

Effects of Reducing the Value Added Tax Rate on Food in Latvia

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ABSTRACT

The present research analyses the effects of reducing the value added tax (VAT) rate for food groups from 21% to 12% on the national economy using interdisciplinary approach. A quantitative analysis was performed by using systemic approach and computer modelling tool developed for assessing the impact of VAT rate changes in the case of limited data availability. During the research, information science has been used, to retrieve data and manage process as well as to determine the VAT rate reduction impact on different economic performance indicators. The authors analysed the effects of reducing the VAT rate on 14 food groups. The effects on food consumption prices, food consumption quantities, value added tax revenues in the government budget, consumers' and producers' gains, as well as inflation were assessed. According to the calculation result, reducing the VAT rate decreases the retail price level of food, although the expected price decrease is not proportional to the VAT rate reduction. Reducing the VAT rate slightly increases the consumption of food. At the same time, reducing the VAT rate decreases VAT revenues in the government budget, while the society's total gain slightly exceeds this decrease.

Key words: food, value added tax, impact on prices, impact on consumption, government budget, consumers, purchasers, model, Latvia

1. INTRODUCTION

The European Union's (EU) legal acts stipulate that standard VAT rates in the Member States may not be less than 15% and reduced rates on certain goods and services – not less than 5% in the period from 1 January 2011 to 31 December 2015. Yet, there might be some exceptions for certain groups of goods or trade territories, including the so called super-reduced rates (less than 5%) and parking rates (on goods and services that should be normally taxed at the standard rate) (Council Directive, 2006).

Besides, there is a possibility to exempt several goods and services from the VAT. By regulating the application of VAT rate in the Member States, it is possible to limit the distortion of competition in the EU's common economic area.

According to European Commission (2012a) data, a progressive increase in the average standard VAT rate in the EU-27 from 19.8% in 2009 to 21% in 2012 was observed. Over the period 2010-2012, almost half the Member States raised the standard and/or reduced rate to increase revenue.

The majority of the Member States made use of the possibility to set reduced VAT rates on certain goods and services as stipulated in the EU's legal acts. The reduced rates were imposed on water supply, pharmaceuticals and medical services, food products, books, periodicals, TV services, hotel services, and social services. In several Member States, the reduced rate was set on such goods and services as shoes and leather products, bicycle trade, hairdressing services, sport activities, restaurant services etc. Denmark was the only Member State in which no reduced VAT rates were imposed in the summer of 2012. However, some services in this country are exempt from the VAT (Kozlinskis et al, 2012).

To make food cheaper and more available to the population, reduced VAT rates are imposed in the majority of the EU Member States. In July of 2012, one of the highest VAT rates (21%) on food in the EU was in Latvia and Lithuania. Higher VAT rates on food exist only in Denmark, Romania, and Hungary. Among the 27 EU Member States, only six countries do not tax food at reduced VAT rates, i.e., in addition to the mentioned ones, also Estonia, Bulgaria, and Lithuania (European Commission, 2012b). Therefore, Latvian farmers and food producers request the government to reduce the VAT rate to at least 12%, so that food prices fall and the consumption of food increases. Given the present situation, the aim of this research is to determine the effects of a potential VAT rate reduction on Latvia's national economy by employing modelling.

2. THEORIES/METHODS

Researches on effects of VAT rate changes on a national economy may be classified according to their impact on: 1) prices, 2) consumption, 3) output quantities, 4) employment, 5) population welfare, 6) social inequality, and 7) economic growth.

T.F.Crossley, D.Phillips and M.Wakefield (2009) point that there are two mechanisms through which the temporary VAT cut might affect spending: first, it will increase spending power, making households feel as if they have more income. The second mechanism is the effect that the tax cut will have through changing the price of goods. R.Pike, M.Lewis and D.Turner (2009) are sure that the change in the VAT rate had an impact on inflation rates. T.Kosonen (2010) points to the diverse effects of reducing the VAT rate – consumers benefited from the lower taxes through prices that are lower, the firms benefited in form of higher profit, but the government lost tax revenues. R.Barrel and M. Weale (2009) also have similar opinions, pointing that the effects of a temporary cut in VAT, identifying three possible effects: an income effect as people benefit from a lower cost of living during the period of the reduction, a substitution effect as people bring their consumption forward and an arbitrage effect as people buy non-perishable goods before the end of the period of low VAT for consumption after the VAT rate has been raised. Jeremy M. Panno (2011) points that it is possible for the VAT to be beneficial to the small business owner, especially given the reduced compliance costs, if the VAT rate is set at the proper level.

To determine the effects of reducing the VAT rate on the national economy, several formulas will be exploited (Auzins et al, 2008):

Market price P : [1]

$$P = a \cdot \frac{l \cdot (1+T) - b}{m + a - k \cdot (1+T)} + b$$

Amount of sales Q : [2]

$$Q = \frac{l \cdot (1+T) - b}{m + a - k \cdot (1+T)}$$

Revenue from VAT for the government Y_T : [3]

$$Y_T = \frac{T}{1+T} \cdot \left(a \cdot \frac{l \cdot (1+T) - b}{m + a - k \cdot (1+T)} + b \right) \cdot \frac{l \cdot (1+T) - b}{m + a - k \cdot (1+T)}$$

Consumers' surplus in the market S_c : [4]

$$S_c = -\frac{a}{2} \cdot \left(\frac{l \cdot (1+T) - b}{m + a - k \cdot (1+T)} \right)^2$$

Producers' or sellers' surplus in the market S_p : [5]

$$S_p = \frac{P_0 \cdot Q_0}{1+T} - \int MC(Q_0) dQ$$

The society's total benefit (in context of the market) S_T : [6]

$$S_T = S_c + S_p + Y_T$$

The model is developed based on equilibrium processes under monopolistic competition and on general equilibrium conditions. According to such an approach, it is assumed in the model that sellers will try to maximise their profit (both at the present VAT rate and in case the VAT rate is changed). Thus, it is possible to more correctly assess a potential VAT effect on food prices, quantities of sales, tax revenues etc. The basic model forms as follows (Auzins et al, 2008):

General equilibrium situation: [7]

$$\begin{cases} p(Q, x) = P(Q) \\ MR(Q, x) = MC(Q) \end{cases}$$

Demand curve D in food industry: [8]

$$P(Q) = a \cdot Q + b$$

Total demand d for goods: [9]

$$p(Q, x) = m \cdot Q + x$$

Total marginal revenue: [10]

$$MR(Q, x) = 2 \cdot m \cdot Q + x$$

Total marginal cost: [11]

$$MC(Q) = k \cdot Q + l$$

Given the VAT effects, an equilibrium situation: [12]

$$\begin{cases} m \cdot Q + x = a \cdot Q + b \\ \frac{2 \cdot m \cdot Q}{1+T} + \frac{x}{1+T} = k \cdot Q + l \end{cases}$$

where: T – VAT rate; a – coefficient of slope of the demand D ; b – intercept of the demand D ; m – coefficient of slope of the demand d ; x – intercept of the demand d (variable value), k – coefficient of slope of the marginal cost curve; l – the free intercept of the marginal cost curve.

To determine the coefficients for the supply side, financial data of trade companies for 2010 and 2011 in Latvia were used. To determine the coefficients for the demand side, micro data of 3798 households in Latvia for 2010 were used.

3. RESULTS AND DISCUSSION

Analysing VAT rates on food in the EU Member States, one can conclude that different VAT rates are often applied to various food products within one country. Most often, reduced VAT rates are imposed on bread and grain products, milk and dairy products. Almost as often (with a few exceptions), reduced VAT rates are applied to vegetables, fruits, and meat. In some cases (Spain, Italy, Portugal, and Poland), a super-reduced rate is applied to unprocessed or only partially processed food products. Reduced VAT rates are applied to food actually in all the EU's West European countries (except Denmark). Among the West European countries, the highest VAT rates are in Denmark (25%) as well as in Sweden, Finland, and over the recent years in Greece (12%, 13%, and 13% respectively). The lowest VAT rates are in the United Kingdom, Ireland (the standard VAT rate on food is 0% in both countries), as well as in the richest EU country, Luxembourg, where food is taxed at a 3% VAT rate (Kozlinskis et al, 2012).

The situation is different in the EU's East European countries. Of 10 Member States, reduced VAT rates are applied to food only in Poland (5% and 8%), Slovenia (8.5%), and the Czech Republic (14%). In all the other countries, the VAT rate on food ranges within 20%-24% (Kozlinskis et al, 2012).

In the present research, non-alcoholic beverages are also included in the category of food, while no alcoholic beverages are included.

For the purpose of this research, all food products are classified into two categories. The first category includes seven basic groups of food products, which comprise all food products and non-alcoholic beverages:

- bread and grain products;
- meat products, eggs;
- fish products;
- dairy products, except butter;
- oils, fats, butter;
- fruits and vegetables;
- other foods (including non-alcoholic beverages).

The second category includes seven certain groups of food products. These food products were selected based on the following criteria:

1. Products in a group have a comparatively short shelf life.
2. Such food products are produced locally.
3. Products in a group are not regarded as unhealthy food.

In the result, seven groups of food products were formed:

- bread (wheat bread, rye bread, sweet and sour bread, and other sorts of bread);
- unprocessed meat (beef, veal, pork, mutton, goat meat, poultry meat, wild animal meat, meat of other animals, and slaughter by-products);
- unprocessed fish (fresh, chilled, frozen);
- basic dairy products (whole milk, low-fat milk, cheese, cottage cheese and curd, cream, fermented milk products);
- eggs;
- fresh fruits (apples, pears, plums, cherries, strawberries, garden berries, wild berries);
- fresh vegetables and potatoes (lettuce, leaf or stalk spice plants, rhubarb, fresh cabbage, fresh cucumbers, fresh tomatoes, cucurbitaceous plants, summer squash, pulses and paprika, carrots, red beets, onions, garlic, garden radish and other root-crops, mushrooms, and potatoes).

The systemic approach and computer modelling tool for various scenarios was employed to make calculations in the research. It means that initial calculations were performed for the basic scenario by using the methodology described in this research. In this process, indicators for assessing an effect are calculated: quantities of sales, price level, and VAT revenue in the government budget, consumers' surplus, producers' surplus, and the society's total gain from various groups of food products. After performing calculations for the basic scenario and developing an initial market equilibrium model, in the next stage the VAT rate is changed, thus developing the so called policy scenario. Data on the new market equilibrium, including the indicators for assessing an effect: quantities of sales, price level, VAT revenue in the government budget, consumers' surplus, producers' surplus, and the society's total gain, are obtained after this change is made.

After the indicators are calculated both for the basic scenario and the policy scenario, they are compared and the deviation of the policy scenario from the basic scenario is considered a policy effect.

In the present research, an effect of reducing the VAT rate on food is assessed if changing it from the present rate of 21% to a rate of 12%. The effect of reducing the VAT rate is calculated for 14 groups of food products (7 basic groups of food products and 7 certain groups). Besides, an affect is calculated for all groups of food products. The calculations provide information on the effect of reducing the VAT rate on food for several years – two calculation variants were produced, which show an effect of reducing the

VAT rate if this reduction is done in the beginning of 2013 or 2014. The calculation results are

summarised in Tables 1 and 2.

Table 1. Effect of a VAT rate reduction to 12% on the basic groups of food products in Latvia in 2013 *

Indicators/Groups of goods	Bread and grains	Meat products, eggs	Fish products	Dairy products, except butter	Oils, fats, butter	Fruits, vegetables	Other foods	Total
Change in sales quantity Q, as a % compared with the basic scenario	2.5	2.3	3.6	2.8	3.8	3.1	4.6	3.1
Change in price level P, as a % compared with the basic scenario	-5.4	-5.4	-5.5	-5.5	-5.6	-5.5	-5.6	-5.5
Change in VAT revenues in the budget Y_T , mln LVL**	-14.06	-23.01	-3.65	-13.77	-3.16	-13.52	-15.47	-86.64
Change in consumers' surplus S_c , mln LVL	11.04	17.84	3.00	11.01	2.61	10.95	12.98	69.43
Change in producers' surplus S_p , mln LVL	4.44	7.39	1.11	4.26	0.96	4.14	4.79	27.09
Change in the society's total gain S_T , mln LVL	1.42	2.22	0.46	1.50	0.41	1.57	2.30	9.88

* Effect of VAT rate reduction if the VAT rate is reduced in the beginning of the corresponding year

** Latvian lat, 1 LVL=0.7028 EUR

If the VAT rate is reduced for all the groups of food in the beginning of 2013 (Table 1), one can forecast that the quantity of food sold would increase by 3.1%, as prices would decrease by 5.5%. As a result of reducing the VAT rate, the government budget would lose a revenue of LVL 86.64 mln, however, the society's total gain is positive and amounts to LVL 9.88 mln, which is mostly comprised of the consumers' surplus.

An analysis of the certain groups of food products shows that the largest change in the quantity of sales is forecasted for the groups of unhealthy food – “other foods” and “oils, fats, and butter” – for which the largest price decrease is expected. The largest decreases in VAT revenues in the government budget are expected from the VAT rate reduction for “meat products, eggs”, “other foods”, and “bread and grain products” – the groups from which the largest gain is expected for the society.

Assuming the VAT rate is reduced in 2014, the VAT revenue in the government budget would decrease less than LVL 87.70 mln, while the society's gain would slightly increase to LVL 10.05 mln, mostly at the expense of consumers' surplus.

After assessing the effect of reducing the VAT rate for food from 21% to 12% on the overall inflation rate in the country, one can conclude that a one-time decrease in inflation by 1.35% is expected in comparison with the basic scenario data.

After analysing an effect of each certain group of food products on inflation, one can conclude that in 2013, reducing the VAT rate on the food group “bread and grains” will decrease overall inflation by 0.23%, “meat products, eggs” – 0.35%, “fish products” – 0.06%, “dairy products, except butter” – 0.22%, “oils, fats, butter” – 0.06%, “fruits and vegetables” – 0.18%, and “other foods” – 0.25%.

If the VAT rate is reduced for the certain groups of food products in the beginning of 2013 (Table 2), one can forecast that the quantity of sales of these products would increase by 3.3%, as prices would decline by 5.6%. As a result of reducing the VAT rate, the government budget would lose LVL 38.70 mln, which is 55% less than if reducing the VAT rate for all groups of food. The society's gain is positive, too, reaching LVL 4.06 mln, yet, it is 59% less than in the first calculation variant. According to the analysis of the certain groups of food products, the largest changes in the quantity of sales are forecasted for “bread” and “basic dairy products”, where the smallest changes – for “unprocessed meat” and “eggs”. Owing to the VAT rate reduction, the largest decreases in government revenues are forecasted from “basic dairy products” and “unprocessed meat”, from which the largest gain is observed for the society.

Assuming the VAT rate is reduced for certain food products in 2014, the VAT revenue in the government budget would decrease less than LVL

38.84 mln, and the society's gain would slightly increase to LVL 4.09 mln, mostly at the expense of consumers' surplus.

Table 2. Effect of a VAT rate reduction to 12% on the certain groups of food products in Latvia in 2013 *

Indicators/Groups of goods	Bread	Unprocessed meat	Unprocessed fish	Basic dairy products	Eggs	Fresh fruits	Fresh vegetables	Total
Change in sales quantity Q, as a % compared with the basic scenario	4.3	2.1	3.0	4.0	0.2	3.8	3.5	3.3
Change in price level P, as a % compared with the basic scenario	-5.8	-5.7	-5.8	-5.8	-2.2	-5.8	-5.8	-5.6
Change in VAT revenues in the budget Y_T , mln LVL**	-6.00	-10.34	-1.42	-11.96	-1.86	-1.52	-5.60	-38.70
Change in consumers' surplus S_c , mln LVL	5.21	8.40	1.20	10.34	0.59	1.31	4.80	31.85
Change in producers' surplus S_p , mln LVL	1.56	2.78	0.36	3.09	1.30	0.39	1.43	10.91
Change in the society's total gain S_T , mln LVL	0.77	0.84	0.14	1.47	0.03	0.18	0.63	4.06

* Effect of VAT rate reduction if the VAT rate is reduced in the beginning of the corresponding year

** Latvian lat, 1 LVL=0.7028 EUR

After assessing the effect of reducing VAT rate for certain food products from 21% to 12% on the overall inflation rate in the country, one can conclude that the total one-time decline in inflation is expected at 0.62% compared with the basic scenario.

After analysing the potential effect of each certain group of food products on inflation, one has to conclude that in 2013, the VAT rate reduction for "bread" will decrease overall inflation in the country by 0.11%, "unprocessed meat" – 0.16%, "unprocessed fish" – 0.02%, "basic dairy products" – 0.21%, "eggs" – 0.01%, "fresh fruits" produced in Latvia – 0.02%, and "fresh vegetables" – 0.08%.

Given the calculation results obtained, policy makers have several options if determining scenarios for reducing the VAT rate for food, depending on the purpose, expected results, and timing. For instance:

- to reduce the VAT rate for all food products;

CONCLUSIONS

By means of the using interdisciplinary and systemic approach and computer modelling tool in the research, one can conclude that the VAT rate reduction for food will result in a 5.5-5.6% decrease in food prices.

- to reduce the VAT rate for all the certain groups of food products;
- to reduce the VAT rate for a certain group of food products – the one included in either Table 1 or Table 2.

However, the experience of other countries in reducing the VAT rate has to be taken into account, as, according to M. Bumpei (2011), the change of the VAT rate display three kinds of trends when the VAT rate is changed. The first trend is that aggregate consumption and economic growth increases (or decreases) just before the rise (or reduction) of the VAT rate. The second trend is that they decrease (or increase) relatively dramatically as soon as the rise (or reduction) is implemented. The third trend is that after the dramatic decrease (or increase) they increase (or decrease) gradually.

The expected decrease in food prices will reduce the overall inflation rate in the country. If the VAT rate is reduced for all food products, the forecasted decrease in inflation will reach 1.35%; if it is reduced for the certain groups of food products, the forecasted decrease in inflation is estimated at 0.62%.

The VAT rate reduction will result in a decrease in VAT revenues in the government budget. By reducing the VAT rate for all food products in the beginning of 2013, the forecasted decrease in VAT revenues is estimated at LVL 86.6 mln, while for the certain groups of food products, it is LVL 38.7 mln.

The society's total gain from reducing the VAT rate is positive, as the sum of increases in consumers' surplus and producers' surplus slightly exceeds the decrease in VAT revenues. By reducing the VAT rate for all food products in the beginning of 2013, the consumers' gain amounts to LVL 69.4 mln, and the producers' gain is LVL 27.1 mln. By reducing the VAT rate for the certain groups of food products in the beginning of 2013, the consumers' gain reaches LVL 31.8 mln, and the producers' gain totals LVL 10.9 mln.

The VAT rate reduction has a positive effect on the food industry's economic indicators, which will be observed owing to an increase in sales for those groups of goods on which the VAT rate is reduced – 3.1-3.3%, respectively.

By reducing the VAT rate for all food products, not the consumption of necessities will increase more than on average (but, for instance, sweets, beverages). From the social and economic point of view, it is not a rational idea to reduce the VAT rate for food products that are not necessities.

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