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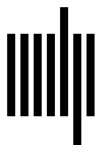
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Economic and Social Externalities

I tried to drown my problems in alcohol, but I realized that they float.
—Anonymous

This chapter deals with the economic and social externalities arising from the production and consumption of wine. The first section provides a theoretical review of the concept of externality, its consequences, and possible solutions. It then describes the positive and negative externalities of the production and consumption of alcoholic beverages in general and wine in particular. Although most people consume a moderate amount of alcohol and benefit from it, alcohol abuse has severe consequences on drinkers and society as a whole. For this reason, the review puts particular emphasis on this latter aspect and draws heavily on medical literature. The last section discusses the policies adopted across countries and over time in order to tackle alcohol abuse and its negative consequences.

7.1 Externalities: Definition, Consequences, and Possible Solutions

7.1.1 Definition of Externalities

Externalities are advantages or disadvantages for either producers or consumers that are created by the activity of an operator who does not receive or pay a price for them. Externalities have the following features.

- They may result from production (for example, pollution generated by the chimneys of industrial companies or soil pollution caused by pesticide treatments) or consumption (for example, use of cars).
- They can be positive (for example, research and development, the planting of an orchard near a beekeeping business, protection of the landscape) or negative (for example, pollution or loud music).
- They are reciprocal: when the right of one party to produce or consume infringes the rights of others, should we stop them? Doing so, however, will harm the

producer/consumer. Consider nightclubs that inevitably end up generating noise—who should exercise their rights: those who enjoy themselves (the right to have fun) or those who impose silence (the right to have quiet)? If a restriction is imposed on nightlife, the first party is damaged to protect the second and vice versa. The choice of which party to protect is subjective and depends largely on sociodemographic factors, such as age and gender, as well as the mentality and customs of a country and the historical period. As an example, in 1905 the governor of Pennsylvania vetoed a law prohibiting public spitting to protect the public from spreading contagions, but this practice was considered an inalienable right of any gentleman.

- Normally a zero level of pollution is not desirable: there is a need for the right balance between benefits and social costs, which requires positive quantities of goods produced and, consequently, of pollution.

7.1.2 Causes and Consequences of Externalities

The onset of externalities is not linked so much to the imperfection of markets as to two other factors. The first is the absence of exchange markets and property rights. When assets belong to the community, operators are encouraged to overexploit resources (e.g., hunting, fishing, using water), causing difficulties and costs to others. The second is the emergence of a good (e.g., noise and air pollution or the dissemination of information technology through worker training) as a result of the production and/or consumption of another good. In the case of pollution, the damage falls on both people (damage to health) and companies (e.g., pollution from sulphur dioxide during the production of iron and steel damages fishing enterprises through acid rains).

The problem of externalities arises because a producer or consumer does not consider the costs or benefits that their choices will have for other individuals. In the case of negative externalities, such as pollution, the balance between supply and demand will occur at point E, where demand and supply are equal (figure 7.1). However, this kind of solution is inefficient from a social point of view. If social costs are taken into due consideration, the supply curve will shift upward and there will be a new equilibrium at point E' with a higher price and a lower quantity. In the presence of positive externalities, we have the opposite case, with a suboptimal production/consumption level and a high price. In this case, public subsidies are necessary to restore a socially efficient equilibrium. If externalities exist, markets are no longer able to guarantee an efficient allocation of resources.

7.1.3 Solutions to Externalities

There are both private and public solutions to solve the problem (for a more detailed analysis, see Katz et al., 2011, chapter 18). The private solutions include the following.

1. *Codes of behavior.* Rules are one way to persuade individuals to take account of the externalities they produce (e.g., do not throw paper on the floor, cough into

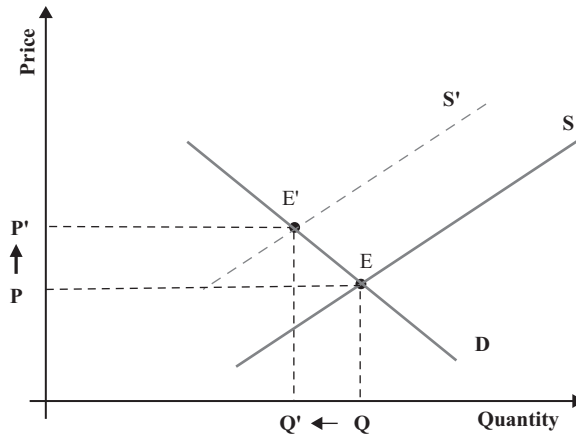


Figure 7.1
Supply curve with negative externalities.

the inside of your elbow, etc.). They correspond to the precept “don’t do unto others what you don’t want others to do to you,” which less elegantly can be translated as “before doing something, consider its external costs and benefits.” An extreme example (more theoretical than real) is when companies decide spontaneously not to pollute for reasons of business ethics.

2. *Mergers.* In the case of pollution, if the two parties involved (e.g., a steel mill and a fishing company) merge, the new single enterprise will internalize the negative externality by maximizing the new profit function. If the steel mill buys the fishing company, it will be willing to reduce pollution so as not to damage the fishing activity too much (and vice versa). Another example similar to mergers is joint ventures and consortia in the field of research and development, which aim to avoid underinvestment caused by the presence of positive externalities (e.g., the Sematech organization of microchip companies).
3. *Bargaining between parties.* If the cause of the discussed inefficiencies is the failure to assign property rights, then the simplest solution is to complete the assignment. This creates a market for the good in question. Property rights actually mean the right to use an asset, especially regarding natural resources. Coase (1960) elaborated a theoretical model,¹ which shows that, if the costs of negotiation and transaction are null, bargaining between economic agents leads to solutions that are efficient from a social point of view, even in the presence of externalities and regardless of who initially owns the property rights. If, in fact, the right is assigned to the polluter, they can reduce the quantities produced if compensated by the injured party, thus restoring a Pareto-efficient equilibrium. If, on the contrary, the right is assigned to the damaged party, they can claim compensation

from the polluter and reach the same result. The *allocation* of resources remains the same; only the *distribution* changes: in the first case the polluter is favored over the damaged party. The assignment of property rights is a political and not an economic choice. The Coase (1960) theorem, however, was criticized because of its too restrictive assumptions. Bargaining can, in fact, fail if: (a) negotiations are burdensome—this happens whenever active participation involves costs (documentation, meetings, travelling, legal fees, etc.) or the parties involved are too numerous, which leads to opportunistic behavior; (b) if there are problems in identifying the cause of or responsibility for damages (one example is the difficulty in identifying the pesticide responsible for the death of bees; in the case of air pollution, there are millions of companies that contribute to this problem); and (c) if information asymmetries exist, making it impossible to know how willing the counterparty is to pay. This can lead to the request for an excessive price, thus causing negotiations to fail.

Public solutions, which mainly concern diseconomies related to pollution, include the items below.

1. *Taxation (subsidy)* on negative (positive) externalities proposed by Pigou (1920). The difference between private and social marginal cost can be removed by introducing a positive tax proportional to quantities produced. Efficiency is restored by adding a tax equal to the social marginal cost to the private marginal cost. The opposite happens if the company creates an external economy and benefits from a subsidy.
2. *Incentives to eliminate external economies*. Instead of imposing a variable tax, the socially optimal quantity can be produced by granting a fixed subsidy for the loss of production. The value of the subsidy in this case is equal to the value of the diseconomy from an optimal social point of view. In this way the curve of private marginal costs is shifted parallelly upward, restoring efficiency.
3. *Negotiable rights to create diseconomies*. These have been introduced to solve the problems of environmental pollution. In this case the “optimal” level of diseconomy has to be established for each company. The right to pollute up to a specified limit is then assigned (e.g., through an auction), and the companies can either use the rights or adopt new technologies, reduce emissions, and sell the rights. This type of solution was adopted in the Kyoto Protocol for the reduction of greenhouse gases. It is important to note that, unlike taxes, the effect seems more certain, given that the level of pollution is prefixed while it is only hypothesized with taxes.
4. *Regulation*. It consists of introducing specific laws that impose limits, the adoption of technologies, and so on (e.g., an obligation to install filters and/or purifiers; an obligation to clear the snow from the sidewalk in front of one’s own home; etc.). This solution automatically eliminates external diseconomies, but the effective compliance with the laws has to be checked and the offenders punished.

As we will see later, there is a much wider range of options available for the consumption of alcoholic beverages that are implemented all over the world with different levels of coercion and effectiveness. In some cases, the negative effects of alcohol abuse fall on consumers themselves and not on third parties, making it very different from a situation where a third party is damaged.

7.2 Externality of Production in the Wine Sector

Wine making in the main wine-producing countries has a turnover of billions of euros, without considering the allied activities linked to the production of rooted cuttings, agricultural machinery, fertilizers, pesticides, industrial machinery, bottling materials, and so forth. As already discussed in chapter 4, various industrial districts have grown in connection with wine production over time. In addition to their multiplicative effects on the regional economies, however, there also exist positive externalities of production, such as (1) the protection of the countryside, (2) the protection of the region, and (3) wine tourism.

The land cultivated with vineyards generates positive production externalities, first of all benefiting everybody who can enjoy the view of the magical landscape. Second, agriculture generally plays a crucial role in safeguarding the countryside. In many countries agricultural land has been “cannibalized” by real estate speculators to make way for houses, industrial warehouses, and large-scale solar parks. Indeed, in countries like Italy these solar parks have benefited from generous incentives granted over a long period for the production of “green” energy and have appeared in many regions. The roots of vines hold the soil in place when it rains, reducing the risk of landslides. Hydrogeological instability and the frequent emergencies that have hit many countries are the result of nefarious policies that have favored the real estate sector to the detriment of the countryside and stability of the land. Last, wine-growing activity generates positive effects on the hospitality industry and trade when consortia successfully promote a wine road.

A series of studies have analyzed the characteristics and demonstrated the positive impact of wine tourism on the economy in countries like Australia (Charters and Ali-Knight, 2002), South Africa (Bruwer, 2003), Spain (López and Martín, 2006), Greece (Karafolas, 2007), Italy (Asero and Patti, 2009; Nunes and Loureiro, 2012; Francioni, Vissak, and Musso, 2017), Chile (Hojman and Hunter-Jones, 2010), and Washington State (Storchmann, 2010).² Wine tourism has enormous potential that requires the concerted efforts of many people and institutions to express itself at its best.

These three positive externalities are closely connected to the cultural content of wine. Article 1 of the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property defines “cultural property” as “property which, on religious or secular grounds,

is specifically designated by each state as being of importance for archaeology, pre-history, history, literature, art or science” (UNESCO 1970). For cultural goods, “the creation of economic value is not their only *raison d’être*” because through them “human beings express their identity and work out ways of living together” (Throsby, 2001, p. 134). Even though wine does not explicitly appear in the long list provided in the same article, UNESCO has named the Champagne and Prosecco hills and wineries as World Heritage Sites (Cardebat, 2017, pp. 38–39).

Wine has been an important element of conviviality and well-being since ancient times. Many wine areas have excelled in achieving high quality, expressing the local identity, and preserving the landscape. The wine “properties, traditions, varieties, and indeed its effects, are a part of European culture and identity as it is to walk our streets or fish our rivers. ... And it is our duty to conserve such a cultural asset” (Hugh Johnson, 2009, p. 9). A useful approach could be to apply the concept of cultural good to wine by asking a simple question: is wine closer to a painting or to a screwdriver? For most wine consumers, the answer is clear: it is close to a painting. Further, while bottles of wine are not nonrival and some consumers are easily excluded, the vineyard landscape is more similar to a public good that everybody can freely enjoy without preventing others from doing so.

Some cultural economists believe that cultural goods carry not only an economic value but also a cultural one that should be considered separately (Throsby, 2001). A cultural good—especially if it is public like the landscape—justifies governmental support based on market failure (Towse, 2010, pp. 51, 171–174); left to the marketplace, people underestimate the positive externalities, and production turns out to be lower than socially optimal (Marks, 2015, pp. 178, 183, 194). Further, for other cultural goods like theaters and classical music, the Baumol and Bowen’s (1966) “cost disease” argument supports the need for public intervention in favor of the arts sector.³ Finally, public subsidies can have a positive influence on the quality of cultural goods and, in turn, on demand, as shown with data on Australian, Austrian, and French theaters by, respectively, Throsby (1990), Krebs and Pommerehne (1995), and Urrutiaguer (2002).

The policy measures government can adopt range from lowering taxes on certain items to subsidizing or directly owning organizations that promote culture (Towse, 2010, pp. 32–34).

7.3 Consumption Externality in the Alcoholic Beverages Sector

The consumption of alcohol produces a series of positive or negative effects depending on the quantities taken on a daily basis. For “moderate consumption,” US authorities mean a glass a day for women and two for men (US Department of Agriculture and US Department of Health and Human Services, 2010, p. 16).⁴

7.3.1 Benefits from Moderate Consumption

Pearl's (1926) seminal population study showed the lower mortality of moderate drinkers. The author cautiously avoided attributing benefits to lighter drinking, but he concluded that such drinking was probably not harmful and suggested that the higher mortality among abstainers in some cases might be due to "constitutional" weakness, which pushed people to avoid alcohol. Since then, the medical literature on the effects of alcohol has expanded and has consistently shown the positive effects of light drinking. The main benefits of moderate consumption are as follows.

- *A reduction in the risk of cardiovascular disease.* Over a hundred scientific studies have shown the existence of an inverse relationship between a moderate consumption of alcohol and the onset of cardiovascular disease (Harvard School of Public Health, n.d.). These surveys use extensive databases, with up to hundreds of thousands of individuals, for periods of time that can exceed fifteen years and record very significant decreases in the main cardiovascular diseases (in some cases up to 80 percent) compared with teetotalers (Stampfer et al., 1988; Klatsky, Armstrong, and Friedman, 1990; Thun et al., 1997; Camargo et al., 1997a, 1997b; Renaud et al., 1999, Mukamal et al., 2003). Moderate consumption of alcohol increases high-density lipoprotein levels, also known as HDL or "good cholesterol," which is said to have protective effects on heart disease. Leger, Cochrane, and Moore (1979) analyzed deaths due to heart disease in eighteen developed countries and found a strong negative relationship with per capita consumption of alcohol and especially wine. Klatsky et al. (2003) also found a J-shaped effect between alcohol consumption—and in particular wine—and mortality. Chiva-Blanch et al. (2013) confirmed the beneficial effects of a moderate daily consumption of alcohol which, however, are even more evident in drinks rich in polyphenols like wine and beer. The effect is heightened with red wine. These studies, therefore, seem to give credence to the so-called "French paradox" that was proposed by the French scientist Serge Renaud in 1991 on the TV show *60 Minutes*, in which he attributed the low incidence of cardiovascular disease among French people (approximately just a third compared with Americans, despite having a similar diet in terms of saturated fat) to the daily consumption of two glasses of red wine (Colman, 2008, p. 83). This led to a rapid increase in the sales of this drink in the United States. Other studies, however, attribute the beneficial effects to alcohol in itself and do not find significant differences among beer-, wine-, or spirit-drinking countries (Rimm et al., 1996; Mukamal et al., 2003).
- *Reduction in the incidence of tumors.* The incidence of kidney tumors (Rashidkhani et al., 2005; Greving et al., 2007) and lymphatic tumors (Morton et al., 2005) is lower among moderate drinkers than chronic and occasional drinkers or teetotalers and is not significantly different for tumors of the colon (Shrubsole

et al., 2007), ovaries (Rota et al., 2012) and other female sexual organs (Hjartåker, Meo, and Weiderpass, 2010).

- *Other beneficial health effects.* Moderate consumption of alcohol leads to a reduction in the probability of catching a cold (Cohen et al., 1993), gallstones (Grodstein et al., 1994; Leitzmann et al., 1999), and type 2 diabetes (Conigrave et al., 2001; Koppes et al., 2005; Djousse et al., 2007). In general, while excessive consumption leads to a reduction in life expectancy due to its harmful effects on health, the potential for domestic and road accidents, and so on, moderate consumers of alcohol, perhaps surprisingly, have a life expectancy that is on average higher than teetotalers. As demonstrated by Doll et al. (1994) using a sample of over twelve thousand male British doctors interviewed in 1978 and studied for the following thirteen years up to 1991, there was an inverse U-shaped effect between alcohol consumption and life expectancy, even though there is a risk of endogeneity due to omitted variables, such as the previous state of health. Teetotalers could, in fact, be such because they do not like the taste of alcohol or because of their precarious health conditions attributable to other diseases, in which case it is not surprising if teetotalers have a shorter life expectancy. Holahan et al. (2010) reviewed empirical studies on this topic and the methodological problems that can skew results. The authors studied the relationship between moderate consumption of alcohol and total mortality (all-cause mortality) net of a series of other sociodemographic variables, previous illnesses, state of health, and so forth, with a database of 1,824 individuals observed for over twenty years: the same positive and significant effect of moderate consumption was still present, though reduced, even after the inclusion of possible confounders in the statistical analysis. Fueller (2011) had similar results.
- *Improvement of sex life.* Moderate consumption of alcohol causes an increase in libido in both men and women (Harvey and Beckman, 1986; Beckman and Ackerman, 1995) and a reduction in anxiety as well as a decrease in erectile dysfunction problems compared with both teetotalers and hardened drinkers (Chew et al., 2009).
- *Effects on mental efficiency.* Moderate consumption of alcohol increases cognitive performance (Galanis et al., 2000; Rodgers et al., 2005) and reduces the risk of developing degenerative brain diseases, such as Alzheimer's disease and other forms of dementia (Cupples, 2000; Sabia et al., 2018), although it does not seem to affect the incidence of Parkinson's disease (Checkoway et al., 2002).
- *Effects on psychological well-being:* Baum-Baicker (1985) reviewed the benefits of alcohol consumption on the human psyche, which include an anti-stress function, increased happiness, euphoria, conviviality, and emotional expressiveness (alcohol as "a social lubricant"). The nonlinear effect of alcohol consumption on happiness has been demonstrated empirically with Russian data by Massin and Kopp (2010) and Krekhovets and Leonova (2013). Monahan and Lannutti (2000) showed that

the consumption of alcohol makes women with less self-esteem more uninhibited and less anxious on a first date with a man, whereas nervous tension and depression decrease with moderate consumption. Pernanen (1991) and Hall (1996) demonstrated its relaxing effect while Skogen et al. (2009) found a U-effect between alcohol consumption on the one hand and anxiety and depression on the other. These results were taken up and developed in an extensive study by Peele and Brodsky (2000), confirming the psychological benefits and emphasizing how scientific literature tends to overemphasize damage.⁵ When we move to heavier drinking, the situation changes. Yörük and Yörük (2012) applied a discontinuity methodology to the consumption of alcohol in twenty-one-year-olds and showed that when the sample subjects reached the legal age for buying alcoholic beverages, their consumption of alcohol increased 1.5 times, but it did not result in greater psychological well-being. The very fact, however, that the majority of citizens in democratic regimes vote freely in favor of selling alcoholic beverages, despite all potential damages that will be described below, may indicate (1) that people underestimate its social costs or (2) that this study underestimated the psychological benefits.

7.3.2 Damage from Abuse

Moderate alcohol consumption is fine, but when it becomes excessive, everything goes wrong. The harmful consequences of alcohol come not only from too much intake but also as a result of the mode of consumption (moderate daily consumption or binge drinking; Rehm et al., 2003, 2004). Alcohol abuse is responsible for 4.5 percent of illnesses and accidents and causes about 2.5 million deaths every year—about 4 percent of the world total. This is higher than diseases such as HIV/AIDS and tuberculosis, making it one of the first causes of death, especially for young people and men (WHO, 2011).

To these we can also add other types of more or less serious harm caused by three mechanisms: (1) long-term toxic effects on internal organs and tissues, (2) short-term intoxication, and (3) dependence (Rehm et al., 2003). The effects are even more harmful when alcohol is produced either at home—illegally—or, in any case, outside government controls, which according to some estimates account for almost 30 percent of the total (WHO, 2011, p. xi). In general, negative consequences can affect the consumer (self-regarding), third parties (other-regarding), both, and society as a whole. Among the negative effects for the drinker are the following items.

- *Physical health*: Decades of medical studies have shown a very strong positive correlation between alcohol abuse and the occurrence of diseases in the cardiocirculatory and gastrointestinal apparatus (e.g., cirrhosis and pancreatitis), diabetes, and tumors of various organs (larynx, esophagus, oral cavity, liver, colon, breast, etc.; see Baan et al., 2007). Since alcohol is a substance that has many calories and

interferes with metabolic functions by urging individuals to eat more, a diet that includes a high consumption of this type of beverage may lead to a greater risk of being overweight or even obese. De Castro (2000) also showed that the amount of food consumed increases with the number of diners and the presence of alcoholic beverages on the table, and it is proven that alcohol reduces the capacity of the organism to burn fat (Leibowitz, 2007; Stewart et al., 2006). French et al. (2010) found, however, rather limited effects of alcohol consumption on Americans' weight. The possible causes are a parallel reduction of food consumption to compensate for the increase in calories or increased sports activity by drinkers of alcohol (French and Zavala, 2007).

- *Mental health and work:* Excessive consumption of alcohol is associated with neuropsychiatric disorders, such as epilepsy (Samokhvalov et al., 2010) and dementia (Sabia et al., 2018), as well as poorer performances at school (Carrell, Hoekstra, and West, 2011; Balsa, Giuliano, and French, 2011) and work with repercussions on productivity, wages, and the probability of becoming and remaining unemployed. The belief that alcohol consumption and/or abuse decreases worker productivity is so ingrained that there are regulations in all countries that prohibit its consumption in the workplace, especially in those jobs where the consequences could be catastrophic (e.g., police officers, soldiers, airline pilots, etc.). On this point, however, the scientific literature has not provided clear evidence against alcohol. In a pioneering work, Fisher (1926) concluded that the daily consumption of three glasses of beer led to a 10 percent reduction in productivity while Pidd et al. (2006) found a strong positive relationship between alcohol consumption and absenteeism in the workplace. But a series of other studies produced contrasting results with negative, positive, parabolic, or null effects (see Berger and Leigh, 1988; Manning et al., 1991; French and Zarkin, 1995; Heien, 1996; Mullahy and Sindelar, 1996; Hamilton and Hamilton, 1997). Renna (2008) showed that negative effects disappear when switching from a one-stage to a two-stage ordinary least squares estimate, in which the total wage decreases because of the reduction in hours of work performed while hourly pay is the same. As pointed out by Kenkel and Ribar (1994), it is difficult to identify the relationship between alcohol consumption and productivity because of the possible presence of (1) errors in self-declarations about consumption, (2) reverse causality between consumption and income, and (3) omitted variables that influence simultaneously consumption and salary. As demonstrated by Dave and Saffer (2008), for example, risk tolerance significantly influences alcohol consumption. The preferences of individuals, however, can determine many other choices about behavior, making it difficult to isolate the effect of the specific variable on the physical and mental health of citizens.
- *Suicides:* The tendency to commit suicide can be influenced by the consumption of alcohol (Cook and Moore, 2000). Blood samples extracted from cadavers of

suicides often have high levels of alcohol (Hayward, Zubrick, and Silburn, 1992) while Skog and Elekes (1993) demonstrated the correlation between alcohol consumption and suicides using Hungarian data. In this case, however, the problem of the reverse causality is very important: while the consumption of alcohol can induce depression, it is also true that depressed people seek consolation or stupor in the abuse of this substance. From an empirical point of view this problem was overcome with a natural experiment carried out by Wasserman, Varnik, and Eklund (1994). The authors, in fact, studied the relationship between these two variables in the Soviet Union during the perestroika period (1985–1990), when the authorities imposed much more restrictive policies on alcohol consumption than in previous years. The study showed that a drastic reduction in suicides and violent deaths was associated with a decrease in alcohol consumption, with –68 percent and –85 percent respectively compared with 1984 levels.

- *Accidents*: Over the decades, ample evidence has been produced about the fact that the loss of clarity of mind and coordination in movements can favor accidents at home and at work as well as road accidents involving cars, motorcycles, and so on (Wechsler et al., 1969; Cook and Moore, 2000; Skog, 2001; Borges, Cherpitelb, and Mittleman, 2004; Quinlan et al., 2005; WHO, 2011; Rickard, Costanigro, and Garg, 2013).

The main damage caused to other people can be found below.

- *Damage to a fetus*: Fetal alcohol syndrome is the most serious of the fetal pathologies caused by the consumption of alcohol in pregnancy and is the result of an intake of eighty grams of alcohol a day. The negative consequences on the fetus can be physical, with facial dysmorphologies and growth and/or psychological and neurological deficits, with a series of disorders and deficiencies. With lower intakes—for example, ten grams per day—the risk of serious damage is reduced but remains; in this case it is called fetal alcohol effects (Waterson and Murray-Lyons, 1990).
- *Episodes of violence and crime*: Alcohol abuse causes loss of control over actions and undermines reasoning ability. It becomes more difficult to appreciate the consequences of one's own actions when highly intoxicated: parents can react violently to their children's provocations or whims, men can insist or even force women to have sexual intercourse or turn a heated discussion into a physical fight, fans at the stadium can look for a fight to avenge the defeat of their own team, the victims of robberies can stupidly rebel in front of a pointed gun, and so forth (Cook and Moore, 2000). A state of intoxication reduces the ability of individuals to negotiate peaceful solutions to disputes that arise inside or outside the family unit as well as exacerbating conflicts about financial or marital difficulties. Some people become particularly violent when they drink (Fagan, 1990). In a study using US data from 1979 to 1988, Cook and Moore (1993) demonstrated

the positive relationship between per capita alcohol consumption and the incidence of rape, armed robbery, and theft. While there is a correlation with murders, it is weak. French and MacLean (2006) came to similar conclusions after having appropriately checked possible endogeneity. Abbey (2002) reviewed studies on sexual assaults in US colleges that considered both the attacker's and the victim's state of intoxication and highlighted the methodological limitations of the literature. A positive relationship, sometimes minimal or moderate, between alcohol abuse on the one hand and the frequency and intensity of domestic violence on the other has been found in several studies (e.g., Leonard and Quigley, 1999; Brecklin, 2002; Testa, Quigley, and Leonard, 2003; Foran and O'Leary, 2008). This is, however, rather controversial because of the problem of omitted variables. While people who abuse alcohol are known to have greater marital conflict that often results in domestic violence, what remains to be demonstrated is whether it is a direct causal relationship and not a mere correlation caused by other variables. Zubretsky and Digirolamo (1996), for example, claimed that alcohol simply acts as an "excuse" for physical attacks and that they do not cease with a reduction in consumption. A treatment sample (those who frequently and badly beat up their partners) is not the same as a control sample because they often live in a context of social degradation and have themselves been victims of violence.

Some of the consequences of alcohol abuse can fall both on those who drink and on completely unrelated third parties. The following fall into this category.

- *Unwanted pregnancies and sexually transmitted diseases:* A state of intoxication means the risk of unwanted pregnancy or the transmission of infectious diseases connected to unprotected sex is often underestimated. Apart from the moral aspects, the problem of children born outside marriage to very young parents is linked to the affective and socioeconomic conditions that they will grow up in. A single mother may have to interrupt or postpone her studies or give up important job opportunities. Sexually transmitted diseases (e.g., HIV/AIDS, gonorrhea, syphilis, chlamydia, etc.) have dramatic consequences on people's health and cause significant costs for the national health system. The incidence of these diseases is highest among young people, homosexuals, drug addicts, and some ethnic groups (e.g., African Americans in the United States). An extensive literature has illustrated the correlation between alcohol consumption and unprotected sex (Donovan and McEwan, 1995) without, however, showing the direction of causation for the usual problem of omitted variables. The most recent studies have tried to isolate the direction of causation by taking into account the heterogeneity of people. In one study on data for US adolescents, Markowitz, Kaestner, and Grossman (2005) found alcohol consumption had no effect on the probability of having sexual relations but identified a negative impact on the probability of taking precautions.

- *Road accidents*: The literature on the effects of alcohol consumption on road accidents has unequivocally shown its ill-fated effect on the ability to control a vehicle (Levitt and Porter, 2001; Baughman et al., 2001; Carpenter and Dobkin, 2011). Levitt and Porter (2001) estimated that the probability of drivers with traces of alcohol in their blood causing fatal accidents is seven times higher than for those who are sober, with this risk rising to thirteen times higher for those who are drunk from a legal point of view. The risk of causing harm to third parties grows with the size of the vehicle involved: with a motorcycle it falls almost exclusively on the driver, but with sports utility vehicles and trucks it falls on third parties (Gayer, 2004).

7.3.3 Costs of Abuse for Society

This review clearly shows the econometric problems involved in measuring the benefits and costs of alcohol consumption that often risk skewing results, though the WHO (2011) seems to ignore them in its report. It is reasonable to think—and it is widely agreed—that moderate consumption of alcohol is acceptable (if not desirable) while abuse, as always, must be condemned for the negative consequences it brings on individuals and other people.⁶ The costs for society are, in fact, enormous. Figure 7.2 reports the WHO world estimates for the percentage share of disability-adjusted life years (DALYs) caused by alcohol according to the type of harm. This index puts the years of life lost and life lived with disabilities due to illnesses and accidents caused by alcohol together in a single indicator, thus measuring the total cost in terms of years of full health lost (Murray and Lopez, 1996; Murray et al., 2002). Clearly, alcohol abuse is responsible for a variable but significant percentage of a series of diseases, disorders, and actions.

Figure 7.3 shows the percentage of deaths attributable to alcohol abuse around the world in 2016. This share is minimal in Muslim countries where consumption is actually close to zero for cultural and religious reasons and highest in the former Soviet Union. Table 7.1 gives the World Health Organization's (WHO's) estimate of the years of life corrected for disability per one hundred thousand inhabitants for major harm to themselves. Alcohol abuse takes on the characteristics of a real social scourge in the Russian Federation, followed by South Africa, Brazil, and China.

Economic quantification or “data monetization” of the damages is not without methodological problems. Rehm et al. (2009) reviewed 247 summaries and forty-seven complete texts of articles and reports with considerable methodological differences that often make it impossible to compare results. The most relevant divergences concern the choice of the discount rate used to calculate the present value of future costs attributable to premature death (usually 6 percent, but it can vary between 3 percent and 10 percent), the inclusion or otherwise of the benefits from moderate consumption, and the types of costs considered. These can, in fact, include the costs

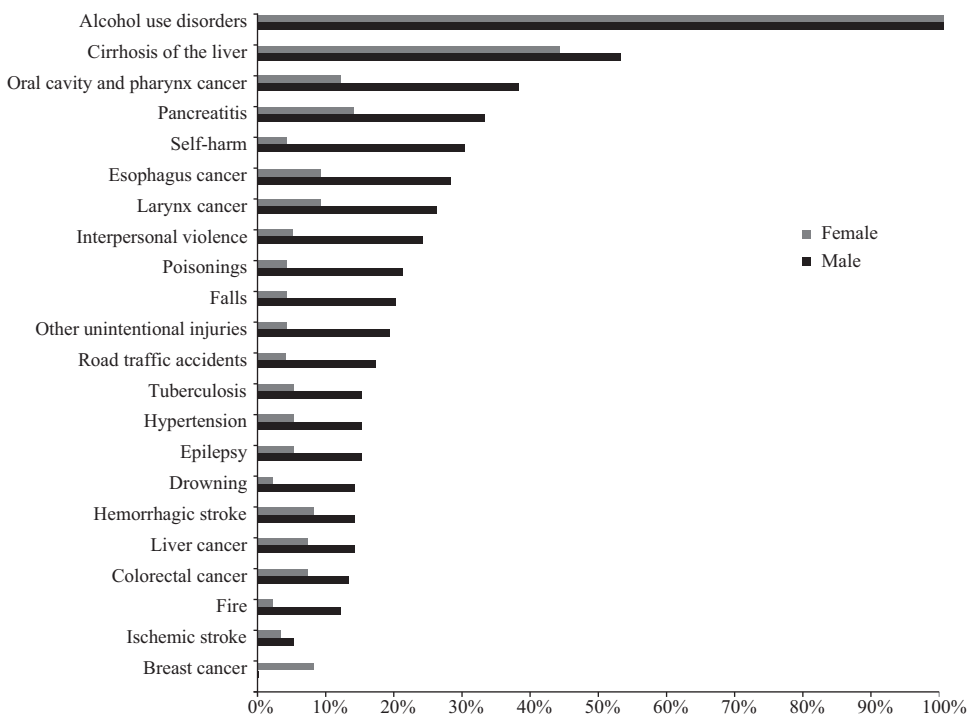


Figure 7.2

Percent share of disability-adjusted life years attributable to alcohol in the world, 2012.

Source: Author's calculations using data from WHO.

borne by the national health and judicial systems, administrative costs, social services, lack of income, decreased productivity, and psychological pain arising from the death of a spouse or their disability. In the same study the authors quantified total costs net of the benefits of moderate consumption in four high-income countries (France, the United States, Scotland, and Canada) and two medium-income countries (Korea and Thailand), which turned out to be between 1.3 percent and 3.3 percent of GDP per capita per year.

7.4 Policies to Combat Alcohol Abuse

The negative effects of alcohol abuse can be countered by a range of policies that vary according to country and to the historical period considered (see table 7.2). The results achieved depend not only on the efforts made but also on the combination of instruments adopted. The WHO (2011) underlined how governments pay little attention to the issues of public health and security policies despite the fact that millions of people die each year from causes related to alcohol abuse.⁷

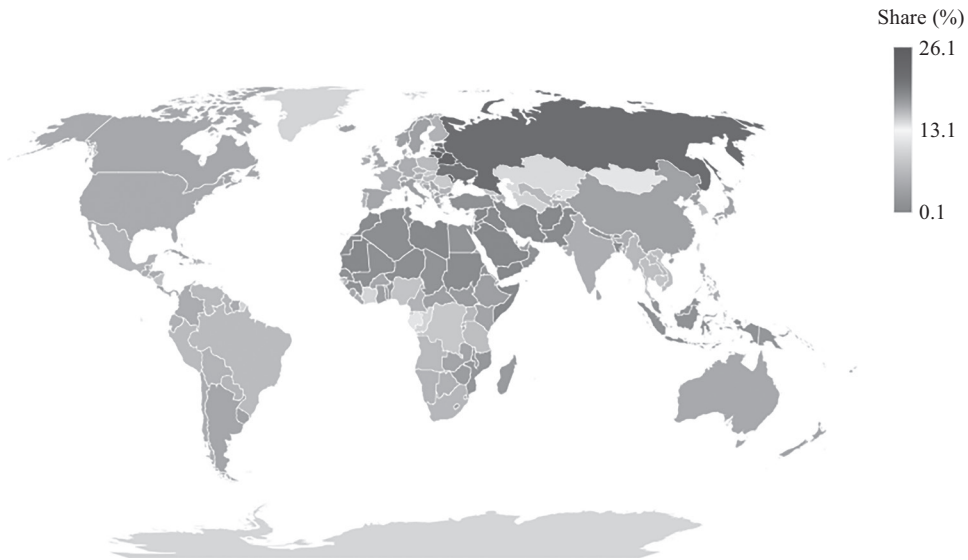


Figure 7.3

Percentage of deaths attributable to alcohol abuse around the world, 2016.

Source: Author's calculations using data from WHO.

Policies can be aimed at either reducing alcohol consumption or mitigating the harmful consequences of abuse. The first, in ascending order of restriction, are (1) prevention campaigns, (2) public and private transport policies, (3) taxes, (4) limits on the availability of alcohol, and (5) prohibition while the second are mainly aimed at discouraging drunk driving and providing cars with adequate active and passive safety features.

7.4.1 Prevention Campaigns

The first tools to discourage abuse are prevention campaigns put in place by governments (“social marketing”), restrictions on alcohol advertising, and medical advice. Campaigns aimed at increasing awareness of the harm caused by alcohol depend entirely on the sensitivity, commitment, and organizational ability of public authorities (see WHO, 2011, p. 52) while restrictions on advertising can reduce or prevent the overall media bombardment or limit it in some contexts (e.g., during time slots when there is a predominantly young audience). Suggestions from a doctor are a very precise tool that only targets people at risk without burdening the entire population as in the case of taxes. This measure can also be less expensive compared to other policies, such as shakedowns and the arrest of violators, that are aimed at discouraging drunk driving. The effectiveness of a doctor’s advice in reducing abuse has been demonstrated in a series of studies using econometric analyses that take into account

Table 7.1
Harm from alcohol abuse (years of life corrected for disability every 100,000 inhabitants), 2004.

Country	Intoxication	Breast cancer	Colorectal cancer	Liver cancer	Oral and pharyngeal cancer	Esophagus cancer	Cerebral vascular disease	Diabetes	Ischemia
Argentina	15	316	142	36	29	45	527	467	666
Australia	80	337	160	28	28	35	228	201	492
Austria	10	259	142	48	53	24	242	261	520
Belgium	37	388	153	27	56	38	350	182	596
Brazil	6	336	103	26	66	50	836	509	951
Chile	11	166	76	38	11	30	396	397	431
China	89	138	81	270	34	184	1,072	232	416
Denmark	86	393	209	27	43	49	358	226	551
Finland	216	245	101	34	18	20	394	190	730
France	23	346	165	65	85	55	242	184	279
Germany	21	311	161	33	48	37	289	213	593
Greece	89	272	99	57	20	11	522	256	727
Iceland	55	295	128	5	22	24	239	96	576
Ireland	10	357	173	27	26	58	280	146	701
Italy	10	277	139	67	33	17	287	276	426
Luxembourg	85	294	135	37	66	35	376	162	513
Holland	22	383	175	20	30	55	291	195	417
Norway	197	301	183	12	19	24	283	175	482
New Zealand	33	387	197	26	26	27	305	209	634
Portugal	19	271	182	38	63	39	681	324	507
Russian Federation	891	312	179	44	60	35	1,776	204	3,051
Spain	38	237	164	11	50	33	276	243	401
South Africa	30	285	92	48	74	168	1,284	839	990
Sweden	56	230	131	38	18	19	281	204	543
Switzerland	7	291	121	5	35	28	184	181	368
UK	47	351	152	67	28	65	348	168	674
USA	160	329	144	17	23	33	327	374	715

Source: Author's calculations using data from WHO.

Cirrhosis	Alcohol abuse disorders	Suffocation	Falls	Fires	Self- inflicted wounds	Other unintentional wounds	Low birth rates and pre-term births	Violence	Road accidents	Total
309	550	47	82	32	217	504	284	365	328	4,961
220	571	24	175	18	248	253	76	59	265	3,498
328	426	18	151	9	298	198	166	29	292	3,474
243	265	14	148	19	372	180	62	56	387	3,573
69	627	111	161	24	129	439	376	1,256	656	6,731
136	543	73	104	32	248	311	90	322	379	3,794
85	495	281	314	20	295	426	411	74	602	5,519
400	514	22	134	17	237	221	105	34	254	3,880
161	687	44	266	29	450	385	67	72	275	4,384
96	520	30	160	18	332	264	52	32	323	3,271
222	519	11	103	11	220	134	106	27	229	3,288
277	365	48	136	10	55	159	110	21	447	3,681
303	291	17	134	21	273	196	53	32	230	2,990
44	470	31	120	16	307	134	93	30	226	3,249
94	80	19	130	8	113	157	74	27	345	2,579
104	485	18	183	14	267	258	116	46	384	3,578
33	499	15	90	6	180	109	67	37	163	2,787
72	969	40	157	25	256	261	28	31	227	3,742
579	284	43	170	17	309	268	140	56	368	4,078
67	413	37	154	16	155	217	88	45	487	3,803
132	1,277	251	473	212	789	1,699	149	845	933	13,312
530	106	28	109	10	137	173	66	41	314	2,967
114	287	77	104	248	359	609	468	2,031	1,138	9,245
91	766	23	107	16	255	146	53	42	206	3,225
171	399	15	139	9	281	173	77	36	205	2,725
185	663	9	97	14	169	131	150	61	203	3,582
70	600	32	114	28	242	202	144	221	449	4,224

Table 7.2
Main policies to reduce alcohol abuse in the world, 2012.

Country	Restricted advertising on TV	Restricted sponsorship on TV	Minimum age	Blood alcohol content (%)	Random breath testing	Educational guides	Restricted sales (days)
Argentina	partial	no	18	5	yes	no	no
Australia	prohibition	no	18	5	yes	yes	no
Austria	no	partial	16	5	yes	yes	no
Belgium	no	no	0	5	yes	yes	no
Brazil	partial	.	18	2	yes	no	yes
Chile	no	no	18	5	no	no	.
China	partial	no	0	2	yes	yes	no
Denmark	partial	prohibition	16	5	.	yes	no
Finland	partial	partial	18	5	yes	yes	yes
France	prohibition	prohibition	16	5	yes	no	yes
Germany	partial	prohibition	16	5	no	yes	no
Greece	.	.	.	5	yes	.	.
Iceland	prohibition	prohibition	20	5	yes	no	yes
Ireland	partial	partial	18	8	yes	no	yes
Italy	partial	voluntary	0	5	yes	yes	no
Luxembourg	.	.	.	.	yes	.	.
Holland	voluntary	no	16	5	yes	yes	yes
New Zealand	no	no	18	8	yes	yes	yes
Norway	prohibition	no	18	2	yes	yes	yes
Portugal	partial	partial	16	5	yes	yes	no
Russian Federation	partial	partial	18	3	yes	no	yes
South Africa	no	no	18	5	yes	yes	no
Spain	partial	no	16	5	yes	yes	no
Sweden	prohibition	prohibition	20	2	yes	no	yes
Switzerland	prohibition	prohibition	16	5	yes	yes	no
UK	partial	prohibition	18	8	yes	no	no
USA	voluntary	no	21	8	yes	.	no

Source: Author's elaborations using data from WHO.

Restricted sales (hours)	Restricted sales (shops)	Restricted sponsorship of sport	Restricted sales promotion	Mono-poly	License	Excise tax (hl)	VAT %	Restricted consumption in public	Warnings on labels
yes	.	voluntary	voluntary	.	.	.	.	prohibition	Yes
no	no	no	partial	no	yes	.	10.0	partial	no
no	no	no	no	no	no	0.0	20.0	no	no
no	no	no	no	no	yes	47.1	21.0	voluntary	Yes
no	yes	no	no	no	yes	.	25.0	partial	Yes
.	.	no	no	no	.	.	19.0	no	no
no	no	no	no	no	Yes	.	17.0	no	no
no	no	no	no	no	yes	82.3	25.0	no	no
yes	yes	partial	prohibition	yes	yes	257.0	22.0	partial	no
yes	yes	prohibition	no	no	yes	3.5	19.6	no	yes
no	no	no	no	no	no	0.0	19.0	no	no
.	.	.	.	.	no	0.0	.	.	.
yes	yes	partial	no	yes	yes	.	24.5	voluntary	no
yes	yes	voluntary	no	no	yes	328.1	21.0	voluntary	no
no	no	partial	partial	no	yes	0.0	20.0	voluntary	no
.	.	.	.	.	.	0.0	.	.	.
yes	yes	voluntary	voluntary	no	yes	68.5	19.0	no	no
no	yes	voluntary	no	no	yes	.	12.5	voluntary	no
yes	yes	prohibition	prohibition	yes	yes	517.7	25.0	partial	yes
no	yes	partial	no	no	yes	0.0	21.0	no	yes
yes	yes	partial	partial	no	yes	.	18.0	prohibition	no
yes	yes	no	no	no	yes	.	14.0	no	no
no	yes	no	no	no	no	0.0	16.0	partial	no
yes	yes	prohibition	prohibition	yes	yes	222.0	25.0	voluntary	no
no	no	partial	partial	no	no	0.0	7.6	partial	yes
yes	.	voluntary	partial	no	yes	265.0	17.5	no	no
yes	.	.	.	no	no	.	8.0	.	yes

the endogeneity linked to the higher levels of consumption by people receiving treatment or, to avoid this problem, with randomization assigned to samples of individuals at risk (see Fleming et al., 1997; Kenkel and Terza, 2011). The literature about restrictions on advertising has produced discordant results with a series of studies that did not find significant effects on the demand and consumption of alcoholic beverages (Smart, 1988; Fisher, 1993; Calfee and Schergata, 1994; Bang, 1998; Nelson, 1999, 2010) and others, on the contrary, that found negative effects (Saffer, 1991; Tremblay and Okuyama, 2001). As emphasized in this last study, however, the fact that advertising does not influence the demand for alcohol does not mean that it does not have any impact on consumption. Even if advertising does not encourage people to increase consumption, the removal of restrictions can generate price competition that leads them to consume greater quantities but with an unchanged demand curve.

7.4.2 Public and Private Transport Policies

Taxes acting on the price of other goods or services needed to consume alcohol are excise taxes on fuel, the cost of public transport, and taxi fares. Chi et al. (2011) demonstrated using Mississippi data that when gasoline prices rise, accidents due to drunkenness decrease. These measures can, to some extent, affect the number of outings with friends and therefore the consumption of alcoholic beverages (income effect), but above all they influence the choice of the mode of transport (substitution effect) by encouraging people to use the cheapest means available, whether public or private. The income effect measures the impact of increased purchasing power on consumption while the substitution effect shows the impact of changing relative income and prices on consumption. However, there is wide consensus that creating an extensive and efficient network of buses and subways and subsidizing or minimizing the cost of taxis can help reduce drunk driving. The decision to drive under the effect of alcohol has two implications: it is dangerous to drink excessively and criminal to drive while intoxicated (Jackson and Owens, 2011). “A person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities” (Becker, 1968). In this comparison of expected utilities, scholars have focused mainly on policies that increase the costs of illegal behavior (e.g., taxes on alcoholic beverages, laws that make it difficult to buy them, and penalties for those who are positive on the breathalyzer). As pointed out by Jackson and Owens (2011), however, there is no empirical literature demonstrating the positive impact of public transport development on road deaths caused by drunk driving for two reasons. First, these policies are accused of combating road accidents but not alcohol abuse, which would still not be discouraged. Second, the infrastructure is “given”; it changes very little over time and therefore from an econometric point of view generates identification problems. The authors tried to fill this gap by using data on the Washington, DC, city metro network, whose opening hours at weekends

was progressively extended between 1999 and 2003 from midnight to three in the morning. The results demonstrated that offering a safer alternative reduces the percentage of people driving while intoxicated, with the effects tending to vanish as the distance increases from areas served by a metro station.⁸ The effect of ridesharing on public health is debated. A number of studies have found that ridesharing services, such as Uber and Lyft, reduce intoxicated driving and fatal accidents (Uber and MADD, 2015; Greenwood and Wattal, 2016; Dills and Mulholland, 2017), even though Brazil and Kirk (2016), using US data from 2005 to 2014, find no association between the timing of the deployment of Uber in US metropolitan counties and the number of subsequent traffic fatalities. The effect of ridesharing on road accidents, therefore, depends on the study analyzed. Furthermore, Burgdorf, Lennon, and Teltser (2019) find that the spread of UberX across the United States has increased alcohol consumption and abuse, as well as employment and total earnings at drinking establishments. The results of these studies suggest that the economic and social effects of ridesharing are complex and deserve further investigation.

7.4.3 Taxes

Taxes generate an income effect that influences the total consumption of alcohol and a substitution effect that affects the choices related to the types of drinks bought (e.g., wine, beer, and spirits). In their extensive review of seventy-two studies, Elder et al. (2010) found a systematic negative relation between tax or price of alcohol and indexes of excessive drinking or alcohol-related health and criminal outcomes. Durrance et al. (2011) showed that taxes on alcohol are negatively correlated with the murders of women while Cook and Durrance (2013) demonstrated in a larger survey with US data that the sudden and substantial increase in federal excise taxes on all alcoholic beverages approved by the Bush administration in 1991 led to a reduction in total alcohol consumption and, as a consequence, a reduction of fatal road accidents and nine types of offenses. In 2004 Finland reduced alcohol duties by one third on average; this was followed by a 10 percent increase in alcohol consumption and a 46 percent rise in liver disease deaths (Mäkelä and Osterberg, 2009).⁹

Taxes on alcoholic beverages consist of excise taxes and value added tax (VAT). From a formal point of view excise taxes are “indirect” as they fall on the producer who then passes them on to the buyer while VAT is “direct” because it weighs directly on consumption. But, from a practical point of view, excise duties are applied to quantities whereas VAT as a percentage of the price.¹⁰ Two similar products (e.g., two bottles of wine) of equal alcohol content but different prices will, therefore, have the same excise duties but different VAT.

The policy of taxing alcoholic beverages implies two important choices. The first concerns the distribution of the burden between taxes on quantities (excise taxes) and taxes on value (VAT). Based on the assumption that the best products are more

expensive, economic theory (see Barzel, 1976) argued that quantity taxes encourage an increase in the quality of products because their relative weight decreases for higher range goods. Ad valorem taxes, on the contrary, do not change the relative prices between products of different quality levels. Ljunge (2011) confirmed these hypotheses in an empirical study of US data showing that the market share of quality wines is a direct function of excise tax on alcohol while ad valorem taxes are irrelevant. In light of these results, if the objective of economic policy is to raise the quality of products to increase competitiveness on international markets, then the shift of the tax burden from VAT to excise duty can be one feasible strategy.

The second choice concerns the possible differentiation of the level of taxation to hit more heavily those drinks that are associated with the greater number of accidents and offenses or are produced in greater quantities abroad. Rickard, Costanigro, and Garg (2013) found, for example, that with the same amount of alcohol consumed, a greater share of wine as part of the total amount is associated with a reduction in road deaths while the opposite happens with beer and spirits. This is perhaps due to the different profile of wine consumers compared with those who drink beer and spirits. A series of studies has shown that wine drinkers have a higher socioeconomic level and adopt healthier lifestyles (Baltieri et al., 2009),¹¹ whereas beer and spirits are the typical drinks of the working class, students (Siegel et al., 2011), and people who try to dull their senses quickly or cheaply. In the United States wine is almost considered a status symbol and is consumed in important places or on special occasions (dinners with friends and relatives, restaurants, wine bars, etc.). If the consumption of alcohol is to be reduced, it seems appropriate to start by hitting the products consumed by the categories most at risk and avoid going against the drinks bought by the more educated and sophisticated part of society that usually considers moderation as its behavior model.

In addition, Saffer (1989) found using US data that the greatest reduction in alcohol consumption occurs with an increase in taxes on spirits, followed by taxes on beer, and finally on wine. The author concluded that one tax on all alcoholic beverages is inefficient whereas higher taxes should be levied on beer and spirits and lower taxes should be levied on wine to reduce the total consumption of alcohol. In Europe, however, the application of a differentiated taxation aimed at favoring the consumption of wine to the detriment of beer is not allowed by EU laws.

Table 7.3 shows excise duties and VAT in Europe: there are very marked differences in the absolute tax burden, with much higher levels in the countries of northern Europe (Cook and Moore, 2000). The Sixth Council Directive 77/388/EEC of 17 May 1977 on the harmonization of the laws relating to turnover taxes (sixth VAT directive) forced member states to impose a single rate of at least 15 percent on goods and services (in Italy it stands at 22 percent). Reduced rates (in Italy, of 10 percent and 4 percent) may be applied to some necessary goods or goods that are of interest to disadvantaged groups, including drinks but not alcoholic ones. It is therefore not

Table 7.3

Excise tax (€/hectoliter) and VAT (%) on alcoholic beverages in Europe, 2013.

Country	Beer			Wine		Other alcoholic beverages	
	Excise tax (degrees Plato)	Excise tax (alcohol)	VAT	Excise tax (alcohol)	VAT	Excise tax (alcohol)	VAT
Belgium	1.84		21	56.97	21	56.97	21
Bulgaria	0.76		20		20		20
Czech Republic	1.24		21		21		21
Denmark		7.51	25	147–197	25	147.68	25
Germany	0.78		19		19		19
Estonia		6.28	20	84.67	20	84.67	20
Greece	2.60		23		23		23
Spain	0.91		21		21		21
France		7.33	20	3.72	20	3.72	20
Croatia		5.25	25		25		25
Ireland		22.55	23	424–616	23	309–424	23
Italy	2.70		22		22		22
Cyprus		6.00	19		19		19
Lithuania		3.10	21	64.03	21	64.03	21
Latvia		2.71	21	65.16	21	65.16	21
Luxembourg	0.79		15		15		15
Hungary		5.47	27		27	33.34	27
Malta	1.73		18		18		18
Holland	7.59–47.48		21	88.36	21	88.36	21
Austria	2.00		20	0.00	20	0.00	20
Poland	1.84		23	37.35	23	23–37	23
Portugal	9.43–26.45		23		13		23
Romania	0.87		24		24	10.65	24
Slovenia		12.10	22		22		22
Slovakia		3.58	20		20		20
Finland		32.05	24	339.00	24	339.00	24
Sweden		20.62	25	267.47	25	267.00	25
UK		23.95	20	334.11	20	334.11	20

Source: Author's calculations using data from WHO.

possible to apply reduced or different rates for wine, beer, and spirits. For years Portugal has violated EC provisions by imposing lower VAT on wine (13 percent) than on beer and spirits (both at 23 percent), thus favoring this locally produced beverage that is consumed most by the strata of society at a lower risk of road accidents.¹²

Member states, however, have some autonomy in determining excise taxes. In fact, unlike beer, the European Union has not established mandatory minimum excise duties for wine (which are zero in Italy), and governments can set different amounts for different types of beverages, as shown in table 7.3. Community legislation does insist, however, that the treatment is not discriminatory toward imported drinks either directly (similar drinks produced by competing countries, such as two wines produced by Italy and France) or indirectly (competing drinks produced predominantly by other countries—e.g., Swedish beer and Italian wine). Therefore, excise duties on beer and spirits cannot be increased to generate a substitution effect in favor of wine (Georgopoulos, 2009). This is the price to pay for compromises in the community between northern European countries' breweries and Mediterranean countries' wine producers and yet another instrument of economic policy which national governments have surrendered into the hands of the European Union.

Leaving to one side any favoritism toward one or other type of product, a desirable solution would, in any case, be to convince EU legislators to include all alcoholic beverages in a reduced VAT scheme (e.g., 10 percent) and to increase excise taxes to stimulate the purchase of products of superior quality that cause less damage to the human body, leaving unchanged the tax burden and therefore total consumption.

7.4.4 Limits on the Availability of Alcohol

Another measure authorities can adopt to reduce alcohol consumption is to limit availability. The restrictions may concern the following issues.

- *The minimum legal drinking age (MLDA)*: Although a minimum age has not been set in about twenty of the 147 countries registered by the WHO (2011), in the other countries it varies between fifteen-years-old and twenty-five-years-old, but is usually eighteen. Clearly a minimum age reduces alcohol consumption and abuse in the excluded age group, but the long-term effect is less obvious. A series of recent US studies have addressed this question by trying to measure the impact of lowering the minimum age from twenty-one to eighteen on alcohol consumption and abuse in adulthood. Cook and Moore (2001) showed that if people had resided in a state with MLDA of eighteen when they were fourteen, they had a 7 percent higher chance of alcohol abuse (binge drinking) four times a month at the age of about twenty-four. Norberg, Beirut, and Grucza (2009) analyzed alcohol use disorders and found a 32 percent lower incidence among twenty-one- to fifty-three-year-olds residing in states with a twenty-one-year-old MLDA compared with those

residing in states with a lower MLDA. Lastly, Kaestner and Yarnoff (2011) showed that men who grew up in states where drinking is allowed at the age of eighteen through twenty recorded higher levels of alcohol consumption and road deaths by 20–33 percent and 10 percent respectively while the effect on women was null.

- *Opening hours and days of shops and bars:* They vary from country to country for on-premise and off-premise consumption. In England pubs had to close by law at 11 p.m. until 2005 while in Italy the sale of alcohol in nightclubs was allowed only until 2 a.m. for a short period in 2007. (For an international comparison, see WHO, 2011.)
- *Places for purchase or consumption:* In the United States each state decides if or which drinks can be sold in food stores (see Rickard, Costanigro, and Garg, 2013) while in Sweden drinks with an alcohol content of more than 3.5 degrees can only be purchased in public monopoly shops (Systembolaget). The sale of alcoholic beverages may also be prohibited for reasons of public safety in some places, such as stadiums or service stations on motorways.

7.4.5 Prohibition

The most restrictive policy of all is, of course, a total prohibition on the production, sale, and consumption of any alcoholic beverage. Currently absolute prohibition is imposed in several countries, all of which are either Muslim and/or monarchical or dictatorial regimes, such as Afghanistan, Saudi Arabia, Bangladesh, Brunei, some states of India, Iran, Kuwait, Libya, Mauritania, Pakistan, United Arab Emirates, Sudan, and Yemen. In the past, however, many other countries, including some Western countries, have adopted the same policy, such as Australia (Capital Territory, 1910–1928), Canada (1901–1924), Faroe Islands (1907–1992), Iceland (1915–1935), Norway (1916–1927), the Russian Empire/Soviet Union (1914–1923), Finland (1919–1932), and Hungary (March–August 1919). The United States imposed prohibition from 1920 to 1933, but the growing financial commitment to counter alcohol smuggling that was in any case only partially successful led both public opinion and the US Congress to change their minds. During this period of time the amount of illegal activity connected with alcohol production and commercialization grew dramatically (see Okrent, 2010, pp. 267–288). However, nowadays in the United States there are still many “dry” counties where the production, distribution, and sale of alcoholic beverages is forbidden (see chapter 8).¹³

There are various channels through which prohibition can influence alcohol prices (Miron and Zwiebel, 1991): (1) a fall in supply and increased production costs related to illegality and the risk of arrest; (2) a fall in demand because of the cost of finding the goods, the risk of being discovered, or finding poor quality products; (3) a fall in demand due to the growing sense of morality that condemns the consumption of alcohol; and (4) a fall in demand “in compliance with the law.” Miron

and Zwiebel's results showed that in the early years of American prohibition consumption contracted consistently but then rose to about 60–70 percent of the initial values to stay there even in the years following repeal. The authors concluded that the decrease in consumption was modest when compared with the increase in prices that more than tripled in just a little over a decade. The only channel that effectively reduced consumption was rising prices while fear of having problems with the law, a sense of duty, and social pressure played a negligible role.

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