Private Prohibition:

How concerns for health and social esteem shape consumption behavior

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Abstract

Past explanations from economics of the major drop in alcohol consumption, observable in most Western societies, stress the importance of consumer knowledge on the detrimental health effects associated with excessive alcohol consumption. In contrast, epidemiological literature emphasizes the contribution of changes in situational drinking norms and societal attitude towards alcohol intake.

We test the differing hypotheses using a set of repeated cross-sectional surveys conducted by the German Federal Center for Health Education between 1976 and 1995. Per capita consumption of alcohol dropped considerably in Germany in this period. Our results reveal that while Germans drink on significantly less occasions, they do consume significantly more per drinking occasion. These results are inconsistent with the assumption that consumers react to the dissemination of health information by optimizing their investment into health capital, but support the proposition on the influence of changing social norms. This suggests attaching great importance to targeting social norms in public health campaigns.

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1. Introduction

The costs associated with excessive alcohol consumption in Germany each year are considerable. The direct and indirect social costs have been estimated to amount to €24.4 billion, or 1.16% of Germany's GDP, in 2002 (Konnopka & König, 2007).[1] For the same year Hanke and John (2003) identify 74,714 alcohol-attributable deaths, i.e. 21% of all deaths between the age of 35 and 65 are due to alcohol-related diseases and accidents. Given the severe consequences to health associated with excess drinking behavior (cf. Edwards et al., 1994; Babor et al., 2003) and its impact both on productivity (Cook & Moore, 1999), and social welfare (Klingemann & Gmel, 2001; Konnopka & König, 2007) special restrictions on commerce and consumption of alcoholic beverages have been justified in order to curb alcohol abuse.

On the other hand, while Germany still ranks among the World's Top 10 in annual per capita alcohol intake (World Health Organization, 2004), per capita consumption has been reduced considerably over the last 35 years, leading to a wave of brewery closures in Germany, for which the term "Brauereistreben" has been coined (Hawley, 2005).

Economists usually ascribe this drop in per capita alcohol consumption to the effects of information diffusion on the detrimental health effects of excessive alcohol consumption and consumer's re-calculation of the net utility of alcohol consumption, conditional on this information (Gallet & List, 1998; Gallet, 1999). While assuming a behavioral adjustments based on increasing awareness of the risks associated with alcohol consumption is plausible for the case of beer and distilled spirits, it is problematic for the case of wine, as annual per capita intake increased in spite of the growing awareness.[2]

An additional explanation has been proposed by epidemiological literature, arguing that changes in situational drinking norms and social perceptions of alcohol consumption may have contributed to decline of alcohol consumption observed for the past 35 years (Room & Roizen, 1973; Greenfield & Room, 1997; Caetano & Clark, 1999). The argument alludes to the role social norms play in consumption decisions; an issue which has recently seen increasing attention in economics (Corneo & Jeanne, 1997; Woersdorfer, 2010).

While both explanations are not mutually exclusive, and the dissemination of information may play a crucial role in changing social norms (Opp, 2001), understanding the relative importance of each motivation is essential in order to design effective regulatory policies. As "large amounts of money, time and effort are poured into [public health] mass media campaigns […] each year in various attempts to

[1] In other studies costs as percentage of GDP ranged from 1.04% to 5.54% depending on specifications and country of observation (Konnopka & König, 2007: 616).

[2] However, contradicting information on the health effects of wine consumption may partially explain the difference in adjustment. Several studies report that wine drinkers have a reduced risk of death from a number of coronary heart diseases and cancer, compared to beer and liquor drinkers. A concise overview over the recent literature and a possible alternative explanation for the findings are provided by Johansen, Friis, Skovenborg, & Grønbæk (2006).

get the public to eat healthy, get moving, stop smoking, and practice safer sex." (Randolph & Viswanath, 2004: 419), understanding what primarily motivates consumers to change their life-style is crucial in designing effective public health campaigns. The historical reduction of per capita alcohol consumption provides an excellent opportunity for an inquiry into these questions.

We argue that in order to explain the drop in per capita alcohol consumption and the diverging development of the different alcoholic beverages, it is necessary to understand the motivational foundations that underlie consumption behavior. A theory of consumer motivation and consumer learning emphasizing the importance of diverging satiation patterns of innate needs will therefore be presented in the following section. Section 3 then analyses the needs connected to alcohol consumption and their respective contributions to its development since 1976. Section 4 introduces the data set and empirical setting is discussed. Results will be given in section 5, while section 6 concludes.

2. The motivational foundations of consumer behavior

In order to explain the drop in per capita alcohol consumption and the diverging development of the different alcoholic beverages, it is necessary to understand the motivational foundations that underlie consumption behavior. We therefore employ the Theory of the Learning Consumer (henceforth: LTC) as proposed by Witt (2001; 2008) as it has successfully been employed in explaining consumption behavior before (Ruprecht, 2005; Chai, 2010; Woersdorfer, 2010).

Its central proposition is that the ultimate end of consumption behavior is the satisfaction of needs.[3] A consumer need is defined as a behavioral disposition arising from a state of deprivation in an individual, i.e. a deficiency, imbalance, or psychic or physic strain impeding the maintenance of basic metabolic processes, and thus threatening the well-being and eventually the survival of the organism. A state of deprivation instinctively motivates the organism to perform actions that end deficiency, reconstitute balance, and relieve or remove strains.

Basic (or innate) needs, like the need for air to breath, for calories to keep up metabolic processes, the avoidance of pain (health), or for social affiliation, are part of the human genetic endowment, and thus

[3] The idea that wants and needs are basic motivators of (consumption) behavior is not entirely new to economics. Behavioral theories of human needs, wants, and corresponding use values were popular from the turn of the 20th century (cf. Menger, 1871; Duesenberry, 1949; Georgescu-Roegen, 1954; Scitovsky, 1992). In his "Principles of Economics", Carl Menger, for instance, argued that inborn needs motivate consumption, because people have learned that their needs can be met by the consumption of goods: "Needs arise from our drives and the drives are embedded in our nature … [T]o satisfy our needs is to live and prosper. Thus the attempt to provide for the satisfaction of our needs is synonymous with the attempt to provide for our lives and well-being." (Menger, 1950/1871: 77). For a more thorough discussion on the career of the concept of utility in economics see, amongst others, Warke (2000), Witt (2005), Binder (2010).

shared inter-individually by all humans.[4] They correspond to the concept of primary or unconditioned reinforcers identified empirically by behavioral psychology (for a list of these reinforcers see: Millenson, 1967). The deprivation of a basic need constitutes a strong motivation for the individual to countervail this by means of adequate consumption acts. The consumption act eventually stops, as the motivation to keep it up ceases with the increasing satisfaction of the underlying need. However, not all innate needs are identical in the ease with which such a level of satisfaction can eventually be reached and maintained. Witt (2008) distinguishes two groups of needs regarding their satiation potential. Most physiological needs are characterized by a homeostatic feature, i.e. boundaries of intake per period of time are genetically fixed and the motivation to consume further vanishes as satisfaction approaches a (comparatively fixed) level of satiation. If income rises above a certain threshold consumption stagnates and expenditure shares decrease. The need for caloric intake, e.g., can fairly easily be satiated and satiety maintained, once rising income allows to sufficiently increase purchases of foodstuffs. Psychological needs, on the other hand, lack this homeostatic feature. Due to positional or habituation effects a level of satiation is much harder to reach for these needs. Using the example of social status recognition; if social status is expressed through symbols, e.g. an affluent style of consumption as claimed by Veblen (1899/1994), then the social status of an individual depends not only on the symbols she can showcase but also on the symbols present in her environment. That is, the use value of an item as a symbol diminishes with the frequency of that item in proximity of the individual, eventually requiring her to either attain more of the same item or to switch to other items.[5] In consequence, the motivation to expand consumption further for items connected to such "insatiable" needs does not vanish in the same way, as for fairly easily satiable needs. Likewise neither consumption stagnates nor do expenditure shares decrease. Thus, as income rises, needs that are less easily satiable, become more and more central in determining consumers' behavior.

However, as various goods may be instrumentalized for the satisfaction of a given need, the concrete choice from a set of equally suitable alternatives is determined by the individual's consumption knowledge, which is build up by personal experience, inventiveness and the observation and imitation of (relevant) others. That is, consumers assess and learn the suitability of potential means for need satisfaction by practical experience and social interaction, implying that consumption behavior is adjusted to changes in the (perceived) efficiency with which a good is able to provide need satisfaction. This is especially virulent for goods that cater for needs whose satisfaction also depends on prior habituation or on the consumer's relative position within her social group. Whereas owning a TV-set in Germany in the 1950s may have been a suitable mean of signaling social status, it was less so 20 years later (Anders, 1997). Adjustment can also be expected to take place if consumers learn that a so far valued item may in fact jeopardize the satisfaction of another, more basic, need. The classical example here are the effects certain life-style choices may have on the health status of an individual. The decline in cigarette smoking in the US after the Second World War, is often described as the effect of consumers' re-calculation of the net utility of smoking based on either the up-coming new information

[4] The common genetic endowment of humans translates into similarities in consumers' desires. i.e. in what motivates them to take actions, and from what kind of actions they derive utility, "implying that preferences are not purely subjective" (Woersdorfer, 2010: 48).

[5] Please note, that more of the same may be understood in both qualitative and quantitative terms.

on its health consequences (cf. Hamilton, 1972; Bishop & Yoo, 1985; Gallet & Agarwal, 1999) or on changes in the social meaning, and thus signaling potential attached to the action of smoking (Lessig, 1995). As a result of ongoing consumer learning the consumption of an item may thus even cease entirely.

3. Needs and alcohol

According to Mäkela (1983) the consumption of alcoholic beverages is driven by a number of distinct motives. Due to its material properties alcoholic beverages can be used for intoxicating, sacral, medical, and nutritional purposes. Their consumption is thus connected to the needs for liquid and caloric intake, for health and for arousal. The perceived suitability of alcohol as a mean for those uses is governed by cultural attitudes towards the beverages and towards the uses. Muslim, Hindu, and ascetic Protestant societies, for instance, condemn the ingestion of alcoholic beverages in any form, whereas other societies may tolerate moderate consumption but condemn drunkenness (Pittman, 1967), i.e. accept its suitability for nutritional, medical, or sacral purposes, but disapprove of its use as an intoxicant. Hence, the consumption of alcoholic beverages is also connected to the need for social recognition and social approval.

However, not all motives seem equally likely to explain the reduction in per capita alcohol consumption observable in Germany over the past 30 years. Annual real per capita income in Germany more than tripled from € 4,647 in 1950 to € 16,245 in 1975, suggesting that by the mid 1970s Germany's economic development had created a consumption environment that allowed for the widespread satiation of homeostatic needs (Andersen, 1997; Hesse, 2007).Thus only in very few cases caloric uptakes will be a driving motivation of beverage consumption after 1975. Additionally, the strong diuretic effects of alcohol render the need for liquid intake as a driver of alcoholic beverage intake unlikely. While containing high percentages of fluids, consumption of alcoholic beverages may result in a negative water balance, i.e. a loss of body water (Stookey, 1999), rendering them (objectively) less suitable as means to quench thirst. On top of that, due to major progress in the pharmaceutical industry medical reasons for the consumption of beverages will nowadays be prominent only in a small fraction of consumption choices (Mäkela, 1983).[6] The mechanism underlying the reduction in alcohol intake has to be linked to the growing importance of non-homeostatic needs in determining consumer behavior. These include the need for arousal, for health, and for social recognition and approval/esteem/appreciation.

[6] However, both the caloric and alcoholic content of alcoholic beverages may have turned into important motivations to refrain from consuming these goods, as will be discussed in the following section.

3.1. Arousal and alcohol

Alcohol directly affects the hedonic systems in the brainstem and the midbrain, causing a feeling of pleasure and regulating the level of arousal (Hoebel, Rada, Mark & Pothos, 1999; Berridge & Kringelbach, 2008; Berridge, 2009). The concept of arousal or excitement has entered the field of consumer theory through the work of Tibor Scitovsky (1992/1976). It describes the state of activation or alertness experienced by an organism (Berlyne, 1960). Based on experiments conducted by Wilhelm Wundt (1874) showing that the experienced pleasantness of a stimulus depends on its intensity, where the highest hedonic values are reached for moderate intensities,[7] Scitovsky argues that humans generally seek to maintain a medium level of excitement avoiding both boredom and hyperarousal. As all psychoactive substances directly influence the level of arousal at the relevant brain sites, are swift in effect, and comparatively cheap, they turn out to be a convenient way regulating one's level of excitement.

The association between alcohol consumption and the need for arousal is corroborated by a number of empirical findings from psychology and economics. In a recent meta-analytic review of 61 studies, conducted between 1978 and 2001, Hittner and Swickert (2006) find a moderate effect between sensation seeking (Zuckerman, 1979) and alcohol consumption. Dave and Saffer (2008) report that the prevalence of alcohol consumption is 6% to 8% lower in (non-pathological) risk-averse individuals compared to risk-tolerant fellow-consumers. Hence, an increase in the relative importance of the need for arousal in determining consumption behavior should translate into a rise of alcohol demand. However, overall per capita consumption of alcohol decreased rather than increased since 1976, suggesting that the need for arousal may in fact play only a minor role in determining the changes in alcohol consumption.[8]

Two other needs figure more prominently in explaining decreases in per capita consumption of alcohol. First, the increasing salience of the need for health, coupled with the ongoing dissemination of information on the adverse health effects of alcohol consumption, and an increased awareness on the personal responsibility for the production of health, beauty and well-being (Sointu, 2004) can be conjectured to be a major driver of changing consumer behavior. Second, the growing importance attached to the need for social esteem or status and changing social expectations and acceptance of either alcohol consumption per se or of the outcome of alcohol consumption may have also driven the changes in per capita consumption since the mid 1970s.

[7] An example of these so-called Wundt curves from gustatory sensory inputs is given in Pfaffman (1960: 261).

[8] As the consumption of illegal substances like marihuana or cocaine increased significantly since the mid-1970s (Perkonigg, Lieb, & Wittchen, 1998), it may be conjectured that the drop in alcohol consumption can be seen as an effect of consumers substituting alcohol for illegal drugs. However, prior micro-econometric analysis provided general evidence for the complementarity of alcohol and illicit drugs (Saffer & Chaloupka, 1998; 1999; Williams & Mahmoudi, 2004), thus rendering a substitution hypothesis unlikely.

3.2. Health considerations

Considerations of health and beauty can relate to two characteristics of alcoholic beverages and their respective effects on health and body-style. While knowledge on the adverse effects of ethanol's intoxicating properties can be assumed to have spread widely in the German society, the fact that beer producers, for instance, introduced light beer in the late 1970s suggests that the caloric content of beverages was also increasingly perceived as problematic by the consumers (Tremblay & Tremblay, 2005).

3.2.1. Health and alcohol

Health considerations as a driver of consumer behavior have been stressed by a number of scholars probing into the changes of demand structures for potentially health impairing goods like beer (Gallet & List, 1998), distilled spirits (Gallet C. A., 1999), and cigarettes (cf. Hamilton, 1972; Schneider, Klein, & Murphy, 1981; Bishop & Yoo, 1985; Gallet & Agarwal, 1999). Another line of research deals with the influence of knowledge, education and information on other potentially health deteriorating behavior, like risky sexual practices (Philipson & Posner, 1994). Referring to models of health state dependent utility, as proposed e.g. by Viscusi and Evans (1990) they generally argue that the dissemination of information on the adverse health effects of certain consumption items (also labeled information shock or "the health scare") leads to a decrease in the demand for these items.[9] Grossman's (1972) human capital based explanation of the demand for health, emphasizing the consumer's role as a producer of her own health, provides the reasoning for the motivational basis of people's reaction to health-relevant information. According to the theory of human capital individuals invest in themselves via education, training and health in order to increase their income. Health is thus not only desired because it makes people feel better, but also because it increases the number of days available to work, and thus to earning of income. However, unlike other goods, health cannot be directly purchased at the market, but has to be produced by the consumer, spending time on health-improving efforts, demanding medical inputs, and avoiding health-deteriorating activities. It is the outcome of an individual's production activity, and hence a classical example of a "commodity" in the sense of Michael and Becker (1973). Health-deteriorating behavior depreciates the health capital stock, and thus directly affects an individual's income, leading a rational agent to minimize such behavior.[10]

[9] Health state dependent utility models follow the more general state dependent utility models proposed by Arrow (1963; 1974/1984) and Phelps (1973) in the context of optimal insurance choice under uncertainty. It is assumed that the utility experienced by any consumer depends not only on his current income and wealth (i.e. the goods he may be able to purchase and enjoy) but also on current state of the world $s = 1,..,n$ drawn from a finite set which in this is case interpreted as the health-state of the individual. Hence, the expected state-dependent utility for all possible health states can be described as $EU = \sum_{s=1}^{n} p_s U_s(Y_s)$ where Y_s denotes the income associated with health state s, and p_s the probability of health state s to occur.

[10] For several reasons health state dependent utility models may not provide an adequate description of structural changes in the demand for alcoholic beverages. First, whereas it correctly predicts a decrease in the demand for

Rationally acting consumers are able, willing and competent to deal with the information provided by public health authorities (and probably their local health practitioner). This information is either actively searched for by the consumer or reaches her via some communication channel, like a patient-doctor consultation or the mass media. Given that the consumer valuates her health either because of investment considerations or because of an innate and hardly satiable drive for an ever better health status, it is conjectured that she will adjust her alcohol intake according to the information provided. As the amount that was considered low-in-risk or even health-beneficial dropped significantly in Germany since 1976 (Bühringer, et al., 2000; Pabst & Kraus, 2008), the adjustment in this case would be a reduction in the intake of alcoholic beverages. Basically three modes of reduction are feasible under such circumstances. The first would be a shift within alcoholic beverages from beverages high in alcoholic content to beverages low in alcoholic content. The other options entail the reduction of the amount consumed per drinking occasion or the number of occasion in which alcoholic beverages are consumed. Instead of having a beer for dinner every night, the consumer can choose to either drink a smaller beer or drink only every second evening. Given that the smaller beer is half the size of the bigger one, the effect of both modes of reduction is identical, namely halving alcoholic intake from beer. Three basic hypotheses can be derived from here.

Hypothesis (1a): Individuals decrease their alcohol intake by substituting alcoholic beverages high in alcoholic content by beverages low in alcoholic content.

Hypothesis (1b): Individuals decrease their alcohol intake by reducing the quantity of alcohol consumed per occasion.

Hypothesis (1c): Individuals decrease their alcohol intake by reducing the number of occasions on which they consume alcoholic beverages.

Assuming consumers' direct reaction to publicly induced updating of knowledge on the detrimental effects of (excessive) alcohol intake, we can conclude that the amount of alcohol intake will decrease. However, which strategy of reduction eventually dominates is by no means clear. To the contrary, whereas we may assume that any given individual i (strongly) prefers one mode of reduction over the others, there is little reason to assume that any one mode is preferred over the other on a population level. In fact, given only the want to react efficiently to the new set of information, it seems reasonable to assume that all modes of reduction in alcohol consumption are equally distributed over the population. The concrete mode chosen may depend to a large extend on personal living conditions, like the amount of free time (increasing the number of opportunities to consume) or the presence of

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beer and distilled spirits, focusing solely on consumer's health considerations cannot explain the rise in per capita wine intake. In fact, given that the information disseminated by health officials and practitioners referred to alcohol as such, an increase in the consumption of any alcoholic beverage is a counterfactual to the theory. Additionally, when confronted with lower and lower levels of risk-free amounts of alcohol intake, consumers should be conjectured to reduce their intake along two dimensions. Whereas we do observe a reduction along the first dimension, i.e. for the beverage with the highest share in consumption, namely beer, there is no clear reduction according to the volume percentage of ethanol in each drink, which is the second dimension.

(young) children in the household (Prais & Houthakker, 1971: 132). However, conditional on controlling for these differences the preference for either mode of reduction should still be equally distributed.

Hypothesis (2): If people react directly to changes in information concerning the risk taken by alcohol consumption, substitution, and reductions in frequency and amount consumed per occasion are equally likely.

3.2.2. Health and caloric content

The second, dimension to which consumers may react is the caloric content. Due to the comparatively high energy density of ethanol,[11] alcoholic beverages have long been used as a mode of caloric intake. Since ancient times alcoholic beverages, especially thickly brewed ales, were an important part of the daily diet, and contributed to a large extent to everyday energy ingestion (Hanson, 1995). However, the introduction of potatoes in Europe led to a rapid decrease in malnutrition, such that alcoholic beverages gradually lost their alimental function in the 18th and 19th century (Tappe, 2002). Yet, research suggests that even today male adults, aged 25 to 51 years take up between 5% and 6% of their total energy in the form of alcohol (Deutsche Gesellschaft für Ernährung, 2004). However, given that in post-war Germany caloric satiation was on average reached in the mid-1970s (Andersen, 1997; Hesse, 2007) only in very few cases caloric uptakes will be a driving motivation of beverage consumption after 1975. On the contrary, at the same time the caloric content of the average diet had become a major scientific issue in Europe, emphasizing the deleterious effects of energy-rich diets on the individual's health (Fine, Heasman, & Wright, 1996). Ruprecht (2005) argues that additionally changes in consumers' beauty norms have facilitated the transition from a high-caloric to a low-caloric diet. As being overweight became more and more socially stigmatized the fear of becoming obese turned into a potent driver of consumption decisions. Thus, avoiding additional calorie intake via beverages should turn into a powerful motivation in the post-1975 era. The notion of conscious avoidance of high-caloric beverages is also connected to society's growing idealization of personal choice and self-responsibility (Furedi, 2004), where the production of beauty, health and well-being "has become increasingly a personal responsibility" (Sointu, 2004: 259 et seq.). While it is likely that calorie and alcohol avoidance simultaneously influence the demand for alcoholic beverages since the mid-1970s, hypotheses (1) and hypothesis (2) will not be affected by the relative weighting of both motivations.

3.3. Social esteem and alcohol

While predicting the dominant mode of alcohol reduction from health capital theory is impossible, another line of research emphasizing the importance of socially acceptable standards of behavior allows

[11] One gram of alcohol contains 7 kcal, compared to 9kcal in one gram of fat and 4kcal in one gram of glucose (Deutsche Gesellschaft für Ernährung, 2004).

for discriminating between the differing strategies. Like most other commodities beverage consumption can be used as a signal of norm compliance or social standing,[12] and is thus connected to the need for social esteem, specified by Millenson (1967: 368). Psychologists since Maslow (1943) have stressed that esteem is a fundamental source of motivation; a finding increasingly acknowledged in behavioral economics (Ellingsen & Johannesson, 2008). There is ample evidence that people's behavior is affected by the presence of others, and that much of this effect stems from the concern of being evaluated.[13] In the case of consumption the desire to appeal to one's social environment translates into decisions that are (assumed to be) positively valued by the relevant (potential) audience.

The motivation to comply with existing norms, thus, stems from the desire to keep or improve one's social standing, and to avoid probably costly sanctions, imposed for breaching these norms. Habermas (1985) defines a norm as a generalized expectation of behavior, which is enforced by social sanctioning mechanisms. Thus, reasons for norm adherence include fear of authority or power, rational appeal of norms, a need for conformity and emotions like shame, guilt and embarrassment that arise from non-adherence (Tuomela, 1985). For example, in Germany (most) individuals are expected not to consume alcohol at the workplace (Sonnenstuhl, 1996), or drive a vehicle under the influence of intoxicants. Norms differ in the degree of coding and the delegation of punishment responsibilities (Tuomela, 1985; Elickson, 1991). Whereas drink driving is an explicitly coded offense under German federal law, and hence a rule norm in the taxonomy proposed by Toumela (1985), drinking at the work place is not subject to legal enforcement, but implicit situational temperance norms (or a part of an employer-employee contract). The latter mode of behavior regulation is generally referred to as a social norm (Elickson, 1991).

Elster (1989) distinguishes different types of social norms, of which especially norms or reciprocity (e.g. gift-giving norms) and norms of cooperation (e.g. tax compliance) have been subject to intensive experimental economics research dealing with social interactions.[14] Consumption norms, defined as "attach[ing] a reputational value to consumer behavior" (Corneo & Jeanne, 1997: 334), encompass mainly Leibenstein's (1950) idea of conformity in consumption choices and Veblen's (1899/2001: 76) "conventional standard of decency in the amount and grade of goods consumed."

Assuming that drinking alcohol is subject to a social valuation which, starting in the 1970s, has become more and more negative we may expect an agent to increasingly refrain from consuming alcohol when under (potential) observation by others, even when such a behavior would be highly valued in the

[12] For an excellent review on status seeking and norm compliance in consumer decisions, see Woersdorfer (2010).

[13] While this phenomenon, also known as social facilitation, was first described by Triplett (1898) in an experiment with cyclists, evaluation apprehension as a key explanatory mechanism was suggested by Cottrell, Wack, Sekerak, and Rittle (1968), and Henchy and Glass (1968), and refined by Carver and Scheier (1981). It is generally argued that valuations of behavior change, when there is a chance that others may observe the behavior or its result. Some behaviors become positively valued (making an effort), while others become negatively valued (picking nose). For a comprehensive survey of the literature on social facilitation see Guerin and Innes (1984), and Blasovich, Mendes, Hunter, and Salomon (1999).

[14] Since the seminal work by Robert Axelrod (1984) the importance of implicit and explicit social prescriptions on behavioral regularities has been stressed by a number of scholars. For a recent review on the contribution of behavioral economic models in explaining norm compliance, see (Faillo & Sacconi, 2007).

absence of other people.[15] Following the motivational consumption theory by Witt (2001), we imply that consumers are endowed with a strong, inborn drive to belong to a social community and an equally strong fear of social ostracism that motivates their behavior, and induces compliance with social expectations. An average adult is confronted by a large number of "public" situations daily, characterized by high odds of being observed by others. If social valuation of drinking alcohol becomes negative, the consumption of alcoholic beverages in these situations becomes inappropriate, thus restricting the opportunities of consumption to more private situations. Such a shift in social valuation will therefore reduce the overall number of opportunities to drink alcoholic beverages, rendering the reduction in frequency of consumption the dominant strategy.

Hypothesis (3): If people react to changing social valuations on the consumption of alcoholic beverages, the frequency of consumption should decrease stronger than the amount of intake per occasion.

Furthermore, if people derive any kind of pleasure from the consumption of alcoholic beverages, e.g. via regulating the level of arousal, their intake should not be influenced in situations in which social control can be safely excluded. To the contrary, to achieve the same outcome consumers have to compensate reduced frequencies by higher intakes per occasion.[16]

Room and Roizen (1973) argue that the social acceptance of drinking depends on time, social context and drinking situation, i.e. that there exist situation-specific drinking norms. Although opinions differ across cultures and subcultures on the acceptance of drinking and drunkenness in given situations, respondents are reported to agree on the relative "wetness" of different situations, i.e. the degree to which drinking at all or being drunk is seen as permissible (Trocki, 1987, cited by: Caetano & Clark, 1999). Using a repeated cross-section of US data from 1979 to 1990, Greenfield and Room (1997) find that drinking is considered less and less permissible in public situations, e.g. when out to lunch with a couple of co-workers, whereas its acceptability changes little in more private situations, e.g. when with friends at home.

Hypothesis (4): If people react to social norms on the consumption of alcoholic beverages, the frequency of consumption should decrease in situations where the consumption act is observable by relevant others. In situations where consumption can take place unobserved the frequency should however stay unchanged or even increase in the case of rebound effects.

Hypothesis (4) exploits the insights from the evaluation apprehension theory (Carver & Scheier, 1981), arguing that if it is unfavorable evaluations that consumers are concerned about, alcohol intake should decrease especially in situations where this behavior is observable by others, whereas situations with no or only slim chances of being monitored should be less prone to reductions.

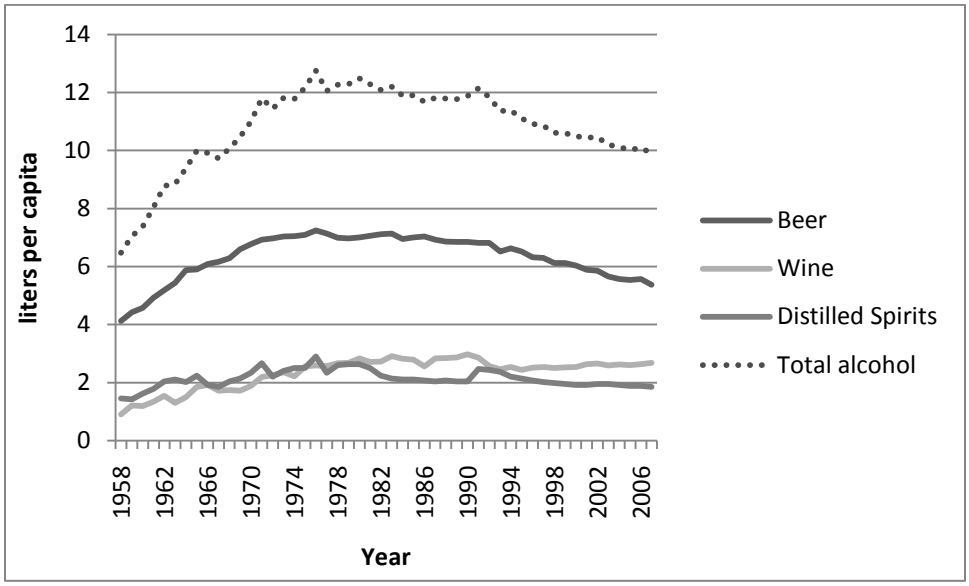
[15] It is a standard finding in behavioral economics that the defection rates dramatically decrease when the opportunity is provided to observe and punish the behavior of other players (Fehr & Gächter, 2000).

[16] It has been argued that even moderate and occasional consumption of alcohol induces a tolerance effect, such that continuously more intake is required to achieve the same outcome (Beirness & Vogel-Sprott, 1984).

4. Empirical Setting

Like in most countries in the Western world consumption patterns for beverages in Germany changed dramatically over the past half-century (Selvanathan & Selvanathan, 2004). Total per capita consumption of alcohol more than doubled from 6.1 liters in 1957 to 12.7 liters in 1976, and then fell back to 9.8 liters by 2007. Figure 1, depicts the development of per capita alcohol consumption in total and of beer, wine, and distilled spirits separately, in Germany from 1957 to 2007.[17] Per capita consumption of all alcoholic beverages increased considerably between the beginning of the observation period and the mid 1970s. No further increases occur after that, but per capita alcohol consumption declines from its peak of 12.7 liters of pure alcohol in 1976 to 9.8 liters by 2007. Annual per capita consumption of all three alcoholic beverages drops, albeit the reduction is strongest for beer and least distinct for wine. This suggests rejecting hypothesis (1a), as the most distinct drop in per capita consumption is observed for the beverage with the least alcohol content.

Figure 1. Pure alcohol consumption by beverage, Germany, 1957 - 2007



The peak in consumption roughly coincides with the start of the first systematic dissemination of information on the risk associated with high levels of alcohol intake dating back to the early 1970s.[18]

[17] All data were obtained from various issues of the Statistical Bulletin (Statistischer Bericht) of the German Brewing Association (Deutscher Brauer-Bund e.V.). Conversion to pure alcohol was achieved using specific volume percentage for beer (4.8%), wine (11%) and distilled spirits (33%) as recommended for Germany by Bühringer et al. (2000).

[18] Though medical sciences had early on specified the relationship between alcohol consumption and disease prevalence, and societal prescriptions on the handling of alcohol can be found for all societies and ages since the ancient world (Hanson, 1995), the first publicly produced brochure in Germany stems from 1976 (Bühringer, et al., 2000).

Since then the maximum amount of daily pure alcohol intake that was considered low-in-risk dropped continuously from 160g per day for both sexes (Bühringer et al., 2000) to 12g and 24g per day in 2006 (Pabst & Kraus, 2008) for females and males, respectively. Thus, the information available to the German consumer increasingly accentuates the risks connected to alcohol consumption and specifies ever lower levels of risk-neutral consumption. It is thus straight forward to assume that consumer knowledge on the subject changed accordingly.

Did the social valuation of alcohol consumption also change? According to Demsetz (1967) and Opp (2001) a necessary condition for a social norm to emerge or change is the occurrence of a new externality to which the (modified) norm provides an efficient solution.[19]

In the case of alcohol it may be argued that the increasing complexity of work life and the ongoing motorization of society led to an increasing risk of (seriously) injuring oneself or others under the influence of alcohol. While a proof for this hypothesis exceeds the possibilities of this contribution, a number of indications can be presented supporting the conjecture. First, as the number of cars almost tripled in the 1960s,[20] the number of people injured or killed in road accidents increased significantly. Between 1958 and 1970 the number of people injured in accidents increased by well over 40%, and the number of people killed in accidents increased by almost 60% (Statistisches Bundesamt, 2009). Street traffic had thus become a major threat to individual health and safety.[21] Drink driving is over proportionally involved in traffic fatalities. By the mid 1970s it accounted for more than 20 percent of all casualties in road accidents (Statistisches Bundesamt, 2009).[22]

Second, the growing public concern about alcohol use and road accidents prompted a considerable amount of legislation aimed at reducing drink-driving behavior. While drunk driving as an offense under federal law came into effect in Germany in 1935 (§ 316, 1935), a legally binding blood alcohol limit was not introduced before 1953. The initial limit of 1.5 per mill blood alcohol was subsequently reduced and differentiated such that by 2007 even a zero limit was implemented for beginners. We conclude thereof that driving under the influence of alcohol and its consequences became an increasingly important topic for authorities and the general public, raising the awareness of third person risk associated with alcohol consumption.

[19] Woersdorfer (2010), for instance, argues that the emergence of a norm for cleanliness in 19th century can be traced to the externality problem of spreading micro-organism born diseases during the phase of industrialization and urbanization.

[20] The number of cars increased almost 10fold between 1950 and 1975, from 2.5 to 21 million (Statistisches Bundesamt, 2009).

[21] A good indication for the heightened sensitivity towards road accident fatalities is the law on mandatory use of seat belts that came in effect in Germany on 1st January 1976.

[22] A number of econometric studies probe into the relationship between public policies, alcohol consumption and traffic fatalities. They generally find that deterrence from drunk driving and reduction in traffic fatalities is correlated with increases in alcohol price or taxes (cf. Evans, Neville, & Graham, 1991; Ruhm, 1996), an increase in legal drinking age (Saffer & Grossman, 1987), the availability of treatment facilities in a region (Freeborn & McManus, 2010), and a variety of other legal options, like the prohibition of night-time alcohol sales or harsher punishment for drink driving offenses (Chaloupka, Saffer, & Grossman, 1993). Reviews on the work from the economic side can be found in Brown, Jewell, and Richer (1996) and Benson, Rasmussen, and Mast (1999).

Third, in his seminal contribution on the regulation of social meaning Lessig (1995) notes that linking a behavior to weak motives, and unhealthy or detrimental results is an important technique in changing the social valuation of that behavior. He argues that the wide cessation of smoking witnessed in the U.S. in the 1980s can be ascribed to changing the social meaning of smoking from a signal of character to a revelation of "personal weakness" (Lessig, 1995: 1031). The late 1960s also witnessed a significant change in the social valuation of drinking, especially of heavy drinking in Germany. In 1968 the Federal Constitutional Court ruled that alcoholism was to be regarded as a form of disease under social law, thereby starting an intense public debate on the morbidity of alcohol consumption and its prevalence in society (Der Spiegel, 39/1968). That is the perspective on heavy drinking changed from being a bad habit to being a serious disease, thereby also changing connotations of public displays of consumption from being a matter of free choice to being a signal of potential morbidity.

Together the different influences helped creating an environment that changed the acceptability of public displays of consumption in certain areas of life, for example at the work-place or when taking care of young children, whereas on other occasions, e.g. at a bar, drinking remained acceptable.

5. Data

We will disentangle the effects of health considerations on the one hand, and succumbing to social pressure on the other, using German data from a number of cross-sectional surveys conducted by the Federal Center for Health Education (Bundeszentrale für gesundheitliche Aufklärung) in the time between 1976 and 1995, corresponding to 7 waves with altogether 15,797 observations. Each wave includes between 1,942 (in 1987) and 3,548 (in 1995) individual observations, designed to be nationally representative samples. Aside from collecting a wide variety of socio-demographic characteristics, subjects provide information concerning their health state and health behavior, amongst others on the frequency, amount, and circumstances of intake of various alcoholic beverages. The frequency of consumption is assessed using the question: "Generally speaking, how often do you drink [alcoholic beverage]?", where [alcoholic beverage] is substituted by beer, wine or distilled spirits, respectively. Pre-specified answers range from 0 (never) to 5 (at least once daily). The amount of consumption per occasion is elicited by showing respondents a number of different glasses and asking them how many of these glasses they consumed, on average, per occasion.[23] The total amount of consumption per occasion is then obtained adding the contents of each glass times the number of glasses consumed per occasion. Consumption behavior in specific environments and the motives for consuming alcohol were additionally collected for a number of waves.

We control for a variety of individual, household and regional characteristics found to be associated with the consumption of alcohol in previous studies. There is broad agreement by economic (Heien & Pompelli, 1989; Selvanathan & Selvanathan, 2004) and epidemiological research (cf. Edwards, et al.,

[23] If consumers claimed to drink alcohol at least once daily, they were asked to give the average amount of alcohol intake per day, instead.

1994; Bürhinger et al., 2000; Babor, et al., 2003) on the role demographic characteristics play in alcoholic beverages demand. Numerous studies evidence a significant influence of gender, age, marital status, educational attainment, and employment status on the individual demand for alcoholic beverages (Heien & Pompelli, 1989; Khan, Murray, & Barnes, 2002; Dave & Saffer, 2008).[24]

Aside from the occupational status, as such, the industry of employment has been reported to influence the amount of alcohol consumed (Sonnenstuhl, 1996; Beiglböck & Feselmayer, 2000). In a study on the Austrian working population Beiglböck and Feselmayer (2000) show that industries differ significantly in their perceived temperance norms. Whereas people working in transport or at the police report their place of work to be very hostile to alcohol consumption, individuals working in agriculture or construction report a more permissive attitude towards alcohol at the work place. To control for possible influence of work place temperance norms we include the relative "wetness" of the industry, as reported by Beiglböck and Feselmayer (2000).[25]

As evidence from a number of epidemiological studies indicates that cigarette smoking is strongly correlated with alcohol use (cf. Grucza & Bierut, 2006) we include a variable denoting whether the individual is currently a smoker or not. Additionally, we control for the social embeddedness of the respondent by including a variable denoting current membership in a sports or social club. Studies linking club membership to alcohol use have come up with contradictory results. In line with official rethorics emphasizing the beneficial health effects of club memberships, some researchers have found that those individual's involved in clubs and especially sports exhibit the lower alcohol consumption, whereas other studies have found that they consume more alcohol than others (for a concise review on the matter, see Peretti-Watel, Beck, & Legleye, 2002).

Inconsistent estimates have also been reported for the link between alcohol consumption and household real income (cf. Dave & Saffer, 2008), which is nevertheless one the most prominent household characteristics to be found in the previous literature. For reasons of data availability we revert to using grouped household income, ranging from 1 (poorest households) to 13 (richest households). Likewise, we control for the equivalent size of the household, applying modified OECD scales (OECD, 2009), and the size of the settlement in which the respondent's household is situated.

We follow Tappe (2002) in arguing that regional drinking patterns in Germany persist to the present day.[26] Dummies controlling for state-level effects are therefore included in the estimation. However, most of the wine growing regions in Germany's southern and south-western parts co-exist with mainly beer dominated regions within the same federal state. We therefore control, on a smaller regional level,

[24] To allow for possible non-linear relationships between educational attainment, occupational status, age and alcohol consumption found in previous studies (Vogt, 1995; Caetano & Clark, 1999; Dave & Saffer, 2008) we construct sets of dichotomous variables capturing single facets of each characteristic.

[25] A industry will be labeled "dry" when the odds ratio that an employee in this industry reports the prevalent work place temperance norms as strict, exceeds 1.3. "Neutral" industries are characterized by $0.7 < OR < 1.3$, and consequently, "wet" industries are defined by an $OR < 0.7$.

[26] Although it is sometimes argued that industrialization has leveled most differences between regions and social classes (Vogt, 1995) there is some indication that the regional drinking patterns shaped in the 1800s still prevail to the present day (Tappe, 2002).

whether the respondent lives in a traditionally wine growing region.[27] A complete list of variables and their descriptive statistics can be found in the Appendix to this paper.

In three earliest observation waves (1976, 1978, and 1980) respondents answered to questions asking whether or not they consumed alcohol on a number of pre-specified occasions. While a number of changes were made between the waves, certain occasions were asked in all three waves, allowing to construct dichotomous variables denoting drinking participation in various occasions.[28] In order to test hypothesis (4), we have to distinguish occasions in terms of the publicity they achieve, i.e. by how likely and well alcohol consumption is observable by (relevant) others. We assume that drinking occasions can be arranged along a continuum from very public to very private. Drinking while alone and drinking while watching TV are occasions which the consumer largely considers as private, while drinking at lunch and drinking at the work-place are occasions more prone to observation by the general public. The simplest reason for this categorization is the scheduling of each activity in an average person's day. As work and lunch happen comparatively early in the day, the likelihood of detection during or after consumption is considerably higher than, for instance, while watching TV, which is an activity prevalent mainly in the evening (AGF, 2009).

It has been suggested that different alcoholic beverages are typical for different locations and consumption contexts (Vogt, 1995). Whereas beer and spirits are usually consumed in pubs, where the clientele is traditionally largely male, wine may be more often consumed in restaurants, bars or the home, i.e. locations with a higher female density. We therefore refrain from aggregating the different alcoholic beverages into one category, but perform estimations for all three beverages separately.

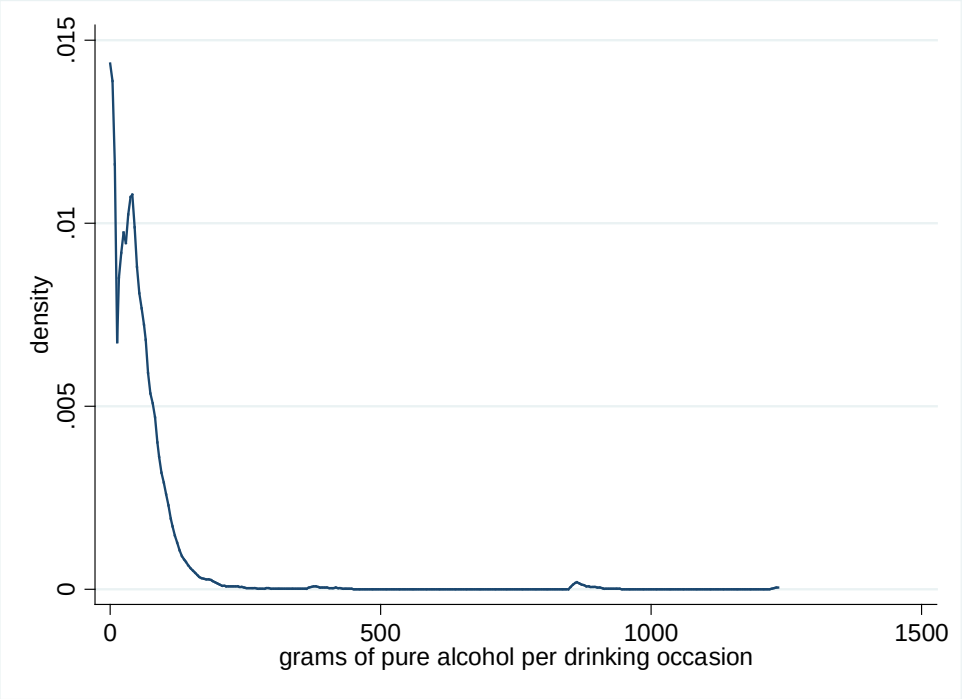
6. Empirical Strategy

We test hypotheses (1), (2) and (3) applying a simple estimation strategy where the dependent variable is (a) the frequency of alcohol consumption and (b) the amount consumed per occasion.

Figure 4. Density Plot, grams of average pure alcohol uptake per drinking occasion, Germany, 1976 -1995

[27] Regions where classified as traditionally wine growing using information on the respondent's place of living in the smaller administrative entity of Regierungsbezirke (RB), that matched closest the wine-growing regions obtained from the website of the German Wine Institute (Deutsches Weininstitut). The following RBs were classified as traditionally wine -growing: Darmstadt, Koblenz, Trier, Rheinhessen-Pfalz, Freiburg, Karlsruhe, Mittelfranken, Unterfranken.

[28] The question is phrased as follows: „Generally speaking, at which of the following occasions do you consume alcoholic beverages?"



As is well-established by epidemiological literature the distributions of alcohol consumption in a population are highly skewed with a long tail towards high consumption levels (Griffith, et al., 1994). Hence, there is a large amount of (declared) abstainers compared to a small number of drinkers. We thus have to assume that both dependents are truncated at zero. Accordingly coefficients are estimated using a tobit model, described by

$$y_i = \alpha + \beta \boldsymbol{X}_i + \gamma T_i + \delta_i + \varepsilon_i, \quad (1)$$

where $\boldsymbol{X}_i$ is a vector of k characteristics describing the individual i, and household in which she lives. β is a vector of coefficients, δ captures the unobserved state effects, and, $\varepsilon_i|\boldsymbol{X}_i \sim N(0, \sigma^2)$. The main coefficient of interest γ reports the effect (if any) which the year of observation T_i has on any of our two outcome variables. It is thus called the time-trend.[29] If people react directly to the health information disseminated by health officials and practitioners $\gamma_{frequency} \approx \gamma_{amount} < 0$, whereas if people react mainly to changes in social norms $\gamma_{frequency} < \gamma_{amount}$, i.e. people drink on less occasions, but not necessarily less amounts per occasion.

To test whether there are indeed differences in the time trend variable conditional on the relative publicity of the situation, coefficients are estimated using a probit model, defined by

$$y_{ij} = \alpha + \beta \boldsymbol{X}_i + \gamma T_i + \delta_i + \varepsilon_i, \quad (2)$$

[29] Note, that in order to improve convergence of the tobit models, year of study was coded as the year in which the study was performed divided by 100. Thus, dividing the coefficients by 100 yields the average annual change in consumption.

where y_{ij} is a binary variable set to 1 if individual i consumes alcoholic beverages at occasion j, and zero otherwise. The independents correspond to the ones defined for estimation (1).

7. Results

7.1. Societal attitudes and information

In section 3 two alternative explanations were proposed to explain decreases in per capita alcohol consumption, witnessed for Germany since 1976. Hypothesis (2) argued that if health or beauty related concerns were the major drivers of the shift in demand we would observe a decrease in frequency and in the amount of intake over time, captured by the parameter γ. Alternatively, hypothesis (3) assumed that if changing social norms created a pressure to abstain from alcohol intake, the decrease should be pronounced stronger in frequency than in amount per occasion. The later, was argued to eventually even increase. The γs for frequency and amount across the three different beverages are summarized in Table 1. The first row presents the coefficients for the time trend variable in estimations where the dependent was the amount consumed per drinking occasion for beer (column 1), wine (column 2), and distilled spirits (column 3), respectively. The second row presents the coefficients for identical estimations where the dependent is the frequency of consumption of each alcoholic beverage.[30] Results reveal both a significant increase in the amount of alcoholic beverages consumed per drinking occasion, and a simultaneous significant decrease in the frequency of consumption, over the period from 1976 to 1995, which is consistent across all alcoholic beverages. This suggests that it is consumer's concerns about her social esteem rather than about her health or living up to a beauty norm that shaped the development of capita alcohol demand in Germany in the period under observation.[31] Results thus confirm hypothesis (1c) and hypothesis (3) while rejecting hypothesis (1b) and hypothesis (2).

Table 1.Summary table: Influence of time on frequency and quantity of alcohol intake, full sample, Germany, 1976-1995 [a,b]

	1	2	3
Dependent	Beer	Wine	Distilled Spirits
Quantity consumed per occasion [c]	4.786***	4.1906***	340.4514***
	(.1991)	(.1732)	(5.9529)
Frequency of consumption [d]	-1.5491***	-10.4534***	-10.3707***
	(.4055)	(.3489)	(.4766)

[a], all regressions control for age, gender, marital status, employment status, social embeddedness, being a smoker, income, household size, whether the respondent lives in a traditionally wine-growing region, the size of the community in which she lives, and state dummies. All include a constant term.

[30] The coefficients for the quantity consumed per occasion were taken from the first row of model (4) in Tables 4 (beer), 6 (wine), and 8 (distilled spirits). The coefficients for frequency of consumption can be found in the first row of model (5) in Tables 5 (beer), 7 (wine), and 9 (distilled spirits).

[31] Yet the fact that social norms are a stronger motivation for abstaining from or reducing alcohol intake than health information, per se, is not so surprising if one takes into consideration that many diseases caused by alcohol develop only after long-term heavy drinking (Edwards et al., 1994: 81), whereas punishment for a breach of social standards is usually swift.

*[b], (Standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

[c], quantity of intake is measured in liters for wine and beer, and in milliliter for distilled spirits

[d], frequency of intake is measured as a rank-ordered variable, ranging from 0 (never) to 5 (at least once daily)

More detailed estimation results are presented in the Appendix.[32] The models replicate a number of well-known phenomena in the context of alcohol consumption. First, the fact that men consume alcoholic beverages more often than women, and when consuming also ingest more is a general finding in economics and epidemiology (cf. Edwards, et al., 1994). This is especially prevalent in the cases of beer and distilled spirits. Surprisingly, however, our results reveal that women consistently drink wine more often, and even tend to consume more wine per occasion than men, suggesting a gender specific preference for less bitter and weaker alcoholic beverages.

Second, we also find the typical inversely U-shaped relationship between alcohol consumption and age, where the highest levels of consumption correspond to medium levels of age (cf. Edwards, et al., 1994; Dave & Saffer, 2008). This finding is consistent for both independents and across all three alcoholic beverages. Middle-aged people not only consume more alcohol, but also consume alcoholic beverages more often. Third, living in a traditionally wine producing region significantly decreases the amount and frequency of beer and liquor intake, thus lending support to the assumption of persisting regional drinking traditions in Germany, proposed by Tappe (2002). Lastly, smokers consume alcohol more often and also drink signifcantly more per occasion. As smoking behavior is used as a proxy for risk preference in many empirical studies (cf. Hersch & Viscusi, 1990), we can assume that this parameter captures the relationship between risk aversion and abstinence, reported by Dave and Saffer (2008).

Contrary to what could be expected from Grossman (1972), we hardly observe a negative influence of educational attainment on the consumption of alcoholic beverages. Except for the case of distilled spirits consumed per drinking opportunity, higher educational attainment seems to be connected to higher amounts and frequencies of alcohol consumption. However, the link between educational attainment and alcohol consumption differs tremendously across the different types of beverage. People with higher educational attainment drink consistently more and more often wine than their lower educated fellow citizens.[33] The picture is less consistent for beer. While having a university degree significantly reduces the amount of beer ingested per occasion, it also increases the frequency of intake. A similar picture can be drawn for distilled spirits.

[32] Note, that OLS, tobit, and ordered probit (and poisson) estimations were performed for all models. Results, however, are robust to the estimator applied. Due to the truncation of the dependents at zero, only tobit estimates are reported. Additionally, a more fine grained measure of consumption frequency is available for the later years of observation (1984-1995). Results are not reported but are highly similar to the ones obtained for the longer time period. All estimates are available from the author upon request.

[33] As the 95% intervals of the estimations on frequency of wine consumption do not overlap for the three different educational attainment measures provided, we may conclude that there are indeed significant differences according to the educational level an individual obtained.

7.2. Situational drinking norms

Table 2 summarizes the relationship between time-trend and the prevalence of consumption in a set of pre-specified circumstances. As information on specific consumption environments is available only for a subset of survey-waves we are restricted to the analysis of the 5-year period between 1976 and 1980. The table presents the coefficients of the time trend variable from probit estimations for a set of situations differing in their degree of publicity. The detailed estimations can be found in the Appendix.[34] While results for the controls largely correspond to the findings from the previous section, we find only limited support for hypothesis that the publicity of a drinking context shapes the effects of time on consumption prevalence. In accordance with hypothesis (4) the prevalence of alcohol consumption during work (column 1) significantly decreases over time, while the prevalence of consumption when alone (column 4) and while watching TV (column 3) remain unaffected. However, the prevalence of alcohol consumption during lunch, which we conjectured to be a public display, only reduced for the sub-sample of population with a low alcohol intake per occasion. The γ-coefficients are negative but insignificantly different from zero for the whole population.

Table 2.Summary table for the influence of situational drinking norms, full sample, Germany, 1976-1980 [a,b]

	1	2	3	4
Dependent	Drinking at work	Drinking at lunch	Drinking while watching TV	Drinking when alone
Prevalence of consumption [c]	-15.5933***	-.8208	1.2848	1.2561
	(3.4526)	(1.5114)	(1.2446)	(1.6178)

[a], all regressions control for age, gender, marital status, employment status, social embeddedness, being a smoker, income, household size, whether the respondent lives in a traditionally wine-growing region, and the size of the community in which she lives. All include a constant term.

*[b], (Standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

[c], prevalence of consumption is measured as binary variable which takes the value of one if the respondents claim to drink in such situations and zero otherwise.

Three issues may have contributed to the results obtained. First, the diffusion of changes in social norms usually take time (Opp, 2001; van Poppel, van Dalen, & Walhout, 2009; Woersdorfer, 2010), such that the window of observation may be insufficient to capture its effects. Second, Figure 1 reveals that the major drop in per capita alcohol consumption cannot be observed until the late 1980s, such that our window of observation may not capture the relevant time period. Third, we assume that lunch is a public activity as it either takes place in public, e.g. when going to the cantina, or due to its position in the day, i.e. the comparatively high chances of encountering relevant others after lunch. However, there is also good reason to believe that to a considerable number of people lunch may be a private activity, especially when consumed with the family at home. Thus, lunch may present an intermediate, rather than an exclusively public case of consumption.

[34] The coefficients for the prevalence of consumption can be found in the first row of model (5) in Tables 10 (drinking at lunch), 11 drinking at work), 12 (drinking when alone), and 13 (drinking while watching TV).

7.3. Robustness and Limitations

It was argued in section 5 that implicit industrial temperance norms determine the acceptability of drinking at the workplace and may thus influence the number of opportunities of alcohol consumption an individual faces. To control for a possible confounding of this factor, the sample was reduced to people that could be assigned to a set of given industries, thus excluding respondents that never worked. Estimation (5) in Tables 4, 6 and 8 (quantity per occasion), and estimation (6) in Tables 5, 7 and 9 (frequency of consumption) in the Appendix report the results for these specifications. While we find no significant influence of workplace temperance norms on either amount or frequency of alcohol intake, results largely confirm the robustness of the results obtained for the full sample.

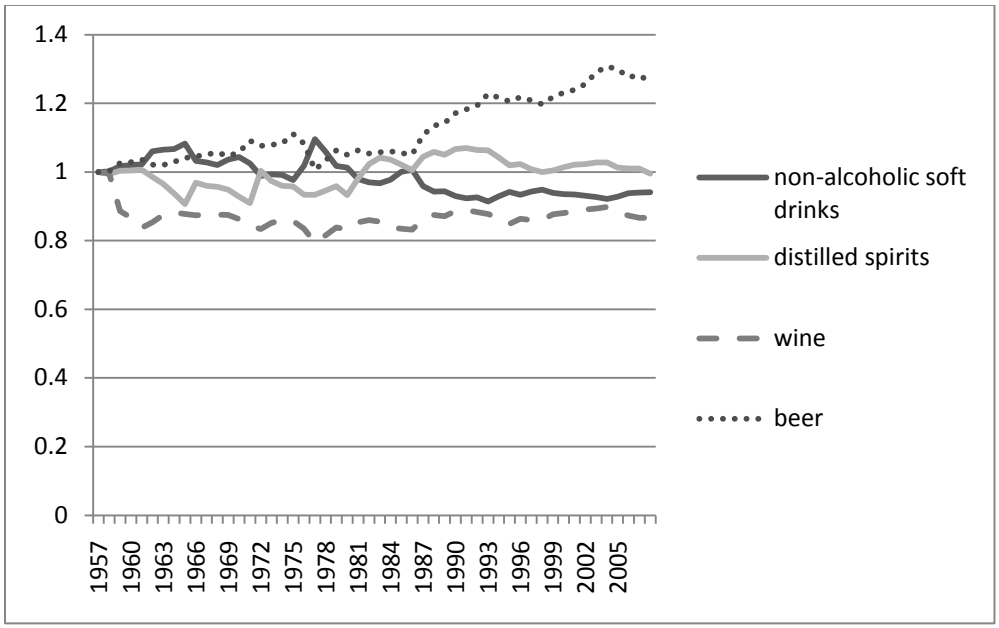
While the sample may be representative with respect to a number of socio-demographic variables, results could still be influenced by a sampling bias, including more respondents with severe alcohol problems in the later waves of the survey. The maximum amount of pure alcohol intake per average occasion observed in pour sample exceeds 1.5 liters, suggesting that a number of respondents suffer from severe alcohol abuse. We therefore ran a specification examining the effects on a restricted sample of non-abusers, i.e. consumers that do not ingest more than 24g of pure alcohol per average drinking occasion. The number corresponds to what is currently perceived to be the threshold for daily low-in-risk intake (Pabst & Kraus, 2008), i.e. we look at the – alcohol-wise – least addicted and most healthy behaving part of the population.

The cut-off point was chosen for two reasons. First, to take out all people that may suffer from various degrees of alcohol abuse, as changes in their density may bias the results. Second, choosing the most healthy behaving part of the population entails the additional advantage that any changes in health-relevant information can be assumed to leave them unaffected, as their behavior is already at the most healthy level. Approximately 35% of the population falls into this category, being significantly less than assumed in epidemiological surveys (Bühringer, et al., 2000; Pabst & Kraus, 2008). Surprisingly, the γ-coefficients remain unaffected, rendering an explanation based on health and beauty concerns unlikely.[35] While increases of intake per occasion, by definition, take place on a smaller scale, reductions in frequency exceed the reductions in the broader population. Heavy drinkers react less sensitive to changes in social drinking norms. Two reasons may account for this quantity-dependent variance in sensitivity. First, the addictive nature of alcohol causes compulsive intake behavior and may effectively overwrite fears of social consequences. Second, if social ostracism is what makes people refrain from over-indulging in alcoholic beverages, then social ostracism will only be a weak motivation for individuals already finding themselves on the edge of society. As alcoholism is a heavily stigmatized disease (Room, 2005), excessive drinkers may not respond to societal motivation or even compensate social embeddedness by alcohol consumption.

[35] The results for this subsample can be found in the last specification in each regression table in the Appendix.

Due to a lack in local and regional price data the present analysis does not include the development of prices for the alcoholic beverages under consideration. This is problematic as findings from prior studies suggest that the price effect operates mainly via the decision to drink rather than the amount consumed conditional on participation (Manning, Blumberg, & Moulton, 1995; Chaloupka, Grossman, & Saffer, 2002; Dave & Saffer, 2008). Thus the effects observed for year of study may simply capture the effects of increases in alcohol prices. However, national data reveals that only the price of beer increased considerably since 1976, whereas the price of liquor actually decreased and the price of wine remained constant. Figure 5 plots the relative price indices of beer, wine, spirits and non-alcoholic soft drinks for Germany in the period from 1957-2007.[36]

Figure 5. Relative Price Indices for Beer, Wine, Distilled Spirits, and Non-alcoholic Soft Drinks, Germany, 1957 - 2007



While the development in prices suggest a beverage-dependent relationship between year of study and the frequency and quantity of intake, we find identical influences of the year of study independent of alcoholic beverage. Results thus suggest that differential price developments cannot be considered a major driver of the development of alcohol consumption in Germany in the period from 1976 to 1995. Additionally, an increase in prices may have contributed to the drop in frequency, but cannot provide an explanation for the increases in the amount consumed per occasion.

[36] Assume p_{it} to be the undeflated price chained to 1957=100 per unit of beverage i in period t, where $i = 1$ for beer, $i = 2$ for wine, $i = 3$ for distilled spirits, and $i = 4$ for non-alcoholic soft drinks. The change in price per unit is given by $Dp_{it} = p_{it} - p_{it-1}$. Relative prices p'_{it} are given by $p'_{it} = p_{it}/P_t$, where P_t is the consumer price index for all beverages. P_t is given by the sum of indexed prices for each beverage i, weighted by the corresponding consumption share $P_t = \sum_{i=1}^{4} w'_{it} p_{it}$, where $w'_{it} = q_{it}/Q_{gt}$, $i = 1,2,3,4$, within the whole beverage market, and $Q_{gt} = \sum_{i=1}^{4} q_{it}$. Thus $Dp'_{it} = p'_{it} - p'_{it-1}$ represents the annual growth rate of relative prices in the beverage market with an average annual growth rate of $D\bar{p}'_i = (1/T-1) \times \sum_{t=2}^{T} Dp'_{it}$.

Living in a wine producing region significantly decreases frequency and amount of beer and liquor intake. However, the results for wine are inconsistent. While there is some indication that the amount of wine consumed per occasion increases when living in a wine producing region, results also suggest that the frequency of drinking wine decreases when living in these regions. Such inconsitency may arise for reasons of data availability. First, wine producing regions do not exactly match with the administrative entities used as proxies, thereby introducing unobserved heterogeneity. Second, estimations for the later 4 waves of observation (1984-1995) and using a more precise measure of frequency find a significant positive link between living in a wine growing region and frequency of wine consumption, hinting at a problem of measurement accuracy.

8. Conclusion

Past explanations from economics of the major drop in alcohol consumption, observable in most Western societies, stress the importance of consumer knowledge on the detrimental health effects associated with excessive alcohol consumption. In contrast, epidemiological literature emphasizes the contribution of changes in situational drinking norms and societal attitude towards alcohol intake. While increasing information on the effects of alcohol consumption to public health may contribute to changes in social norms (Opp, 2001), direct and indirect effects of health information differ substantially in the reactions they elicit. If health or beauty considerations are the major drivers of the reduction in consumption, frequency of consumption and the quantity consumed per occasion should decrease by roughly the same order of magnitude. Reductions in frequency only, point to the influence of social norms.

We test the differing hypothesis using a set of repeated cross-sectional surveys conducted by the German Federal Center for Health Education between 1976 and 1995. Our results reveal that while Germans drink on significantly less occasions, they do consume significantly more per drinking occasion. These results are inconsistent with the assumption that consumers react to the dissemination of health information by optimizing their investment into health capital. For a subset of the surveys, we also find that drinking prevalence in situations that are characterized by a high publicity, e.g. at work, significantly decrease, while the prevalence of drinking in private does not change. This supports the conjecture that a general attitude towards alcohol and situational drinking norms were the major drivers of the drop in per capita alcohol consumption witnessed in Germany over the past 30 years. We thus provide empirical evidence for the importance of targeting social norms in public health campaigns. As the success of public health campaigns, demanding considerable public expenditures each year, varies greatly (Hornik, 2002; Randolph & Viswanath, 2004), our results emphasize the importance of further investigations into the dynamics of the links between behavior, social norms, and information. However, our results also reveal that there is an inverse relationship between susceptibility to social norms and the amount of alcohol consumed, stressing the importance of other policy tools, like excise taxation, in order to curb problem drinking (Dave & Saffer, 2008).

Lastly, changing social and situational acceptability of alcohol consumption may provide an explanation for the ongoing convergence drinking patterns across Europe (Aizenman & Brooks, 2008). If there is a general trend in reducing the number of situations in which the consumption of alcohol is considered acceptable - especially concerning daytime public drinking – then the alcoholic beverage most often consumed should also be affected the most. Hence, the consumption of beer reduces in the primarily beer consuming countries of northern and central Europe, whereas countries with a high share of wine consumption experience a reduction in this beverage.

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Appendix

Table 1. Descriptive Statistics

	Variable	Coding	Obs	Mean	Standard Deviation	Min	Max
		Dependents					
Beer	Amount per occasion	cardinal, in liter	14482	.5547	.9118	0	15
	Frequency	ordinal, from 0 (never) to 5 (at least once daily)	15746	2.2545	1.9366	0	5
Wine	Amount per occasion	cardinal, in liter	14790	.3728	.9417	0	9.9
	Frequency	ordinal, from 0 (never) to 5 (at least once daily)	15729	2.126	1.7461	0	5
Liquor	Amount per occasion	cardinal, in milliliter	14029	7.8183	22.6053	0	700
	Frequency	ordinal, from 0 (never) to 5 (at least once daily)	15692	1.5145	1.7609	0	5

Prevalence of alcohol consumption	During lunch	binary	5962	.1169	.3213	0	1
	During work	binary	3970	.0975	.2966	0	1
	When alone	binary	5962	.0844	.2779	0	1
	While watching TV	binary	5962	.2435	.4293	0	1
		Independents					
	Year	Year of study times .01	15801	19.8536	.0679	19.76	19.95
	Gender	binary	15801	.4544	.4979	0	1
	Age < 18	binary	15801	.0387	.1929	0	1
	Age 18-30	binary	15801	.1983	.3988	0	1
	Age 45-65	binary	15801	.2927	.455	0	1
	Age > 65	binary	15801	.1916	.3935	0	1
	Middle school (Realschule)	binary	15801	.2518	.4341	0	1
	High school (Abitur)	binary	15801	.0733	.2607	0	1
	University degree	binary	15801	.0782	.2684	0	1
	Full-time employment	binary	15801	.3696	.4827	0	1
	Part-time employment	binary	15801	.0732	.2604	0	1
	Unemployed	binary	15801	.2437	.4293	0	1
	Retired	binary	15801	.2098	.4072	0	1
	Self-employed	binary	15801	.0611	.2395	0	1
	Dryness of industry	nominal; 1 (wet), 2 (neutral), 3 (dry)	10790	2.1384	.5768	1	3
	Married	binary	15801	.6119	.4873	0	1
	Divorced or widowed	binary	15801	.1773	.3819	0	1
	Equivalent household size	cardinal	15770	1.6999	.5661	1	5.6
	Smoker	binary	15546	.3316	.4708	0	1
	Social embeddedness	binary	13402	.4996	.5	0	1
	Income group	ordinal, 1 (poorest hh) to 13 (richest hh)	13268	9.5953	2.7441	1	13
	Traditional wine growing region	binary	15801	.2059	.4044	0	1
	City size	ordinal, 1 (< 2000 inhabitants) to 7 (> 500,000 inhabitants)	15801	4.6707	1.9744	1	7

Table 4.The amount of beer consumed per occasion [a,b]

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Time-trend	1.9544***	4.2136***	4.2501***	4.786***	6.2023***	1.5371***
	(.1220)	(.1733)	(.1746)	(.1991)	(.4095)	(.2724)
Gender	0.4769***	.7971***	.7893***	.7086***	.8087***	.2341***
	(.0168)	(.024)	(.0246)	(.0275)	(.0389)	(.0269)
Age < 18	-.2308***	-.5115***	-.5462***	-.5094***	-.5256***	-.1165*
	(.0488)	(.0721)	(.075)	(.0813)	(.1218)	(.0678)
Age 18-30	.0210	.0048	-.0099	-.0103	-.0546	-.0212
	(.0225)	(.0315)	(.0332)	(.0358)	(.0474)	(.0361)
Age 45-65	-.0628***	-.1242***	-.1167***	-.0884***	-.1114***	.0069
	(.0197)	(.0277)	(.028)	(.0298)	(.0397)	(.0295)
Age > 65	-.1619***	-.3414***	-.3213***	-.2394***	-.2403***	.0314
	(.0289)	(.0423)	(.044)	(.0478)	(.0683)	(.0417)
Middle school	-.0443**	-.0288	-.0312	-.0255	-.0296	-.0044
(Realschule)	(.0177)	(.0252)	(.0252)	(.0276)	(.0378)	(.0263)
High school (Abitur)	.0139	.0493	.0481	.0258	.0628	-.0436
	(.0312)	(.0432)	(.0434)	(.0509)	(.0745)	(.0586)
University degree	-.1183***	-.1023***	-.1022***	-.1283***	-.1231**	-.00005
	(.0279)	(.0385)	(.0386)	(.0437)	(.0619)	(.0524)
Full-time employment	.0716**	.1422***	.1631***	.0878	.1158	.0867
	(.0327)	(.0458)	(.0473)	(.0552)	(.0812)	(.0529)
Part-time employment	.0002	.0748	.0923	.0161	.0522	.0622
	(.0422)	(.0599)	(.0616)	(.0694)	(.0984)	(.0656)
Unemployed	.0231	.0236	.0456	.0128	.0357	.0161
	(.0359)	(.0508)	(.0527)	(.0606)	(.0896)	(.0586)
Retired	-.0380	.0063	.0311	-.0318	-.0476	.0423
	(.0399)	(.0566)	(.0583)	(.0663)	(.0975)	(.0615)
Self-employed	-.0049	-.0104	-.0110	.0211	.0277	.0295
	(.0301)	(.0421)	(.0422)	(.045)	(.059)	(.0417)
Married			-.0518	-.0335	-.0243	-.0369
			(.0333)	(.0377)	(.0507)	(.0371)

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Divorced or widowed			-.0704*	-.0176	-.0255	-.0866*
			(.0419)	(.0475)	(.0665)	(.0441)
Equivalent Household			.0281	.0489*	.0475	.0123
size			(.0222)	(.0258)	(.0338)	(.0234)
Smoker				.2630***	.2424***	.0964***
				(.0236)	(.0321)	(.0234)
Social embeddedness				.1152***	.1285***	.0636***
				(.0234)	(.0322)	(.0218)
Income group				.0019	.0039	.0052
				(.0052)	(.007)	(.0045)
Traditional wine growing				-.1238***	-.1389***	-.0851**
region				(.0387)	(.0517)	(.0359)
City size				.0181***	.0204**	-.0002
				(.0065)	(.0089)	(.0059)
Dryness of industry					.0017	
					(.0237)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14482	14482	14451	10436	7348	3663
Adj./Pseudo R^2	0.113	0.0741	0.0742	0.0956	0.0697	0.0907
LR χ^2	64.64	2868.82	2868.25	2570.82	1348.37	340.07

[a], *dependent variable is amount of beer consumed per occasion*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 5. Frequency of beer consumption [a,b]

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Time-trend	-1.3179***	-.5922***	-2.5033***	-2.4031***	-1.5491***	-1.1114	-15.471***
	(.2297)	(.0867)	(.3294)	(.3314)	(.4055)	(.7608)	(1.5911)
Gender	1.3942***	.6299***	1.982***	1.9259***	1.6585***	1.3979***	1.3379***
	(.0329)	(.0129)	(.0475)	(.0487)	(.0589)	(.073)	(.1498)
Age < 18	-.9184***	-.4872***	-1.4818***	-1.4847***	-1.2779***	-1.0201***	-1.0358***
	(.0967)	(.0412)	(.1421)	(.1483)	(.1745)	(.2294)	(.3767)
Age 18-30	-.1161**	-.0467***	-.1879***	-.1884***	-.1049	-.0266	-.1252
	(.0448)	(.0164)	(.0636)	(.0669)	(.0779)	(.0898)	(.199)
Age 45-65	-.1225***	-.0555***	-.2186***	-.1967***	-.1017	-.1204	-.2368
	(.0393)	(.0144)	(.0558)	(.0564)	(.0651)	(.0753)	(.164)
Age > 65	-.3748***	-.1851***	-.6590***	-.544***	-.3483***	-.3911***	-.3305
	(.0574)	(.0226)	(.0834)	(.087)	(.102)	(.1274)	(.2295)
Middle school	.0797**	.0393***	.1699***	.1585***	.1645***	.1453**	.2376*
(Realschule)	(.0351)	(.0132)	(.0502)	(.0503)	(.0593)	(.0711)	(.1442)
High school (Abitur)	.1291**	.0580**	.2498***	.2403***	.2157*	.2237	-.0375
	(.062)	(.0226)	(.088)	(.0883)	(.1118)	(.144)	(.334)
University degree	.0960*	.0417**	.1969**	.1845**	.1884*	.1693	.2017
	(.0557)	(.0196)	(.0785)	(.0786)	(.0961)	(.1189)	(.2978)
Full-time employment	.1868***	.0712***	.2581***	.2514***	.1321	.2005	.2324
	(.0655)	(.0242)	(.0931)	(.0959)	(.1205)	(.1551)	(.2964)
Part-time employment	.1827**	.1060***	.2983**	.2510**	.0677	.0665	-.0295
	(.0836)	(.0324)	(.1198)	(.1231)	(.1497)	(.1863)	(.3633)
Unemployed	.0673	.0394	.0838	.0468	.0015	-.0520	-.0952
	(.0711)	(.0273)	(.1019)	(.1058)	(.1309)	(.1706)	(.3234)
Retired	.0922	.0555	.1528	.1478	.0532	.1414	.2114
	(.0794)	(.03)	(.1139)	(.1171)	(.1432)	(.1852)	(.3428)
Self-employed	-.0622	-.0245	-.0818	-.0885	-.0595	-.0961	-.0062
	(.0609)	(.0214)	(.0858)	(.0859)	(.0993)	(.1118)	(.2357)
Married				.0498	.0553	.1345	.1185
				(.0674)	(.0821)	(.0962)	(.2103)

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Divorced or widowed				-.2587***	-.2243**	-.0693	-.2733
				(.0834)	(.1011)	(.1242)	(.2442)
Equivalent Household size				.0286	.0274	.1002	.0844
				(.0447)	(.0562)	(.064)	(.1311)
Smoker					.3363***	.2123***	.1687
					(.0518)	(.0608)	(.1314)
Social embeddedness					.3144***	.3359***	.3859***
					(.0507)	(.0607)	(.1217)
Income group					.0006	.0023	-.0067
					(.0114)	(.0132)	(.0249)
Traditional wine growing region					-.3024***	-.2486**	-.6556***
					(.084)	(.0983)	(.2052)
City size					.0032	.0246	-.0125
					(.0141)	(.0168)	(.0324)
Dryness of industry						.0375	
						(.0442)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15746	15746	15746	15716	11375	7374	3638
Adj./Pseudo R^2	0.1572	0.0629	0.0465	0.047	0.0424	0.0351	0.0337
LR χ^2	102.26	4170.6	2846.2	2870.11	1884.65	1023.04	407.79

[a], *dependent variable is the frequency of beer consumed*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 6.The amount of wine consumed per occasion [a,b]

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Time-trend	1.9487***	4.8985***	4.9612***	4.1906***	8.0518***	.7191***
	(.1296)	(.1802)	(.1815)	(.1732)	(.3957)	(.1316)
Gender	.0489***	-.0106	-.0221	-.0272	-.1074***	-.1388***
	(.0179)	(.0246)	(.0253)	(.024)	(.0367)	(.0143)
Age < 18	-.1502***	-.3817***	-.3354***	-.2528***	-.278**	.0068
	(.0528)	(.0756)	(.0788)	(.0726)	(.1155)	(.0333)
Age 18-30	.0192	.0175	.0608*	.0434	.0195	.0368**
	(.0242)	(.0329)	(.0347)	(.0316)	(.0454)	(.0178)
Age 45-65	-.0265	-.0461	-.0413	-.0283	-.0302	.0421***
	(.0211)	(.0289)	(.0292)	(.0262)	(.038)	(.0147)
Age > 65	-.0622**	-.1567***	-.1282***	-.0802*	-.0462	.0419**
	(.031)	(.0432)	(.0452)	(.0415)	(.0645)	(.0201)
Middle school	.0503***	.1426***	.1471***	.0939***	.1524***	.0384***
(Realschule)	(.019)	(.0259)	(.026)	(.0239)	(.0357)	(.0125)
High school (Abitur)	.0509	.1695***	.1832***	.166***	.2598***	.0482*
	(.0333)	(.0446)	(.0448)	(.0441)	(.0703)	(.0278)
University degree	.0564*	.2295***	.2359***	.1712***	.2484***	.1267***
	(.0298)	(.0396)	(.0397)	(.0377)	(.0579)	(.024)
Full-time employment	.0023	.0465	.0207	.0731	.1092	-.0005
	(.0353)	(.0481)	(.0498)	(.0492)	(.0783)	(.0263)
Part-time employment	.0056	.1006*	.0453	.0881	.1320	.0289
	(.0449)	(.061)	(.063)	(.0602)	(.0931)	(.0312)
Unemployed	.0091	.0218	-.0295	.0432	.0462	.0049
	(.0384)	(.0524)	(.0547)	(.0534)	(.0856)	(.0281)
Retired	.0078	.0360	.0071	.0932	.0860	.0169
	(.0429)	(.0589)	(.0608)	(.0585)	(.0936)	(.0301)
Self-employed	-.0034	.005	.0007	.0347	.057	.0074
	(.0324)	(.0446)	(.0447)	(.04)	(.0571)	(.0216)
Married			.1171***	.0541	.0517	-.0027
			(.0354)	(.0337)	(.0491)	(.0188)

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Divorced or widowed			.0938**	.0414	.0845	.0043
			(.0435)	(.0413)	(.0629)	(.0213)
Equivalent Household			.0489**	.0273	.0426	.0167
size			(.0233)	(.0229)	(.0326)	(.0114)
Smoker				.0647***	.0552*	-.0044
				(.0211)	(.0308)	(.0119)
Social embeddedness				.0724***	.0838***	.0142
				(.0206)	(.0307)	(.0107)
Income group				.0162***	.0218***	.0054**
				(.0046)	(.0067)	(.0022)
Traditional wine growing				.0034	-.0077	.0358**
region				(.0338)	(.0491)	(.0172)
City size				.0209***	.0391***	.0078***
				(.0058)	(.0086)	(.0029)
Dryness of industry					.0153	
					(.0228)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14790	14790	14759	10655	7353	3663
Adj./Pseudo R^2	0.0205	0.0294	0.03	0.0456	0.0374	0.1277
LR χ^2	11.69	1151.65	1172.2	1111.09	670.14	295.22

[a], *dependent variable is amount of wine consumed per occasion*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 7. Frequency of wine consumption [a,b]

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Time-trend	-9.1003***	-4.4391***	-10.7063***	-10.6048***	-10.4534***	-19.6732***	-33.4989***
	(.21)	(.0931)	(.275)	(.2761)	(.3489)	(.6739)	(1.4463)
Gender	-.2229***	-.1085***	-.356***	-.4135***	-.41***	-.2958***	-.6901***
	(.0301)	(.0129)	(.0395)	(.0405)	(.0506)	(.0643)	(.1335)
Age < 18	-.6363***	-.3447***	-.9933***	-.8212***	-.9695***	-.7574***	-.5011
	(.0884)	(.0411)	(.1184)	(.1233)	(.1503)	(.2027)	(.3335)
Age 18-30	-.1583***	-.0714***	-.201***	-.1085*	-.1051	-.0348	.0906
	(.041)	(.017)	(.0532)	(.0559)	(.0671)	(.0794)	(.1749)
Age 45-65	-.0933***	-.0394***	-.1265***	-.1132**	-.0967*	-.0387	.0464
	(.0359)	(.0148)	(.0466)	(.0471)	(.0559)	(.0665)	(.1434)
Age > 65	-.2454***	-.1135***	-.3686***	-.2556***	-.183**	-.0749	.0899
	(.0525)	(.0222)	(.0688)	(.0719)	(.087)	(.112)	(.1997)
Middle school	.2985***	.1455***	.4378***	.4387***	.3313***	.3231***	.3891***
(Realschule)	(.0321)	(.0133)	(.0417)	(.0417)	(.0508)	(.0626)	(.1257)
High school (Abitur)	.4345***	.2235***	.6438***	.6571***	.5195***	.5202***	.4661
	(.0566)	(.0238)	(.0735)	(.0736)	(.0958)	(.1266)	(.2923)
University degree	.6116***	.2892***	.8639***	.8635***	.6427***	.6455***	.9199***
	(.0509)	(.0203)	(.0656)	(.0655)	(.0827)	(.105)	(.2601)
Full-time employment	.1827***	.098***	.2648***	.1625**	.1549	.1687	.1878
	(.0599)	(.0258)	(.0783)	(.0806)	(.1046)	(.1381)	(.2657)
Part-time employment	.2827***	.1268***	.3923***	.2136**	.1538	.2122	.1919
	(.0764)	(.0319)	(.0993)	(.1021)	(.1284)	(.1642)	(.3188)
Unemployed	.0741	.04	.0963	-.0775	-.0061	.0633	.0635
	(.065)	(.0282)	(.085)	(.0883)	(.1131)	(.151)	(.2853)
Retired	.1306*	.0626**	.1754*	.0555	.0838	.088	.2233
	(.0726)	(.0316)	(.0952)	(.0978)	(.1237)	(.1646)	(.3036)
Self-employed	.1619***	.0669***	.1966***	.1907***	.2185**	.0638	.0617
	(.0557)	(.0217)	(.072)	(.072)	(.0856)	(.0989)	(.2073)
Married				.3619***	.1475**	.1725**	.3274*
				(.0567)	(.0711)	(.0853)	(.1857)

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Divorced or widowed				.0326	-.0531	-.0726	-.0224
				(.0694)	(.0866)	(.109)	(.2124)
Equivalent Household size				.0055	-.0665	.0579	.1266
				(.0373)	(.0483)	(.0566)	(.1145)
Smoker					-.0393	-.0638	-.0789
					(.0448)	(.0539)	(.1162)
Social embeddedness					.3068***	.3038***	.2316**
					(.0436)	(.0536)	(.1068)
Income group					.0379***	.0408***	.0061
					(.0098)	(.0117)	(.0218)
Traditional wine growing region					-.1634**	-.0924	-.1075
					(.0722)	(.087)	(.1808)
City size					.0486***	.0661***	.013
					(.0121)	(.0149)	(.0284)
Dryness of industry						.0154	
						(.039)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15729	15729	15729	15698	11357	7365	3629
Adj./Pseudo R^2	0.1346	0.0513	0.0341	0.0353	0.0325	0.0378	0.0523
LR χ^2	85.38	3136.47	2056.84	2127.47	1442.86	1102.43	702.01

[a], *dependent variable is the frequency of wine consumed*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 8.The amount of liquor consumed per occasion [a,b]

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Time-trend	140.8416***	273.7251***	273.4899***	340.4514***	24.8623***	48.3857***
	(2.6923)	(4.7787)	(4.8165)	(5.9529)	(1.9575)	(4.3844)
Gender	4.0119***	10.5779***	10.6936***	10.1769***	1.7575***	-.1248
	(.3615)	(.6265)	(.6427)	(.7857)	(.1838)	(.4425)
Age < 18	-2.2618**	-13.8481***	-12.7829***	-16.7663***	-2.6923***	-3.7921***
	(1.05)	(2.0432)	(2.1139)	(2.5225)	(.6085)	(1.1928)
Age 18-30	-.9512*	-2.0431**	-1.7653*	-2.9069***	-.2475	.0242
	(.4845)	(.8234)	(.8688)	(1.0282)	(.2232)	(.5787)
Age 45-65	-1.5109***	-3.0644***	-3.2782***	-2.8254***	-.1745	-.0361
	(.4249)	(.7253)	(.7337)	(.8556)	(.1865)	(.4847)
Age > 65	-1.9649***	-6.3483***	-6.8207***	-6.4783***	-1.2605***	-.3021
	(.6219)	(1.1251)	(1.1684)	(1.3965)	(.3273)	(.6875)
Middle school	.5752	1.3755*	1.4376**	2.0247**	.2563	.3055
(Realschule)	(.3812)	(.6616)	(.6642)	(.7933)	(.1781)	(.4309)
High school (Abitur)	-2.3049***	-1.5186	-1.5223	.6779	.3288	.9768
	(.6765)	(1.1219)	(1.1269)	(1.4434)	(.3485)	(.8868)
University degree	-2.673***	-2.2995*	-2.3236***	-3.5553***	.0895	.0609
	(.6062)	(.9977)	(1.0005)	(1.2315)	(.2871)	(.8434)
Full-time employment	1.5283**	4.7197***	4.1651***	1.9658	1.0862***	-.7426
	(.7084)	(1.2144)	(1.2586)	(1.6041)	(.3877)	(.8565)
Part-time employment	1.6813*	6.3283***	5.7881***	4.2889**	1.2457***	-1.0793
	(.9118)	(1.5739)	(1.6215)	(2.0049)	(.4655)	(1.0518)
Unemployed	2.6221***	4.1451***	3.5712**	4.2665**	1.06**	-1.6191*
	(.776)	(1.3397)	(1.3934)	(1.7541)	(.4261)	(.9344)
Retired	.8723	2.7757*	2.0979	1.4429	.8804*	-.3008
	(.8653)	(1.5045)	(1.5535)	(1.9299)	(.4663)	(.9856)
Self-employed	2.7534***	4.0432***	4.1374***	4.9501***	.4346	.6893
	(.6474)	(1.1037)	(1.1075)	(1.2898)	(.2785)	(.6917)
Married			1.3775	-3.418***	-.0645	1.0223
			(.8806)	(1.0883)	(.2395)	(.6268)

	1	2	3	4	5	6
Estimation method	OLS	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	work force	<24g
Divorced or widowed			1.4346	-.4777	.2028	1.3547*
			(1.1018)	(1.368)	(.3138)	(.7278)
Equivalent Household			-.8329	-3.0012***	-.0296	-.3644
size			(.5947)	(.7576)	(.1603)	(.4024)
Smoker				6.7843***	1.3602***	1.9483***
				(.6775)	(.15087)	(.3816)
Social embeddedness				2.082***	.7233***	1.1361***
				(.6768)	(.1526)	(.3588)
Income group				.4045***	.1127***	.222***
				(.1536)	(.0334)	(.0757)
Traditional wine growing				-6.5607***	-1.0215***	-.7289
region				(1.1677)	(.2562)	(.6299)
City size				.6715***	.0835*	-.031
				(.1925)	(.0428)	(.0997)
Dryness of industry					-.04048	
					(.1122)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14029	14029	13998	10151	7313	3663
Adj./Pseudo R^2	0.3512	0.0814	0.0816	0.1026	0.0339	0.06
LR χ^2	262.89	6199.46	6196.1	5642.18	798.7	351.05

[a], *dependent variable is amount of liquor consumed per occasion*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 9. Frequency of liquor consumption [a,b]

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Time-trend	-7.1372***	-4.9952***	-10.5002***	-10.476***	-10.3707***	-21.1732***	-25.6115***
	(.2132)	(.1126)	(.3787)	(.3809)	(.4766)	(.9405)	(1.7067)
Gender	.7126***	.4836***	1.2811***	1.2609***	1.0424***	.9172***	.7981***
	(.0306)	(.0157)	(.0546)	(.056)	(.0688)	(.0902)	(.1578)
Age < 18	-.7794***	-.6837***	-1.6961***	-1.5484***	-1.6582***	-1.5814***	-1.7609***
	(.0897)	(.0553)	(.1691)	(.1759)	(.2104)	(.2964)	(.4031)
Age 18-30	-.0618	-.0312	-.0961	-.0365	-.0277	-.0764	.0705
	(.0416)	(.0199)	(.0726)	(.0764)	(.0905)	(.1099)	(.2057)
Age 45-65	-.0772**	-.0451**	-.1738***	-.1820***	-.0862	-.1023	-.2484
	(.0365)	(.0174)	(.0638)	(.0645)	(.0757)	(.0923)	(.1708)
Age > 65	-.2197***	-.1508***	-.4968***	-.4736***	-.3211***	-.4147***	-.5745**
	(.0533)	(.0272)	(.0959)	(.1001)	(.1197)	(.1589)	(.2415)
Middle school	.0439	.0425***	.1558***	.1603***	.1949***	.2372***	.4119***
(Realschule)	(.0326)	(.016)	(.0575)	(.0577)	(.0692)	(.0875)	(.1507)
High school (Abitur)	-.0175	.0053	.0996	.1113	.1731	.3593**	.3392
	(.0575)	(.0296)	(.1014)	(.1017)	(.1305)	(.1767)	(.3447)
University degree	.0147	.0335	.1492*	.1497*	.0956	.1059	.1323
	(.0518)	(.0248)	(.0897)	(.0899)	(.1119)	(.1462)	(.3121)
Full-time employment	.3042***	.1987***	.5464***	.4605***	.2882**	.2546	-.1389
	(.0607)	(.0313)	(.1074)	(.1107)	(.1414)	(.1919)	(.3109)
Part-time employment	.3264***	.2553***	.6572***	.5319***	.267	.2629	-.4067
	(.0776)	(.0398)	(.1374)	(.1413)	(.1751)	(.2295)	(.3793)
Unemployed	.1291*	.1175***	.2745**	.1550	.1007	-.0521	-.5423
	(.066)	(.035)	(.1177)	(.1221)	(.1536)	(.2111)	(.3383)
Retired	.1625**	.1315***	.3029**	.2028	.1138	.0301	-.2757
	(.0737)	(.0382)	(.1315)	(.1354)	(.1683)	(.2298)	(.3599)
Self-employed	.0293	.0184	.0563	.0545	.0619	.0354	.1184
	(.0566)	(.0252)	(.0975)	(.0976)	(.115)	(.1363)	(.2455)
Married				.2643***	.1903**	.2583**	.6835***
				(.0776)	(.0961)	(.1181)	(.2216)

	1	2	3	4	5	6	7
Estimation method	OLS	Poisson	Tobit	Tobit	Tobit	Tobit	Tobit
Sample	full	full	full	full	full	work force	<24g
Divorced or widowed				.1226	.036	.0535	.4428*
				(.096)	(.1185)	(.1529)	(.2571)
Equivalent Household				-.0353	-.1421**	-.0394	-.2416*
size				(.0514)	(.0658)	(.0788)	(.1386)
Smoker					.5496***	.4615***	.4081***
					(.0602)	(.0745)	(.1366)
Social embeddedness					.5015***	.5448***	.4451***
					(.0593)	(.0749)	(.1275)
Income group					.0415***	.0489***	.0449*
					(.0133)	(.0163)	(.0264)
Traditional wine growing					-.5852***	-.5216***	-.429*
region					(.1003)	(.1244)	(.2196)
City size					.0031	.006	-.0599*
					(.0165)	(.0206)	(.0341)
Dryness of industry						-.0099	
						(.054)	
State dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15692	15692	15692	15662	11338	7345	3624
Adj./Pseudo R^2	0.124	0.0696	0.0351	0.0354	0.0389	0.0454	0.0456
LR χ^2	77.59	4140.33	1876.87	1885.02	1550.33	1199.69	514.77

[a], *dependent variable is the frequency of wine consumed*

[b], *all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 10.Prevalence of alcohol consumption during lunch, Germany, 1976-1980 [a,b]

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	Full	full	full	full	work force	<24g
Time-trend	-1.0639	-0.82	-.8678	-.8208	-.5499	-7.1127***
	(1.3839)	(1.6036)	(1.5066)	(1.5114)	(1.7404)	(2.4609)
Gender	.2851***	.3272***	.2998***	.3125***	.3693***	.0346
	(.0443)	(.0633)	(.0501)	(.0614)	(.0696)	(.0985)
Age < 18	-.5627***	-.7042**	-.4557***	-.3742**	-.6578**	-.1824
	(.1401)	(.3071)	(.1601)	(.1827)	(.3183)	(.2664)
Age 18-30	-.1572**	-.1301*	-.1252	-.1055	-.1219	-.0952
	(.0672)	(.0758)	(.0761)	(.0775)	(.0835)	(.1375)
Age 45-65	-.0263	-.0344	-.0493	-.0595	-.0535	-.0033
	(.0576)	(.0641)	(.0606)	(.0619)	(.0671)	(.1071)
Age > 65	-.0392	-.1835*	-.0678	-.1167	-.2101*	.1404
	(.0625)	(.1061)	(.0757)	(.0959)	(.1158)	(.1463)
Education	.0762***	.0765**	.0501*	.0564*	.0463	.087
	(.0269)	(.0319)	(.0298)	(.0308)	(.0353)	(.0529)
Full-time employment		.0688		.0954	.0326	.0554
		(.1563)		(.1259)	(.166)	(.2116)
Part-time employment		.1310		.1264	.1149	.0147
		(.1791)		(.1534)	(.1907)	(.2507)
Unemployed		.1964		.1369	.1753	.0499
		(.1707)		(.1397)	(.1818)	(.2278)
Retired		.2453		.163	.1763	.075
		(.1807)		(.1477)	(.1914)	(.24)
Self-employed		.0486		.086	.0697	.2482*
		(.0837)		(.08)	(.0878)	(.1267)
Dryness of industry		.0093			.0046	
		(.0338)			(.0349)	
Married			.0212	-.0028	-.0046	-.0702
			(.0768)	(.0802)	(.0872)	(.1385)
Divorced or widowed			.1038	.0869	.1137	.0744
			(.0953)	(.0967)	(.1076)	(.1524)

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	full	full	full	work force	<24g
Equivalent Household			-.1154**	-.1126**	-.1002*	-.0057
Size			(.0522)	(.0533)	(.0591)	(.0855)
Smoker			-.0304	-.0343	-.0236	-.0824
			(.0502)	(.0503)	(.0555)	(.089)
Social embeddedness			-.0528	-.0510	-.0777	.0206
			(.0492)	(.0495)	(.0558)	(.0802)
Income group			.0281***	.0275***	.025**	.0229
			(.0098)	(.0101)	(.0116)	(.016)
Traditional wine growing			-.158*	-.1571*	-.1229	-.1279
region			(.0816)	(.0816)	(.092)	(.129)
City size			-.0028	-.0015	-.0016	-.0021
			(.0128)	(.0129)	(.0145)	(.0213)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5885	4465	5526	5526	4211	2808
Adj./Pseudo R^2	0.0572	0.0601	0.0598	0.0605	0.0624	0.0523
Log Likelihood	-2007.0326	-1586.4431	-1896.68	-1895.437	-1503.215	-702.7011
LR χ^2	243.7	202.84	241.45	243.93	200.13	77.51

[a] *, dependent variable is amount of beer consumed per occasion*

[b] *, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 11.Prevalence of alcohol consumption during work, Germany, 1976-1980 [a,b]

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	full	full	full	work force	<24g
Time-trend	-13.1414***	-17.0208***	-12.0604***	-15.5933***	-16.6076***	-19.2956*
	(3.1074)	(3.4435)	(3.3211)	(3.4526)	(3.6767)	(9.9957)
Gender	.6788***	.3641***	.6031***	.3580***	.347***	.1495
	(.0627)	(.0822)	(.0695)	(.0843)	(.0901)	(.2169)
Age < 18	-.6490***	-.368	-.5834***	-.3372	-.3504	
	(.1709)	(.2778)	(.2088)	(.2292)	(.3088)	
Age 18-30	.1263	.1349	.1749*	.1855*	.1971**	.1507
	(.0774)	(.0864)	(.0915)	(.0948)	(.0985)	(.2543)
Age 45-65	-.3369***	-.1751**	-.3131***	-.1830**	-.1583*	.1324
	(.0753)	(.082)	(.0792)	(.0828)	(.0852)	(.2174)
Age > 65	-1.4107***	-.5207**	-1.3928***	-.4819**	-.4694*	
	(.1544)	(.239)	(.1666)	(.2128)	(.2486)	
Education	-.0417	-.043	-.0881**	-.0702*	-.0611	.101
	(.0362)	(.0416)	(.0396)	(.0419)	(.0452)	(.1097)
Full-time employment		.1707		.4297***	.0068	-.6831**
		(.1637)		(.1549)	(.1771)	(.3312)
Part-time employment		-.0943		.2612	-.2234	-1.1505**
		(.1997)		(.1937)	(.2154)	(.4511)
Unemployed		-.8668***		-.5417***	-.9405***	-1.4692***
		(.2116)		(.1922)	(.2244)	(.4511)
Retired		-1.2736***		-.8775***	-1.4638***	-1.5336**
		(.3003)		(.2636)	(.3144)	(.6107)
Self-employed		-.3802***		-.3719***	-.3656**	.2108
		(.1334)		(.1372)	(.1433)	(.3335)
Dryness of industry		.0104			-.0013	.0498
		(.0454)			(.0469)	(.1152)
Married			.0514	.0762	.1364	.2760
			(.0969)	(.1019)	(.1073)	(.2813)
Divorced or widowed			.2728**	.2816*	.3528**	.2180
			(.1383)	(.1434)	(.1512)	(.355)

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	full	full	full	work force	<24g
Equivalent Household			-.1721**	-.0745	-.1024	-.3526*
Size			(.0688)	(.0728)	(.0763)	(.2126)
Smoker			.1726***	.1566**	.1642**	.2234
			(.0652)	(.0675)	(.0715)	(.1811)
Social embeddedness			.2166***	.1699**	.1627**	.1036
			(.0694)	(.0723)	(.0766)	(.1864)
Income group			.049***	.022	.0272*	.0352
			(.0142)	(.0151)	(.0161)	(.0408)
Traditional wine growing			.0172	.0268	.0271	-.7261
region			(.1289)	(.1341)	(.1434)	(.4959)
City size			.032*	.0278	.0286	.0455
			(.0192)	(.02)	(.0213)	(.0547)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3902	2970	3707	3707	2826	724
Adj./Pseudo R^2	0.1464	0.1748	0.162	0.207	0.1827	0.1839
Log Likelihood	-1067.3119	-903.4995	-993.77663	-940.4053	-853.79542	-128.55781
LR χ^2	366.1	382.87	384.15	490.89	381.68	57.96

[a] *, dependent variable is amount of beer consumed per occasion*

[b] *, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 12.Prevalence of alcohol consumption when alone, Germany, 1976-1980 [a,b]

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	work force	full	full	work force	<24g
Time-trend	2.6272*	1.2098	1.5214	1.2561	-.0093	-5.8043**
	(1.4645)	(1.6713)	(1.6092)	(1.6178)	(1.8445)	(2.8166)
Gender	.2765***	.1027	.2745***	.2257***	.1638**	.2462**
	(.0479)	(.0652)	(.0549)	(.0655)	(.0725)	(.1215)
Age < 18	-.6302***	-.2906	-.7141***	-.5083**	-.2947	-.5517*
	(.1613)	(.2462)	(.1834)	(.2041)	(.262)	(.3266)
Age 18-30	-.1192*	-.1009	-.2898***	-.2614***	-.2324***	-.4321**
	(.0702)	(.0784)	(.0824)	(.0838)	(.089)	(.1741)
Age 45-65	-.1206*	-.0703	-.1613**	-.1297*	-.0939	.0351
	(.0623)	(.0687)	(.0668)	(.0682)	(.0731)	(.1245)
Age > 65	-.1525**	-.1652	-.3128***	-.1775*	-.2745**	-.1988
	(.0683)	(.1185)	(.0833)	(.1067)	(.1294)	(.1826)
Education	.0732**	.0854**	.0666**	.0866***	.0924**	.133**
	(.0286)	(.0334)	(.0317)	(.0329)	(.0371)	(.0619)
Full-time employment		.1014		.3389**	.2048	.1684
		(.1522)		(.1334)	(.1659)	(.2341)
Part-time employment		-.0594		.3253*	.1641	.2821
		(.1799)		(.1658)	(.1965)	(.2845)
Unemployed		-.1688		.1271	.022	.1318
		(.1719)		(.1508)	(.1867)	(.2577)
Retired		.0026		.1315	.0598	-.2407
		(.1837)		(.1597)	(.1977)	(.2793)
Self-employed		-.0429		-.0014	.018	.0497
		(.093)		(.0915)	(.0987)	(.1772)
Dryness of industry		-.0587*			-.0586	
		(.0355)			(.0371)	
Married			-.2448***	-.2614***	-.2622***	-.44***
			(.0813)	(.0839)	(.0899)	(.163)
Divorced or widowed			.067	.0423	.0995	-.0455
			(.0971)	(.0978)	(.107)	(.1731)

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	work force	full	full	work force	<24g
Equivalent Household			-.1327**	-.093	-.1219*	-.0414
Size			(.0575)	(.0587)	(.064)	(.1117)
Smoker			.2735***	.2659***	.2716***	.1901*
			(.0528)	(.0532)	(.0586)	(.1004)
Social embeddedness			.0424	.0238	.0384	.0814
			(.054)	(.0545)	(.0608)	(.0981)
Income group			-.0097	-.0193*	-.0127	-.0478**
			(.0107)	(.011)	(.0125)	(.0199)
Traditional wine growing			-.0116	-.0083	.0114	.0471
region			(.1029)	(.1033)	(.1157)	(.187)
City size			.0042	.005	-.0026	.0395
			(.0147)	(.0148)	(.0165)	(.0271)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5885	4465	5526	5526	4211	2808
Adj./Pseudo R^2	0.0332	0.029	0.0584	0.0627	0.0561	0.0874
Log Likelihood	-1658.6841	-1340.9759	-1527.2154	-1520.3044	-1234.9376	-432.36295
LR χ^2	113.95	80.09	189.45	203.27	146.91	82.77

[a] *, dependent variable is amount of beer consumed per occasion*

[b] *, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*

Table 13.Prevalence of alcohol consumption when watching TV, Germany, 1976-1980 [a,b]

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	work force	full	full	work force	<24g
Time-trend	2.342**	.8817	1.5115	1.2848	-.4192	-1.9363
	(1.1346)	(1.3012)	(1.2402)	(1.2446)	(1.4232)	(1.9245)
Gender	.4427***	.4536***	.3697***	.3912***	.4304***	.2021***
	(.0367)	(.0521)	(.0413)	(.0513)	(.0572)	(.0836)
Age < 18	-.8723***	-.5208***	-.7386***	-.5426***	-.461**	-.6903***
	(.1124)	(.1964)	(.1324)	(.1489)	(.2111)	(.2292)
Age 18-30	-.1296**	-.0719	-.1279**	-.1059*	-.094	-.0732
	(.0529)	(.0592)	(.0605)	(.0616)	(.0659)	(.1017)
Age 45-65	-.2557***	-.1987***	-.2327***	-.2023***	-.1861***	-.1011
	(.0475)	(.0528)	(.05)	(.051)	(.0553)	(.0834)
Age > 65	-.5217***	-.4095***	-.4368***	-.2926***	-.3478***	-.1868
	(.0543)	(.0916)	(.0648)	(.0819)	(.0998)	(.1235)
Education	-.0088	.0357	-.0174	.0023	.0301	.0472
	(.0231)	(.027)	(.0254)	(.0263)	(.0296)	(.0447)
Full-time employment		.2883**		.2958***	.239*	.0302
		(.1219)		(.1013)	(.1301)	(.1603)
Part-time employment		.2624*		.2593**	.2546*	.1181
		(.1417)		(.1247)	(.1518)	(.1909)
Unemployed		.3416**		.286**	.3507**	.0504
		(.1349)		(.1128)	(.1439)	(.1742)
Retired		.0938		.0712	.0224	-.2066
		(.1465)		(.1216)	(.1551)	(.1881)
Self-employed		-.0185		-.0193	.0174	.0871
		(.0724)		(.0711)	(.0765)	(.1182)
Dryness of industry		-.0026			-.0088	
		(.0278)			(.0287)	
Married			.0972	.0579	.0286	.0817
			(.0631)	(.0656)	(.0704)	(.1117)
Divorced or widowed			.0665	.035	.0403	.1067
			(.0803)	(.0814)	(.0896)	(.1301)

	1	2	3	4	5	6
Estimation method	Probit	Probit	Probit	Probit	Probit	Probit
Sample	full	work force	full	full	work force	<24g
Equivalent Household			-.0921**	-.0771*	-.1025**	.0264
Size			(.0426)	(.0436)	(.0482)	(.07)
Smoker			.2774***	.274***	.2232***	.1695**
			(.0403)	(.0405)	(.0449)	(.0677)
Social embeddedness			.0629	.0597	.0485	.1588**
			(.0409)	(.0411)	(.0462)	(.0656)
Income group			.0151*	.0096	.0095	-.0013
			(.0082)	(.0085)	(.0096)	(.0134)
Traditional wine growing			.0175	.0154	.0412	.1604
region			(.0775)	(.0776)	(.0874)	(.1283)
City size			.018	.0195*	.0214*	.019
			(.0112)	(.0112)	(.0126)	(.0182)
State dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5885	4465	5526	5526	4211	2808
Adj./Pseudo R^2	0.0482	0.0444	0.0563	0.0591	0.0504	0.0451
Log Likelihood	-3115.5761	-2499.4195	-2926.6869	-2917.9886	-2356.5032	-1087.3688
LR χ^2	315.72	232.29	349.44	366.84	250.17	102.73

[a] *, dependent variable is amount of beer consumed per occasion*

[b] *, all regressions include a constant term (White-corrected standard errors in parentheses); ***, Significant at the 1% level; **, Significant at the 5% level; *, Significant at the 10% level*