

Government or invisible hand? Who is in charge of retail food prices? Evidence from the Baltics

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Abstract. The article is aimed at revealing the factors, which influence the retail food prices the most. Not only the main 10 factors influencing retail food prices have been distinguished, but also governments' capacities to influence food prices have been researched. It has been found that although government can directly influence three (retailer's concentration level, purchasing power of consumers, state support for growing particular food products) and can partially influence two (production costs and tax burden) of the ten most important factors, influencing retail food prices, its influence on retail prices is quite considerable, as the free market principles are still prevailing in food prices. Therefore, governments' intentions to make food more affordable to its citizens have only limited potential for success.

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1. INTRODUCTION

During the first almost three decades of independence, Baltic countries, as well as other post-soviet countries have undergone a number of institutional transformations, restructuring the planned economy into the supply-demand driven one for satisfaction of socioeconomic interests of the local population through liberal exchange of goods. Formation of market relations requires innovative restructuring of the whole economy which includes deep, multifaceted and versatile restructuring of economic mechanisms, business ideology and economic relations (Cabinova et al., 2018; Kozlovskiy et al., 2018). One of the first

economic mechanisms, which had to face free market principles was price setting. As dairy products (food) are characterized by constant and undisruptive demand, they were the first to react to such change. Employees, involved in industrial goods' production were trapped in a situation, where they had to sell their production for lower prices than earlier as the main markets for their products have disappeared (the Soviet Union) and then to buy food products for a much higher price. This situation caused social discontent and demanded immediate government reaction. Similar processes of social disappointment occurred in Baltic countries (Latvia and Lithuania) when they switched to Euro, then retail prices for food products were increasing again (Eurostat, 2017). As this situation has a clearly repeating nature due to governments' inability to react to free market influences accordingly, there is an obvious necessity to study the retail pricing mechanisms at Baltic food markets more detail.

According to the traditional post-soviet expectations, the government must get involved in retail price setting, as the majority of citizens are used to well-established state control over economy. Thus, rising food prices lead to disappointment among citizens not only by the government, but by the whole free market economic system as a whole (Bridges & Pine, 2013). The experts in political economy (Krueger, 1974; Keohane, 2005) argue that the state is the main player in price setting game and thus it should ensure low and affordable prices for products of first priority to its citizens, as the latter are the weaker side in economic transactions, as compared to production corporations or big retailers. At the same time, neoliberal economic proponents (Hirschl, 1998; Appel, 2000; Clift & Tomlinson, 2012; Draskovic, 2016; Scekcic et al., 2016; Draskovic et al., 2019; Luchko, Lukanovska & Ratynsky, 2019; Vovk, 2012) state that the government has only a few instruments to influence retail prices. In their turn, prices are being set and controlled only by a supply-demand mechanism and all governmental interventions leads only to negative consequences for both producers, retailers and consumers. These contradictions in economic and public administration literature predetermine the aim of this paper which is formulated as follows: to reveal the factors that influence the retail prices for food and to find out whether governments can influence them or not.

2. LITERATURE REVIEW

Retail industry in fast moving consumer goods (FMCG) is being characterized by a very high ratio of sticky prices compared to other products, like gasoline, electricity and etc. It is assumed, that retailer chooses the longer duration of reference prices so as to limit markup variation, which typically do not vary more than 10% (Eichenbaum et al., 2011). Following this fact it can be stated, that when the retailer changes reference prices, it reestablishes the value of the unconditional markup, i.e., the retailer passes through all the changes in reference costs that have occurred since the last reference price change. Taken together, these findings support the view that the retailer chooses the duration of reference prices to keep markups within relatively narrow bounds (Eichenbaum et al., 2011). Although it is a clear example of execution of market power, forcing other participants of a value chain to dampen the exogenous demand shocks, if the raw material markets show permanent negative change vectors, the retailers are being forced to transfer part of the cost savings to consumers (Chen et al., 2017; Lu et al., 2018). It should be noted, that the bigger market power is being enjoyed by the retailer, the longer is the gap between World prices and local retail price adjustments. That was the reason to employ food prices dynamics of a World market into the survey.

When analyzing aggregate money influence on price level, which, according classical monetary theory (Keynes, 1936) is direct and inevitable, we support Midriganu (2011) adjustments to Golosov and Lucas (2007) model, that imposes an idiosyncratic nature of costs influence on price as "since the idiosyncratic shocks to the different goods are not perfectly correlated, at any point in time some goods' prices may be far from their desired level while other may be close to their desired level" (Midriganu, 2011, p.2). This, coupled with Hedonic price theory (Greenstone, 2017; Gibbons et al., 2014), allows us to presume, that

price changes not necessarily are the mirror reflection of costs changes, as Eichenbaum et al. (2011) states. If it is a case, it means, that minor cost changes only indirectly influence the setting of retail prices, the reason, which allows us to neglect the influence of commodities, fuel price changes in the survey. This assumption is augmented by the fact that these costs only attribute to less than 2% of all costs in food value chain (Babin, 2016; Stellingwerf et al., 2015).

Because of high industry concentration in all steps of value chain of food products, except the farm level, it is commonly assumed that wholesalers, producers and retailers use their market power to employ pricing strategies which allow a complete, versatile and rapid pass through of cost and tax burden increases but slower and less complete transmission of cost savings. This price transmission asymmetry in food industry is being characterized by two independent ways for estimation of irreversible functions: Houck procedure and Chow - type test (Kinnucan & Forker, 1987). According to Gardner (1975), this scientifically proven phenomenon exists because of three main reasons: difference in concentration levels across value chain, any form of Government intervention in pricing of agricultural products (subsidies, quotas, interventional purchase price, minimal set price for goods and etc.) and differential impacts of shifts in retail demand versus farm supply that are typically defined by the idiosyncratic changes in consumer behavior. The main factors, affecting consumer behavior in food market are (McCluskey et al., 2016; Messer et al., 2015; Ajzen, 2015; Bilan et al., 2018; Gorb, 2017): product substitutability (number of alternatives), number of strong brands in a particular product category, frequency of purchase, purchasing power of customers (as a measure for it, we in our survey, use a minimum wage, not an average salary in country, as correlation analysis of food prices and minimal wage and Colchero et al. (2016) research show a stronger link between the minimal wage and retail food price level, than the average salary). Analyzing indicators, reflecting above mentioned three main groups, that impacts retail prices in the case of Lithuanian food market, such important aspects relevant to retail price formation as: concentration ratio of farmers, producers and retailers (it is worth mentioning, that in Baltic States, the wholesalers do not have very big influence on prices) in particular food industry, price history, aggregate demand (number of customers), logistics features (necessity for special logistics/storing conditions, best before period, value of a product and etc.), World prices for the same product, and EU Direct Payments under the Common Agricultural Policy, as they do not directly set the price floor for products, but cover a substantial part (up to 80%) of farmers costs, thus allowing them to sell their products on a lower price, were identified.

Product substitutability within product category, as well as cross category also has a strong influence on retail prices. Price increases are strongly synchronized within the same product group (Midriganu, 2011). It means that a sharp increase in one product prices is being followed by other products in the same product group. The bigger category is – the bigger influence on overall prices it has. However the cross-category price synchronization has been observed. If a cheese can be substituted with bacon in a preparation of sandwich, the sharp increase in cheese prices would trigger the price increase for bacon, as following the cheese price increase, the consumers would shift to bacon, thus creating an unexpectedly high demand, which would be followed by a price increase. It contradicts with classical economic standpoint, which postulates, that bigger competition reduces the price. This, relatively poorly studied phenomena motivates to include product substitutability into the research.

In a FMCG market, to which all dairy food products are attributed, sales promotions play an important role. Not only because they allow consumers to acquire products at a lower price, but sales promotions also generates the demand, which increases from 2 times (if a sales promotion for the particular product appeared past week) to 4,7 times (if there no promotions for product for a week and more) (Hendel & Nevo, 2006). Sales promotions creates an aggregated short term demand, which is over the actual consumption rate and leads to a storage of goods in consumers inventory if the product is storable/ durable or to over exceeding amount of food, which is being wasted. From the price perspective, the result of such behavior is twofold.

The bigger amount sold makes the product cheaper as fixed costs are being divided into larger number of items. However, as consumer buys more, he spends more and notices, that everyday products (those biggest part is composed of diary food products) require bigger part of his budget and starts to believe deceivably in price increase, as he sees it as the only reliable explanation of his budget changes (in case the income is constant or even increasing). This situation is highly supported by a psychological price increase theory (Hsu et al., 2017; Lorino et al., 2017; Bradlow et al., 2017).

The psychological motives also play a big part in a perception of price and its volatility. It has been scientifically proven, that the average size of individual price changes is much bigger than overall inflation rate (Dhyne et al., 2011). It creates a wrong assumption of unjustified and exponential price increase. The perception is being augmented by the increasing phenomenon of growing part of retail brands in an overall assortment of retail chains. Although retail brands offer the same quality for the lower price (Choi, 2017), Lithuanian consumers can be characterized as having high loyalty to renowned and established brands (Vanagienė & Ramanauskienė, 2007) which tend to be considerably more expensive. The Nielsen (2017) research shows, that the more price conscious lower income customers appear to be more brand loyal than the upper middle level income customers. It leads to situation, when lower income customers experiences sharper price fluctuations, as more expensive FMCG show higher volatility in prices (Dhyne et al., 2011). Such discrepancies lead to a feeling of disappointment, exclusion, social unjustness, and calls for a Government to manage the situation.

3. METHODOLOGY

In order to identify factors, that have the biggest influence in determining the products retail price intentions to rise, an expert survey was conducted. 14 selected experts were professionals from both academic (with a PhD and a field of scientific interests related to retail or marketing) and business fields (with no less than a Master of Science degree, has no less than 5 years experience in retail and occupies a position of a manager), which is enough in order to get reliable results (Libby & Blashfield, 1978). 6 experts represent Lithuania, 5 experts from Latvia and 3 experts represent Estonia. It was not necessary for experts to be equally represented from all states, as some food retailers have their HQ in Lithuania, but their retail chain maintains presence in all Baltic States, so they are qualified experts of all three Baltic markets.

Scientific literature indicates more factors that influence the retail price of food products, than it is possible to quantify using Analytical Hierarchy Process (AHP) as a core method of this research. In order to solve this issue a preliminary expert survey was performed, which allowed identifying 10 most important factors, influencing retail price of food products (see Table 1):

Table 1

The most important factors impacting retail price of food products

No.	Factor	Impact on retail price if a value of factor increases
1	World prices of a particular product	Price increases
2	State (EU) support for growing particular food products	Price decreases
3	Production costs	Price increases
4	Tax burden	Price increases
5	Producers' concentration level	Price increases
6	Retailer's concentration level	Price increases
7	Price history	Price increases
8	Purchasing power of consumers	Price increases
9	Aggregate demand	Price decreases
10	Loyalty to brand	Price increases

Source: own work

The obtained results were processed using AHP. This method was selected for its suitability in solving complex, multifaceted problems, where purely quantitative methods cannot be directly applied (Mathiyzhagan et al., 2016). In order to get more precise undisputable results, both *Balanced* (Salo & Hamalainen, 1997) and *Koczkodaj* (Koczkodaj, 2016) scales were employed. Obtained results were normalized. The data processing process is as follows: after the experts evaluate all the presented factors, influencing a retail price using the pair wise questionnaire form, a consistency check of each questionnaire is being performed. Then, if consistency level is within acceptable range ($\alpha \leq 0.05$) a pair wise comparison matrix A is being computed from the results of each questionnaire:

$$A = \begin{pmatrix} \frac{a_1}{a_1} & \frac{a_1}{a_2} & \dots & \frac{a_1}{a_n} & \frac{a_2}{a_1} & \frac{a_2}{a_2} & \dots & \frac{a_2}{a_n} & \frac{a_n}{a_1} & \frac{a_n}{a_2} & \dots & \frac{a_n}{a_n} \end{pmatrix} = (b_{11} \ b_{12} \ \dots \ b_{1n} \ b_{12} \ b_{21} \ \dots \ b_{2n} \ b_{n1} \ b_{n2} \ b_{nn});$$

here a is the number of factors influencing retail prices; b_{ij} – pairwise comparison matrix element; $\frac{a_i}{a_j}$ – the significance level of the i -th factor with the respect to j -th factor.

When a multiplication of the i -th line elements is being calculated to every A matrix:

$$\Pi_i = \prod_{j=1}^n a_{ij}, \quad (i = 1, \dots, n).$$

The obtained values are being normalized using formula:

$$q_i = \frac{\sqrt[n]{\Pi_i}}{\sum_{i=1}^n \sqrt[n]{\Pi_i}} = \frac{\sqrt[n]{\prod_{j=1}^n x_{ij}}}{\sum_{i=1}^n \sqrt[n]{\prod_{j=1}^n x_{ij}}}, \quad (i = 1, \dots, n; \sum_{i=1}^n q_i = 1) \quad q_i = \frac{\sqrt[n]{\Pi_i}}{\sum_{i=1}^n \sqrt[n]{\Pi_i}} = \frac{\sqrt[n]{\prod_{j=1}^n a_{ij}}}{\sum_{i=1}^n \sqrt[n]{\prod_{j=1}^n a_{ij}}}, \quad (i = 1, \dots, n; \sum_{i=1}^n q_i = 1).$$

After the significance of factors has been obtained, the overall consistency index of all pairwise matrices is being calculated. At first, the initial matrix A is being multiplied by its own column weights $q = (q_1, q_2, \dots, q_n)$:

$$Aq = (a_{11} \ a_{12} \ \dots \ a_{1n} \ a_{12} \ a_{21} \ \dots \ a_{2n} \ a_{n1} \ a_{n2} \ a_{nn})(q_1 \ q_2 \ q_n) \\ = (a_{11}q_1 + a_{12}q_2 + \dots + a_{1n}q_n \ a_{12}q_1 + a_{21}q_2 + \dots + a_{2n}q_n \ a_{n1}q_1 + a_{n2}q_2 \\ + \dots + a_{nn}q_n) = \lambda_{max}(q_1 \ q_2 \ q_n) = (\lambda_{max}q_1 \ \lambda_{max}q_2 \ \lambda_{max}q_n);$$

Then a Stability index S_1 is being calculated using formula:

$$S_1 = \frac{\lambda_{max} - n}{n - 1};$$

Employing calculated Stability index (S_1) and the random Compatibility index (C_A) (see Table 2), the Consistency Index (CI) of the final modified pairwise comparison matrix is being obtained:

$$CI = \frac{S_1}{C_A};$$

Table 2

Random Compatibility index

n	3	4	5	6	7	8	9
C_A	0.58	0.90	1.12	1.24	1.32	1.41	1.45

If obtained CI is less than predefined threshold of 0.05, the matrix is consistent and results are scientifically reliable, if not, expert evaluation should be repeated or rejected and the assessment of inconsistency should be increased. It is being done using formula (Kendall, 1970):

$$\chi^2 = W_r(n - 1) = \frac{12CI}{rn(n+1)};$$

Using standard χ^2 distribution table, we found the critical value χ_{krit}^2 with the early predefined level of significance α ($\alpha = 0.05$), allowing a degree of freedom $\nu = n-1$.

4. EMPIRICAL RESULTS AND DISCUSSION

After calculation of the chi-square criterion value, the following results were found: $\chi^2 = 19.467$, $\chi_{0,05,8}^2 = 12.411$, that satisfies the inequality $\chi^2 \geq \chi_{\alpha,v}^2$. It allows to state, that the consistency of expert opinions is sufficient and is scientifically proven.

After acquiring the desired level of experts' opinions consistency, the weights and ranks of the analyzed factors were calculated. The results are presented in a 3 table below.

Table 3

Weights and ranks of the analyzed factors, influencing retail price of food products

No.	Factor	Principal Eigenvector using Balanced scale	Principal Eigenvector using Koczkodaj scale	Normalized principal Eigenvector
1	World prices of a particular product	0,1941	0,1902	0,1922
2	State (EU) support for growing particular food products	0,0432	0,0517	0,0475
3	Production costs	0,1736	0,1842	0,1789
4	Tax burden	0,0714	0,0680	0,0697
5	Producers' concentration level	0,0795	0,0766	0,0781
6	Retailer's concentration level	0,1533	0,1487	0,1510
7	Price history	0,0652	0,0601	0,0627
8	Purchasing power of consumers	0,0985	0,0914	0,0950
9	Aggregate demand	0,0811	0,0856	0,0834
10	Loyalty to brand	0,0401	0,0435	0,0418

Source: own work

As the results show, the most important factor in determining the retail food price is the price of this product in international World market. We call it fair price, as it is being set by independent supply – demand balance on a World scale and nor Government, nor particular retailer has enough power to affect it. Of course, only quite big producers can afford a possibility to supply its products into the World market, the smaller ones still have to adapt to local conditions and other factors that influence price on a local scale. Thus it is concluded that Government cannot influence the most important factor (World prices) to food retail price.

Second most important factor in determining the retail price of food products is a production costs. Some production costs are set by World prices (ex: price of raw materials and commodities sold on a World market, as cacao, grain, milk flour and etc.), some are a subject of local conditions, that are not at least under the direct control of the Government (increasing labor costs related to shortage of labor costs due to internal migration, unfavorable weather conditions leading to worse harvests and etc.), but some are the subject of proper decisions of national authorities, for example Government can influence the price of electricity, gas, waste management and etc., as it is a sole owner of the transportation grids and the biggest market player in State's gas and electricity supply market (VKEKK, 2018). There are also smaller production costs (payments for using State's roads to commercial vehicles, environmental regulations and etc.). Taking into account the above mentioned, it can be stated, that Government can partially influence this factor (production costs).

The third most important factor, influencing food retail price is the concentration level of retailers. Today in Lithuania the maximum market share that can be taken by one retailer is no more than 30%. It is

being done trying to prevent the market players of acquiring the dominant position in the market and monopolizing it in that way. Although it is a good and reasonable law, it takes into account only one market player. Today five biggest retail chains in Lithuania control more than 87% of market share (81% in Latvia and 72% in Estonia, respectively) (Nielsen, 2018), that can be classified as typical oligopoly according to classical economics (Stigler, 1964) with all its consequences. It is suggested to Government to use Hershfindahl–Hirschman index or other tools to measure the concentration level in retail business in order to prevent the further increase in prices. It is solely Governments responsibility, so it is concluded that this factor (concentration level of retailers) can be influenced by the Government.

Fourth factor, according to the influence to food retail price increase, is the purchasing power of consumers. As a measuring figure for this factor, the minimum wage was used in this research. This measuring figure is scientifically proved as it reflects the dependency between income and price fluctuations better in comparison to average salary. In addition, according to the agreement between Government and trade unions, the minimum wage in Lithuania is pegged to average salary by a ratio equal to the average of 4 biggest values of this ratio in EU Member States and in the borders of 45-50% of average salary. It is obvious, that increasing purchasing power of consumers creates a bigger demand, especially from ones, who earn minimum salary, as they are forced to limit their needs, and having possibility to allow more, are unable to refrain. According to National Tax Authorities of Lithuania, a large share of employees (more than 24%) earn a minimum wage or an amount very close to it, even slight increase of a minimum wage significantly impacts the increase in retail prices. Although the increase in minimum wage helps to solve a serious social problems (poverty, economic inequality, social exclusion) it should be stated, that Government has a direct influence onto this factor (purchasing power of consumers).

The fifth by importance factor is aggregate demand. The bigger market is, the less significantly fixed costs are reflected in a retail price. In addition, the bigger amounts of product sold leads to increasing production and bigger purchases of raw materials that leads to bigger discounts. Although not all the savings are being transferred to the final consumers, taking into account high levels of competition between manufacturers, some positive adjustments in retail price can be expected. The aggregate demand shows steady decreasing trend, having shrunk to 2.85 million citizens from 3.399 million in Lithuania in a period from 2004 to 2017 (Statistics Lithuania). The main emigration routs lead to more developed EU and European Economic Area members, where average salaries are 3-4.5 times bigger than in Baltic countries (Eurostat, 2018). As Baltic States are part of EU and Schengen area, free and unimpeded movement of labor is being guaranteed and encouraged, no legal intentions directed to slowing emigration can be implemented. Although there are State's incentives to improve the demographic situation in Lithuania and Latvia, some facilitation programs for employees from third countries to immigrate and work in Lithuania and Latvia or personal tax adjustments in order to increase the disposable income of citizens cannot be directly influenced by Government. Thus, this factor (aggregate demand) is out of Government impact on retail food price range.

The sixth factor, which is of twice lower significance compared to first or second ones, is producers' concentration level. The smaller number of producers leads to lower competition, increasing concentration level, which is being reflected by increase in prices and vice versa. It is hardly Government can impact this factor, as the land, which is required to produce food belongs to private owners and there are no obvious ways, how Government can increase the arable land area. We do not consider it possible and acceptable to use extreme measures such as to reduce protected and conservation areas or etc. in order to increase arable land, so we conclude, that Government cannot significantly influence this factor.

Although discussions about the impact of a value-added tax (VAT) on the price and consumption of food are ongoing (Romani et al., 2016; Nordström & Thunström, 2011; Steenhuis et al., 2011; Mytton et al., 2007; Caraher & Cowburn, 2005) no clear theory concerning the results of State's intervention to retail price

setting by manipulation with VAT has been formulated. Thus, Poterba (1996) findings are followed in this research, who states, that increasing VAT on food increases its retail price, but decreasing of the VAT does not influence the change. It is concluded, that Government can only partially control this factor.

The third least important factor in retail prices is price history. Price setting partially reflect past, so if the price for the product has increased in the past, it is much more likely it will increase in the future, because the consumers got used to it and do not get so much angry, than the price increases again. It is concluded, that Government has no instruments to influence price history (besides what they can do today to influence historical prices).

Second least important factor is State's support to farmers. Although in Baltics EU subsidies is very substantial and account almost half of all farmers income (Volkov et al., 2019), they all are being absorbed in a value chain, particularly by farmers and producers and are almost not reflected in a retail price, but it is a factor, that can be fully controlled by the Government.

The least important factor, according to the employed survey, is loyalty to brand. Although scientific literature emphasizes the importance of brand in marketing and its influence on price (Romeo et al., 2015; Masuda & Kushihiro, 2018), it is found as a least importance. Such a discrepancy can be associated with the fact, that in the survey the dairy products were being researched, where brand names are not so well established and almost a quarter of consumers, getting a minimum wage or close to it are more concerned about the price but not about the brand. As brand name is a property of producers and building loyalty to a brand is producers marketing know-how, it is concluded that Government has no influence on this factor. All the summarized results have been presented in a 4th table.

Table 4

Order of factors influencing retail price of food products according their significance and Governmental impact

Rank of significance	Factor	Can Government influence it?
1	World prices of a particular product	No
2	Production costs	Partially
3	Retailer's concentration level	Yes
4	Purchasing power of consumers	Yes
5	Aggregate demand	No
6	Producers' concentration level	No
7	Tax burden	Partially
8	Price history	No
9	State (EU) support for growing particular food products	Yes
10	Loyalty to brand	No

Source: own work

The role of democratic and free market State's in shaping food retail prices is rather low or medium significant. This is also confirmed by a survey conducted in Lithuania. Summarizing results, it can be noticed that Government can directly influence three (retailer's concentration level, purchasing power of consumers, state support for growing particular food products) of ten factors, which affect the retail price. It also can partially influence two more factors (production costs, tax burden), so its influence onto retail prices is quite considerable, but still the free market principles are prevailing in the food prices, so the Governments intentions of making food more affordable to its citizens have only limited potential for success.

5. CONCLUSION

Our research showed, what an incentives to departure from competition driven retail price setting mechanism of food products has the limited potential for success. It can only influence three of ten most important factors in a retail price setting mechanism and on two more factors it can establish a partial influence. All other factors are at the disposable of invisible market hand, forcing us to conclude, that a responsibility of setting retail price on food, while not solely, lays on a free market mechanisms. Although in reality this ideal supply-demand based market regulation mechanism is being violated to varying degrees by Governmental decisions, and in particular conditions Governments actions may have a positive effect on a retail price change from consumer perspective, these changes would be of a temporary nature and would only disturb already set price equilibrium, which, as literature review shows, tend to set at a higher point then it was prior Government's incentives. So, in order to make food more affordable, it is suggested to Government to try to influence the price setting mechanism indirectly by increasing competition in retail and production, lowering market entry barriers, facilitating immigration, but not directly getting involved in a final retail price setting mechanism.

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