green et al., 2014), immigration policy (Bohn et al., 2014), political transition (Pieters et al., 2014), (Cunningham et al., 2015), organized crimes (Pinotti, 2015), nutrition interventions (Qian et al., 2016), health finance (Kreif et al., 2016), corporate political connections (Acemoglu et al., 2016), welfare reforms (Basu et al., 2016), legalized prostitution (Cunningham & Shah, 2018) etc. The reason for its popularity can largely be denoted to its transparency, interpretability, computational simplicity, visual appeal and advantages over other research design methods in social sciences.

The synthetic control method (SCM) is based on construction of synthetic unit which is derived using weighted average of the outcome variable from the group of units similar to the treated unit⁷⁰. The difference between the synthetic unit/counterfactual post intervention period denotes the impact of intervention. The other methods for impact evaluation are direct matching⁷¹, propensity score matching, regression discontinuity⁷², instrumental variable technique⁷³, differences in differences (DiD)⁷⁴ and changes in changes⁷⁵ method. However, for the reasons presented earlier the synthetic control method is preferred for the analysis in this chapter. The other most commonly used method in empirical research in economics is linear regression. However, Abadie (2021) notes the traditional regression are ill suited to estimate the effects of infrequent events on aggregate units, moreover the utilization of time-series

⁷⁰ The treated unit in our case is state/unit under alcohol prohibition over a period.

⁷¹ The controls developed in direct matching and propensity score matching method are based only on observed characteristics.

⁷² The regression discontinuity designs exploit the closeness of units to the threshold value and assign the untreated units close to threshold as control unit.

⁷³ The instrumental variable method relies on instrument/variable that is correlated to explanatory variable but uncorrelated to dependent variable thus allowing to separate out the effects of treatment.

⁷⁴ The difference in difference rely on parallel trend assumption such that the difference in treated unit and the control unit is referred as effect/impact of treatment post-intervention.

⁷⁵ A changes in changes approach is a non-linear version of difference in difference method such that this approach does not rely on functional form assumption.

techniques to estimate the effect of intervention for medium and long term is also complicated (due to presence of shocks to outcome variable).

In the terms of linear regression (Abadie, 2021; Abadie et al., 2015) specifies that linear regression is akin to synthetic control method such that it uses the “linear combination of the outcomes in the donor-pool⁷⁶ with regression weights to reproduce the outcome of treated-unit in the absence of the intervention”. However, he mentions, there are several advantages of using synthetic control method compared to other methods and in particular to regression-based counterfactual. The regression based counterfactual may rely on extrapolation whereas the synthetic control method precludes extrapolation such that the weights are not outside the interval [0,1]. Secondly, synthetic control makes the discrepancy between treated unit and the convex combination of untreated units transparent. Thirdly, the synthetic controls does not rely on post-treatment outcomes during the design phase which is in contrast to regression. Such pre-registration of synthetic control weights provides safeguard against specification searches⁷⁷ and p-hacking. Fourthly, the simplicity and transparency of counterfactual allows validating the use of the method and the direction of potential biases. Finally, the synthetic controls are sparse⁷⁸ compared to the regression. Sparsity plays an important role in interpretation and evaluation of the estimated post-intervention counter-factual. In comparison to difference in difference (the SCM is a special case of DiD with equal weights for all cross-sectional units) method the synthetic control method moves away from single control unit (or simple averages of control units). Secondly, it is sometimes difficult to establish the credibility of the control group and the parallel trend assumption making the synthetic control method a reliable choice. Also, for the smaller number of treated units the synthetic controls would be better than difference in difference.

The Setting and Estimation: Synthetic Control method

Let $J + 1$ be the number of units such that the first unit denotes the unit where the intervention takes place and rest of the J units be the part donor pool. The number of time periods be denoted by T with T_0 denoting the time period before intervention. Y_{jt} denotes the observed outcome of interest for unit j and time t . For each unit j we observe a set of k predictors of the outcome. The set of k predictors may also include the pre-intervention values

⁷⁶ The donor pool is the pool of units/states in our case, used to compute counterfactual.

⁷⁷ Specification searches and p-hacking are problems related to data mining such that a researcher can choose which result to report and thus present manipulated findings.

⁷⁸ Synthetic controls made of small number of comparison units.

of Y_{jt} . The $k * J$ matrix $X_0 = [X_2 \dots X_j]$ includes the values of predictors for the untreated units. Y_{1t}^I denotes the potential response under intervention for $t > T_0$ and Y_{1t}^N denotes potential response without intervention. The effect of intervention then is given by

$$1) \quad \tau_{1t} = Y_{1t}^I - Y_{1t}^N.$$

As noted earlier a synthetic control is the weighted average of the units in the donor pool we can represent synthetic control estimators Y_{1t}^N and τ_{1t} as

$$2) \quad Y_{1t}^N = \sum_{j=2}^{J+1} w_j Y_{jt}$$

with W a $(J * 1)$ vector is a set of weights, $W = (w_2, \dots, w_{J+1})'$

and

$$3) \quad \tau_{1t} = Y_{1t} - Y_{1t}^N \quad \text{note: } (Y_{1t} = Y_{1t}^I \text{ for } t > T_0)$$

The synthetic control is chosen, $W^* = (w_2^*, \dots, w_{J+1}^*)'$ that minimizes

$$4) \quad \|X_1 - X_0 W\| = \left(\sum_{h=1}^k v_h (X_{h1} - w_2 X_{h2} - \dots - w_{J+1} X_{hJ+1})^2 \right)^{1/2}$$

under the restriction w_2, \dots, w_{J+1} are non-negative and adds up to one. v_1, \dots, v_k are positive constants reflecting the relative importance of synthetic control reproducing the values of $X_{11} \dots X_{k1}$ for the treated unit (i.e. predictive power of variables $X_{11} \dots X_{k1}$ for approximating Y_{1t}^N). For a given set of weights, $V = (v_1, \dots, v_k)$ the minimizing equation is accomplished using constrained quadratic optimization. V is chosen such that the synthetic control minimize the mean squared prediction error (MSPE) with respect to Y_{1t}^N :

$$5) \quad \sum_{t \in \mathcal{T}_0} \left(Y_{1t} - w_2(V) Y_{2t} - \dots - w_{J+1}(V) Y_{J+1t} \right)^2$$

for some set $\mathcal{T}_0 \subseteq \{1, 2, \dots, T_0\}$ of pre-intervention periods. (alternatively ADH (2015) suggest choosing v_1, \dots, v_k via out of sample validation wherein the pre-intervention period is divided into training period and validation period and W^* is calculated using $W^* = W(V^*)$)

The treatment effect for the time $t = T_0 + 1, \dots, T$ is given by

$$6) \quad \tau_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}$$

5.3 Data Issues

One of the critical issues in utilization of the synthetic control method for impact evaluation is the requirement of data over a long period of time along with necessary predictors of the units. The other important requirement is the predictors to satisfy the convex hull condition⁷⁹. The additional requirement based on the type of question we are dealing (in this case prohibition policy) requires removal all the states which implemented the prohibition policy over the range of the period for which data is used. This effectively removes multiple states from the donor pool like Kerala, Tamil Nadu, Orissa, Gujarat, Andhra Pradesh, Haryana based on the state for which SCM is applied. Several predictors for states like Goa, and North-Eastern states are not available hence these states could not be always be used in the donor pool. Observing the necessary conditions mentioned above and small size of donor pool available, an alternative to whole of the state was required for application of the synthetic control method.

Considering all the required conditions, a feasible solution to the problem at hand comes out to be enlarging the donor pool along with the consideration that data of the necessary predictors can be obtained or estimated if required. Thus, the state was divided into sectors of rural and urban units and the necessary predictors were separately estimated for each of the units. This method was utilized for analysis of the expenditures in terms of budget shares of the households for the prohibition in the states of Andhra Pradesh and Haryana. The analysis on Orissa is neglected as the prohibition in this state was effective only for a single year.

In estimation for the Bihar prohibition the NSSO data was not released by the NSSO in the public domain. This restricts the analysis on household budget shares for Bihar. However, the analysis on state excise revenue could be conducted for the Bihar.

While dealing with state excise revenue we have used share of excise revenue in state's own tax revenue instead of excise revenue itself. This was necessary as state excise revenue data is very bouncy where as its share in state's own tax revenue does not vary as much⁸⁰. Secondly, it was not possible to divide the state excise revenue data into rural and urban counterparts, which becomes an important limitation of the available data. As Bihar is an

⁷⁹ It requires the differences in the characteristics of affected unit and the synthetic control should be as small as possible. i.e., $X_{11} - w_2 X_{12} - \dots - w_J X_{1J+1} \approx 0, \dots, X_{k1} - w_2 X_{k2} - \dots - w_J X_{kJ+1} \approx 0$ (Abadie, 2021)

⁸⁰ This does lead to some estimation issues compared to directly estimating based on state excise revenue (especially for partial prohibition) which remains as a caveat.

extreme state in most of the parameters/characteristics a good pretreatment fit would be difficult to obtain. Hence two types of results are reported on state excise revenue of Bihar. One is using the available values of share of state excise revenue (with the best possible pretreatment fit that can be obtained using the available set of predictors) and the other, first difference of state excise revenue as the share of state's own tax revenue.

Another important limitation with the available data that is worth noting is substantial fluctuations in estimated budget shares over the years in the NSSO rounds (due to its annual nature) and in state excise revenue. To address this issue moving averages was used to approximate the values whenever required.

5.4 Results (state-wise)

We explore the results on state finances and household expenditure state-wise considering each state has its own specific background for implementing the prohibition policy. For example, in Andhra Pradesh the precursor of prohibition policy has been education and propagation of stories (seetha-katha) among the women which led to a wide-spread protest by the women. Thus, any impact needs to be measured from precursor of prohibition rather than the date of prohibition itself. Hence, for Andhra Pradesh we note the impact of prohibition for the year 1993 (precursor), 1994 (Arrack Prohibition), 1995 and 1996 (Total Prohibition), 1997 (Arrack Prohibition). Similarly, for Haryana we note the impact for the years 1995 (precursor), 1996 and 1997 (Total Prohibition) and for Bihar we note the impact from the year 2015 (precursor) and 2016-2021 (Total Prohibition)⁸¹.

The following sub-section presents the results obtained using synthetic control methods.

It is observed that the method weights Karnataka the highest with the value 0.614 followed by Sikkim, Jammu & Kashmir and Punjab. The predictor balance for monthly per capita expenditure (log), scheduled caste percentage, and lagged year values of share of excise revenue resemble closely between treated and synthetic unit. The difference in the household size is not to the liking however, it is the smallest that can be achieved after iterating the procedure multiple times. The Figure 17 pictorially presents the difference and Table 10

⁸¹ Mahal (2001) and Rahman (2004) provides details on legislation over the years for total prohibition and arrack or partial prohibition.

presents the values numerically. The Figure 18 and Figure 19 presents the sensitivity analysis/robustness check of the findings pictorially using placebo⁸² and p-values tests.

Section 5.4.2 and all the rest of the subsection follows the similar lines of Section 5.4.1 For e.g. In the analysis of budget shares on food expenditure for Andhra Pradesh, UP urban receives the highest weight as 0.423 which is followed by Sikkim urban, Karnataka rural, Maharashtra rural, Punjab rural and Sikkim rural. This is followed by representation of predictor balance and sensitivity analysis/robustness check.

5.4.1 Impact on State Excise Revenue of Andhra Pradesh

Table 8 Synthetic Control Weights for Revenue Analysis in Andhra Pradesh

State	Synthetic Control Weight
Assam	0
Bihar	0
Goa	0
H.P.	0
J&K	0.142
Karnataka	0.614
M.P.	0
Maharashtra	0
Meghalaya	0
Punjab	0.036
Rajasthan	0
Sikkim	0.208
Tripura	0
U.P.	0
W.B.	0

Note: Authors estimation using Synthetic Control Method

Table 9 Synthetic Control Predictor Balance for Revenue Analysis in Andhra Pradesh

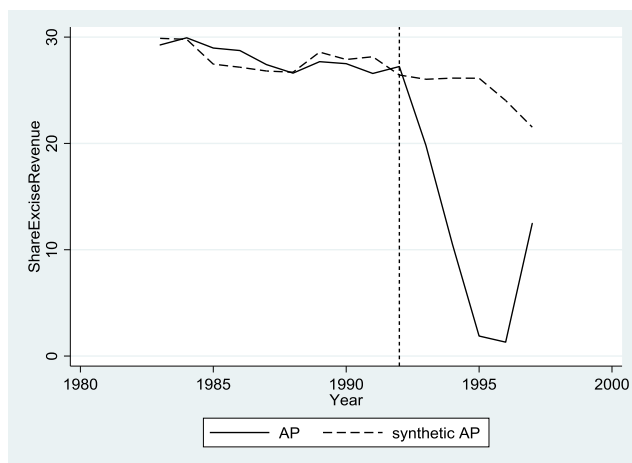
Predictor Variables	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	5.601073	5.66977
Household Size	4.391111	5.457046
Schedule Caste Percent	12.09798	11.63844
Share Excise Revenue (1983)	29.26132	29.88209
Share Excise Revenue (1985)	28.97033	27.45303
Share Excise Revenue (1987)	27.41273	26.81141

⁸² The placebo tests replaces the treated unit with untreated unit in each iteration. The resulting impact is considered robust when the actual treated unit stand out differently in comparison to the placebos.

Share Excise Revenue (1991)	26.57809	28.15217
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Note: Authors estimation using Synthetic Control Method

Figure 17 Synthetic Control Estimate for Revenue Analysis in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method. The Y-axis represents the share of excise revenue on state's own tax revenue, x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Table 10 Synthetic Control Impact measured for Revenue Analysis in Andhra Pradesh

Year	AP synthetic	AP treated	Difference
1993	26.03185	19.81304	6.218806
1994	26.1423	10.49598	15.64632
1995	26.13005	1.88475	24.2453
1996	24.03602	1.308935	22.72709
1997	21.53044	12.47591	9.054534

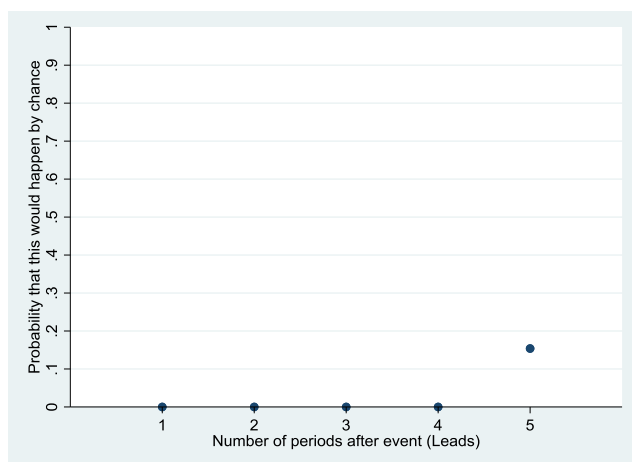
Note: Authors estimation using Synthetic Control Method

Figure 18 Synthetic Control Placebo for Revenue Analysis in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

Figure 19 Synthetic Control p-values Standardized for Revenue Analysis in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

5.4.2 Impact on Food Expenditure of the Households in Andhra Pradesh

Table 11 Synthetic Control Weights for Impact on Food Expenditures in Andhra Pradesh

State Unit	Synthetic Control Weight
Assam Rural	0
Assam Urban	0
Bihar Rural	0
Bihar Urban	0
Goa Rural	0
Goa Urban	0

H.P. Rural	0
H.P. Urban	0
J&K Rural	0
J&K Urban	0
Karnataka Rural	0.163
Karnataka Urban	0
M.P. Rural	0
M.P. Urban	0
Maharashtra Rural	0.066
Maharashtra Urban	0
Meghalaya Rural	0
Meghalaya Urban	0
Punjab Rural	0.047
Punjab Urban	0
Rajasthan Rural	0
Rajasthan Urban	0
Sikkim Rural	0.027
Sikkim Urban	0.275
Tripura Rural	0
Tripura Urban	0
U.P. Rural	0
U.P. Urban	0.423
W.B. Rural	0
W.B. Urban	0

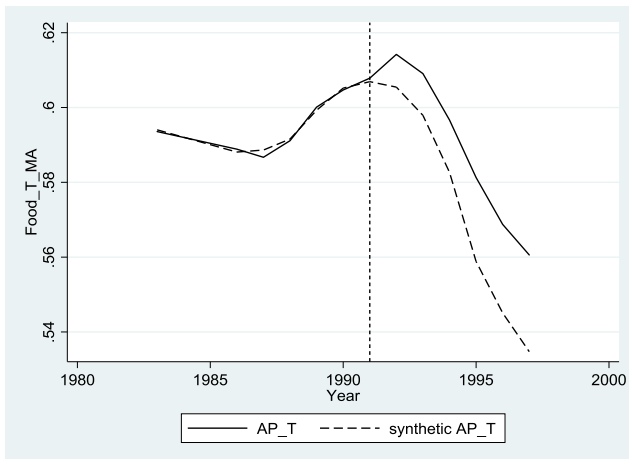
Note: Authors estimation using Synthetic Control Method

Table 12 Synthetic Control Predictor Balance for Impact on Food Expenditures in Andhra Pradesh

Predictors	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	5.718285	5.883213
Household Size	4.397258	5.067372
Miscellaneous Expenditure	0.160136	0.179516
Food BS (1983)	0.593569	0.594035
Food BS (1987)	0.586702	0.588629
Food BS (1989)	0.600113	0.599278
Food BS (1990)	0.604687	0.60519

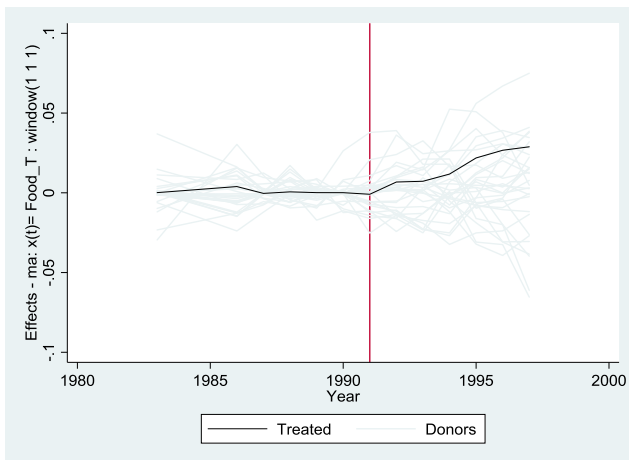
Note: Authors estimation using Synthetic Control Method

Figure 20 Synthetic Control Estimate for Impact on Food Expenditures in Andhra Pradesh



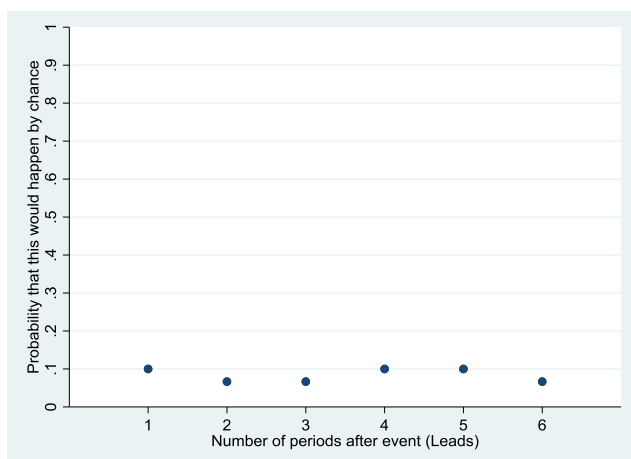
Note: Authors depiction using Synthetic Control Method. The Y-axis represents the moving averages of the food budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Figure 21 Synthetic Control Placebo for Impact on Food Expenditures in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

Figure 22 Synthetic Control p-values Standardized for Impact on Food Expenditures in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

5.4.3 Impact on Pan Tobacco Intoxicants Expenditure of the Households in

Andhra Pradesh

Table 13 Synthetic Control Weights for Impact on Pan Tobacco and Intoxicant Group Expenditures in Andhra Pradesh

State Unit	Synthetic Control Weight
Assam Rural	0
Assam Urban	0
Bihar Rural	0
Bihar Urban	0
Goa Rural	0
Goa Urban	0.005
H.P. Rural	0
H.P. Urban	0.178
J&K Rural	0
J&K Urban	0
Karnataka Rural	0
Karnataka Urban	0
M.P. Rural	0
M.P. Urban	0
Maharashtra Rural	0
Maharashtra Urban	0
Meghalaya Rural	0.228
Meghalaya Urban	0.056
Punjab Rural	0
Punjab Urban	0
Rajasthan Rural	0
Rajasthan Urban	0

Sikkim Rural	0
Sikkim Urban	0
Tripura Rural	0
Tripura Urban	0.487
U.P. Rural	0
U.P. Urban	0
W.B. Rural	0
W.B. Urban	0.047

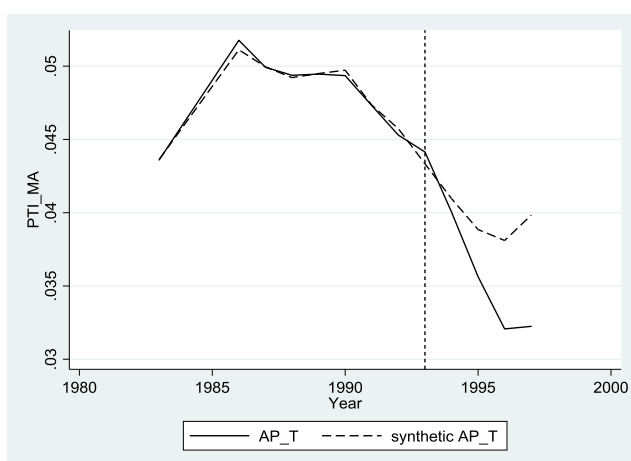
Note: Authors estimation using Synthetic Control Method

Table 14 Synthetic Control Predictor Balance for Impact on Pan Tobacco and Intoxicant Group Expenditures in Andhra Pradesh

	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	5.727703	6.073175
Household Size	4.425985	4.615599
Miscellaneous Expenditure	0.161343	0.157426
Pan Tobacco Intoxicants BS (1983)	0.043597	0.043636
Pan Tobacco Intoxicants BS (1987)	0.049924	0.049953
Pan Tobacco Intoxicants BS (1989)	0.049459	0.049497
Pan Tobacco Intoxicants BS (1991)	0.047314	0.047342

Note: Authors estimation using Synthetic Control Method

Figure 23 Synthetic Control Estimate of Impact on Pan Tobacco and Intoxicant Group Expenditures in Andhra Pradesh



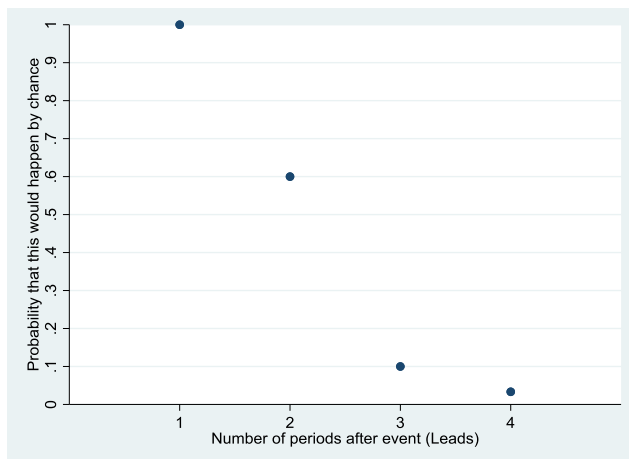
Note: Authors depiction using Synthetic Control Method. The Y-axis represents the moving averages of the Pan Tobacco & Intoxicants budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Figure 24 Synthetic Control Placebo of Impact on Pan Tobacco and Intoxicant Group Expenditures in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

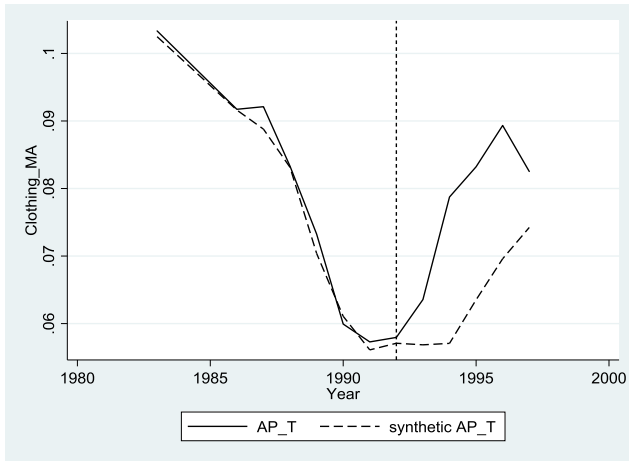
Figure 25 Synthetic Control p-values Standardized of Impact on Pan Tobacco and Intoxicant Group Expenditures in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

5.4.4 Impact on Clothing and Footwear Expenditure of the Households in Andhra Pradesh

Figure 26 Synthetic Control Estimate of Impact on Clothing Expenditure in Andhra Pradesh



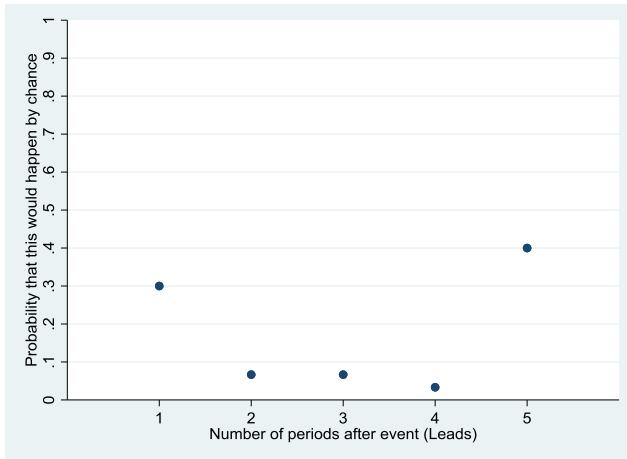
Note: Authors depiction using Synthetic Control Method. The Y-axis represents the moving averages of the clothing budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Figure 27 Synthetic Control Placebo of Impact on Clothing Expenditure in Andhra Pradesh



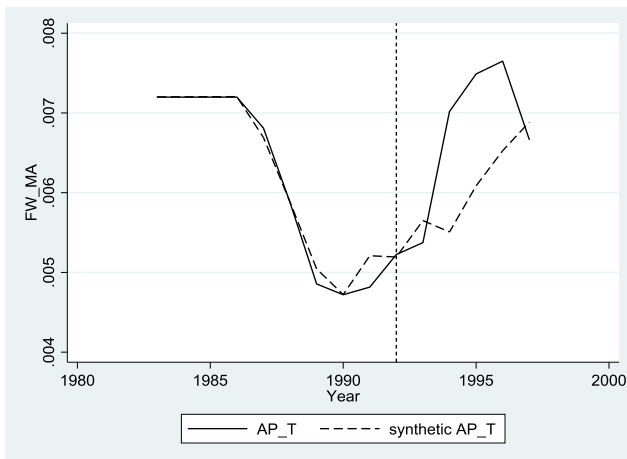
Note: Authors depiction using Synthetic Control Method

Figure 28 Synthetic Control p-values Standardized of Impact on Clothing Expenditure in Andhra Pradesh



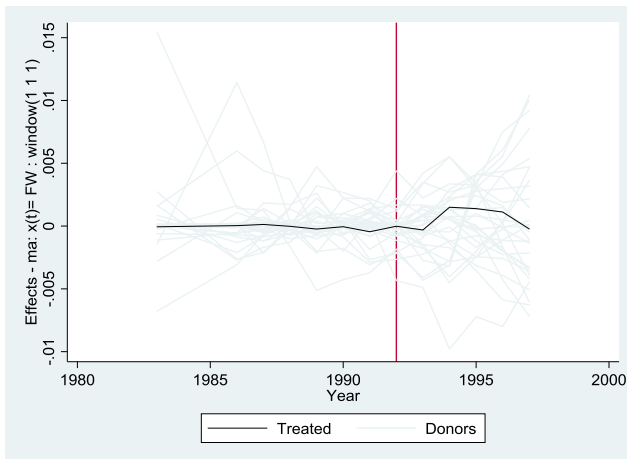
Note: Authors depiction using Synthetic Control Method

Figure 29 Synthetic Control Estimate of Impact on Footwear Expenditure in Andhra Pradesh



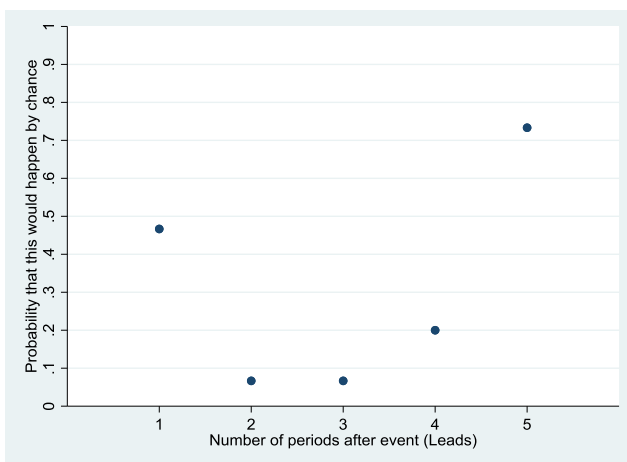
Note: Authors depiction using Synthetic Control Method. The Y-axis represents the moving averages of the footwear budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Figure 30 Synthetic Control Placebo of Impact on Footwear Expenditure in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

Figure 31 Synthetic Control p-values Standardized of Impact on Footwear Expenditure in Andhra Pradesh



Note: Authors depiction using Synthetic Control Method

5.4.5 Impact on State Excise Revenue of Haryana

Table 15 Synthetic Control Weights for Revenue Analysis in Haryana

State	Synthetic Control Weight
Assam	0
Bihar	0
Goa	0.122
H.P.	0
J&K	0

Karnataka	0
M.P.	0
Maharashtra	0
Meghalaya	0
Punjab	0.516
Rajasthan	0.18
Sikkim	0
Tripura	0.039
U.P.	0.144
W.B.	0

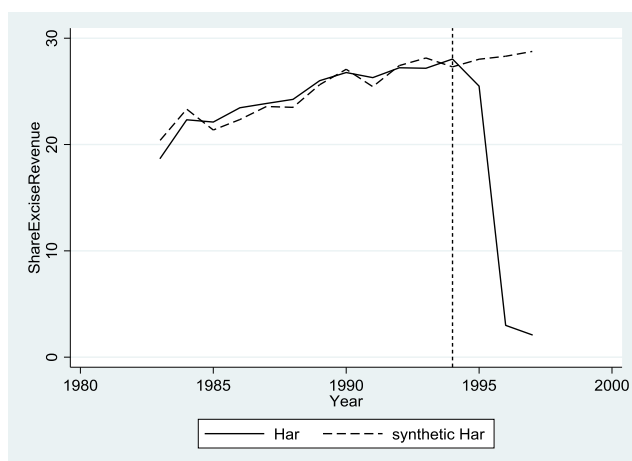
Note: Authors estimation using Synthetic Control Method

Table 16 Synthetic Control Predictor Balance for Revenue Analysis in Haryana

	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	5.973285	5.947266
Total Literacy	45.45455	45.49006
SC Percent	15.93235	17.52656
Household Size	5.771364	5.418103
Share Excise Revenue (1983)	18.69516	20.39565
Share Excise Revenue (1985)	22.11437	21.36682
Share Excise Revenue (1987)	23.86213	23.57889
Share Excise Revenue (1991)	26.29365	25.44458

Note: Authors estimation using Synthetic Control Method

Figure 32 Synthetic Control Estimate for Revenue Analysis in Haryana



Note: Authors depiction using Synthetic Control Method. The Y-axis represents the share of excise revenue on state's own tax revenue, x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Table 17 Synthetic Control Impact Measured for Revenue Analysis in Haryana

Year	Haryana Treated	Haryana Synthetic	Difference
1995	25.49425	28.02313	2.528887
1996	2.992366	28.30231	25.30994
1997	2.095304	28.75549	26.66019

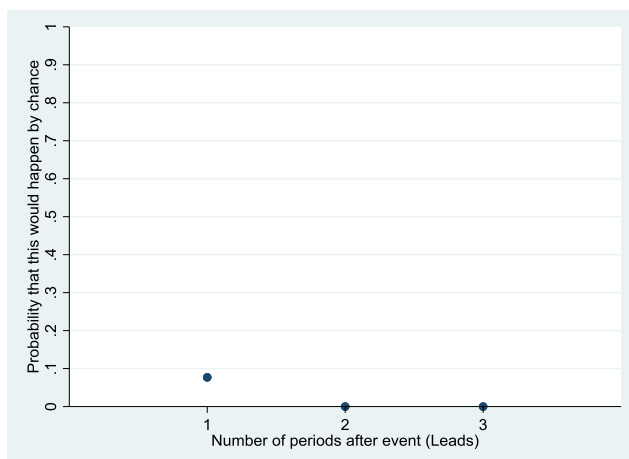
Note: Authors estimation using Synthetic Control Method

Figure 33 Synthetic Control Placebo for Revenue Analysis in Haryana



Note: Authors depiction using Synthetic Control Method

Figure 34 Synthetic Control p-values Standardized for Revenue Analysis in Haryana



Note: Authors depiction using Synthetic Control Method

5.4.6 Impact on Food Budget Shares in Haryana

Table 18 Synthetic Control weights for Impact on Food Expenditures in Haryana

State Unit	Synthetic Control Weight
Assam Rural	0
Assam Urban	0.283
Bihar Rural	0.076
Bihar Urban	0
Goa Rural	0
Goa Urban	0
H.P. Rural	0.174
H.P. Urban	0.011
J&K Rural	0
J&K Urban	0
Karnataka Rural	0
Karnataka Urban	0
M.P. Rural	0
M.P. Urban	0
Maharashtra Rural	0
Maharashtra Urban	0.255
Meghalaya Rural	0
Meghalaya Urban	0
Punjab Rural	0
Punjab Urban	0.062
Rajasthan Rural	0
Rajasthan Urban	0
Sikkim Rural	0
Sikkim Urban	0
Tripura Rural	0
Tripura Urban	0
U.P. Rural	0
U.P. Urban	0.14
W.B. Rural	0
W.B. Urban	0

Note: Authors estimation using Synthetic Control Method. The Y-axis represents the moving averages of the food budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

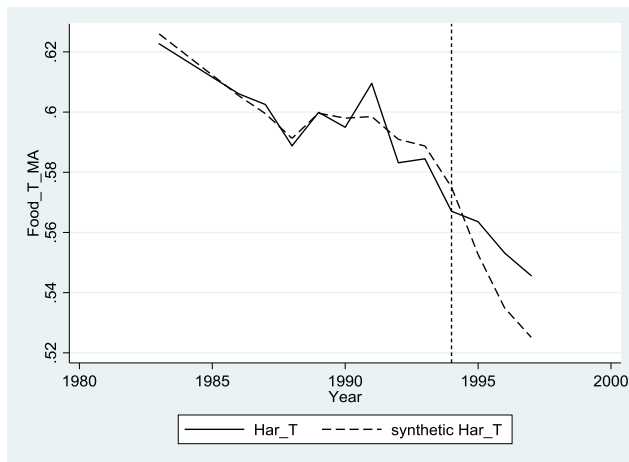
Table 19 Synthetic Control Predictor Balance for Impact on Food Expenditures in Haryana

	Treated	Synthetic
--	---------	-----------

Monthly Per Capita Expenditure, (log)	6.017865	6.003871
Household Size	5.451394	4.824996
Miscellaneous Expenditure	0.16155	0.174289
Food BS (1983)	0.622701	0.625983
Food BS (1986)	0.606058	0.605432
Food BS (1988)	0.588781	0.591275
Food BS (1991)	0.609558	0.598512
Food BS (1992)	0.583163	0.590941
Food BS (1994)	0.567049	0.575047

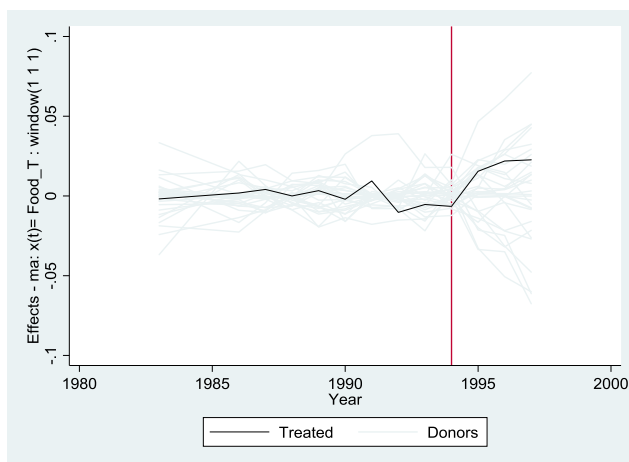
Note: Authors estimation using Synthetic Control Method

Figure 35 Synthetic Control Estimate for Impact on Food Expenditures in Haryana



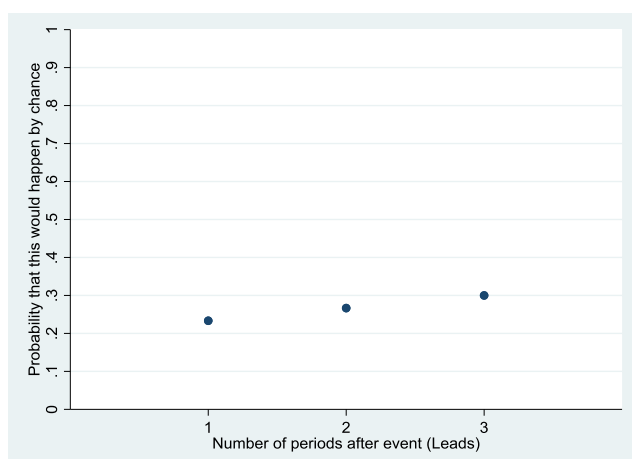
Note: Authors depiction using Synthetic Control Method

Figure 36 Synthetic Control Placebo for Impact on Food Expenditures in Haryana



Note: Authors depiction using Synthetic Control Method

Figure 37 Synthetic Control p-values Standardized for Impact on Food Expenditures in Haryana



Note: Authors depiction using Synthetic Control Method

5.4.7 Impact on Pan Tobacco Intoxicants Budget Shares in Haryana

Table 20 Synthetic Control Weights for Impact on Pan Tobacco and Intoxicant Group Expenditures in Haryana

State Unit	Synthetic Control Weight
Assam Rural	0.08
Assam Urban	0
Bihar Rural	0
Bihar Urban	0.343
Goa Rural	0
Goa Urban	0.002
H.P. Rural	0
H.P. Urban	0
J&K Rural	0
J&K Urban	0
Karnataka Rural	0
Karnataka Urban	0
M.P. Rural	0
M.P. Urban	0
Maharashtra Rural	0
Maharashtra Urban	0
Meghalaya Rural	0
Meghalaya Urban	0
Punjab Rural	0
Punjab Urban	0
Rajasthan Rural	0
Rajasthan Urban	0

Sikkim Rural	0
Sikkim Urban	0
Tripura Rural	0
Tripura Urban	0.321
U.P. Rural	0.254
U.P. Urban	0
W.B. Rural	0
W.B. Urban	0

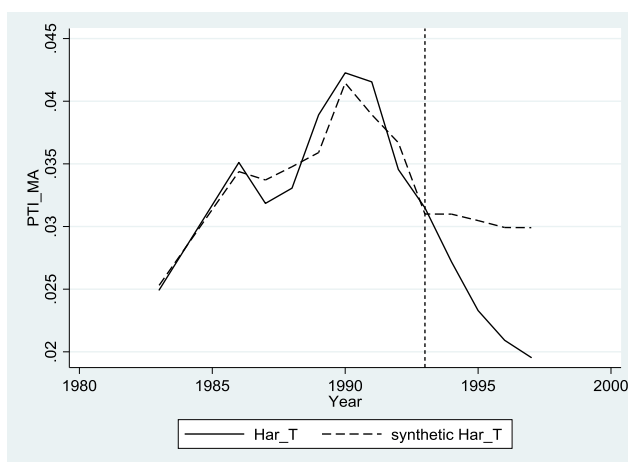
Note: Authors estimation using Synthetic Control Method. The Y-axis represents the moving averages of the Pan Tobacco & Intoxicants budget shares and x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Table 21 Synthetic Control Predictor Balance for Impact on Pan Tobacco and Intoxicant Group Expenditures in Haryana

	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	6.018791	5.809448
Household Size	5.523504	5.032512
Miscellaneous Expenditure	0.158996	0.150009
Pan Tobacco Intoxicants BS (1983)	0.024935	0.025307
Pan Tobacco Intoxicants BS (1986)	0.035111	0.034384
Pan Tobacco Intoxicants BS (1988)	0.033064	0.034772
Pan Tobacco Intoxicants BS (1990)	0.042265	0.041455
Pan Tobacco Intoxicants BS (1992)	0.034552	0.036692

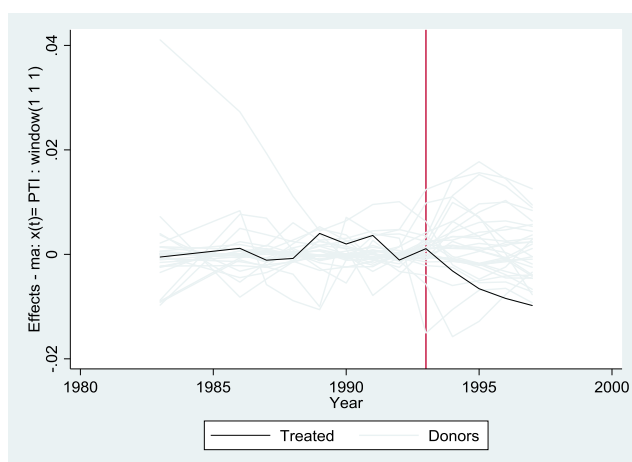
Note: Authors estimation using Synthetic Control Method

Figure 38 Synthetic Control Estimate for Impact on Pan Tobacco and Intoxicant Group Expenditures in Haryana



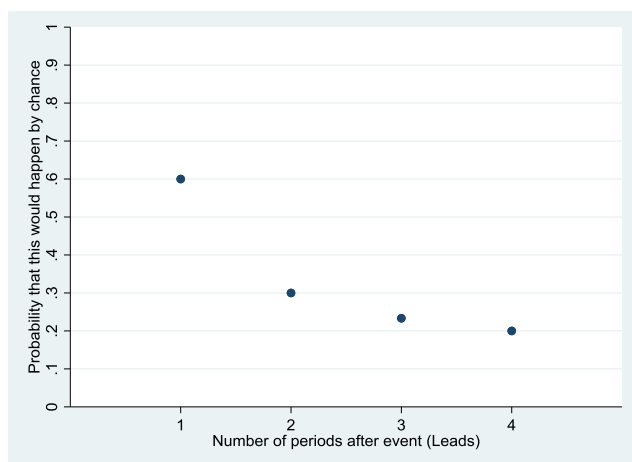
Note: Authors depiction using Synthetic Control Method

Figure 39 Synthetic Control Placebo for Impact on Pan Tobacco and Intoxicant Group Expenditures in Haryana



Note: Authors depiction using Synthetic Control Method

Figure 40 Synthetic Control p-values Standardized for Impact on Pan Tobacco and Intoxicant Group Expenditures in Haryana



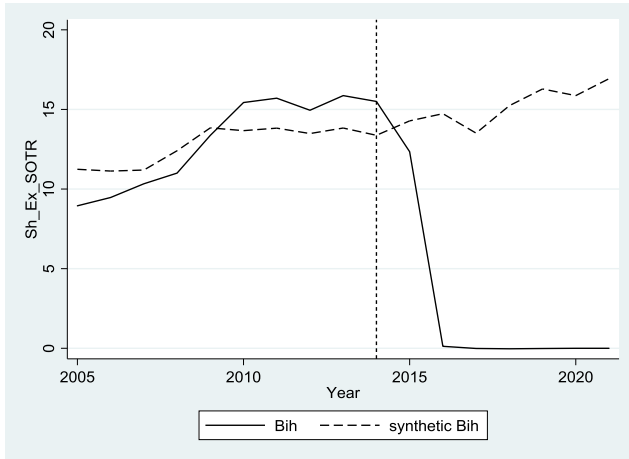
Note: Authors depiction using Synthetic Control Method

5.4.8 Impact on State Excise Revenue of Bihar

The Impact on state excise revenue was tried using the standard/previously-used method; however, considering the characteristics of the state which has extreme characteristics in the Indian context, it was not possible to develop a reasonable counterfactual such that the

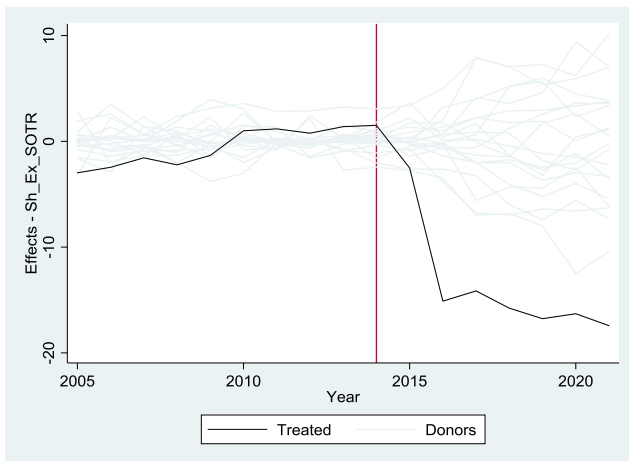
pre-treatment fit and root mean squared probability error (RMSPE) is reliable. The output of this exercise along placebo and P-values is shown in the following figures.

Figure 41 Synthetic Control Estimate for Impact on Revenue Analysis of Bihar



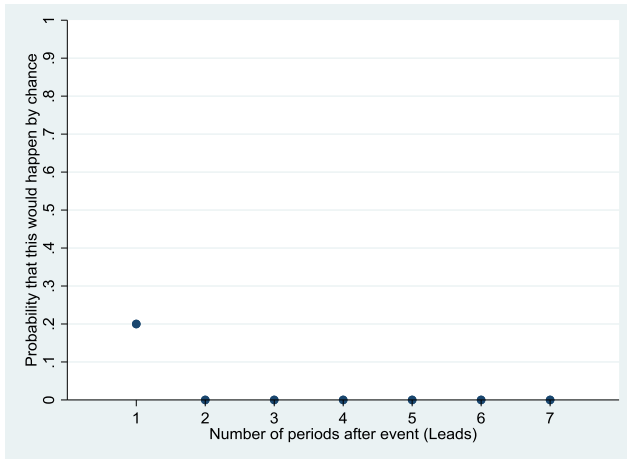
Note: Authors depiction using Synthetic Control Method. The Y-axis represents the share of excise revenue on state's own tax revenue, x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.

Figure 42 Synthetic Control Placebo for Impact on Revenue Analysis of Bihar



Note: Authors depiction using Synthetic Control Method

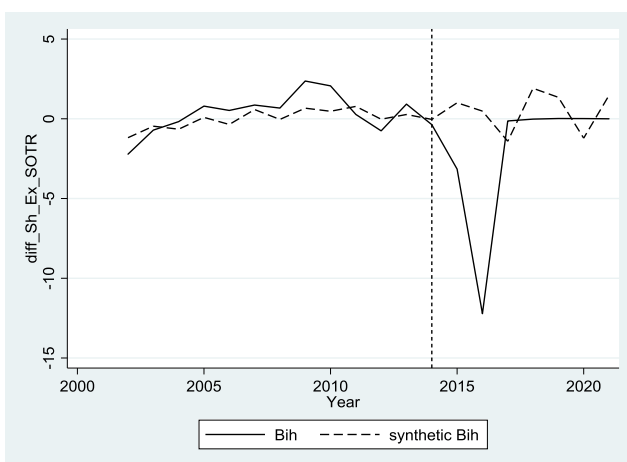
Figure 43 Synthetic Control p-values Standardized for Impact on Revenue Analysis of Bihar



Note: Authors depiction using Synthetic Control Method

Additionally, as an alternative to overcome this issue, a difference method is tried with the synthetic control method. Here we use the difference of present value from its previous value and use it as the indication of shock or the treatment. Hence in the case of Bihar, the difference of revenue in 2015 from 2014 is indicative of shock due to precursor of prohibition and difference between revenues from 2016 from 2015 is the shock due to first year of prohibition. We match the states in the same way we matched the states previously (using the state level predictors). Using this method, a good/reliable pre-treatment fit and low RMSPE was obtained. The output of this method is shown in the Fig 47.

Figure 44 Synthetic Control Estimate for Impact on Revenue Analysis of Bihar using Difference Method



Note: Authors depiction using Synthetic Control Method

**The Y-axis represents the difference in share of excise revenue on state's own tax revenue, x-axis represents the year and the dotted vertical line represents the year from which the impact is measured.*

The synthetic control weights of the units, the predictor balance, and the estimated impact is shown in the following tables.

Table 22 Synthetic Control Weights for Revenue Analysis in Bihar

State	Synthetic Control Weight
A.P.	0
Assam	0.447
Chhatisghar	0
Goa	0
H.P.	0
Haryana	0
J&K	0
Jharkhand	0
Karnataka	0
Kerala	0
M.P.	0
Maharashtra	0
Meghalaya	0
Orrissa	0.553
Punjab	0
Rajasthan	0
Sikkim	0
T.N.	0
Tripura	0
U.P.	0
W.B.	0

Note: Authors estimation using Synthetic Control Method

Table 23 Synthetic Control Predictor for Revenue Analysis in Bihar

	Treated	Synthetic
Monthly Per Capita Expenditure, (log)	6.302245	6.373047
Household Size Rural	5.442857	4.854915
Casual labour Rural	115	124.127
Food BS Rural	0.546975	0.54052
diff Share Excise revenue (2002)	-2.21702	-1.18471
diff Share Excise revenue (2005)	0.793953	0.08922
diff Share Excise revenue (2008)	0.671876	-0.03952
diff Share Excise revenue (2010)	2.063252	0.47091
diff Share Excise revenue (2013)	0.919895	0.270004

Note: Authors estimation using Synthetic Control Method

Table 24 Synthetic Control Impact measured for Revenue Analysis in Bihar

Year	Bihar Synthetic	Bihar Treated	Difference
2014	15.50143	15.50143	0
2015	16.50553	12.34523	4.160297
2016	16.98806	0.124925	16.86313
2017	15.57757	-0.01155	15.58912
2018	17.4887	-0.03121	17.51991
2019	18.83488	-0.01373	18.84862
2020	17.62044	0	17.62044
2021	19.09003	0	19.09003

Note: Authors estimation using Synthetic Control Method

5.5 Discussion & Conclusion

The analyses by states confirm a substantial fall in revenue due to prohibition. In the year 1993 for Andhra Pradesh the state's excise revenue as a share of state's own tax revenue has fallen by 6.22 percent. This fallen share is attributed to women's agitation in the year 1993. In the year 1994 when arrack prohibition was introduced a fall off 15.64 percent of state's excise revenue as a share of state's own tax revenue is estimated. In the year of total prohibition 1995 and 1996 the fall measured is 24.25 percent and 22.73 percent respectively⁸³. In the year 1997 when total prohibition is removed however the arrack prohibition remains in force the fall measured is 9.05 percent. To develop an approximation 6.22 percent of state's own tax revenue equals Rs. 203.323 crore with reference to the year 1992. The cumulative loss from 1993 to 1997 in 1992 prices⁸⁴ is Rs. 2639.54 crore. Similarly, for Haryana, for the first year of women's movement (year 1995) the estimated fall in state's excise revenue as a share of state's own tax revenue is 2.53 percent whereas due to total prohibition in the year 1996 and 1997 the estimated fall is 25.31 percent and 26.66 percent respectively. Estimating this with reference

⁸³ These are the most relevant estimates for our analysis as it reflects the impact of total prohibition on excise revenues which almost becomes zero due to enactment of prohibition law.

⁸⁴ Estimated with reference to the year 1992 as states own tax revenue in post-intervention years would itself be affected by low state excise collections.

to year 1994⁸⁵, the loss in the year 1995 is estimated to be Rs 47.76 crore and cumulative loss for the years 1995, 1996 and 1997 equals Rs. 1029.07 crore in 1994 prices. The losses for the state of Bihar in the year 2015 is estimated to be Rs. 863.2 crores. The estimated cumulative loss (with reference to the year 2014⁸⁶) from 2015 to 2021 is estimated to be Rs. 22781.66 crores in 2014 prices. It must be noted all the estimates of the losses will be lower bound as estimation for enforcement was not possible⁸⁷. Secondly, the estimations for the total prohibition years are the most relevant ones, as the share of excise revenue in state's own tax revenue becomes zero for the prohibition years and contrarily, for all the other years' state's own tax revenue (which is the base used) in itself is affected by fall in state's excise revenue.

The other important aspect that can be observed is about the trends of state excise as a share of state's own tax revenue. The trend based on estimated counterfactual suggest a falling share of excise revenue over the years post prohibition (1993-1997) in Andhra Pradesh. Contrarily the share is rising for Haryana (1994-1997). In the case of Bihar, the trend would have been rising and would have been highest in the years 2019, 2020 and 2021 which are corresponding to pandemic (Covid-19) years.

The analyses on household budget shares for the state of Andhra Pradesh suggests higher food budget shares during the years of women's movement, arrack prohibition and total prohibition; lower budget shares in pan tobacco and intoxicants group during the prohibition years. The results also suggest higher expenditure in clothing and foot wears during the arrack prohibition and total prohibition years.

The difference in the years of women's movements (1992 & 1993) the rise in food budget shares is about 1 percent. In the year of arrack prohibition (1994) the rise is 1.47 percent whereas during the years of total prohibition (i.e.1995 & 1996) the rise is of about 2.4 percent. For Pan Tobacco Intoxicants group their budget shares see a decrease of 0.3 percent (from 3.8 percent to 3.5 percent) and 0.6 percent (from 3.8 percent to 3.2 percent) and 0.7 percent (from 3.9 percent to 3.2 percent) for the year 1995, 1996 and 1997 respectively. The budget share in

⁸⁵ Estimated with reference to the year 1994 as states own tax revenue in post-intervention years would itself be affected by low state excise collections.

⁸⁶ Estimated with reference to the year 2014 as states own tax revenue in post-intervention years would itself be affected by low state excise collections.

⁸⁷ Alternatively, instead of excise tax revenue as a share of state's own tax revenue it is possible to use excise tax revenue as a share of net or gross state domestic product. However, analyses here is kept restricted to excise tax revenue as a share of state's own tax revenue only.

clothing sees a rise by around 2 percent for the years 1994, 1995 and 1996. The budget share in footwear also sees a rise in the year 1994, 1995 and 1996.

All the results of excise revenues for Andhra Pradesh, Haryana and Bihar along with budget shares for Andhra Pradesh are robust to backdating, additional set of predictors and sensitivity analyses using placebo tests. However, the results for budget shares of Haryana state has higher probability to be obtained by chance hence we consider these results as only of probable nature.

In the case of Haryana, we obtain similar results for budget shares of food as well as pan tobacco and intoxicant group. For the year 1995 the budget share of food group is higher by 1 percent (55 percent to 56 percent) which increases to 1.8 percent and 2 percent respectively in the year of total prohibition i.e. 1996 and 1997 respectively. Similarly, the budget shares of pan tobacco intoxicants reduces by 0.8 percent (3.1 percent to 2.3 percent) and 0.9 percent (3.1 percent to 2.2 percent). The other groups of budget share were also tried with but due to unacceptable pre-treatment fit and predictor balance, the results were discarded.

In conclusion, prohibition policies lead to a substantial decline in a state's own tax revenue, often resulting in reduced expenditure on development and social sectors, including education, sports, art and culture, water supply and sanitation, district administration, and welfare (See Appendix 5.7.3 & 5.7.4 as a case of Andhra Pradesh and Haryana). Under such circumstances, states typically need to rely on central assistance and grants to sustain the prohibition policy (See Appendix 5.7.5 as a case of Bihar). On the positive side, the short-term benefits of women's education movements and prohibition measures include increased expenditure on food, clothing, and footwear, along with reduced spending on intoxicants such as pan tobacco and liquor.

5.7 Appendix

5.7.1 Relative importance of various sources of revenues

Table 5.7.1.1 Relative importance of various sources of revenues for Andhra

Pradesh as a percentage of State's Own Tax Revenue

Fiscal Year	Income	Property & CT	Commodity	Excise
2000-2001	1.31	7.59	91.10	11.78
2001-2002	9.05	6.61	84.34	13.15
2002-2003	1.25	8.65	90.09	14.71
2003-2004	1.22	8.32	90.46	13.87
2004-2005	1.11	8.76	90.13	12.87
2005-2006	1.18	10.86	87.96	13.98
2006-2007	1.30	12.56	86.14	14.36
2007-2008	1.24	11.53	87.23	14.03
2008-2009	1.12	9.42	89.46	17.24
2009-2010	1.22	8.31	90.47	16.63
2010-2011	1.09	9.11	89.81	18.31
2011-2012	1.01	8.79	90.20	18.04
2012-2013	0.97	9.10	89.93	15.25
2013-2014	0.81	7.25	91.94	9.75
2014-2015	0.69	8.11	91.20	10.21

Note: CT refers to Capital Transactions; Excise is a part of Commodity Tax Revenue

Table 5.7.1.2 Relative importance of various sources of revenues for Bihar as a percentage of State's Own Tax Revenue

Fiscal Year	Income	Property & CT	Commodity	Excise
2000-2001	0.00	12.99	87.01	9.40
2001-2002	0.00	15.35	84.65	11.26
2002-2003	0.00	16.50	83.50	9.04
2003-2004	0.00	16.51	83.49	8.33
2004-2005	-0.02	13.84	86.18	8.15
2005-2006	0.00	15.74	84.26	8.95
2006-2007	0.00	13.13	86.87	9.47
2007-2008	0.00	14.48	85.52	10.33
2008-2009	0.00	13.25	86.75	11.00
2009-2010	0.00	13.87	86.13	13.37
2010-2011	0.00	12.54	87.46	15.43
2011-2012	0.23	13.06	86.70	15.71
2012-2013	0.23	14.63	85.14	14.95
2013-2014	0.24	14.60	85.16	15.87
2014-2015	0.26	14.35	85.39	15.50

Note: CT refers to Capital Transactions; Excise is a part of Commodity Tax Revenue

Table 5.7.1.3 Relative importance of various sources of revenues for Haryana as a percentage of State's Own Tax Revenue

Fiscal Year	Income	Property & CT	Commodity	Excise
2000-2001	0.02	10.00	89.98	19.50
2001-2002	0.02	10.21	89.77	17.60
2002-2003	0.00	9.93	90.07	15.83
2003-2004	0.00	11.27	88.73	14.54
2004-2005	0.00	9.92	90.08	13.62
2005-2006	0.00	14.90	85.10	12.19
2006-2007	0.00	16.27	83.73	11.14
2007-2008	0.00	15.26	84.74	11.87
2008-2009	0.00	11.45	88.55	12.17
2009-2010	0.00	9.86	90.14	15.58
2010-2011	0.00	13.87	86.13	14.09
2011-2012	0.00	13.75	86.25	13.88
2012-2013	0.00	14.17	85.83	13.74
2013-2014	0.00	12.57	87.43	14.46
2014-2015	0.00	11.30	88.70	12.56

Note: CT refers to Capital Transactions; Excise is a part of Commodity Tax Revenue

5.7.2 Share of various liquor types in State Excise before and during prohibition

Year	State	State Excise	Share_CS	Share_CFL	Share_ML	Share_FL
1990-91	Andhra Pradesh	727.98	77.76	7.25	1.80	14.04
1991-92	Andhra Pradesh	811.95	77.63	8.01	1.67	12.21
1992-93	Andhra Pradesh	922.8	71.97	10.13	1.94	15.32
1993-94	Andhra Pradesh	759.42	48.92	9.12	2.05	38.57
1994-95	Andhra Pradesh	443.71	5.11	11.96	2.37	72.08
1995-96	Andhra Pradesh	77.66	NA	NA	NA	NA
1996-97	Andhra Pradesh	63.9	1.77	70.12	0.25	16.05
1997-98	Andhra Pradesh	887.48	5.13	8.38	2.44	81.89
1998-99	Andhra Pradesh	924.01	3.56	6.27	5.83	83.00
1990-91	Haryana	286.35	93.07	0.00	0.00	0.47
1991-92	Haryana	341.87	92.37	0.00	0.00	0.95
1992-93	Haryana	393.84	92.36	0.00	0.00	2.47
1993-94	Haryana	431.76	83.66	0.00	0.00	2.33
1994-95	Haryana	529.35	70.68	0.00	0.47	2.31
1995-96	Haryana	552.96	70.36	0.00	0.00	0.00
1996-97	Haryana	64.13	54.44	0.00	0.00	0.68
1997-98	Haryana	49.63	46.53	0.11	0.00	0.00
1998-99	Haryana	774.63	91.67	0.04	0.00	28.44
2011-12	Bihar	1980.98	31.52	0.00	0.27	65.31

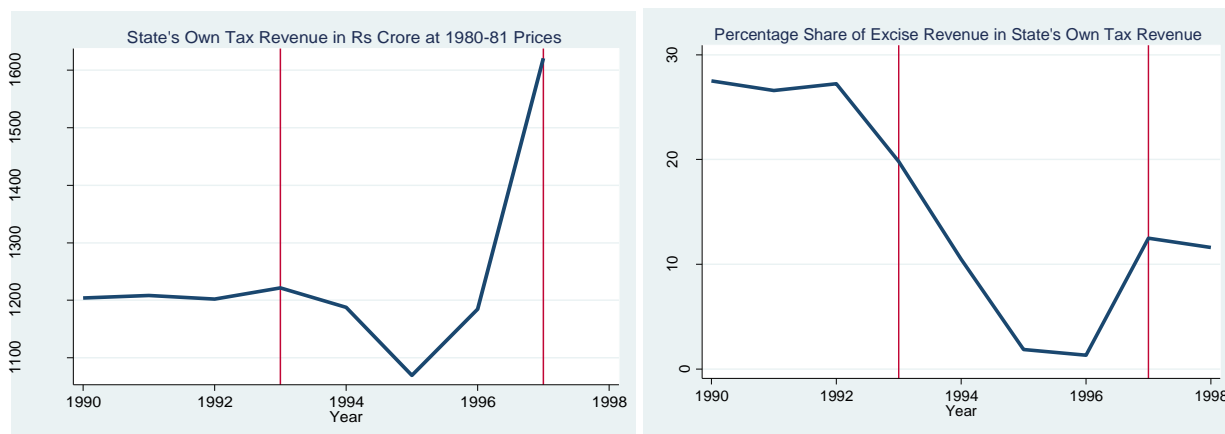
2012-13	Bihar	2429.82	31.96	0.00	0.26	64.99
2103-14	Bihar	3167.72	38.61	0.16	0.29	58.54
2014-15	Bihar	3216.58	41.20	0.75	0.25	55.25
2015-16	Bihar	3141.75	41.46	0.00	0.07	56.76
2016-17	Bihar	29.66	49.73	0.00	0.06	86.57
2017-18	Bihar	-3.43	11.52	0.00	0.00	

Note: Share_CS refers to Share of Country Spirit; Share_CFL refers to Share of Country Fermented Liquor; Share_ML refers to Share of Malt Liquor; Share_FL refers to Share of Foreign Liquor and Spirits; NA refers Not Available.

5.7.3 Revenue and Expenditure in Andhra Pradesh

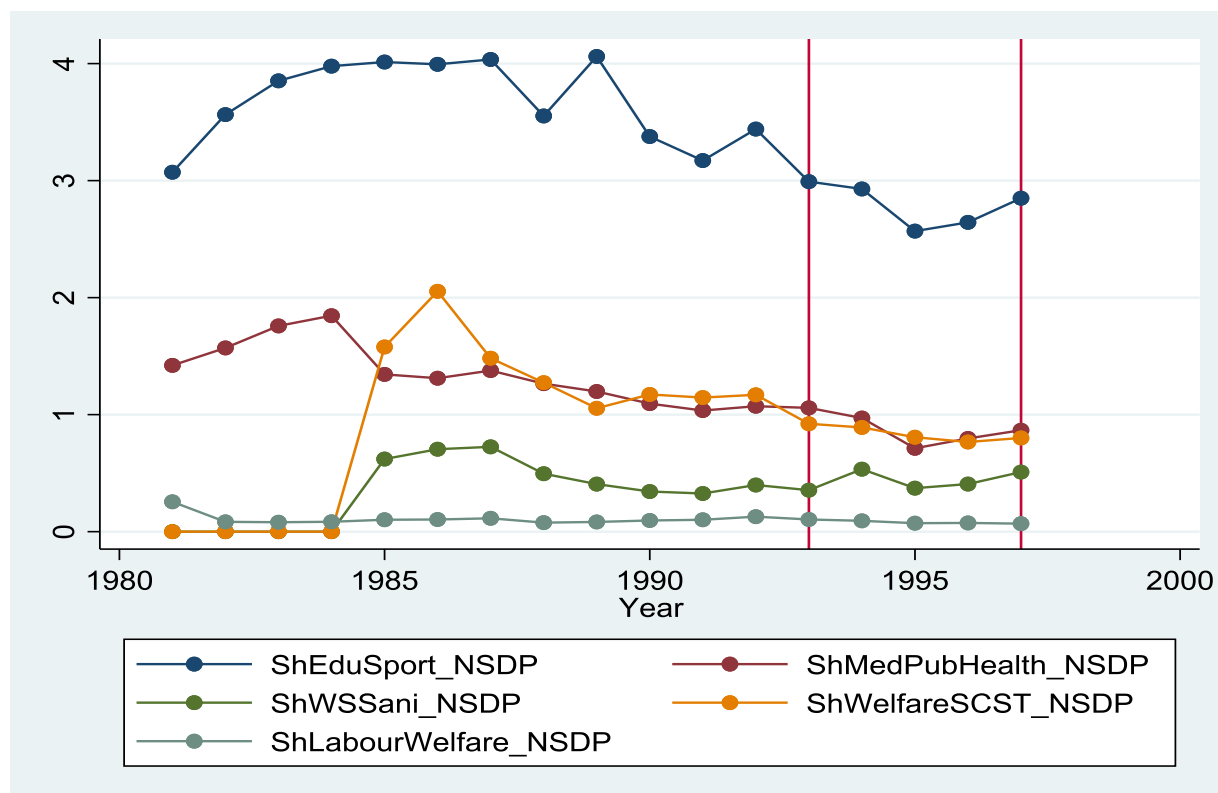
5.7.3.1 State's Own Tax Revenue and Share of Excise Revenue in State's Own Tax

Revenue



Note: Author's depiction using Annual Financial Statements of Andhra Pradesh data

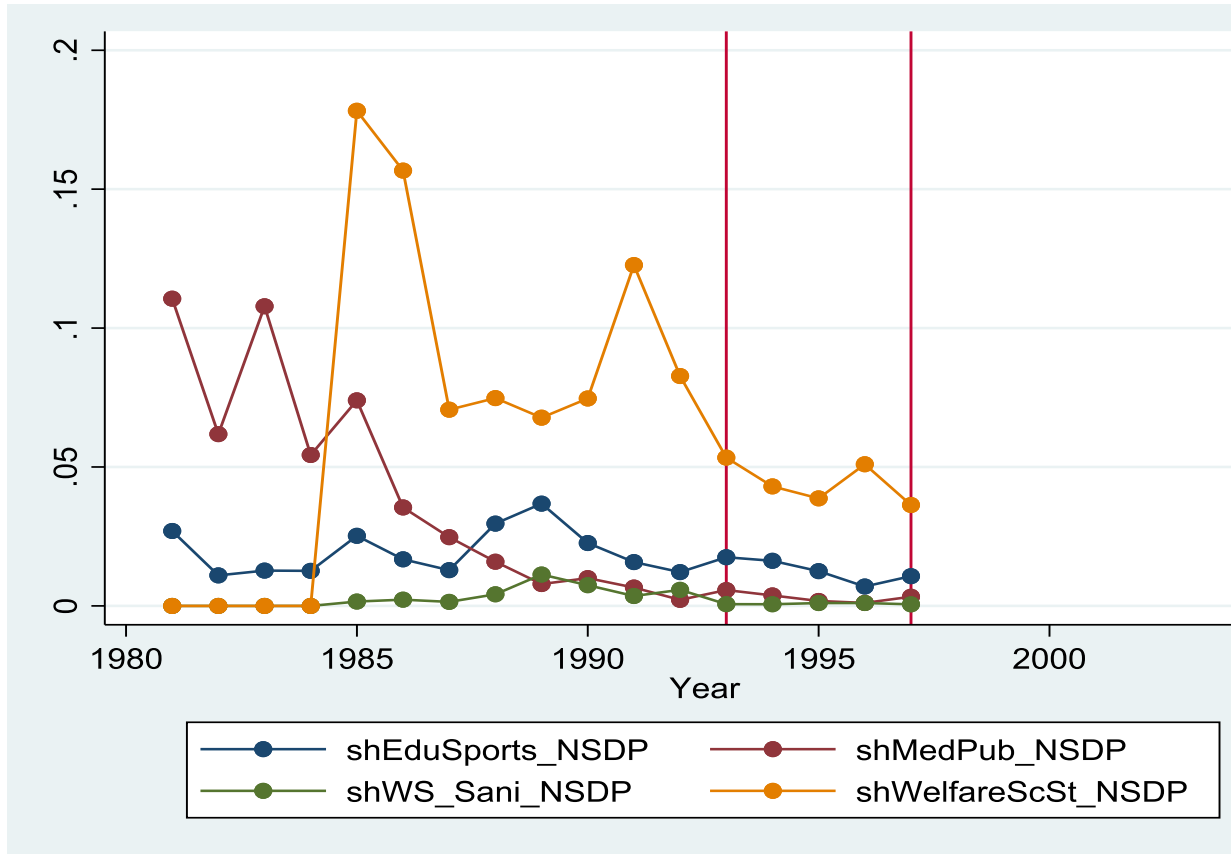
5.7.3.2 Revenue expenditure share of NSDP



Note: Author's depiction using Annual Financial Statements of Andhra Pradesh data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation;

WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe; LabourWelfare denotes Labour and Labour Welfare Revenue Expenditure Heads.

5.7.3.3 Capital expenditure share of NSDP

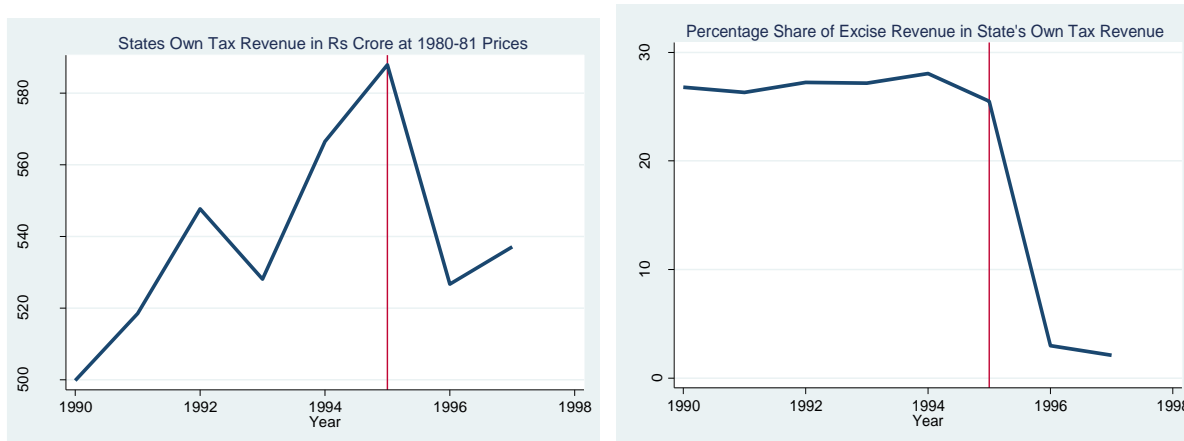


Note: Author's depiction using Annual Financial Statements of Andhra Pradesh data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation; WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe Capital Expenditure Heads.

5.7.4 Revenue and Expenditure in Haryana

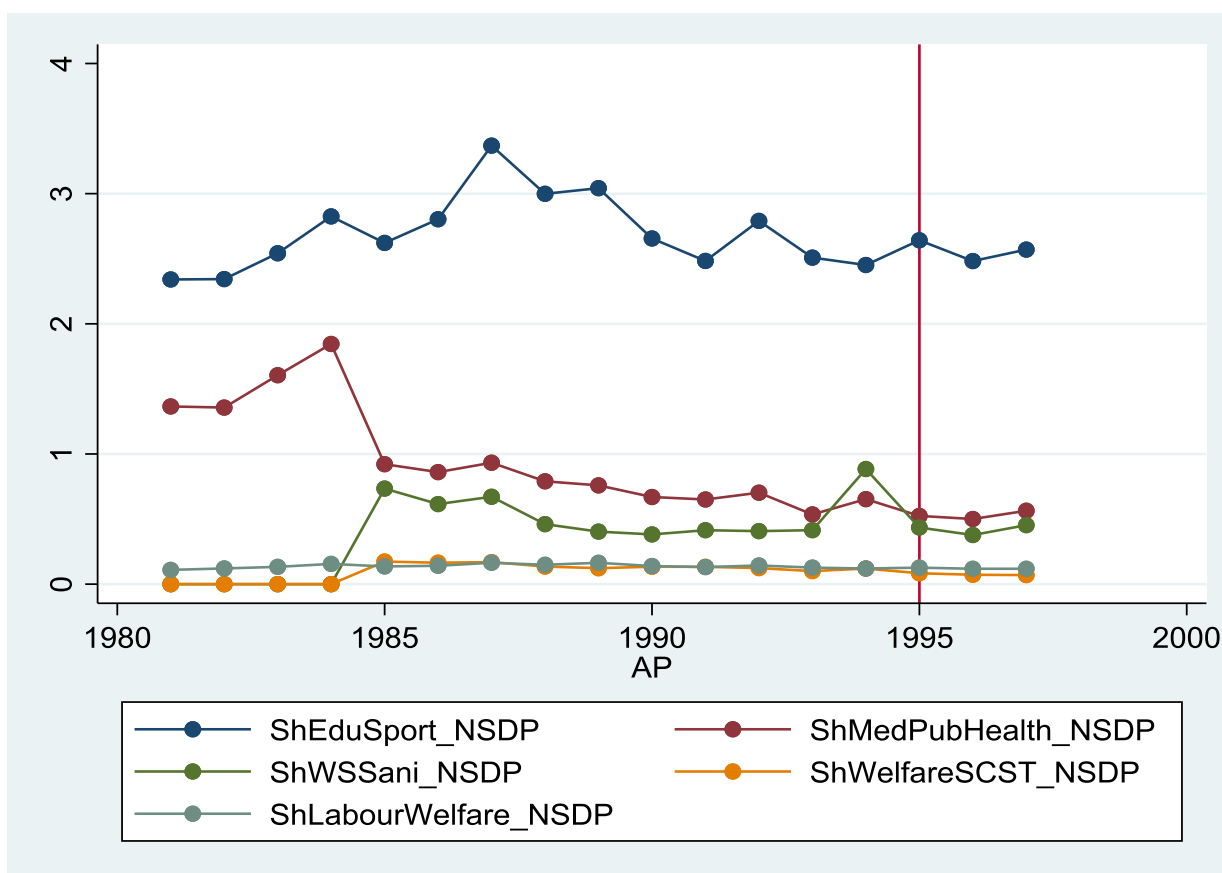
5.7.4.1 State's Own Tax Revenue and Share of Excise Revenue in State's Own Tax

Revenue



Note: Author's depiction using Annual Financial Statements of Haryana data.

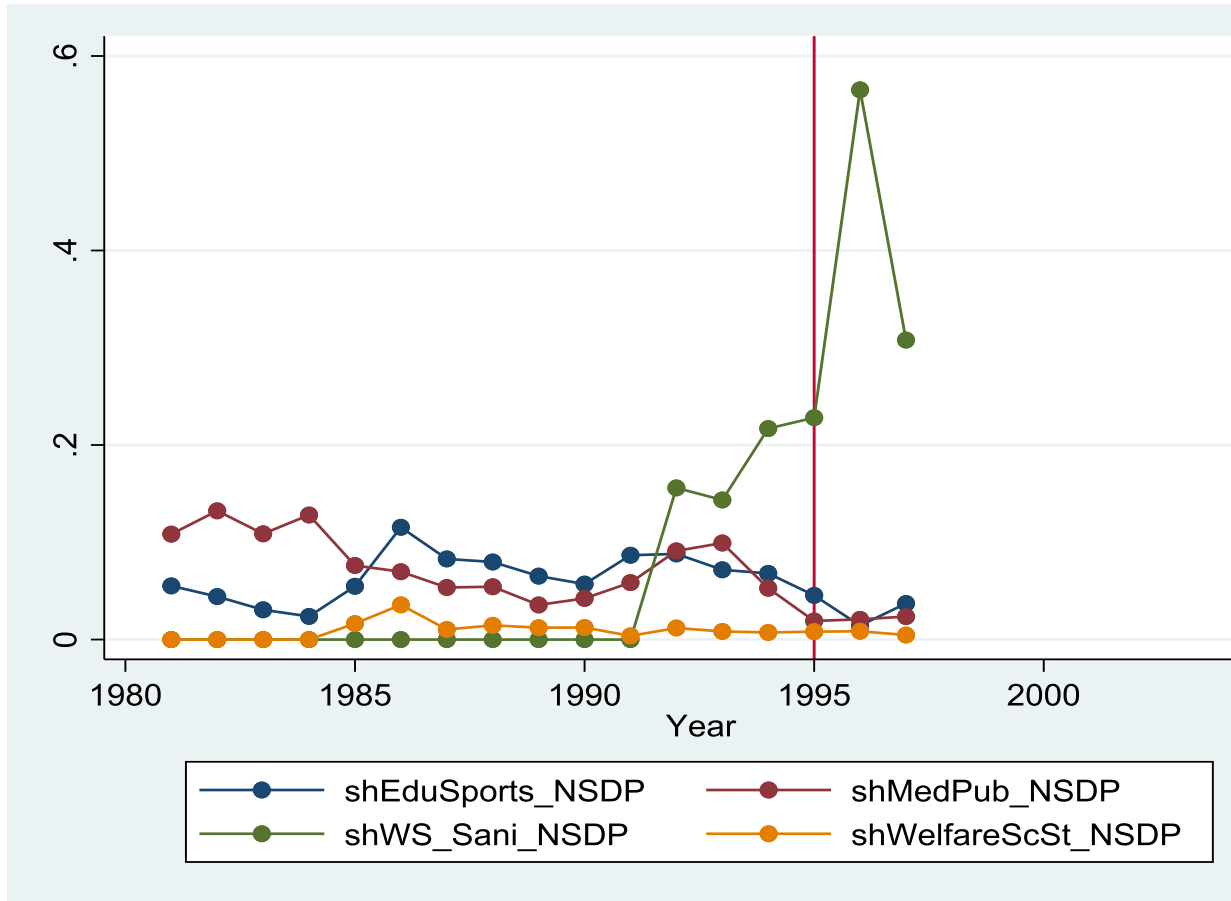
5.7.4.2 Revenue expenditure share of NSDP



Note: Author's depiction using Annual Financial Statements of Haryana data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation;

WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe; LabourWelfare denotes Labour and Labour Welfare Revenue Expenditure Heads.

5.7.4.3 Capital expenditure share of NSDP

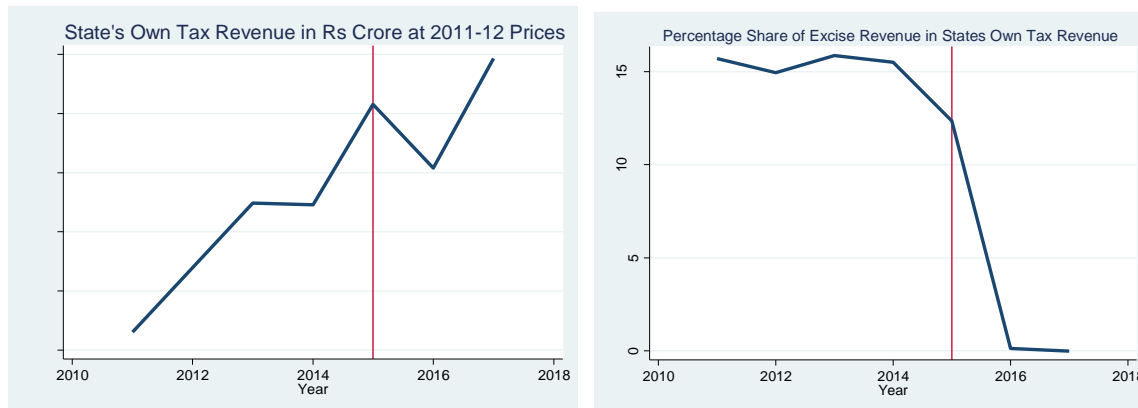


Note: Author's depiction using Annual Financial Statements of Haryana data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation; WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe Capital Expenditure Heads.

5.7.5 Revenue and Expenditure in Bihar

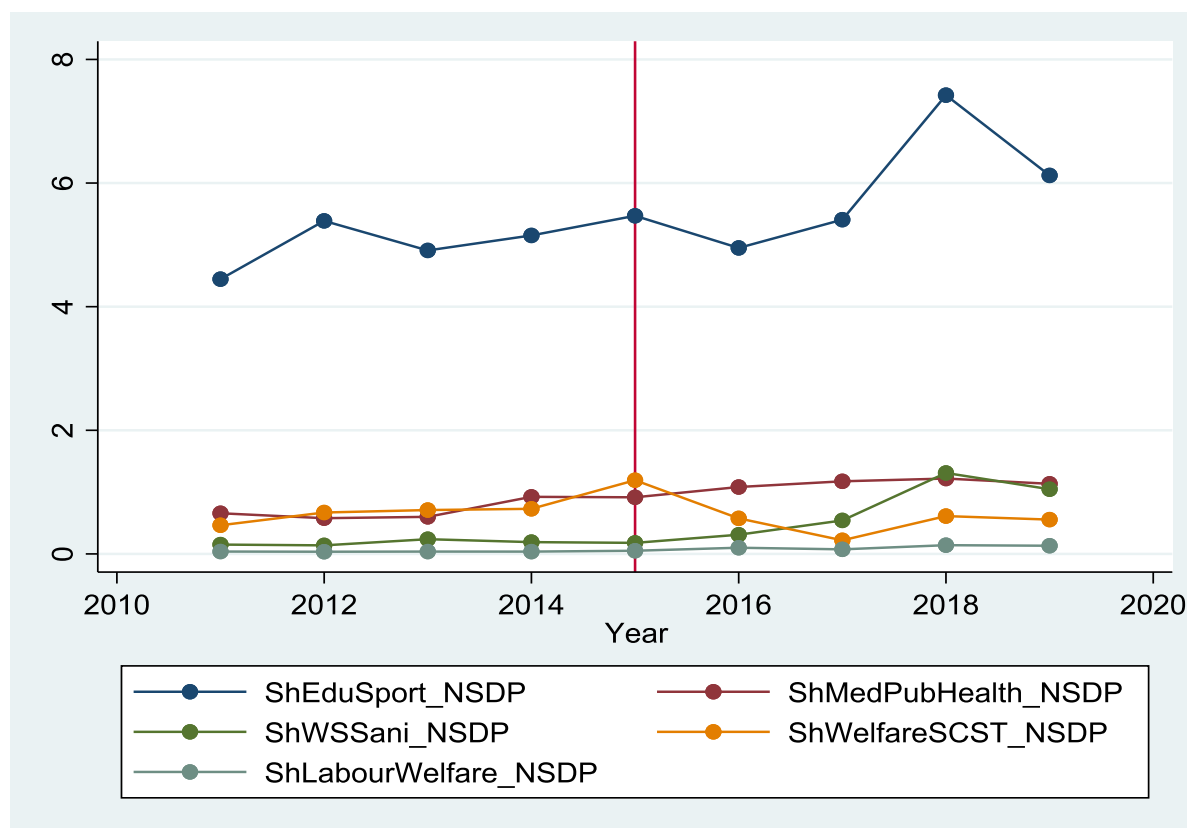
5.7.5.1 State's Own Tax Revenue and Share of Excise Revenue in State's Own Tax

Revenue



Note: Author's depiction using Annual Financial Statements of Bihar data.

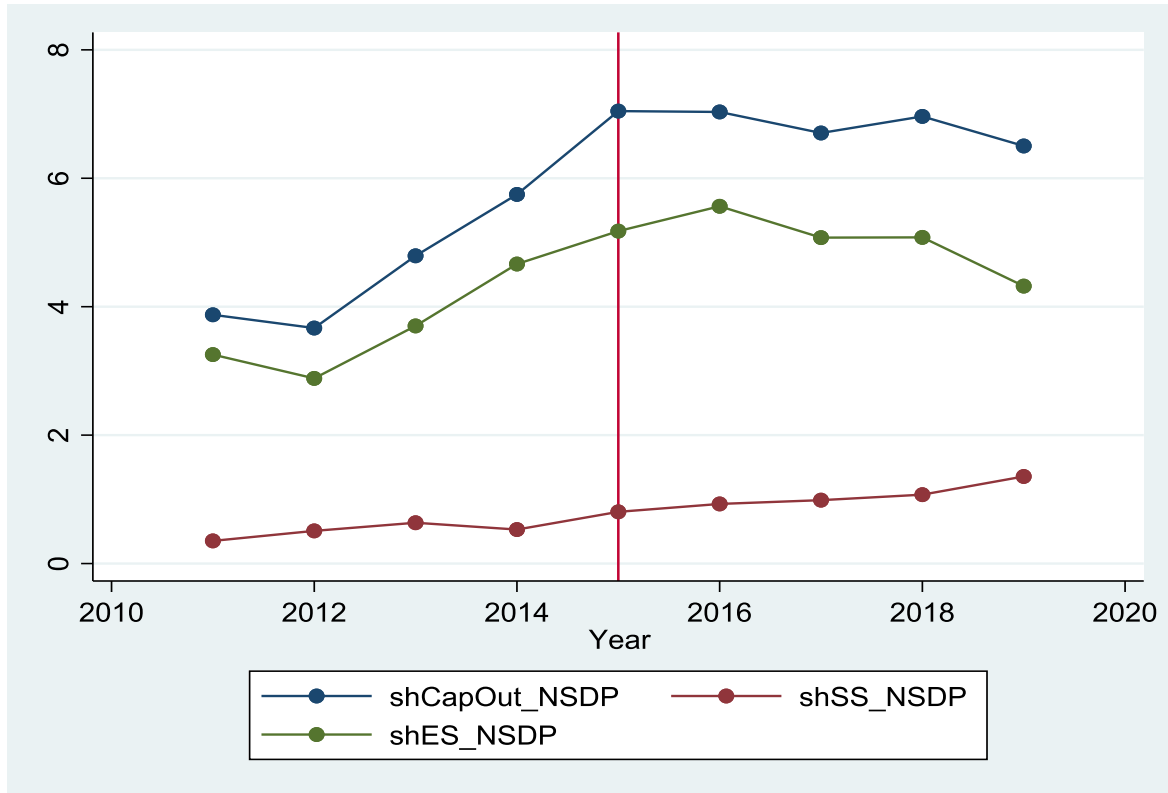
5.7.5.2 Revenue expenditure share of NSDP



Note: Author's depiction using Annual Financial Statements of Bihar data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation;

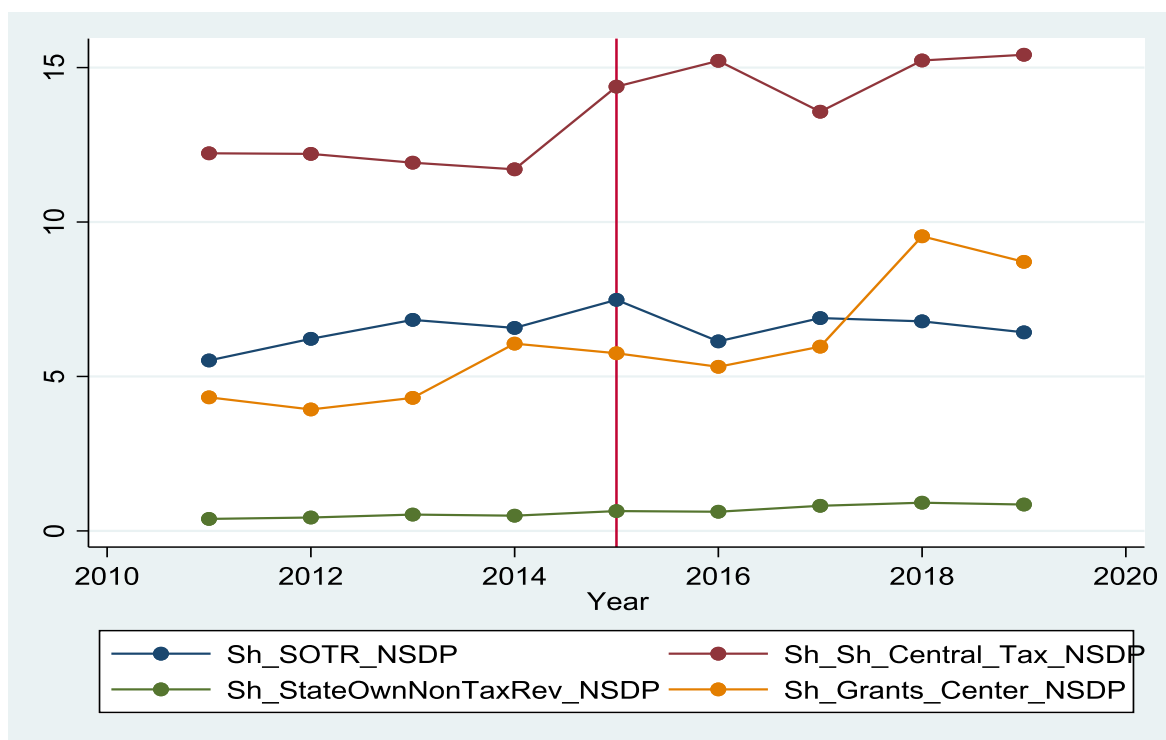
WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe; LabourWelfare denotes Labour and Labour Welfare Revenue Expenditure Heads.

5.7.5.3 Capital expenditure share of NSDP- Major Heads



Note: Author's depiction using Annual Financial Statements of Bihar data. NSDP denotes Net State Domestic Product; Sh denotes Share; EduSport denotes Education, Sports, Art and Culture; MedPubHealth denotes Medical and Public Health; WSSani denotes Water Supply and Sanitation; WelfareSCST denotes Welfare of Scheduled Castes and Scheduled Tribe Capital Expenditure Heads.

5.7.5.4 Tax devolution and Grants share of NSDP



Note: Author's depiction using Annual Financial Statements of Bihar data. NSDP denotes Net State Domestic Product; Sh denotes Share; SOTR denotes State's Own Tax Revenue; StateOwnNonTaxRev denotes State's Own Non-Tax Revenue; Grants_Center denotes Grants from the Center; Central_Tax denotes Share in Central Taxes

Chapter 6: District Level Prohibition in Gadchiroli: A Primary Survey

6.1 Introduction

There have been multiple studies on the topic of alcohol consumption and prohibition however, a district level study on alcohol consumption and its prohibition is scarce to find. The present chapter is an attempt to understand the characteristics of alcohol consumption in the prohibited areas (in our case Gadchiroli district). The literature/opinions on the district level alcohol prohibition suggests that prohibition at the district level is less likely to be successful. The rationale presented is the district level prohibited areas are likely to be surrounded by unprohibited districts/areas and considering the distance it would be much easier for locals who want to consume liquor to travel the distance and get drunk. It is often very easy for the residents of sub-district (talukas) which share the border with the unprohibited area of the other district. This renders absolutely no benefit of the prohibition policy. The situation may get aggravated if there is a general disregard for the law. To add to it the culture (especially tribal culture in India) can bring serious dent in successful implementation of the prohibition law.

The other important aspect of the study is this is the study during the pandemic (COVID) period spaced between the deadly second wave and before the third way. The study hence caters the question on consumption characteristics in prohibited areas during the extreme conditions (in this case pandemic). The extreme condition here refers not just the medical emergency but also general loss of employment, increased poverty and psychological response to unforeseen conditions⁸⁸.

Before the detailed analysis, it is worthwhile to discuss the rationale for selecting the Gadchiroli district, which is:

- 1) Gadchiroli is one of the alcohol prohibited districts in Maharashtra.
- 2) Data analysis using NSSO, NFHS and DLHS suggests that even after prohibition is in place, the district has one of the highest prevalence of alcohol consumption.
- 3) The district is unique in prohibition as the prohibition was imposed due to popular protests and women's movement contrary to other prohibited district Wardha.

⁸⁸ However, during the survey respondents mentioned that situation is back to normal i.e. similar to pre-covid period.

There was a significant risk involved in covering the entire district due to the threat to life. Hence only the Gadchiroli taluka was selected for data collection. The rationale for the selection of Gadchiroli taluka was:

- 1) An Important administrative centre with prohibition law, and
- 2) A unique mix of Urban, Rural and Tribal sectors, which is contrary to other talukas, as they might be fully rural or even largely tribal.

This chapter hence is dedicated to understand in detail the functioning of prohibition policy at the district level. In particular, this chapter aims to understand the perception about alcohol prohibition amongst people of the district and provide a broader perspective over the prohibition policy which would otherwise be amiss in a purely quantitative study based on secondary survey data. Apart from general perceptions on alcohol consumption, this study also aims in measuring the prevalence of alcohol consumption among the households of the prohibited region. This provides us with detailed information on characteristics of intoxicants (liquor, tobacco and tobacco products) consumption by several household characteristics/features and individual characteristics/features along with the prevalence of domestic violence in alcohol consuming and non-consuming households. Lastly, this chapter aims in estimating the effect of prices, income and education on alcohol consumption at the individual level, providing us with policy implication regarding “what works in controlling alcohol consumption?”. The approach taken in this chapter is mixed which includes both qualitative as well as quantitative study.

6.2 Qualitative Survey:

One major reason why a qualitative study is useful is it help develop deeper insights/understanding of the subject area which is alcohol prohibition policy in our case. The process of conducting a qualitative survey allows researchers to acquire an extensive understanding of attitudes and beliefs by tapping into participants' intuition and feelings. The flexibility of the approach also allows for a more fluid exploration of ideas, resulting in a research outcome that incorporates diverse and genuine perspectives.

Overcoming the lack of coverage for the entire district the responses collected helped generalizing at the district-level (considering interviews were conducted only in Gadchiroli Taluka and key informants were selected based on their expected domain knowledge) and also

over the years (as respondents were able to recall the situation over several years during prohibition). The method used for collecting the qualitative data/information is stated below.

6.2.1 Method

The survey questionnaire of semi-structured interview with a key-informants approach was utilized, such that there was a definite frame of listed questions and it also allowed for open ended responses⁸⁹. This survey could generalize the situation over the entire Gadchiroli District however, the perceptions may be largely relevant for the period of the survey i.e., October 2021- Jan 2022.

The frame for the qualitative study with key informant approach included college teachers, lecturers, senior government officials, survey experts, ASHA workers, medical officers and men previously employed in illegal sales of liquor. However, senior government officials did not respond/meet even after multiple attempts hence the study remains devoid of their opinion and attitudes.

A cluster sampling approach was considered appropriate such that we expect to obtain enough of variability within the cluster in terms of perceptions on prohibition policy. In this case we identify a cluster as Primary Health Centre, College etc. and interview every member of the cluster for qualitative survey once the cluster/unit is selected. In some cases, a purposive selection is done (for qualitative survey) based on availability of the individual e.g. men previously employed in illegal sales of liquor. The interviews were conducted with the interviewee's prior consent and under the condition of anonymity. Responses were then quantified to develop a generalized picture on perceptions about various aspects regarding prohibition law and are presented in the Appendix 6.6.1.

6.2.2 Findings

The interviews provided insight into whether prohibition successfully accomplished its main goal of eradicating or drastically lowering alcohol usage. According to the interviewees/respondents, alcoholic beverages were easily accessible throughout the entire area even though Prohibition has been put into effect. According to every interviewee, the district's consumption of alcoholic beverages could not be reduced or eliminated by prohibition (see Appendix Table 6.6.1.1 & Table 6.6.1.2). A Professor at College even stated that “in some villages, nearly 90 percent of households consumed liquor, “as observed in surveys conducted

⁸⁹ The qualitative survey hence was a schedule-based open-ended survey.

over the years”, he added. This points to a significant failure of Prohibition to curb the widespread consumption of liquor. Many further pointed out that it's relatively simple for people to obtain liquor from nearby districts, undermining the benefits of Prohibition's geographical restrictions. For instance, “Chandrapur, a wet district, is only 11 km from the metropolitan area of the dry Gadchiroli taluka urban center, and those who prefer to consume any type of alcoholic beverage can do so by taking a short bike ride to the location” stated one respondent.

The respondents also spoke about how Prohibition affected people's overall disregard for the law. One of respondent stated that “corruption is commonplace and there is a general disdain for the law enforcement in departments,” The other stated that “liquor cannot be available without corruption in enforcement departments”. Moreover, a hundred percent of respondents agreed that there is general disregard for law in the district (see Appendix Table 6.6.1.1 & Table 6.6.1.2). According to these findings, Prohibition not only is unsuccessful in minimising alcohol consumption but also helps create an environment where corruption and lawlessness can be fostered.

Turning to the effect of Prohibition on the economic, social, and physical conditions of the drinking classes, the interviewees paints a bleak picture. There is no improvement observed stated a hundred percent of sample male respondents and seventy-five percent of sample female respondents (see Appendix Table 6.6.1.1 & Table 6.6.1.2), and in fact, “alcohol consumption has increased over time, particularly in rural areas” stated a college Professor. This alarming trend indicates that Prohibition has not achieved its intended goal of improving the well-being of those affected by alcohol consumption.

The participants discussed about how prohibition affected both rural and urban communities' labour productivity and general well-being. Unfortunately, neither setting shows any signs of progress. A disparity in labour participation was highlighted by one of the interviewees who stated, "In rural areas, women continue to work daily, while men work for only 4-5 days." Alcohol-related problems, which disproportionately impact male workers, may be responsible for this difference. According to the sample data, 100 percent of men and 83 percent of women said that the district's alcohol prohibition had neither increased labour productivity nor improved general well-being (see Appendix Table 6.6.1.3 & Table 6.6.1.4)

Additionally, the consequences of Prohibition on children have been negative according to most respondents, one respondent said “Prohibition has increased adult tobacco

use. Tragically, this habit has been passed on to children of all ages, with youth regularly consuming a tobacco product called as Kharra”. Other respondent stated, “children are involved in liquor business. For e.g., children from Dhivar Mohalla and Fule Wada are involved in selling liquor”. Consequently, many others believed no effect on minors due to prohibition. (see Appendix Table 6.6.1.3 & Table 6.6.1.4)

The perception of "increased mortality" by gender has been ambiguous. Male respondents preferred to respond "can't say" when asked about changes in mortality, whereas the majority of female respondents were of the opinion, death had increased due to the consumption of counterfeit liquor (see Appendix Table 6.6.1.3 & Table 6.6.1.4). The vast majority of respondents, both male and female, agreed that domestic violence is extremely common in households that drink alcohol. The qualitative survey sample indicates that 73 percent of men and 75 percent of women think that domestic violence is more common in households that drink alcohol (see Appendix Table 6.6.1.5 & Table 6.6.1.6). According to one respondent, “Increased mortality rates and domestic violence are particularly noticeable in rural areas and urban slum areas. Another respondent stated, "Drink deaths are mostly prevalent in urban slum areas but not among Adivasi groups”. These distressing consequences point to the negative side effects of Prohibition (drink death due to spurious liquor) and indicate that it may have inadvertently worsened certain social issues.

When discussing the disproportionate impact of Prohibition on the poor, the respondents confirmed that the poor have been most affected. One interviewee stated, “a person earning around Rs 200 a day may spend as much as Rs 150 on alcohol”, exacerbating their economic struggles. It is emphasized that rural areas are particularly hard-hit by these circumstances. According to the qualitative survey sample, 91 percent of men and 67 percent of women agreed that the poor are negatively impacted (see Appendix Table 6.6.1.5 & Table 6.6.1.6).

In relation to the impact of prohibition on tourism, it is discovered that the district does not see a lot of tourism, mostly because of other causes like Naxal issues. Although it may have had some influence, prohibition is not the only factor preventing more tourists from visiting the region (see Appendix Table 6.6.1.7 & Table 6.6.1.8).

According to estimates, between 50 and 80 percent of the general populace actively supports Prohibition. This was explained by one of the respondents, who claimed that "females and people in white-collar jobs are the primary supporters of the Prohibition policy, which may

be around 70 percent of the population," implying that these groups may perceive to have benefited from its implementation.

When asked about the role of the permit system in the prohibited district, the interviewees asserted that, "there is no permit system or don't know about it", indicating a lack of control over the sale and consumption of alcohol (see Appendix Table 6.6.1.7 & Table 6.6.1.8).

In general, from the state revenue perspective, the respondents agreed that the state's ability to fund various initiatives and governance may have been hampered by the decline in revenues brought on by Prohibition. Most people have, however, emphasised that this does not excuse the lack of Prohibition. According to one of the respondent, "there are opportunities for revenue generation through the efficient functioning of government departments such as animal husbandry, forestry, and agriculture", implying that moral considerations are crucial and that alcohol sales do not necessarily need to be seen as appropriate for development and welfare (see Appendix Table 6.6.1.7 & Table 6.6.1.8).

In terms of their political insights, male respondents believe that prohibition was primarily motivated by the "need to win the elections", and other stated that, "Prohibition remains in force for the economic benefit of the existing liquor producers/manufacturers from the western Maharashtra as otherwise they may face stiff competition from Mahua liquor (produced locally by tribal) which is considered to be of much better quality than the existing ones". On the other hand, the majority of female participants disagree that politics plays any factor in the prohibition policy. This probably suggests women are likely to be unaware of political factors that can shape a policy like prohibition.

On the question of current socio-economic scenario, one male respondent stated "Prohibition has created a parallel economy, some communities have migrated into this region to gain substantial profits, for e.g. in the Chamorshi taluka a group Bengali people are involved in illicit liquor production." (see Appendix Table 6.6.1.9 & Table 6.6.1.10).

The average score on implementation of prohibition policy given by male respondents was 3 out of ten whereas females gave 3.3 out of ten. It was highlighted that, checks conducted by the Regional Transport Office (RTO) are infrequent, indicating a lack of rigorous enforcement (see Appendix Table 6.6.1.9 & Table 6.6.1.10).

The range of alcohol prices noted by respondents were between two to three times of the existing Maximum Retail Price (MRP) of individual alcohol by both males and females. This indicates the presence of a thriving black market with huge profits from alcohol in the prohibited district (see Appendix Table 6.6.1.9 & Table 6.6.1.10).

In terms of recommendation, majority of males believed in removal of prohibition policy whereas all the females believed in continuation of prohibition policy but with better implementation and enforcement (see Appendix Table 6.6.1.9 & Table 6.6.1.10).

Finally, the respondents/interviewees provided recommendations for the way forward. Following are the two important cases.

Case 1: It is advised that agricultural technology be adopted as a way to boost the economy and lower alcohol consumption. The prevalence of alcohol use can be decreased by offering adult workers the employment possibilities through agricultural programmes, such as offering land for cultivation in exchange of a profit-sharing arrangement with the government. In order to promote development in the district, the respondent further emphasised the necessity for the government to increase the effectiveness of numerous departments, including agriculture, forestry, and animal husbandry. With social awakening, better education and health facilities, higher welfare spending, good/responsible administration, and an emphasis on poverty eradication and economic development (from the government's standpoint), prohibition policy can be more successfully implemented.

Case 2: Alcohol prohibition should not be in place. The prohibition policy is not effective at all. The alcohol is smuggled from Telangana state, Chhatisgarh state and Chandrapur district. The policy has made labour costly in Gadchiroli. The labour in the surrounding district is cheaper compared to Gadchiroli district, the respondent emphasised it by mentioning "labour in Gadchiroli will ask around 400 Rs daily wages compared to 200 Rs in the surrounding districts". This is majorly due to high cost of liquor in Gadchiroli. Most of the labour even migrate temporarily for work in surrounding districts creating scarcity and high cost of labour in the Gadchiroli district. The respondent further stated, "the NGO's working for the benefit of the people are also politically motivated".

After taking into account all the responses and recommendations on prohibition as a policy, the following is the overall take or conclusion.

The interviews highlight the significant challenges and failures associated with prohibition in the district. The widespread availability of alcohol, disregard for the law, corruption, increased liquor consumption, negative impacts on labor, juveniles, and the poor, as well as the absence of positive changes in the social and economic conditions of the affected classes, all indicate that prohibition has fallen short of achieving its primary objectives. The interviewee's recommendations emphasize the need for comprehensive and holistic approaches that address societal issues beyond mere alcohol restrictions.

6.2.2 Interview with Representative of NGO (Muktipath)

The Muktipath is working for the welfare of the people by controlling intoxicants (liquor and kharra) availability and consumption. The organisation claims (based on the study conducted by them in the year 2014-15) 378 crore rupees were expended by people on consumption of intoxicants (liquor and kharra) and this even after alcohol prohibition law is at place. Thus, to control the problem Muktipath was established by Dr. Abhay Bang in the year 2016.

The Muktipath has devised a working model to reduce alcohol and kharra consumption in the district. The model specified is based on reduction in both demand and supply of the mentioned intoxicants. The demand side is controlled by two methods 1) Awareness of the ill effects of alcohol, 2) Providing solutions to the addicted. From the supply side 1) Proper implementation, 2) Making social groups. Moreover, the organization follows a five-tier approach starting from village level groups, gram panchayat samiti, taluka samiti, district samiti and state level action group.

The Muktipath mentions its objectives to be 1) reduction in alcohol and tobacco consumption by 50 percent, 2) reduction in illegal selling, 3) saving nearly 100 crores rupees of consumers. The Muktipath claims their efforts has resulted into 39 percent alcohol free and 19 percent tobacco free villages in the district. According to Muktipath, the drinkers have now reduced by 29 percent (48000 men), tobacco consumers have now reduced by 21 percent (97000 people) along with reduction in their expenditures by 91 crore rupees.

The discussion with the executive handling the organization did not result in specific answers to qualitative questionnaire, however the executive maintained that prohibition policy has been effective in controlling the liquor menace in the district and it must be continued for larger benefit.

6.3 Quantative Analysis

The qualitative analysis provided a much broader views and perceptions on alcohol prohibition policy at the district level. These viewpoints may however have had individual biases embedded into the responses. It was hence imperative to conduct a household/individual level survey to understand the current situation of liquor and intoxicants consumption in the prohibited region.

This section is dedicated for the population estimates on prevalence of alcohol consumption based on quantitative survey. Initially the methodology⁹⁰ used for collecting the data from the individual household is presented following which the household level population estimates on alcohol and other intoxicants is presented.

6.3.1 Methodology

The household survey was conducted with a small modification to existing survey design of the NSSO Consumption Expenditure survey. A third sector, namely the tribal sector, was carved out of existing census specifications of the rural sector with a population of tribal more than 50 percent. The rest follows the existing sample design of NSSO Consumption Expenditure Survey such that, a stratified two-stage design was adopted. *The first stage units (FSU) otherwise also represented as primary sampling unit (PSU) were villages/Urban Wards/sub-units (S.U.s) as per the situation.* The second stage units (SSU) *otherwise also represented as secondary sampling unit* were households in the sectors. In this way, within each sector of Gadchiroli Taluka, the respective sample size was allocated to the different strata in proportion to the population as per Census 2011. From all the sub-strata in rural, urban and tribal sectors within each stratum, the required number of FSUs was selected by the Simple Random Sampling Without Replacement (SRSWOR) scheme.

Allocations: A total of 406 sample households are allocated as follows⁹¹.

Table 25 Sample size allocation

Sector	HH Population	Sample Size	Percent Sample Size
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⁹⁰ The methodology largely borrows from the procedure used by National Sample Survey Office in collecting unit level data. The only difference in the methodology is inclusion of the separate tribal sector considering the unique population composition of the taluka.

⁹¹ 381 or more samples are needed to have a confidence level of 95 percent that the real value is within +/- 5 percent of surveyed value.

Rural	20748	241	59.36
Tribal	2527	32	7.88
Urban	13111	133	32.76
Total	36386	406	100

Allocations of FSUs: A total of 32 FSUs are selected for the survey.

- 1) Urban: 8 FSUs
- 2) Rural: 20 FSUs
- 3) Tribal: 4 FSUs

Table 26 Allocation of First Stage Units

Household Sample Description						
Place	Sector	H.H. Pop	Population	Sub-unit	Sample size	Percent
Ward 1	Urban	378	1496	su1	19	4.68
Ward 13	Urban	568	2100	su2	19	4.68
Ward 17	Urban	814	3552	su2	18	4.43
Ward 21	Urban	868	3537	su2	12*	2.96
Ward 23	Urban	568	2412	su2	18	4.43
Ward 4	Urban	603	2445	su2	14*	3.45
Ward 5	Urban	581	2262	su1	18	4.43
Ward 7	Urban	512	2003	su2	15*	3.69
BAMHANI	Rural	281	1069	su2	14	3.45
BHIKAR MAUSHI	Rural	106	445	su1	5	1.23
BODHLI	Rural	385	1560	su2	14	3.45
DHUNDESHIVNI	Tribal	453	1718	su1+su2	22	5.2

DONGAR GAON	Rural	188	771	su1	14	3.45
GOGAON	Rural	500	2040	su3	14	3.45
INDALA	Rural	316	1235	su1	14	3.45
KADASI	Tribal	57	299	su1	5	1.23
KATALI	Rural	79	288	su1	6	1.48
KHURSA	Rural	329	1442	su2	14	3.45
KOSAMGHAT	Rural	47	246	su1	5	1.23
KOTGAL	Rural	821	3338	su1	14	3.45
KRUPALA	Rural	47	204	su1	6	1.48
MARKBODI	Rural	239	914	su1	14	3.45
MUDAZA	Rural	472	1826	su2	14	3.45
NAVEGAON	Rural	1534	6743	su4+su7	28	6.9
RAJAGHAT MAL	Rural	286	1107	su1	14	3.45
RANKHEDA	Rural	143	559	su1	14	3.45
SAWELA	Tribal	96	406	su1	5	1.23
SHIVNI	Rural	482	1883	su1	14	3.45
TEMBLA	Rural	386	1581	su2	14	3.45
YEVALI	Rural	669	2428	su3	14	3.45
Total					406	100

Note: The Urban response rate was lower than both Rural and Tribal sectors.

6.3.2 Analysis at the Household Level

The following is the result on prevalence (consumption in past one year) based on household and household head. For comparative purpose the results of prevalence using DLHS-4 for the district of Gadchiroli is presented in the Appendix 6.6.6. It is to be noted that these results are not directly comparable as the survey is conducted at the taluka level and the

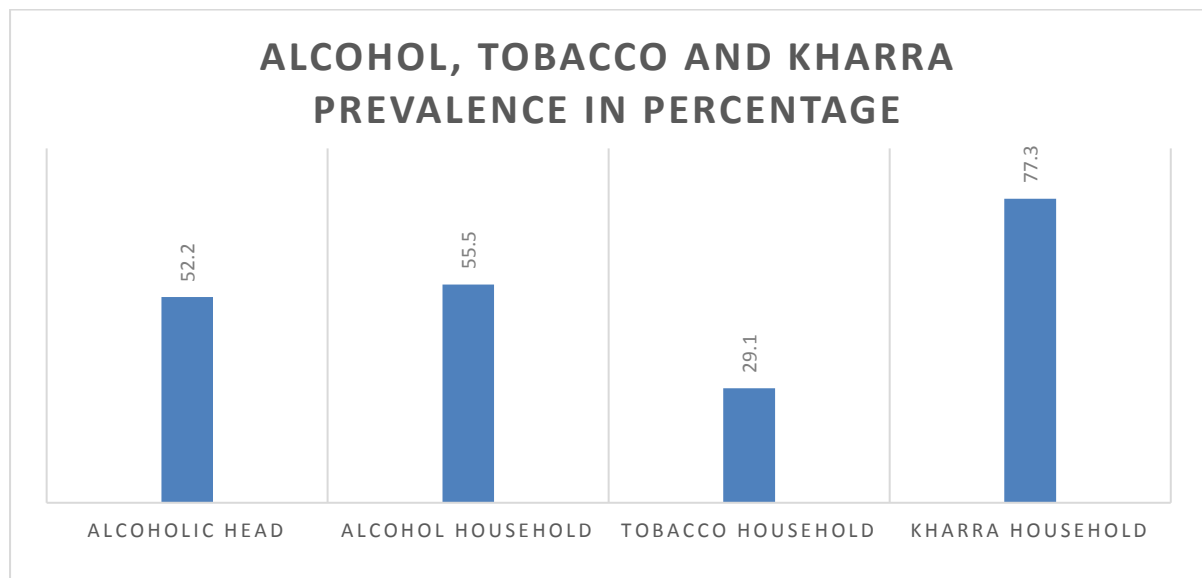
taluka is connected to surrounding wet district. Secondly, the survey is conducted during Covid-19 and lastly the time gap and survey methodology will also exert its influence. Hence the results presented in the Appendix section is for indication purpose only.

The following are some of the important findings listed below

- 1) The prevalence by any member/at least one member of household consume liquor is estimated to be 55.5 percent.
- 2) Household head with education above graduate level shows the least prevalence in alcohol consumption.
- 3) Mahua is the most prevalent form of liquor in Gadchiroli taluka and its prevalence is highest among tribal households.
- 4) IMFL and country liquor is reported to be most prevalent in the lowest income quantile.
- 5) The prevalence of violence in alcohol consuming household is estimated to be higher than non-alcohol consuming households.

The analysis of survey data in Gadchiroli taluka suggests the prevalence of alcohol consumption by any member in the household is 55.5 percent. However, it can be observed that the highest prevalence in the taluka is of Kharra which makes around 77.25 percent (see Fig 48)

Figure 45 Prevalence of Intoxicants in Households



Note: Authors estimation using sampling weights. Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

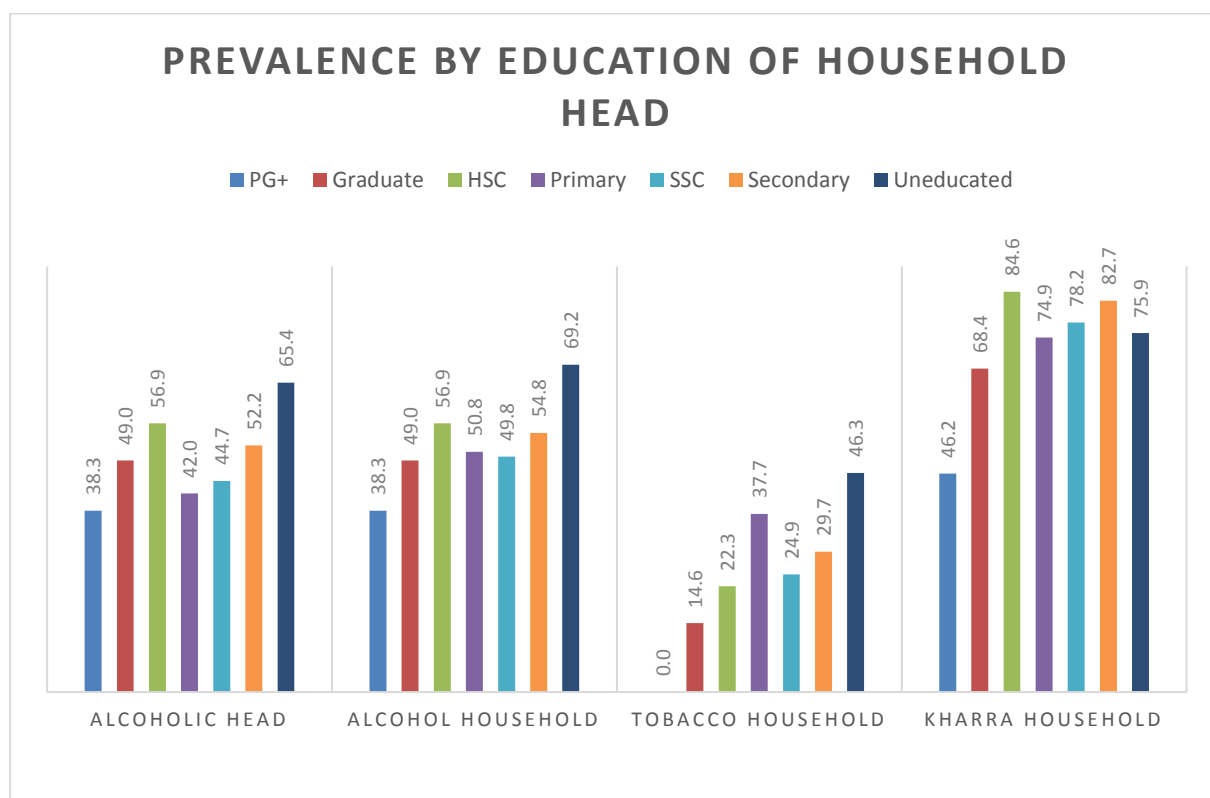
By Sector the highest prevalence of alcohol consumption is in the tribal sector with around 83.35 percent households has any member which consumes alcohol. Similarly, tribal sector households also have higher consumption of both Tobacco and Kharra compared to urban and rural households. The prevalence of Kharra in tribal sector is estimated to be as high as 92 percent (see Appendix Table 6.6.5.1)

The bulk of the sample population in the taluka practise either Buddhism or Hinduism, but there are also a small number of Sikh and Muslim adherents. Only the Hindus and Buddhists have been estimated because the numbers of followers of Islam and Sikhism are too low. Due to the higher proportion of female household heads in Buddhist households, there is a higher incidence of alcohol usage among Hindu household heads than among Buddhist household heads. However, the opposite is true when considering whether any household member consumes alcohol. This shows that, in contrast to Buddhist families, members of Hindu households are more likely to be sober. However, it is estimated that Buddhist families consume less tobacco and kharra than Hindu households. (see Appendix Table 6.6.5.2)

Prevalence estimation by type of family suggests the joint family has larger prevalence (66.6) than independent family, suggesting the scale effect. Prevalence of alcohol by social category suggests highest prevalence among Scheduled Tribe (58.6 percent) and Scheduled Caste (58.2) (see Appendix Table 6.6.5.3)

Regarding education, if the household head has a degree higher than a Graduate degree (i.e. PG+), then their “individual” prevalence of alcohol consumption is the lowest compared to all other education categories; similarly, if the household head has a degree higher than a Graduate degree, then “overall household’s” prevalence of alcohol consumption is also the lowest; this remains true for tobacco and kharra consumption as well(see Fig 49)

Figure 46 Prevalence of Intoxicants by Education of Household Head

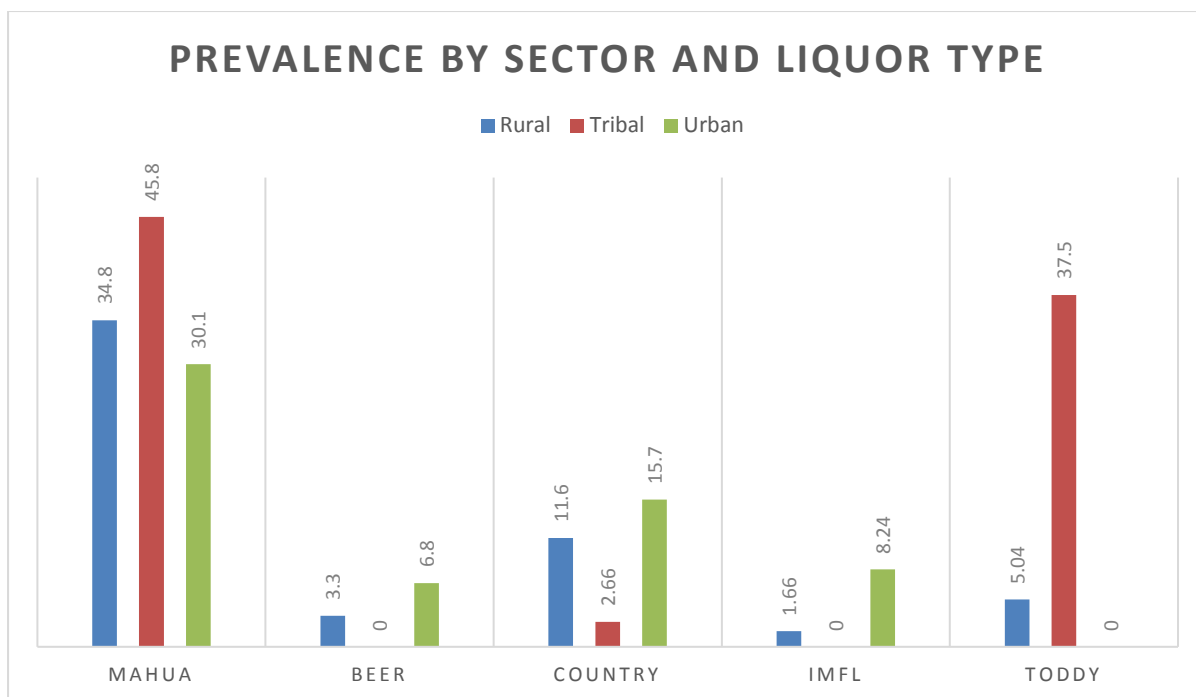


Note: Authors estimation using sampling weights.; Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

The prevalence based on farm size suggests almost similar level of prevalence among households with different farm sizes however, the household head with small and semi medium farm size has the lowest prevalence of alcohol consumption.

Prevalence by sector suggests Mahua liquor followed by toddy has the highest prevalence in the tribal sector. In the rural sector highest prevalence is of Mahua liquor followed by country liquor. In the urban sector as well, the highest prevalence is of Mahua liquor followed by country liquor. Prevalence by liquor type suggests Beer, country liquor and Indian Made Foreign Liquor (IMFL) has higher prevalence in the urban sector and Mahua and toddy has higher prevalence in tribal sector (see Fig 50)

Figure 47 Prevalence of Intoxicants by Sector and Liquor type

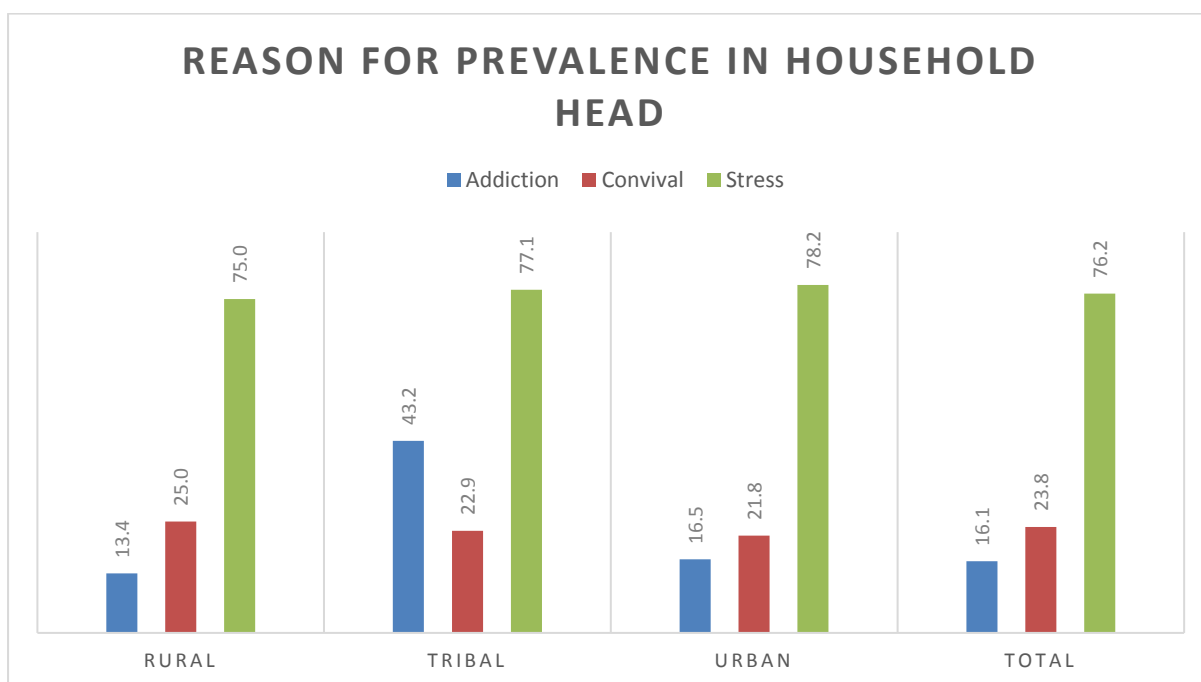


Note: Authors estimation using sampling weights

The percentage of household heads consuming only one type of liquor is 45.95 percent and that consuming two different type of liquor is 6.46 percent. The prevalence of multiple liquor is highest among urban household heads (see Appendix Table 6.6.5.5)

By the time of consumption, the largest number of household heads consume in the evening after work followed by the ones at night. The prevalence of consumption is higher at night time in rural sector compared to urban sector (see Appendix Table 6.6.5.6). On reasons of alcohol consumption, 23.82 percent population drink for convivial purpose followed by addiction which is 16.1 percent however, the major reason for drinking prevalence is noted to be stress estimated to be 76.2 percent. It can also be noted that prevalence due to stress is higher in rural sector than both urban and tribal sector. Whereas addiction reason is highest among tribal household heads when compared with rural and urban household heads. (see Figure 51)

Figure 48 Reason for Prevalence in Household head



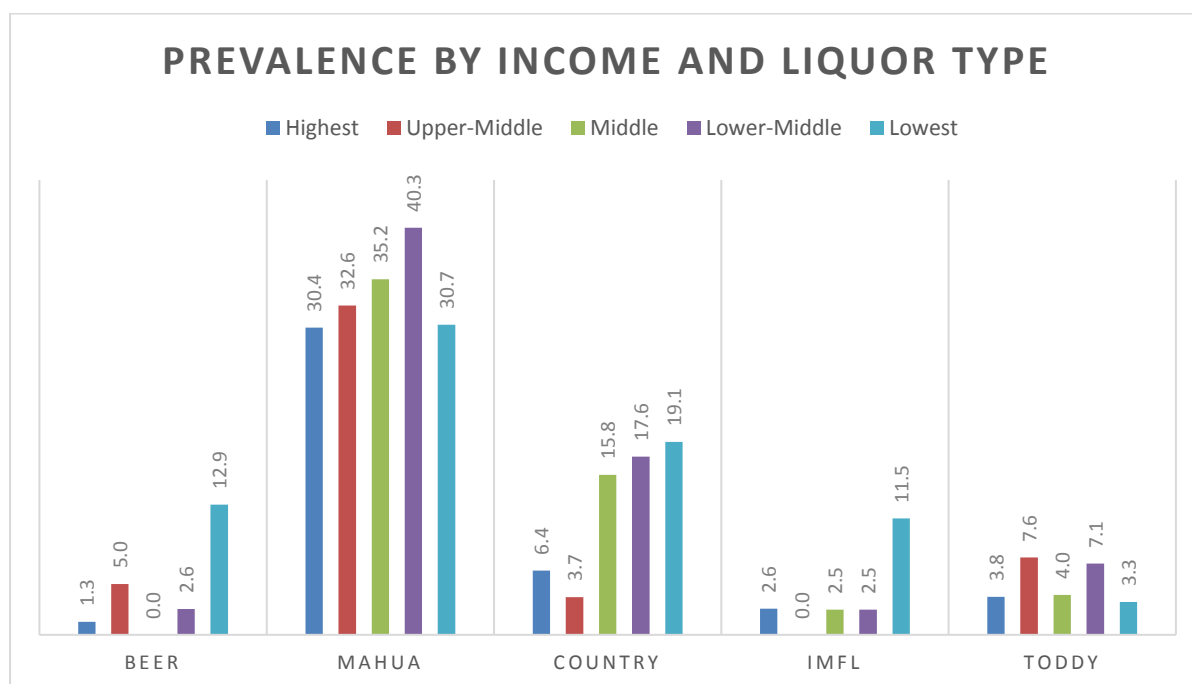
Note: Authors estimation using sampling weights

By frequency, number of household heads reported drinking once a day is 12.2 percent, once a week is 5.01 percent and once a month is 4.21 percent. Secondly, the highest frequency(mode) in a day is one-time a day, in week it is 3 times a week and in a month it is 3 times a month (see Appendix Table 6.6.5.7)

In terms of monthly per capita income/monthly per capita consumption expenditure (MPCE), the highest prevalence of alcohol in households is among lower-middle (4th quantile), highest prevalence of tobacco is in Middle (3rd quantile) and kharra is again at lower-middle (4th quantile). The lowest prevalence of alcohol, tobacco and kharra is observed among topmost quantile by MPCE (see Appendix Table 6.6.5.8)

By individual liquor type highest reported prevalence of beer is among lowest MPCE quantile, Mahua in Lower-Middle (4th quantile), country liquor in the Lower-Middle (4th quantile), IMFL in the lowest quantile and toddy in the Upper-Middle (2nd quantile) (see Fig 52).

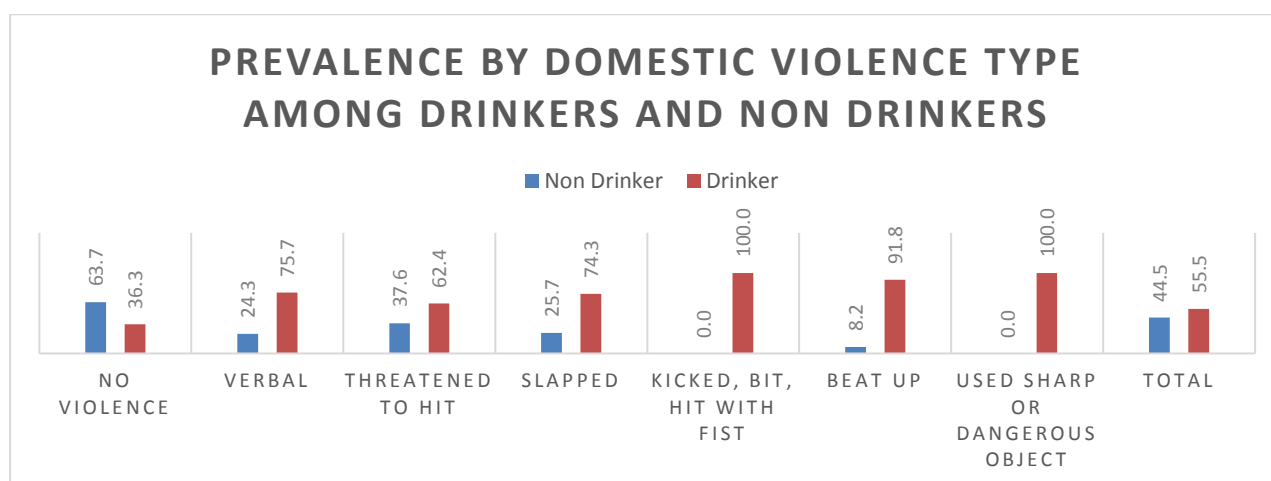
Figure 49 Prevalence in Household by Income and Liquor type



Note: Authors estimation using sampling weights

The prevalence of no violence against women is higher among non-drinking households which is 63.72 percent and that of drinking households it is much lower 36.28 percent. All the forms of violence are higher among alcohol consuming households than non-alcohol consuming households (see Fig 53)

Figure 50 Prevalence of domestic violence by drinker and non-drinker households



Note: Authors estimation using sampling weights

In summary the household level analysis confirms several claims presented in qualitative analysis. It is clearly observed that alcohol prohibition policy is weakly enforced and prevalence of liquor consumption is as high as 55.5 percent at household level even after

the enforcement of prohibition policy. Secondly, prevalence of domestic violence among drinking household is found to be much higher than in non-drinking household exemplifying the women stand in support of liquor prohibition policy in the district.

Moreover, higher prevalence of liquor consumption among tribal clearly suggest the cultural significance of liquor among tribal households and lower prevalence among above graduate level education also explains the importance of higher education.

However, the household level analysis masks the individual responses to liquor consumption (except for household head prevalence presented earlier), moreover a descriptive analysis is insufficient to measure the effect of factors that affect liquor consumption among individuals. Hence, the next section is devoted to individual level analyses using econometric method to point what works in controlling the liquor consumption in the prohibited district of Gadchiroli.

6.4 Individual Level Analysis

The preceding estimates revealed important details about the prevalence of alcohol usage at the household level. The following analysis has its own uniqueness based on the data acquired, which overcomes the constraints of the NSSO and NFHS surveys and incorporates significant/important variables on alcohol consumption.

A total of 1599 people were included in the data collection, with 593 men and 596 females in the 15 years and older age group. Only 6 women in the female sample reported/admitted to drinking, hence only men in the 15+ age range are taken into account for analysis. After the sample's non-response rate, outliers and missing value adjustments, 590 men made up the final sample for male respondents. In this section, Men's sample characteristics are first reported and then analyses making use of this data is presented.

The sample collected for men had 43 percent drinkers with majority drinkers consumed Indian liquor with 32 percent and only 5 percent reported to drink Foreign type liquor. Majority of drinkers reported Mahua as the preferred drink especially considering low cost and high alcohol content drink. In terms of frequency the consumption of Mahua is averaged around 17.4 (100 ml drinks) per month in the overall sample of 590 men of above 15 years of age. Among drinkers, the same average goes to 77.1 (100 ml drinks) per month. The frequency of

ethanol⁹² drinks measured using 100 ml of ethanol stands 9.24 (100 ml drinks) for entire sample and 28.7 (100 ml drinks) among drinkers on an average (see Appendix Table 6.6.7.1)

6.4.1 Dependent Variables

The primary dependent variable used for the analysis is frequency of ethanol (measured in 100 ml) consumption. The histogram for drinkers is presented in the appendices (see Figure 6.6.7.2) The questions were asked in the survey about frequency of each type of drinks consumed and standard quantity of consumption. This information along with alcohol by volume in each type of liquor was used to estimate quantity and frequency in 100 ml for a month.

6.4.2 Independent Variables

The independent variables used in the analysis is average price of ethanol per litre, Monthly Per-capita Consumption Expenditure (MPCE)- proxy for income, age and age squared, education in years, and dummy for sector. The price of ethanol is estimated using prices mentioned in the survey for each type of liquor and weighted according to proportion of consumption. Similarly, the price of ethanol for Indian type liquor was estimated using Mahua, Toddy and Country Liquor. The prices were estimated in price per litre of the drink. The log of monthly per capita consumption expenditure is used to incorporate the effect of income. As the consumption varies with age, the age and age squared variable is introduced to control for curvilinear relationship. The education in years has effect both in participation and consumption (is also observed in descriptive analysis) hence it is introduced in the model. Finally, participation and consumption both varies by sector (also observed in the descriptive analysis) is introduced as control variable.

6.4.3 Method

The basic econometric model takes the following form

$$1) E(y | \mathbf{x}) = \exp(\mathbf{x}'\boldsymbol{\beta})$$

Where, the dependent variable “y” in our case is frequency of drinks which is an integer and the independent variables “x” are prices and MPCE along with other control variables

⁹² Measured using alcohol by volume of each individual liquor

stated above. The coefficient of independent variable prices and income measures the price and income elasticity.

The corresponding first-order conditions are solved by the Poisson MLE.

$$2) \sum_{i=1}^N \{y_i - \exp(\mathbf{x}_i' \boldsymbol{\beta})\} \mathbf{x}_i = \mathbf{0}$$

If the frequency of drinks data is derived from distinct subpopulations, the estimate of the coefficients is the average of the effects across subpopulations and may conceal substantive differences among subpopulations. As a result, we estimate Equation (1) using a number of FMMs with Poisson-distributed subpopulations.

The finite mixture of “c” distribution is written as

$$3) f(y_i | \mathbf{x}_i, \boldsymbol{\theta}_1, \dots, \boldsymbol{\theta}_c) = \sum_{j=1}^c \pi_j f_j(y_i | \mathbf{x}_i, \boldsymbol{\theta}_j), \sum_{j=1}^c \pi_j = 1, 0 < \pi_j < 1$$

Where π_j are the scalar to be estimated.

If we consider π_j as a function of observables we can replace π_j by π_{ji} where,

$$4) \pi_{ji} = \frac{\exp(\mathbf{z}_i' \boldsymbol{\gamma}_j)}{1 + \exp(\mathbf{z}_i' \boldsymbol{\gamma}_2) + \dots + \exp(\mathbf{z}_i' \boldsymbol{\gamma}_c)}$$

allows making the model further flexible.

6.4.4 Model Selection

The initial estimation includes single class Poisson and NB models. The comparison was conducted using likelihood-based model selection criteria including Akaike information criterion and Bayesian information criterion (BIC) to find the model that best fits the data. Among the single class models, we find that Poisson regression fits better than negative binomial model, furthermore, 2 class model of negative binomial models fail to converge suggesting the component density was actually Poisson. A 3 class Poisson model was later estimated along with the flexible form of 2 class and 3 class Poisson models. The model selection information criteria suggested a 3 class Poisson model is the best option to fit the data (see Table 27)

Table 27 Model Selection

Model	Log likelihood(model)	df	AIC	BIC
Single Class Poisson Model	-7187.96	8	14391.91	14426.96
2 component, constant probability FMMs	-2138.52	17	4311.03	4385.49
3 component, constant probability FMMs	-1384.47	26	2820.95	2934.83
2 component, variable probability FMMs	-2216.55	14	4461.09	4522.42
3 component, variable probability FMMs	-1710.46	22	3464.93	3561.29

Note: Authors Estimation using Primary Survey Data and Application of Various Models

6.4.5 Results

The estimation of latent class probabilities suggest class 1 is composed of largest sample size of 75 percent with lower frequency of drinking of means 2.38, class 2 to is composed of 14 percent of the sample with moderate frequency of drinking of means of 27.75 and class 3 is composed of 11 percent of sample with high frequency of drinking of means 57.42.

The preliminary analysis using single class Poisson model suggests high price elasticity with statistically significant value of “-4.8”. Moreover, all variables are significant with income elasticity of “0.35” (see Appendix Table 6.6.7.3). However, the three-component model presents price elasticity to be highest for moderate frequency drinkers at “-4.32” and lowest for high frequency drinkers at “-1.91”. Clearly, the one class model hides these differences among classes. The p-values suggests that price elasticities of class 2 and class 3 are significantly different from each other. The income elasticity is positive with value “0.55” for low frequency drinkers and elasticity values between low and moderate frequency drinkers are significantly different from each other. We also observe the effect of education in years is estimated to be negative in all the three groups (see Table 28). Plotting the predicted frequency of liquor consumption allows us to compare the resulting distributions of the means visually (see Fig 54)

Table 28 Three Component Model using FMMs

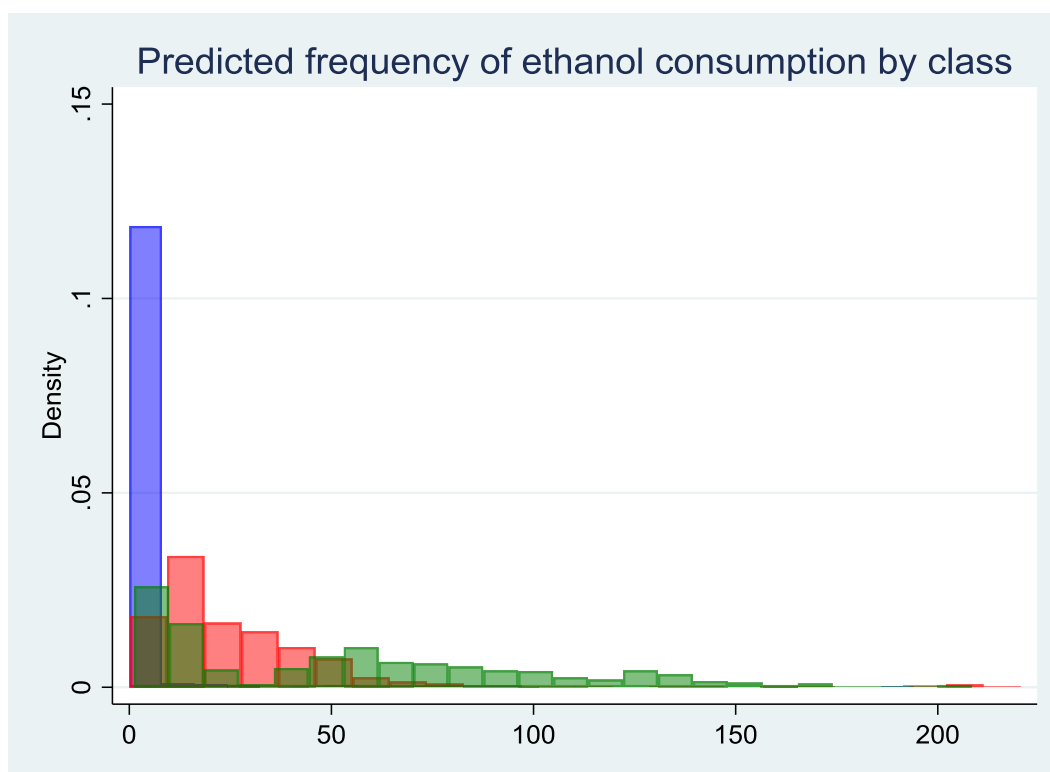
VARIABLES	FMM Component 1	FMM Component 2	FMM Component 3	p-values 1-2	p-values 1-3	p-values 2-3
Prices, log	-2.911* (1.487)	-4.342*** (0.536)	-1.905** (0.951)	0.377	0.555	0.080
MPCE, log	0.551*	-0.317	-0.0986	0.028	0.233	0.491

	(0.336)	(0.206)	(0.417)			
Age	1.283***	0.110	-0.0806	0.000	0.000	0.035
	(0.279)	(0.0837)	(0.137)			
Age squared	-0.0136***	-0.00164*	0.000589	0.000	0.000	0.027
	(0.00328)	(0.000957)	(0.00158)			
Years of Education	-0.0594	-0.0746***	-0.0139	0.692	0.305	0.019
	(0.0417)	(0.0219)	(0.0416)			
Tribal dummy (base Rural)	4.332***	0.910***	-3.577***	0.000	0.000	0.000
	(0.292)	(0.291)	(0.535)			
Urban dummy (base Urban)	-0.832	1.151***	-1.960***	0.009	0.057	0.000
	(0.924)	(0.257)	(0.459)			
Constant	-14.48	33.35***	20.19**			
	(12.57)	(3.824)	(8.281)			
Observations	590	590	590			

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 51 Predicted frequency of Ethanol consumption for 3-component model



Note: Authors depiction using FMMs Model on Primary Survey Data

6.4.6 Robustness

The single component model and the two-component model which apparently masks latent components, estimates price and income elasticities in the range of 3-component model. For example, the two-component model estimates price elasticity for low frequency drinkers

(a larger group of 63 percent of sample) to be “-5.05” whereas for high frequency drinkers (a smaller group with 37 percent of sample) is estimated to be “-1.33” (see Appendix Table 6.6.7.3). Secondly, last two columns of the same table present robustness for two component model using “ounces” consumed per week. The price and income elasticities values are found to be largely similar to “100 ml” estimates. Hence the two-component model is clearly robust⁹³.

To check for the robustness of three component model, a drinker only sample is used with the same specification and quantile regression is run over the data. The initial quantiles have non-significant results, however higher quantiles show significant results with price elasticities of “-2.43” for Q80 quantile, “-2.29” for Q90 quantile and “-1.64” (significant at 20 percent level) for Q95 quantile which are largely similar to the estimates of 3 component model using FMMs for high frequency drinkers (see Table 6.6.7.5). Finally, the estimated elasticities are also tested with alternative specifications such as adding exogeneous variables like social category and religion in the model, additionally and separately. The inclusion of social category is based on cultural aspects of tribal community which is supportive to drinking and the inclusion of religion is due to prohibition in certain religion like Islam. In this model addition of any variable is leading to non-convergence issue however the estimated price elasticities show highest price elasticity for moderate drinkers. For example, the inclusion of social category estimates price elasticity for moderate frequency drinkers to be “-2.50”, and for low frequency drinkers and high frequency drinkers it is estimated to be “-1.63” and “-1.75” respectively. Similarly, when religion is added as additional independent variable the price elasticity is also predicted to be highest for intermediate frequency drinkers with a value of “-4.25” and lower for low frequency and high frequency drinkers with values of “-0.93” and “-1.24” respectively. It is to be noted that these results are presented only as indicative of range and distribution of elasticities and cannot be considered as actuals due to non-convergence issue.

6.5 Discussion & Conclusion

The interview responses as well as quantitative analysis show that issue of liquor consumption persists even after alcohol (and other intoxicants) have been outlawed. This reflects the problem at hand i.e. consumption of liquor and intoxicants cannot be resolved by

⁹³ The similar method for 3 component model (using ounces) could not be applied as selection criteria did not favour use of 3 component model.

prohibition policy alone or that the prohibition is largely an ineffective policy in the current form at the district level.

The alcoholic drinks along with other intoxicants are easily available and there is a general disregard of law. The qualitative survey also suggests that corruption among the officials is eventually leading towards easy availability of intoxicants. It is further suggested that prohibition has not brought any benefits to the poor and labour class moreover prohibition has encouraged young ones to get involved in to profitable business. The only exception to these findings were the doctors/medical officers who expressed their views in contradiction.

The quantitative analyses justify the perception of the qualitative survey. The survey finds that the prevalence of alcoholic drinks in a household is as high as 55.5 percent. However, it is interesting to note that Kharra (tobacco intoxicant) has the highest prevalence. The highest prevalence of alcohol is found in tribal sector which is as high as 83.4 percent even after prohibition. This is not abnormal as tribal considers alcoholic drinks as a part of their culture and consumption once a year especially during festivals and marriage ceremonies is largely noted in the literature. The lower prevalence in households falling in highest income quantiles, the lower prevalence where the household head has a post-graduate degree or higher in education, as well as the fact that stress was identified as the primary factor in intoxicant consumption, all point to the value of education, as well as the reduction of poverty and improved employment opportunities as necessities for reduction in alcohol prevalence.

Additionally, the econometric analysis using finite mixture method discovers the three latent classes for the entire distribution of liquor consumption based on frequency of consumption. The price elasticity estimated for each individual class suggests higher price elasticity for moderate frequency drinkers compared to both low and high frequency drinkers. This suggests higher responsiveness to prices in moderate frequency drinkers which is comparatively a larger group than high frequency drinker group. The price elasticity of individual component is elastic (this finding is similar to Ayyagari et. al., (2011)), suggesting prices can be an effective tool for the government to reduce the consumption of alcohol. Secondly, additional year of education is also related to lower frequency of alcohol consumption. This supports the argument that government policy should put more emphasis on raising people's levels of education in order to reduce their consumption of alcohol, which was also voiced by respondents to the qualitative survey and in earlier research by Mahal (2001) and Rahman (2004).

Lastly, it is important note the women perspective in support of prohibition, which is largely driven by problems faced by them due to alcoholic husbands. The women support for prohibition policy can be justified by the findings of the prevalence of domestic violence and their intensity, based on the drinking habit of their husband (as found in the quantitative analysis section)

The qualitative survey pointed out that every woman surveyed considered “prohibition is important and must be continued”. Taking this into account, prohibition is likely to remain an important part of popular politics to lure women voters and a sudden removal of prohibition without giving importance to education, employment and poverty alleviation is likely to have political ramifications.

6.6 Appendix

6.6.1 Quantified Qualitative Responses

Table 6.6.1.1 Perception by Gender-Male (Question 1-Question 4)

Candidate	Gender	Prohibition Effective		Disregard of Law		Corruption			Improvement Living Standard	
		Y	N	Y	N	Y	N	D	Y	N
Other 1	Male		1	1		1				1
Other 2	Male		1	1		1				1
College Lecturer 2	Male		1	1		1				1
College Lecturer 3	Male		1	1		1				1
College Lecturer 4	Male		1	1		1				1
College Lecturer 5	Male		1	1		1				1
College Lecturer 6	Male		1	1		1				1
College Lecturer 7	Male		1	1		1				1
College Lecturer 8	Male		1	1		1				1
College Lecturer 9	Male		1	1		1				1
College Lecturer 10	Male		1	1		1				1
Total			11	11	0	11	0	0	0	11
Percentage			100	100	0	100	0	0	0	100

Note: 1-denotes answer in affirmation; Y- Yes, N-No, D- Don't Know

Table 6.6.1.2 Perception by Gender-Female (Question 1-Question 4)

Candidate	Gender	Prohibition Effective		Disregard of Law		Corruption			Improvement Living Standard	
		Y	N	Y	N	Y	N	D	Y	N
College Lecturer 1	Female		1	1		1				1
ASHA worker 1	Female		1	1		1				1
ASHA worker 2	Female		1	1		1				1
ASHA worker 3	Female		1	1		1				1
ASHA worker 4	Female		1	1		1				1

ASHA worker 5	Female		1	1		1				1
ASHA worker 6	Female		1	1		1				1
Medical Officer 1	Female		1	1				1		1
Medical Officer 2	Female		1	1				1		1
Medical Officer 3	Female		1	1				1	1	
Sister 1	Female		1	1		1			1	
Sister 2	Female		1	1		1			1	
Total		0	12	12	0	9	0	3	3	9
Percentage		0	100	100	0	75	0	25	25	75

Note: 1-denotes answer in affirmation; Y- Yes, N-No, D- Don't Know

Table 6.6.1.3 Perception by Gender- Male (Question 5-Question 7a)

Candidate	Labour well-being			Effect on Juvenile			Increased Mortality		
	Y	N	CS	G	B	NE	Y	N	CS
Other 1		1			1			1	
Other 2		1			1			1	
College Lecturer 2		1			1				1
College Lecturer 3		1			1		1		
College Lecturer 4		1				1			1
College Lecturer 5		1				1	1		
College Lecturer 6		1				1			1
College Lecturer 7		1			1				1
College Lecturer 8		1			1				1
College Lecturer 9		1			1		1		
College Lecturer 10		1			1				1
Total	0	11	0	0	8	3	3	2	6
Percentage	0	100	0	0	72.7	27.3	27.3	18.2	54.5

Note: 1-denotes answer in affirmation; CS- Can't Say, G-Good, B-Bad, NE-No Effect

Table 6.6.1.4 Perception by Gender-Female (Question 5-Question 7a)

Candidate	Labour well-being			Effect on Juvenile			Increased Mortality		
	Y	N	CS	G	B	NE	Y	N	CS
College Lecturer 1		1				1	1		
ASHA worker 1			1		1		1		
ASHA worker 2		1			1		1		
ASHA worker 3		1			1		1		

ASHA worker 4		1			1		1		
ASHA worker 5		1			1		1		
ASHA worker 6		1			1		1		
Medical Officer 1		1			1			1	
Medical Officer 2		1			1			1	
Medical Officer 3			1	1				1	
Sister 1		1				1			1
Sister 2		1				1			1
Total	0	10	2	1	8	3	7	3	2
Percentage	0	83.3	16.7	8.3	66.7	25.0	58.3	25.0	16.7

Note: 1-denotes answer in affirmation; CS- Can't Say, G-Good, B-Bad, NE-No Effect

Table 6.6.1.5 Perception by Gender-Male (Question 7b - Question 9)

Candidate	Domestic Violence			Effect on Poor			Effect on Tourism
	Y	N	CS	G	B	CS	
Other 1	1				1		No Scope
Other 2	1				1		No Scope
College Lecturer 2	1				1		Didn't Develop due to alcohol
College Lecturer 3	1				1		Didn't Develop due to alcohol
College Lecturer 4	1				1		No Scope
College Lecturer 5	1				1		No Scope
College Lecturer 6	1				1		No Scope
College Lecturer 7			1		1		No Scope
College Lecturer 8			1		1		No Scope
College Lecturer 9	1				1		No Scope
College Lecturer 10			1			1	Didn't Develop due to alcohol
Total	8	0	3	0	10	1	
Percentage	72.7	0.0	27.3	0.0	90.9	9.1	

Note: 1-denotes answer in affirmation; CS- Can't Say, G-Good, B-Bad

Table 6.6.1.6 Perception by Gender-Female (Question 7b - Question 9)

Candidate	Domestic Violence			Effect on Poor			Effect on Tourism
	Y	N	CS	G	B	CS	
College Lecturer 1	1				1		No Scope
ASHA worker 1	1					1	Can't Say
ASHA worker 2	1				1		Can't Say
ASHA worker 3	1				1		Can't Say
ASHA worker 4	1				1		No Effect
ASHA worker 5	1				1		No Effect
ASHA worker 6	1				1		No Effect

Medical Officer 1		1			1		No Effect
Medical Officer 2		1			1		No Effect
Medical Officer 3		1		1			Can't Say
Sister 1	1					1	No Effect
Sister 2	1					1	No Effect
Total	9	3	0	1	8	3	
Percentage	75.0	25.0	0.0	8.3	66.7	25.0	

Note: 1-denotes answer in affirmation; CS- Can't Say, G-Good, B-Bad

Table 6.6.1.7 Perception by Gender-Male (Question 10-Question 12)

Candidate	Support from People			Permit System	State Revenue Effect
	Pop=80-100%	Pop<=50%	Pop=50-80%		
Other 1		1		Can't Say	Can't Say
Other 2			1	Can't Say	Bad Effect
College Lecturer 2		1		No Role	Some Effect
College Lecturer 3		1		No Role	Some Effect
College Lecturer 4			1	No Role	Moral angle is important
College Lecturer 5			1	Can't Say	Revenue from alcohol inappropriate
College Lecturer 6			1	Can't Say	Revenue from alcohol inappropriate
College Lecturer 7			1	Can't Say	Affect developmental work
College Lecturer 8			1	Can't Say	Affect developmental work
College Lecturer 9			1	No Role	Moral angle is important
College Lecturer 10			1	No Role	Some Effect
Total	0	3	8		
Percentage	0.0	27.3	72.7		

Note: 1-denotes answer in affirmation

Table 6.6.1.8 Perception by Gender-Female (Question 10-Question 12)

Candidate	Support from People			Permit System	State Revenue Effect
	Pop=80-100%	Pop<=50%	Pop=50-80%		

College Lecturer 1			1	No Role	Affect developmental work
ASHA worker 1			1	Can't Say	Can't Say
ASHA worker 2			1	Can't Say	Can't Say
ASHA worker 3			1	Can't Say	Can't Say
ASHA worker 4			1	Can't Say	Can't Say
ASHA worker 5			1	Can't Say	Can't Say
ASHA worker 6			1	Can't Say	Can't Say
Medical Officer 1	1			Can't Say	No Effect
Medical Officer 2			1	Can't Say	No Effect
Medical Officer 3			1	Can't Say	Can't Say
Sister 1			1	No Role	Can't Say
Sister 2			1	No Role	Can't Say
Total	1	0	11		
Percentage	8.3	0.0	91.7		

Note: 1-denotes answer in affirmation

Table 6.6.1.9 Perception by Gender-Male (Question 13-Question 16)

Candidate	Political Insights	Implementation Rating	Alcohol Prices	Recommendation
Other 1	No idea	3	2 times	Prohibition
Other 2	Created Parallel Economy	3	2 times	No Prohibition
College Lecturer 2	Lure women voters	2	2-2.5 times	No Prohibition
College Lecturer 3	Lure women voters	2	2 times	No Prohibition
College Lecturer 4	Lure women voters	3	2-3 times	No Prohibition
College Lecturer 5	Lure women voters	3	2-3 times	No Prohibition
College Lecturer 6	Lure women voters	3	2-3 times	No Prohibition
College Lecturer 7	Lure women voters	3	2 times	No Prohibition
College Lecturer 8	Lure women voters	3	2 times	No Prohibition
College Lecturer 9	Lure women voters	5	2-2.5 times	Prohibition
College Lecturer 10	Created Parallel Economy	3	2 times	No Prohibition
Total		33		
Percentage		30		

Table 6.6.1.10 Perception by Gender-Female (Question 13-Question 16)

Candidate	Political Insights	Implementation Rating	Alcohol Prices	Recommendation

College Lecturer 1	Lure women voters	3	2 times	Prohibition
ASHA worker 1	No politics involved	2	2 times	Prohibition with better implementation
ASHA worker 2	No politics involved	3	2 times	Prohibition; close daru bhatti
ASHA worker 3	No politics involved	3	2 times	Prohibition with better implementation
ASHA worker 4	No politics involved	1	2 times	Prohibition; Clean Corruption, police takes money
ASHA worker 5	No politics involved	1	2 times	Prohibition with better implementation
ASHA worker 6	No politics involved	1	2 times	Prohibition; Clean Corruption, police takes money
Medical Officer 1	No politics involved	6	No Idea	Prohibition with better implementation
Medical Officer 2	No politics involved	5	No Idea	Prohibition with better implementation
Medical Officer 3	No politics involved	8	No Idea	Prohibition implementation is good
Sister 1	No Idea	3	No Idea	Prohibition with better implementation
Sister 2	No idea	4	No Idea	Prohibition with better implementation
Total		40		
Percentage	0.0	33.3		

6.6.2 Sample Design

a) Formation of sub-units (SUs):

1) **Rural and Tribal Area:** A rural village will be notionally divided into a number of sub-units (SU) of more or less equal population during the preparation of frame. The procedure of SU formation will be implemented in the villages with population *more than or equal to 1000 as per Census 2011*. In the remaining villages, no SU will be formed. Population less than 1000- 1 SU; 1000 to 1999- 2 SUs; 2000 to 2999- 3 SUs: and so on.

2) **Urban Area:** SUs will be formed in urban sector also. The procedure will be similar to that adopted in rural areas except that SUs will be formed on the basis of households in the Urban Wards. Less than 250- 1SU; 250 to 499- 2SUs; 500 to 749 3SUs; and so on.

b) **Outline of Sample Design:** A stratified two stage design will be adopted. *The first stage units (FSU) will be villages/Urban Wards/sub-units (SUs) as per the situation.* The second stage units (SSU) will be households in the sectors.

c) **Sampling Frame for First Stage Units (FSUs):** There will be no SU formation in uninhabited villages and villages with population less than 1000 as per Census 2011 and entire village will be considered as one FSU. All such villages will be the First Stage Units (FSUs). In the remaining villages, notional sub-units (SUs) will be considered as First Stage Units (FSUs). For the Urban Wards with less than 250 households, the entire Urban Ward will be considered as one FSU. In the remaining Urban Wards, the SUs will be considered as First Stage Units (FSUs).

Stratification of FSUs:

- 1) All inhabited villages within Gadchiroli Taluka will constitute a rural stratum.
- 2) All inhabited wards within Gadchiroli Taluka will constitute a urban stratum.
- 3) All inhabited villages within Gadchiroli Taluka with tribal population of 50 percent or more will constitute a tribal stratum.

Sub-stratification of FSUs:

Rural and Tribal sector: Three groups of villages will be formed within each stratum.

Group 1: all villages with Census 2011 population less than 250

Group 2: all villages with Census 2011 population more than or equal to 250 but less than 500

Group 3: remaining villages.

The sample size for a rural and tribal stratum will be allocated among 3 groups in proportion to population. Let r_1 , r_2 and r_3 be the allocations to Group 1, Group 2 and Group 3 respectively. The villages within each group will be first arranged in ascending order of population. For all the three groups within each stratum, ' $r_1/4 > 1$ ', ' $r_2/4 > 1$ ' and ' $r_3/4 > 1$ ' will imply formation of 2 or more sub-strata in each group. Sub-strata will be demarcated in Group 1, Group 2 and Group 3 respectively in such a way that each sub-stratum will comprise a group of villages (all SUs of a village considered together) of the arranged frame and have more or less equal population within the respective group.

If number of FSUs in a particular Group is very small, no sub-stratum may be formed in that Group. Further, in those strata where allocations are very small, minimum allocation for Group 1 and Group 2 may be 1 each.

Urban sector: Let ' u ' be the sample size allocated for an urban stratum. For all strata, if ' $u/4 > 1$ ', implying formation of 2 or more sub-strata, all the UFS blocks within the stratum will be first arranged in ascending order of total number of households in the UFS blocks as per urban frame. Then sub-strata will be demarcated in such a way that each sub-stratum will comprise a group of UFS blocks (all SUs of a block considered together) having more or less equal number of households.

Allocation to strata: Within each sector of Taluka, the respective sample size will be allocated to the different strata in proportion to the population as per Census 2011. Stratum level allocation will be adjusted to multiples of 4.

Selection of FSUs within a stratum/sub-stratum: From all the sub-strata in both rural and urban sector within each stratum, required number of FSUs will be selected by Simple Random Sampling Without Replacement (SRSWOR) scheme.

Allocations: A total 400 sample households are allocated as follows.

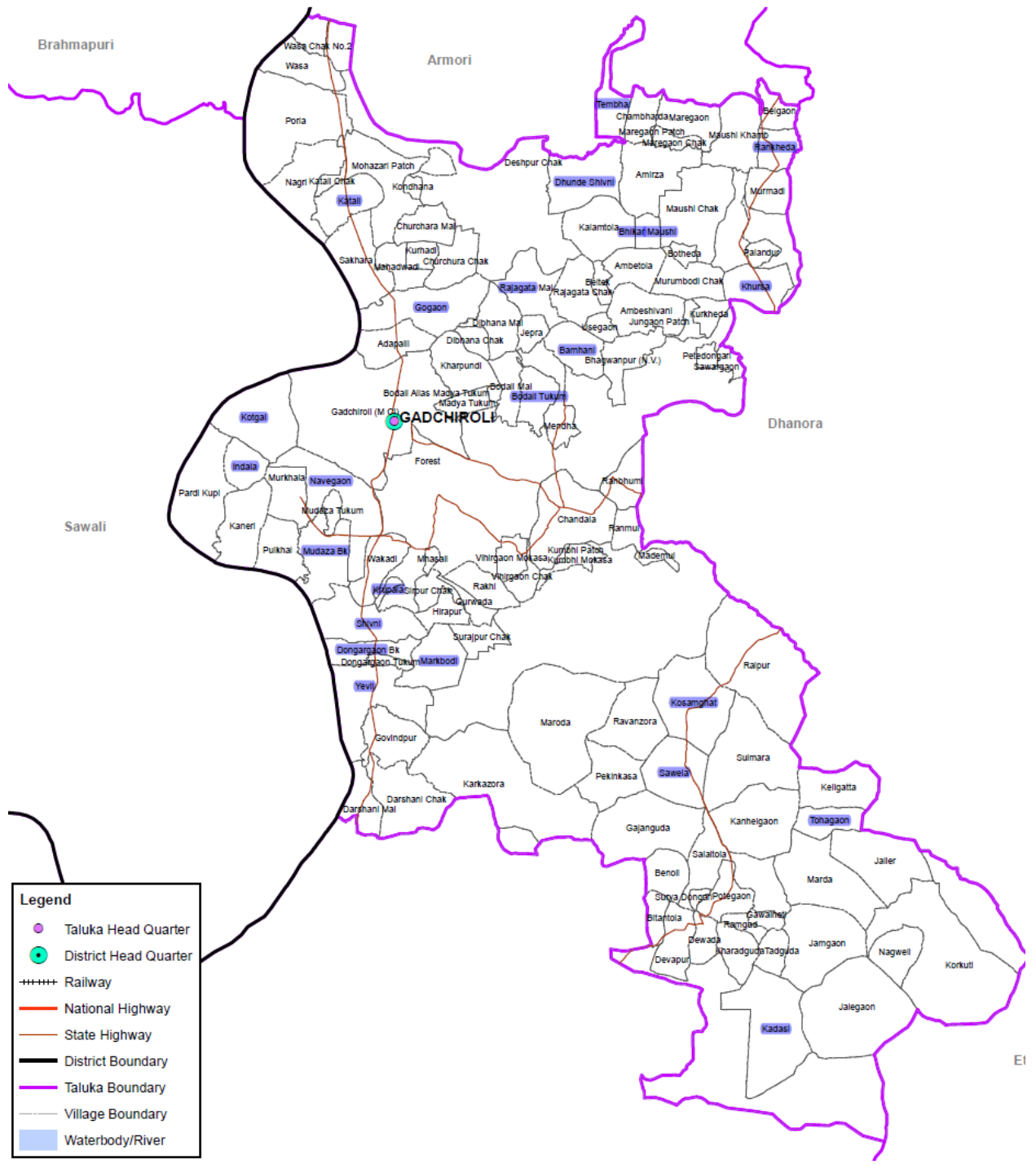
- 1) Urban: 148 (Urban Population- 54152)
- 2) Rural: 224 (Rural Population- 81223)
- 3) Tribal: 28 (Tribal Population- 10578)

Allocations of FSUs: A total of 32 FSUs are selected for the survey.

1)Urban: 8 FSUs, 2) Rural: 19 FSUs, 3) Tribal: 5 FSUs

Note: The sampling design follows the NSSO framework/methodology.

6.6.3 Location of selected FSU's (highlighted in purple)



6.6.4 Quantitative Questionnaire

IDENTIFICATION	
DISTRICT	
TEHSIL/TALUK	
CITY/TOWN/VILLAGE	
URBAN-1, RURAL-2	
NAME OF HOUSEHOLD HEAD	
ADDRESS	
MOTHER TONGUE	
RELIGION	
CASTE	
SOCIAL CATEGORY	
JOINT/INDEPENDENT FAMILY	

HOUSEHOLD MEMBERS								
NO	RELATION TO HEAD	AGE	GENDER	MARITAL STATUS	EDUCATION	OWNS LAND	OCCUPATION	ALCOHOL
1								
2								
3								
4								
5								
6								
7								

OVERALL EXPENDITURE (HHs)		
ITEMS ON EXPENDITURE	PER MONTH (RS)	PER ANNUM (RS)
FOOD (WITH MILK AND MILK PRODUCTS)		
MILK AND MILK PRODUCTS		
FUEL & LIGHTS		
MEDICAL CARE		
AMUSEMENT AND RECREATION		

HOUSING DURABLES GOODS		
CLOTHING, BEDDING & FOOTWEARS		
EDUCATION		
RENT		
CONVANCE AND TRAVELLING		
INTEREST AND DEBT		
SAVINGS		
OTHERS		
TOTAL		

BEVERAGES AND INTOXICANTS (HHs)		
ITEMS ON EXPENDITURE	PER MONTH (RS)	PER ANNUM (RS)
TEA AND COFFEE		
TODDY		
COUNTRY LIQUOR		
IMFL		
BEER		
TOBACCO		
PAN		
BIDI/CIGARETTEE		

HOUSEHOLD WOMEN QUESTIONNAIRE				
SR. NO.	QUESTION	1	2	3
1	WHAT IS YOUR CURRENT MARITAL STATUS?			
2	DO YOU STAY WITH YOUR HUSBAND?			
3	HOW MANY CHILDREN YOU HAVE?			
4	HOW MANY BOYS YOU HAVE?			
5	DID ANY CHILD DIE IN THE PAST?			
6	IF YES, WHAT WAS THE GENDER?			
7	IF YES, HOW OLD WAS HE/SHE?			
8	DID YOU EVER HAD ABORTION/MISCARRIAGE/STILL BIRTHS?			

9	IF YES HOW MANY TIMES?			
10	DOES YOUR HUSBAND EVER BEAT YOU?			
11	HOW MANY TIMES IN A MONTH THERE IS QUARREL BETWEEN YOU AND YOUR HUSBAND?			
12	TYPE OF VIOLENCE?			

DRINKERS QUESTIONNAIRE (Individual)									
SR.NO	DRINK NAME	PRICE NOW (RS)	INTRODUCED BY	TIME	PLACE	REASON	QUANTITY	FREQUENCY	EXPENDITURE PER DAY
1									
2									
3									
4									
5									

Codes:

Religion : hinduism-1, islam-2, christianity -3, sikhism-4, jainism-5, buddhism-6, zoroastrianism-7, Others-9

Social Category : scheduled tribes-1, scheduled castes-2, other backward classes-3, others-9

Joint/independent family: joint family-1, independent family-2

Gender: male-1, female-2.

Relation to head: self-1, spouse of head-2, married child-3, spouse of married child-4, unmarried child-5, Grandchild-6, father/mother/father-in-law/mother-in-law-7, brother/sister/brother-in-law/ Sister-in-law/other relatives-8, servants/employees/other non-relatives-9

Marital status: never married – 1, currently married – 2, widowed – 3, divorced/separated – 4

General educational level: not literate -01, Literate without formal schooling: through egs/nfec/aec - 02, through tlc -03, Others- 04;

Literate with formal schooling: below primary -05, primary -06, middle -07, secondary - 08, higher secondary -10, diploma/certificate course -11, graduate -12, postgraduate And above -13

Occupation:

for rural areas: self-employed in: agriculture -1, non-agriculture - 2; Regular wage/salary earning - 3, Casual labour in: agriculture - 4, non-agriculture -5; others-9

For urban areas: self-employed-1, regular wage/salary earning-2, casual labour-3,

Owns land: yes-1, no-2

Alcohol: yes-1, no-2

Introduced by: friends-1, parents/relatives-2, customs-3, other-4

Time: *holidays/festivals-1, before work-2, during work-3, after work-4*

Reason: *strain of work-1, addiction-2, medical reason-3, fun-4, other-5*

Type of violence: *1-verbal, 2-threatened to hit, 3- threw, smashed, hit or kicked something, 4- pushed, 5- slapped/spanked, 6- kicked bit or hit with fist, 7-hit or tried to hit with object, 8- beat up, 9- threatened with sharp or dangerous object, 10- used sharp or dangerous object.*

6.6.5 Descriptive Statistics

Table 6.6.5.1 Prevalence of Intoxicants in Households by Sector

	Percent-Weighted	Percent-Unweighted
Alcoholic Head		
Rural	49.42	49.79
Tribal	80.69	81.25
Urban	52.58	52.63
Alcohol Household		
Rural	53.22	53.53
Tribal	83.35	84.37
Urban	54.87	54.89
Tobacco Household		
Rural	29.47	29.47
Tribal	55.47	53.13
Urban	24.16	24.06
Kharra Household		
Rural	76.61	76.76
Tribal	92.03	90.62
Urban	75.96	75.94

Note: Authors estimation using primary survey data; Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

Table 6.6.5.2 Prevalence of Intoxicants in Households by Religion

	Percent-Weighted	Percent-Unweighted
Alcoholic Head		
Buddhist	47.90	48.65
Hindu	53.58	54.60
Alcohol Household		
Buddhist	58.55	59.46
Hindu	55.18	56.13
Tobacco Household		
Buddhist	27.74	29.73
Hindu	29.98	30.06
Kharra Household		
Buddhist	68.33	68.92
Hindu	80.10	80.37

Note: Authors estimation using primary survey data; Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

Table 6.6.5.3 Prevalence of Intoxicants in Households by Social Category

	Percent-Weighted	Percent-Unweighted
Alcoholic Head		
NT	52.19	53.41
OBC	52.60	52.55
SC	47.54	48.19
ST	55.09	57.61
Alcohol Household		
NT	53.35	53.41
OBC	52.65	52.55
SC	58.24	48.19
ST	58.57	57.61
Tobacco Household		
NT	29.13	29.54545
OBC	29.33	29.19708
SC	27.13	28.91566
ST	32.61	32.61
Kharra Household		
NT	84.61	85.22
OBC	78.13	78.10
SC	69.38	69.88
ST	79.06	79.35

Note: Authors Estimation using primary survey data; The Other group population is negligible or very low in the taluka hence not shown. Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

Table 6.6.5.4 Prevalence of Intoxicants in Households by Farm Size

Farm Size	Alcoholic Head		Alcohol Household		Tobacco Household		Kharra Household	
	Non-drinker	Drinker	Non-drinker	Drinker	Non-drinker	Drinker	Non-drinker	Drinker
No Land	47.6	52.4	44.94	55.06	75.23	24.77	25.82	74.18
Marginal	46.82	53.18	44.34	55.66	69.49	30.51	20.13	79.87
Small & Semi Medium	62.71	37.29	43.57	56.43	49.59	50.41	30.86	69.14

Note: Authors estimation using sampling weights; Alcoholic Head refers to Head of a household consume alcohol, Alcohol Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

Table 6.6.5.5 Prevalence in Household Head by Number of Liquor Types

Sector	Multiple Liquor		
	None	One type	Two types
Rural	50.56	42.79	6.23
Tribal	16.65	80.69	2.66
Urban	46.64	45.86	7.5
Total	47.34	45.95	6.46

Note: Authors estimation using sampling weights

Table 6.6.5.6 Prevalence in Household Head by Sector and Time

Sector	Morning	Evening	Night	Anytime
Rural	3.75	27.27	17.17	4.17
Tribal	7.94	52.44	23.91	9.65
Urban	4.54	27.81	12.04	7.51
Total	4.25	28.86	15.81	5.61

Note: Authors estimation using sampling weights

Table 6.6.5.7 Prevalence in Household Head by Frequency

Sector	Frequency (Day)			Frequency(Week)			Frequency(Month)		
	One time	Two time	Three time	One time	Two time	Three time	One time	Two time	Three time
Rural	12.54	6.27	2.36	4.61	3.63	4.02	3.33	2.92	8.67
Tribal	9.65	22.5	2.66	12.31	5.31	17.63	2.66	0	7.97
Urban	12.01	3.02	6	4.54	0.75	8.26	6.02	1.49	5.29
Total	12.2	6.07	3.61	5.01	2.75	6.22	4.21	2.27	7.48

Note: Authors estimation using sampling weights

Table 6.6.5.8 Prevalence of Intoxicants in a Household by Quantiles

Quantile	Alcohol Household		Tobacco Household		Kharra Household	
	No	Yes	No	Yes	No	Yes
Highest	54.33	45.67	81.83	18.17	35.72	64.28
Upper-Middle	51.02	48.98	70.91	29.09	22.08	77.92
Middle	43.24	56.76	57.48	42.52	18.3	81.7
Lower-Middle	35.04	64.96	63.17	36.83	9.68	90.32
Lowest	39.03	60.97	81.28	18.72	28.12	71.88
Total	44.54	55.46	70.89	29.11	22.75	77.25

Note: Authors estimation using sampling weights; Alcoholic Head refers to Head of a household consume alcohol, Alcoholic Household refers to any member of Household consume alcohol, Tobacco Household refers to any member of Household consume Tobacco, Kharra Household refers to any member of Household consume Kharra.

6.6.6 District Level estimates for Gadchiroli using secondary data- DLHS-4

(2012-13)

6.6.6.1 Prevalence by Sector and Gender

Sector	Male (percent)	Female (percent)
Rural	35.3	2.4
Urban	26.2	0.8
Total	31.1	1.6

Note: Authors estimation using sampling weights on DLHS 4 data

6.6.6.2 Prevalence by Sector among Household Head

Sector	Percent
Rural	41
Urban	27
Total	34

Note: Authors estimation using sampling weights on DLHS 4 data

6.6.6.3 Prevalence by Major Religion among Household Head

Religion	Percent
Hindu	34
Muslim	36
Christian	33
Buddhist	33
Total	34

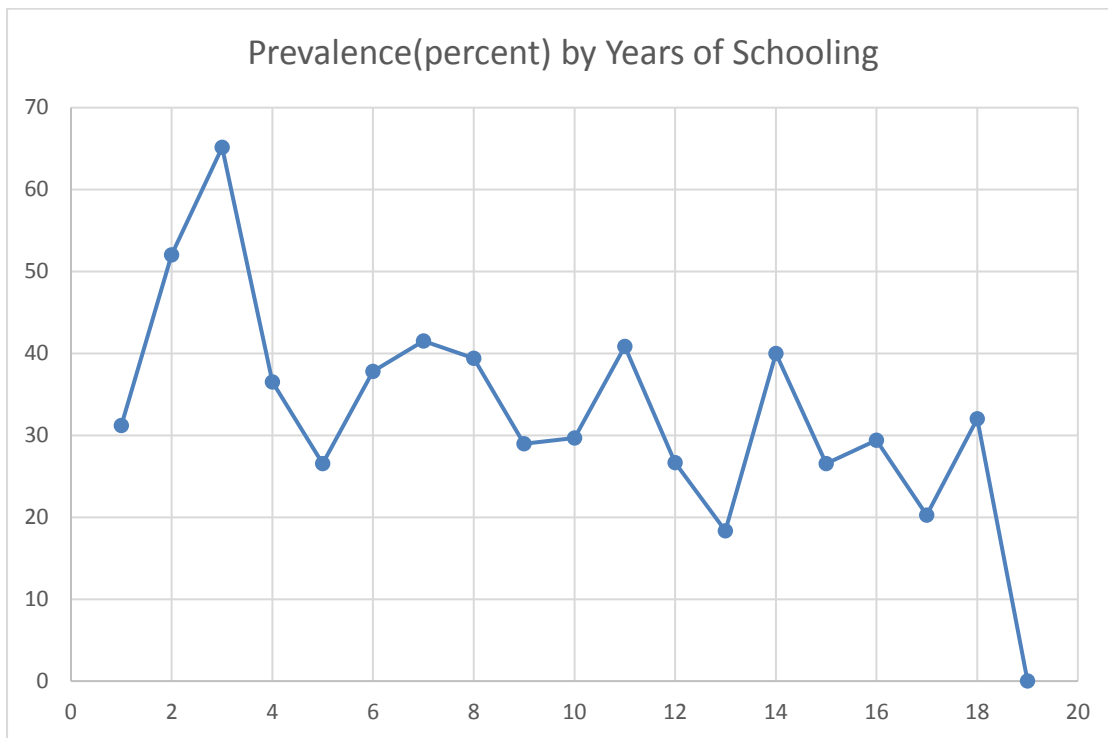
Note: Authors estimation using sampling weights on DLHS 4 data

6.6.6.4 Prevalence by Social Category among Household Head

Social Category	Percent
SC	30
ST	44
OBC	29
Other	27
Total	34

Note: Authors estimation using sampling weights on DLHS 4 data

6.6.6.5 Prevalence by Years of Schooling among Household Head



Note: Authors depiction using sampling weights on DLHS 4 data. x-axis denotes years of schooling; y-axis denotes years in percentages

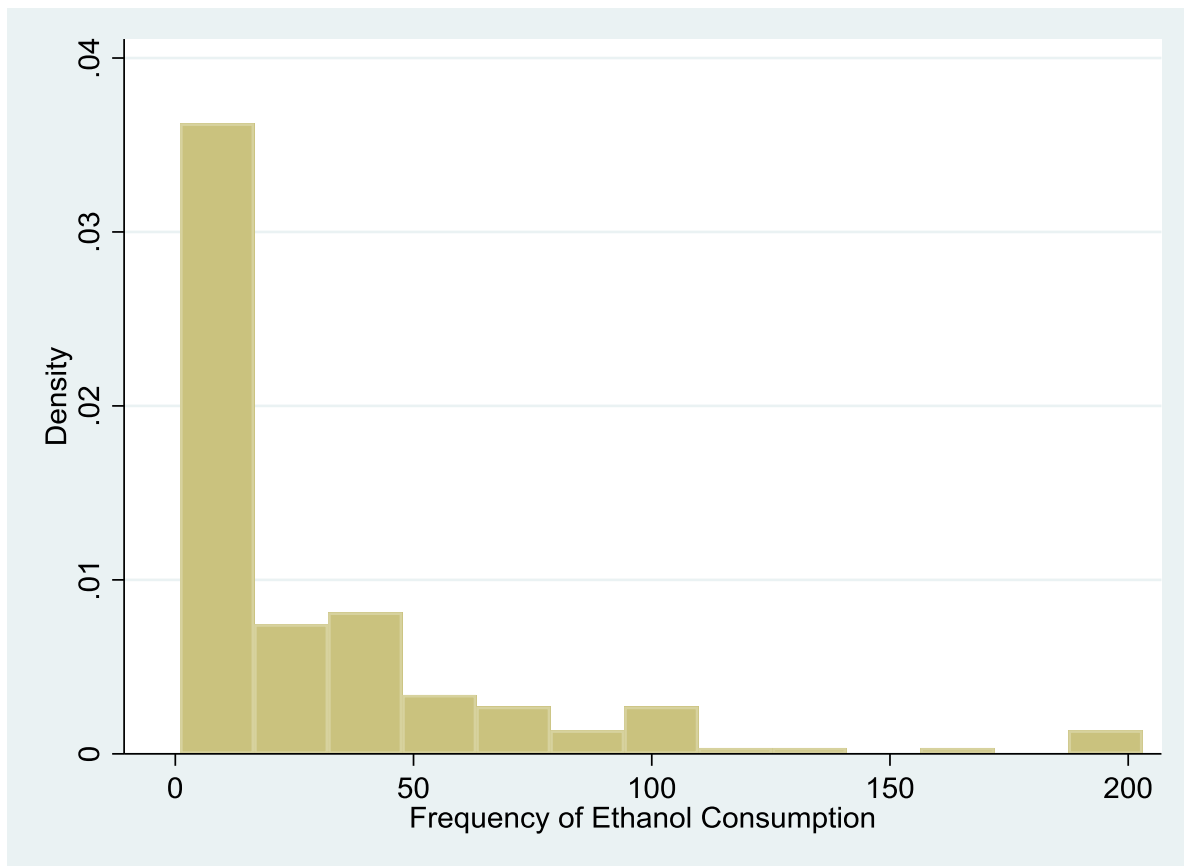
6.6.7 Tables and Figures on Econometric Analysis

Table 6.6.7.1 Summary Statistics of the Sample

Variable	Observations	Mean	Std. dev.	Min	Max
Drinks any alcohol type	590	0.43	0.50	0	1
Drinks Indian Liquor	590	0.32	0.47	0	1
Drinks Foreign Liquor	590	0.05	0.22	0	1
Drinks Mahua	590	0.23	0.42	0	1
Drinks Country Liquor	590	0.09	0.29	0	1
Drinks Toddy	590	0.04	0.20	0	1
Drinks IMFL	590	0.03	0.16	0	1
Drinks Beer	590	0.03	0.16	0	1
Frequency of Mahua drinking per month (100ml)	590	17.38	54.65	0	455
Frequency of Country Liquor drinking per month (90ml)	590	2.84	12.09	0	120
Frequency of Toddy drinking per month (100 ml)	590	1.36	11.25	0	121
Frequency of IMFL drinking per month (90 ml)	590	0.32	2.87	0	43
Frequency of Beer drinking per month (330 ml)	590	0.22	2.67	0	59
Frequency of Ethanol drinking per month (100 ml)	590	9.24	25.91	0	203
Frequency of Mahua drinking per month (100ml) for drinkers	133	77.09	93.21	1	455
Frequency of Country Liquor drinking per month (90ml) for drinkers	56	29.91	27.21	1	120
Frequency of Toddy drinking per month (100 ml) for drinkers	24	33.46	46.03	1	121
Frequency of IMFL drinking per month (90 ml) for drinkers	15	12.67	13.39	2	43
Frequency of Beer drinking per month (330 ml) for drinkers	14	9.36	15.20	1	59
Frequency of Ethanol drinking per month (100 ml) for drinkers	190	28.69	39.12	1	203

Note: Authors estimation using the collected primary survey data in Gadchiroli.

Fig 6.6.7.2 Distribution of Frequency of Ethanol Consumption in Males Drinkers



Note: Authors estimation using the collected primary survey data in Gadchiroli.

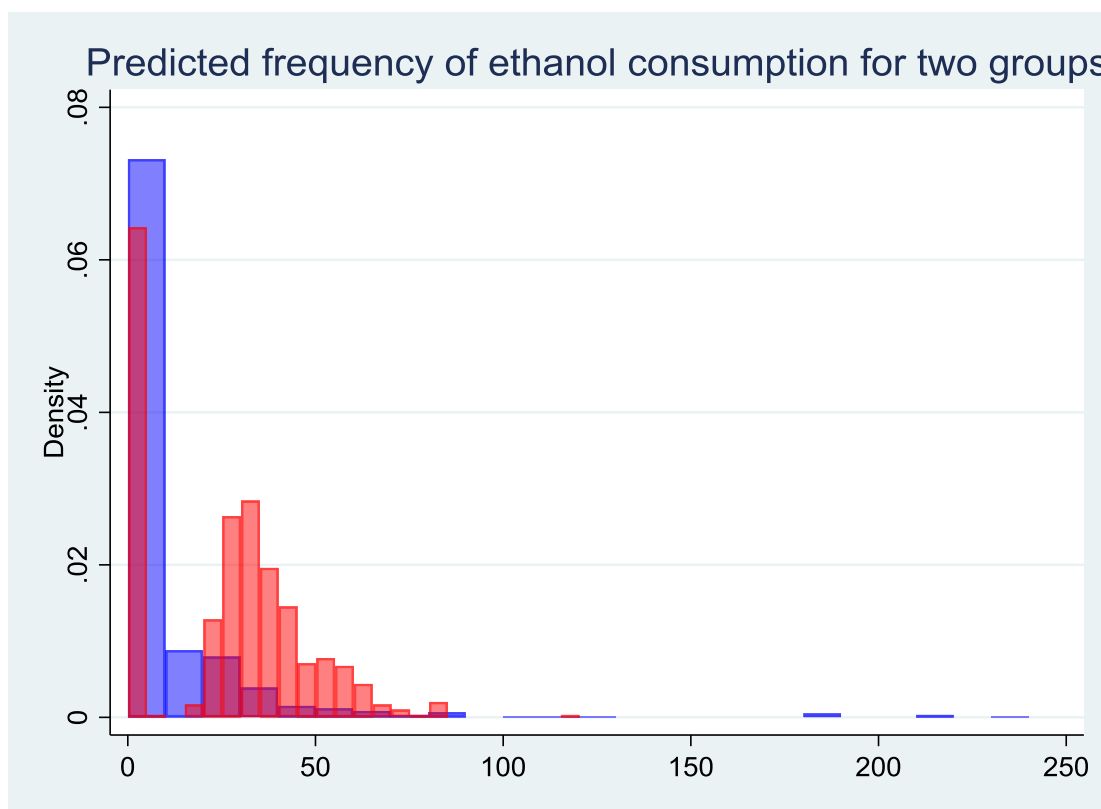
Table 6.6.7.3 Estimation using Poisson, Negative Binomial and FMMs 2-

Component Model

VARIABLES	Frequency in 100 ml per month	Frequency in 100 ml per month	Frequency in 100 ml per month	Frequency in 100 ml per month	Frequency in ounces per week	Frequency in ounces per week
	Poisson	NB	Component-1 Poisson, FMM	Component-2 Poisson, FMM	Component-1 Poisson, FMM	Component-2 Poisson, FMM
Prices, log	-4.812***	-1.286	-5.056***	-1.337*	-5.109***	-1.342*
	(1.059)	(1.213)	(0.783)	(0.696)	(0.793)	(0.712)
MPCE, log	0.365*	0.593*	0.148	0.456**	0.147	0.459*
	(0.199)	(0.316)	(0.247)	(0.227)	(0.269)	(0.237)
Age	0.268***	0.503***	0.225***	0.0265	0.236***	0.0296
	(0.0571)	(0.0788)	(0.0719)	(0.0825)	(0.0854)	(0.0847)
Age squared	-0.0030***	-0.0056***	-0.00279***	-0.000420	-0.00292***	-0.000449
	(0.000652)	(0.000882)	(0.000771)	(0.000917)	(0.000923)	(0.000935)
Years of Education	-0.124***	-0.197***	-0.0976***	-0.0356**	-0.0974***	-0.0343*
	(0.0195)	(0.0239)	(0.0208)	(0.0158)	(0.0219)	(0.0178)
Tribal dummy (base Rural)	0.665*	0.45	1.604***	0.631***	1.573***	0.623***
	(0.365)	(0.463)	(0.345)	(0.221)	(0.361)	(0.226)
Urban dummy (base Rural)	0.488**	0.226	3.869***	-4.615***	3.841***	-4.564***
	(0.216)	(0.316)	(0.214)	(0.386)	(0.249)	(0.412)
Constant	26.71***	-2.904	28.81***	8.915	28.74***	8.606
	(7.536)	(8.571)	(5.249)	(5.507)	(5.448)	(5.713)
Log alpha		2.167***				
		(0.0964)				
Observations	590	590	590	590	590	590

Note: Authors estimation using the collected primary survey data and using various models with standard error in parenthesis

Fig 6.6.7.4 Predicted frequency of Ethanol consumption for two component model



Note: Authors depiction using FMMs Model on primary survey data

Table 6.6.7.5 Robustness using Quantile Regression using Drinkers only Sample

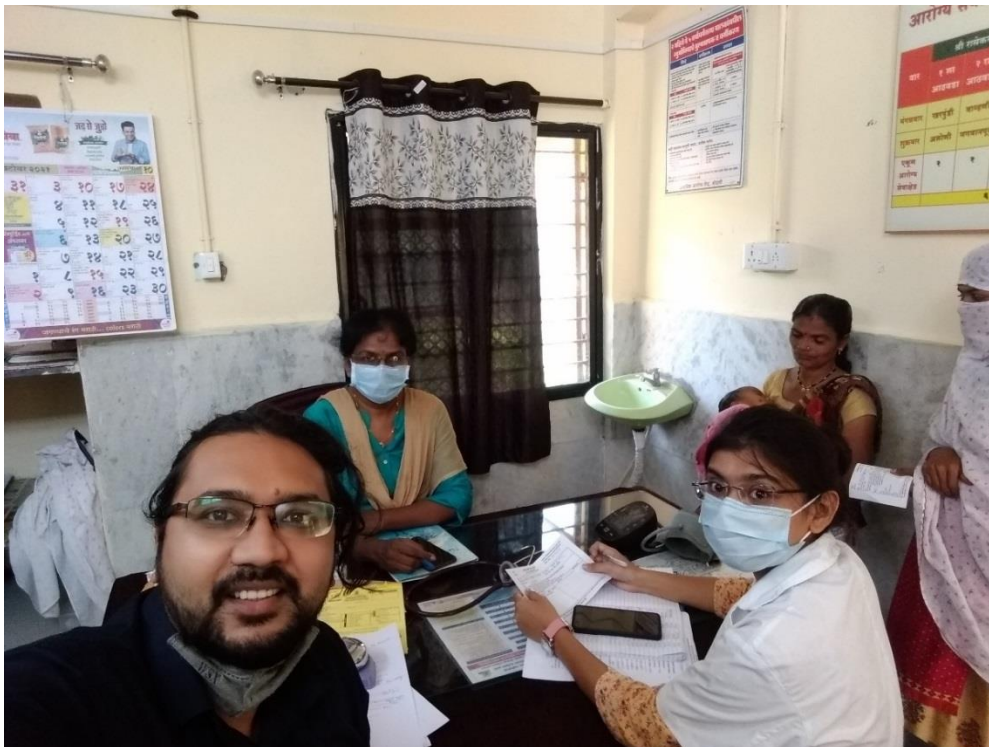
VARIABLES	q25	q50	q80	q90	q95
Prices, log	0.200 (1.678)	-1.636 (2.812)	-2.429* (1.250)	-2.295* (1.244)	-1.644 (1.300)
MPCE, log	0.151 (0.277)	0.0112 (0.378)	0.0145 (0.367)	0.285 (0.436)	-0 (0.540)
Age	0.146*** (0.0501)	0.256*** (0.0716)	0.309*** (0.0967)	0.131 (0.145)	-0.0396 (0.155)
Age squared	-0.0015*** (0.000538)	-0.0029*** (0.000784)	-0.0036*** (0.00103)	-0.00171 (0.00159)	0.000182 (0.00178)
Years of Education	-0.0715** (0.0312)	-0.154*** (0.0260)	-0.155*** (0.0197)	-0.107*** (0.0209)	-0.0776** (0.0382)
Tribal dummy (base Rural)	-0.107 (0.356)	-0.202 (0.355)	-0.0548 (0.632)	0.0540 (0.643)	-0.220 (0.644)
Urban dummy (base Urban)	0.292 (0.440)	0.857** (0.350)	0.345 (0.212)	0.351 (0.307)	0.177 (0.308)
Constant	-4.534 (12.02)	8.805 (19.82)	14.49 (9.545)	15.42 (9.710)	17.31 (11.09)
Observations	256	256	256	256	256

Note: Authors estimation using Quantile Regressions, standard error in parenthesis

6.6.8 Survey Images



A visit to primary health center at Gadchiroli (Urban)



A visit to primary health center at Gadchiroli (rural)



A visit to college at Gadchiroli (Urban)



A visit to college at Gadchiroli (Urban)



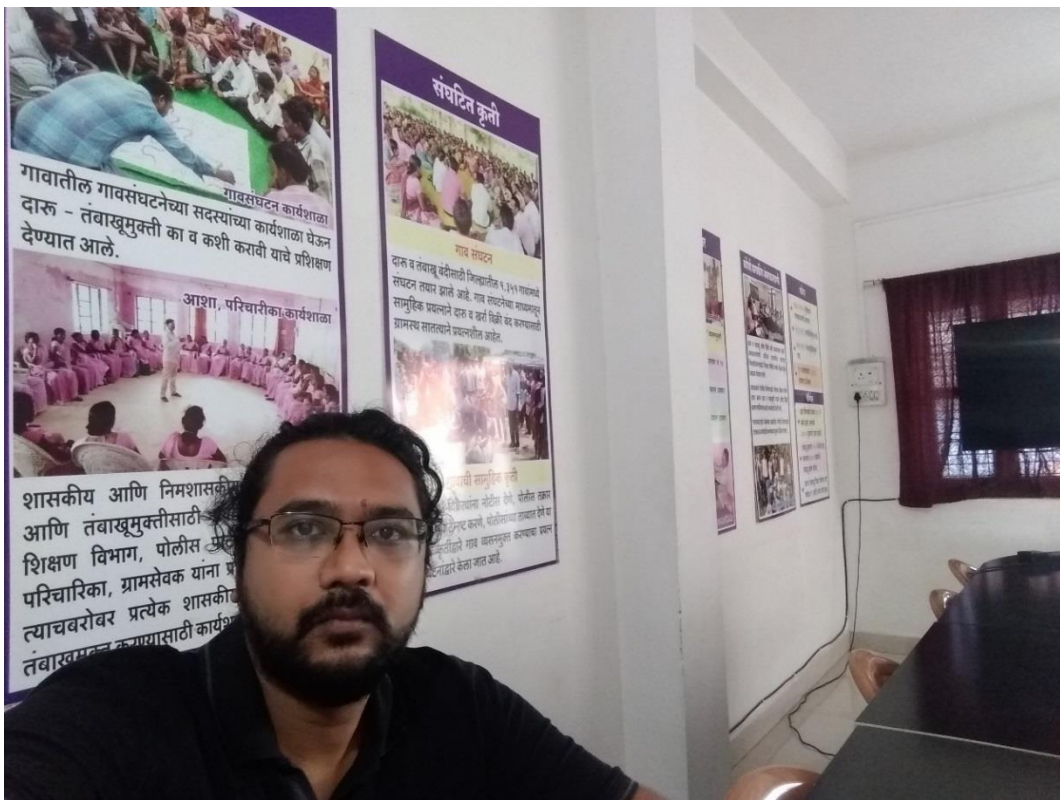
Primary survey in a village at Gadchiroli (rural)



Primary survey in a village at Gadchiroli (rural)



A sample of country liquor bottle found in a village at Gadchiroli (rural)



A visit to an NGO office at Gadchiroli (Urban)



A visit to an NGO office at Gadchiroli (Rural)



A visit to an NGO office at Gadchiroli (Rural)

Chapter 7: Conclusion

7.1 Introduction

In order to reduce alcohol consumption and advance social welfare among Indian inhabitants, this dissertation examines the efficacy of alcohol prohibition measures in the country. The prohibition hypothesis was based on the idea that policies of alcohol prohibition bring about social welfare for citizens and successfully eliminate or reduce alcohol use in areas where it is forbidden. In order to test the prohibition hypothesis, this dissertation seeks to explore the historical and contemporary literature related to alcohol consumption, temperance, and prohibition, and assesses the efficacy of various measures in controlling alcohol consumption. It further investigates the current situation of alcohol consumption in various states of India and districts of Maharashtra, as well as the effects of policy regulations (such as prohibition) on alcohol participation and consumption. Additionally, it explores the type of good that alcohol is associated with, the effect of prohibition on state revenues and expenditure, the effect of prohibition and the women's movement on household budget allocation. A qualitative survey was also carried out in the Maharashtra district of Gadchiroli, where alcohol consumption is prohibited, to gain insight into the issues of corruption, domestic violence, active support of the populace, disregard for the law, labour productivity and well-being, tourism, and impact on the underprivileged. Finally, the primary survey was utilized to measure the prevalence of alcohol and other intoxicants (in alcohol prohibited taluka of Maharashtra state) by various socio-economic characteristics of households.

This chapter summarizes the important findings and then presents the overall perspective on the topic of alcohol consumption and its prohibition in India.

7.2 Summary of Findings

One of the prime objective of this study was to develop insights on the previous attempts of alcohol prohibition in India and understand its effect. Based on a thorough review of the existing literature, it appears that education, inculcation of moral values, and promotion of spiritual progress of individuals and society as a whole may be the most rational means of reducing alcohol consumption in the country. Although not drinking at all may have certain health benefits as compared to moderate drinking, these benefits alone may not justify prohibition as a policy. The Indian experience with prohibition over the long run has shown that illegal liquor tends to resurface in the prohibited areas, leading to the creation of a parallel

economy. On the other hand, from the perspective of the government, pricing and taxation of alcohol can result in positive outcomes. (see Chapter 2)

As emphasized in the literature review, it became important to explore the impact of pricing or taxation on alcohol consumption. For analyzing the importance of pricing or taxation, analyses at the all-India level is conducted in this dissertation which suggests taxes/prices are vital for reduction in alcohol consumption among drinkers (especially for light and moderate drinkers). Secondly, the analyses clarified for Indian made foreign liquor the taxes/prices are more responsive to moderate drinkers. Additionally, the analyses of price elasticities for South India follows a similar trend as that of national level for the country liquor; however, in South India the price elasticity for moderate drinkers is higher than for light as well as heavy drinkers of IMFL, Beer and Toddy, suggesting higher responsiveness to prices for moderate drinkers. As a special case of Maharashtra state, it was found that heavy drinkers are highly responsive to prices of country liquor as well as IMFL, suggesting prices as an important policy instrument to reduce IMFL and Country Liquor consumption (see Chapter 3)

The values of income elasticity of alcohol suggest alcohol as a normal good. The positive income elasticities along with increasing responsiveness to income as consumption increases suggests that alcohol is a stable source of tax revenue (to the government) and the rise in income shall lead to increase in tax revenue. Moreover, the estimated values of income elasticities suggest the government can consider progressive taxation on alcohol to capture larger share of income from higher quantile consumers/ heavy drinking households (see Chapter 3)

Diploma and Certificate level education shows larger negative impact when compared to other education levels (including Graduation and above Graduations levels) amongst higher quantiles of alcohol (quantity) consumers. This probably highlights the importance of skill based education in India to control the liquor consumption (see Chapter 3)

The policies related to alcohol are formulated and implemented as the state level. For developing an effective alcohol control measure it is imperative to trace the prevalence of alcohol consumption at various administrative levels. To attain this objective, the state of Maharashtra is analyzed (especially considering the state has two alcohol prohibited districts namely Gadchiroli and Wardha). Analyses conducted using secondary data based on household surveys suggests prohibition in the district of Gadchiroli and Wardha has failed to arrest alcohol consumption. Moreover, alcohol consumption turns out to be more prevalent among poor in these alcohol prohibited districts. It is generally observed (in several districts of Maharashtra

along with the prohibited districts of Maharashtra) that the alcohol drinkers among tribal and scheduled castes are higher than in other social categories; the men belonging to the occupation⁹⁴ Group 6 (skilled agricultural and fishery workers) and Group 789 (craft and related trades workers, plant and machine operators and assemblers, elementary occupations) often have a higher proportion of drinkers than other occupations; higher educated men have a lower proportion of alcohol consumers than uneducated men, and by religion, the prevalence of alcohol consumption is highest among Buddhists in most districts. The higher occurrence of a certain phenomenon is ascribed to cultural practices, particularly among tribal populations, the desire for leisure and amusement following strenuous physical work, limited access to education, economic deprivation, and the intertwining of these factors. (see Chapter 4, Section 4.3)

Apart from measuring the prevalence of alcohol consumption the other important objective was to measure the effectiveness of alcohol prohibition at the district level. Again the secondary dataset based on consumption expenditure rounds of NSSO was employed and this led to some of the critical conclusions. One of the critical conclusion (of district level prohibition in Maharashtra) is- country liquor prices and enforcement index has no significant role in controlling participation of country liquor. The analysis based on education (conditional on participation of alcohol consumption) suggests, a level increase in education of household head would significantly fall pure alcohol consumption quantity and country liquor quantity, along with increase in the budget share of alcohol in the household, suggesting the plausibility of a costlier version of alcohol consumed in such households. On analyzing the nature or type of good alcohol is it is found that alcohol is a normal good (this finding is similar to Rahman (2004) finding at all-India level), however, it is observed that budget share on consumption (conditioned on participation of alcohol) reduces with the rise in MPCE suggesting there is no proportional rise in expenditure. On studying the relationship of alcohol with other addictive goods it is found that alcohol (participation) is a complement to tobacco and tobacco products along with Pan and Supari (this finding is also similar to Rahman (2004) findings at the all-India level analysis (see Chapter 4, Section 4.4)

Considering the district level prohibition can erase a significant share of state excise revenue, the revenue characteristics of state excise of Maharashtra is explored and it is observed that the fall in the state revenue due to Chandrapur prohibition is not substantial. Moreover, the trends in excise revenue by alcohol type suggests an increasing trend in the share of foreign

⁹⁴ Based of National Classification of Occupations (2004)

type liquor and a decreasing trend in the share of Indian type liquor (see Chapter no 4, Section 4.5)

The literature review (as conducted and presented in Chapter 2) suggested that the fall in state excise revenue as the significant reason for removal of alcohol prohibition policy. The analyses on state's excise revenue points out that prohibition in states like Andhra Pradesh, Haryana, and Bihar showed a large fall in state revenue, suggesting the requirement/necessity of central assistance to implement state-level alcohol prohibition. It is also observed that the fall in state revenue has a significant correlation with a fall in welfare and development expenditure (specific heads) of the state (implementing prohibition). Furthermore, there is a suggestive evidence that the women's movement and prohibition both showed positive benefits in terms of alcohol (lower participation/consumption) and food expenditures (increased expenditure) of the households (see Chapter 5)

The qualitative survey (using key informant approach) designed to understand perceptions of people in prohibited area (Gadchiroli district in this case) suggests that alcohol is commonly available in the district. However, the opinion on prohibition appears divided. Every woman surveyed suggested prohibition must be in place; however, there was no such uniformity of opinion among men. This leads to a larger share of the population supporting the prohibition policy (see Chapter 6, section 6.2)

Research based on secondary data are insufficient to provide a thorough grasp of a subject like alcohol prohibition. The primary survey conducted (at taluka level) to overcome this limitation finds that there is high prevalence of alcohol consumption in Gadchiroli taluka (alcohol prohibited area in Maharashtra state) with the highest prevalence in the tribal sector. It is estimated that nearly 55.5 percent of the household heads reported consuming some or the other form of liquor. It is also estimated that the most common form of liquor (although illegal due to prohibition policy at place) available in the taluka is Mahua (flower based alcoholic beverage). Analysis by sector estimates that toddy has a higher prevalence in the tribal sector than other sectors, whereas Indian Made Foreign Liquor (IMFL) has a higher prevalence in the Urban sector compared to the rural and tribal sectors. Additionally, estimates based on other intoxicants available in the taluka suggests the highest prevalence of intoxicant is Kharra (a tobacco product). The data also estimated a high prevalence of domestic violence among households with alcoholic heads (see Chapter 6, section 6.3)

The individual level analysis finds three latent classes in the existing distribution based on frequency of consumption and suggests price elasticity of each component i.e., low,

moderate and high drinking frequency is elastic, suggesting prices can be an effective tool for the government to reduce the consumption of alcohol. Secondly, additional year of education correspond to lower frequency of alcohol consumption. This supports the argument that government policy should put more emphasis on raising people's levels of education in order to reduce their consumption of alcohol in the prohibited district of Gadchiroli.

So what is it that can be concluded based on this study? What is the larger perspective? Based on above mentioned results along with details established during primary survey (at district level) the following section summarizes the answers to the objectives/questions mentioned in the Introduction (Chapter 1) of this dissertation.

7.3 Discussion and Conclusion

It cannot be neglected that prohibition has shown some benefits by reducing the prevalence (or reported prevalence) of alcohol consumption in prohibited states (compared to the rest of the unprohibited states of India) (see Chapter 3, Section 3.2). Contrarily, the district level prohibition in Gadchiroli and Wardha districts in Maharashtra shows high prevalence even after alcohol prohibition, suggesting a policy failure at the district level (see Chapter 4, Section 4.3 and Chapter 6).

The review of literature (see Chapter 2) suggests that the cultural and socio-economic factors are important determinants of alcohol consumption. As in the case of Gujarat, and as pointed out by the "national commission of alcohol prohibition", the "relative success" of alcohol prohibition was "expected" considering the cultural factors and population composition of Gujarat. This, however, is not the case with district-level prohibition in Wardha and Gadchiroli districts of Maharashtra. Enforcing prohibition at the district level is unlikely to succeed if the surrounding districts allow alcohol consumption, and if the local population is predominantly composed of tribal communities, peasants, and laborers who view alcohol as a cultural norm and a form of recreation after a hard day's work (see Chapter 4 and Chapter 6).

The consistent factor that is significant and shows a fall in alcohol participation and quantity of consumption is the education as well as the own-prices. Moreover, prohibition didn't turn out to be significant in explaining the variation of district-level prohibition in Maharashtra, suggesting higher impetus to be given to educating people and government can work upon appropriate prices to lower down alcohol consumption. The finding that Diploma and Certificate education leads to lower consumption compared to all the other levels of

education including Graduation and above among moderate and heavy drinking households suggest the importance of skill based education in India. (see Chapter 3, Chapter 4 and Chapter 6)

The other important aspect of alcohol prohibition is its effect on state government revenue. The impact of district-level prohibition (Chandrapur) is not substantial, but a state-level prohibition marks a serious concern, especially during the present times when most of the sources of state government revenue are subsumed by the enactment of Goods and Service Tax⁹⁵ (GST). This creates a vertical imbalance making states more reliant on grants and central transfers/central assistance (see Chapter 4 and Chapter 5)

A qualitative survey reveals that women's support for alcohol prohibition is largely motivated by the incidents of domestic violence and social disturbance caused by alcohol. The analysis of alcohol prohibition in Gadchiroli taluka also highlights a higher prevalence of domestic violence against women in households where alcohol is consumed. This observation could potentially serve as a central political strategy to attract female voters and influence election outcomes (see Chapter 6). In the larger perspective, even if women are true in understanding the problem associated with drunk husbands in day to day life, the bigger picture of social awakening, improved educational facilities, better health infrastructure/ facilities, and higher welfare expenditure remains largely ignored (as pointed out by professors and lecturers in qualitative survey). The considerable difference in alcohol consumption even after alcohol prohibition compared to developed/higher Monthly Per-capita Consumption Expenditure districts of the Maharashtra points- substantial work is required to be done in the social sector by the state government (i.e. promote education, eradicate poverty and boost economic growth/development) which can eventually bring a reduction in alcohol consumption in these districts (the same was also pointed out during interviews of the qualitative survey) (see Chapter 4, Section 4.3 and Chapter 6)

This study leads to the conclusion that prohibition in the current times can be reflective of the loss of state excise revenue (see Chapter 1 and Chapter 5), skewed centre-state fiscal relation, weak/no intent for policy implementation, rampant corruption in public officials, additional expenditure on state exchequers along with people consuming deleterious drinks (adversely affecting their health) (see Chapter 1 and Chapter 6), showing the policy which was

⁹⁵ The goods and service tax (GST) since July 2017 has replaced multiple indirect taxes levied by state governments subsuming State VAT, Luxury Tax, Entry Tax, Entertainment and Amusement Tax (except when levied by the local bodies), Taxes on advertisements, Taxes on lotteries, betting and gambling, State Surcharges, and Cesses.

constructed for the benefit of masses turning out to be regressive for democracy and economy as a whole. On the flip-side there are some benefits like lowering the prevalence to some extent and improved household allocation of budget shares towards food expenditure (see Chapter 3 and Chapter 5). However, it is difficult to distinguish if the improved allocation on food expenditures was due to women empowerment or due to prohibition (see Chapter 5).

The recommendations based on the findings of this study are:

The government of the day should prefer to raise alcohol taxes as an important tool to control alcohol consumption in the respective state of India (see Chapter 3 and Chapter 4). The finding that price elasticity falls in the range of -0.2 to -1 makes liquor demand less elastic to price-rise, suggesting higher tax revenue to the government (see Chapter 3 and Chapter 4). Secondly, the government should promote education among individual along with special impetus to skill based education like diploma and certificate education (see Chapter 3 and Chapter 4). Thirdly, the government can consider progressive taxation on alcohol to capture larger share of income from higher quantile consumers/ heavy drinking households (see Chapter 3). Fourthly, the government should prioritize expenditure on development, welfare, and poverty alleviation program considering prevalence and initiation of alcohol has a complex association with socio-economic status of an individual or a household (see Chapter 6, Section 6.2). This recommendation can also borrow from the fact that The World Health Organization (WHO) reports- the harm per litre of alcohol is greater for the poor than for affluent classes in a given society. Fifthly, the literature review presented in Chapter 2 leads to the recommendation that regulating the physical availability of alcohol (restrictions on the number of shops, appropriate location and severe penalties) is one the proven methods of controlling the liquor problems since the Mauryan period of Indian History. Sixthly, the requirement of continuous monitoring and surveillance of alcohol situation in India is warranted. Inadequate research and deficiency of data is a significant problem that needs immediate attention. The Ministry of Social Justice and Empowerment, Government of India recognizes that the problem is due to lack of resources at one hand and sheer vastness of country on the other. Owing to the problem this dissertation has reported limitations of various datasets like NSSO and NFHS in multiple chapters (see Chapter 3 and Chapter 4) and also carried out estimation using primary survey which overcame those limitations (see Chapter 6, Section 6.4). To overcome the existing limitations in nationally representative surveys, it is recommended to conduct a regular national/state/district representative sample surveys with dedicated and uniform questions on alcohol consumption (as a part of larger survey). The ultimate aim of such exercise will be to present relevant and reliable information to policy makers and decision makers in a timely

manner leading to effective interventions to reduce the harmful use of alcohol. Finally, a community level solution is recommended to resolve the alcohol problems as community action can build upon local knowledge, cultural norms, beliefs and value system. The descriptive statistics and the econometric/statistical analysis both in Chapter 3 and Chapter 4, literature review in Chapter 2 and quantitative analysis at Gadchiroli taluka shows how prevalence among scheduled tribes is higher than rest of the other social category groups. This implies that a solution at the community level is more likely to be effective.

In addition to the evidence presented in this dissertation, it is noteworthy to mention other recommendations in the literature that have proven effective in reducing alcohol-related harm. The World Health Organization (WHO) suggests several measures, including: 1) raising awareness of the harm to others and among vulnerable groups, avoiding stigmatization, and discouraging discrimination against affected groups and individuals; 2) ensuring universal access to health for low socio-economic groups; 3) establishing and maintaining a system to register and monitor alcohol-related morbidity and mortality; 4) promoting and supporting local initiatives to address local problems; 5) implementing policies and countermeasures to prevent drink-driving; 6) regulating the marketing of alcoholic beverages; 7) reducing the alcoholic strength of different beverage categories; 8) developing and strengthening tracking and tracing systems for illicit alcohol; 9) issuing public warnings about health risks associated with informal and illicit alcohol; and 10) developing strong leadership, raising awareness, political will, and commitment to fund comprehensive and inter-sectoral national policies that clarify the roles and responsibilities of the different partners involved. These recommendations, combined with the previously mentioned suggestions, have the potential to effectively address the issue of alcohol harm in India, without resorting to state or district-level prohibition measures.

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