

# Distribution of the increased tax burden for agricultural products and food in the Czech Republic

PETR DAVID

*Faculty of Business and Economics, Mendel University in Brno,  
Brno, Czech Republic*

**Abstract:** The article determines the transfer rate of tax burden to the buyers of agricultural products and food consumer in the most recent major change in the reduced rates of value added tax in the Czech Republic in late 2007 and 2008. At the same time, it identifies the size of the portion of the increased tax burden which agricultural producers and sellers of food carry, after the increase in the reduced rate of VAT in the Czech Republic. The possible future changes in this field are considered on the basis of determining the values of the distribution of the increased tax burden. It also includes the determination of the indicator of change in the selling prices of agricultural products and food in the increase of the reduced rate of VAT in the Czech Republic. In 2008, the buyers of agricultural products carried a considerable part of the increased tax burden and food buyers were burdened by significantly more than just by an increased tax burden of the reduced rate of the value added tax. The growth in prices of agricultural products in the given period corresponded to the growth of the tax burden. Food prices doubled compared to the increase in the tax burden. These results should be considered when planning future changes in the field of the rates of VAT in the Czech Republic.

**Key words:** tax burden, value added tax, agricultural products, food

Transfers and the impact of the tax burden belong to the key issues and research questions as the theory of public finance, and empirical research (Svátková et al. 2007). The examination of tax incidence is very important because the transfers of the tax burden significantly modify the original goals of tax policy (Boněk et al. 2001). The identification of the impact of tax burden is essential in the frame of tax incidence. Economists use the term tax burden just to determine who actually pays the taxes imposed by the law (Stiglitz 1997). The analysis of impact therefore examines the distribution of tax burden in the society.

Taxes fall on the entities in two ways, which should be distinguished. In addition to the legal tax impact, where this liability is imposed to the entity by law, there is the real or effective impact of the tax, also called the economic incidence (Musgrave and Musgrave 1994). The legal effect is relevant in the terms of the tax practice, therefore from the liability of the taxpayers to fulfil the liabilities resulting from the tax laws.

Taxes are mandatory payments and if the entity is forced to pay them, then at least he/she is trying to transfer this liability to someone else. It is clear that the final tax burden is carried by individuals, therefore, business owners, employees, consumers of goods or services, or owners of production factors

and consumers of other goods and services, whose modified buying and selling behaviour affects other elements of the economic cycle (Kubátová 1996). Companies are transferring the tax burden and it is difficult to determine the real impact of this phenomenon (Devarajan et al. 1980). There are many different approaches and attempts to determine these effects, which differ in their methodology in terms of both belief and in terms of output needs. This is not a mistake, but instead it is a better state, which is based on the studies than on random decisions on tax policy (Devarajan et al. 1980).

The tax trend to move from direct taxes and to concentrate on the indirect ones increased the importance of the VAT (Bánociová 2009). Value added tax is an indirect tax; therefore it is levied by one taxpayer, but paid by the other taxpayer in the price of product or service. The tax is imposed on the flow quantity, specifically on the added value. Value added tax is also a tax in rem setting ad valorem. Taxes in rem are paid regardless of the solvency of the taxpayer and the ad valorem tax is determined by the price of the taxed basis. Its amount is determined on the tax basis in monetary units, usually a percentage (Široký et al. 2008). Value added tax is collected at each stage of economic activity from the value that

Supported by the Ministry of Education, Youth and Sports of the Czech Republic (Project No. MSM 6215648904).

was added within its framework. However, it is not part of the cost, with the exception of costs of the final consumer. This tax is directly proportional to the price of the product or service.

Value added tax is, in terms of its features, an unsurpassed tax on consumption, although it has some negatives. The technique of collection of this tax allows determining the tax paid at the each stage of processing and due to its properties, it is very suitable for application in the international trade. It is therefore important to ensure a sufficient clarity, transparency and equal treatment for players from the European Union by creation and modifications of the rules of the value added tax set at the EU level and within the European Union countries (David 2009).

In the Czech Republic, there are applied two rates of the VAT, there is a basic and a reduced rate, which is imposed on the selected goods and services. Due to the efforts for the future growth of the reduced rate of the value added tax in the Czech Republic, it is appropriate to examine similar cases that occurred in the past and to assume, on this basis, the shares of distribution of the potential increase of the tax burden on entities in the market, because the real impact does not have to correspond to the legal impact.

The aim of this paper is to lay down the values of the distribution of changes in the tax burden between the producers of commodities of livestock and plant production, the buyers of these commodities, then between food sellers and their consumers in the Czech Republic in the recent major change in the reduced rate of the value added tax in 2008, and also to identify the rate of growth in prices of food after the introduced change. On this basis, it is then possible to deduce more about the impact of other anticipated changes in rates of the value added tax in the Czech Republic.

## MATERIAL AND METHODS

The distribution of the increased tax burden of the value added tax will be determined on the basis of the identification of impacts of the recent major change of the reduced tax rate that took place in the Czech Republic by 1<sup>st</sup> January 2008. By comparing selling prices of the selected commodities before and after the change in rate, there can be identified the impact on the producers of commodities of livestock and plant production, the buyers of these commodities, food sellers and their consumers. Selected items include all products included in the consumer basket by the Czech Statistical Office with the complete price documentation in the reference period from October

2007 to March 2008, such as slaughter animals, cereals, milk, eggs, fruit or vegetables, and in the frame of food, again all items included in the consumer basket by the Czech Statistical Office with the complete price documentation in the reference period, such as meat, meat products, milk, milk products, bread, other flour products, fruits or vegetables.

Standard methods of scientific work were used in processing of this topic. The method of analysis is applied to identify the characteristics of the investigated phenomena; the method of synthesis is used in the final sections of the text in order to formulate structures of unifying character. It was also necessary to apply the method of description to describe the present state of this issue and other facts and events so that a substantial connection could be created on the basis of processing and evaluation of the relevant data. There were also used methods of induction and deduction. These methods allowed to generalize the observed findings and to formulate the generally applicable principles.

Through these methods and selected data, it is possible, except the simple distribution of the increased tax burden, to identify the indicators with a different explanatory power by the progressive elimination of unlikely consequences of the increase in the tax burden. Furthermore, it is possible to confront the introduced examination with simple results of the average change in prices of food again including the elimination of the unlikely consequences of increasing the tax burden.

## RESULTS

The distribution of the tax burden, thus resulting in tax incidence, depends on the initial imposition of the tax, on rates, on the definition of the tax base and on other factors. The economic incidence in its final effect depends mainly on the response of the economy. Factors affecting the tax transfer and impact are the particular elasticity of supply, demand elasticity and the nature of the market.

In a competitive market, the price of sold goods, and thus the transfer tax rate, is determined by the curves of supply and demand. Producers of goods and providers of services have some ability to change the production capacity in the market. There are sectors in which it is relatively easy to flexibly change the amount of the produced quantity, but in other sectors it is just the opposite. The elasticity of supply approaches infinity in the sectors where producers can immediately switch their production to another field. The elasticity of supply is also high in sectors

where there are minimal barriers to entry and exit the market, and thus the ability to quickly respond to the changing market demand. During the reduction of production, it is possible to raise prices and thus to transfer the tax increase to consumers.

Goods and services can be distinguished according to the elasticity of demand. If demand elasticity is low, then the buyer requires the same amount almost regardless of price. In contrast, when there is a high elasticity of demand, the requested amount by buyer is very sensitive to the price of goods and it changes significantly with its amendments. Low elasticity of demand is characteristic mainly for the goods of basic living needs. However, there are differing views on the taxation of goods. The imposition of taxes on food and other basic necessities is in the long-term criticized.

Generally, it can be said that the price rise will be higher in the high elasticity of supply and in the low demand elasticity. At the same time, the decline in production will be the lower; the less elastic will be demand and supply.

Besides the already described factors influencing the tax incidence, there are other determinants of tax transfers and impacts. These are mainly the importance of the taxed market, the openness of the economy and the time factor. Time factor is related to the elasticity of supply and demand. In the short term, demand and supply is inelastic. In the very long term, when all inputs become variable, demand and supply is elastic. From the above, we can deduce that shortly after the introduction of tax, the tax burden would be by the entity required to pay tax under the law. However, due to the fact that it is appropriate to manage tax payers in advance, the subjects can respond to these changes at the moment of their introduction, or even earlier.

Given that markets are not closed systems, but significantly related parts of the economy, the taxation of one market logically affects also other markets. The factor of openness of the economy is closely linked to the already identified factors of the elasticity of supply and demand which are increasing with the openness of the economy. Time factor is also associated with the elasticity of supply and demand. In the short term, supply and demand are inelastic. In the very long term, when all inputs become variable, supply and demand are elastic. The more the situation on the taxed market is away from perfect competition, the more difficult is to set the overall impact of tax (Široký et al. 2008).

From this we can deduce, shortly after the introduction of tax, that only the entity liable to pay the tax under the law should carry the tax burden. However, it is appropriate to inform taxpayers about tax changes

in advance, so that the entities can respond to these changes already at the moment of its introduction, or even earlier. This for example can lead to price increases before the actual introduction of the tax. This effect is called the notification effect of tax.

In the case of excise taxes, it is assumed that the entire tax is carried by consumers, or that the tax will be distributed between the consumer and producer (Svátková et al. 2007). In the incidence analysis, there is used the assumption of the transfer of tax burden to consumers between 80% and 100%. Analyses are based on the assumption that only changes in taxes lead to price change, while it is necessary to note and interpret the other factors influencing the price. For example, in a broader perspective Manente and Inflammation (2010) demonstrated that the reduction rate of the VAT may cause a reduction in unemployment. On the other hand, the tax reduction is not fully captured in the price reduction (Bahl et al. 2002).

The basic motive of the authors of the publications dealing with finding the optimal tax system is discovering simple rules which the tax policy-makers could follow (Bradford and Rosen 1970). There are two approaches to determining the tax burden in the incidence analysis. Either the tax burden assigned to each entity is derived on the basis of some selected assumptions about the transfer tax, or the behaviour of the entities on the side of supply and demand is specified in the general equilibrium model and then calculated the final tax burden for the individual entities. Measuring of tax transfers and impacts is difficult as to the quantity and quality of the input data.

It is suitable to measure the tax impact at the time of the change of tax by identifying changes in consumer prices, the quantities of consumed goods and the development of these indicators over time so that the changes in tax rates on consumption generally reflect into consumer prices or respectively to state during the imposition of the taxes on consumption or during the increase of their rates implies that this fact will be somehow reflected into consumer prices.

The taxation of consumption through the value added tax is preferred over the taxation of income mainly due to the low susceptibility to fraud due to the mechanism of determining the tax liability of the individual entities. . On the other hand, a more progressive income tax policy could offer a stabilizing alternative. It could result in more revenue, more countercyclical policy, and more income equality and thus a more stable demand growth (Weller and Rao 2010). Value added tax is transparent in the terms of the possibility to determine the tax burden of a product at any stage of its production. Nevertheless, some countries show a weak resistance of this tax to

evasion, when there is improperly used the claim to tax deduction on export (Kubátová 2010). Value added tax meets the basic requirement imposed on the tax system – it is neutral. It allows excluding production inputs in the taxation of consumption, it does not favour products with low levels of processing, and thus it does not contribute to the pressure for vertical integration as a turnover tax (Široký et al. 2008). The taxpayer imposes by the value added tax only that portion of value which he himself/herself added to a product or service. The so-called double taxation, however, in some cases still occurs. It is possible to tax almost all services more effectively by the value added tax compared to the turnover tax. It is also favourable in terms of international trade, because its mechanism allows not to tax exports; and thus to remove the existing distortion. This tax, unlike the direct progressive taxation, does not distort the labour market, it does not directly affect the amount of savings and it is relatively less demanding for the necessary administration. De Mello (2010) found, that the VAT efficiency rises the lower is the VAT rate, the lower is the share of administrative costs in the tax revenue, the more pro-competition is the regulatory framework in product markets and the better are the country's governance indicators.

The principle of the absolute neutrality of the VAT is often in the EU countries distorted by a higher number of tax rates, the Czech Republic is not exception. Regardless it, Jensen and Wanhill (2002) say that a more efficient and equitable economic solution would result from cutting the VAT. Tax burden of goods and services of the basic living needs should be reduced by the differentiation of rates. However, socially disadvantaged groups and populations with high income levels equally contribute to the consumption of these commodities. Boeters et al. (2010) point out, that in the tax policy debate, the differentiation of value-added taxes is often justified by distributional concerns. Their quantitative analysis for Germany indicates that such concerns are misplaced. A significant variance in the rates of the value added tax leads to the distortion of price relationships, substitution effects and thus distortions (Široký et al. 2008). This is in addition to the dominant tax reason a source of the current efforts to unify the rates of the value added tax in the Czech Republic or their convergence. This unification or convergence will particularly affect the reduced rate of the value added tax, which would quite significantly increase under the current proposals. Slintáková and Klazar (2010) found, that the Czech VAT is regressive when the annual income is analysed, while the lifetime income analysis indicated that the VAT is progressive. Under the assumptions of fixed

coefficients and inelastic demand, the VAT as well as the corporation income tax will be neutral. Only the VAT, applied to every industry at equal rates, will not affect the relative factor and commodity prices (Bhatina 1982). Tax policy in the field of the reduced rates of the value added tax should be very sensitive and have a maximum amount of information about the development of the distribution of the tax burden on the entities in the market. Lazarev and Pleshchinskii (2003) have shown that increased tax rates may result in greater price volatility in the economy.

The object of research is the proportion of the legal impact of the increase in tax burden carried by the agricultural producers of food ingredients, buyers of raw materials, traders selling food and ultimately the final consumers. It is generally considered that the agricultural businesses are highly dependent on the commercial food chain, including the transfer of risks arising from the growth in input prices. In 2008, there was a growth of the reduced rate of the VAT in the Czech Republic from 5% to 9%. Under this change, there can be identified a change of the tax burden carried by those entities in the market of food and raw materials. From these results, it can be concluded about the impact of the supposed increase in the examined rate of the value added tax in the Czech Republic. There was a further growth of the reduced rate of the VAT in the Czech Republic in 2010, but it was only an insignificant 1% increase. It should also be noted that the objective of this study is not to determine the increase in the cost of living of inhabitants, thus working with different groups of income of the population and their consumption baskets. This analysis is provided for example by the study of Dušek and Janský (2010). Smart and Bird (2009) found, that while Canadian provinces replaced the retail sales taxes with the value-added taxes, the effects of this tax substitution on consumer was small, albeit perhaps somewhat regressive.

Prices of raw materials and food are identified in the period before the change of the reduced rates of the value added tax and after the change of this rate since January 2008. Consumer prices of commodities in October, November and December 2007 are considered as starting. Prices of the given commodities in January, February and March 2008 are considered as compared. Selection of the period of the exploration of prices was made with regard to the date of the change of the reduced rate of the value added tax, to the possibilities of a gradual inclusion of the increased tax burden by sellers into the prices and also with regard to the need to include only a short period of time with regard to the occasion of the potential effects of other price factors.

Table 1. Distribution of tax burden of producers and buyers of agricultural products in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Buyers	59	24	34	107	64	94	104	57	95
Producers	41	76	66	-7	36	6	-4	43	5

Source: author's calculation, CSO (2007, 2008)

The Czech Statistical Office (CSO 2007, 2008) disposes of complete information about prices for the period October 2007 to March 2008 for the total of 36 products of plant and livestock production. Presently, the Czech Statistical Office (CSO 2007a, 2008a) has complete information about prices for October 2007 to March 2008 for the total of 53 kinds of food. Prices are quoted without the VAT. The following tables show the calculated values of the rate of tax transfer gradually for the months January, February and March 2008 with regard to the months of October, November and December 2007.

The relative impact on buyers<sup>1</sup>, respectively on consumers, and producers<sup>2</sup>, respectively sellers, can theoretically reach the values from minus infinity to infinity. This value is calculated by dividing the absolute change in the price of the product or food<sup>3</sup> in the compared months and the absolute change in the amount of the value added tax in the price of the product or food<sup>4</sup> in the compared months, which is defined as the difference between the value added tax calculated by the coefficient for a 5% rate of price including tax<sup>5</sup> in the month before the change of the rate of the value added tax and the value added tax calculated by the coefficient for the 9% rate of price including tax<sup>6</sup> in the month after the change in the rate of the value added tax. The months are in the following tables marked by the serial numbers of the

year, when the months 10, 11 and 12 are the months in 2007 are 1, 2 and 3 are the months in 2008.

Producers of plant and livestock production transferred to the buyer of raw materials in average 71% of the increased tax burden, they carried themselves, therefore, 21% of that burden. It is therefore a kind of a standard transfer of the tax burden, when the seller and also the buyer carry some portion of the tax burden. One can identify two cases when there was transferred the buyer more than 100% of the increased tax transfer by the detailed look at the values of rate of the tax transfer in Table 1. In both cases, there is a price comparison to January 2008. Values of the tax transfer are rather dramatically lower in other months of 2008. The effect of the time factor, and thus the gradual mainstreaming of tax changes, can be identified particularly when comparing the values of distribution of the increased tax burden in January and February against the surveyed months of the previous year.

So far there have been identified and analyzed the impacts of the increased tax burden on producers and buyers of the commodities of livestock and plant production in the Czech Republic. The question is whether we find similar values also in the case of the sellers of food made from the products of agricultural producers and final consumers of food.

A simple average impact from the mentioned comparisons of the relevant months on the consumers

Table 2. Distribution of tax burden of sellers and consumers of food in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Consumers	180	162	169	166	150	152	163	145	146
Sellers	-80	-62	-69	-66	-50	-52	-63	-45	-46

Source: author's calculation, CSO (2007a, 2008a)

$$^1I_B = \Delta P / \Delta T$$

$$^2I_P = (\Delta T - \Delta P) / \Delta T$$

$$^3\Delta P = P_1 - P_0$$

$$^4\Delta T = T_1 - T_0$$

<sup>5</sup> $P_0$  is the value added tax calculated by the coefficient for 5% rate of price including tax.

<sup>6</sup> $P_1$  is the value added tax calculated by the coefficient for 9% rate of price including tax.

Table 3. Distribution of tax burden of producers and buyers of agricultural products with the exclusion of unlikely values in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Buyers	135	132	152	120	119	135	110	105	118
Producers	-35	-32	-52	-20	-19	-35	-10	-5	-18

Source: author's calculation, CSO (2007, 2008)

of food was identified at 159%; the impact on selling was therefore -59%. The corresponding increase in the tax burden is therefore entirely carried by the consumers. The sellers transferred on consumers by 59% more than was the increase in the tax burden and thus they even theoretically earned on the increase in the tax burden.

The values of the rate of the tax transfer on consumers identified in the Table 2 varied between 150% and 180%. The difference of the rate of the tax transfer in the shortest period (December 2007 and January 2008) and the longest analysis period (October 2007 and March 2008) is only 6%, so it is not so important. Generally, however, it is possible to observe the decline in values of the tax transfer in the surveyed time period. The time factor thus rather works the other way than it might be expected, so that the rate of the transfer of the tax burden should increase with the elapsed time since the legal change in the rate of the value added tax.

It is possible to modify the examined values of the tax transfer so that the results have from certain aspects a higher explanatory power and would not contradict the logic of the transfer of the tax burden. In Table 3 and 4, there are thus the values of the distribution of the tax burden adjusted so that the buyer or respectively the consumer should carry no more than 100% of the increased tax burden. At the same time, the producer or seller can carry a minus infinity to 100% of the increased tax burden. This means that we do not expect the reduction of the price of that commodity and food with regard to an increase in the tax burden. The reduction of prices of some commodities and food in the surveyed period must be therefore attributed to other than non-fiscal effects.

It was found out by the above mentioned modification of input values by calculations based on the logic of the tax transfer, that producers of livestock and plant products transferred on buyers of these products more than just the increase in the tax burden, namely an average of 125% of that burden. Producers of plant and livestock production themselves did not carry any part of the tax burden, conversely their sales increased by another 25% from the increased burden of the VAT.

From Table 3, it is obvious that the rate of transfer of the tax burden is increasing over time, mainly during the month of March compared with the January and the February values. On the contrary, the values of the tax transfer are declining over time in 2007.

Based on the results of the examinations of tax transfers from the non-modified data, it can be suggested that even in the case of the adjusted data, the values of the rate of the tax transfer will be higher for consumers than in the case of buyers of agricultural products. This situation is illustrated in Table 4.

By purifying the rate of the tax transfer on the consumer of food of the unlikely values, we get the results of the transfer of tax burden again more important, namely an average of 184%. The impact on the seller is then - 84%. After making the modification, it is again clear that the entire tax burden is carried by the consumer; the seller does not carry any part of the increased tax burden. On the contrary, this situation can be interpreted that the seller quite significantly profits on the increased tax burden.

The identified values of the tax transfer on consumers, according to the data in Table 4, range from 166% to 208%, whereas over time in 2007 the rate of the transfer is reducing and with regard to the individual months of 2008, it appears to be de facto independ-

Table 4. Distribution of tax burden of sellers and consumers of food with the exclusion of unlikely values in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Consumers	200	208	205	178	186	178	169	171	166
Sellers	-100	-108	-105	-78	-86	-78	-69	-71	-66

Source: author's calculation, CSO (2007a, 2008a)

Table 5. Distribution of tax burden of producers and buyers of agricultural products with the exclusion of extreme values in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Buyers	73	61	64	79	68	71	80	63	65
Producers	27	39	36	21	32	29	20	37	35

Source: author's calculation, CSO (2007, 2008)

ent. The time factor, even after the modification of the observed values of the rate of the tax transfer, has rather the opposite than the well-known features. That is not true when comparing the shortest and the longest studied period, when the transfer was in the short period by 36% lower than in the long run.

Another condition set out in the calculation of the values of distribution of the increased tax burden is the possibility to transfer this burden by producers and sellers on buyers and consumers only in the range from 0% to 100%. It eliminates the possibility that the seller or consumer can earn on the increase in the tax burden. Extreme values less than zero and more than one hundred percent are attributed to other than the fiscal effects. Producers and buyers and also sellers and buyers divide in a certain ratio the increase in the tax burden.

It was found out by examining the results by the finally modified input data in Table 5, that buyers of agricultural products carry in average 69% of the increased tax burden. Producers of livestock and plant production themselves then carry the remaining 31% of the increased tax burden. From the viewpoint of the time factor, no significant conclusions nor clear trends can be made in the 2007, neither in the 2008. The transfer of the tax burden on buyers is growing in February compared to January 2008 and then declining in the month of March.

The average impact of the increase in tax burden on consumers after the removal of extreme values is reaching 86%; the sellers carry 14% of the increased tax burden. The values of the rate of the tax transfer on consumers identified in the Table 6 vary between

81% and 92%. The difference of the rate of the tax transfer in the shortest and the longest period is 11% for the long periods. Generally, however, there can be seen rather the decline of the values of the tax transfer in the surveyed time period.

The change of the tax rate and the percentage change in the price level of the taxed commodities are often compared during the determination of the impacts of changes in the rates of the general excise tax. Generally, it is assumed that the impact on buyers or consumers in the frame of prices will be only a part (though significant) of the increase in the tax burden. There was an increase in the reduced rate of the VAT from 5% to 9% (so by 4%) in the Czech Republic by 1<sup>st</sup> January 2008. From Table 7 and 8, there are apparent the average values of price changes<sup>7</sup> in each of the analyzed and compared periods from October 2007 to March 2008. The calculated results are then adjusted of the unrealistic possibility of reducing the selling price of the product or food due to a higher tax burden.

From the calculation of the values of prices of agricultural products of plant and livestock production, it is evident that the simple average growth of prices in the surveyed period is in average 4.30%. This corresponds de facto to the 4% growth of the reduced rate of the VAT. If we eliminate the possibility of lowering the selling price of products due to the increased tax burden, then the simple average price growth reached 5.62%, nearly 2% higher than the actual increase in the reduced rate of the VAT. The mentioned modification in addition to the logical rationale also does not provide for the possibility of

Table 6. Distribution of tax burden of sellers and consumer of food with the exclusion of extreme values in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Consumers	87	85	81	87	88	85	92	87	85
Sellers	13	15	19	13	12	15	8	13	15

Source: author's calculation, CSO (2007a, 2008a)

$${}^7\Delta P = (P_1/P_0) - 1$$

Table 7. The impact of change in the tax rate on prices of agricultural products in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Adjusted	4	3	5	5	4	5	4	4	5
Net	6	6	7	5	5	6	5	5	5

Source: author's calculation, CSO (2007, 2008)

compensation of the reduction in price of one product by another significant increase in the price of other product of the given manufacturer.

The simple average growth in food prices in the Czech Republic in the surveyed period is reaching 7.94%, compared to the growth in the rate of 4%. If, therefore, we abstract from other price determinants, it is clear that prices rose due to the increase in the rate of the value added tax more than the increase in the rate. Assuming the impossibility of reducing food prices due to the growth of the rate of the value added tax, we reach the resulting average increase in food prices as much as 8.52%. The result can be interpreted that food prices were, due to the increase in the rate of the value added tax, ad hoc growing times more than the given tax rate.

However, it is clear that there are important factors, apart from the tax effects, determining selling prices of agricultural products and consumer prices of food in the Czech Republic. The global agri-food markets have recently seen a significant volatility. Food prices are already affected by the prices of inputs of farmers and processors, such as energy, fuel, fertilizers, chemicals, seeds, and also a number of other unpredictable factors. We can say that the factors that significantly affect prices of agricultural products and food are the natural conditions, or the good or bad crop of input commodities, the openness of the economy, when changes in the demand quantity of food in other countries and on other continents will affect food prices in the home country, or the preferences of the use of biofuels and thus the substitution of plant production, or the change in production quotas within the competence of the European Union and of course the competitive environment in the agribusiness and supermarket chains in the Czech Republic.

## CONCLUSION

It was found out, by studying the values of the transfer rate of the increased tax burden imposed on food due to the growth of the reduced rate of the value added tax in the Czech Republic in 2008 that the buyers of agricultural products carry a significant part of the increased tax burden and food consumers carry the entire increase of the tax burden. In the case of calculations without additional assumptions, it was found out that two thirds of the increased tax burden were transferred to the buyers of agricultural products, and to the consumers of food, there was transferred significantly more than just the increased tax burden. During the introduction of the assumption of the impossibility of reducing the price of the individual food due to the increased of tax burden, further increases in both the average value of the transfer of the tax burden to the buyers of agricultural products and to food consumer takes place. Both values exceed the limit of 100%, and the impact on buyers of food is in this case significantly higher than in the case of buyers of agricultural products. Eliminating extreme values of the tax burden carried by agricultural producers, buyers of agricultural products, consumer of food and sellers of food, we obtain results pointing to the fact that almost the entire burden of a higher value added tax imposed on agricultural products and food is transferred to the buyers of agricultural products and to the consumers of food. An important finding is the fact that agricultural producers in contrast with sellers of food carry in all examined models a higher proportion of the increased tax burden, which indicates a significant bargaining power of the commercial food chains towards agricultural producers. It was not possible, in the frame of the increase in

Table 8. The impact of change in the tax rate on prices of food in %

	Impact-period								
	10-1	10-2	10-3	11-1	11-2	11-3	12-1	12-2	12-3
Adjusted	10	9	9	8	7	8	7	7	7
Net	10	10	10	8	8	8	7	8	7

Source: author's calculation, CSO (2007a, 2008a)



the reduced rate of the value added tax; to explicitly confirm the theoretically and practically known notification effect of implementing or raising tax; at least not in the surveyed period before that change in the months October, November and December 2007. The factor of time as a factor showing a gradual tax change into the sales or consumer prices was also not fully established. Changes in agricultural and food products were made mainly just at the time of the change of the rate of the value added tax.

Compared to the general assumptions about the distribution of the increased tax burden between consumers and sellers in a certain ratio, it was found out by exploring selling prices of food that during the 4% growth of the rate of the general excise tax in the Czech Republic, prices of agricultural products increased de facto equally and food nearly of 8%. These values then underwent 1.32% increase in the case of agricultural products, respectively, or by 0.72% in food, due to the elimination of the possibility of reduction in prices of food due to the increase in the tax burden. These results complete the picture of the balance of power in the market with agricultural products and food in the Czech Republic.

These findings should be taken into account when deciding on any future action of fiscal policy in the Czech Republic in the field of the general excise tax rates, although it is certainly appropriate to transfer the tax burden in favour of indirect taxes in comparison with direct taxes and the given apparent advantages of the value added tax. If after the planned increase and unification of the rates of value added tax to 14% and 17.5% (so the growth of the current reduced rate by 4% and next 3.5% from the current 10%), the market will behave in the same way as during the last significant increase in the rate, then we can expect the growth of prices of the respective products and food at least by 4% and 3.5%, but together rather by more than 7.5%. All this assuming that sellers will increase the prices of food by the increase of the rate of the value added tax and of other additional percentage points as in the case of the comparison of the adjusted prices of food from December 2007 and January 2008. At the same time, we can assume that a significant part of the increased tax burden will be carried by agricultural producers; thereby a further decline in their net profit will take place.

A significant increase in the cost of living caused by the increase in prices of the respective food due to the growing tax burden needs to be compensated especially for people with low incomes, eventually the very basic food should be removed from the increase of rates. However, it brings about many problems. If the compensation is adequate, then the change of the

rate of the general excise tax will particularly affect the general population with average incomes, which can be seen as the true sense of the planned change. It is fiscally more advantageous to tax the middle class than people with high or low incomes. More serious effects can be expected for agricultural producers and food producers who already have no significant space to reduce their net sales, and an increase in the tax burden can become liquidating for many of them, because until now there was not assumed any adequate compensation for other burdens to which agricultural businesses are liable in the terms of fiscal policy of the Czech Republic.

## REFERENCES

- Bahl R., Bird R., Walker M.B. (2003): The uneasy case against discriminatory excise taxation: Soft drink taxes in Ireland. *Public Finance Review*, 31: 510–533.
- Bánociová A. (2007): The analysis of value added tax in the Slovak Republic. *Ekonomie a Management*, 12: 104–115.
- Bhatina K.B. (1982): Value-added tax and the theory of tax incidence. *Journal of Public Economics*, 19: 203–223.
- Boeters S. (2010): Economic effects of VAT reforms in Germany. *Applied Economics*, 42: 2165–2182.
- Boněk V. et al. (2001): *Lexikon – daňové zákony*. (Lexicon – Tax Concepts.) Sagit, Ostrava; ISBN 80-7208-265-5.
- Bradford D.F., Rosen H.S. (1970): The optimal taxation of commodities and income. *American Economic Review*, 66: 94–101.
- CSO (2007). Průměrné ceny zemědělských výrobců v zemědělství v Kč. (Average prices of agricultural producers in CZK.) Czech Statistical Office, Prague. Available at [http://www.czso.cz/csu/2007edicniplan.nsf/publ/7006-07-za\\_prosinec\\_2007](http://www.czso.cz/csu/2007edicniplan.nsf/publ/7006-07-za_prosinec_2007) (accessed December 2010).
- CSO (2007a). Průměrné spotřebitelské ceny vybraných druhů zboží v Kč. (Average consumer prices of selected commodities in CZK.) Czech Statistical Office, Praha. Available at [http://www.czso.cz/csu/2007edicniplan.nsf/publ/7006-07-za\\_prosinec\\_2007](http://www.czso.cz/csu/2007edicniplan.nsf/publ/7006-07-za_prosinec_2007) (accessed February 2011).
- CSO (2008). Průměrné ceny zemědělských výrobců v zemědělství v Kč. (Average prices of agricultural producers in CZK.) Czech Statistical Office, Prague. Available at [http://www.czso.cz/csu/2008edicniplan.nsf/publ/7006-08-za\\_brezen\\_2008](http://www.czso.cz/csu/2008edicniplan.nsf/publ/7006-08-za_brezen_2008) (accessed December 2010).
- CSO (2008a). Průměrné spotřebitelské ceny vybraných druhů zboží v Kč. (Average consumer prices of selected commodities in CZK.) Czech Statistical Office, Prague. Available at [http://www.czso.cz/csu/2008edicniplan.nsf/publ/7006-08-za\\_brezen\\_2008](http://www.czso.cz/csu/2008edicniplan.nsf/publ/7006-08-za_brezen_2008) (accessed February 2011).
- David P. (2009): Aspects of the value added tax within the self-assessment system and the extended guarantees for

- the provision of services in the countries of the European Union. *Agricultural Economics – Czech*, 55: 335–346.
- De Mello L. (2009): Avoiding the value added tax: Theory and cross-country evidence. *Public Finance Review*, 37: 27–46.
- Devarajan S., Fullerton D., Musgrave R.A. (1980): Estimating distribution of the tax burdens: A comparison of different approaches. *Journal of Public Economics*, 13: 155–182.
- Dušek L., Janský P. (2010): Odhad dopadů navrhovaných změn sazeb DPH na životní náklady domácností. (Estimated Impact of Proposed Changes in VAT Rates on Household Living Expenses.) IDEA, Praha. Available at [http://idea.cerge-ei.cz/documents/pa\\_201001.pdf](http://idea.cerge-ei.cz/documents/pa_201001.pdf) (accessed January 2011).
- Jensen T.C., Wanhill S. (2002): Tourism's taxing times: Value added tax in Europe and Denmark. *Tourism Management*, 23: 67–79.
- Kubátová K. (1996): Teoretické a praktické otázky měření incidence daní ze spotřeby. (Theoretical and practical issues of measuring the incidence of taxation on consumption.) *Finance a úvěr*, 46: 335–346.
- Kubátová K. (2010): Daňová teorie a politika. (Tax Theory and Policy.) Wolters Kluwer, Praha; ISBN 978-80-7357-574-8.
- Lazarev I.A., Pleshchinskii A.S. (2007): Value added taxation: A mesoeconomic analysis. *Studies on Russian Economic Development*, 18: 428–435.
- Manente M., Zanette M. (2010): Macroeconomic effects of a vat reduction in the Italian hotels & restaurants industry. *Economic Systems Research*, 22: 407–425.
- Musgrave R.A., Musgrave P.B. (1994): *Veřejné finance v teorii a praxi. (Public Finances in Theory and Practice.)* Management Press, Praha; ISBN 80-85603-76-4.
- Slintáková B., Klazar S. (2010): Impact of harmonisation on distribution of vat in the Czech Republic. *Prague Economic Papers*, 2: 133–149.
- Smart M., Bird R.M. (2009): The economic incidence of replacing a retail sales tax with a value-added tax: Evidence from Canadian experience. *Canadian Public Policy*, 35: 85–97.
- Stiglitz J.E. (1997): *Ekonomie veřejného sektoru. (Economy of Public Sector.)* Grada, Praha; ISBN 80-7169-454-1.
- Svátková S. et al. (2007): *Zatížení spotřebního koše domácností daněmi ze spotřeby v České republice. (The Load of the Consumption Basket of Households by Consumption Taxes in the Czech Republic.)* Eurolex Bohemia, Praha; ISBN 80-7379-001-7.
- Široký J. et al. (2008): *Daňové teorie s praktickou aplikací. (Tax Theory with Practical Applications.)* C.H. Beck, Praha; ISBN 978-80-7400-005-8.
- Weller C., Rao M. (2010): Progressive tax policy and economic stability. *Journal of Economic Issues*, 44: 629–659.

Arrived on 28<sup>th</sup> March 2011

---

*Contact address:*

Petr David, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic  
e-mail: david@mendelu.cz

---