Aspects of the corporate financial governance of food retail chains and its possible spillover into the area of increased food poverty in the EU with a focus on V4 member countries

Oksana Dubanych, David Bezděk, Jan Vavřina

Abstract: The concept of supporting socially disadvantaged population groups is not new and has a tradition both in core EU countries and in newer ones as well. However, there are new challenges the European society have to face, whether it was a pandemic of a new type of coronavirus or the current war of Russia against Ukraine. People suffering from a lack of quality food with regard to individual nutritional needs are more likely to be affected by chronic diseases, and a lack of food is also associated with many adverse effects on the overall health of the population, or the threat of an increase in socio-pathological manifestations in human society. Food banks then, as specific purpose entities, play an important role within the so-called safety net that serves for immediate, time-limited assistance to the groups of the population most affected by the food poverty. Aim of this article is to address the food poverty increase in the EU by identifying the financial performance of food chains in Visegrad 4 member countries, which have been most affected by food price increases among EU member states. Subsequently, the relationship between business goals in the area of profitability and the public interest in food security is discussed. We employ in our explorative study both market data on price development of one of the basic foodstuff – butter as a processed milk product and also corporate micro-financial data of food retailers based in Visegrad 4 member countries, to explore relationships between consumer prices development and financial performance of food retail sector. The search for a solution to deal with the existence of food insecurity in Europe in the long run must definitely be anchored in a more comprehensive and systematic approach. This article considers food retail chains as an important stakeholder in that area. In light of unprecedented food price inflation in years 2022 and 2023, it is also discussed a possible overlap in the area of financial business goals of food retailers regarding the food poverty increase in Europe.

Keywords: food retail chains, food poverty, financial performance, food banks.

JEL Classification: G39, L81, Q18

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1 Introduction

Food poverty is not a new phenomenon. At the level of the international community, however, it was until recently addressed more intensively especially in developing parts of the world. However, the concurrence of two global crises, namely the pandemic of a new type of coronavirus and Russia's current war against Ukraine, amplifies the issue of food poverty even in developed economies (Caraher, 2022; Thompson, 2022; Warshawsky, 2023), among which EU member states can clearly be included in the European context (Zachmann et al. 2022). The government authorities of the EU member states must therefore react to this negative development, taking into account a wider spectrum of stakeholders (Zerbian et al., 2022). Starting on the one hand with disadvantaged groups of the population, people in temporary economic distress, on the other hand with regard to businesses of the agri-food complex and their efforts to ensure the competitiveness and long-term sustainability of their business activities.

According to the Food and Agricultural organisation of United Nations (©2023), food poverty can be defined as a situation in which there are individuals in the population who do not have the possibility of regular access to the necessary amount of healthy and nutritionally valuable food to meet their nutritional needs. Food poverty is fundamentally caused by the unavailability of food, or the lack of resources to obtain it. Worldwide, at least 700 million people are suffering from hunger in 2022 according to the latest available official statistics.

An often inflected problem affecting a current food poverty increase among EU member countries is the unprecedented rise of foodstuff price inflation (Headey and Hirvonen, 2022). Several studies provides possible factors behind the negative food inflation trends such as supply shock, demand driven inflation or market distortions anchored in an excessive bargaining power of food retailers throughout the value chain (e.g. Abildgren and Kuchler, 2021; Sipiczki and Varga, 2022; Sohag et al., 2023). Lowrey et. al. (2022) states that food bank services and other similar types of charities and food donation initiatives are considered to be the counterpart to the food retailers´ business goals.

2 Methods

The aim of this article is to address, via an exploratory type of study, the food poverty in Europe by identifying the financial performance of food chains in Visegrad 4 member countries that have been most affected by food price increases among EU member states. Subsequently, the relationship between business goals in the area of profitability and the public interest in food security is discussed. Authors employ in this article secondary corporate financial data of food retail businesses, which are active in selected Visegrad 4 member countries, namely Czechia, Hungary, Poland and Slovakia. Market data on price development of basic foodstuff representatives, namely raw milk and butter are then considered for a further comparison purposes of food price inflation development within a diverse sample of countries according to development of Harmonised Index of Consumer Prices (HICP) regarding its benchmark values gained at level of EU-27 (Eurostat, ©2023c). Namely, selected older EU member states with a similar development of observed foodstuff inflation regarding the EU-27 benchmark, namely Germany and Netherlands, followed then by Estonia and V4 member countries as representatives of newer EU members with a higher inflation level of the foodstuff prices in comparison with the EU-27 benchmark. Additionally, a secondary data on world commodity markets´ price of crude oil and electricity are beside raw milk prices development employed as possible explanatory variables in OLS regression of consumers´ price for butter in the time series January 2022 to March 2023. Due to non-available data of commodity price monitoring of European Commission (©2023) for the case of Hungary, this country is excluded from the OLS regression analysis. Database ORBIS of Bureau van Dijk (©2020) is then used as the

source of corporate financial data. Identified sample of food retail businesses is consistent with the EU NACE industry classification G – Wholesale and retail trade and respective subcategory No. 4711. The availability of data in the database ORBIS was limited for the period of years 2011 – 2019. Authors assume normality of data due to a sampling procedure for identifying active food retailers and extent of the sample per se. The food retailers are classified according to their economic size, using the following attributes anchored in the employed financial data of the corporate database Orbis (Bureau van Dijk, ©2020):

- large companies: annual operating revenue higher than 10 million EUR; total assets for a year-period higher than 20 million EUR; a number of employees higher than 150;
- small and medium-sized companies: annual operating revenue lower than 10 million EUR; total assets for a year-period lower than 20 million EUR; a number of employees lower than 150.

The employed corporate financial indicators of individual businesses are gathered as median values from the financial data in the database Orbis of Bureau van Dijk (©2020) in respective years 2011–2019. The following indicators are selected in order to reveal mutual relationships in achieving Return on Equity (*ROE*) as a widely accepted key corporate financial performance indicator via its dynamic breakdown. The following indicators of the dynamic breakdown are considered – Return on Assets (*ROA*), Return on Sales (*ROS*), Financial Leverage (*FL*) and Total Assets Turnover (*TAT*). Dynamic decomposition provides further possible analytic outputs of mutual relationships within the *ROE* indicator breakdown, including partial contribution on its year on year change:

$$ROE = Net\ Income \,/\, Equity\ Shareholders\ Funds \quad (1)$$

$$ROA = Net\ Income \,/\, Total\ Assets \quad (2)$$

$$ROS = Net\ Income \,/\, Sales \quad (3)$$

$$TAT = Sales \,/\, Total\ Assets \quad (4)$$

$$FL = Total\ Assets \,/\, Equity\ Shareholders\ Funds \quad (5)$$

$$\text{Contribution of } \Delta FL \text{ to } \Delta ROE = (\mathrm{LN}(FL_t/FL_{t-1})/\mathrm{LN}(ROE_t/ROE_{t-1}))*(ROE_t/ROE_{t-1}-1) \quad (6)$$

$$\text{Contribution of } \Delta ROS \text{ to } \Delta ROA = (\mathrm{LN}(ROS_t/ROS_{t-1})/\mathrm{LN}(ROA_t/ROA_{t-1}))*(ROA_t/ROA_{t-1}-1) \quad (7)$$

$$\text{Contribution of } \Delta TAT \text{ to } \Delta ROA = (\mathrm{LN}(TAT_t/TAT_{t-1})/\mathrm{LN}(ROA_t/ROA_t-1))*(ROA_t/ROA_{t-1}-1) \quad (8)$$

Where the aforementioned formulas (6) – (8) cannot be applied due to negative input values the year-on-year index approach for revealing partial contributions is employed.

The sample of food retailers consist of the following structure of size categories of businesses identified in the corporate database Orbis of Bureau van Dijk for respective countries. Namely, the sample from Czechia involves 6131 SMEs and 66 large food retail businesses, the sample of Hungary involves 3898 SMEs and 46 large food retail businesses and the sample of Poland involves 1688 SMEs and 194 large food retailers.

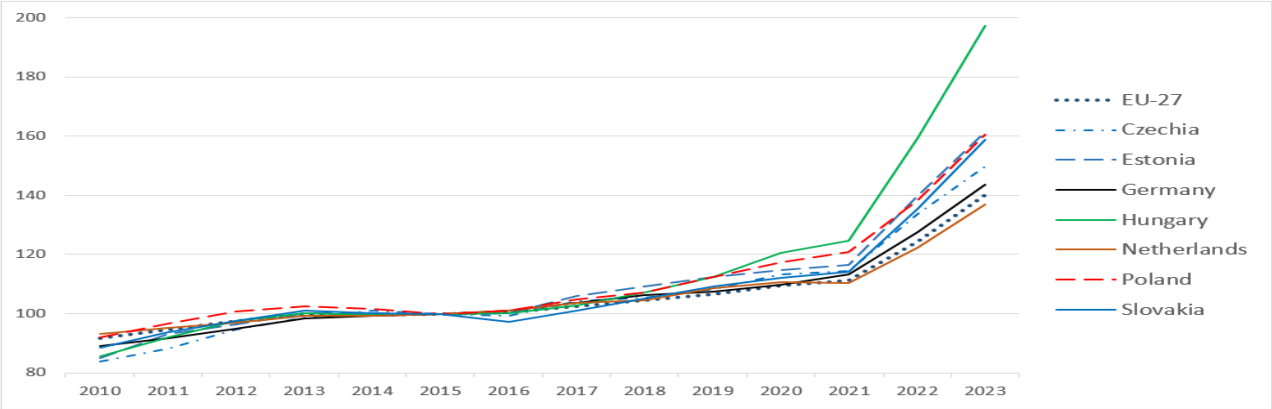
3 Research results

Authors' focus of analyses in this article is the selected basic foodstuff from processed cow raw milk – butter – and entrepreneurs in the food retail sector. In the first subsection it is provided the analysis of food consumer prices development among EU Member States and the related activities of food banks united within the European Food Banks Federation (FEBA). The second subsection of the empirical part of the text employs the correlation analysis to reveal relationship between the price of butter and the basic energy commodities – oil and electricity – are researched. In the third subsection, the financial performance development of food retail business entities in newer EU Member States is analysed on an empirical basis.

3.1 Food consumer prices development among EU Member States and related activities of food banks

The empirical analysis on the development of consumer prices in EU-27 and selected EU Member States is provided via the Harmonised Index of Consumer Prices (HICP). It provides a harmonised inflation measure for the sample countries. This indicator provides a measure on prices development of consumer goods and services acquired by households and it is provided by the EC Eurostat (Eurostat, ©2023c). Fig. 1 provides a comparison of food price inflation in EU-27 and selected Member States by employing base period of year 2015.

Figure 1 Development of food Harmonised Index of Consumer Prices in EU-27 and selected Member States within years 2010 – 2023 (year 2015 = 100)



Source: Own processing using data of Eurostat (©2023c)

A stable increase of food inflation is identified in EU-27 after year 2016, specifically then in the period of years 2017–2019 an average increase using HICP under 5 %. The outbreak of COVID-19 disease increased the price inflation using HICP to the average growth rate level at slightly above 9 % within years 2019 – 2021. Finally, Russia's war against Ukraine caused the highest average growth rate of food consumer food prices in the modern history of the EU. Namely, increase of consumers' food price measured by HICP in EU-27 at level of average growth rate nearly 32 % within years 2022 – 2023. In addition, however, there are specifically newer EU Member States, which highly overcame that increase with Hungary as the representative of the highest average increase for that period, namely increase over 77 %, followed by Estonia in that period with increase at around 50 %, Slovakia and Czechia with average increases of 46 % and 41 %. On the other hand, representatives of older EU countries in the sample, namely Germany and Netherlands were identified as those with the lowest average increase of food price inflation in the period of years 2022 – 2023, i. e. slightly above 35 % for the case of Germany and below 30 % for the case of the Netherlands.

The unfavourable development of food prices in the EU member states was reflected in the increasing demand for activities of the social safety net type of food banks associated in the European Federation of Food Banks (FEBA), see Tab. 1 for details.

Table 1 Development of the scope of European food bank services within their association in FEBA within years 2017 – 2022

Item / year	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*
Food banks and branches	214	291	300	335	341	351
Food help distribution (th. of tons)	501	781	768	860	907	876

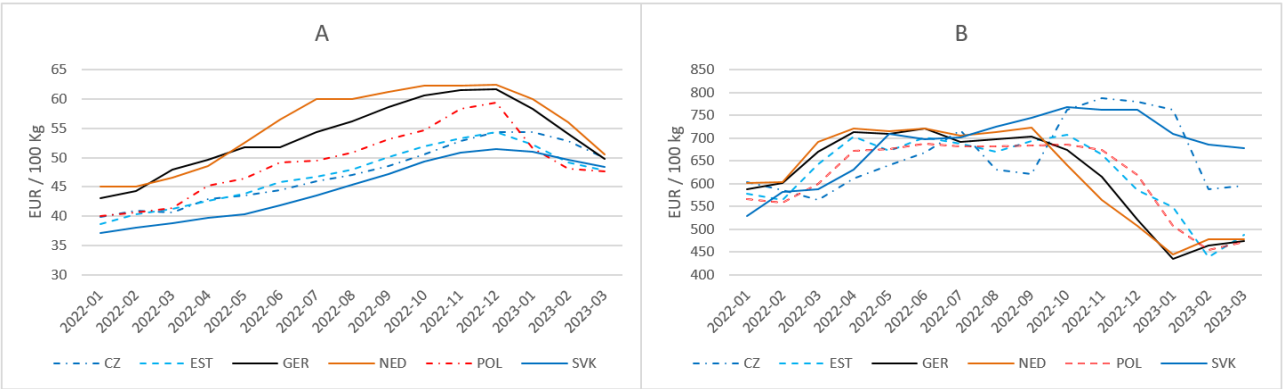
Source: Own processing using data of European Federation of Food Banks (©2023)

The European food banks and their branches faced an increasing demand for their services during year 2023. Food banks can be regarded as an intermediate stage between the existing growing nutritional deficit of affected groups of the European population in social need on the one hand, and stable food production and distribution chain operations on the other hand. However, this imbalance further deepens the issue of food waste across EU Member States. EC Eurostat (©2023) reported for the year 2021 the food waste extent at 131 kg/per inhabitant within the EU Member States.

3.2 Consumer price development of butter in selected EU countries

Development of consumer price of butter in the period from January 2022 to March 2023 is analysed via publicly accessible data, while employing possible influencing factors – prices of crude oil, electricity and raw cow milk. Fig. 2 summarises the price development of raw milk and consumer price of butter in selected core and newer EU member countries.

Figure 2 Development of raw milk price (sub-figure A) and butter (sub-figure B) in time series January 2022–March 2023



Source: Own processing using data of European Commission (©2023)

The highest average growth rate of butter consumer prices in observed time series is identified in Slovakia and Czechia. Additionally, price observation in Czechia and Slovakia also reveals the lowest variability from mean prices of butter, namely variation coefficient from the observed high level of butter consumer prices at value 11,5 % and for the case of Slovakia 10 %. In comparison, the levels of raw milk prices, which were identified both among the lowest in the absolute terms and also with the lowest variability. Namely, the variability from the mean

in Czechia and Slovakia was identified around only 10 %, i.e, again among the lowest ouf of the sample of countries.

Results of OLS regression that puts crude oil as the explanatory variable of butter consumer price development is provided in Tab. 2. Regression results point out at the observations in Czechia and Slovakia as representatives of only countries of not positively correlated development of market prices of crude oil and consumer prices of butter.

Table 2 Results of OLS regression for single independent variable "Brent Oil Close" to explain price of butter in selected countries

Explanatory variable	**Brent Oil Close**					
OLS statistics / Country	*Czechia*	*Estonia*	*Germany*	*Netherlands*	*Poland*	*Slovakia*
Coeff. – constant	763.116	166.244	-4.713	-26.097	210.179	755.015
Coeff. – dependent var.	-1.066	4.775	6.516	6.761	4.230	-0.738
t–stat. – dependent var.	-0.611	3.506	4.855	5.003	2.908	-0.460
p–value – dependent var.	< 0.01***	< 0.01***	< 0.01***	< 0.01***	0.012**	0.653
Std, error of the regression	80.910	63.141	62.221	62.649	67.424	74.321
Adjusted R^2	-0.047	0.446	0.617	0.632	0.348	-0.060

Source: Own processing using data of Nasdaq, Inc. (©2023)

Results of OLS regression that puts market price of electricity as the explanatory variable of butter consumer price development is provided in Tab. 3. Similarly to the previous results of regression analysis regarding relationships of crude oil and consumer prices of butter the regression analysis of explanatory variable electricity and butter points out again at the outstanding observations in Czechia and Slovakia.

Table 3 Results of OLS regression for single independent variable "Electricity" to explain price of butter in selected countries

Explanatory variable	**Electricity**					
OLS statistics / Country	*Czechia*	*Estonia*	*Germany*	*Netherlands*	*Poland*	*Slovakia*
Coeff. – constant	652.800	465.893	434.720	421.645	447.871	630.156
Coeff. – dependent var.	0.033	0.616	0.721	0.780	0.655	0.213
t–stat. – dependent var.	0.127	2,873	2.815	3.073	3.281	0.944
p–value – dependent var.	0.901	0.013**	0.015**	< 0.01***	< 0.01***	0.362
Std, error of the regression	82.013	68.881	82.255	81.551	64.064	72.483
Adjusted R^2	-0.076	0.341	0.331	0.376	0.411	-0.008

Source: Own processing using data of Eurostat (©2023a)

Results of the last intended partial OLS regression on market price of raw milk as the explanatory variable of butter consumer prices development can be seen in Tab. 4. In this case the observed development of price levels reveals Czechia and Slovakia as only countries´ sample with a moderate positive correlation between raw milk price and consumer price development in the observed period January 2022 to March 2023.

Table 4 Results of OLS regression for single independent variable "Raw Milk" to explain price of butter in selected countries

Explanatory variable	**Raw Milk**					
OLS statistics / Country	*Czechia*	*Estonia*	*Germany*	*Netherlands*	*Poland*	*Slovakia*
Coeff. – constant	180,969	647,989	689,322	705,444	395,579	183,820
Coeff. – dependent var.	10,163	-0,533	-1,321	-1,536	4,464	11,1629
t–stat. – dependent var.	3,132	-0,111	-0,284	-0,358	1,198	4,836
p–value – dependent var.	< 0.01***	0,913	0,782	0,726	0,252	< 0.01***
Std, error of the regression	61,951	88,027	104,040	106,629	82,205	44,783
Adjusted R^2	0,387	-0,076	-0,070	-0,066	0,0301	0,615

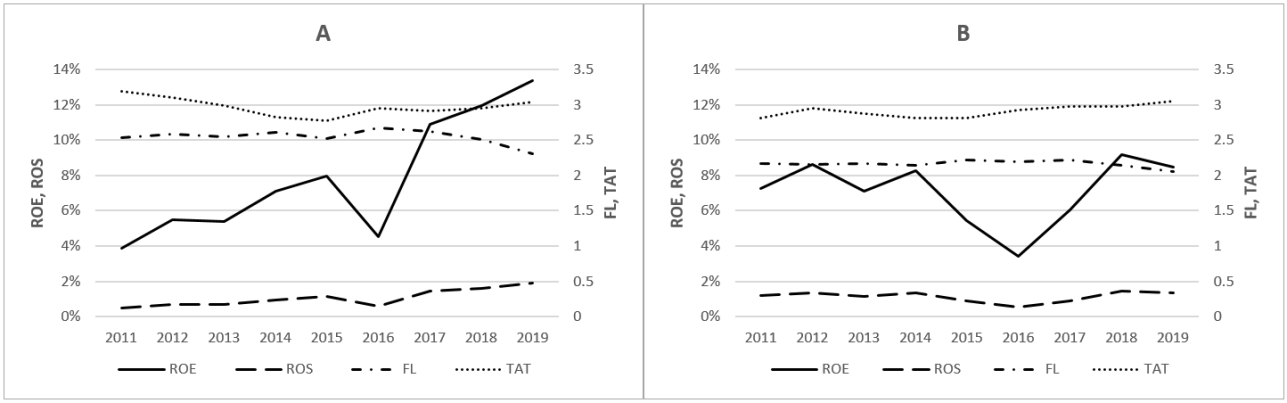
Source: Own processing using data of European Commission (©2023) and Eurostat (©2023b)

Partial results of the conducted regression analysis are followed by insight into the financial performance development of food retail businesses in Central European Countries Czechia, Hungary and Poland.

3.3 Development of financial performance of food retail businesses in selected Visegrad 4 countries

The outstanding results in the selected foodstuff consumer price development in some newer EU member states was further analysed according to an aggregated financial performance of food retailers in V4. Fig. 3 provides the overall description of key performance indicator Return on Equity (*ROE*) among two distinguished economic size categories of small and medium sized (SMEs) and large food retailers employing its analytic breakdown employing indicators Return on Sales (*ROS*), Financial Leverage (*FL*) and Total Assets Turnover (*TAT*). In further detail to observed V4 members, SMEs food retailers based in Czechia and Poland represent businesses with the most stable profitability in years 2011 – 2019, i.e. time period involving stable economic growth of national economies before Covid-19 world crisis. Breakdown of the indicator *ROE* specifically reveals its synchronicity with indicator Return on Sales (*ROS*)

Figure 3 Food retail businesses in V4 member countries: Analytic breakdown of indicator *ROE* using indicators *ROS*, *FL*, *TAT* regarding SMEs (sub-figure A) and large businesses (sub-figure B) in time series 2011–2019

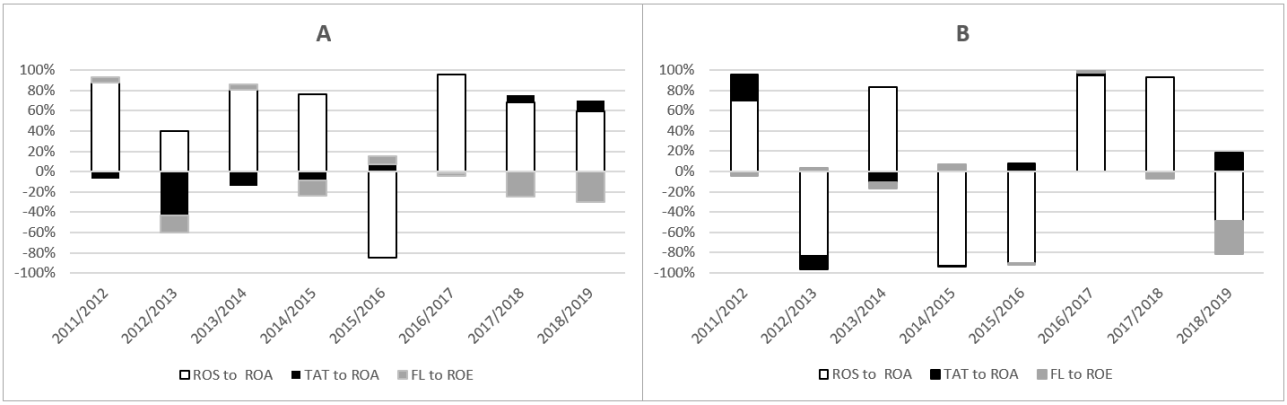


Source: Own processing using data of Bureau van Dijk (©2020)

Development of performance indicator Return on Equity (*ROE*) among the observed sample of economically largest food retailers in selected V4 members reveals similarly to the sample of SMEs a synchronicity with the indicator Return on Sales (*ROS*) in the time period of years 2011 – 2019 (see Fig. 3 sub-figure B). An insight into respective V4 members reveals that the observed economically largest food retailers based in Czechia represent businesses with the most stable profitability in years 2011 – 2019.

A further analysis of the influence on year on year development of the key performance indicator *ROE* is provided via its dynamic breakdown for the both economic size groups of food retailers (see Fig. 4 for details). The dynamic breakdown of the indicator *ROE* among the both observed economic size groups of food retailers in selected V4 members reveals the prevailing influence of the *ROS* indicator on year-on-year development of the indicator *ROE*. A specific representative of V4 members sample in the context of the *ROS* indicator influence on the *ROE* among SME food retailers is again Czechia. Analysis of SME businesses settled in other member countries, namely Poland, Hungary and Slovakia, reveals negative influence of the indicator *FL* on development of the indicator *ROE* around the year 2019.

Figure 4 Food retail businesses in selected V4 member countries: Dynamic breakdown of indicator *ROE* using relative contributions of indicators *ROS*, *FL*, *TAT* regarding SMEs (sub-figure A) and large businesses (sub-figure B) in time series 2011–2019



Source: Own processing using data of Bureau van Dijk (©2020)

It was identified via a dynamic type breakdown of indicator *ROE* for the observed group of the largest food retailers a prevailing influence of the indicator *ROS* on year-on-year development

of the key performance indicator *ROE*. Specifically then, a continuous influencing positive effect of the indicator *TAT* on development of observed *ROE* profitability was identified among food retailers based in Hungary. In addition, a negative effect on year-on-year change in indicator *ROE* influenced by the *FL* indicator was observed only rarely for the sample of large food retailers based in the sample of V4 members, namely around the year 2019. So it is a similar partial result as for the observed group of SME food retailers.

4 Discussion

The issue of food security has been an important topic for government authorities in Europe since the end of World War II (e. g. Hamblin, 2012; Wilkinson, 2015). From the EU perspective, this area is consistent through the objectives of the Common Agricultural Policy. The stability of the agricultural and food sector in the EU can be linked to the fact of general food overproduction (Messner et al., 2020). However, the concurrence of several global crises in recent years has highlighted the problematic framework of food security, which must also be given the necessary attention in the future. Whether it is the changing requirements for nutritional and environmental aspects of food production on the one hand (Ritchie and Roser, 2020), or the structure and geographic location of the food value chain itself on the other hand (Smetana et al., 2021). Other empirical study of Hamulczuk and Skrzypczyk, 2021 reveals a negative and statistically significant relationship between an export-import ratio as the indicator for the country's self-sufficiency level in the pre-COVID-19 period and price changes in the pandemic outbreak in year 2020.

The solution to the issue of food insecurity in the short run is connected with the activities of food banks and other charitable types of organizations (e.g. Laowrey, 2022), where, in addition to direct food aid, the philanthropy of businesses that donates food is also emphasized. In this context, however, it is necessary to consider that donated food from retailers are mainly perishable goods with an approaching use-by date, or best before date of the respective foodstuff. In fact, it is also indicating a presence of market failures in placing the foodstuff on market. Beck and Gwilym (2023) document the rise of food banking in the context of declining social security by examining a decade of austerity in the UK as the representative of a developed market economy in the period of COVID-19 outbreak. They also contextualized the process of normalizing food banks as a safety net in addressing the reduced capacity of the state to address growing social problems at the governmental level. The authors argue that the welfare state has failed to address a basic need – food security. Penalver and Aldaya (2022) stress out a multi-purpose role of food banks via reducing a possible food wastage effects on unnecessary greenhouse gas emissions, deforestation or loss of biodiversity.

The problem area of identified differences in price inflation levels among EU member states can be discussed with findings of Bredin, Potì, and Salvador (2022). They distinguish two forms of short-term trading with food products, when they consider the influence of distortion by the so-called manipulators and the correction effect on the part of the so-called speculators in relation to the basic price of the relevant product. Empirical evidence has been provided of the increased role played by manipulators during the period most associated with related financial transactions. Kusz, Kusz, and Hydzik (2022) identified in the years 2005-2019 statistically significant differences between the trends in the prices of agricultural raw materials and food were recorded for wheat, bread, and flour; milk, butter, and cottage cheese, eggs and egg retail prices, as well as livestock for slaughter, cattle, and sausages in the case of Poland. These data were indicating a different level of price transmission depending on the respective product group. Similarly, Fernández-Polanco, Llorente, and Asche (2021) show how organization along the value chain and differentiation of domestic product provide different distribution channels and different mechanisms of price transmission. Domestic and international producers establish

alliances with downstream agents both at national and international level depending on to the market targeted. As a result, producers have a lower ability to influence downstream prices, but they can move to a less volatile price scenario. In addition, Nes, Ciaian, and Di Marcantonio (2021) show that also other factors such as heterogeneous consumer preferences across EU Member States, distance, price level, and product complexity can contribute to a business incentives to offer different versions of supposedly identical branded food products in different EU Member States.

5 Conclusions

Development of the financial performance of food retailers has recently been associated specifically in the newer EU member states with their pressure to reduce prices into an artificially low levels, often below cost levels of its production. All this in connection with the empirically proved efforts of large retail chains to increase their market shares. Findings of this article regarding V4 member countries show very low levels of Return on Sales in the period of years 2011 – 2019. Namely stagnation of Return on Sales for the sample of large businesses, characterised by a low variability at 25 % from its mean value 1.2 % and a slow growth for the case of SMEs characterised with variability under 45 % from its mean value slightly above 1 % in the observed period. Business goals in the area of Return on Equity were therefore compensated by a high level of Total Assets Turnover. This situation inevitably also influences the possible wasting with natural resources and processed foods. Sustainable food production has to follow a counterbalance among needs of price affordability of foodstuff, its availability and a complex quality, influencing nutritional and other qualitative criterions, including also environmental sustainability. Market economy itself cannot cover all the aforementioned aspects, but a pure state regulation base cannot provide a long run solution as demonstrated regarding the role of food banks. For the sustainable economic performance of the agri-food sector and the protection of the environment as a whole, it is therefore necessary to further consider broader approaches, including consumer awareness of food security in its comprehensive scope.

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