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Impact of the changes in excise duties on households in the Czech Republic

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Abstract: Excise duties are an important source of the government revenue and their rates change relatively often in the Czech Republic. Reforms of excise duties change the prices of goods, a change to which the households respond by adjusting their expenditures. In the contribution, there are used detailed Czech Statistical Office data and the estimates of own- and cross-price and income elasticities for the individual households to create a microeconomic simulation model that enables to simulate the impact of changes in excise duties on the households' demands. There is shown the distributional impact of the current excise duties and then the impact of the hypothetical increases of 10 per cent in each of them is simulated. Further, there is simulated the impact of certain approved or proposed changes in the excise duties including the unsuccessful 2012 proposal to introduce an excise duty on wine.

Keywords: consumer behaviou, excise duties, excise duty on wine, households, tax reforms

Excise duty is an indirect, consumption tax applied to a purchase of certain types of goods. Excise duties are applied in most countries, including the Czech Republic. Excise duty in the Czech Republic is imposed on, in the order of the government revenue magnitude: mineral oils (most importantly motor fuels, petrol and diesel), tobacco products (cigarettes, cigars and other products) and alcoholic beverages (beer, spirits and other alcoholic beverages; still wine is excluded).

Excise duties are important for most governments from the macroeconomic point of view, and here I focuse on their microeconomic aspects in the Czech Republic. The main motivation is to improve the evidence-based policy making through applying appropriate methods for the simulation of changes that are being proposed or implemented in the Czech Republic and also to shed more light on the impact of the current excise duties. Learning about the impact of the current system and changes in excise duties through microeconomic analysis is one of the first steps on the way to recommending and implementing changes that will improve it.

There is no shortage of the recently approved or proposed changes in excise duties and I identify at least two general sources: rising government debts, which incentivise public discussions about raising taxes, including excise duties, and the European Union, to which regulation of the excise duties the member governments need to respond. Specific examples for the Czech Republic are the unsuccessful 2012 proposal to introduce a new excise duty of 10 Czech crowns per 1 litre on wine (circa 0.4 euro), and the increases of Czech excise duty on cigarettes in 2013 and 2014 (which is in total a circa 7% increase) to comply with the minimum rates set by the European Union.

This article aims to answer the following questions: How much do the households pay in excise duties? What is the impact of various hypothetical, approved or proposed changes in excise duties on the demand of households in the Czech Republic? Are the excise duties progressive or regressive? To answer these questions, I apply methods that are explained in detail, including the fact that I use the previously estimated income and price demand elasticities for Czech households as well as the best available data for the Czech Republic.

LITERATURE REVIEW

In the following discussion of the economic literature, I briefly review two areas: the works that asked similar questions in other countries, and the literature specifically studying the situation in the Czech Republic.

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Crawford et al. (2010) provide an excellent introduction to the indirect taxation generally as well as the excise duties on alcohol and tobacco specifically. Although their discussion is centred on the United Kingdom, their reviewed literature and most of their arguments are relevant for other European Union countries, as well as the Czech Republic specifically. Crawford et al. (2010) also provide empirical results on the income and expenditure shares of excises and find that the tobacco taxes are highly regressive on the basis of income but less so on the basis of expenditure, and indicate similar trends for the alcoholic drinks. These observations led me to apply a similar distributional analysis in this current article.

For some countries, the demand systems have been estimated specifically for the analysis of excises such as Jones and Mazzi (1996) for the Italian tobacco market. They find that the quadratic Engel curves in their QUAIDS model are important, and discuss the implications of their demand system estimates for the indirect tax policy. For Mexico, Abramovsky et al. (2012) applied the QUAIDS model and simulated changes in the VAT as well as the excise rates and they present results of the distributional impact for the evaluated overall tax reforms rather than for the changes in excise rates separately. Gruber et al. (2003) manage to estimate price elasticities of cigarettes in the presence of smuggling using detailed data from Canada and provide a very good literature review on this important problem that I am currently unable to empirically address for the Czech Republic due to the insufficient data.

Methodologically similar studies for the Czech Republic have not often studied the indirect taxation. For example, Večerník (2006) used the Czech Microcensus survey in 1988, 1996, and 2002 to describe the redistribution via the tax-and-benefit system at the household level, but his analysis did not include the excise tax. Schneider and Jelínek (2005) used the household budget surveys in 1999–2002 to analyse the distributive impacts of the particular welfare benefits and tax allowances, however, their analysis did not include the excise tax. Therefore, Klazar et al. (2006), and the related publications such as Klazar and Zelený (2008), are likely the most comprehensive, although somewhat outdated, studies of the impact of indirect taxes, including excise duties, in the Czech Republic. They develop a microeconomic simulation model for the VAT and excise duties, which, however, does not account for the potential for consumers to substitute between goods as the relative prices changes due to the changes in taxes.

There are also a number of more recent studies that simulate the impacts of changes in the indirect taxation in the Czech Republic. Dušek and Janský (2012a, b) provided results for a static simulation of the impact of changes in the value added tax (VAT) rates on the households' demands and government revenues, without specifically modelling the behavioural response of households. This behavioural response was later estimated by (Janský 2014), who applied a consumer demand model of the quadratic almost ideal system (QUAIDS) on the basis of Banks et al. (1997).

Since it is not the objective of this section to review all the articles studying various excise duties, let me discuss just four that are very relevant for this current work: two on tobacco, the third and fourth one on fuel and alcohol, respectively. David (2010) analyses the incidence of the cigarette taxation in the Czech Republic using the data on prices and changes in excise duties between 2004 and 2009 and finds that consumers bear 81% of the increased tax burden, which corresponds with the often assumed incidence between 80 and 100%. Shirane et al. (2012) discuss the tobacco industry and tobacco taxation in the Czech Republic and conclude that there is a substantial scope for the tobacco tax increases in the Czech Republic.

Brůha and Ščasný (2006) use a microsimulation model to analyse distributional effects of the environmental regulation in the Czech Republic. For example, they simulate a 50% increase in the excise duty on fuel and they find this excise duty to be slightly regressive. Janda et al. (2010) offer a relevant contribution to the discussion of excise duties on alcohol in the Czech Republic. They estimated the Czech demand system focused on alcoholic beverages: beer, wine and spirits. They find that beer has the lowest own-price elasticity and suggest that from the fiscal perspective, taxing beer should be relatively more efficient than levying taxes on the other two beverage types. By contrast, they find the income elasticity for beer to be relatively high.

The existing research on simulating the impact of excise duties in the Czech Republic is somewhat limited in both its scope and in the methods used and my objective is to fill in this gap in two dimensions. First, and in contrast to Klazar et al. (2006), I take into account the behavioural response through the inclusion of elasticities in my microeconomic simulation model. Second, and in comparison to David (2010) or Janda et al. (2010), I study all types

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of excises together, which has obviously its disadvantages since I cannot take into account all the detailed characteristics of the individual excise duties, but on the other hand, it enables me to directly compare their distributional impact.

METHODOLOGY

This section describes the methodology and it also provides an overview of excise duties for the Czech Republic and connects them with the available data. Excise duties form an important part of the government revenues for all European Union members and in the Czech Republic they made up 14.3% of the total tax revenue of the central government in 2012 (130.1 billion CZK out of the total tax revenue of 912.3 CZK) according to Ministry of Finance of the Czech Republic (2013). As shown by Crawford et al. (2010), the Czech Republic ranks below average but not at the bottom in terms of the amount of excise duties when compared to other European Union members. Excise duties are obviously important for the Czech government and to study their microeconomic aspects, I need both detailed data and the in-depth knowledge of what the excise rates apply.

The most suitable data for the Czech Republic are the Household Budget Statistics (HBS) from the Czech Statistical Office (CZSO), but as I explain below, these are quite limited in some respects. The HBS provide detailed information on the households' expenditures and characteristics in a representative sample collected on a yearly basis of around 3000 Czech households. For each of them, the HBS contains information on how much they spend on various goods and services (around 250 expenditure items), who they are (around 60 demographic variables) and how they earn their income (around 30 income items). In addition to the concerns discussed, for example, in (Janský 2014), there are issues specific to excise goods, discussed to some extent in Janda et al. (2010), mainly that the expenditures on alcohol or tobacco might be misreported and not representative of the population. I use the last available year of the data as of mid-2013, which is 2011.

For prices, I also employ the HBS. For some goods, the HBS include not only expenditures but also the quantity of the purchased goods and services. It is then possible to divide expenditures by the quantity to derive unit values, and to use these as prices. This has the advantage of relatively easily obtaining very detailed expenditure- and household-specific prices, but it can in some cases be inaccurate, as discussed in (Janský 2014). Since I focus here on the narrowly defined expenditure categories similarly to Janda et al. (2010), it seems reasonable to use the HBS data on prices instead of the price data gathered for the purpose of the Consumer Price Index.

Table 1 below provides an overview of the extent of information available from the HBS on excises. This Czech data seem of the average quality in the international comparison and the detail of the available data could be improved – especially as far as the quantities of goods are concerned since these are only available for alcoholic drinks. In the table below, I describe, only briefly due to the space constraints, the excise rates as applied in the Czech Republic according to the current law, the Act on Excise Duty, or as being implemented or discussed in the case of future changes or proposals, respectively. Also, Table 1 provides a more detailed description of the data relevant for excise duties and I discuss the solutions to problems posed by the unavailability or a low detail of the data.

Table 1. Excise duties and the HBS information on excise goods in the Czech Republic

Excise good	HBS name (code)	Data on quantity available (units)	Price	Excise duty rate	Elasticity used
Petrol and diesel	Fuels and lubricants for personal transport equipment (3640)	No	The average price of the most popular petrol (i.e. Unleaded Petrol 95 Natural) of 34.58 and of diesel of 34.25 CZK per litre CZK per litre (Ministry of Transport 2012)	13.71 CZK per litre for petrol and 10.95 CZK per litre for diesel. I assume that all expenditures are on either petrol (71.25% according to (Ministry of Transport 2012)) or diesel and a weighted average excise duty of 12.30 CZK per litre	Transport from (Janský 2014)

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Continued Table 1.

Excise good	HBS name (code)	Data on quantity available (units)	Price	Excise duty rate	Elasticity used
Cigarettes	Cigarettes (3901)	No	Assumed to be 69.72 CZK per cigarette pack of 20 on the basis of (European Commission 2013)	28, 27 and 27 % as an ad valorem part, 1.12, 1.16 and 1.19 CZK per piece as a specific part with a required minimum, which I assume to be the excise rate, of 2.10, 2.18 and 2.25 in CZK per piece in 2012, 2013 and 2014, respectively	Eating out etc. from (Janský 2014)
Cigars	Cigars (3902)	No	Assumed to be 30 CZK per piece on the basis of author's market research	1.25, 1.30 and 1.34 CZK per piece in 2012, 2013 and 2014, respectively	Eating out etc. from (Janský 2014)
Other tobacco	Other tobacco (3903)	No	Assumed to be 3000 CZK per kilogram on the basis of author's market research	1400, 1635 and 1800 CZK per kilogram in 2012, 2013 and 2014, respectively	Eating out etc. from (Janský 2014)
Wine	Wine from grapes and other fruit, other, consumed in restaurants, cafes, bars (2841, 2842, 2941, 2942)	Yes (litre)	Estimated as household-specific unit values from the HBS	No excise duty currently levied on (still) wine	Eating out etc. from (Janský 2014)
Beer	Beer, Beer consumed in restaurants, Beer consumed in cafes, bars and similar establishments (2830, 2931, 2932)	Yes (litre)	Estimated as household-specific unit values from the HBS	1.6 CZK per half litre of beer of 10 degrees Plato (most popular and assumed as the excise rate), with higher rates for higher degrees and lower rates for small independent breweries	Eating out etc. from (Janský 2014)
Spirits and other alcohol	Spirits, Other alcoholic beverages consumed in restaurants, cafes, bars (2850, 2951, 2952)	Yes (litre).	Estimated as household-specific unit values from the HBS	285 CZK per litre of ethanol (this implies 114 CZK for spirits per litre at 40%). I assume the average excise rate is 57 CZK per litre	Eating out etc. from (Janský 2014)

Source: own compilation

RESULTS

In this section, I first discuss the importance of the distributional aspects of excise duties and look at who currently pays the excise duties. I then proceed to simulate the hypothetical changes in excise duties and then the changes that are either forthcoming or discussed.

There are good reasons in favour as well as against the importance of distributional aspects of excise duties in the Czech Republic. The main argument against is that excise duties have different objectives than the social policy and should be used for them as discussed in Crawford et al. (2010). Although there are better policies such as the direct taxation or social benefits to achieve the redistributive policy objectives, there are at least three arguments for studying these in detail. The introduction of new excise duties is usually not compensated by the other redistributive instruments and therefore the immediate impact is actually important. Furthermore, excise goods are often consumed by specific groups in high quantities and therefore these selected households cannot in fact be well compensated through the

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general tools of the welfare state even if that was the intention. Last but not least, in order to know the redistributive impact of the overall welfare system, we need to know the distributional impact of the individual taxes including excise duties even if these were used only as one component for assessing the overall impact. Therefore, I consider it important to study the distributional aspects of excise duties and I do so below for the current excise duties and their changes.

Current excise duties

In an answer to the question of who currently pays the excise duties, Table 2 shows the results for the distributional impact of fuel, alcohol and tobacco excise duties.[1] I present results for five groups of excise duties: fuel, beer, spirit, cigarettes, and other tobacco.[2]

I use four different approaches to examine the distributional incidence, because the previous re-

Table 2. Income and expenditure shares of excise duties (in %), 2011

	Fuel	Beer	Spirit	Cigarettes	Other tobacco
Income quintiles and income shares					
1 (poorest)	1.1	0.09	0.08	0.75	0.07
2	1.05	0.13	0.1	0.55	0.03
3	1.41	0.13	0.1	0.77	0.01
4	1.38	0.11	0.07	0.9	0.02
5 (richest)	1.33	0.09	0.08	0.63	0.01
Average	1.25	0.11	0.08	0.72	0.03
Income quintiles and expenditure shares					
1 (poorest)	1.28	0.11	0.09	1 (poorest)	1.28
2	1.39	0.18	0.12	2	1.39
3	1.85	0.18	0.13	3	1.85
4	1.96	0.17	0.1	4	1.96
5 (richest)	2.1	0.14	0.12	5 (richest)	2.1
Average	1.72	0.15	0.11	0.99	0.04
Expenditure quintiles and income shares					
1 (poorest)	0.85	0.08	0.05	0.54	0.06
2	1.06	0.12	0.09	0.63	0.03
3	1.25	0.13	0.09	0.8	0.02
4	1.47	0.13	0.1	0.88	0.01
5 (richest)	1.63	0.11	0.09	0.75	0.02
Average	1.25	0.11	0.08	0.72	0.03
Expenditure quintiles and expenditures shares					
1 (poorest)	1.37	0.13	0.09	0.88	0.08
2	1.56	0.17	0.13	0.91	0.04
3	1.74	0.18	0.12	1.11	0.03
4	1.97	0.17	0.12	1.16	0.01
5 (richest)	1.93	0.13	0.11	0.89	0.02
Average	1.72	0.15	0.11	0.99	0.04

Source: own calculation based on data from the Czech Statistical Office

[1]For these results I use the estimates of excise duties paid rather than the expenditure on excise goods. I believe this more directly corresponds with what I am interested in, the distributional impact of current excise duties. Since excise duties are specific, their shares per expenditures on excises differ across households.

[2]Wine is not included, because no excise duty levied on it currently, and results for cigars are not presented, because of only tiny expenditures on these.

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search, such as Crawford et al. (2010), highlighted the sensitivity of the results to the approach chosen. All of these approaches are defined on a household level with the OECD adjustments for the size of a household.[3] The first part of Table 2 shows the results of excise duties paid per income according to quintiles based on income, a measure that is often used for discussion of the distributional impact. The second part shows the results of the excise duties shares of income according to the quintiles based on expenditures. The third part shows the results of the excise duties shares of expenditure according to the quintiles based on incomes. The fourth part shows the results of the excise duties paid as a share in the total expenditure according to the expenditure quintiles. These quintiles are arguably more consistent with the life-cycle hypothesis, because there is a higher variation in incomes than in expenditures over the lifetime.

The results of all approaches share some lessons for the distributional impact of excise duties, although there is a high variation in the results. Excise duties generally seem to be progressive, i.e. in average the households with higher incomes or expenditures seem to pay a higher share of their incomes or expenditures in excise duties. There are many exceptions to this general observation. The fourth quintile mostly seems to be paying higher shares than the fifth quintile. Other tobacco includes tobacco for smoking that is mostly seen as a cheaper alternative to cigarettes, and this is in line with the mostly progressive excise duties on cigarettes and the regressive excise duties on other tobacco. Excise duties on alcohol seem to be paid most heavily by the middle quintiles, which is partly due to their higher expenditure on alcohol, and partly due to the lower prices and therefore proportionally higher duties paid per drink.

The prevailing progressivity contrasts with, for example, some of the results for the United Kingdom by Crawford et al. (2010), who found tobacco to be regressive using the equivalents of both the first and fourth approaches applied here. The progressivity of the excise duty on fuel also contrasts with Brůha and Ščasný (2006), who found it to be to be slightly regressive.

Table 2 shows the sensitivity of the results of the distributional impact according to the approach taken. For example, the first part of Table 2 based on income quintiles and income shares shows the same values for the first and the fifth quintiles for beer and spirits, whereas most other results show progressivity for these excise duties. I thus confirm the sensitivity of the results to the approach to examine the distributional incidence chosen for the Czech Republic. However, for brevity I rely solely on the fourth approach in the presentation of the results below and, therefore, I show only results as a share in the total expenditure for quintiles based on the total expenditure. It is reasonable to assume that the results presented below would differ across the three approaches in a similar way to these presented in Table 2.

Impact of the hypothetical 10 per cent increase in the currently paid excise duties

This section answers the question of who will pay the excise duties if they are increased. I evaluate the impact of the hypothetical changes in each of the existing excise duties. I chose to simulate 10% increase in each of the currently paid excise duties as a good yardstick for any potential increases that can indicate the current incidence of excise duties *and potentially suggest the dynamic for some other, more realistic proposals. In contrast to the static results in the previous section, these are based on* the *simulation methodology that, as* discussed above, *has a number of limitations, but it reflects the elasticities estimated for each household and can capture the impact of change on other goods than excises.*

I present the results for the estimated impact of that increase on households' demands by presenting the percentage changes in the quantity demanded. Table 3 presents the estimated impact on the households' real demands (in percentage change with respect to the overall expenditures) according to the eight expenditure groups as defined in (Janský 2014) and according to the OECD income quintiles for the motor fuel, beer, wine, spirits, cigarettes and other tobacco, respectively.

As presented in Table 3, there is a great variety in the impact of the changes in excise duties, across the different excise goods as well as income groups, but this variation seems to be mostly in line with the results from the previous section. Still, there are

[3]The OECD's adjusted consumption unit scale recommended by Eurostat, the Statistical Office of the European Communities, implies that the first adult of the household receives the weight 1, other over 13-year-olds receive the weight 0.5, children receive the weight 0.3 (0 to 13-year-olds).

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some interesting observations to be drawn from the results in Table 3. The cross-effects seem to be relatively important, that is, a change in the excise that is included in one of the eight expenditure groups has an impact on the demand for the other seven expenditure group through the cross-price elasticities. Although these cross-effects are less important than the own-effects and are largely statistically insignificant at the standard levels, they together contribute to the overall impact of the changes that is relatively substantial, with the exception of other tobacco, and it ranges from a decrease of 0.05% for

Table 3. The simulated impact on households of the 10 percentage point increase in each of the excise duty, changes in the quantity demanded (%)

	Food	Eating out and other luxuries	House-hold g.	Clothing	Other services	Transportation	Energy	Other goods	Total
Motor fuel									
1 (poorest)	–0.19	–0.04	0.6	0.39	–0.12	–0.67	–0.15	–0.19	–0.15
2	–0.23	–0.04	0.59	0.45	–0.14	–0.01	–0.18	–0.2	–0.12
3	–0.24	–0.04	0.48	0.41	–0.14	–0.83	–0.18	–0.19	–0.17
4	–0.26	–0.04	0.41	0.39	–0.15	–1.01	–0.18	–0.18	–0.2
5 (richest)	–0.23	–0.02	0.27	0.29	–0.12	–0.99	–0.17	–0.15	–0.2
Average	–0.23	–0.03	0.46	0.39	–0.13	–0.71	–0.17	–0.18	–0.17
Beer									
1 (poorest)	0.02	–0.5	0.1	–0.14	0.13	–0.04	–0.06	–0.03	–0.05
2	0.02	–0.55	0.09	–0.17	0.15	–0.06	–0.06	–0.03	–0.05
3	0.02	–0.53	0.07	–0.15	0.15	–0.05	–0.06	–0.03	–0.06
4	0.02	–0.49	0.05	–0.13	0.16	–0.04	–0.06	–0.02	–0.06
5 (richest)	0.03	–0.42	0.04	–0.13	0.17	–0.02	–0.06	–0.02	–0.04
Average	0.02	–0.5	0.07	–0.14	0.15	–0.04	–0.06	–0.03	–0.05
Spirit									
1 (poorest)	0.01	–0.39	0.07	–0.1	0.1	–0.04	–0.05	–0.02	–0.04
2	0.01	–0.43	0.06	–0.12	0.12	–0.04	–0.05	–0.02	–0.04
3	0.02	–0.46	0.06	–0.13	0.13	–0.04	–0.06	–0.02	–0.06
4	0.02	–0.4	0.04	–0.1	0.13	–0.03	–0.05	–0.02	–0.05
5 (richest)	0.02	–0.39	0.04	–0.14	0.16	–0.02	–0.06	–0.02	–0.05
Average	0.02	–0.41	0.05	–0.12	0.13	–0.04	–0.05	–0.02	–0.05
Cigarettes									
1 (poorest)	0.03	–0.84	0.19	–0.22	0.22	–0.09	–0.1	–0.05	–0.1
2	0.03	–0.72	0.1	–0.2	0.21	–0.07	–0.09	–0.04	–0.1
3	0.04	–0.84	0.1	–0.22	0.25	–0.08	–0.11	–0.04	–0.12
4	0.04	–0.76	0.08	–0.2	0.24	–0.07	–0.1	–0.04	–0.12
5 (richest)	0.05	–0.7	0.07	–0.32	0.29	–0.05	–0.11	–0.04	–0.12
Average	0.04	–0.77	0.1	–0.23	0.24	–0.07	–0.1	–0.04	–0.11
Other tobacco									
1 (poorest)	0	–0.09	0.03	–0.02	0.02	–0.01	–0.01	–0.01	–0.01
2	0	–0.04	0	–0.01	0.01	0	–0.01	0	0
3	0	–0.03	0	–0.01	0.01	0	0	0	0
4	0	–0.01	0	0	0	0	0	0	0
5 (richest)	0	–0.02	0	–0.01	0.04	0	0	0	0
Average	0	–0.04	0.01	–0.01	0.02	0	0	0	0

Source: own calculation based on data from the Czech Statistical Office

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Table 4. Excise duty on cigarettes from 2012 to 2013, changes in the quantity demanded (%)

2.10 to 2.18 CZK per cigarette									
	food	eating out etc.	house-hold g.	clothing	other services	transportation	energy	other goods	total
1 (poorest)	0.01	–0.33	0.08	–0.09	0.09	–0.03	–0.04	–0.02	–0.04
2	0.01	–0.28	0.04	–0.08	0.08	–0.03	–0.03	–0.02	–0.04
3	0.01	–0.32	0.04	–0.08	0.09	–0.03	–0.04	–0.02	–0.05
4	0.01	–0.29	0.03	–0.08	0.09	–0.03	–0.04	–0.02	–0.05
5 (richest)	0.02	–0.27	0.03	–0.12	0.11	–0.02	–0.04	–0.01	–0.04
Average	0.01	–0.3	0.04	–0.09	0.09	–0.03	–0.04	–0.02	–0.04
2.10 to 2.25 CZK per cigarette									
	food	luxuries	house-hold g.	clothing	other services	transportation	energy	other goods	total
1 (poorest)	0.02	–0.62	0.14	–0.16	0.16	–0.06	–0.07	–0.04	–0.07
2	0.02	–0.53	0.07	–0.15	0.15	–0.05	–0.06	–0.03	–0.07
3	0.03	–0.6	0.07	–0.16	0.18	–0.06	–0.08	–0.03	–0.09
4	0.03	–0.55	0.06	–0.15	0.17	–0.05	–0.07	–0.03	–0.09
5 (richest)	0.03	–0.5	0.05	–0.23	0.21	–0.03	–0.08	–0.03	–0.08
Average	0.03	–0.56	0.08	–0.17	0.18	–0.05	–0.07	–0.03	–0.08

beer and spirits to a decrease of 0.11% and 0.17% for cigarettes and motor fuel.

Impact of the forthcoming and proposed changes in excise duties

I simulated the impact of changes in two excise duties. They are the approved, partly implemented and partly forthcoming, changes in the excise duties for tobacco products. They have the same, two-year timescale for implementation, but the government used different arguments in proposing them. The increase in the excise duty on cigarettes was motivated by the minimum rates set by the European Union. The minimum excise duty on cigarettes increases from 2.10 to 2.18 and to 2.25 CZK per cigarette from 2012 to 2013 and to 2014. Table 4 shows the simulated changes in the quantity demanded. The second change affects other

Table 5. Excise duty on other tobacco from 2012 to 2013 (from 1400 to 1635 CZK per kilogram) , changes in the quantity demanded (%)

	Food	Luxuries	Household g.	Clothing	Other services	Transportation	Energy	Other goods	Total
1400 to 1635 CZK per kilogram									
1 (poorest)	0	–0.16	0.05	–0.04	0.04	–0.02	–0.02	–0.01	–0.01
2	0	–0.06	0.01	–0.01	0.02	0	–0.01	0	–0.01
3	0	–0.05	0.01	–0.02	0.01	–0.01	–0.01	0	–0.01
4	0	–0.02	0	–0.01	0.01	0	0	0	0
5 (richest)	0	–0.04	0	–0.01	0.07	0	–0.01	0	0
Average	0	–0.06	0.01	–0.02	0.03	–0.01	–0.01	0	–0.01
1400 to 1800 CZK per kilogram									
1 (poorest)	0.01	–0.27	0.09	–0.07	0.07	–0.03	–0.03	–0.02	–0.02
2	0	–0.1	0.01	–0.02	0.03	–0.01	–0.02	–0.01	–0.01
3	0	–0.09	0.01	–0.03	0.02	–0.01	–0.01	0	–0.01
4	0	–0.03	0	–0.01	0.01	0	0	0	0
5 (richest)	0	–0.07	0.01	–0.02	0.11	0	–0.01	0	0
Average	0	–0.11	0.02	–0.03	0.05	–0.01	–0.01	–0.01	–0.01

Source: own calculation based on data from the Czech Statistical Office

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Table 6. Excise duty on wine of 10 CZK per litre, changes in quantity demanded (%)

	Food	Luxuries	House-hold g.	Clothing	Other services	Transportation	Energy	Other goods	Total
1 (poorest)	0.11	–3.58	0.69	–1	0.92	–0.35	–0.41	–0.21	–0.34
2	0.11	–3.46	0.53	–1.01	0.96	–0.37	–0.41	–0.18	–0.32
3	0.14	–3.63	0.47	–1	1.04	–0.35	–0.46	–0.19	–0.43
4	0.15	–3.11	0.33	–0.82	1	–0.26	–0.39	–0.16	–0.4
5 (richest)	0.18	–2.82	0.26	–0.9	1.06	–0.18	–0.43	–0.15	–0.32
Average	0.14	–3.31	0.45	–0.94	1	–0.3	–0.42	–0.18	–0.36

Source: own calculation based on data from the Czech Statistical Office

tobacco products, and the government argued for this increase on the basis of the need for the additional government revenues in the light of the increasing government deficits. Excise duty on other tobacco increases from 2012 to 2013 and to 2014 from 1400 to 1635 and to 1800 CZK per kilogram. Table 5 shows the simulated changes in the quantity demanded.

The results of the distributional impact in Tables 4 and 5 correspond with the results for the current excise duties above. An increase in the cigarettes excise duties hits the third and fourth quintiles most hardly, whereas an increase in excise duties on other tobacco is borne much more by the poorer rather than the richer quintiles.

The majority of the European Union members (16 out of 27) levy a zero excise duty tax on wine, and the Czech Republic is one of them. When compared with the often heavy taxes on other alcoholic beverages, it is not surprising that the proposals to levy a non-zero excise duty on still wine (in contrast to sparkling wine, on which excise duty is levied) are regularly put forward.

Most recently, there was a proposal to introduce an excise duty of 10 Czech crowns per litre on wine in 2012, which, once again, proved unsuccessful. The proposal was rather complex in the sense that it had a number of exceptions, which I, however, ignore below when simulating the impact of this proposal; I assume instead that it would be levied on all wine consumed. I therefore simulate the impact of the introduction of an excise duty of 10 CZK per 1 litre of wine. Table 6 shows the resulting impact on households by their income quintiles.

The results show that a new excise duty on wine would have a similar distributional impact as the existing duties on other alcohol: the highest impact on the third and fourth quintiles and a lower and similar impact on both the poorest and richest quintiles.[4]

The information in Table 7 about the wine consumption sheds some additional light on the reasons behind the results in Table 6. Table 7 indicates that the richer household consume more litres of wine, spend more on wine in absolute as well as relative terms, and buy more expensive wine. So the estimated regressive impact of the excise duty on wine in Table 6 stems from the higher prices paid by the richer households and their overall higher expenditure. It also follows that any ad valorem excise duty would have a more progressive impact on Czech households than a specific excise duty on wine.

Table 7. Litres, unit value prices and other details of the monthly average wine consumption

	Litres consumed	Expenditures on wine (CZK)	Share of expenditures on wine in total expenditures (%)	Unit value price of a litre of wine (CZK)
1 (poorest)	0.76	49.35	0.45	80.84
2	1.15	83.52	0.58	91.04
3	1.52	110.29	0.64	93.19
4	1.75	140.7	0.67	96.39
5 (richest)	2.37	216.65	0.72	107.11
Average	1.51	120.07	0.61	94.24

Source: own calculation based on data from the Czech Statistical Office

[4]In fact, when we compare only the poorest quintile (–0.34) with the richest quintile (–0.32), the impact seems slightly regressive, but the difference is not significant at the standard significance levels.

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CONCLUSION

As long as the excise duties remain an important source of the government revenues, the analysis of their impact will remain an important area of applied research. In this article, I have used the Czech Statistical Office data and the previous estimates of the own- and cross-price and income elasticities for the individual households to estimate the impact of changes in excise duties on the households' demands in the Czech Republic. I have presented the estimated impacts of hypothetical 10 percentage point increases to each of the main excise duties. I have also evaluated some forthcoming or proposed changes including the unsuccessful 2012 proposal to introduce an excise duty of 10 Czech crowns per 1 litre on wine in the Czech Republic.

Although I expect increases in the excise duties in the light of the current pressure on the sustainability of public finances, the implication of this article is not to propose any changes to excise duties, but rather to recommend the evaluation of the impacts of any proposed changes in as a rigorous manner as possible. The use of the detailed microeconomic data and relevant elasticities, as applied in this article, should be considered a minimum for such evaluations.

Simulating all major excise duties together, as I have attempted, has a number of advantages such as a direct comparison of the impact of various excise duties, but the future research should be more selective and provide the Czech policy makers with more focused analytical tools, for example, for the simulation of each of the excise goods separately. The current analysis is very limited due to the low quality of data and when this is improved, the future research should include the simulation of changes in the government revenues. The areas for a further research also include the demand systems estimated specifically for excise duties in the Czech Republic. Demand systems with more narrowly defined expenditure categories would result into estimates of more detailed elasticities. These would enable the policy makers to reflect not only the price elasticity in a theoretically consistent way, but also with respect to the individual characteristics of each of the excise goods. A further research on the simulations of the government revenue should also answer questions such as how much do excise duties yield for the government directly from the excise duties, and how much indirectly from the VAT revenues.

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