

Analysis of Substance Use and its Relation to the Tax Policy of the Czech Republic

KOLÁŘOVÁ, E., HOMOLA, D., KOLÁŘOVÁ, V., KRAMNÁ, E.

Tomas Bata University, Faculty of Management and Economics, Zlín, Czech Republic

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BACKGROUND: Addictive substances have been part of our lives since historical times. For the Czech Republic, this is especially true of the consumption of cigarettes and alcohol. It has long since been proven that these substances are harmful for the human organism and addiction to such substances has far-reaching impacts on the social and economic life of people. On the other hand, revenues to state budgets arising from the taxation of these substances are significant in every country around the world, and to find a balance between the prevention of their use and the revenues of the state is a problem faced by every government. **AIM:** The aim of this paper is to focus on the consumption of alcohol and cigarettes in the Czech Republic and ascertain its impacts on the revenues of the Czech Republic. **METHODS:** The sources of data for this research were publicly available from individual ministries of the Czech Republic and

from the Czech Statistical Office. Statistical methods were used for the data analysis and interpretation of the findings, including quantitative research, in which basic types of dependency were demonstrated and basic hypotheses were tested. **RESULTS:** The results have shown that there is a dependency between the number of smokers and excise tax on cigarettes and that there is a dependency between tax revenues from beer and the average wage in the Czech Republic. **CONCLUSIONS:** This shows that the amount of excise tax does not affect substance use in the Czech Republic and these prevention policies are not effective in the Czech setting. On the other hand, a single significant increase in the excise tax rate would perhaps help in the area of prevention but it would not benefit the state treasury of the Czech Republic, as the impact of a higher tax rate on state revenues would be cancelled out by a drop in consumption.

Keywords | Tax Policy – Czech Republic – Alcohol – Smoking – Excise Tax

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Corresponding author | Eva Kolářová, PhD, Tomas Bata University, Faculty of Management and Economics, Mostní 5139, 760 01 Zlín, Czech Republic

ekolarova@utb.cz

● 1 INTRODUCTION

The excessive consumption of alcohol and smoking are among the most serious social and economic problems of contemporary society. The level of health of the population is important for the social and economic development of the country; a poor health level can disturb the stability of the entire national community.

Current data from the annual drug report in the Czech Republic show that the consumption of alcohol and tobacco in its population is still high. According to the research result, 2,400,000 people smoke cigarettes daily, the number of electronic cigarette users continues to grow, approximately 690,000 people drink alcohol daily or almost daily, and only 3.8% of adults are lifelong teetotallers (Drogy-info.cz, 2016). The 2018 Global Status Report on Alcohol and Health published by the WHO summarises that the absolute per capita consumption of alcohol recorded in the Czech Republic has risen to 14.4 litres per year and more than one fifth of the Czech population smokes. As far as the type of alcoholic beverages consumed is concerned, the most consumed alcoholic beverages were beer, which covers 54%, spirits (25%), and wine (21%). The WHO recommends working with the setting of the price, advertising, and availability of these commodities (WHO, 2018).

Alcohol and nicotine belong among the most widespread legal addictive substances in the world. According to the data of the Czech Statistical Office, it is evident that the trend of alcohol consumption and smoking in the Czech Republic is not favourable. Although the consumption of alcohol and smoking decreased in 2015, the level of consumption began to grow again in the following year (CZSO, 2018).

The Law on the Protection of Health from the Harmful Effects of Addictive Substances came into force in 2017. It could help reduce smoking and alcoholism in the Czech Republic (Zákony pro lidi, 2018). At the multinational level, the World Health Organisation (WHO) is the main engine in the fight against smoking and the consumption of alcohol. One of the important documents in this field is the International Framework Convention on Tobacco Control (FCTC), which was ratified by the Czech Republic in 2012. Its aim is to reduce the negative impacts of tobacco consumption on public health and the economy. One of the measures to reduce tobacco consumption is to implement optimal tobacco taxation and at the same time the government should ensure that there is no illegal trade in tobacco (WHO, 2018).

Europe is the region with the highest alcohol consumption. Because of a combination of a high degree of potential harmfulness and a high rate of widespread use, the application of a pragmatic harm reduction and risk reduction approach to alcohol is necessary. From the economic point of view, the cost of treatment, prevention, research, law enforcement, and lost productivity resulting from alcohol consumption in countries with higher and middle incomes is about 1–3% of their gross domestic product (Rehm et al., 2009); in the original EU15, it was 1.3% of GDP in 2003

(Anderson & Baumberg, 2006). These estimates do not include the associated material costs of individuals and their families. The cost of implementing risk minimisation interventions is simply worth it in the light of the above. Interventions to reduce alcohol-related harm at the structural level most often take the form of legislative measures through laws, decrees, and other regulations. According to Babor et al. (2003), who, on basis of more than 500 alcohol policy studies, assessed the cost-effectiveness of individual strategies, it can be recommended to pay particular attention to taxation, limiting accessibility in the form of age limits for alcohol sales and alcohol testing behind the wheel. Anderson et al. (2009) came to a similar conclusion in their survey study: from the point of view of cost-effectiveness, cost-cutting and accessibility strategies are most advantageous; prohibition of advertising and measures against driving under the influence of alcohol can also be effective under certain circumstances. In September 2011, the European Regional Committee endorsed the “European Action Plan on the Reduction of Harmful Use of Alcohol 2012–2020”. On basis of previous European action plans in the area of alcohol, the main objectives and action points of the new Action Plan are aligned with the World Health Organisation Global Alcohol Strategy (WHO, 2011).

Fifty-four years have passed since the ground-breaking report on the harmful effects of smoking cigarettes. Governments are striving to find a balance between trying to reduce tobacco consumption, increasing budget revenues, and regulating tobacco consumption through tax measures. An excise tax on cigarettes is imposed by the vast majority of countries in the world. Cigarette smoking is generally considered harmful and states are interested in reducing it. At the same time, governments are gaining substantial revenues to the state budget from the taxation of cigarettes. The tax component accounts for a significant portion of the retail price of cigarettes, but the amount of excise duty would not have an impact in terms of an increased illicit tobacco trade. Such settings are also being pursued by organisations fighting against smoking.

Six cost-effective measures should be prioritised in comprehensive tobacco control programmes, comprising taxes, smoke-free laws, public information, advertising bans, direct health warnings, and access to treatment. Increasing taxation on tobacco products is the most effective measure; however, the evidence suggests that the best result is achieved when a comprehensive tobacco control policy is implemented (Feliu et al., 2018)

Recommendations aimed at reducing tobacco consumption have been summarised in the MPOWER document, which represents the six main priorities of the effective strategies of the World Health Organisation (Sovinová, & Czemy, 2013):

- 1| Monitor tobacco use and prevention policies
- 2| Protect people from tobacco smoke
- 3| Offer help in quitting smoking
- 4| Warn about the dangers of using tobacco

- 5| Promote a ban on tobacco advertising and its promotion and sponsorship
- 6| Increase tobacco taxes

Some of these recommendations are already being implemented in the Czech Republic, particularly within the framework of the implementation of the 2015–2018 Tobacco Control Action Plan and the Harm Reduction Action Plan for 2015–2018. Both of these Action Plans are based on the first strategic objective – Improving public health and reducing health inequalities (Health 2020) – of the National Strategy for Health Protection and Promotion and Disease Prevention.

Tobacco companies have publicly denied for decades that nicotine was addictive. In 2000, Philip Morris became the first tobacco company to publicly state that nicotine is addictive. The tobacco industry avidly promotes new nicotine products, emphasising that nicotine addiction is the key driver of smoking. To improve addiction outcomes, public health authorities should continue expanding and strengthening social and environmental restrictions on cigarette smoking (Jesse Elias et al., 2018).

Since June 2017, there has been a ban on smoking inside restaurants, theatres, and cinemas in the Czech Republic. The norm also introduced a ban on smoking in uncovered parts of public transport stops and the use of electronic cigarettes in hospitals, schools, or shopping centres. It also prohibits the sale of cigarettes in vending machines from which it is possible for children under the age of 18 to buy cigarettes without obstacles (MZCR, 2017).

Taxes are commonly found in every person's life. They can influence us either directly or indirectly in the prices of goods or services. Excise taxes are among the indirect taxes, and the most important of this group of taxes are taxes on mineral oils, since they account for the largest part of the revenues of the state budget. The second most profitable tax in the Czech Republic is that on tobacco products. The excise tax on cigarettes is based on a fixed tax rate part and also on a tax rate calculated as a percentage. The resulting tax is calculated by adding them together. For each pack of cigarettes, at least a minimum excise tax is payable. The rates of excise taxes on tobacco products are very often amended; the data set out in Section 104 of the Excise Tax Act is always in effect. The alcohol tax, more specifically the tax on alcohol and spirits, is the third most profitable excise tax in the Czech Republic. There is a distinction between the alcohol tax on fruit spirits and the tax on alcohol and spirits contained in other products. Spirits distilled from home-grown fruit in small-scale distilleries are taxed at a half rate. The amount of excise tax depends on the alcohol content of the products. The tax revenue from the excise tax on beer does not change much in individual years. The tax rates favour smaller breweries. The tax rate is based on the quantity of beer produced by the brewery, expressed in hectolitres. For all wine other than sparkling wine and semi-sparkling wine, the excise tax rate is zero (Marková, 2018).

● 2 DATA AND METHODOLOGY

The paper focuses on the two main addictive substances which are legally consumed in the Czech Republic. The aim of the research was to analyse the development of the consumption of these substances in relation to tax revenues. The research was carried out in 2018 and primary data was obtained for the years 2007 to 2017. Data relating to tax revenues was obtained from the State Closing Account of the Czech Republic and the respective tax rates were obtained from the tax laws of the relevant years. Data on average wages, average alcohol consumption, and the number of smokers was obtained from the Czech Statistical Office and the Customs Office of the Czech Republic. The SPSS statistical program, which is suitable for the area of finances, was used to test dependencies in order to analyse the impact of the tax rate on cigarette consumption and the number of smokers. The Shapiro-Wilk test was used to determine if the data was normally distributed and the Pearson's correlation coefficient was used to determine the dependencies. We tested the relationship between the number of smokers and the cigarette tax rate and the average wage and the relationship between cigarette consumption per capita and the excise tax on cigarettes. Time series were also subsequently tested in detail.

It can be clearly seen that the most consumed alcoholic beverage in the Czech Republic is definitely beer and that is why we focus on it in our research. The dependency of beer consumption on average wages was tested in order to prove the dependency between average wages and tax revenues from beer consumption.

On the basis of the data obtained, the following hypotheses were stated:

Hypothesis H_1 – An increase in the cigarette tax reduces the number of smokers

Hypothesis H_2 – An increase in average wages results in an increase in tax revenues from the excise tax from alcohol.

2.1 Data for tobacco testing

According to research conducted in the population aged 15–64 in the Czech Republic, we refer to smokers as those who smoke regularly, those who smoke one cigarette a day, and those who smoke, but only irregularly. Primary data was obtained from the Czech Statistical Office, the Customs Office of the Czech Republic, and the respective tax laws. The percentage of taxation for a pack of cigarettes differs on basis of many criteria, so only the minimum rate is stated in *Table 1*.

In 2018, 28.5% of the adult population of the Czech Republic were smokers. Compared with 2017 (25.2%), we recorded an increase of 3.3 percentage points. From the current smokers, more than two thirds (21.1%) are daily smokers. 24.5% of men and 17.9% of women in the Czech Republic

Year	2007	2008	2009	2010	2011
Smokers %	38.2	28.2	29.2	29.3	29.1
Minimum rate of tax per piece in CZK	1.64	1.92	2.01	2.01	2.01
Minimum excise tax on tobacco in CZK	32.80	38.40	40.20	40.20	40.20
Average wage in CZK	20,957	22,592	23,344	23,864	24,455
Tax Revenues from Tobacco in Billion CZK	47.00	37.51	37.70	42.47	44.96
Year	2012	2013	2014	2015	2016
Smokers %	31.3	29.9	31.4	24.1	28.6
Minimum rate of tax per piece in CZK	2.01	2.18	2.25	2.37	2.52
Minimum excise tax in CZK	40.20	43.60	45.00	47.40	50.40
Average wage in CZK	25,101	25,128	25,686	26,467	27,589
Tax Revenues from Tobacco in Billion CZK	47.00	46.82	44.70	50.86	54.40

Table 1 | Development of researched data in the Czech Republic in 2007–2016. Source: Czech Statistical Office, Customs Office, Excise Tax Act

Consumption (litres)/ Tax Revenues in CZK	2007	2008	2009	2010	2011
Total consumption	185.8	183.2	177.6	170.9	168.8
Total revenue in billion CZK	11.11	10.98	10.73	11.14	11.57
Consumption of 40% spirits	8.2	8.1	8.2	7.0	6.9
Pure alcohol and spirits in million CZK	7.122	7.082	6.965	6.528	6.767
Wine consumption	18.5	18.5	18.7	19.4	19.4
Tax on wine in million CZK	336	336	326	320	313
Beer consumption	159.1	156.6	150.7	144.4	142.5
Tax on beer in million CZK	3.657	3.564	3.439	4.297	4.488
Consumption (litres)/Tax Revenues (CZK)	2012	2013	2014	2015	2016
Total consumption	175.2	172.3	173.3	172.4	173.5
Total revenue in billion CZK	10.55	11.18	11.7	12.4	12.2
Consumption of 40% spirits	6.7	6.5	6.7	6.9	7.0
Pure alcohol and spirits in million CZK	6.510	6.382	6.754	7.132	7.206
Wine consumption	19.8	18.8	19.5	18.9	19.6
Tax on wine in million CZK	321	284	295	321	358
Beer consumption	148.6	147.0	147.0	146.6	146.9
Tax on beer in million CZK	4.656	4.516	4.593	4.709	4.605

Table 2 | Consumption of alcoholic beverages per capita in the Czech Republic and tax revenues from alcoholic beverages. Source: Czech Statistical Office, Customs Office, State Closing Account of the Czech Republic

smoke daily. From the long-term point of view, it can be stated that despite the isolated annual variations, a decrease in the prevalence of smoking can be observed in the years that were monitored, starting from 2012, to 2018.

2.2 Data for Alcohol testing

According to the World Health Organisation, Europe is the region with the highest alcohol consumption. Risky use patterns make alcohol one of the most harmful psychoactive substances. (Table 2.)

Regular and frequent drinking, i.e. drinking daily or every other day, was reported by 16.7% of respondents in 2018, which is three percentage points more than in 2016. For

men, the incidence of frequent drinking (in 2018) was 25.6%, for women 8.1%. Drinking alcoholic beverages at least once a week was reported by 49% of men in 2018 (46% in 2016) and 27% of women (22% in 2016). Given the confidence intervals, the differences in frequent drinking from 2012 to 2018 cannot be interpreted as an indication of a significant shift towards more frequent alcohol consumption. On the contrary, it seems to be an unchangeable and stable consumption characteristic.

● 3 RESULTS AND DISCUSSION

The number of smokers has not changed significantly in the past ten years, even though some fluctuations can be identified, such as between the years 2007 and 2008, and this was

also confirmed by the State Health Institute of the Czech Republic (MZCR, 2017). This development in the Czech Republic follows the development in other countries of Western Europe. As for the current development, in 2017, the number of smokers dropped to 25.2%. The Czech population mainly smokes cigarettes. The share of other tobacco products intended for smoking is negligible. Tobacco products other than cigarettes include pipes, cigars, and hookahs.

Consumer prices for tobacco have increased steadily since 1989 (excluding stagnation in 2003). A dramatic rise in prices was recorded in 1991 because of the decentralisation of the economy. A substantial increase in prices was recorded in 1993 when the new tax system entered into force, and VAT and excise taxes started to affect the development of tobacco prices.

The highest year-on-year increase in cigarette consumption was in 1990. Cigarette consumption culminated in 1997, when an average smoker consumed 2,354 cigarettes a year; this amount dropped to 1,852 cigarettes a year later as a result of an increase in prices; in 2001, cigarette consumption fell to a minimum of 1,664 cigarettes a year. With accession to the EU and the related increase in excise taxes, the rise in cigarette consumption began to slow down gradually. In 2007, the Czech government approved an increase in the excise tax. As a result of high cigarette prices, cigarette consumption decreased between 2008 and 2013, but not significantly. Smokers smoked 12.3 cigarettes a day in 2017. In general, the number of smokers in the Czech Republic has remained fairly stable in the time frame that was monitored. The number of smokers in the Czech Republic dropped by 3.5 per cent from 2016 to 2017. About five per cent more people also want to quit smoking. These results are taken from a survey by the State Health Institute, which monitors smoking in the population every year (MZCR, 2017). (Figure 1).

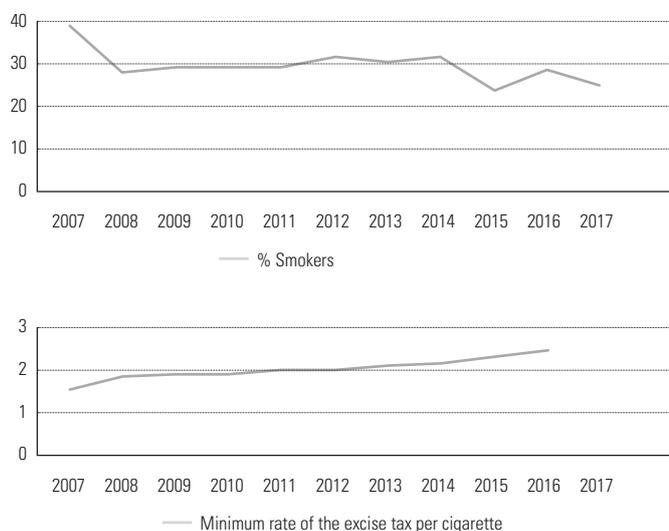


Figure 1 | Development of smoking in the Czech Republic between 2007 and 2016. Source: original research

A visual analysis of the graphs of the course of the time series of the values that were monitored would be too subjective and there would be a high probability that the different users would evaluate dependencies differently, so the charts are included for presentation purposes only. We have used a statistical program to test the dependencies.

From the statistical data it can be concluded that:

- With regard to the percentage of smokers, we are unable to say whether it has increased or decreased since 2007;
- The minimum rate of tax per cigarette increased by 56.5 per cent between 2007 and 2016;
- The minimum excise tax increased by 53.6 per cent between 2007 and 2016;
- Tax revenues from tobacco increased by 31.6 per cent between 2007 and 2016.

We tested the following dependencies in the SPSS statistical program:

- Number of smokers to cigarette tax rate – there is a weak dependency;
- Number of smokers to the average wage – there is no statistically significant dependency;
- Consumption of cigarettes per capita to tax revenues – there is no statistically significant dependency;
- Consumption of cigarettes per capita to excise tax on a packet of cigarettes – there is a dependency;
- Tax rate on cigarettes to tax revenues – there is no statistically significant dependency.

The relationship between the number of smokers and the cigarette tax rate shows a dependency; however, R^2 is too low (only 0.461). This means that an increase in the excise tax causes the number of smokers to decrease, but only a little, and in some years it does not decrease at all. Even though the excise tax on cigarettes increases every year, the percentage of smokers remains basically the same throughout the years. This means these prevention policies are not very effective in terms of their impact on smokers in the Czech Republic. A single significant increase in the tax rate would not benefit the state treasury. The impact of a higher tax rate on state revenues would be cancelled out by a decrease in consumption.

3.1 Alcohol

Alcohol revenues represent the third largest source of revenue from excise taxes in the Czech Republic. It can be clearly seen from the data above that the total consumption of alcohol in the Czech Republic has remained fairly stable for the past 10 years. In our research, we focused on beer consumption. There was a slight decrease in the consumption of beer and spirits after 2009 but it was compensated for by an increase in the consumption of wine in recent years. The tax rate on beer has increased significantly since 2009, when the standard rate was increased from CZK 24/hl. to CZK 32/hl. (Figures 2 and 3.)

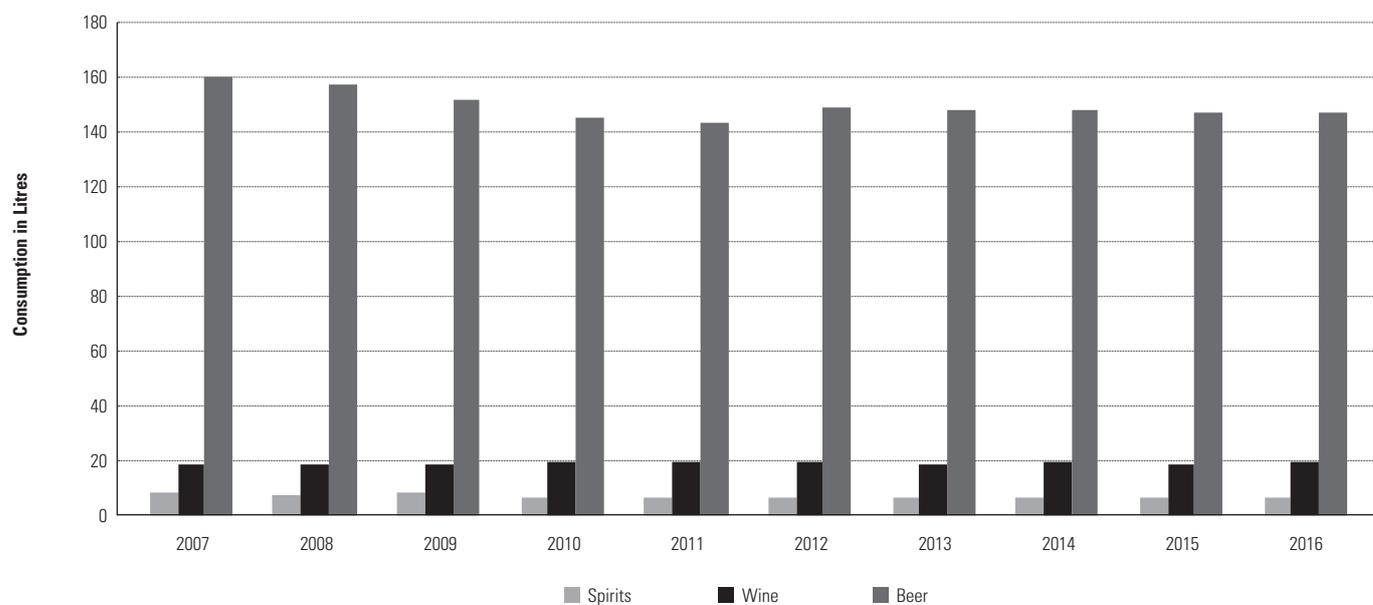


Figure 2 | Alcohol consumption in the Czech Republic. Source: original research

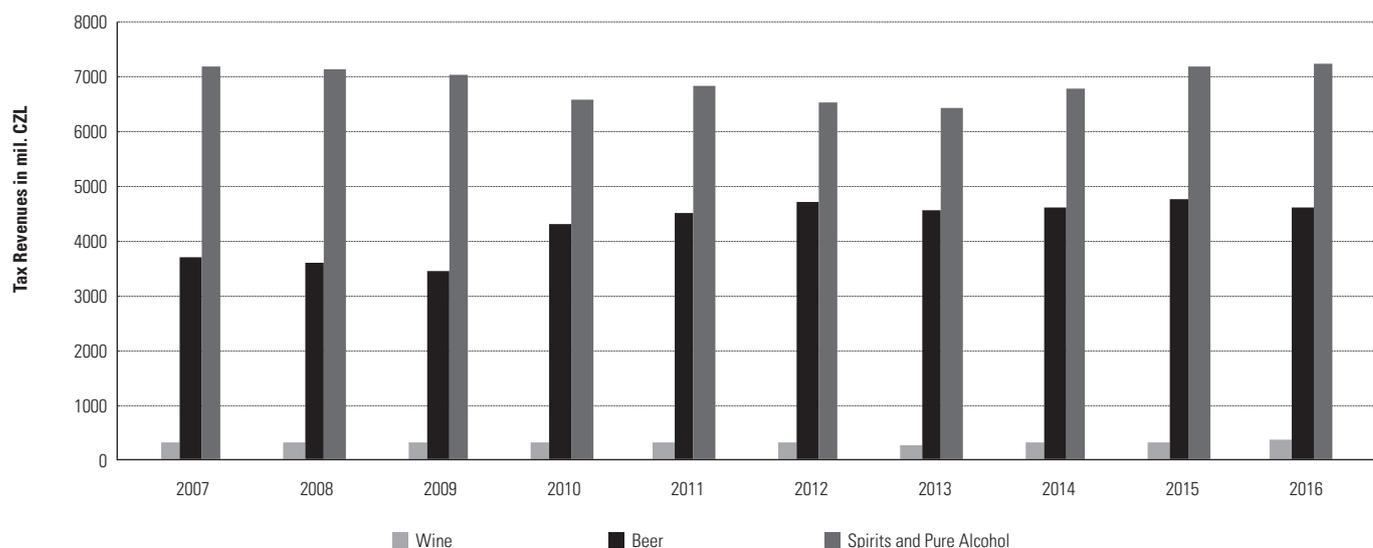


Figure 3 | Tax revenues from alcohol in the Czech Republic. Source: original research

A 26-year survey, called Global Burden of Disease, involving several thousand individuals between the ages of 15 and 95 in a total of 195 countries, examined the impacts of the amount of alcohol consumed on the health of the respondents who were monitored. When the final analysis finally arrived after years of experimentation, it was clearly shown that those who consume alcohol, even to a lesser extent, have an increased risk of cancer. Negative impacts of alcohol are very probable for one fifth of the Czech adult population. These facts emerged from a survey of the State Health Institute in 2014. (GBD Alcohol Collaborators, 2018)

To show the development of the consumption of alcohol beverages and the related tax revenues more clearly, we included the figures above. The most significant factors in

the area of tax revenues appear to be spirits and pure alcohol, but that does not mean that spirits generate higher revenues than, for example, beer. This category includes not only spirits but also pure alcohols which are used in the industrial processing of other alcoholic beverages and are not used for personal consumption. Excise tax revenues from wine are generally lower than those from other categories, as there are significant tax exemptions for wine. There is no excise duty on still wine.

From the statistical data it can be concluded that:

- The total consumption of alcoholic beverages decreased from 2007 to 2016, but the lowest consumption was in 2011;

- With regard to the total tax revenue from the consumption of alcoholic beverages, we are unable to say whether the trend is increasing or decreasing. Until 2009, total tax revenues decreased and from that year they increased, with the exception of 2012;
- Beer consumption decreased until the year 2011, and from 2012, the level of consumption remained basically unchanged;
- The tax revenues from beer declined until 2009, but since 2010, when the standard tax rate increased by 33.3 per cent, tax revenues from beer have increased by 28.6 per cent on average.

We tested the following dependencies in the SPSS statistical program:

- Tax revenues from beer to the average wage – there is a dependency;
- Consumption of beer to the average wage – there is a weak dependency;
- Consumption of pure alcohol and spirits to time – there is a dependency;
- Consumption of alcohol to the average wage – there is a weak dependency.

Other dependencies were insignificant.

The dependency between beer consumption and excise tax revenues from beer was identified as R^2 is 0.680. A further investigation is recommended for this dependency. That means that tax revenues from beer increase in parallel with the increase in the average wages in the Czech Republic. As the tax rate has not changed at all since 2010, it can be said that the increase in tax revenues is due to an increase in the amount of beer consumed in the Czech Republic, which means that with increasing wages people spend more on beer.

● 4 CONCLUSIONS

In our research on cigarette consumption, we have confirmed that there is only a weak dependency between the number of smokers and the cigarette tax rate; R^2 is very low (only 0.461). This means that an increase in the excise tax causes the number of smokers to decrease, but only a little, and in some years, it does not decrease at all. Neither did we identify a statistically significant dependency between the per capita consumption of cigarettes and tax revenues or between the tax rate on cigarettes and tax revenues. Even though the excise tax on cigarettes increases every year, the percentage of smokers remains basically the same throughout the years. This means the prevention policies are not very effective in terms of their impact on smokers in the Czech Republic. Neither would a one-off significant increase in the tax rate benefit the state treasury. The impact of the higher tax rate on state revenues would be cancelled out by a decrease in consumption.

The Institute for Health Economics and Technology Assessment (iHETA) dealt with the relationship between cigarette prices and consumption. From our analysis it is clear that the price of cigarettes depends on the standard rate of cigarette tax, as the cigarette tax accounts for more than 70% of the price of cigarettes in the Czech Republic. In our research, we found that there is a weak dependency between the tax on cigarettes and the number of smokers, but the dependency is very low. With this, Hypothesis H_1 cannot be confirmed.

One of the basic tools of economics is to examine the demand. The demand research is associated with the price elasticity of the demand, which shows how the quantity that is demanded will change depending on the price of certain goods – in our case cigarettes – with the other factors unchanged. In a meta-analysis, Gallet and List (2003) summarised the results of research on the demand for cigarettes, with an impressive number of 523 articles summarised in their study. In terms of short-term price elasticity, the median of the studies examined ($n = 368$) is 0.40 and long-term elasticity is 0.44 ($n = 155$); thus, a price increase of 1% will lead to a decrease in demand by 0.4% in the short term and 0.44% in the long term. Mlčoch and Doležal (2014) concluded in their research that adults are 16% less elastic in their demand, but young adults are 13% more elastic, and teenagers are even 89% more elastic than adults. This shows that young people, in particular, are much more responsive to price changes than adults are, and the price discourages them from smoking – in descriptive statistics, the median price elasticity of teenagers was -1.46 ($n = 8$). Chaloupka et al. (2012) similarly claim that the price response is two to three times greater for young people than for older people, so a higher price may discourage these smokers and consequently not create a dependency on tobacco. We did not examine the relationship between the number of smokers in the younger population and the level of cigarette taxes, but it would be an interesting continuation of our research. The study by Decker and Schwartz (2000) points to significant cross-links between cigarette and alcohol consumption. More specifically, an increase in the price of alcohol leads to a reduction in alcohol consumption, as well as a reduction in tobacco consumption. Conversely, an increase in the price of cigarettes leads to a reduction in cigarette consumption but an increase in alcohol consumption, which may indicate a shift from a more expensive drug to a cheaper one.

In our research on alcohol consumption, we have confirmed that tax revenues from beer are dependent on the average wage and also that the consumption of beer is dependent on the average wage. The dependency between beer consumption and excise tax revenues from beer had R^2 amounting to 0.680. A further investigation is recommended for this dependency, as tax revenues from beer increase in parallel with the increase in the average wages in the Czech Republic. As the tax rate has not changed at all since 2010, it can be said that the increase in tax revenues is due to an increase in the amount of beer consumed in the Czech Republic, which means that with increasing wages people spend more on beer.

Beer is the most consumed alcoholic beverage in the Czech Republic and we also focused on it in our research. Increasing the minimum tax rate on beer by one unit will increase tax revenues from beer by CZK 0.193 billion. An increase in time by one unit (i.e. one year) will increase the tax revenues from beer by CZK 0.426 billion. This proves Hypothesis H₂. It is also in line with similar research studies conducted on this topic.

This article provides a clear presentation of valid existing data in one paper and may serve as a summary of data about alcohol and cigarette consumption and existing relations in the Czech Republic. However, this paper is limited by the fact that it was oriented in general toward the consumption of alcoholic beverages and of cigarettes and we did not focus on a particular group of consumers (such as young people, or women), as this would enable a better comparison with other research studies and could show other interesting results. However, this still remains an opportunity for future research.

The consumption of addictive substances, and for the Czech Republic the consumption of beer and smoking cigarettes, in particular, can be considered a deeply rooted and hard-to-change custom. This leads us to the conclusion that, regarding the main WHO priorities, Priority No. 6, increasing the tobacco tax, has little or no effect in the Czech setting. As far as future developments are concerned, we have already stated that a one-off significant increase in the excise tax rate would maybe help in the prevention area, but it would not benefit the state treasury of the Czech Republic, as the impact of a higher tax rate on state revenues would be cancelled out by a drop in consumption. For the Czech Republic it would be better to focus on other priorities, such as Priority No. 5, promoting a ban on tobacco advertising and its promotion and sponsorship, and Priority No. 1, monitoring tobacco use and prevention policies, e.g. targeting prospective substance users and protecting them from the harmful effects of addiction. This could be done through education from a young age and it could result in a more significant decrease in the number of smokers and people dependent on alcohol in the future.

Authors' contribution: Eva Kolářová and David Homola designed the study and proposed the study design. Eva Kolářová performed the statistical analysis; David Homola participated in the interpretation of the data and the preparation of the manuscript. Vendula Kolářová was in charge of the collection of the data necessary for the statistical analysis. Eva Kramná was responsible for the

literature review and the summary of related work and for the drafting of the introduction to the article. All the authors contributed to the article and approved the final version of the manuscript.

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REFERENCES

- Anderson, P., & Baumberg, B. (2006). *Alcohol in Europe: A public health perspective. A report for the European Commission*. London: Institute of Alcohol Studies.
- Anderson, P., Chisholm, D., & Fuhr, D. C. (2009). *Alcohol and Global Health 2: Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol*. London: Lancet. Jun 27;373(9682):2234-46. doi: 10.1016/S0140-6736(09)60744-3.
- Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., et al. (2003). *Alcohol: No Ordinary Commodity. Research and Public Policy*. Oxford: Oxford University Press.
- Decker, S. L., & Schwartz, E., A. (2014). *Cigarettes and alcohol: substitutes or complements?* NBER working paper n. 7535, Available from: <<http://www.nber.org/papers/w7535>>
- Drogy-info, (2016). *Výroční zpráva o stavu ve věcech drog v České republice v roce 2016*. Available from: <https://www.drogy-info.cz/data/obj_files/32732/786/VZ_2016_drogova_situace_v_CR.pdf>
- Elias, J., Hendlin, H. Y., & Ling, P. L. (2018). Public versus internal conception of addiction: An Analysis of internal Philip Morris documents. *PLoS Medicine*. May 1;15(5):e1002562. doi: 10.1371/journal.pmed.1002562
- Feliu, A., Filippidis, F., Joossens, L., Fong, G. T., Vardavas, I. C., Baena, A., Castellano, Y., Martínez, C., & Fernández, E. (2018). *Impact of tobacco control policies on smoking prevalence and quit ratios in 27 European Union countries from 2006 to 2014*. *Tobacco Control*. Jan; 28(1):101-109. doi: 10.1136/tobaccocontrol-2017-054119.
- Gallet, A. C., & List, A. J. (2003). Cigarette demand: a meta-analysis of elasticities. *Health Economics* 12, 821-835.
- Gallus, S. et al. (2006). Price and cigarette consumption in Europe. *Tobacco Control* 15, 114–119.
- GBD Alcohol Collaborators (2018). Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Available from: <<https://www.thelancet.com/action/showPdf?pii=S0140-6736%2818%2931310-2>>
- Chaloupka, F. J. (2012). Tobacco taxes as a tobacco control strategy. *Tobacco Control* 21, 172–180.
- Marková, H. (2018). *Zákon č. 353/2003 Sb. - Zákon o spotřebních daních*. Praha: Grada.
- Mlčoch, T., & Doležal, T. (2014). *Jaký je vztah mezi cenou a jejich spotřebou*. IHETA. Available from: <http://www.iheta.org/ext/publication/files/vzath%20mezi%20cenou%20c.%20a%20jejich%20spot%C5%99ebou_final.pdf>
- MZČR. (2017). *Předpis č. 65/2017 Sb. - Zákon o ochraně zdraví před škodlivými účinky návykových látek*. Praha: Sagit.
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). *Alcohol and Global Health 1: Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders*. London: Lancet. Jun 27; 373(9682):2223-33. doi: 10.1016/S0140-6736(09)60746-7
- Sovinová, H., & Czemy, L. (2013). *Užívání tabáku a alkoholu v České republice 2012*. Available from: <http://www.szu.cz/uploads/documents/czcp/zavislosti/Uzivani_tabaku_a_alkoholu_v_Ceske_republice_2012.pdf>
- World Health Organisation. (2011). *European action plan to reduce the harmful use of alcohol 2012–2020*. Available from: <<https://www.stap.nl/en/home/european-alcohol-policy.html>>
- World Health Organisation. (2018). *Global status report on alcohol and health 2018*. Available from: <http://www.who.int/substance_abuse/publications/global_alcohol_report/gsr_2018/en/>
- Zákony pro lidi.cz. (2018). *Zákon č. 65/2017 Zákon o ochraně zdraví před škodlivými účinky návykových látek*. Available from: <<https://www.zakonyprolidi.cz/cs/2017-65>>