CHANGES IN THE VAT BURDEN ON EXPENSES OF SELECTED HOUSEHOLDS IN THE CZECH REPUBLIC (2007–2014)

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Abstract

The Czech Republic is a typical representative EU Member State which has several times changed VAT rates during the analyzed period 2007–2014 in an effort to consolidate the public budget. These changes are reflected in household spending, which were analyzed by means of the consumer basket, the composition of which is also undergoing changes. Another factor that has an impact on household expenditures is the transfer of commodities between the reduced and standard rate of VAT. The final factor used is the differentiation of households according to their income levels. The aim of this paper is to determine how these changes took effect in the Czech Republic in the share of consumption of commodities included in the standard and reduced VAT rates and in exempt transactions according to household income groups in the analyzed period 2007–2014 and to determine the impact of these changes on the tax burden on selected households by value added tax and confirmation of the assumption of VAT regressivity.

Keywords

VAT Rates, Household Expenditures, Tax Burden, VAT Regressivity

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I. Introduction

Value added tax was introduced in the Czech Republic on 1 January, 1993. In the EU, VAT is the only permitted general tax on consumption and it is characterized as a general indirect non-duplicate turnover tax imposed on the final consumption of goods and services. Its development is significantly specific and it is very difficult to compare it with the history of other taxes – for more details, see Tait (1988), Cnossen (2003) or, from Czech authors, Kotlán, Machová (2012).

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Although VAT is the most harmonized tax in the EU, it gives the Member States sufficient flexibility in certain areas after imposing barriers (Zodrow, 2003). Especially in the case of the amount of rates, the Member States have a relatively large amount of freedom, beginning with Article 93 to Article 129 of the Council Directive 2006/112/EC of 28 November, 2006, on the common system of value added tax, only basic rules of VAT rates application are defined. These determine that services and goods are normally subject to the standard rate of VAT, which must not be lower than 15%. The Member States may also select either one or two reduced rates which must not be lower than 5% and these reduced rates can be applied only to a limited set of goods and services listed in Annex III of the VAT Directive (Eur-lex, 2006). The possibility of increasing the tax rate resulting from the existence of only a lower rate limit was also applied in the Czech Republic.

The issue of the amount of VAT rates is not a clearly resolved topic even in theory, e.g. Schenk, Oldman (2007). In the practice of the EU, after complex discussions (for more details, see Bogetić, Hassan, 1993), the basic VAT model was determined, which was a model with two types of tax rates – standard and reduced, with Denmark as the only Member State not applying a reduced rate aside from the standard VAT rate.

The specifics of VAT incidence in comparison to other types of indirect taxes are particularly visible on the different scope of price levels (for more details, see Šíroký, Střilková, 2015, p. 29–30; from recent literature, see Schenk, Thuronyi and Cui, 2015, p. 47–57).

One of the aims of this paper is finding how these changes have manifested in the Czech Republic in the share of consumption of commodities included in the standard and reduced VAT rates and in exempt transactions according to household income groups. Other goals are to determine the impact of these changes on the tax burden on selected households by value added tax and confirmation of the hypothesis of VAT regressivity. Each of these objectives will be analyzed for the period 2007–2014.

II. The development of basic factors affecting the research

Development of VAT rates

Most countries (e.g. Croatia, Cyprus, Czech Republic, Finland, France, Greece, Hungary, Portugal and Spain) chose a method of increasing VAT rates when solving the consequences of the economic crisis and striving to increase the revenue side of the state budget.

During the analyzed period 2007–2014, a total of 29 changes in the standard VAT rate were made and a total of 17 changes in the reduced VAT rate were carried out (see Appendix; for more details, see Schellekens, 2015). The largest increase in the analyzed period was recorded in the Czech Republic, at 10% (from 5% in 2007 to 15% in 2013).

Development of the consumer basket composition

The consumer basket is composed in order to express the structure of “hypothetical” household expenditures which cannot exist in practice because it would have to consume just the average expenditures of all households in the Czech Republic. Consumption expenditures are classified according to the CZ-COICOP “Classification of individual consumption by purpose”. The aim of the classification is to classify all kinds of individual

consumption (expenditures on goods and services) by purpose, with the first 12 divisions of the classification used for monitoring household consumption.

The consumer basket, according to the Czech Statistical Office (2014a), includes food goods, non-food goods and services sorted according to international classification into the following basic items: (01) Food and non-alcoholic beverages, (02) Alcoholic beverages, tobacco, (03) Clothing and Footwear, (04) Housing, water, electricity, gas and other fuels, (05) Furnishings, household equipment and routine household maintenance, (06) Health, (07) Transport, (08) Communication, (09) Recreation and Culture, (10) Education, (11) Restaurants and hotels, (12) Miscellaneous goods and services.

During the period examined, the consumer basket in the Czech Republic had four compositions. For the years 2007–2009, it was based on data from the Household Budget Survey (HBS) 2005, in the years 2010–2011, it was based on data from HBS 2008, in the years 2012–2013, it was based on data from HBS 2010, and in the year 2014 it was based on data from HBS 2012. The weights of individual items in the consumer basket are illustrated in Table 1.

Table 1: Composition of the consumer basket in the period 2007–2014

COICOP classification	The categories of the consumer basket	Weight 2007–2009	Weight 2010–2011	Weight 2012–2013	Weight 2014
01	Food and non-alcoholic beverages	162,63	170,33	149,82	170,82
02	Alcoholic beverages, tobacco	81,72	85,99	96,01	94,98
03	Clothing and Footwear	52,43	47,21	35,93	32,87
04	Housing, water, electricity, gas and other fuels	248,29	253,40	280,35	265,63
05	Furnishings, household equipment and routine household maintenance	58,06	55,19	57,97	61,14
06	Health	17,86	25,00	23,07	23,76
07	Transport	114,10	114,89	105,01	101,33
08	Communication	38,73	39,88	36,08	30,58
09	Recreation and Culture	98,66	93,68	90,38	87,60
10	Education	6,18	7,77	7,78	7,41
11	Restaurants and hotels	58,39	44,26	48,56	55,57
12	Miscellaneous goods and services	62,96	62,40	69,03	68,30

Source: Czech Statistical Office (2015)

Development of household expenditures

In order to achieve the research objective, it was also necessary to determine the development of hypothetical household expenditures and expenditures of households in classification according to the level of net income which, of course, includes expenses including VAT.

Development of hypothetical household expenditures

The development of total annual expenditures of a person who is part of a hypothetical household in the analyzed period is shown in Table 2.

Table 2: Development of the hypothetical household expenditures (in CZK per person)

Year	Expenditures	Year	Expenditures
2007	104 017	2011	117 882
2008	112 256	2012	118 819
2009	115 309	2013	120 827
2010	116 244	2014	122 049

Source: Czech Statistical Office (2015)

Development of household expenditures by net income level

The development of total annual expenditures of households classified by net income level (so-called deciles) in 10 categories is illustrated in Table 3. Columns represent expenditures from the lowest 10% to the highest 10% of households in the Czech Republic for the seven-year period. Each data in Table 3 is recalculated to show the average per person and does not represent the expenditures of whole households for the reason that a different number of household members would not misrepresent the data.

Table 3: Development of household expenditures by net income level (in CZK per person)

	1	2	3	4	5
2007	62 775	75 845	85 053	94 728	93 719
2008	67 344	83 522	93 244	99 651	105 893
2009	68 046	86 358	94 045	103 300	107280
2010	69 761	87 588	99 756	104 584	109 387
2011	64 518	87 847	99 414	107 554	116 493
2012	69 284	88 673	100 005	109 855	113 652
2013	70 332	89 724	100 486	110 538	118 864
2014	72 593	91 616	103 096	110 718	119 881
	6	7	8	9	10
2007	108 629	115 564	131 294	143 713	183 048
2008	112 248	123 723	136 015	159 070	198 964
2009	117 742	122 601	140 265	166 338	211 486
2010	117 444	127 907	143 121	160 882	206 350
2011	120 927	136 701	145 572	165 165	212 950
2012	122 850	134 386	148 446	163 690	203 601
2013	124 922	133 952	150 298	166 494	217 291
2014	125 086	134 689	148 680	173 815	208 814

Source: Czech Statistical Office (2015)

III. Methodology and Data

The authors work with the research assumption that the government, in an attempt to reduce public budget deficits deepened by the economic crisis uses as a tool, inter alia, VAT rates. This increase must thereafter necessarily be reflected in household spending. When determining absolute household expenditures on VAT, it is necessary to include not only the changes in the VAT rate in analyses, but also the changes in the individual segments of the consumer basket in terms of the proportion of the burden by the standard

rate, reduced rate and transactions exempt from VAT, the potential shift of commodities and other relevant factors, particularly any revision of the consumer basket itself.

The authors also work with the simplified assumption that the change in the VAT rate will be reflected in the change of consumer product prices. However, they are aware that the reducing of VAT rates does not necessarily lead to changes in the prices of consumer products.

The methodology of the research can be represented by equation (1).

$$\Delta CE_{VAT} = f(\Delta R_{VAT}, \Delta Ch_{VAT}, \Delta C, \Delta CB, \Delta O), \quad (1)$$

where ΔCE_{VAT} is the change of the selected household expenditures on VAT in the analyzed period, ΔR_{VAT} is the change of tax rates, ΔCh_{VAT} is the change arising from the transfer of commodities between the reduced and standard rate, ΔC is the change of cash expenditures, ΔCB is the change of the consumer basket and ΔO is the change of other factors (e.g. the marginal propensity to savings) from which the authors abstract.

No advanced econometric methods are used in this paper. The authors examine the field of research from the hard data collected by the CSO through questionnaires and from the authors' own calculations. Analytic-synthetic methods were used to achieve the objectives. In the introductory part of the research a comparative method was used, which was used in the study of the legislation of the EU and the Czech Republic, in the next part the effects of changes in tax expenditures were evaluated using comparison, description, deduction and the following synthesis.

All data necessary for research (sorted in Tables 1 to 3) were obtained from the HBS, which monitors the management of private households and provides information on expenditure and the consumption structure of a range of household types (see Czech Statistical Office, 2014b). Information about differences in consumption of households classified by various aspects or on impacts of various factors on expenditure structure and consumption behaviour of households cannot be received from sources other than from the HBS, as obtained by the Czech Statistical Office.

The composition of the reporting sample of the HBS flexibly changes to cover current changes in basic household attributes, such as its composition, economic activity, income level, etc. The HBS is the only trustworthy source of information on household expenditures in relation to household incomes.

HBS-reporting households (3000) are selected by means of purposive quota sampling, when the sample unit and a reporting unit is a private household, i.e. a group of people living together on a common budget (food, routine maintenance costs, housekeeping, etc.). Every reporting household of the HBS keeps detailed records of expenditures on food and non-alcoholic beverages for a period of two months per year and in the remaining 10 months only the total expenditure on purchasing these products is reported.

For the classification of consumption expenditures in the HBS, classification CZ-COICOP has been used for seventeen years.

All calculations were performed in an Excel spreadsheet. Due to the required extent of the paper, it is not possible to indicate here the summary tables with calculations (for each of the analyzed eight-year periods, the authors worked with 11 tables describing household

expenditures on items of the consumer basket, which includes 730 items). Requests for detailed calculations can be sent to the authors' email addresses, and the methodology is also described in more detail in the previous authors' research, i.e. Šíroký, Střilková, Bánociová, Zlaczka (2014) and Šíroký, Střilková (2015).

IV. Results

To determine a ratio of individual items according to the criteria for their inclusion in the standard tax rate, reduced tax rate and in the tax exempt section of the total consumer basket, it was necessary to assign the applicable VAT rates to the individual items of the consumer basket.

This procedure is shown by equations (2) to (4).

$$RR_{\%} = 01 + 04_r + 05_r + 06_r + 07_r + 09_r + 11_r + 12_r \quad (2)$$

$$SR_{\%} = 02 + 03 + 04_s + 05_s + 06_s + 07_s + 08_s + 09_s + 11_s + 12_s \quad (3)$$

$$EXM_{\%} = 04_{1-(r+s)} + 06_{1-(r+s)} + 07_{1-(r+s)} + 08_{1-(r+s)} + 09_{1-(r+s)} + 10 + 12_{1-(r+s)}, \quad (4)$$

where $RR_{\%}$ represents the proportion of commodities in the consumer basket subjected to the reduced tax rate, $SR_{\%}$ illustrates the ratio of commodities in the consumer basket subject to the standard tax rate. $EXM_{\%}$ reflects the proportion of consumer basket items that are exempt, r is the reduced rate of tax, s is the standard rate of tax, and numbers 1 to 12 are the corresponding items of the consumer basket according to commodity classification by purpose, as explained above.

The results obtained by equations (2) to (4) for each year of the analyzed period are illustrated in Table 4.

Table 4: Percentage composition of the consumer basket according to the VAT rate

	2007	2008	2009	2010	2011	2012	2013	2014
EXM	17,39	17,39	17,39	18,74	18,74	19,83	19,83	18,20
RR	28,35	28,42	28,84	29,21	29,21	27,63	27,37	29,08
SR	54,26	54,19	53,77	52,05	52,05	52,54	52,78	52,72

Source: Own calculations

Table 4 shows that the largest share of hypothetical household expenditures is for commodities taxed at the standard rate and that the lowest share of expenditures is for goods and services exempt from VAT. This fact is constant practically throughout the whole period; values expressed in a percentage achieve the maximum difference of 2%. Surprisingly, the ratio of expenditures on transactions exempt from VAT is relatively high.

In the next step, absolute values of a hypothetical household expenditures and expenditures of households according to their net income with a definite type of VAT rate (RR, SR, EXM) were calculated, as illustrated by Figure 1, Figure 2 and Figure 3.

Figure 1: Expenditures on goods and services according to household net income imposed by reduced VAT rate

Source: Own calculations

Figure 1 illustrates the development of household expenditures of 10 types of household according to net income and hypothetical household expenditures on goods and services taxed according to the reduced VAT rate. The first and tenth decile and a hypothetical household as an imaginary centre are more clearly marked. Figure 1 indicates that the growth of expenditures on goods and services loaded with reduced rate of VAT is more appreciable for higher income groups of households. Due to the short analyzed period, this trend is not so noticeable.

Figure 2: Expenditures on goods and services according to household net income imposed by standard VAT rate

Source: Own calculations

Figure 2 shows the development of household expenditures of 10 types of household according to net income and hypothetical household expenditures on goods and services taxed at the standard VAT rate. The first and the tenth decile and a hypothetical household as an imaginary centre are also more clearly marked here. Figure 2 indicates that the highest income group of households (the tenth decile) shows greater fluctuation during the monitored period. Therefore it cannot be stated (as with the reduced VAT rate) that the growth of expenditures is more appreciable for the higher income groups of households.

Figure 3: Expenditures on goods and services according to household net income exempt from VAT

Source: Own calculations

Figure 3 shows the development of household expenditures of 10 types of household according to net income and hypothetical household expenditures on goods and services exempt from VAT. The first and tenth decile and a hypothetical household are also marked more clearly in this figure. Figure 3 indicates that the growth of expenditures on goods and services exempt from VAT is steeper for higher income groups of households. Figure 3 also shows a surprising location for hypothetical household expenditures, as an imaginary centre, when it is not placed between the fifth and the sixth decile, as is assumed.

V. Conclusion

The subject of the research was concretised in terms of the VAT rate changes and their reflection on changes in the prices of the consumer basket in the Czech Republic; however, this methodology and the methods used may also be applied in other countries and can be used for international comparison in the area of VAT incidence. Value added tax is, in a period of economic crisis, also used as a tool of economic policy, with changes in VAT rates particularly being used by Member States as an instrument to help lower the public budget deficit. During the period monitored, a total of 27 amendments were made to the Value Added Tax Act of the Codes of the Czech Republic (2014), out of which six changes in VAT rates (two to the standard rate and four at a reduced rate) were made. Since VAT is included in the price of goods and services purchased by a consumer who pays the tax in the total price of a purchase, this tax also burdens the consumption of goods and services purchased by households (James, Nobes, 2010). The impact of changes in

VAT rates as a consumption tax is different when compared to changes in direct taxes (for more details, see Nerudová, Šíroký, 2010).

The assumption of VAT regressivity was confirmed. Households with higher net income spend significantly higher expenditures on purchasing goods and services subjected to the reduced VAT rate and on commodities exempt from VAT in comparison with households with lower income. This fact is not very noticeable for expenditures on commodities subject to the standard rate of VAT.

The authors are aware of the limitations of their research, mainly in terms of the seven-year length of the period analyzed and the exclusion of other influences, e.g. Kolář, Vítek, Pavel et al. (2005); nevertheless, the results obtained and the expected follow-up research may serve as information for actors of economic policy as well as a contribution to the theory of tax incidence. The conclusions could also trigger unceasing debate on current issues in the whole system of VAT (see Eur-lex, 2010).

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Appendix

Dates	Reduced Rate	Standard Rate
Austria		
1. 1. 1995	10	20
Belgium		
1. 1. 2000	6 12	21
Bulgaria		
1. 1. 2007	7	20
1. 4. 2011	9	20
Croatia		
1. 1. 2006	10	22
1. 8. 2009	10	23
1. 3. 2012	10	25
1. 1. 2013	5 10	25
1. 1. 2014	5 13	25
Cyprus		
1. 8. 2005	5 8	15
1. 3. 2012	5 8	17
14. 1. 2013	5 8	18
13. 1. 2014	5 9	19
Czech Republic		
1. 5. 2004	5	19
1. 1. 2008	9	19
1. 1. 2010	10	20
1. 1. 2012	14	20
1. 1. 2013	15	21
Denmark		
1. 1. 1992	–	25
Estonia		
1. 1. 2000	5	18
1. 1. 2009	9	18
1. 7. 2009	9	20
Finland		
1. 1. 1998	8 17	22
1. 10. 2009	8 12	22
1. 7. 2010	9 13	23
1. 1. 2013	10 14	24
France		
1. 4. 2000	2.1 5.5	19.6
1. 1. 2012	2.1 5.5 7	19.6
1. 1. 2014	2.1 5.5 10	20

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Dates	Reduced Rate	Standard Rate
Germany		
1. 1. 2007	7	19
Greece		
1. 4. 2005	4.5 90	19
15. 3. 2010	5 10	21
1. 7. 2010	5.5 11	23
1. 1. 2011	6.5 13	23
Hungary		
1. 9. 2006	5	20
1. 7. 2009	5 18	25
1. 1. 2012	5 18	27
Ireland		
1. 1. 2005	4.8 12.5	21
1. 12. 2008	4.8 12.5	21.5
1. 1. 2010	4.8 12.5	21
1. 7. 2011	4.8 9 13.5	21
1. 1. 2012	4.8 9 13.5	23
Italy		
1. 10. 1997	4 10	20
17. 9. 2011	4 10	21
1. 10. 2013	4 10	22
Latvia		
1. 5. 2004	5	18
1. 1. 2009	10	21
1. 1. 2011	12	22
1. 7. 2012	12	21
Lithuania		
1. 1. 2001	5 9	18
1. 1. 2009	5 9	19
1. 9. 2009	5 9	21
Luxembourg		
1. 1. 1993	3 6	15
Malta		
1. 1. 2004	5	18
1. 1. 2011	5 7	18
Netherlands		
1. 1. 2001	6	19
1. 10. 2012	6	21
Poland		
4. 9. 2000	3 7	22
1. 1. 2011	5 8	23

Continued on next page

Dates	Reduced Rate	Standard Rate
Portugal		
1. 7. 2005	5 12	21
1. 7. 2008	5 12	20
1. 7. 2010	6 13	21
1. 1. 2011	6 13	23
Romania		
1. 1. 2004	9	19
1. 12. 2008	5 9	19
1. 7. 2010	5 9	24
Slovak Republic		
1. 1. 2007	10	19
1. 5. 2010	6 10	19
1. 1. 2011	10	20
Slovenia		
1. 1. 2002	8.5	20
1. 7. 2013	9.5	22
Spain		
1. 1. 1995	4 7	16
1. 7. 2010	4 8	18
1. 9. 2012	4 10	21
Sweden		
1. 1. 1996	6 12	25
United Kingdom		
1. 9. 1997	5	17.5
1. 12. 2008	5	15
1. 1. 2010	5	17.5
4. 1. 2011	5	20

Source: European Commission (2015)