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## URBAN SPRAWL ENTREPRENEURSHIP AS AN ALTERNATIVE TO DECENTRALIZATION OF THE LABOR MARKET: CASE STUDY ON THE KRAKÓW METROPOLITAN AREA

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### ABSTRACT

The territories of large cities and their neighboring areas are subject to dynamic changes. The process of population movement from city centers to suburban areas has an impact on the economic structures of these areas. A significant portion of economic activity is reallocated with migrating residents to peripheral areas. The aim of the article is to assess the diversity of the urban sprawl entrepreneurship phenomenon in the metropolitan area of Kraków. Analysis has shown that the movement of enterprises related to the population migration takes place to the greatest extent in the zone directly adjacent to Kraków and the Tarnów influence zone. These communes create an attractive environment for residents and encourages them to locate their businesses within that territory.

**Key words:** entrepreneurship, metropolitan areas, suburbanization, urban sprawl

**JEL codes:** H7, L26, R12, J61

### INTRODUCTION

For a dozen or so years now, the space of big cities has been undergoing transformational processes, which are largely due to the emergence of globalization and regional movements. Mutual integration of countries and regions has led to the beginning of metropolitanization processes in cities – a new phase of urbanization. In this phase there are not only changes in the distribution of the population, but also a transfer of metropolitan functions to the areas influenced by the big city. The change of existing interactions between the core and suburban zones implies socio-economic development of the entire metropolitan area, while the effects of new connections between the city and its neighboring areas are intensified suburbanization.

There are movements within metropolitan areas towards the center – but growth of the suburban zone causes depopulation of the urban core and a population concentration in the urbanized zone.

The influx of people into suburban areas and their daily existence will lead to a dynamic change of suburbs into more complex structures. Increased housing construction and the creation of new spatial infrastructure (mainly transportation) cause the disappearance of the traditional rural or small-town landscape in the areas surrounding the metropolis in favor of amorphous structures with unidentified identity. The growth of cities in a spontaneous, uncontrolled and chaotic way has led to inefficiencies in spatial planning. Local governments abandoned all forms of spatial management for the sake of increasing competition of their

administrative unit in relation to neighboring municipalities. Suburbanization does not only concern the population. When moving to areas around the city, inhabitants often give up their jobs in the metropolis and relocate their businesses or create new ones in their place of residence or its close vicinity. The distribution of economic units, like that of the population, takes on an uncontrolled character and is not the same in all municipalities. Therefore, the aim of the article is to assess the diversity of the urban sprawl entrepreneurship phenomenon in the metropolitan area of Kraków. The time range of the conducted analyses covered the years 2010–2019.

### **URBAN SPRAWL AS A SPECIFIC FORM OF SUBURBANIZATION**

Definitions of the metropolis in literature are not unambiguous and put emphasis on various factors determining its designation. Studies of the Union of Polish Metropolises define that it is a “settlement complex of a city (or cities) of knowledge, where more than 500 thousand inhabitants live and more than 50 thousand students study, constituting a European (supranational) transport node. The network of metropolises is an international environment of capital, business and knowledge [own translation]” [Adamowicz 2012]. Bassand [1997], on the other hand, defines the metropolis by a number of the above-mentioned features. Its task is a city with an exceptional specificity, with a population of at least 500 thousand, distinguished by the excellence of services, equipment and institutions. It has unlimited innovative potential in the social, economic and cultural field. In turn, Markowski and Marszał [2006] have identified six criteria on the basis of which Polish cities can be qualified as metropolises. According to them, such a unit should be large and must have between 0.5 and 1 million inhabitants. Moreover, it is a territorial unit highly situated in the national hierarchy, characterized by a high economic and investment potential demonstrated by a developed service sector and the number of scientific units and research and development centers. The authors also pointed out that the city should be highly accessible in spatial scales of various degrees and should act as a center of communication, information and

organizational links. Additionally, city leaders in making key decisions should strive to create a network model of management and economy.

Metropolization does not only mean a transformation of the urban space of the city but also a transformation of functional connections of the metropolitan area [Lisowski and Grochowski 2008]. Taking into account the fact that the metropolitan area is a consequence of the considerations on the metropolis it is reasonable to try to define the term. In this case there are also definition problems. According to the study resulting from the project entitled *INTIS. Integration and Synergy. Strategy for the Development of the Gdansk Metropolitan Area 2014–2030*, the first definition was created for the United Nations conference in Stockholm in 1961. The term was explained as an area which is inhabited by no less than 100 thousand people and has at least one city with a population of at least 50 thousand people, and adjacent units are of a metropolitan nature [Komornicki et al. 2015a]. Trafas [2003] believes that the metropolitan area is: “a spatially continuous, metropolitan settlement system consisting of separate settlement units covering a large city (metropolis) or a compact urban area – as the center (core) of the system and a functionally related urbanized zone with a significant intensity of social, economic and spatial conflicts [own translation]”. According to Markowski and Marszał [2006], the definitions of the concept of a metropolitan area, due to the great freedom of terminology, are usually abstract and fuzzy.

Metropolises, as centers of the region, have a significant economic and social potential and concentrate on their territory the most important determinants of economic development, such as: knowledge represented by the presence of universities, highly qualified social capital, favorable conditions for the development of innovation and investments in the most productive sectors [Noworól and Hołuj 2016]. Therefore, they are referred to in the literature as the driving force of the economies of neighboring local government units. Sokol [2004], following Scott’s and Stoper’s thought, defines the metropolis as the locomotive of the economy. Therefore, the existence of diverse functional connections between metropolises and their surrounding areas leads to increased activation of suburbanization processes.

The nature of contemporary urbanization, the growing scale of the phenomenon and the area scope of urban expansion, result in the emergence of new settlement systems, the complexity of which blurs the key differences between urban and rural areas [Cohen 2004]. Urbanization of suburbs takes place at a different pace and according to different rules in different countries. However, in some countries, these uncontrolled transformations take the form of a chaotic, violent and lively urbanization, characterized by a lack of spatial order. This phenomenon was defined in the early 1960s as urban sprawl, meaning “a lack of continuity in [urban] expansion” [Clawson 1962]. The literature also defines it as a process of unmanaged structural transformations in suburban municipalities resulting from intensified suburbanization movements [Persky and Wiewel 2012].

The task, according to Brueckner [2000], of urban sprawl in economic terms is to impose greater net marginal costs on public sector entities and households as a consequence of urban decentralization. These costs relate to expenditure on the creation and maintenance of infrastructure and other services for which the local government is responsible, personal transport, as well as urban transport, inefficient use of energy, and many others resulting from the remoteness of human settlements from the city center. However, these are not the only consequences of urban sprawl. In the literature, this process is assessed as definitely negative. Uncontrolled development of suburban areas often leads to spatial chaos and degradation of the landscape. The inflow of population to the area surrounding the metropolis causes a rapid loss of its rural and agricultural character, but also a multi-faceted deagrarianization mainly due to the development of housing, relocation of industry and services and an increase in infrastructural development [Kurek et al. 2014].

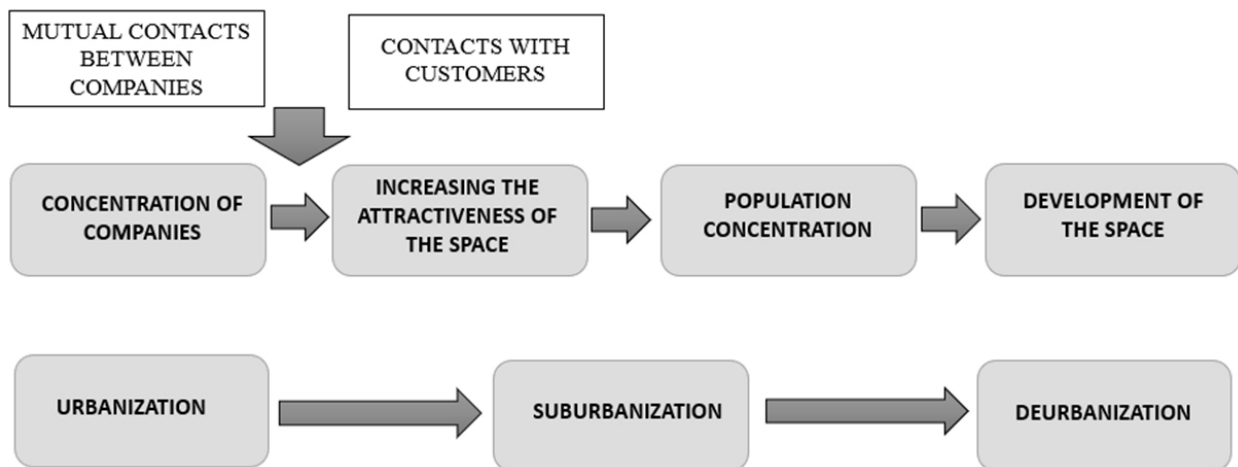
Scientists present the consequences of urban sprawl as a bad allocation of resources; however, an increasing number of researchers dealing with suburbanization identify urban sprawl not with negatively evaluated processes, but on the contrary, they find positive economic effects. In their opinion, the transfer of metropolitan functions to suburban areas may be an important factor in maintaining low and stable

transport expenditures, reducing overcrowding in the city center and increasing economic efficiency.

In highly centralized cities, a mismatch of the real estate market can be observed. The predominance of demand over supply of land results in an increase in real estate prices and in higher fees resulting from renting residential and office premises [Cheshire and Sheppard 2002]. Therefore, the dispersion of the city into a suburban zone allows to lead jobs out of the costly and overpopulated core of the metropolitan area. The development of ICT networks and the increase in the number of mobile professions is a conducive factor [Anas 2012]. The relocation of the population is usually the phase preceding the decentralization of jobs and the suburbanization of entrepreneurship. The increase of interest in suburban areas in order to run a business has a multifaceted justification and is to a large extent conditioned by lower costs of business location than in the city. On the other hand, according to the theorists dealing with the topic of business location, the choice of the place of operation of a company has a large impact on the development of the social and economic spaces of the urbanized zone, and then on the occurrence of agglomeration and urbanization processes (Fig. 1).

The accumulation of enterprises and the resulting mutual contacts of business entities, as well as relations with customers, increases the attractiveness of the space and result in the concentration of the population. This results in a chain of consequences for the development of the space, as well as stimulates multi-faceted structural changes. Originally there is a process of urbanization, and until the agglomeration develops there is an influx of people from the outer zone of the city to the centers. The development of transportation and the lower price of land initiate another stage called suburbanization of entrepreneurship, i.e. the transfer of people and economic entities from the metropolis to suburban areas. The next stage is deurbanization, consisting in overloading metropolitan areas and moving the population to other smaller towns, more distant from the core of the metropolitan area, which are in the urbanization stage. The areas subject to metropolitanization processes differ from each other in size, structure or specificity and are subject to rapid territorial, economic and social changes resulting from the power of influence of the metropolis.





**Fig. 1.** Influence of business location selection on the agglomeration  
Source: Authors' own study on the basis of Głębińska and Grewiński [2005].

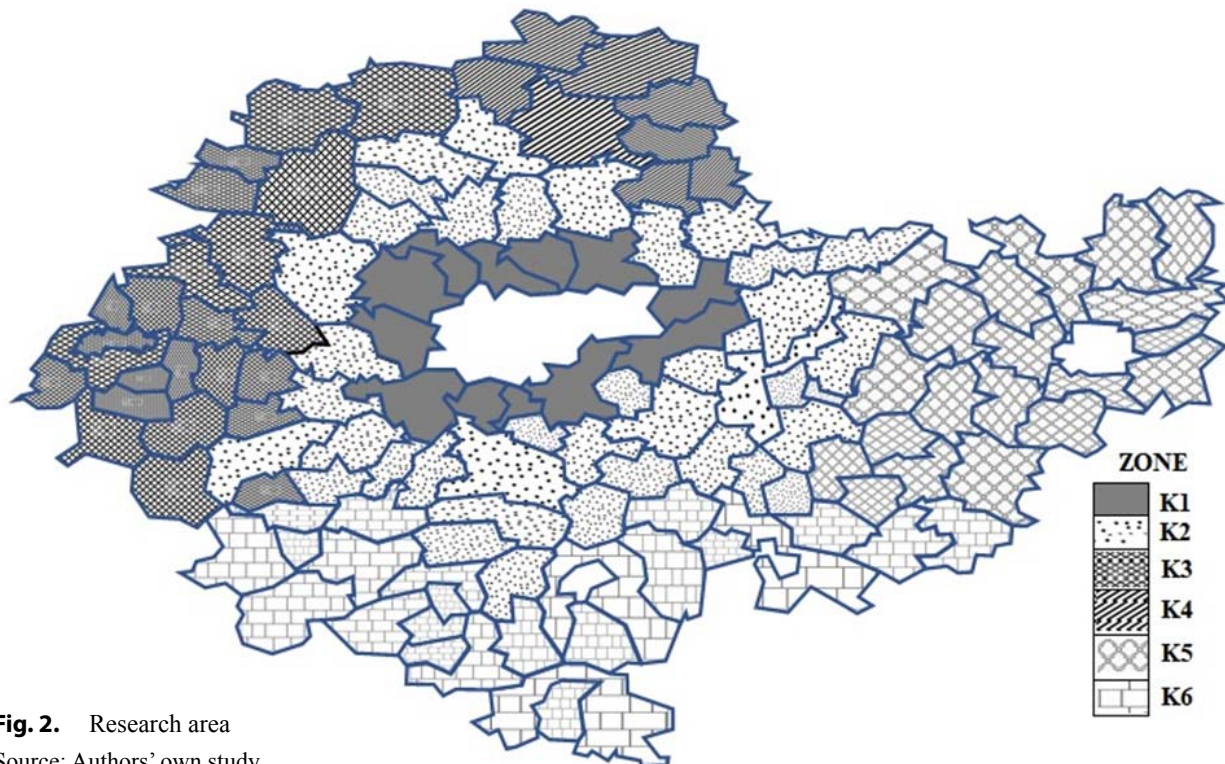
## METHODOLOGY

According to most sources, the Kraków Metropolitan Area is the third largest metropolitan area in Poland in terms of population. Kraków is the capital of the dynamically developing Małopolska Region; it is a historical metropolis which is subject to strong structural transformations and which continues to develop its metropolitan functions. Being a strong center and creating a *europolis*, it remains in numerous interactions with neighboring settlement units. Due to the lack of detailed criteria of the functional delimitation of metropolitan areas in Poland, their area coverage is very different. A lack of regulations on the national level causes the literature on the subject to present an ambiguous definition of the scope of influence of the Kraków Metropolitan Area. Therefore, for the purposes of the article, the limits of the territorial range have been determined on the basis of useful report by the Institute of Geography and Spatial Organization Polish Academy of Sciences (Instytut Geografii i Przestrzennego Zagospodarowania im. Stanisława Leszczyckiego Polska Akademia Nauk) entitled *Oszacowanie wartości wskaźnika dostępności czasowej na potrzeby dokumentów strategicznych, których postępy są monitorowane w ramach bazy STRATEG (izochrona*

*drogowa 60 i 90 minut)*, which was prepared during the third stage of the project entitled *Oszacowanie oczekiwanych rezultatów interwencji za pomocą miar dostępności transportowej dostosowanych do potrzeb dokumentów strategicznych i operacyjnych dot. perspektywy finansowej 2014–2020* [Komornicki et al. 2015b]. The isochrone (travel time over a given distance) of 60 min is identified with the range of the labor market as a contractual limit value for regular employee commuting.

The analysis was carried out in the communes of Małopolskie Voivodeship under the influence of the Kraków Metropolitan Area, which were divided into six zones (Fig. 2):

- Zone K1 “suburban”: separated on the basis of National Science Centre (Narodowe Centrum Nauk) grant project by Wojciech Sroka, entitled *Rolnictwo miejskie, jako wyzwanie zrównoważonego rozwoju obszarów metropolitarnych w Polsce – aspekty ekonomiczno-społeczne, środowiskowe i planistyczne*, which included 13 municipalities closely adjacent to the city of Kraków;
- Zone K2 “commuting to work”: 39 communes designated on the basis of the Spatial Development Plan adopted by the Resolution XV/174/03 of the Małopolskie Voivodeship Regional Assembly of 22 December 2003;



**Fig. 2.** Research area  
Source: Authors' own study.

- Zone K3 of the “mixed catchment”: determined on the basis of the results of Noworól’s and Hołuj’s research [2016]. There are 24 communes within its range, which are under the influence of both the city of Kraków and the neighboring cities of the Śląskie Voivodeship;
- Zone K4 of the “agricultural north”: determined on the basis of the index of agricultural production space valorization, includes eight communes with the highest values of this index;
- Zone K5 of the “impact of Tarnów”: the criterion for designation is the same as for K3 zone, the zone consists of 19 communes located under the influence of two cities with district rights: Kraków and Tarnów;
- Zone K6 “sub-mountain”: determined on the basis of the index of agricultural production space valorization and its terrain component, was included in this group of 25 communes characterized by unfavorable conditions for agricultural production.

The research area includes communes that differ in their degree of socio-economic development. This is

due to both environmental, cultural and economic conditions, the state of development of a given territory, as well as the strength of integration links between the unit and the center of the area. All the above-mentioned conditions determine the processes of suburbanization of the population as well as entrepreneurship, which is a result of the urban sprawl process. In order to assess the distribution of newly created economic units in the communes under the influence of the Kraków Metropolitan Area, the distribution coefficient called Florence’s concentration index ( $F$ ) and described by the formula was used:

$$F = \frac{\sum_{i=1}^k (S_i - U_i)}{100}, \quad S_i - U_i > 0$$

where:

$S_i$  – means the percentage share of the first phenomenon by spatial units,

$U_i$  – means the percentage share of the second phenomenon by spatial units,

$i = 1, 2, \dots, k$  – number of spatial units.

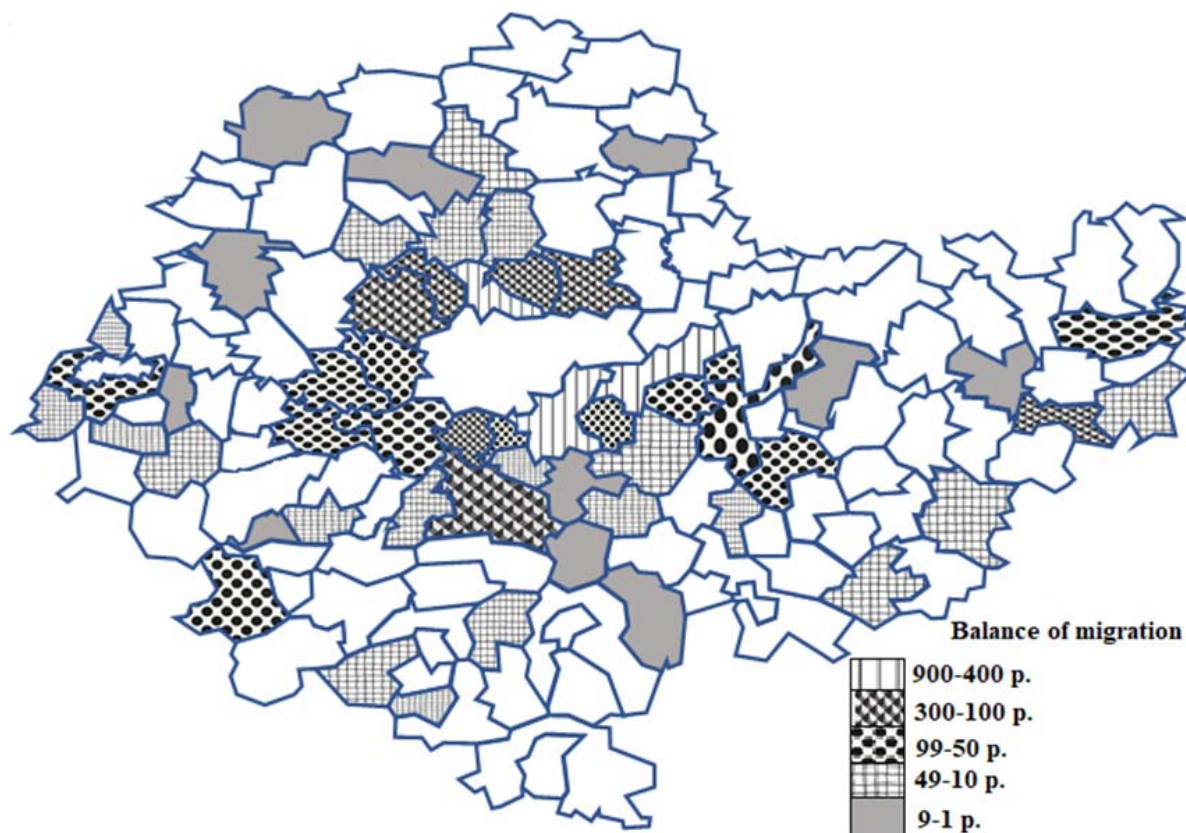
The Florence index allows to indicate the degree of distribution of objects in the analyzed space. It assesses the degree of concentration of the examined feature in the territorial unit, as well as indicates the disproportions occurring between particular research areas [Czyż 2016]. The distribution coefficient was calculated for newly registered entities of the national economy taking into account the balance of population migration in the years 2010–2019. The research was conducted on the basis of data from the Statistics Poland (Główny Urząd Statystyczny).

### RESULTS OF THE RESEARCH

Migration of people is a phenomenon known in economic sciences. Among the causes of population movement are often indicated the availability and quality of jobs, the attractiveness of the place of residence, the advantages of the location associated, among others,

with well-developed transportation networks [Drejerska et al. 2014]. One of the types of migration is the phenomenon of changing the place of residence by the current residents of cities and settling them outside large urban centers. Such processes have been taking place for many years also in the Małopolskie Voivodeship, including with particular intensity in the Kraków Metropolitan Area.

The phenomena of suburbanization and related population migration are most intense in the vicinity of Kraków. Especially municipalities located to the southeast of Kraków experience a large influx of urban population. The process of population migration from the center is also visible in the communes located in the K2 zone (commuting to work), but its intensity is lower there. The second area where the urban sprawl phenomenon is visible are the municipalities adjacent to Tarnów, the second most populous city in the voivodeship (Fig. 3).



**Fig. 3.** Positive migration balance in 2019 in the research zone  
Source: Authors' own study based on Statistics Poland data.

Taking into account the values of the migration rates from cities, the largest number of people moved from the city to the Tarnów impact zone (K5). In each of the analyzed years, the share of this zone was clearly greater than the others, while in 2018–2019 this difference was particularly high (Table 1).

Among the municipalities in the Tarnów impact zone (K5), the process of population migration from cities was most visible in the municipalities of Wierzchosławice and Pleśna. Both these communes are directly adjacent to Tarnów and have good transportation with it. An important, additional advantage of the Wierzchosławice commune is the motorway junction located on its territory. For many entrepreneurs it is a very important argument when locating a business, because it enables efficient delivery of raw materials necessary in the production process and the possibility of quick transport of manufactured products [Glaeser and Kahn 2001, Rakowska 2014].

The creation of new enterprises by people migrating from the cities to the suburban area is also the result of calculating the costs of running a business. Highly urbanized areas, despite providing many facilities for running businesses, also generate higher costs. They are associated with higher rental rates for production and office space, higher rates of taxes and local fees, and often also the need to offer higher remuneration to employees. Suburbanized areas are able to offer much cheaper space for business. Moreover, local authorities wanting to stimulate entrepreneurship apply a tax policy that is favorable to business and residents [Barczyk et al. 2018]. Entrepreneurial behaviors play an

important role in shaping the development of a given region; on the other hand, the level of development of a given area may have an impact on decisions concerning the location of economic units [Satoła 2014].

Creating new economic entities on a given territory is proof of the entrepreneurship of the inhabitants and an expression of seeing in the environment opportunities to improve their financial condition. The new production and service entities, through the action of multiplier effects, contribute to the development of areas in which they are located.

New enterprises were created in each Kraków Metropolitan Area zone. Most of them were created in the commuting zone (K2) and the mixed catchment zone (K3). However, in the latter zone, the indicator of entrepreneurship development showed a constant and clear downward trend. By far the lowest level of entrepreneurship was characteristic for units representing the agricultural zone of the north (K4), which in a way confirms the agricultural character of this part of the region (Table 2).

The research conducted with the use of Florence's location index proved the existence of urban sprawl entrepreneurship. This means that the change of location of enterprises occurred as a consequence of the change of residence from an urban center to a village by city residents. The most significant phenomenon of urban sprawl entrepreneurship was observed in the Tarnów impact zone (K5) and in the suburban zone (K1). The average value of Florence's location index at the level of 0.23 means a rather large dispersion of this type of entrepreneurship. It is worth noting, however, that the

**Table 1.** List of migration indicators for permanent residence from cities by zones of the Kraków Metropolitan Area

| Zone | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|------|------|------|
| K1   | 20.5 | 19.8 | 19.8 | 19.2 | 18.9 | 19.0 | 20.2 | 20.1 | 18.4 | 19.1 |
| K2   | 17.9 | 18.4 | 18.2 | 18.5 | 17.8 | 17.7 | 16.8 | 18.0 | 15.3 | 14.3 |
| K3   | 17.6 | 17.2 | 18.0 | 17.3 | 16.9 | 16.6 | 16.5 | 16.1 | 15.6 | 13.4 |
| K4   | 1.7  | 1.8  | 1.4  | 1.6  | 1.9  | 2.1  | 1.9  | 1.9  | 1.6  | 1.3  |
| K5   | 35.3 | 36.2 | 35.7 | 36.5 | 37.7 | 38.6 | 37.7 | 37.6 | 43.0 | 46.9 |
| K6   | 7.0  | 6.6  | 6.8  | 6.9  | 6.9  | 6.0  | 6.9  | 6.3  | 6.0  | 5.1  |

Source: Authors' own calculations based on Local Data Bank (Bank Danych Lokalnych) of the Statistics Poland data.

**Table 2.** List of entrepreneurship share indicators by zones of the Kraków Metropolitan Area

| Zone | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|------|------|------|
| K1   | 15.7 | 17.7 | 17.4 | 16.9 | 17.3 | 17.2 | 18.1 | 17.6 | 17.2 | 18.2 |
| K2   | 24.4 | 24.9 | 24.0 | 25.6 | 24.7 | 24.3 | 24.8 | 25.4 | 25.3 | 25.8 |
| K3   | 24.8 | 23.3 | 22.7 | 22.0 | 22.4 | 21.5 | 21.3 | 21.0 | 20.6 | 19.6 |
| K4   | 1.9  | 2.3  | 2.1  | 2.5  | 2.5  | 2.3  | 2.4  | 2.0  | 2.3  | 2.0  |
| K5   | 17.7 | 17.3 | 18.3 | 18.0 | 16.8 | 18.1 | 17.4 | 17.7 | 17.9 | 18.1 |
| K6   | 15.6 | 14.6 | 15.5 | 15.0 | 16.4 | 16.6 | 16.1 | 16.3 | 16.8 | 16.4 |

Source: Authors' own calculations based on Local Data Bank (Bank Danych Lokalnych) of the Statistics Poland data.

dynamic analysis of the index conducted in the years 2010–2019 makes it possible to state that every year there was a greater concentration of new enterprises as a consequence of urban sprawl processes. This means that there is a limited number of municipalities to which economic entities are transferred as a consequence of earlier migration of residents from large cities to the peripheries (suburban areas). This group of communes is made up of units offering the most attractive offer for residents in terms of accessibility and quality of public services provided [Marks-Bielska et al. 2019].

## CONCLUSIONS

Suburban areas of the metropolis arouse great interest not only among city dwellers, who are more and more willing to choose these areas as their place of residence, but also among entrepreneurs, who in turn perceive them as a chance to reduce the costs of production resources. Both the change of place of residence as well as the location of the company due to the lack of effectiveness of the Polish spatial planning system are characterized by great chaos and spontaneity. These processes show great spatial dynamics disguised as urban sprawl. Many researchers dealing with the subject of suburbanization focus their attention only on the development of the residential function of peripheral areas; however, the territorial distribution of the economic function has also been relocated within several decades.

The conducted research confirmed that within the Kraków Metropolitan Area there is also a process of

shifting entrepreneurship from the city to the suburban area. However, this phenomenon assumes a different degree of intensity in individual communes and it depends on socio-economic and cultural conditions. Florence's distribution index indicates a very high degree of distribution of entrepreneurship, which means that the new economic units were poorly concentrated. The relocation of economic entities is understood as a change of spatial orientation and their concentration resulting from the fact of population migration is most noticeable in the zone directly adjacent to Kraków and the areas between the metropolis and the city of Tarnów. Nevertheless, the dynamics of changes in both areas is definitely different.

According to the analyzed data, as the years go by, entrepreneurs are increasingly rarely choosing the location of their enterprise in the municipalities directly bordering on Kraków. It can be assumed that the reason for such a choice is the prestige of these administrative units. Increased attractiveness causes an increase in costs of production factors, and high local tax rates discourage new entrepreneurs from locating their business units. Therefore, business owners are looking for a location generating lower costs. In this case, they may be located between two cities with district rights, i.e. Kraków and Tarnów. Concentration of enterprises in these areas may prove to be a key factor of spatial and economic development at the local level. The presented research does not exhaust the whole problem. A proposal for future research may be to identify the factors of differentiation of the location of enterprises in urban sprawl areas.

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## **PRZEDSIĘBIORCZOŚĆ URBAN SPRAWL JAKO ALTERNATYWA DECENTRALIZACJI RYNKU PRACY NA PRZYKŁADZIE KRAKOWSKIEGO OBSZARU METROPOLITALNEGO**

### **STRESZCZENIE**

Obszary dużych miast oraz sąsiadujących z nimi obszarów podlegają dynamicznym zmianom. Procesy przenoszenia się ludności z centrów miast na tereny podmiejskie wywierają wpływ na kształtowanie się struktur ekonomicznych tych obszarów. Część aktywności gospodarczej jest realokowana wraz z migrującymi mieszkańcami na obszary peryferyjne. Celem artykułu jest ocena zróżnicowania zjawiska przedsiębiorczości *urban sprawl* na obszarze metropolitalnym Krakowa. Analizy wykazały, że przemieszczanie przedsiębiorstw związane z migracją ludności w największym stopniu zachodzi w strefie bezpośrednio sąsiadującej z Krakowem oraz strefie oddziaływania Tarnowa. Gminy te tworzą atrakcyjną ofertę dla mieszkańców oraz sprzyjają lokalizacji przez nich przedsiębiorstw na ich terenie.

**Słowa kluczowe:** przedsiębiorczość, obszary metropolitalne, suburbanizacja, *urban sprawl*

## PRICE INTERDEPENDENCE OF AGRICULTURAL COMMODITIES FROM UKRAINE AND WORLD MARKETS

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### ABSTRACT

The objective of the paper is to present the price interdependencies between agricultural commodity products from Ukraine (both export and non-export oriented) and other commodities whose prices are shaped on world markets, with a special focus on the role of their volatility. The research demonstrates a tight connection between the global prices of crude oil and prices of Ukrainian corn and wheat. Additionally, the volatility of world prices of agricultural commodities influenced the Ukrainian national market and had significant impact on domestic price declines. At the same time, the mechanisms for pricing non-export related agricultural commodities are formed mostly under the influence of factors from the domestic market. It is argued that a low interdependency between non-export oriented agricultural commodities and world markets stipulates the social stability of Ukraine's population.

**Key words:** price interdependencies, agricultural commodities, financialization, Ukraine

**JEL codes:** L11, L16

### INTRODUCTION

Agricultural commodity prices on the market are subject to constant changes, which have significantly speeded up in recent years. A common characteristic provided e.g. by Gilbert [2010] is that the overall prices for agricultural products are increasing and fluctuate significantly. Having in mind that the market for agricultural commodities has a global scope, price volatility takes place both in developed and developing countries. One such developing country, and of special importance, is Ukraine. On the one hand, the country belongs to a risky agricultural region with high dependence on agricultural production; on the other hand, as one of the world's biggest producers

of agricultural commodities, it is under the influence of global market processes, especially price volatility.

Ukraine transformed into a free market economy three decades ago. The transformation processes that have taken place in agriculture and the food sector have been driven by the development of new institutions, the creation of an institutional structure for agricultural markets and the adaptation of the players to free market conditions [Zinchuk et al. 2017]. In a new situation, agriculture has become one of the driving sectors of the Ukrainian economy. According to the State Statistics Service of Ukraine [Derzhavna sluzhba statystyky Ukrayiny 2018], in just the last decade, the agricultural sector has contributed 10–12% to Ukrainian GDP. It is also worth mentioning that in the

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period 2010–2017 the share of agricultural products in total export increased from 21% in 2010 to 44% in 2017, while share of agricultural products in total imports fluctuated around 10%. Agricultural exports have been the largest export category for Ukraine since 2013. In 2017, its share was almost two times bigger than that of the second largest export category (ferrous and non-ferrous metals). Tight connection with the world market of agricultural commodities has also impacted pricing mechanisms.

Modern market challenges are reflected in the excessive volatility of domestic market prices; dependence on global market prices combined with a decrease in government price control requires further research, especially regarding crop price mechanisms in Ukraine's agricultural sector. It is thus important to understand existing research on crop pricing, and to keep in mind that crops provide not only consumer products, but also resources to deliver products of animal origin as well as raw material for other sectors of the national economy. This emphasizes the importance of the crop pricing mechanism in Ukraine, especially with regard to price interdependencies.

Thus, the objective of the paper is to present the price interdependencies of agricultural commodity products from Ukraine (both export and non-export oriented) with other agricultural and non-agricultural commodities, whose prices are shaped on global markets, with a special focus on the role of their volatility.

## THEORETICAL BACKGROUND

Gardebreek et al. [2014] argue that the other *signum temporis* (sign of the times) characteristics of agricultural commodity prices are their volatility and interactions across markets. The volatility for farmers means that their market diversification strategies will report a drop in effectiveness and a rise in costs of risk mitigation. The roots of such situations can be found not only in classical economic theories of market functioning [Gilbert and Morgan 2010] but also in theories of trade [Anderson and Nelgen 2012].

The theory of industrial organisation points out another reason, which is financing of the economy, also with regard to agricultural markets [Ménard and

Valceschini 2005]. Today, financial markets are no longer the only place where cash financing occurs. A promised land for financing is the investment in agriculture. According to Franc-Dąbrowska and Bereźnicka [2018], financing in agriculture has three forms: investment in agricultural land, increase in investment in goods and raw materials, including agricultural raw materials, and – increase in the level of farm debt. As concluded by Hamulczuk et al. [2012], one developed process is the financing of agricultural commodity markets. The financing (known also as financialization) is a process of shifting the centre of gravity of the economy from the sphere of production to the sphere of finance. Fernandez and Morley [2015] added that due to financing of agricultural markets there are observed also effects of commodity price volatility and further, the increased price volatility is translated into higher risk mitigation costs for farmers. As a consequence of the financialization of agricultural commodity markets, volatility spillovers can decrease the effectiveness of options for diversification in financial markets when agricultural and energy prices present any degree of price co-movement [Guhathakurta et al. 2020]. As indicated by Franc-Dąbrowska [2019], financialization has different perspectives and can be interpreted in different ways. Through financialization investors are able to obtain financial benefits from financial operations. From another perspective, financialization also creates an additional value that is transferred to commodity markets, especially in raw materials and agricultural products (purchased directly from farmers), and land (agricultural land in particular).

Financialization can impact markets in many ways. Recent studies show tight connections between the prices of crude oil and the prices of agricultural commodities, especially wheat, soy or corn. Gokmenoglu et al. [2020] suggested that it is oil prices that impact the price of agricultural commodities and that this process can work in both directions. Another finding can be found in research done by Czech et al. [2019], who argue that changes in oil prices influence wheat price changes, however, not *vice versa*. It was found that when oil prices decrease, there is an increase in the prices wheat. Accordingly,

while analysing the interrelations between prices in food and energy markets, one needs to pay special attention on the impact of biofuels. Kong et al. [2012] showed that biofuel production as an alternative to expensive fossil fuels increased the competitiveness on the agricultural markets. According to these authors, grain commodities face competition from the demand for biofuels. They also show that the price of grains from which the biofuels are produced influences the volatility in the price of crude oil. A contrary opinion, based on empirical evidences, is given by Fernandez-Perez et al. [2016], who argue that crude oil prices have direct impact on the prices of agricultural commodities for energy purposes, but that there is no case in opposite direction. That indicates that there are both contemporaneous and long-term interactions among fuel, biofuels and agricultural commodities, with different directions of influence. These directions can be impacted by many market and non-market factors. Some of the most important factors are investments [Du et al. 2011], the exchange rate or interest rate [Chiou-Wei et al. 2019], as well as policy issues [Hamulczuk et al. 2019b].

Ukraine, being distinct from countries which have had no fundamental changes in social economic relationships, has the experience of transforming its agricultural commodity pricing mechanisms, including for crops, during a relatively small period of time. There have only been a few such transformations in the 20th century. The foundation of pricing mechanisms under the conditions of free market relationships existed in Ukraine before 1917 [Lukinov 1964]. Next came a period of planned administrative economy from 1920 to 1990, where there was a system of centrally planned market relationships [Kutsmus et al. 2017]. In this period, the agrarian transformations caused asymmetric development of Ukrainian agriculture, most notably due to a striking discrepancy between the results of economic reforms and the assumed goals of those reforms. Prices were adjusted artificially to the needs of society with the primary objective of ensuring food security.

Under the free market economy conditions that were implemented when the country regained independence from the Soviet Union, the problem of price correlation and the impact from world markets

arose. Several agricultural economists analysed the price volatility of Ukraine's agricultural commodities from different perspectives. Those scholars indicate a high dependence of price volatility from the formation and development of market institutions and relations [Shpychak et al. 2000], peculiarities in forming an offer from crop markets under the conditions of world price volatility [Varchenko et al. 2017], and an issue of price integrity while trading crops [Dem'yanenko and Nemchenko 2014]. Special attention was paid to the correlation between profit at agricultural enterprises and the price environment of the global agriculture market. Several studies [Shkvarchuk 2010, Shubravs'ka and Prokopenko 2011, Paskhaver 2016] showed high price dependencies on the dynamics of agricultural market development through the lens of international tendencies.

At the present stage in Ukraine, the features of crop production pricing consist of differentiation of crops according to export orientation [OECD 2019]. For today, the volume of exports represent crops and their products from wheat (35%), corn (54%), sunflower-seed oil (90%), soy (54%), rape seed (99%). Additionally, as a way to ensure food security, today plant products are also considered to be a type of power resource [Shpychak et al. 2017]. Hamulczuk et al. [2019b] showed that Ukraine is a price maker in the energy crop market (i.e. rapeseed) and that the change in prices on the global market are directly transmitted into the fluctuations of local agricultural commodity prices. However, the reverse situation is also likely to happen. Hamulczuk et al. [2019a] also indicated that the increase in bioethanol production along with other market fluctuations such as low inventory, tightens the connection between Ukrainian grain prices and global crude oil prices.

## **MATERIAL AND METHODS**

There is a systematic approach to identify the primary causes of pricing dynamics for domestic export oriented and non-export oriented crop production. Thus, the objective of the paper was to present the price interdependencies between agricultural commodity products from Ukraine (both export and non-export oriented) and other non-agricultural and agricultural

commodities whose prices are shaped on global markets, with a special focus on the role of their volatility. The research attests to the closely coupled connections between the global prices of crude oil and prices of Ukrainian commodity products.

For above-stated purpose, retrospective analysis was used to systematize the features of pricing for crop production. The monographic method was used to present the theoretical background of the process of financialization. The research contains crops price elasticity of traditional fuel prices in the global market. The connection between prices of traditional energy resources and potential energy crops was shown. Data for prices of analysed commodities was collected from the State Statistics Service of Ukraine (Derzhavna sluzhba statystyky Ukrainy), Food and Agriculture Organization of the United Nations and the World Bank. The analyses period covered years 2013–2017. The approach presented by Cameron and Trivedi [2005] was applied in the analysis. The Shapiro–Wilk normality test for joint distribution was also performed. Pearson’s correlation and linear regression methods were used to assess the interdependence of prices for crop products in the global and domestic markets. Price elasticity was computed in Excel using the XLSTAT statistical software.

## RESEARCH RESULTS AND DISCUSSION

The dependencies that arise from world prices on export oriented types of crops were analysed. In particular, a cross-correlation analysis was conducted on the basis of annual values for prices of wheat, corn, soy

oil and crude oil on world markets, in the course of which the performance indicators were prices on corresponding types of plant products ( $Y_n$ ) (soy oil, corn, wheat), and factor points were prices on crude oil ( $X$ ). The results are presented in Table 1.

The research shows a very tight connection between the prices of crude oil and prices of corn (correlation coefficient 0.90) and costs of wheat (correlation coefficient 0.92). It shows high values of elasticity rates in term of price changes from 2005 to 2017. At a price change of crude oil by 1%, prices on corn change by 0.9%, on wheat accordingly by 0.76%. In addition, the level of connection between the prices of crude oil and soy oil was investigated. Here the coefficient of correlation was 0.89, which shows closely coupled connections. Thus, price changes of crude oil by 1% stipulate price changes on soy oil by 0.84%.

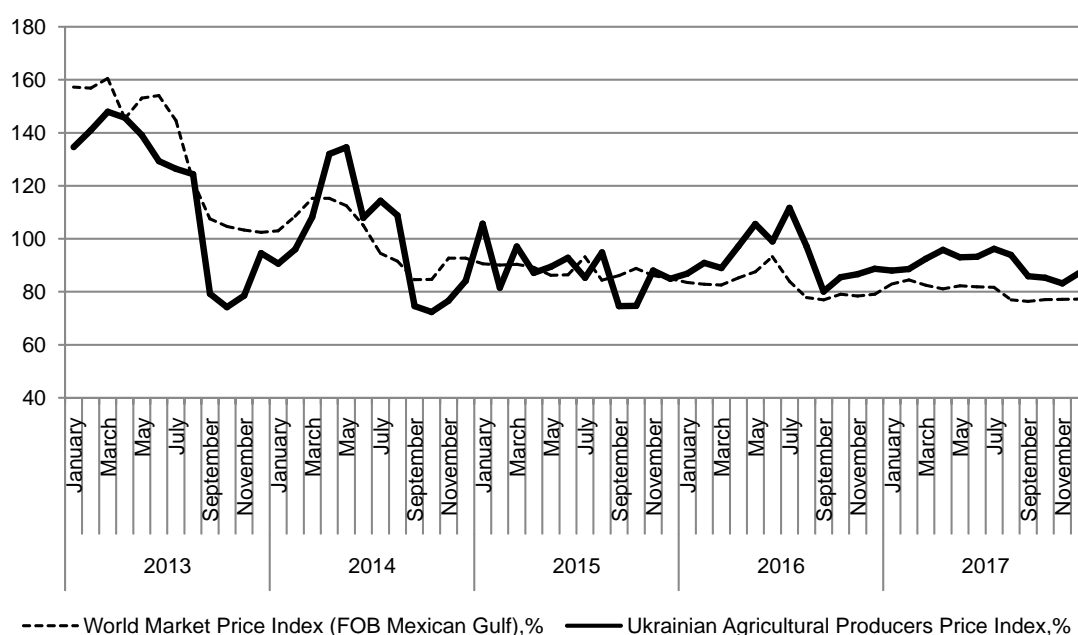
That the volatility of world prices influenced the national market unfortunately was shown by the internal price declines. It was clearly traced on the market of corn (2013/2014, 2014/2015, in the first half of 2017/2018) that is presented in Figure 1. In this case it needs to be stated that the effective internal mechanisms of governmental price control, insurance against price vibrations, possibilities of prognostication of prices on internal and world markets are absent on the internal market of export oriented crops. In conditions of price instability on the world market and its corrections, traders include price risks in the margin that forms the difference between internal and export prices. At the starting point is the export price, but all price risks are levelled due to reductions of the purchase price from a direct producer.

**Table 1.** Cross-correlation dependence between prices of traditional types of fuel and prices of separate types of crop products in the world markets in 2015–2017

| Type of crop | Correlation coefficient | Determination coefficient | Elasticity coefficient | Regression equation      |
|--------------|-------------------------|---------------------------|------------------------|--------------------------|
| Soya oil     | 0.89                    | 0.78                      | 0.84                   | $Y = 308.9176 + 8.1269X$ |
| Corn         | 0.90                    | 0.82                      | 0.90                   | $Y = 64.95776 + 1.7398X$ |
| Wheat        | 0.92                    | 0.85                      | 0.76                   | $Y = 85.8306 + 2.1998X$  |

$X$  – price of crude oil,  $Y_n$  – prices of corresponding types of crop products.

Sources: Authors’ own investigation based on data from the World Bank (World Bank commodities price data, the Pink Sheets).



**Fig. 1.** Interdependence of world and internal prices on the example of corn in 2013–2017 (2014 = 100%)

Sources: Authors' own investigation based on data from the State Statistics Service of Ukraine and the World Bank.

Today, the process of forming internal prices on the home markets of export oriented types of crop products takes place according to the following sequence: orientation to the standard of prices on large exchanges of the world – making export contracts with the indicated cost of delivery, cost settling of products purchased on the internal market for its direct producer with the deduction of logistic charges related

to transportation of commodities to port elevators or other setting points. On the basis of the conducted cross-correlation analysis, high enough dependence of internal prices is induced on export oriented types of crop products from the price situation on the world market (coefficient of correlation 0.78–0.80 depending on the type of product). The induced dependencies are presented in Table 2.

**Table 2.** Cross-correlation dependence between prices on export oriented types of crops on internal and world markets in 2013–2017

| Type of crop | Correlation coefficient | Determination coefficient | Regression equation       |
|--------------|-------------------------|---------------------------|---------------------------|
| Corn         | 0.78                    | 0.60                      | $Y = 51.3891 + 0.6316X$   |
| Wheat        | 0.79                    | 0.63                      | $Y = 50.7442 + 0.50763X$  |
| Barley       | 0.80                    | 0.64                      | $Y = 21.3499 + 0.93471X$  |
| Sunflower    | 0.78                    | 0.61                      | $Y = 12.11400 + 0.34708X$ |
| Soya beans   | 0.78                    | 0.61                      | $Y = 144.59469 + 0.7136X$ |

$X$  – price at world exchanges on the corresponding type of crop,  $Y_n$  – prices on the internal market for the corresponding type of crop.

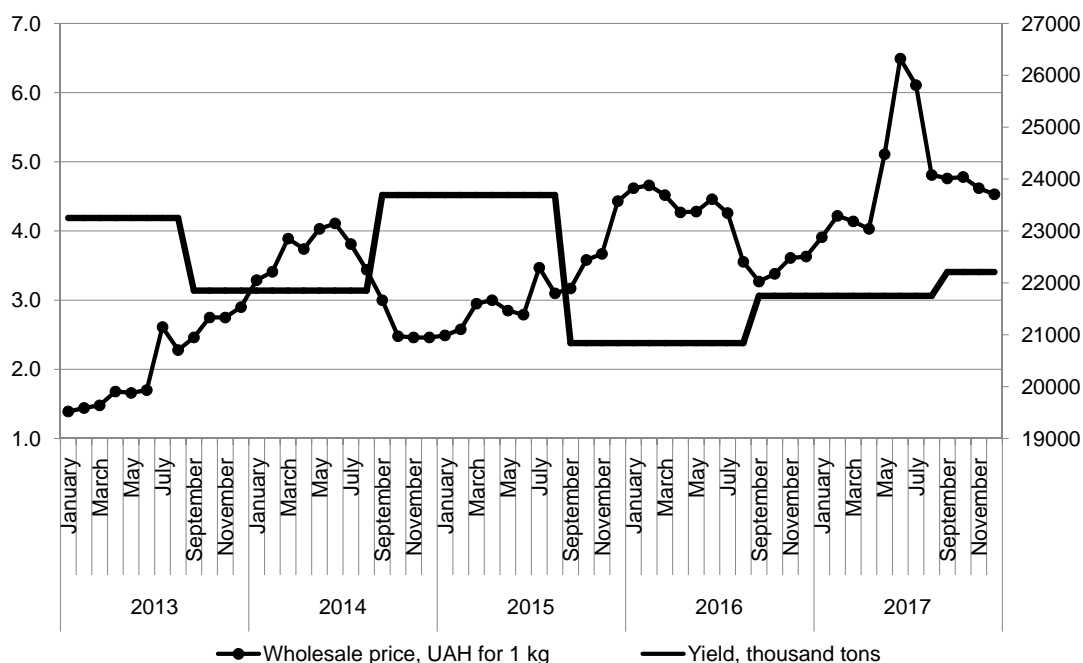
Sources: Authors' own investigation based on data from the State Statistics Service of Ukraine.

Analysis was also conducted focusing on the dependencies that arise from world prices on non-export oriented types of crops. The non-export oriented types of crops (potato, vegetables, garden-stuffs and other) are used mainly for domestic consumption, largely out of commodity-money relations (potato – 76%, vegetables – 42%). Their export volume represents up to 12% of production volume depending on the commodity. These types of products are grown mainly in small family farms (80–98% depending on the commodity). The mechanism of pricing on these products is formed mostly under the influence of factors from the internal market (Fig. 2).

During the analyzed period, where high rates of inflationary and dilutive processes (as in 2014–2015) resulted in the decline in profit levels for the Ukrainian population, the non-export oriented types of products secured food availability for the rural population. It is especially observed with regard to the retail price of potatoes, which did not have considerable rates of increase, while the index of the share of consumed potatoes of self-production increased.

## CONCLUSIONS

One can argue that there is a price dependence between export oriented agricultural products from Ukraine (such as corn, wheat, barley, sunflower seeds and sunflower oil, crude, soy) and the price situation of such products on the world market. This happens due to demand levels on the world market and extend to the export volume of these crops from Ukraine. In the case of favorable market conditions, they provide a major cash flow for producers. Such a situation has lent itself to a considerable investment in agriculture and is one of the reasons to concentrate on these types of products. In order to decrease the dependence of domestic market prices on export oriented crops and the volatility of world prices, there needs to be diversification of product usage to encompass alternative uses, including industrial. These products may be used in flour, in the oil and fat industry or for feeding on milk, beef or pork farms. Ukrainian farmers and industrial enterprises need to find their own new places in the world market. Additionally, a low interdependency



**Fig. 2.** Dependence between the dynamics of prices on the potato market and volume of its gross harvest in Ukraine in 2013–2017

Sources: Authors' own investigation based on data from State Statistics Service of Ukraine.

between non-export oriented agricultural commodities and the world market can give a special avenue for social stability of the Ukrainian population and should therefore be a subject of state policy.

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## WSPÓLZALEŻNOŚCI CENOWE TOWARÓW ROLNYCH Z UKRAINY I RYNKU ŚWIATOWEGO

### STRESZCZENIE

Celem artykułu jest przedstawienie zależności cenowych towarów rolnych z Ukrainy (zarówno eksportowanych, jak i nieeksportowanych) od innych towarów, których ceny kształtują się na rynkach światowych, ze szczególnym uwzględnieniem roli ich zmienności. Badania wskazują na istnienie związku między światowymi cenami ropy naftowej a cenami ukraińskiej kukurydzy i pszenicy. Dodatkowo kształtująca rynek krajowy zmienność światowych cen surowców rolnych miała istotny wpływ na spadki cen na Ukrainie. Mechanizm cen towarów rolnych niezwiązanych z eksportem kształtuje się głównie pod wpływem czynników rynku krajowego. W związku z tym mała współzależność cen nieeksportowanych towarów rolnych i cen na rynku światowym warunkuje stabilność społeczną na Ukrainie.

**Słowa kluczowe:** współzależności cenowe, towary rolne, finansjeryzacja, Ukraina

## LABOUR MARKET FLEXIBILITY IN THE CONTEXT OF THE SHADOW ECONOMY FOR THE CONSTRUCTION INDUSTRY

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### ABSTRACT

The article analyses labour market flexibility in the context of the shadow economy. The main research problem is devoted to the flexibility of the construction labour market in relation to the level of labourers who work in a country's shadow economy. The following hypothesis was adopted: Flexibility of the labour market for the construction industry decreases with an increase in the level of the shadow economy. The MIMIC approach was used to calculate the level of the shadow economy in a group of selected countries, divided into three categories. The first category includes countries with a relatively low level of shadow economy (less than 15% of their GDP). The second group contains a level starting from 15 to 25% of their GDP, while the third group has a shadow economy that exceeds 25% of GDP. The Pearson correlation index was applied in order to measure the coefficient level between market flexibility and the size of the shadow economy. The flexibility of the labour market was calculated as the change of unemployment caused by the change of construction industry output. The research proved that the correlation between market flexibility and the shadow economy is significant. This is due to the fact that the Pearson index reached the level of 0.866, which means that whenever the shadow economy increases, the labour market flexibility of the construction industry decreases.

**Key words:** shadow economy, market flexibility, price setting, equilibrium, labour market, construction industry

**JEL codes:** O17, H26, C39, K42, J22

### INTRODUCTION

Markets are believed to be more flexible than other economic categories, although the meaning of flexibility remains imprecise. For mainstream academics, researchers and economists, market flexibility is considered from a quite narrow perspective – as price changes in market equilibrium. Such assumptions are typically discussed from two approaches: price setting and price adjustment, especially from allocation strategy. But in the wider approach, market flexibility can be understood as the effectiveness of allocation from both a macro- and microeconomic perspective

toward goal achievement. It is common knowledge that some markets are more flexible than others even though they are influenced by the same factors. Arguments about supply and demand elasticity pertain to the ideal case of perfectly competitive markets, which assumes aggregate supply and demand curves with many sellers and buyers who are price checkers and who trade by price alone. Discussion of flexible and rigid prices, as is habitual in neoclassical theories, gives a false impression that prices are either variable or static. Moreover, they often remain stable and cannot be changed, although strong impacts can be foreseen. Such phenomena is explained in many ways.

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Distinctive clarifications are generally based on the structure of the market, the level of development and social egalitarianism. During the business cycle, market prices are expected to move procyclically [Jackson 2015]. Whenever there are fewer administrative prices the market appears to be more inflexible. Such prices are controlled by government authorities and any change requires official approval.

Contradictory situations appear whenever there is an unrestricted market with uncluttered price competition. However, such justifications are often unsatisfactory. This is because market flexibility can change unexpectedly and can rapidly break all known economic rules and formulas. Such occurrences are being noticed more and more often. In some markets, flexibility plays a crucial role. For example, this is a key factor fostering electricity market. This market needs flexibility in order to cope with the uncertainty associated with large-scale intermittent resource penetration [Goutte and Vassilopoulos 2019]. Flexibility is applied in construction as well. During pandemic time (the case of crown virus) higher number of hospitals are needed in a relatively very short time. Chinese construction companies could provide a hospital on turn-key basis within 14-day time. It is a good example of market adaptability. However, from the other hand agility is not a typical idea, which can be proceeded by market agents, especially from supply and demand perspective. Such mould is applied on different markets [Villar et al. 2018]. In market-oriented economies there is characteristic steady tension on firms to adopt themselves to changing market environment. If they are agile, finally they are coined “flexible firms”. This refers to types of organisational forms that enable employers to achieve required flexibility in order to maintain their competitiveness in the market [Bilic 2017].

The term “flexibility” came to economy from physics. It has Latin roots and can be translated from *flexus* as the ability to bend, wind or bow without losing structure and remain unbroken. In economics, the idea of flexibility is generally discussed as the level and speed of changes influenced by selected factors. Such an approach is typical in orthodox economy; for example, whenever flexibility of production is being deliberated and the focus is changes in the manner of production based upon market forces. When the needs

of the market require modifications in production, and if those modifications appear quickly and substantially, the market appears to be flexible. If not, the market appears to be stable or firm.

According to neoclassical approaches, price movements induce market responses, which can be documented by supply and demand curves. The market is regarded to be very flexible whenever a small change in prices reaches quick market equilibrium, as opposed to when even big changes in price cannot push market fluctuations and adjustments become difficult. Deviation from expected market adjustments was noted from the early beginnings of economic analysis, but was commonly explained by unfair competition. Even though such an explanation is widespread and often accepted, it is not thorough enough – there are crucial doubts and questions referring to the roots of unfair competition and its mechanism in a market-oriented economy. What factors foster unfair competition? Why is unfair competition (at least in some markets) allowed to develop? What is the real framework of unfair competition? This is why orthodox neoclassical economics cannot explain virtual price adjustments of the market. Market equilibrium is the result of many individuals taking part in economic performance. Those individuals come from different parts of the market, represent different strategies and search for different goals.

Additionally, orthodox neoclassical economists prefer to analyse market flexibility from a static perspective. This leads to very theoretical models of assumption that are quite removed from real market performance, especially nowadays when changes are so rapid, very frequent and their effects seem to be very contradictory. Moreover, some companies have much stronger market influence than the others. In such cases, their impact on market flexibility is more visible than it is for others. Moreover, their strategy should be taken into account, as well – if they wish to retain market flexibility on a certain level, they are able to do so more effectively than other companies. Such a situation should be discussed not only during mergers and acquisitions, or when companies take over projects, but also, for example, tax optimization.

Economics theory needs to clarify the present situation in more realistic way, providing not only solutions but also creating more truthful mechanisms of market

performance. Orthodox neoclassical economy relies on too many convenient assumptions which overly simplify the explanation of market flexibility. This is especially apparent with investment flexibility, which is defined as a firm's ability to adjust the amount of capital investment in response to its current or projected profitability. Managerial freedom to adjust existing operations enhances equity value, because when managers have such freedom, they can capitalize on favourable investment opportunities and limit losses from adverse market conditions as new information arrives [Myers 1977]. Upon developing such an assumption, the question on the limits of market freedom and emerging investment opportunities should be answered. If the market is affected by any limits, the discussion should focus on the impact on market freedom and investment opportunities. Whenever this impact becomes robust, market freedom starts to be imperfect, thus reducing market flexibility significantly. Greater economic freedom reduces friction and allows a firm to exercise these investment options; such freedom can enhance the firm's future investment in response to current profitability (investment flexibility) and the degree of convexity of equity value with profitability [Chen et al. 2015].

## THE METHODOLOGICAL ASSUMPTION

The main goal of the research is to indicate the changes in flexibility of the labour market for the construction industry resulting from the size of a country's shadow economy. The level of the shadow economy was measured by MIMIC approach. In this respect, the following data were taken into an account: unemployment rate, criminality rate, number of VAT payers, the share of construction in GDP. Such data are very useful in explaining the level of the shadow economy in any country due to several assumptions. One is that a high rate of criminality enlarges the shadow economy. Since VAT affects the final price of products, VAT payers try to avoid such taxation. The unemployed seek any source of earnings, so activity in the shadow economy might be source of engagement. Among all industries, the construction industry is most likely to perform in the shadow economy framework [Rusche and Kirchheimer 1939, Warren and McManus 2007, Kindsfateriené

and Lukaševičius 2008, Goel and Nelson 2016].

In calculation the MIMIC model becomes a multi regression function. Structural parameters are appraised with commanding restraints on the coefficient matrix and the covariance matrix of error. All data used in equations were appraised by a likelihood procedure, taking the reduced form into consideration and not imposing any restrictions on the variance–covariance matrix. Statistica software was applied to calculate (based on MIMIC approach) the level of the shadow economy among selected countries. Analysed countries were divided into three categories.

The first category includes those countries where the level of the shadow economy is relatively low (less than 15% of GDP) and is generally assumed that it does not disturb market performance. The second category refers to those countries where the shadow economy operates at a higher level – from 15 to 25% of GDP, and the third group of countries consists of those where the level of the shadow economy is higher and its impact on the national economy is believed to be quite significant. Based upon such assumptions, the following countries were taken into an account:

- Category 1: Iceland, Switzerland, Austria, Finland, Norway, Sweden, Denmark;
- Category 2: Estonia, Latvia, Lithuania, Czechia, Poland, Slovakia, Portugal;
- Category 3: Greece, Slovenia, Italy, Croatia, Serbia, Romania, Bulgaria, Spain, Russia.

The flexibility of the construction market was calculated as the change of unemployment caused by the change of construction industry output. The following formula is applied:

$$\text{flexibility of the market (\%)} = \left| \frac{\Delta \text{ unemployment change (\%)}}{\Delta \text{ construction output (\%)}} \right|$$

The research was conducted for the years 2015–2018. The change of unemployment rate and construction industry output was calculated as the difference between the year 2018 and 2015. The shadow economy level was calculated as an average result for 2015, 2016, 2017 and 2018. Then the Pearson correlation index was applied in order to measure the coefficient level between the market flexibility and the size of the shadow economy.

Data was used from the OECD Statistical Compendium, Economic Outlook Statistics and Projections, OECD Standardised National Accounts, OECD Labour Force Statistics and National Statistics of Statistical Offices representing the group of selected countries.

The following hypothesis was taken: Flexibility of the labour market for the construction industry lowers with the increase of the shadow economy level.

### **THE SHADOW ECONOMY IMPACT ON MARKET PERFORMANCE**

At the same time when legal economic activity started, the shadow economy also appeared [Buszko 2019]. Shadow and legal economies perform together and they can be regarded as substantive for each other. Loayza [1996] points out that whenever the shadow economy increases the same time the legal economy is reduced. The roots and of the shadow economy are recognised and remain vital even up till now. But the motion of it supposed to be researched since lot of changeable factors fostering shadow economy activity. The roots of shadow economy are generally associated with:

1. The taxation system. Whenever taxes are higher the level of shadow economy increases [Krstić and Schneider 2015].
2. The complicated and contradicted law system [Ainsworth 2011].
3. High level of corruption supports shadow economy development [Choi and Thum 2003].
4. Organised crime is closely linked with illegal activity including shadow economy performance [Dabla-Norris and Feltenstein 2003].
5. Cultural implications [Alm and Torgler 2006].
6. The quality of institutional solutions [Laruelle 2008].

The shadow economy is studied from many perspectives like: history, psychology, anthropology, law, cultural aspects, sociology and – very importantly – economy. Albeit the legal and shadow economies perform parallely, they usually infiltrate each other. It could even be stated that they depend on each other. The shadow economy is divided into different categories like grey economy, black, evel white immoral one. Nevertheless, a lot numerous cases are related

to undeclared employment. This happens when managers or owners of the companies do not officially hire workers. They are paid due to the oral agreement only. Such practice is very common in construction industry, especially. This is because in this sector different skills are required, starting from relatively quite simple jobs to very complicated ones, based on well prepared, educated staff. The last category of employees generally require written agreement, but sometimes the official salary is not so high since the rest of money is paid unofficially [Bajada and Schneider 2005].

Taking such an assumption into consideration, it is worth highlighting that the shadow economy is a very important economic category which must be explored. Schneider estimates the size of the shadow economy in 2005 to range from 7.9% of official GDP in the United States to 66.4% in Georgia. On average, shadow economic activities amount to 15% of official GDP in Organization for Economic Cooperation and Development (OECD) countries, while the average size in other parts of the world is around 35%. The shadow economy proved to be very dangerous, especially in developing countries. This is due to the fact that it supports budget deficit (fiscal capacities becomes inefficient) and there is less money for needed redistribution. Such situation happens not only in Greece (where shadow economy constitutes nearly 30% of GDP of this country and has negative impact on taxation and security system) but in Spain, Italy and Portugal as well. Greek debt crisis, which started in 2010, showed all negative consequences of shadow economy performance [Buehn et al. 2013].

Even though considerable literature exists on different aspects of the shadow economy there is still a lack of a common (widely accepted) definition of the shadow economy. Buehn et al. [2013] suggest to implement description that shadow economy consists of all market activity, which is deliberately hidden from public authorities to avoid income payment obligations. Moreover shadow economy affects working standards – making them worse – like decreasing wages, safety and violating nearly all administrative procedures.

Furthermore, shadow economy makes inappropriate international competitiveness. Those countries with high level of shadow economy do not obey any rules and depraving the market regulation. Quite often, the

offered products or services are manufactured without any standards and final quality become very poor one. In addition, the shadow economy favours corruption and depress the confidence in institutions, finally citizens are generally very disappointed and annoyed [Barbosa et al. 2013].

Various authors point out particular positive aspects of the shadow economy. Some individuals may find a job over there, otherwise they will remain jobless. Even for a long time. It should be noticed that unemployed need government support. Working in the framework of shadow economy one can improve its financial standing. Government care is less needed. Part time activity (even illegal one) can add a dynamic element to the economy and increase competition in some sectors, and can improve income distribution in society [Smith 2002].

Whenever company faces problem with its financial standing it is more likely to perform in the shadow economy. Effective law and appropriate penalties may discourage potential applicants. Enterprises which are sued are less (or practically not) willingly to conduct themselves illegally. At the same time, companies may expect some superfluous protection due to the discriminating sanctions set down by corrupted officials. Another situation is also workable. If companies operating in the shadow economy frameworks found out that fines or other restrictions are merciful ones, they would remain incentive to carry out their business over there. They would not switch into legal sphere of economy [Andrews et al. 2011]. Although substantial literature on various shadow economy aspects exists there are seldom studies focused on the relation between market flexibility and the shadow economy.

### **THE SPECIFICS OF THE CONSTRUCTION INDUSTRY IN THE CONTEXT OF ILLEGAL EMPLOYMENT**

The construction industry is always regarded to be as the pillar of national economy. This is because construction improves urban and rural infrastructure very much, strengthens urbanization process and improves business efficiency [Sharma and Sehgal 2010]. The construction industry constitutes important share of national GDP (accounting from 3 to 10%). Additionally

creates significant employment opportunity and implements important government investment projects. In another sense, the products of the construction industry are investment or capital goods, for their value is high in relation to the income of the purchaser [Hillebrandt 1985]. There is no doubt that the construction sector plays a vital role in an individual's well-being in terms of the live conditions and suitable infrastructure [Durdyev et al. 2017].

Construction is known as labour intensive industry that why it requires not only more labour force but employees of various skills. For this reason in many countries, the labour demand in construction sectors is supplied by rural surpluses. Such situation was noticed not only in less developed countries but in India and China as well [Sharma and Sehgal 2010]. Working on construction site even less skilled employees can be useful by completing simple tasks. They are paid relatively modest. Additionally to that, they can learn more because of assisting better or the best skilled workers. Managerial posts are occupied by well-educated and trained people. In this way, practically each person can find a job in construction sector [Kirubaashini 2015]. This feature makes good space for shadow economy activity, mainly because of three very important issues:

- cost saving operations;
- possibility to get some money in the form of part-time work;
- even during recession, illegal employment plays as the “safe pillow” for unemployed workers.

Referring to the first issue, all social benefits and taxes are excluded, so the final price offer for investors may be very attractive. In this way, a construction company can achieve competitive advantage. The shadow economy can be considered as a chance for part-time workers to earn some additional money. This is mainly due to the fact that in the construction industry, any person – even without any skills – can get work. Earned in this way, money (at least part of it) can be spent in the legal economy. If the VAT is paid so paradoxically, one can say that illegal employment can support national budget revenue. During a recession, illegal employment in the framework of the shadow economy is the only choice for workers to be paid any money. In this manner they can survive, especially in those countries where government social assistance is not well

developed. This is one reason that legal authorities are often not so keen to reduce not only illegal employment, but the size of the shadow economy as a whole.

## FINDINGS AND DISCUSSION

The level of the shadow economy among selected countries vary significantly (Table 1). The highest

level was noticed in Russia and Greece, 35% and 32% of their GDP, respectively. The lowest was observed in Scandinavian countries. The shadow economy in Russia has a long history and generally is accepted by the nation. It has different aspects, but nowadays organised crime and corruption have the most dangerous impact fostering shadow economy development in Russia [Pomeranz 2010]. However, in Greece, the shadow

**Table 1.** Change of construction industry output and unemployment rate in context of shadow economy level in 2015–2018

| Country     | The change of industry output | The change of unemployment | The size of shadow economy as % GDP | Flexibility of the market |
|-------------|-------------------------------|----------------------------|-------------------------------------|---------------------------|
|             | %                             |                            |                                     |                           |
| Iceland     | 2.00                          | 4.00                       | 8.00                                | 2.00                      |
| Switzerland | 2.00                          | 3.00                       | 10.00                               | 1.50                      |
| Austria     | 2.00                          | 4.00                       | 9.00                                | 2.00                      |
| Finland     | 3.00                          | 4.00                       | 12.00                               | 1.34                      |
| Norway      | 3.00                          | 4.00                       | 12.00                               | 1.34                      |
| Sweden      | 2.00                          | 4.00                       | 12.00                               | 1.34                      |
| Denmark     | 2.00                          | 3.00                       | 12.00                               | 1.34                      |
| Estonia     | 3.00                          | 2.00                       | 21.00                               | 0.67                      |
| Latvia      | 2.00                          | 1.00                       | 24.00                               | 0.50                      |
| Lithuania   | 4.00                          | 1.00                       | 25.00                               | 0.25                      |
| Czechia     | 4.00                          | 2.00                       | 24.00                               | 0.50                      |
| Poland      | 4.00                          | 2.00                       | 25.00                               | 0.50                      |
| Slovakia    | 4.00                          | 2.00                       | 25.00                               | 0.50                      |
| Portugal    | 3.00                          | 1.00                       | 25.00                               | 0.34                      |
| Greece      | 2.00                          | 0.20                       | 32.00                               | 0.10                      |
| Slovenia    | 2.00                          | 1.00                       | 30.00                               | 0.50                      |
| Italy       | 3.00                          | 1.00                       | 29.00                               | 0.34                      |
| Croatia     | 3.00                          | 1.00                       | 29.00                               | 0.34                      |
| Serbia      | 2.00                          | 1.00                       | 28.00                               | 0.50                      |
| Romania     | 3.00                          | 2.00                       | 27.00                               | 0.67                      |
| Bulgaria    | 3.00                          | 1.00                       | 31.00                               | 0.34                      |
| Spain       | 2.00                          | 1.00                       | 28.00                               | 0.50                      |
| Russia      | 4.00                          | 0.50                       | 35.00                               | 0.12                      |

Source: Author's own calculation based on data from OECD Statistical Compendium, Economic Outlook Statistics and Projections, OECD Standardised National Accounts, OECD Labour Force Statistics and National Statistics of Statistical Offices representing the group of selected countries. The size of shadow economy was calculated based on MIMIC approach presented in methodological approach.

economy is not only affected by history but mainly by long-lasting economic crisis, and its performance is included in official statistics. This was done because authorities wanted to statistically reduce the debt and get official acceptance for further money borrowing [Aristidis and Ioannis 2014]. In Scandinavian countries the low level of the shadow economy is explained by a sound market-oriented economy and strong democratic movement, thus limiting the space for shadow economy development. In Central European Countries the level of the shadow economy is relatively high, but during recent years its level has been decreasing. The same process has been perceived in Baltic states like Estonia, Latvia and Lithuania. Spain, Portugal and Italy face some problems with high rates of unemployment, especially among the younger population. This factor fosters shadow economy development. Additionally, their economies have lowered and their standard of living has worsened. That is why the shadow economy is regarded as an alternative source of income.

The market flexibility differs in selected countries. The highest level was recognised in well developed countries, the lowest level in countries still under transformation and with economic problems like Russia, Greece and the Balkan region. The low market flexibility scoring should be taken into an account even in Italy, Spain and Portugal. This is because the efficiency of proposed reforms might be not successful. Attention grabbing is the score of Pearson correlation index between market flexibility and the shadow economy.

The coefficient level between market flexibility and the shadow economy is significant and it is calculated at 0.866 (Table 2). This means that whenever the shadow economy grows, market flexibility decreases. Such a result has important influence not only

on market performance, both on macro- and micro-economic levels, but on the effectiveness of any activity as well. It is important to underline that there are two economies: legal and shadow. Depending on their sizes, market flexibility varies. When the level of the shadow economy increases, the market flexibility becomes rigid. In this way, two economic occurrences can be explained: the low efficiency of reforms (in those countries where the shadow economy plays an important role) and the appearance of unexpected market situations.

At least some economic reforms are bad executed since they start from misleading assumptions, and decisions makers do not take into an account the role of the shadow economy in the context of market flexibility [Bresser-Pereira 1993]. Ignoring such a role of the shadow economy and market flexibility, this has been the cause of higher costs of reforms, especially in those countries where transformation was introduced. From economy perspective spending's supposed to be associated with action and effects. Moreover, new rules and solutions are provided. It is important not to make steps without taking efficiency into consideration. Obviously investment-designed logic is applicable, so there is a need to establish unique form of methodological motion. Such an approach is not so easy and created system, even logical one is limited to available resources constrains [Sukharev 2015].

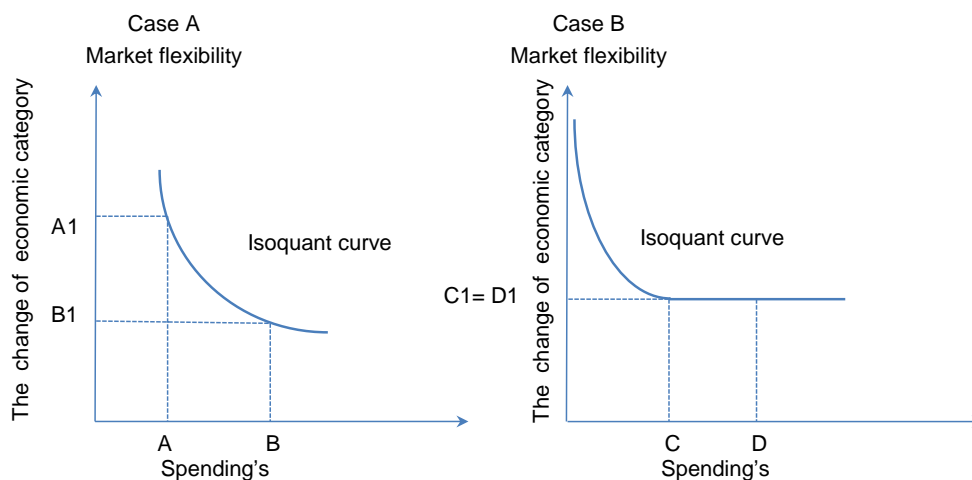
An unexpected situation showing the influence of the shadow economy can be seen when there is a higher level of budget revenues, even though a recession is observed. This is because money from the shadow economy is spent in an official way and VAT supports the national budget. Referring to the theory originally presented by Hayek, who stressed the role of prices as the purest and most important source of

**Table 2.** The value of correlation between market flexibility and size of the shadow economy

| Category           | Market flexibility | Shadow economy |
|--------------------|--------------------|----------------|
| Market flexibility | –                  | –0.866         |
| Shadow economy     | –0.866             | –              |

$p < 0.05$ .

Source: Author's own calculation based on Table 1 data.



**Fig.** Market flexibility based upon shadow economy size  
Source: Author's own elaboration.

information on economy and market performance, such an approach may be applied in the shadow economy in the context of capital allocation. Freely and unlimited prices no matter the wholesale or retail ones are articulated by wages, interest rates, foreign currency cross-rates, quantifiable opportunity, transaction costs and many other forms, are the most important signals looming out in a healthy economy [Hayek 1945, Roberts 2010]. A discussion summary is presented in the figure.

Case A is applied to those countries with a low level of shadow economy and Case B to those with a high level of shadow economy. In the first situation, the isoquant curve is regular and demonstrates the changes between spending and market flexibility. Although the shadow economy affects market flexibility, some positives results can be achieved. The situation changes intensely in Case B. Even though spending grows, there are no changes in the market flexibility – it has become rigid.

## CONCLUSIONS

Based upon the research results it can be stated that the hypothesis has been accepted. Firstly, the shadow economy is associated with the market flexibility. Whenever a high level of shadow economy is observed, the market flexibility lowers, and finally is converted to an unchanging position. In this way a new

outlook on market performance, including its equilibrium, must be taken into an account. If this result is applied to industries other than construction, a change in the traditional approach to market flexibility will be required. Secondly, another scope of exploration can be suggested, connected with the efficiency of reforms in consideration of the shadow economy level. Even though that shadow economy can exist separately from legal activity, its performance will occur in lawful motion. Thirdly, the shadow economy can explain market paradoxes, which are very hard to be clarified with neoclassical economic theory. This theory has quite lot of supporters but should refer also to other economic categories such as the shadow economy, since market performance will be not only more detailed but more correctly described, as well.

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## ELASTYCZNOŚĆ RYNKU PRACY W KONTEKŚCIE SZAREJ STREFY

### STRESZCZENIE

Artykuł poświęcono elastyczności rynkowej w kontekście szarej strefy. Główny problem badawczy dotyczy elastyczności budowlanego rynku pracy w odniesieniu do poziomu szarej strefy. W badaniach przyjęto następującą hipotezę: Elastyczność budowlanego rynku pracy spada, kiedy wzrasta poziom szarej strefy. W badaniach wykorzystano narzędzie MIMIC do ustalenia poziomu szarej strefy w wybranych krajach. Podzielono je na trzy kategorie. W pierwszej grupie ujęto te, w których poziom szarej strefy był niższy od 15% PKB, w drugiej te, w których poziom szarej strefy waha się od 15 do 25% PKB, a w trzeciej te, w których szara strefa jest na poziomie wyższym od 25% PKB. Posłużono się także współczynnikiem korelacji Pearsona w celu ustalenia związku między elastycznością rynku pracy a poziomem szarej strefy. Elastyczność rynku pracy została zmierzona zmianą poziomu bezrobocia wynikającą ze wzrostu produkcji budowlano-montażowej w analizowanych krajach. Na podstawie przeprowadzonego badania stwierdzono silną korelację ujemną (0,866) między szarą strefą a elastycznością budowlanego rynku pracy. To oznacza sytuację, w której elastyczność budowlanego rynku pracy maleje wraz ze wzrostem poziomu szarej strefy.

**Słowa kluczowe:** szara strefa, elastyczność rynku, kształtowanie ceny, równowaga, rynek pracy, budownictwo

## WORKING CAPITAL MANAGEMENT STRATEGY AND SELECTED MEASURES OF FINANCIAL SECURITY FOR DAIRY COOPERATIVES IN POLAND

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### ABSTRACT

The article evaluates select financial security indicators from groups of dairy cooperatives, and examines the relationship between the net working capital ratio and these indicators, in order to illustrate the strength of the relationship between pursued strategies and financial security. Most of the surveyed entities pursued a conservative strategy in the area of working capital management. The greatest relation between the share of net working capital in current assets and financial security ratios was found in the case of financial liquidity (according to the literature and the author's expectations), where this relation was close to unity. A negative strength in the relationship was noted between the ratio of working capital share in current assets and trading in inventories in days in all groups of cooperatives, regardless of the working capital strategy applied.

**Key words:** dairy cooperatives, working capital, financial security

**JEL codes:** P12, Q13, Q14

### INTRODUCTION – LITERATURE REVIEW


According to Delas et al. [2015], the financial security of its companies is one of the main elements of national security in each country, because companies are taxpayers who create the revenue side of the budget and create jobs. Financial security is particularly important for cooperative business entities, due to the specificity of their activity, which is expressed in the timely fulfilment of current obligations towards their owners, farmers – in this case, suppliers of dairy raw materials. These entities are not strictly focused on increasing financial results, but on maintaining financial liquidity [Ganc 2020].

Financial security has been defined as the ability of a company to maintain its capability to meet its current liabilities and high efficiency [Franc-

-Dąbrowska 2006]. In contrast, Wędzki [2002] stresses that the higher the surplus of current assets over current liabilities, the greater the financial security of the company.

Research on the financial security of companies was conducted, among others, by Franc-Dąbrowska [2006], Szczecińska [2007], Kagan and Ziętara [2009]. These researchers looked mainly at agricultural enterprises. Maintaining financial security affects the financial surpluses that are generated. However, the direction of this impact may be disputed. On the one hand, an aggressive financing strategy and low levels of liquidity ratios result in a higher return on equity, and on the other hand, according to studies by Franc-Dąbrowska [2006] and Szafraniec-Siluta [2013], maintaining financial security may result in a higher return on equity.

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Research by Zaporozhtseva et al. [2017], apart from the current financial liquidity ratio, did not indicate the accelerated and immediate liquidity ratio, nor the inventory cycle in days, the receivables cycle in days, the liabilities cycle in days or the working capital cycle. However, it highlighted the need to examine the rotation rates of current receivables and current liabilities. Zuba [2006, 2010] also included the cash conversion cycle in this group of indicators and noted the measurement of solvency, including inter alia, the debt service coverage ratio, and the interest liabilities coverage ratio (i.e. similarly to Pawłowicz), or the debt ratios. Pawłowicz [2005] and Zaporozhtseva et al. [2017] also pointed to the measurement of the long-term debt ratio as one of the factors shaping financial security. This indicator is also relevant for cooperative dairy farmers, who use long-term debt as their main financing source. Among the measures of financial security assessment presented by Franc-Dąbrowska [2006] and Duraj [2013], there were also asset structure indicators, which were used in the study to determine the working capital management strategy of the investigated cooperatives.

The literature distinguishes three ways of financing activities with working capital: conservative, moderate and aggressive [Czekaj and Dresler 1997, Sierpińska and Wędzki 1998, Krzemińska 2000, Bień 2002, Wędzki 2002, Kaczmarek 2012, Szymańska 2017]. The conservative strategy is to finance current assets, practically all of them with fixed capital, thus engaging in the cooperative long term. This strategy pays particular attention to maintaining a high level of liquidity and minimizing the risk of insolvency. This strategy is generally more costly than the others because it is based on equity and long-term liabilities. However, this results in a significant reduction in the return on equity. By adopting a conservative strategy, the company seeks to maintain its credibility and market position.

An aggressive strategy accepts higher levels of risk and profit maximization in the long term. During the implementation of this strategy, the dairy cooperative shows greater capital needs, mainly in foreign capital. Funding for operations is obtained from outside and

liquidity is kept low, which may threaten insolvency. The profitability of equity is high and involves lower costs of obtaining short-term loans than for long-term loans. There is a possibility to use high leverage and tax shielding effects. The financial risk associated with over-indebtedness increases and the current solvency ratios decrease with it.

A moderate strategy takes into account the characteristics of an aggressive and conservative strategy. The fixed capital finances all fixed assets used in the cooperative. The net working capital is zero or takes low positive values. Such a financing concept enables the synchronization of cash flows, related to spending and generating revenue. At the same time, this fact helps to maintain the company's liquidity and financial balance at an average level.

## PURPOSE AND METHODS

The study identified the relationship between the working capital management strategy applied and the dairy cooperatives' financial security. An attempt was made to verify the hypothesis that dairy cooperatives with a conservative working capital management strategy are the financially safest. The research used financial data of 66 dairy cooperatives in Poland. The analyzed collection can be described as "quasi" representative because of its nearly 80% share in the national milk collection market, which means that the research results can be generalized to the entire population of dairy cooperatives. Other entities, not accepted for analysis, have a marginal share in the milk market in Poland.

The strategy was defined using two indicators calculated for each cooperative:  $W_1$  means the share of current assets in total assets,  $W_2$  means the share of current liabilities in total liabilities. If  $W_1 > W_2$ , a conservative working capital strategy has been defined. If  $W_1 = (\text{approx.})^1 W_2$ , a moderate strategy was adopted. If  $W_1 < W_2$ , an aggressive working capital strategy has been defined.

In groups of cooperatives separated in terms of working capital management strategy, the profitability of equity and assets, current and immediate financial

<sup>1</sup> The indicators in the study were not created equal, but had very similar values, for example:  $W_1 = 49.3$ ,  $W_2 = 50.7$  – in such a situation, the cooperative was qualified as applying a moderate strategy of working capital management.

liquidity, as well as the efficiency of inventory, receivables and liabilities management were assessed. Profitability indicators that do not constitute measures of financial security were adopted for analyses in order to illustrate the specificity of the dairy cooperative, which manifests itself in low profitability of operations [Wasilewski and Chmielewska 2006]. The research period covered the years 2016–2019. The number of cooperatives in each group is shown in Table 1.

**Table 1.** The number of cooperatives in groups in terms of working capital management strategy in 2016–2019

| Strategy | 2016 | 2017 | 2018 | 2019 |
|----------|------|------|------|------|
| C        | 36   | 38   | 38   | 36   |
| M        | 18   | 16   | 18   | 17   |
| A        | 12   | 12   | 10   | 13   |
| Total    | 66   | 66   | 66   | 66   |

C – conservative working capital strategy, M – moderate working capital strategy, A – aggressive working capital strategy.

Source: Author’s own study.

Due to the small differences in the extreme values of indicators assigned to a given strategy, a test was carried out on the significance of Kruskal–Wallis differences, as more than two groups of companies were under investigation. The value of the statistics was  $H(3, N=66) = 177.420, p = 0.0000$  (at the significance level  $p = 0.05$ ), the null hypothesis of the cumulative distribution equality in the compared subgroups was rejected. There are statistically significant differences between the compared groups of cooperatives.

This test has shown the validity of separate groups of cooperatives. In addition, the analysis of the financial security links with working capital was deepened by assessing the correlation (Spearman’s rank-order correlation) between the ratio of net working capital share in current assets and selected financial security indicators in the analyzed groups of cooperatives.

## RESULTS

Table 2 presents the development of selected financial condition indicators in groups of dairy cooperatives. In all years, the highest profitability of this fund was observed in cooperatives with a conservative working

**Table 2.** Financial condition ratios in groups of cooperatives distinguished in terms of the working capital management strategy in 2016–2019

| Ratio     | 2016 |      |      | 2017 |      |      | 2018 |      |      | 2019 |      |      |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|
|           | C    | M    | A    | C    | M    | A    | C    | M    | A    | C    | M    | A    |
| ROE (%)   | 2.2  | 2.1  | -5.3 | 2.1  | 0.4  | -4.6 | 3.7  | 2.4  | 2.0  | 7.9  | 3.9  | 5.9  |
| ROA (%)   | 1.4  | 1.0  | -1.9 | 0.9  | 0.3  | -2.3 | 2.3  | 1.2  | 0.9  | 3.2  | 2.4  | 3.0  |
| FL (%)    | 0.8  | 1.1  | -3.4 | 1.2  | 0.1  | -2.3 | 1.4  | 1.2  | 1.1  | 4.7  | 1.5  | 2.9  |
| CL        | 1.72 | 0.90 | 0.83 | 1.64 | 1.04 | 0.87 | 1.65 | 1.07 | 0.86 | 1.66 | 1.06 | 0.88 |
| CLR       | 0.31 | 0.03 | 0.01 | 0.25 | 0.02 | 0.01 | 0.24 | 0.05 | 0.02 | 0.27 | 0.13 | 0.10 |
| IT (days) | 20   | 24   | 17   | 24   | 25   | 35   | 20   | 21   | 15   | 21   | 19   | 13   |
| RT (days) | 32   | 30   | 39   | 40   | 32   | 40   | 41   | 42   | 33   | 35   | 36   | 27   |
| LT (days) | 55   | 74   | 69   | 60   | 76   | 98   | 63   | 70   | 59   | 57   | 68   | 56   |

ROE – own fund profitability ratio, ROA – asset profitability ratio, FL – financial leverage ratio, CL – current liquidity ratio, CLR – cash liquidity ratio, IT – inventory turnover, RT – receivables turnover, LT – liabilities turnover.

C – conservative working capital strategy, M – moderate working capital strategy, A – aggressive working capital strategy.

Source: Author’s own study.

capital management strategy. The highest return on equity in this group of cooperatives occurred in 2019 and amounted to 7.9%, with a growing trend since 2017 (by 5.8 p.p.). Cooperatives with a moderate strategy were also effective in terms of using their own funds, with a level approximately twice lower in 2018–2019, and the biggest difference in this respect occurred in 2017, when the profitability of these funds in these cooperatives was only 0.4%. In cooperatives with aggressive working capital policy in the years 2016–2017, the equity fund was not used effectively, as a net loss was found in these cooperatives. In the following years, these cooperatives were profitable in terms of using their own funds. In 2019, this profitability amounted to 5.9% and was higher by 2 p.p. than in the cooperatives with a moderate strategy. This means that a more aggressive financing strategy can be cost-effective. Rationally employed outside capital significantly increases the return on equity, which is related to the leverage effect. Moreover, dairy cooperatives use mainly long-term liabilities as sources of financing or use their own funds as a tax-free source of financing their activities [Dworniak 2008].

The profitability of the assets was calculated as the relation of the net profit (loss) to the value of the assets of the cooperative. The relationships in this respect were similar to those for the return on equity. In cooperatives with an aggressive working capital management strategy in 2016–2017, the use of assets was not effective, while in 2019, the profitability of the employed assets increased to 3.0%. In 2019, this profitability was by 0.6 p.p. higher than in the cooperatives from the group with a moderate strategy. In cooperatives with conservative and moderate strategies, assets were profitable, although at a relatively low level.

The leverage ratio reflects the effectiveness of foreign capital commitment as a source of funding. The greatest benefit in this respect was recorded in cooperatives with a conservative working capital management strategy, where the highest ratio occurred in 2019 and amounted to 4.7%. The lowest was in 2016 (0.8%), and in the group of cooperatives with a moderate strategy, the lowest level was only 0.1% in 2017. The relationships that were found proved the low effectiveness of the use of foreign capital in the groups of cooperatives under analysis. This may be in

part due to the underutilization of this capital in business, often due to a lack of liquidity and thus a lack of creditworthiness. In cooperatives with an aggressive strategy, in the years 2016–2017, a loss was recorded due to foreign capital involvement in the financing process, at the level of 3.4% and 2.3%, respectively. In dairy cooperatives, measures should be taken to increase foreign capital efficiency through, for example, more favorable credit terms (use of preferential credit, lower interest rates, grace period for loan or interest payments, etc.). The increasing level of leverage in cooperatives with an aggressive strategy proves that they are increasingly benefiting from the involvement of foreign capital. This may be due to the need to make investments to adapt to the EU, which make cooperatives more efficient by modernizing production technology. The financial leverage in this group of cooperatives was higher than in those with a moderate strategy in 2019 (2.9%) and slightly lower (1.8 p.p.) than in those with a conservative strategy. The rational use of foreign capital also contributes to the efficiency of the equity fund.

Current liquidity was found to decline as the working capital management strategy became more aggressive. It can be seen that in conservative cooperatives, current liquidity was maintained at the level of 1.64–1.72. In cooperatives with a moderate strategy, the level of current liquidity was much lower and oscillated between 0.90 and 1.09. This means that these cooperatives were at risk of losing their current liquidity. An even greater threat in this respect concerned cooperatives with an aggressive strategy, where the size of the analyzed indicator remained at a relatively similar level in the analyzed years. It should also be stressed that the difference in this respect compared to cooperatives with a moderate strategy was not large (approx. 0.17). This means that only a conservative approach to working capital management during the period considered allowed dairy cooperatives to maintain their current liquidity. In terms of immediate liquidity, the situation of the surveyed cooperatives was even more unfavorable than in terms of current liquidity. Assuming an optimum immediate liquidity ratio of 0.5, it was found that the size of the ratio was already twice as low as the recommended level in the group of cooperatives

with a conservative strategy. However, given the low profitability of the dairy sector, a level of 0.2 of this indicator can be assumed to be satisfactory, especially as there has been a slight upward trend in this respect.

In the group of cooperatives with an aggressive strategy, the level of immediate liquidity increased slightly, from only 0.01 in 2016–2017 to 0.10 in the last audited year. In all the years under analysis, in cooperatives with a strategy of moderate working capital management, the level of the analysed indicator was only slightly higher than in those with an aggressive strategy. Therefore, the aggressive strategy did not differ significantly from the moderate strategy in terms of immediate liquidity loss, which depends on the skill of the cooperatives' managers in this respect. However, it should be stressed that there is a high risk of loss of immediate liquidity in groups of dairy cooperatives with a more aggressive approach to financing their activities, through greater use of foreign capital. In cooperatives with a conservative strategy, a stable level of immediate liquidity was found. The fact of their effective functioning proves that the amount of 0.2 of the immediate liquidity ratio is sufficient to maintain financial liquidity in the dairy sector.

Inventory management in the surveyed cooperatives should be assessed positively. Except for 2017, the turnover was the fastest in cooperatives with an aggressive working capital management strategy, as it ranged between 13 and 17 days, which can be considered a very favorable figure. Such dependence is justified by the need to repay current liabilities, and excessive inventory freeze funds. Only in 2017 did the turnover in this group of cooperatives last 35 days, which was mainly due to high inventory in one of the surveyed cooperatives in this group. The most stable inventory management policy was that of cooperatives with a conservative strategy (approx. 20–24 days), whereas in the group of cooperatives with a moderate strategy, the difference between the extremes of the inventory trading period was 6 days. Dairy cooperatives produce products with a short shelf life, which justifies their quick sale.

The management of receivables in the surveyed cooperatives should be assessed positively, as their turnover did not generally exceed 42 days. The most

favorable situation in this respect in the years 2016–2017 concerned cooperatives with a moderate strategy, while in the remaining years of those with an aggressive strategy, in which the shortest trade in receivables in the period in question occurred (27 days in 2019). The differences between the separated groups of cooperatives in this respect were relatively small, and the highest was in 2018 between the first and the third group of cooperatives and amounted to 8 days. Only in the third group of cooperatives was a uniform tendency (since 2004) to decrease the receivables turnover ratio seen in the analyzed years (by 13 days), which is justified by the need to obtain cash as a result of the threat of losing immediate financial liquidity. In general, it can be concluded that in the surveyed cooperatives there were no major problems with the payment of receivables by product recipients. This is mainly due to the stability in cooperation with certain regular customers, which secures against a high risk of losing any payments that are due.

In all groups of cooperatives, the period for regulating short-term liabilities was longer than for regulating receivables, which should be regarded as a generally beneficial relationship. The biggest difference in this respect occurred in the third group of cooperatives in 2017 and amounted to 58 days, while the smallest was in the first group of cooperatives in 2016 (23 days). The most stable level of the difference between the period of receivables and liabilities settlement was characterized by cooperatives with the conservative strategy of working capital management (20–23 days). This is a positive phenomenon, as the cooperatives in this group paid the debts received in a short period of time, which may have resulted from good payment relations with the recipients of dairy products.

The longest turnover of liabilities in the years under review was in the third group of cooperatives in 2017, and was 98 days, which should be considered too long. In the following years, there was a significant shortening of the period of regulating liabilities in this group of cooperatives. The managers of these cooperatives in 2018–2019 extended the deadlines for the settlement of liabilities to a lesser extent than cooperatives with a conservative strategy and moderate working capital management.

The ratio of the share of net working capital in current assets shows how much of the company's current assets are financed by net working capital. The higher the level of the ratio, the better the company's financial liquidity assessment. A clear trend was found in the development of the ratio of the share of net working capital in current assets along with a change in the strategy of managing this capital. The highest level in this respect was recorded by cooperatives with a conservative strategy, while the lowest (negative) level was recorded in those with an aggressive strategy. According to the literature on the issue and expectations, the greatest relationship between the share of net working capital in current assets was found in the case of financial liquidity, where this relation was close to unity (Table 3).

The strength of the relationship between the current ratio and the audited working capital measure

was the lowest in the cooperatives with a moderate net working capital management strategy, while the highest (close to unity) was in those with an aggressive strategy. Similar relationships were observed in the case of the immediate liquidity ratio. However, the lowest correlation strength occurred in this case in cooperatives with an aggressive strategy in the audited period (0.67 in 2016, 0.65 in 2017, 0.61 in 2018, 0.60 in 2019), while in other groups of cooperatives, the correlation coefficient between the ratio of the share of net working capital in current assets and the immediate liquidity exceeded 0.8.

A negative strength in the relationship was noted between the ratio of working capital share in current assets and trading in inventories in days in all groups of cooperatives regardless of the working capital strategy applied. A similar dependence occurred in the case of the share of working capital in current assets and

**Table 3.** The level of the ratio of the share of net working capital in current assets and the strength of the relationship between this ratio and selected measures of financial security of dairy cooperatives in 2016–2019<sup>a</sup>

| Year | NWK/CA | Strategy | CL   | CLR  | IT    | RT    | LT    | FL    |
|------|--------|----------|------|------|-------|-------|-------|-------|
| 2016 | 0.41   | C        | 0.89 | 0.92 | -0.45 | -0.66 | -0.77 | -0.38 |
|      | 0.01   | M        | 0.65 | 0.96 | -0.59 | -0.73 | -0.69 | 0.26  |
|      | -0.20  | A        | 0.99 | 0.67 | 0.23  | -0.54 | 0.09  | 0.67  |
| 2017 | 0.40   | C        | 0.98 | 0.91 | -0.49 | -0.51 | -0.76 | -0.41 |
|      | 0.04   | M        | 0.91 | 0.89 | -0.34 | -0.68 | -0.67 | 0.32  |
|      | -0.14  | A        | 0.97 | 0.65 | 0.22  | -0.60 | 0.07  | 0.66  |
| 2018 | 0.38   | C        | 0.87 | 0.82 | -0.51 | -0.61 | -0.81 | -0.41 |
|      | 0.06   | M        | 0.72 | 0.81 | -0.34 | -0.71 | -0.74 | 0.44  |
|      | -0.16  | A        | 0.98 | 0.61 | 0.24  | -0.56 | -0.09 | 0.65  |
| 2019 | 0.39   | C        | 0.92 | 0.93 | -0.48 | -0.63 | -0.69 | -0.43 |
|      | 0.06   | M        | 0.61 | 0.84 | -0.62 | -0.60 | 0.82  | 0.27  |
|      | -0.13  | A        | 0.99 | 0.60 | 0.24  | -0.53 | 0.11  | 0.70  |

<sup>a</sup>The interpretation of the test results assumed: when  $r = 0$ , variables are not correlated; when  $0 < r < 0.1$ , variables' correlation is very weak; when  $0.1 < r < 0.3$  variables' correlation is weak; when  $0.3 < r < 0.5$ , variables' correlation is average; when  $0.5 < r < 0.7$ , variables' correlation is high; when  $0.7 < r < 0.9$  variables' correlation is very high; when  $0.9 < r < 1$ , variables are fully correlated.

NWK/CA – net working capital/current assets, CL – current liquidity ratio, CLR – cash liquidity ratio, IT – inventory turnover, RT – receivables turnover, LT – liabilities turnover, FL – financial leverage ratio.

C – conservative working capital strategy, M – moderate working capital strategy, A – aggressive working capital strategy.

Source: Author's own study.

the ratios of receivables turnover in days and liabilities turnover in days (except for 2019, in cooperatives with a moderate and aggressive strategy, where the dependence was positive). The negative correlation proves that in the surveyed cooperatives, an increase in the ratio of the share of net working capital in current assets is accompanied by a decrease in the rotation of inventories, receivables and liabilities in days.

Moreover, it is worth noting that the strength of the relationship between the ratio of the share of working capital in current assets in this respect was average or high in cooperatives with a conservative and moderate strategy of managing working capital, and weak in those with an aggressive strategy. In cooperatives pursuing a conservative and moderate strategy in terms of working capital, there was a high or very high correlation between the ratio of the cycle of liabilities in days and the share of net working capital in current assets, while in cooperatives with an aggressive strategy, the strength of the relationship in this respect was weak or insignificant.

In the case of correlation coefficients between the leverage ratio and the share of net working capital in current assets, a large variation was observed, both in the strength of the relationship and the direction. In cooperatives with a conservative strategy, there was a negative correlation in this respect, while in the remaining groups of cooperatives a positive correlation was found.

## CONCLUSIONS

The managers of cooperatives should rationalize the level of their assets in relation to the scale of purchasing and processing raw milk material. This is because in some cooperatives the level of purchase is much higher than the processing capacity, and in some cases the situation is the opposite. Therefore, it is important that managers be able to match the production potential with their ability to use it effectively. To sum up, it can be stated that the efficiency of asset use in the investigated dairy cooperatives was relatively low, which is a standard situation in the case of cooperative enterprises in the milk market, which are characterized by low profitability of assets and capital [Soboh et al. 2011].

Cooperative managers finance their activities to a large extent from their own funds if they need external financing sources and use less risky long-term foreign capital. Hence, most of the surveyed entities pursued a conservative strategy of working capital management. Moreover, in dairy cooperatives, most of the current liabilities are future payments to owner-farmers-suppliers, which determines high liquidity maintenance in these entities.

Given the relatively low profitability and liquidity, a change in working capital management strategy could be considered as a way to seek greater financial security in the dairy industry. Working capital management is one of the most important areas for financial decision-making. Activities undertaken in this area are primarily aimed at maintaining financial liquidity and optimizing current assets' size and structure.

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## **STRATEGIA ZARZĄDZANIA KAPITAŁEM OBROTOWYM A WYBRANE MIERNIKI BEZPIECZEŃSTWA FINANSOWEGO SPÓŁDZIELNI MLECZARSKICH**

### **STRESZCZENIE**

Dokonano oceny wybranych wskaźników bezpieczeństwa finansowego w grupach spółdzielni mleczarskich oraz zbadano zależności występujące między wskaźnikiem udziału kapitału obrotowego netto a tymi wskaźnikami w celu zobrazowania siły związku między realizowaną strategią a bezpieczeństwem finansowym. Większość badanych podmiotów realizowała strategię konserwatywną w zakresie zarządzania kapitałem obrotowym. Największy związek między udziałem kapitału obrotowego netto w aktywach obrotowych a wskaźnikami bezpieczeństwa finansowego stwierdzono przy płynności finansowej (zgodnie z literaturą i oczekiwaniami autora), w przypadku której ta zależność była bliska jedności. Ujemną siłę związku zauważono między wskaźnikiem udziału kapitału obrotowego w aktywach obrotowych a obrotem zapasami w dniach we wszystkich grupach spółdzielni niezależnie od stosowanej strategii w zakresie kapitału obrotowego.

**Słowa kluczowe:** spółdzielnie mleczarskie, kapitał obrotowy, bezpieczeństwo finansowe

## **STABILITY OF LEADERSHIP AS A DETERMINANT IN THE DEVELOPMENT OF BUDGETARY UNITS IN POLAND**

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### **ABSTRACT**

This study investigates the concept of the stability of the state and the public finance sector (PFS) based on a review of current literature in the field. An attempt has been made to define the principles of public management and present the structures of public finance sector units (PFSU) in Poland. The study focuses on the public finance sector, units included in this sector, mechanisms influencing the functioning of public service organisations and their management. Part of the research is a case study analysis of a sample PFSU, which is a central administration body. The purpose of the study was to identify the measures used to assess the stability of a public finance sector unit and to interpret those measures in relation to the studied areas of the PFS in Poland. The paper explores the principles of managing the organisation of the public finance sector, the notion of public management and its genesis. The selected PFSU case was used to indicate the relationship between the functioning of a public finance sector unit and the stability of leadership in that unit. The study is descriptive and uses inference methods. The research material included the literature on public finance and management as well as internal materials of the studied public finance sector unit. The main objective of the study was to show how the destabilisation of leadership can affect the functioning of the state office. As a result of the analysis, measures most accurately describing the phenomenon of leadership stability have been constructed. They include: measures based on quantitative assessment, measures based on institutional behaviour assessment and measures based on the subjective opinions, behaviours and expectations of employees, stakeholders and associates of the PFSU. The existence of a relationship between the stability of leadership and the functioning of a public finance sector unit was confirmed. Changes were recorded in the functioning of the office during frequent personnel changes in senior civil service positions.

**Key words:** public finance sector, stability, public management

**JEL codes:** H41, H72, H83, E6

### **INTRODUCTION**

In the literature, the term “stability” is usually placed in the context of political stability of a state and is used by analysts and researchers to determine the condition of a given state or assess the effects of implemented policies. The review of the literature, conducted in order to explore the concept of stability itself, its

essence, measures and effects, revealed a three-fold approach. The researchers focus on legal aspects and constitutional conditions of the stability of state organs, the stability of the state in the international dimension or identification of factors that may impact the effectiveness of management and functioning of individual organisations, e.g. local governments or budgetary units.

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The stability of the state in the constitutional dimension is indispensable for the existence of an organised political and social community, as well as the institutions representing authority whose role is to protect the functioning and existence of the community [Weber 1998, p. 56]. The lack of a stable government leads to both economic and social crises, which in turn contributes to changes at the highest levels of power. To avoid cycles of adverse phenomena, the recommended solution is to define the state authority in compliance with the constitutional principles and the stability and effectiveness of the executive power [Balicki 2018, p. 206]. Shepherd [2010, p. 8] suggests that political stability, unrelated to any type of political regime, should be a way of exercising power aimed at achieving positive effects. Shepherd equates political stability with the notion of good governance, i.e. good administration, understood as making and implementing decisions by public institutions at various levels of power and maintaining relationships with civil society organisations. Entities that directly experience the effects of decisions participate indirectly in taking those decisions. In the literature on the subject, stability is defined as the ability of the organizational units of these sectors to provide public services without negative consequences in the future [Bath 2001, pp. 7–8, Navarro-Galera et al. 2016, pp. 3961–3975].

Nowadays, the new public management concepts appear in the literature on public service organisation management, including innovative research and implementations aimed at adapting ideas, methods, techniques and institutional solutions utilized in the private sector to the public finance sector [Lubińska 2011, p. 52]. The need to have managerial skills while governing a budgetary unit is becoming a necessity, especially in the situation of limited financial resources for the implementation of basic local government tasks, the burdening of local governments with additional tasks and increased social pressure. Therefore, the stability of leadership and effectiveness of public sector entities depends on effective public management following a set of principles, which every good manager should respect. These include: caring for people, being culturally aware, defining clear goals, pursuing self-improvement, communicating effectively, setting efficient control

system and defining the vision of success [Kuźmiński 2020, pp. 62–67].

## **SUBJECT AND SCOPE OF THE STUDY**

This study involved an analysis aimed to determine the principles of functioning of the public finance sector unit – PFSU (jednostka sektora finansów publicznych) in terms of the implementation of its statutory tasks against a backdrop of frequent leadership changes at the top of the organisation. The investigation focused on the public finance sector in Poland, units included in this sector and mechanisms influencing their functioning and management. Part of the research is a case study analysis of an exemplary PFSU – the Central Office of Measures (Główny Urząd Miar), which is the central organ of Polish administration and is subject directly to the minister responsible for economy. The research covered the years 2011–2017, which made it possible to identify changes in the functional structure of the analysed public finance sector unit.

The main objective of this study was to identify measures utilised to assess the stability of a public finance sector unit and to interpret these measures in relation to the studied areas of public finance sector operations in Poland. The study explores the principles of managing the organisation of the public finance sector, the notion of public management and its origins. The case study of the public finance sector unit was an attempt to demonstrate the relationship between the functioning of a public finance sector organisation and the stability of leadership in that unit.

## **PUBLIC MANAGEMENT**

The state economy consists of two sectors: private and public. The private sector is the result of free market operations, happenings and interdependencies while the public sector results from public and political decision-making processes. The public sector pursues a predefined mission, which is to provide goods and services to the citizens of a given country. The activities undertaken within the public sector ensure national security, social assistance and spatial planning.

The public sector covers the functions of the state, expenses incurred for their implementation, ownership of state assets and funds and the way they are used [Zawicki 2011, p. 11]. The scope of state and public administration activities comprises tasks assigned only to the public sector. The main tasks include: defence and military tasks, defence policy, equipment and functioning of the army as well as ensuring legal and institutional order. The latter also includes tasks related to internal security and protection of property and freedom of individuals. The specificity of public organisations is contained in their mission, goals and values.

Strategic management in public administration is analysed as an instrument of exercising power through decision-making processes ensuring the rationalisation of conducted operations. The primary task is the choice of development directions for a given unit by including public managers in the process of planning and coordinating operations [Prowle 2000, pp. 22–24].

The implementation of strategic management in public administration is the result of the reorganisation of the public sector, its modernisation and rationalisation. The public finance sector exhibits certain specific characteristics that distinguish it from many other economic sectors [Navarro-Galera et al. 2016, pp. 3961–3975]. The conditions for efficient implementation of strategic management include: specifying the mission, organisational goals, rules and conditions for assessing the status of a given entity; measuring results; giving public managers a greater scope of responsibility; increasing their flexibility within the scope of unit structures and resource distribution; and implementing managerial methods and techniques. It follows from the above that strategic management is closely related to the managerial approach, which was created on the basis of so-called the new public management [Włóka and Jędrzejak 2014, pp. 88–100] and is currently being adopted in Polish public institutions.

## **THE STRUCTURE AND FUNCTIONING OF PUBLIC FINANCE SECTOR UNITS IN POLAND**

Units of the public finance sector form a very complex structure in terms of their organisation and distribution of power. Government administration at the

central level comprises the President of the Council of Ministers (Prime Minister), individual ministries, central offices and agencies. The organs directly accountable to the Council of Ministers include: central offices and organisational units of special administration; central organs and organisational units; the voivodes (governors of regions) together with the voivodship office and regional courts, which are directly controlled by the Council of Ministers. The territorial self-government units in Poland since 1 January 1999 are broken down by voivodship (województwo), county (powiat) and commune/municipality (gmina), established by the Act of 24 July 1998 on the introduction of a basic three-tier territorial division of the state.

One control instrument in the public finance sector is the internal audit, whose aim is to assess the correctness, efficiency and effectiveness of public finance sector units and the rationality of spending the funds at their disposal. The scope of control activities as part of an internal audit is based on verifying the assumptions and objectives of the PFSU, which include:

- clearly defined organisation goals,
- introduction of procedures for monitoring the achievement of objectives,
- timeliness and compliance with procedures,
- use of tools to measure the effectiveness and efficiency of achieving the objectives,
- identifying, assessing and managing risk related to achieving the adopted objectives.

Verification of the effect of monitoring activities includes: comparative analysis of the level of public expenditure in recent years; an assessment of adopted legal and organisational regulations in the field of public funds management in the organisation; and evaluation of the criteria for assessing the effectiveness and efficiency of planning and spending [Skoczylas-Tworek 2013, pp. 198–199].

External control is exercised by the principal state audit body, which in the public finance sector is the Supreme Audit Office (Najwyższa Izba Kontroli). Its audit procedure follows five main principles:

- The principle of a separate regulation of the audit proceedings conducted by the Supreme Audit Office. The audit proceedings should be conducted under the provisions of a separate law – the Supreme Audit Office Act.

- The principle of planning and programming of audits (audits are conducted in accordance with an audit plan adopted by the College of the Supreme Audit Office).
- The principle of objective truth (audit findings reflect the actual state of operations of the audited entity and are thoroughly documented).
- The principle of contradictory procedure (the head of the audited entity has the right to use different appeal procedures).
- The principle of written form (all audit activities take a written form).

Stability is associated with predictability, reducing the risk of unexpected changes and thus control over the system or phenomenon to which the stability relates. Stability is therefore a positive phenomenon, generating the desired effect also from the point of view of public finances. Ensuring stability also implies responsibility for the proper performance of all tasks involving public funds.

## DESCRIPTION OF THE STUDIED PUBLIC FINANCE SECTOR UNIT

The public finance sector unit selected for the case study is the central body of government administration, accountable to the minister appropriate for economy – the Minister of Entrepreneurship and Technology. Central government administration bodies to which the central office is subject exercise supervision over it. These bodies also have impact on the appointment of central office managers, on the structure of the office as well as on its operations. In the Acts, the central

office appears as a one-man body – the President of the Central Office of Measures.

The nature of the analysed PFSU's operations illustrates the current system of governance as well as the organisational structure in the examined institution. However, over the years 2011–2017 a number of changes and modifications were introduced which significantly affected the functioning of the unit. According to the data published in the previous Bulletin of Public Information, in the past, the Directors General remained in the post for at least several years, which allowed them to get to know the specifics of the functioning of the Office, the nature of its activities, the expertise in the area of both the civil service and public finances as well as in the scientific field that the Office deals with on a daily basis. As demonstrated in the table, changes in the position of Director General of the Office became more frequent.

The significance and rank and function of the Director General position is confirmed by the scope of tasks assigned to the Director General and resulting from the Civil Service Act of 21 November 2008. Among the Director General's tasks, the Act lists obligations related to ensuring the continuity of the office's operation, obligations in the field of labour law towards persons employed in the office, and implementation of HR policy.

In 2010, the Central Office of Measures drew up a document specifying its strategic goals for period 2010–2015 [GUM 2010]. The strategy set four main directions for future development of the office. The conducted analysis of the operations of the Central Office of Measure in years 2011–2017 showed

**Table.** Time in post of Director General in the Central Office of Measures

| Dates of holding the post of Director General | Time in post of Director General |
|---|----------------------------------|
| 26.11.1997 – 31.05.2011                       | 13 years 6 months                |
| 11.10.2012 – 20.01.2016                       | 4 years 3 months                 |
| 17.02.2016 – 18.05.2016                       | 3 months                         |
| 19.05.2016 – 03.04.2017                       | 10 months                        |
| 06.04.2017 – Till now                         | more than a year                 |

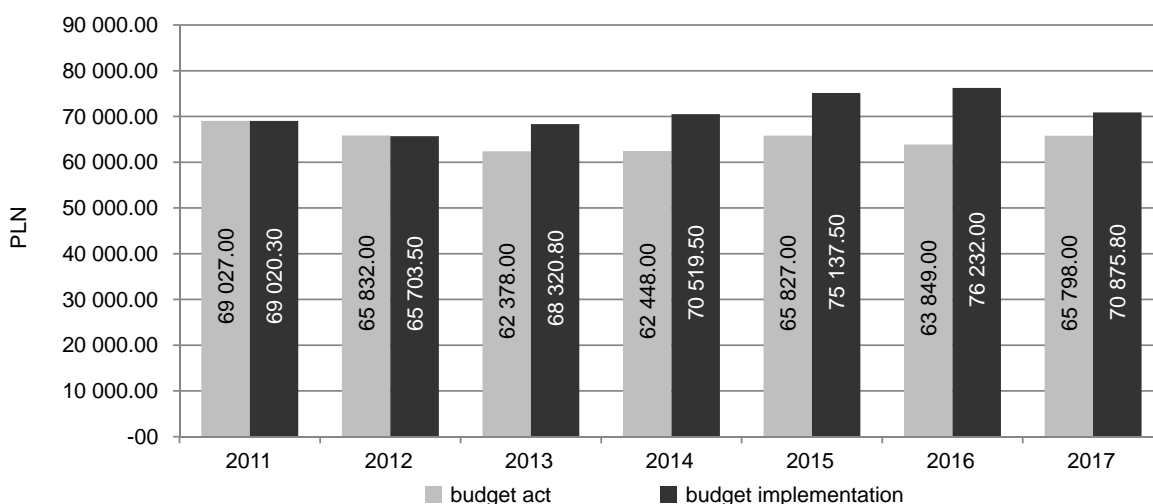
Source: Bulletin of Public Information of the Central Office of Measures.

changes in its functioning in strategic areas as a result of leadership changes at the top of the organisation. This change in leadership is also reflected by dynamics in the volatility of revenue, expenditure, employment and average gross salary earned by the Office employees. Based on the annual audit reports of the Supreme Audit Office for 2011–2017, we selected facts and figures that clearly indicate imbalances and highlight changes in the field of revenue, expenditure, number of employees and average salary.

The figures for the PFSU revenue in 2011–2017 compiled in Figure 1 indicate that since 2015 there

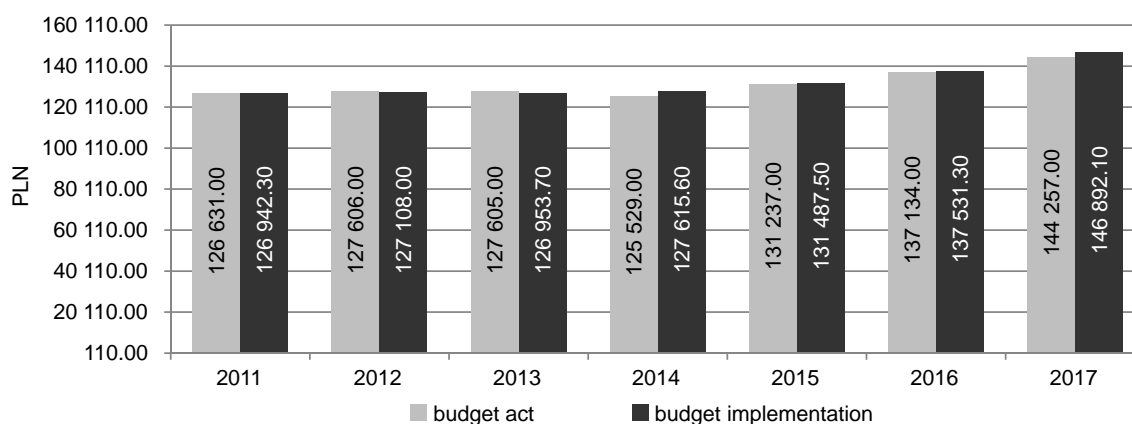
was a significant increase in the recorded revenue compared to the plans included in the Budget Act and also when compared to the entire period under examination. The highest level of recorded revenue was achieved in 2016, when it exceeded the revenue planned in the Budget Act by 19.4%. In 2017, the sum of generated revenue showed a downward trend.

An analogous trend can be observed with regard to PFSU’s spending in 2011–2017 presented in Figure 2. From 2015, expenditures showed an upward trend until reaching the highest level in 2017.



**Fig. 1.** Revenue of the Central Office of Measures in years 2011–2017

Source: Annual audit reports of the Supreme Audit Office [NIK 2011–2017].



**Fig. 2.** Incurred expenditure of the Central Office of Measures in years 2011–2017

Source: Annual audit reports of the Supreme Audit Office [NIK 2011–2017].

In 2012 and 2013, the level of planned expenditure was not exceeded. Many investment purchases were made regarding the subject of metrology, but also purchases related to the brand image of PFSU, which so far had not been incurred to such an extent. In order to show the differences in the examined period of 2011–2017, on the implementation of revenue and expenditure in a public finance sector unit.

The data from Figure 2 clearly demonstrate that since 2015 there has been a change in the levels of revenue and expenditure. The illustrated revenue values showed an upward trend in 2013–2016, followed by a downward trend in 2017 with expenditure values that showed an upward trend from 2016.

In addition the analysis of figures regarding employment and average gross salary of the PSFU’s employees in 2011–2017 reveals significant changes. The data are presented in Figure 3.

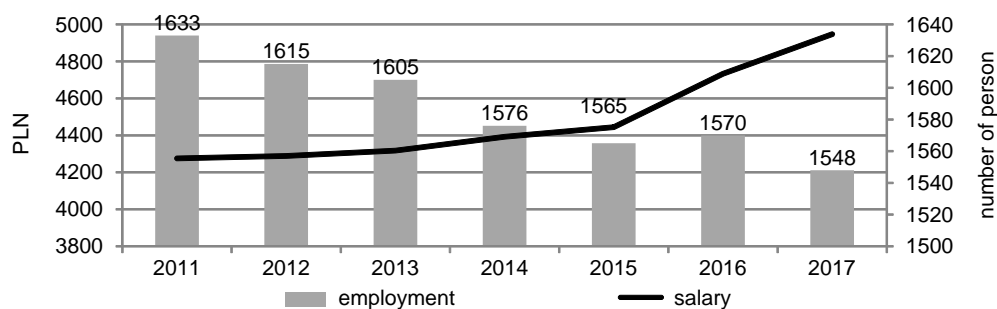
The juxtaposition of figures representing the number of people employed in the analysed PFSU in the period 2011–2017 shows that despite an observed gradual decline in employment, in 2016 there was a slight increase in the number of employees, followed by a visible decrease in 2017. The demonstrated level of average gross salary since 2016 shows a significant upward trend. In the years 2011–2017 employees’ salaries showed a uniform upward trend, however, the increase in remuneration compared to the previous year varied. Salary increases ranged between 0.3 and 6.11%, where the highest increase was recorded between 2015 and 2016 and the lowest between 2011 and 2012. The maximum average gross salary was recorded in 2017 and reached almost PLN 5,000. If we compare the average gross salaries of the PFSU’s

employees to the average gross salary in the national economy over the years 2011–2017, it is noticeable that the increase in the average national salary showed different growth amplitude and fluctuated between 2.84 (2012–2013) and 5.58% (2016–2017).

### MEASURES OF LEADERSHIP STABILITY IN PUBLIC FINANCE SECTOR UNIT

The literature discussing the determination of measures of stability proposes measures of financial stability. Some of the most appropriate measures of stability were selected and applied to the object of this study – a public finance sector unit – in order to ultimately develop, describe and evaluate the measures of leadership stability.

- Measures based on quantitative assessment: value of received revenue, average monthly gross salary of full-time employees, lack of rapid changes in the value of expenditure, lack of sudden changes in the number of employees,
- Measures based on subjective opinions, behaviours and expectations of employees, stakeholders and associates: number of people resigning from employment, number of stakeholders resigning from services,
- Measures based on assessment of institutional behaviour: adopted action strategies, implementation of adopted strategies, compliance with internal regulations and procedures,
- Time-related measures: short-term, long-term, at least a year (one financial year),
- Measures depending on the external situation: ease and speed of implementing legislative changes,



**Fig. 3.** Employment and average gross salary of the employees of the Central Office of Measures in 2011–2017  
Source: Annual audit reports of the Supreme Audit Office [NIK 2011–2017].

resistance to political changes in the country, lack of disturbances in the functioning of the institution [Alińska 2016, pp. 56–57].

From this pool of measures, it is possible to distinguish those that accurately describe the phenomena that occurred in the Central Office of Measures in years 2011–2017. The measures, which seem most adequate with regard to finances, are measures based on quantitative assessment covering the value of received revenue, the average gross salary of full-time employees, lack of rapid changes in the value of expenditure and changes in the number of employees. The overall situation of the Central Office of Measures as an organisation can be evaluated with the measures based on the assessment of institutional behaviour, which examine adopted strategies of action, (when they refer to the future), and implementation of adopted strategies and their compliance with internal rules and procedures, (when they refer to the present). In addition, the measures based on subjective opinions, behaviours and expectations of employees, stakeholders and associates of the Central Office of Measures play a crucial role. By determining the number of people resigning from employment in the Office and the number of stakeholders withdrawing from cooperation, the Office status as an employer and service provider can be examined, which translates into an overall evaluation of its functionality.

The analysis of the aforementioned measures of financial stability related to various areas of functionality generated descriptive measures examining the stability of leadership in an organisation:

- Measure of time – a minimum period of time necessary to obtain information on the occurrence of certain repetitive phenomena as a result of functional activities in various areas of the institution has been determined. Persons in managerial positions in the office should become familiar with the specifics of the overviewed operations (minimum in one cycle) to be able to properly assess statutory activities and then manage them effectively.
- Measure of rules – a set of rules, legal provisions and internal procedures, compliance with which is the basic determinant of the correct and stable functioning of the office. These rules are set and monitored by the office authorities.

- Measure of transparency in dealing with external changes – smooth adaptation of the office operations to the inevitable external changes (including amendments to existing legislative acts), remaining apolitical, keeping pace with technological progress and focusing on achieving the set goals regardless of adverse external factors utilising the risk-management measures.
- Measure of proper management of financial resources – managing financial resources has impact on the functioning of all areas of the institution including remuneration, which is a form of motivating staff, other current expenditure ensuring smooth operation of the office, investment expenditure ensuring a better quality of services rendered by the office as well as enhanced working conditions for employees and revenue which should be properly accounted in terms of tax liabilities.

The main purpose of the study was to demonstrate how the destabilization of leadership can affect various areas of a state office's operation. The literature review and the collected research material have led to the following conclusions:

- The measure based on quantitative assessment (embracing the received revenues, the average gross salary of full-time employees in the PFSU, the lack of rapid changes in incurred expenditures and changes in the number of employees) juxtaposed with the data obtained from the annual audit reports of the Supreme Audit Office shows that during the period of leadership instability disturbances were recorded in the aforementioned areas. The carried out revenues recorded a significant increase (2016), followed by a decrease (2017), the salaries increased significantly, which indicates a good financial standing of the entity. On the other hand, the collected data show an alarmingly rapid increase in the level of expenses and decreasing number of employees.
- The measure based on the assessment of institutional behaviour analyses adopted strategies, assesses the implementation of predetermined strategies and checks their compliance with the rules and internal procedures of the PFSU. Based on the obtained information, it was concluded that the Office's action plan for years 2010–2015 had not



been positively assessed. A new, comprehensive strategic action plan was prepared and adopted for subsequent years (2018–2021), which eliminates the errors of the previous strategy, as noticed and pointed out by the auditors from the Supreme Audit Office, and presents the organisation as a modern and innovative institution in a very professional manner consistent with modern standards [GUM 2017].

- The measure based on the subjective opinions, behaviours and expectations of employees, stakeholders and associates of the PFSU utilises data like the number of people resigning from employment in the Office or the number of stakeholders no longer using the Office's services and leads to conclusions regarding the Office's status as an employer and service provider. According to information obtained from an employee of the Human Resources and Professional Development Department, the aforementioned downward trend in the number of employees resulted from termination of employment contracts by mutual consent. However, observing the fall in revenues in 2017, it can be assumed that in fact it results from the decreasing number of stakeholders using the services provided by the analysed PFSU.
- The measures describing the stability of leadership itself have been linked to such phenomena as the long-time tenure of senior positions, the authorities' respect for and monitoring of the applicable procedures, transparency in dealing with changing external regulations and effective management of financial resources. The analysis of the activity of the PFSU in years 2011–2017, showed that the guidelines of the measure describing the stability of leadership had not been fully implemented. In 2016 and 2017, several senior managerial positions in the Office were filled and re-filled several times. This situation resulted from lack of decision-makers' expertise concerning the functioning of this organisation, which in turn affected decisions on finances, personnel, procedures and legislation. The strategy for years 2018–2021 eliminates the noted failings of the preceding document and assumes the development and transformation of PFSU into an innovative metrological institute

matching up to similar institutions in countries with a high level of economic development.

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## STABILNOŚĆ WŁADZY JAKO DETERMINANT ROZWOJU JEDNOSTEK BUDŻETOWYCH

### STRESZCZENIE

W opracowaniu przedstawiono istotę pojęcia stabilności państwa oraz pojęcia sektora finansów publicznych na podstawie przeglądu literatury przedmiotu. Podjęto próbę wskazania zasad zarządzania publicznego oraz przedstawiono struktury jednostek sektora finansów publicznych (jsfp) w Polsce. Opracowanie skupia się na zagadnieniach sektora finansów publicznych, jednostkach wchodzących w jego skład oraz mechanizmach wpływających na sposób funkcjonowania i zarządzania jego obszarami. Część pracy poświęcono analizie przykładowej jsfp jako centralnego organu administracji. Celem opracowania jest zidentyfikowanie mierników wykorzystywanych do szacowania stabilności jsfp oraz interpretacja tych mierników w odniesieniu do badanych obszarów funkcjonowania sektora finansów publicznych w Polsce. Scharakteryzowano zasady zarządzania organizacją sektora finansów publicznych oraz przedstawiono pojęcie zarządzania publicznego wraz z jego genezą. Na przykładzie jednostki finansów publicznych podjęto próbę wskazania zależności między funkcjonowaniem jsfp a stabilnością władzy w tej jednostce. Opracowanie jest opisowe i wykorzystuje metody wnioskowania. Literatura przedmiotu z zakresu finansów publicznych i zarządzania oraz materiały wewnętrzne jsfp stanowiły materiał badawczy. Zasadniczym celem opracowania jest wskazanie, w jaki sposób destabilizacja władzy może wpłynąć na obszary funkcjonowania państwowego urzędu. Jako efekt prowadzonej analizy skonstruowano wzorce mierników najtrafniej opisujących zjawisko stabilności władzy: miernik oceny ilościowej w zakresie uzyskiwanych dochodów, wysokości przeciętnego wynagrodzenia brutto pełnozatrudnionych w jsfp; miernik oceny zachowań instytucjonalnych, dzięki któremu można analizować przyjęte strategie działania, oceniać realizację przyjętych strategii oraz sprawdzać jakość oraz sposób przestrzegania przepisów i procedur wewnętrznych jsfp; miernik subiektywnych opinii, zachowań oraz oczekiwań pracowników, kontrahentów i współpracowników jsfp. Potwierdzono istnienie zależności między stabilnością władzy a funkcjonowaniem jsfp. Dostrzeżono zmiany w funkcjonowaniu urzędu w okresie częstych zmian personalnych na wyższych stanowiskach służby cywilnej.

**Słowa kluczowe:** sektor finansów publicznych, stabilność, zarządzanie publiczne



## LINKS BETWEEN THE CREATING SHARED VALUE CONCEPT AND A COMPANY'S MARKETING STRATEGY

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### ABSTRACT

The aim of the article is to try to define the relationship between the corporate social responsibility (CSR) and the creating shared value (CSV) concepts and marketing strategy. To achieve this goal, a method of critical analysis of national and foreign literature relating to these issues was used. On this basis, conclusions were formulated defining the scope and content of these relations. They relate primarily to a company's mission, marketing research and marketing strategy. The relationship between the CSV concept and marketing strategy can be particularly seen in the evaluation and selection of new geographic markets and new buyer segments. They refer to changes in product policy – creation of products constituting common value. Relationships also relate to distribution policy, which may include the creation of local clusters and the inclusion of companies from these markets in production and distribution.

**Key words:** CSR, CSV, marketing strategy

**JEL codes:** M31

### INTRODUCTION

In both the subject literature and practice we often come across the concepts of the corporate social responsibility (CSR) and the creating shared value (CSV) as well as criticism concerning particularly their practical uses. The relationship between these concepts and the marketing strategy of a company implementing or intending to implement them is very rarely discussed. The aim of this article is an attempt to define this relationship and its substance. In order to achieve this aim the author uses a critical analysis of Polish and foreign research literature concerning these issues. On the basis of this literature review the author formulates conclusions referring to the extent and substance of these relations. These conclusions relate primarily to the company's mission, its marketing research and marketing strategy.

The presented text is the result of the first (conceptual) stage of a research project carried out at the Department of Marketing, University of Lodz. Quantitative research will be carried out in the second stage, in 2021.

### BASIC ASSUMPTIONS OF THE CORPORATE SOCIAL RESPONSIBILITY

The concept of CSR assumes that the aim of modern companies is to get to know the ever-increasing social expectations of different groups of stakeholders in order to include them in the company's strategy concerning its market activities, as well as to monitor the impact of the created social-economic values on the increase in the company's market value and its competitiveness. The main objective of CSR is to ensure social sustainability. According to this assump-

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tion, it is already at the stage of building its strategy that a company voluntarily takes into account social interests, environmental protection and relations with different groups of stakeholders. Apart from a company's relations with its stakeholders they include, among others, fair market practices, the company's approach to environmental protection and its engagement in social issues and community development [Krzepicka and Tarapata 2013, Żychlewicz 2015]. A company's social responsibility with respect to stakeholders (groups interested in the company's activities) should be based on the principles of cooperation, reliable information, the will to build lasting partner relationships and mutual trust. The concept of CSR assumes that companies offer customers the highest quality products and take responsibility if they do not comply with quality and security standards. A company's activities with regard to CSR involve concern for environmental protection and the reduction of the company's negative impact on the natural environment by minimizing the harmful effects of production and consumption and improving social welfare. The ultimate goal is to achieve a balance between socio-economic growth and the preservation of natural resources [Błach et al. 2017].

In order to achieve the above-mentioned goals, companies can use different tools for CSR purposes. They involve corporate volunteering, engaging buyers and other stakeholders, social campaigns launched in cooperation with media and non-governmental organizations and various programs aimed at meeting local community expectations. They can address environmental pollution, health hazards, children and youth education, activities to prevent disabled people from deprivation, the fight against childhood malnutrition, etc. All these activities, also referred to as socially responsible investments, combine a company's internal goals (e.g. increasing sales or profits, entering new markets, etc.) with external goals related to solving social problems. As has already been mentioned, CSR activities in companies cannot be random or incidental, they should be a permanent element of the company's strategy used on a regular, not sporadic, basis. Additionally, they should also have a complex character. Implementing these activities on a permanent basis generates costs that the company has to

bear. At the same time, planned and rational use of CSR tools results in positive effects such as building and improving the corporate image and implementing the company's strategic goals [Buczowski et al. 2016].

According to Kramer and Porter, the CSR concept is implemented in stages [Witek-Crabb 2016]. The first stage involves random and sporadic activities that bring the company small economic benefit. This preliminary stage is called the stage of corporate philanthropy. The next stage is the so-called strategic philanthropy. Its activities are long-term and they are conducted in order to improve the company's competitive position. The economic effectiveness of these activities is also higher. The interest of the company, however, should be closely connected with its social and ecological activities. Therefore, these activities should evolve into the next stage of CSR which involves taking business decisions closely linked to social decisions in order to create the so-called shared value. In consequence, the company should be looking for social areas related to the company profile and make a profit and loss account of the economic and social costs related to its CSR activities [Witek-Crabb 2016]. The concept of creating shared value was presented by Porter and Kramer in *Harvard Business Review* in 2011 as a criticism of the CSR concept used at the time and its implementation [Porter and Kramer 2011].

## **ASSUMPTIONS OF THE CREATING SHARED VALUE**

Porter and Kramer claimed that the CSR activities that were then used by companies had numerous drawbacks. They were often internally inconsistent and uncoordinated and corporate reports concerning them were unreliable and did not show the links between the CSR concept and corporate strategy. The concept of CSR was perceived in companies as philanthropic activities (corporate philanthropy), often caused by the pressure of the company's environment and frequently undertaken as a result of some unclear preferences. The CSR concept was treated mainly as an element of a company's costs and therefore resulted in the company's reluctance to bear them. It was not perceived as the company's chance for development. Other flaws of

the CSR concept included the lack of effectiveness of the measures undertaken by the company and the risk that a company's CSR activities would be perceived as equivalent to public relations activities [Urbanowska-Sojkin and Weinert 2016]. As we can see, this criticism mainly referred to the practical use of CSR, and not to its essence.

The lack of consistency and internal coordination in CSR activities, unreliability of reports concerning them and the fact that there were no links between the CSR concept and the company's strategy did not result from the concept of CSR as such but, no doubt, from the activities of particular companies. The philanthropic character of CSR activities is not a drawback as long as they improve a company's competitive position and its corporate image and at the same time contribute to the improvement of the environment and public health. If CSR activities are of permanent character and, according to their assumptions, address the conditions and needs of the company's environment, they also have long-lasting and durable effects. Perceiving CSR activities as an element of a company's costs does not seem to be incorrect, either as, as a rule, every single activity carried out by a company generates costs. In practice, however, companies were, in fact, frequently not willing to undertake more advanced CSR activities because of their relatively high costs. The fact that there are no measures of the effectiveness of CSR activities, however, is a real weakness of the CSR concept; however, it does not result from the reluctance to undertake such activities, but is rather a result of the difficulty to develop indicators to measure their effectiveness. They are long-term activities and they concern building a company's image and social changes. Standards of the CSR were defined just at the turn (or in the early years) of the 21st century. It seems that the risk of CSR activities being perceived as synonymous to public relations results from a lack of knowledge within companies and not from the CSR concept as such.

According to Porter and Kramer the solution to the drawbacks of the CSR concept is the new concept of CSV, i.e. creating shared value in social and economic areas, which, in fact, means moving to a more advanced stage of CSR. The new CSV concept emphasises the links between a company's success and

social development. The CSV involves a company's activities aimed to improve its competitiveness by incorporating social activities (social causes) into its strategy. Its aim is to provide value for the company's customers by addressing, at the same time, important social and economic needs of the communities that the company operates in. The idea is to involve not only some selected stakeholders, e.g. stockholders or customers, but all the participants of the value chain. At the same time, the costs that the company bears in creating shared value should be balanced against the benefits that they bring. On the one hand, CSV activities incur costs that may lower a company's profit; on the other hand they should bring additional revenues and profits. It results from the fact that the company enters new markets and offers new products by creating shared value. The priority in the process of developing a company's strategy is to recognise problems and social issues in the company's environment. It can be said that CSV is not about undertaking charity activities but it involves developing the company's strategy in a way that takes into account the improvement of environmental well-being as well as the company's profits, and creates a new economic value.

There are three ways of implementing the CSV concept:

- First, developing new markets by recognising local community problems.
- Second, introducing new production, technological and organizational solutions in order to reduce the company's negative impact on the natural and local social environment.
- Third, enabling local clusters involved in processes of supply, production and provision of services to develop.

Thus, improving a company's competitiveness by creating shared value results from entering new markets and improving the company's image.

The CSV concept as a subsequent stage of CSR was presented in the form of a general framework and it addressed the concept of corporate social opportunities and creating the blended value. It can be concluded that CSV is an attempt to correct the flaws of the CSR concept. There is no doubt that it can be called a concept that aims to provide consistency of

economic and social goals (sustainable development model)<sup>1</sup>. The subject literature also presents the process of companies shifting gradually from the stage of using the CSR concept as a result of a company's environment pressure, through perceiving CSR as charity activities carried out by companies for their own satisfaction, to finally undertaking CSR activities in order to improve the company's competitiveness.

There is also a slightly different approach presented in the subject literature of implementing CSR by companies in stages. This approach mentions four or five stages of this process, the first three of which correspond to the first stage as defined by Porter and Kramer. The fourth stage is equivalent to their second one, namely to strategic charity activities and the final stage corresponds to the CSV stage [Mirvis and Goggin 2006, Visser 2012, Witek-Crabb 2016].

#### **CREATING SHARED VALUE CONCEPT AND A COMPANY'S MARKETING ACTIVITIES**

Every company preparing its marketing strategy first determines its mission and vision. A company's mission is the aim of the company's existence, the needs that it intends to satisfy and its contribution to the development of society. It is also said that a company's mission is the whole set of values that the customers and other stakeholders expect the company to provide. On the other hand, a company's vision is its projection of the future and what it is going to function like in subsequent periods of time. In other words, it is the visualisation of its future state. Thus, the CSR concept refers particularly to a company's mission because it involves, among other things, answering the question of who the company functions for, what activities it undertakes for the benefit of the community that it operates in, and what way it is going to contribute to the development of society. A marketing strategy that includes, for example, the company's marketing goals is based on the company's mission. A company's marketing goals should take into account the protection and development of the company's competitiveness, its customers' needs and, according to the CSR

concept, also provide sustainable social development [Janeczek 2014]. Having established the goals, a company selects the target markets on which it is going to operate and the marketing tools that it is going to use to achieve its marketing goals.

Assuming that a company implements the CSR concept in stages, marketing used by the company that addresses this concept can be referred to as social or sustainable marketing. The use of this type of marketing also results from a change in the behaviour of customers who are increasingly interested in social and environmental issues and therefore expect ethical behaviour, reliable information and response to social needs as well as good-quality products that are ecological and safe for people's health. All this forces producers and suppliers to present an enhanced offer providing additional social and ecological benefits. Social marketing can be defined as a process of creating, communicating and providing value for customers which addresses their needs, social, economic and ethical expectations as well as the company's efforts to enhance its competitiveness [Czubala 2013]. It involves building and implementing a marketing strategy that takes into account the social consequences of decisions. In practice the most common form of marketing is so-called environmental marketing, also referred to as green, ecological or eco-marketing. Its name suggests that the activities planned by a company – and the marketing instruments it uses – are in accordance with the principles of sustainable development and are both environmentally friendly and socially responsible.

As a result, companies modify the offered products and their composition and develop new ecological products and ecological packaging. They also launch social campaigns in order to change people's attitudes and behaviours in order to make them more friendly for the natural environment [Czubala 2013]. In practice, sustainable marketing involves a wider range of activities than traditional marketing. It concerns marketing research, strategy and organisation. The data collected by a company within the marketing information system should not just concern cus-

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<sup>1</sup> Some authors referred to the CSV concept as a "useful utopia" or "noble" concept [Mączyńska 2011].

tomers' demographic, economic, geographical and psychosocial characteristics. It is also necessary to collect information about the above-mentioned customer expectations regarding the quality of goods and the prosocial activities that customers engage in. In consequence, the range of company market research increases and the information collected in the process of market research should be used for the purposes of a company's strategy.

The first CSR stage will mostly involve charity activities that can be random and sporadic and are seldom associated with a company's future financial results. As a result, companies do not analyse the effectiveness of CSR outlays and it is not necessary to introduce changes in the company's organisation of marketing. Companies most frequently increase the range of their promotional activities along with the frequency and intensity of the use of such promotional instruments as public relations and sponsoring. The subject literature also refers to such marketing activities as so-called cause-related marketing [Kozłowski 2008]. It is essentially restricted to promotional activities related to some particular social cause and charitable activities carried out by a company in order to solve a social problem. Potential customers are informed about the aims of such activities and the fact that a purchase of a company's product is linked to a particular social action. It has a positive impact on the image of the company as a socially responsible organisation sensitive to the needs of different communities. It makes the company recognisable on the market (brand awareness), helps to improve positioning of the company's products and as a result increases revenues and strengthens the company's competitive position.

If a company moves to subsequent CSR stages (strategic philanthropy), the range of such activities increases and is reflected in the company's marketing strategies. Activities of the CSR are then not of random but continuous and long-term character and are selected in accordance with certain defined criteria. Their aim is to enhance a company's competitiveness, addressing at the same time the socio-ecological needs of the company's environment. In consequence, the range of a company's marketing research is extended in order to address the CSR areas and to achieve a higher level of competitiveness. Marketing activi-

ties generally focus on intensive promotion, including advertising, public relations and sponsoring. Companies use employee volunteering, engage customers and other stakeholders, launch social campaigns in cooperation with mass media and non-governmental organisations along with programs aimed to meet the expectations of the company's environment. At this stage companies also attempt to measure the effectiveness of CSR outlays. It is not necessary to introduce substantial changes in the company's marketing structure. Marketing activities supporting the CSR concept can be conducted by a company's marketing division operating on the basis of functional, product-related, geographical and market segment-oriented criteria depending on the specifics, offer and customers of a particular company.

Moving to the next CSR stage involves the use of the CSV concept that is creation of shared value. As at the previous stage, the company's marketing activities should start with marketing research that should collect information about the company's environment. It also refers to the foreign environment if the company operates or intends to operate abroad. Thus, the company should collect information about its potential customers, their characteristics and behaviours in the same way as at the previous stages of the CSR concept implementation. It is especially important, however, to extend the range of the company's marketing research incorporating into it the social areas corresponding to the company's profile and product offer. It is necessary to collect data about economic infrastructure, health care and education systems and the condition of the natural environment in the regions where the company operates or intends to operate. This data should be analysed in order to draw conclusions concerning potential problems in the above-mentioned areas of the company's environment. Therefore, it is necessary that the company should have a well-developed marketing information system. Then the company can juxtapose its resources and capacity with potential social problems in its environment. As a result, the company chooses the area in which it can start to create shared value, geographical markets in which it can operate and market segments. It may appear then that the company will have to deal with new markets and market segments.



The next step is to define the company's marketing goals in the selected regions and with respect to the appropriate market segments. Selecting the area for creating shared value is in turn a basis to create the marketing tools, particularly those referring to production, technology and organization in the company. As far as the company's product policy is concerned, it is possible not to change the company's product offer and to use price-related and promotional instruments in CSV activities. The other option is to introduce changes to the company's product in order to create shared value. It should be supported by promotional activities and the use of pricing policies corresponding to the specifics of the selected market segment.

A further step concerning the company's product policy is to create a new product addressing the social needs of the company's environment. It can be a tangible product related to the company's existing product lines or a service provided by the company for the benefit of the community in a given region<sup>2</sup>. In relation to its product policy the company should also analyse the development of local clusters, including supply processes, production and provision of services. Its purpose is to launch new or improved products and to extend the company's group of suppliers in order to use raw materials and components offered by companies operating on the local markets on which the company's shared value will be created and offered.

It should be emphasised that it is extremely important that the company should have a marketing information system that will enable it to find local enterprises with the right potential which can participate in the company's supply chain and the process of creating shared value. A crucial element of CSV is the calculation of benefits resulting from the process of creating shared value. The company should make calculations of the costs incurred during the process of creating shared value and the sales revenues by taking into account different variants. The next step can be defining other marketing activities and tools connected with distribution and promotion and closely associated with

the shared value. The company can change or extend its distribution channels by incorporating companies from the markets on which it operates. It is especially the case when creating shared value involves entering new geographical markets. The potential of local companies can be also used in activities promoting the created shared value. Implementing the CSV concept does not have to cause essential changes in the organizational structure of marketing. It can involve, however, expand the marketing research division which collects data about the company's environment, looks for new markets and local clusters on new markets.

The use of the CSV concept is also related to the type of marketing strategy. This is especially visible in the case of strategies distinguished by the market on which the company operates and its product offer (the so-called Ansoff matrix). Ansoff has defined four development strategies here: market penetration, market development, product development and diversification (innovation).

- The market penetration strategy assumes no changes in the product offer and the use of other marketing-mix instruments for a company's development and sales growth. The company aims at increasing the frequency of purchases by the buyers, increasing the number of purchases, and limiting the purchases of competitive products by consumers. These goals can be achieved by offering new after-sales services, using new distribution channels, intensive promotional activities, price reductions.
- The market development strategy consists in introducing existing products to new markets. This objective can be achieved by taking over market segments serviced so far by competitors or offering products to buyers (new segments) who have not yet purchased a given product. There is also a possibility of geographical expansion, i.e. entering new territorial markets – e.g. foreign markets.
- The product development strategy assumes offering modified or new products on existing markets. Modification can take place by improving the

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<sup>2</sup> An example of creating shared value can be organising and financing language courses and training for school-age youth in regions with low household incomes by a manufacturer of computer and audio-visual equipment. It will improve the level of education in the region, young people's chances for further education and getting a job. At the same time, it improves the company's image and increases sales opportunities.

quality of products, adding new additional functions, changes in colour, packaging, size, varieties and new product models. Similar activities are used in relation to other marketing-mix tools, and this particularly applies to promotion.

- The diversification (innovation) strategy is to introduce new products to new markets. This can be achieved by offering new products to new segments of buyers or by offering new products on new territorial markets, e.g. abroad. The company must therefore create a new product on its own, buy a license or patent for the new product or absorb a producer who has the new product at its disposal [Grzegorzczak 2015]. It also happens that the company, in order to create its own new product faster, buys suppliers of raw materials, materials, intermediate products or subcontractors (vertical diversification).

From the above-mentioned types of marketing strategies, the CSV concept can be applied to product development and diversification strategies. In the first instance, new products are created, which can be of common value or can be created through cooperation with local companies and the development of local clusters, including the supply of raw materials, production or new product distribution systems in existing markets. With regard to the strategy of diversification (innovation), the selection of new markets should include an examination of their social and environmental problems, the needs of buyers and the market structure of suppliers and intermediaries. This provides a basis for creating new products that take these needs into account, and helps create local supply and production clusters to enter new markets.

As has been emphasised above, CSR implementation requires, among other things, building long-term partner relationships with groups of stakeholders, particularly with a company's customers, regardless of what stage the CSR process in the company is at. Therefore, it is necessary that a company follow the principles of partnership marketing (also called relationship marketing). The definitions of relationship marketing emphasise the importance of relationships for a company's market strategy, to quote just two examples: Relationship marketing is, among others, used to transform the company's customers into

co-creators of the company's product or value in order to connect them with the company on a long-term basis [Rogoziński 1998]. The idea of relationship marketing involves creating and maintaining bilateral and multilateral relationships with the company's customers and other subjects in the process of creating and supplying goods and services [Fonfara 1999].

As can be seen, the main purpose of relationship marketing is to strive to build long-lasting and satisfying relationships with stakeholders which contribute to the increase of social welfare. According to the CSR concept, this relationship building involves not only customers but also suppliers, intermediaries, potential employees and the so-called influential institutions (e.g. banks, insurance sector, consumer associations, social movements, environmental protection institutions). It has been noted above that in consequence of these assumptions a company widens the scope of its marketing research by collecting more detailed information about stakeholder behaviours and relationships. The tools that companies use in their marketing strategies in practice are customer relationship management (CRM) programmes. Customer relationship management is based on the information systems available and regularly monitors the behaviours, needs and expectations of customers in order to build and maintain long-term relationships with them.

## SUMMARY

The CSR concept is closely related to a company's marketing strategy. Its assumptions are part of a company's mission, which, in turn, determines a company's marketing strategy. The last stage of CSR implies that the importance of a company's marketing research increases and that the organisational unit dealing with it should be expanded. The links between CSV and a company's marketing strategy can be especially noticed in the process of assessing and selecting new markets and new market segments. They also concern changes in product policy that should involve creating products representing shared value. These links also refer to a company's distribution policy which should include creating local clusters and engaging local companies into the process of production and distribution.

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## RELACJE MIĘDZY KONCEPCJĄ *CREATING SHARED VALUE* A STRATEGIĄ MARKETINGOWĄ PRZEDSIĘBIORSTWA

### STRESZCZENIE

Celem publikacji jest próba określenia relacji między koncepcjami *corporate social responsibility* (CSR) oraz *creating shared value* (CSV) a strategią marketingową. Dla realizacji tego celu wykorzystano metodę krytycznej analizy literatury krajowej i zagranicznej odnoszącej się do tych zagadnień. Na tej podstawie sformułowano wnioski określające zakres i treści tych relacji. Odnoszą się one przede wszystkim do misji przedsiębiorstwa, prowadzonych przez nie badań marketingowych i strategii marketingowej. Współzależność CSV i strategii marketingowej można szczególnie dostrzec w ocenie i wyborze nowych rynków geograficznych i nowych segmentów nabywców. Odnoszą się one do zmian polityki produktu – kreowania produktów stanowiących wspólną wartość. Relacje dotyczą także polityki dystrybucji, która może dotyczyć tworzenia lokalnych klastrów i włączania do produkcji i dystrybucji firm z tych rynków.

**Słowa kluczowe:** CSR, CSV, strategia marketingowa

## IMPACT OF TAX INSTRUMENTS ON THE ORGANIC FOOD MARKET IN POLAND

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### ABSTRACT

This article is an analysis and assessment of the impact of tax instruments on the organic food market in Poland. The assessment was made on the basis of primary data obtained by the author as part of a survey conducted on the inhabitants of the Silesian Voivodeship. In Poland, the VAT rates on food vary, depending on the product classification code. They can be 23%, 8% or 5%. Organic food has not been treated exceptionally, while changes introduced in the tax rates in July 2020 for specific foods are quite significant. The impact of these changes on organic food purchases has been determined in the results of the survey. Therefore, the purpose of the article is to assess the impact of the VAT rate on the organic food market in Poland.

**Key words:** organic food, consumption taxes, food market, Value Added Tax

**JEL codes:** H20, H31, Q18

### INTRODUCTION

Multi-functional agriculture relates to non-market products and services that agriculture delivers with various degrees of jointness with either farm productivity or farm/rural sceneries. Such non-market goods and services generally are connected to national food security, farm conveniences, recreational opportunities, cultural heritage, activity of rural communities, and an extensive range of ecosystem services comprising nutrient recycling, carbon sink, or groundwater recharge [Moon et al. 2017]. Major modifications in food consumption patterns and changes in composition of consumer diets have been a meaningful phenomenon noticed in many parts of the world in recent decades. Some of the most significant changes have been the expanding consumer need for organic, local, environmentally friendly, tenable, and functional foods that offer profits beyond elemental nutrition. In spite of these commonalities

in food consumption trends, changeover in dietary patterns has been observed to vary by country mainly because of economic, socio-demographic and cultural contrasts, as well as urbanization and trade liberalization policies [Hovhannisyan et al. 2020].

Organic food is a type of food products produced in accordance with ecological farming (organic, biological, biodynamic), that is, an ecologically, economically and socially sustainable management system formed entirely on natural production methods. By means of stimulating natural production mechanisms, it generates conditions for nourishing, improving prolificacy and enhancing fertility of soil, ensures the healthiness of plant and animal organisms and makes it attainable to gain high-quality agricultural products. The creed of this kind of farming is a resignation from the use of agricultural chemicals for the sake of biological, mechanical or agrotechnical approaches [Angowski and Bujanowicz-Haraś 2019].

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In the methods of organic food production, all stages and processes connected with its manufacture are continuously assessed and controlled. Every step is essential, from the means of increasing soil quality, through the choice of the plant cultivation procedure, to the selection of farm animals and methods of their rearing, the means applied to food processing, the labelling of products, and the appropriate transportation to places of sale or distribution [Kacprzak and Wielewska 2019]. In a lot of situations, organic food producers are small farmers. Even though there is a great consumer demand for their products, smaller farms have difficulties competing for a share of this growing market. Despite the fact that marketing channel challenges vary by product and setting, restrictions from limited available quantities, logistic factors and lack of price competitiveness have a negative influence on the capability of smaller producers to supply this market. Among these restrictions, the relative inability of smaller in comparison with larger farms to transport, distribute, and deliver their product is a crucial marketing challenge [Willis et al. 2016].

During the last decade, a lot of research has been carried out around the world to study the eagerness of consumers to pay a price premium for different ecological products. Therefore, according to a global survey by the Nielsen company in 2015, for 30,000 consumers in 60 countries, 66% of respondents were ready to pay more for ecological goods, a rise of 11% compared to 2014 and a 16% increase over the same index in 2013. The Millennial Generation most of all are willing to pay extra – almost 73% of respondents. Ecological awareness is able to affect the purchase of an ecological product for 45% of surveyed consumers [Kucher et al. 2019].

From the perspective of the nature of their motivations, three groups of organic food purchasers can be recognized [Łuczka 2019]:

- Consumers who consider organic goods as a basic necessity because of their essential effects; these are the ones who intend to address their central values.
- Consumers for whom it is very crucial to look for harmony with the environment because it gives them peace of mind, while also being a method to express their accountable attitudes.
- Consumers led by integrated motivations who recognize the consumption of organic products in

a comprehensive way, because the practical value of purchased goods coexists with spiritual values; these are the most educated and most conscientious buyers who strongly believe that harmony with the environment, which is achieved by purchasing organic products, has influence on satisfaction and self-fulfillment.

The organic food market in Poland is systematically developing, but there are some factors which make the development of organic farming difficult, such as: territorial dispersion of farms, low production scale, low consumer income levels, low environmental awareness. After 2004, organic farming in Poland was characterized by a high growth rate in the number of farms and cultivated area. The key causative agent growth processes were supported by European Union funds [Hermaniuk 2018]. There are also situations on the organic food market, where producers take advantage of consumer ignorance and offer information that suggests the organic origin of food, even though it has not been produced in accordance with the requirements of ecological production processes and has not obtained relevant certificates [Nestorowicz 2018].

In Poland, domestic demand for organic food only correlates with a small part of the whole food market. Thus, the Polish organic food market is continuously in a niche. In Poland, net annual spending on organic food is noticed to have increased quickly over the past five years, at a yearly rate of 20%. In 2017, it was ca. PLN 1.1 billion (VAT included). The fundamental conditions for further development of organic food production involve both opportunities (for instance, increased competitiveness of food producers and processors functioning in this market) and obstructions (such as the absence of well-organized distribution channels and high costs achieved at various stages of the marketing chain, which significantly hinder the ability to convert market potential into a strong competitive position). To develop the organic food market, it is crucial to support the demand and supply side by preparing productive distribution channels and by taking into consideration the unique nature of these channels, as defined by other customer segments [Grzybowska-Brzezińska and Gorłowa 2019].

High prices are an essential factor which restricts the general availability of organic food for consumers.

Non-organic products are definitely cheaper than their organic counterparts. This fact is related to the weak expansion of the domestic organic food processing sector, a high share of foreign products, and high margins on organic food. High consumption of organic food is especially visible in highly developed European countries. The highest annual levels of organic food consumption per person have been reported in Switzerland (EUR 177), Denmark (EUR 162), Luxembourg (EUR 134), Austria (EUR 127) and Lichtenstein (EUR 100) [Hermaniuk 2018]. The lowest numbers connected with organic food consumption in Europe can be noticed in Central and Eastern European countries, including Poland (EUR 7) [Doba et al. 2019].

In order to decide what information to present to future consumers and how to present it, it can be useful for farmers and retailers to understand the consumer decision-making process together with consumer choices. Decision making is a mental process of collecting information from the outside environment and using it to make a decision. Buyers in a shopping environment are exposed to a lot of clues that can be used to assess the product and make a purchasing decision [Katz et al. 2019].

In empirical studies, a particular challenge is the fact that consumers who commonly purchase organic food have a tendency to choose more vegetables, fruit, wholegrain products and less meat, and are likely to follow healthier dietary patterns. Each of these dietary aspects is connected with a decreased risk for mortality from particular chronic diseases or their incidence. Consumers who regularly purchase organic food are also more physically active and do not usually smoke. However, connections between organic and conventional food consumption and health outcomes need to be carefully adapted to differences in dietary quality and lifestyle aspects, and the probable presence of

residual variables needs to be taken into account [Mie et al. 2017].

The impact of changes in VAT rates on purchasing behavior of consumers in the area of organic food is examined in this research article. The most important and significant changes in VAT rates on food that have been introduced since 1 July 2020 are listed in the table.

A favorable change is the standardization in the rate for bread and pastry goods. Before introducing the change, each product may have had a different tax rate depending on the declared expiry date. Since 1 July 2020, there has also been a reduction in the rate of tax on goods and services for citrus fruit from 8 to 5%.

The impact of the above-described changes on consumer behavior is illustrated in the following research results. It is worth noting that originally, changes to the VAT matrix were to be introduced as early as 1 April 2020. However, due to the COVID-19 pandemic, the government decided to postpone the change implementation deadline in order to give entrepreneurs time to adjust to the new rates.

## METHODOLOGY

Research within this article was conducted with the use of a questionnaire. The questionnaire consisted of 13 closed and semi-open questions and a metric in which respondents were asked about age, sex, education and net income per person in the family. The questionnaire was completed by 154 adults who live in the Silesian Voivodeship. The selection of the sample was disproportionate and deliberate. The study was conducted from February to May 2020 in a direct way by personal contact.

The questions concerned the purchase of organic food, the motives for choosing such food and knowledge about it. The main part of the survey included

**Table.** Changes in VAT rates effective since 1 July 2020

| Product   | Rate before the change                      | Rate after the change |
|---|---|-----------------------|
| Tropical and citrus fruits, some nuts (pistachio, almonds, coconut) | 8%  | 5%                    |
| Bread and pastries  | 5%, 8%, 23%<br>depending on the expiry date | 5%                    |

Source: Author's own elaboration on the basis of Wydawnictwo C.H. Beck [n.d.].

questions related to the change in VAT rates for selected food products, which entered into force on 1 July 2020. Respondents were asked their opinion on each of the described changes and their response to these legislative activities. Respondents were also asked about the possible use of tools that would encourage them to choose organic food, with a particular emphasis on fiscal tools.

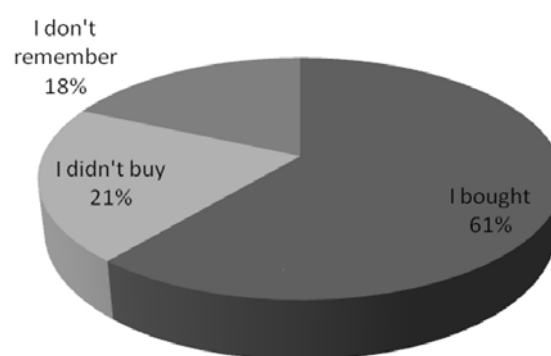
## RESULTS

At the beginning of the analysis of the obtained results, the characteristics of the research sample was outlined. The vast majority of the respondents were women (68%). However, such a distribution of the research sample does not distort the research results, because it is women who are most often responsible for purchasing food in the household. Most of the respondents were people with secondary education (62%). Respondents with higher education accounted for 29% of the total sample. Half of the respondents were between the ages of 18–25 (53%). Consumers over the age of 25 also constituted a significant part of the studied population (47%). The respondents in the sample are characterized by an average net income per person in the family in the range of PLN 1,001–2,000 (EUR 227–454) – 40% and PLN 2,001–3,000 – 29% (EUR 454–682). Respondents who earn more than PLN 3,001 accounted for 18%.

Figure 1 shows the results of the answers to the first substantive question. It turns out that most of the respondents had bought organic food in the last three months. Among them, 36% were women. For these variables a  $\chi^2$  test was used, which is 2.911 at  $p = 0.233$  and  $df = 2$ . A test value is lower than the critical value, which means that these data are not statistically significant.

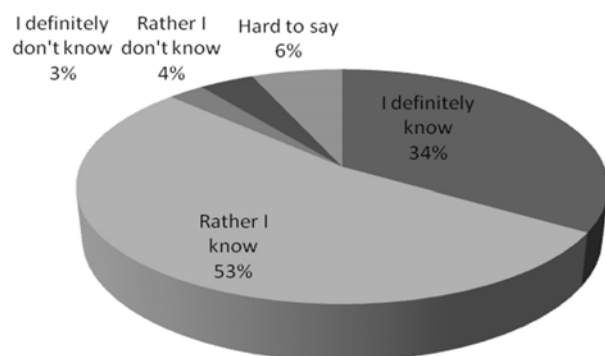
The results of respondents' answers to the question regarding the knowledge about the difference between organic and conventional food should be viewed as positive. Almost 90% of respondents definitely know or rather know how organic and conventional food differ. Figure 2 illustrates the full range of data.

Healthiness and lack of preservatives are the main and most important reasons for purchasing organic food by the respondents. All the options of respondent choice are presented in Figure 3.



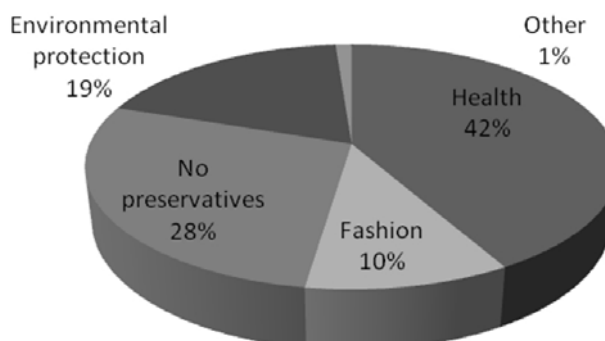
**Fig. 1.** The purchase of organic food in the last three months

Source: Author's own elaboration on the basis of primary research.



**Fig. 2.** Knowledge about differences between conventional and organic food

Source: Author's own elaboration on the basis of primary research.

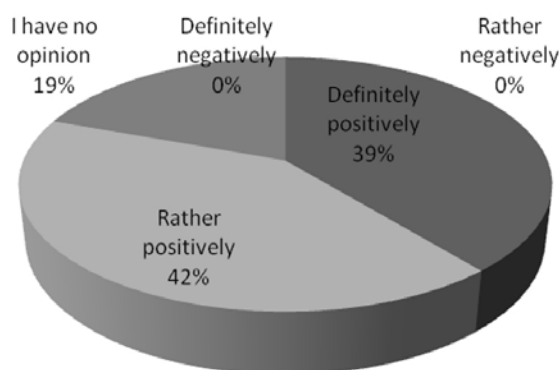


**Fig. 3.** Motives for buying organic food

Source: Author's own elaboration on the basis of primary research.

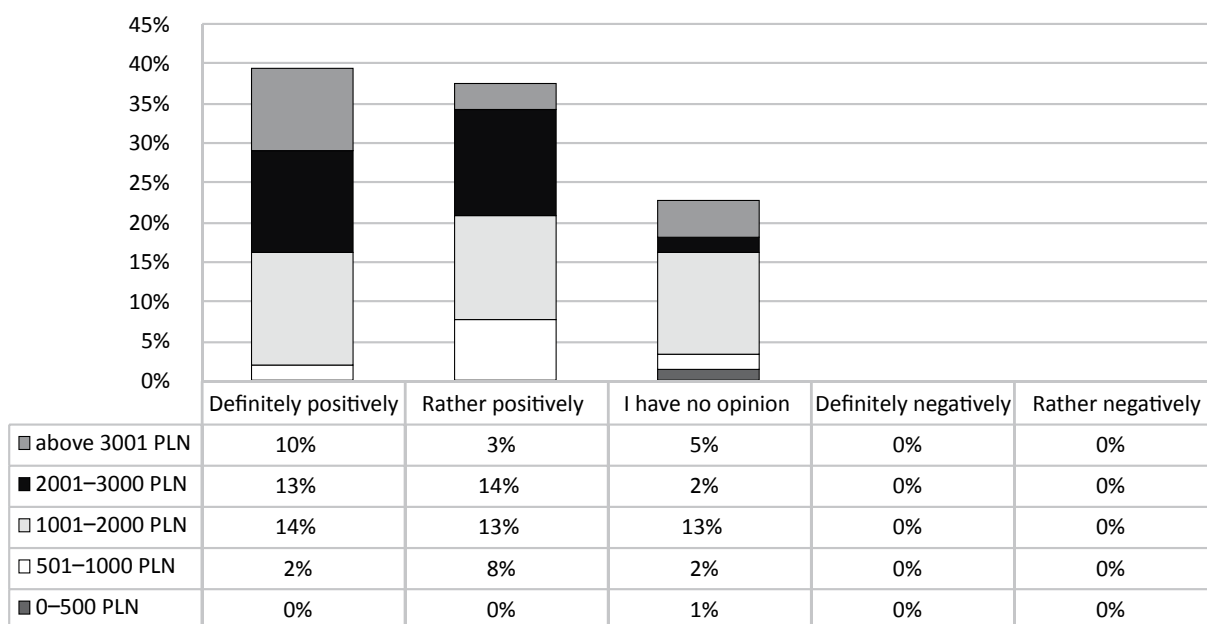
In the next question, respondents were asked to assess the reduction of the VAT rate on bread to the level of 5%, effective since 1 July 2020. This change was unanimously defined by the respondents as definitely positive and rather positive. The results are illustrated in Figure 4.

Fifty-four percent of respondents with income of PLN 1,001–3,000 estimated the reduction of the VAT rate on bread in a definitely positive way. The detailed distribution of the respondents' answers is shown in Figure 5. Between these variables a correlation coefficient has been calculated, which is in this case – 0.55997. A moderate negative correlation here means that with the deteriorating assessment of the change in the rate, the respondents' income decreases.



**Fig. 4.** How do you assess the reduction of the VAT rate on bread up to 5% since July 2020?

Source: Author's own elaboration on the basis of primary research.



**Fig. 5.** How do you assess the reduction of the VAT rate on bread up to 5% since July 2020? Due to net income per person in the family

Source: Author's own elaboration on the basis of primary research.

On the other hand, the respondents were unable to assess the impact that a reduction in VAT on bread would have on purchases of organic bread. Only one-third of respondents stated that they would rather buy more organic food than before. Data is illustrated in Figure 6.

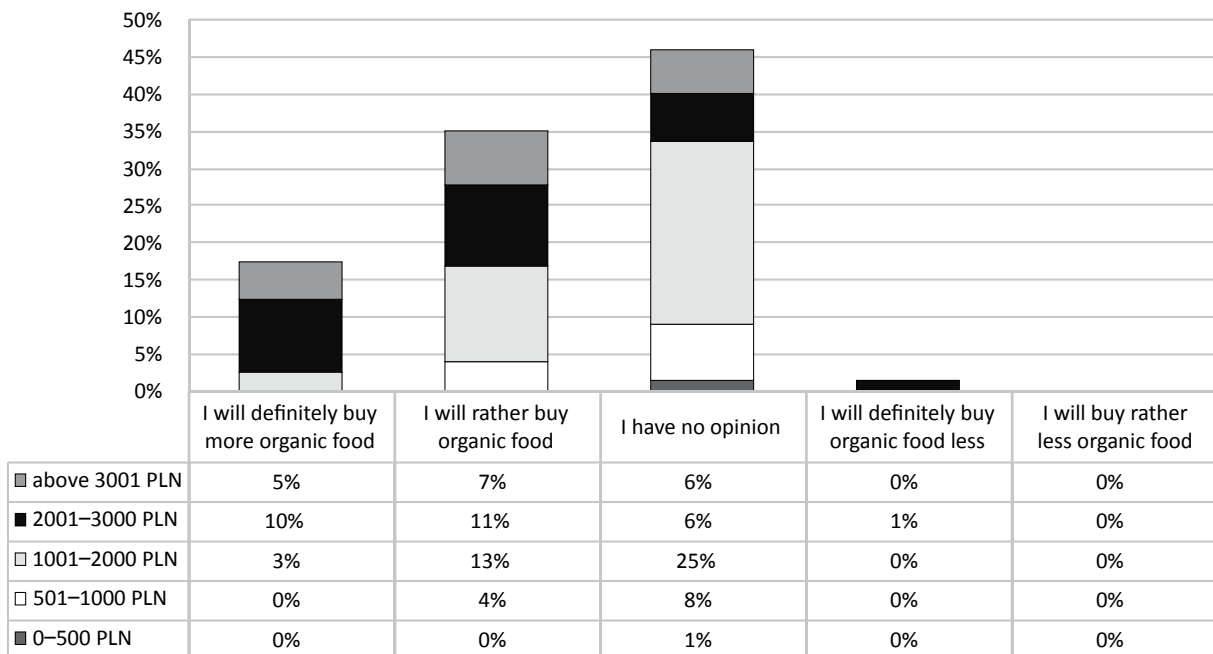
Among respondents who did not have an opinion, the largest number were those with a net income per person in the family of PLN 1,001–2,000 (25%). The correlation coefficient in this set of variables is 0.275471. It is a very weak dependency which confirms the economic position of no impact of income on





**Fig. 6.** How will the reduction in VAT on bread affect your consumption of organic bread?

Source: Author’s own elaboration on the basis of primary research.



**Fig. 7.** How will the reduction in VAT on bread affect your consumption of organic bread? Due to net income per person in the family

Source: Author’s own elaboration on the basis of primary research.

the demand for basic goods. In the case of bread, there is no such dependence, either (Fig. 7).

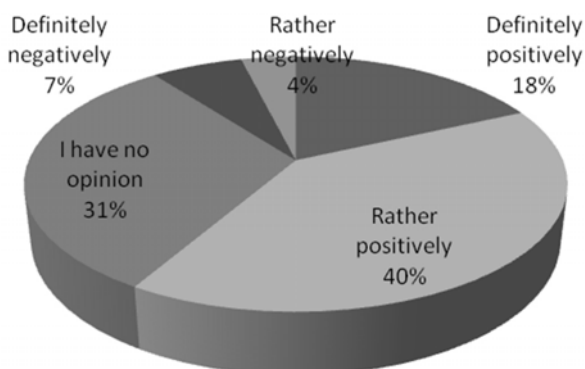
In turn, respondents rated the reduction of VAT on cakes to 5% as being rather positive. One-third did not have an opinion. All the data is presented in Figure 8.

Interest in a lower tax rate on cakes, including organic cakes, was shown by respondents aged 18–25. As many as 29% of those respondents evaluate this change positively (Fig. 9).

The respondents were also unable to assess the impact of a reduction in VAT on cakes on the purchase

of organic cakes. However, almost the same number of respondents stated that they would rather buy more organic food than before. The data is illustrated in Figure 10.

Among the respondents who declared that they would rather buy more organic cakes after the VAT rate reduction, most had an income range of PLN 1,001–2,000 (14%) and PLN 2,001–3,000 (10%). Between these variables there was also a moderate positive relationship of 0.41339, which means that as income increases, consumer opinions become more neutral.

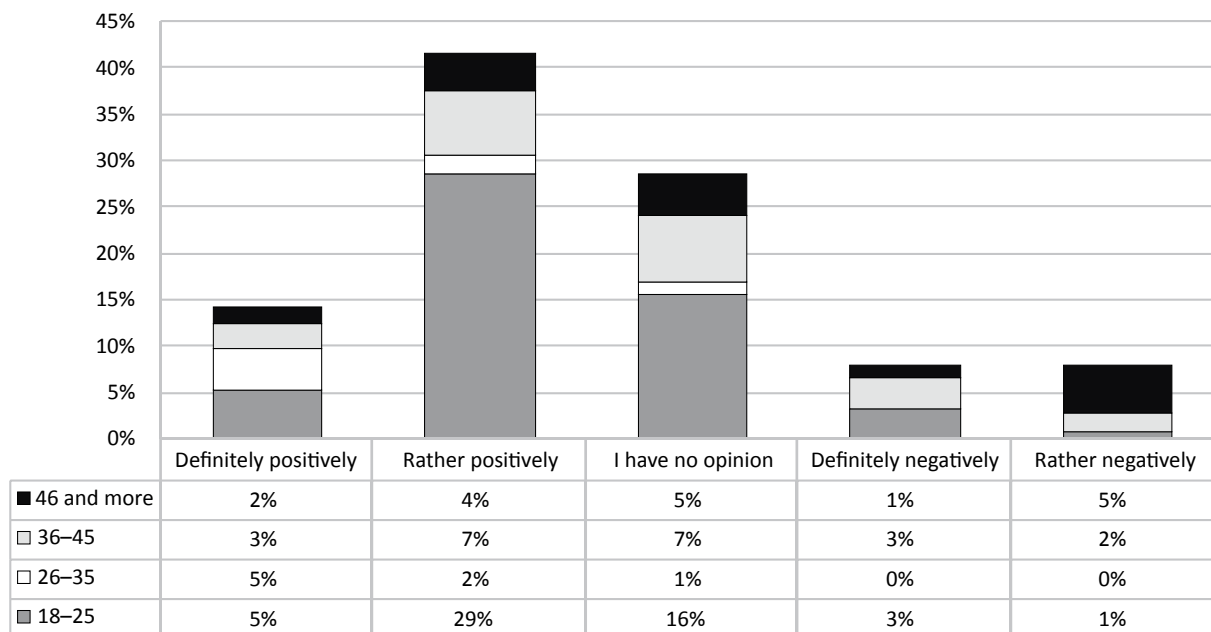


**Fig. 8.** How do you assess the reduction in VAT rates on cakes and confectionery to 5% since July 2020?

Source: Author's own elaboration on the basis of primary research.

The respondents assessed the reduction of VAT on tropical fruit to 5% in a very similar way. They stated that the reduction is definitely positive or rather positive. The data is illustrated in Figure 11.

According to respondents, public subsidies received by organic farmers support the production of organic food in a determined or moderate way. Figure 12 shows the exact results. Among consumers who assessed their support of farmers through subsidies as average, the largest number of respondents were people with an income range of PLN 1,001–2,000 (15%) and 2,001–3,000 (10%).

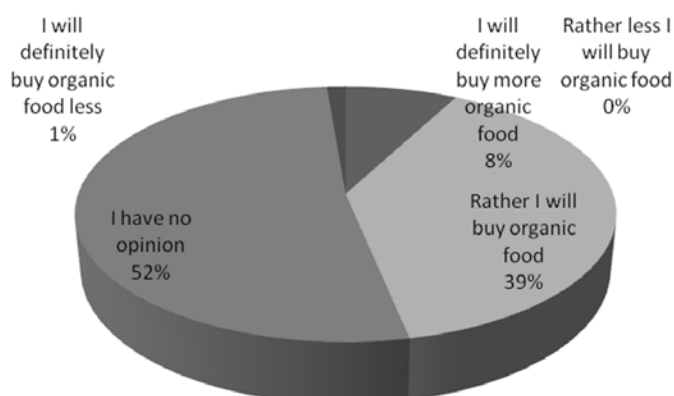


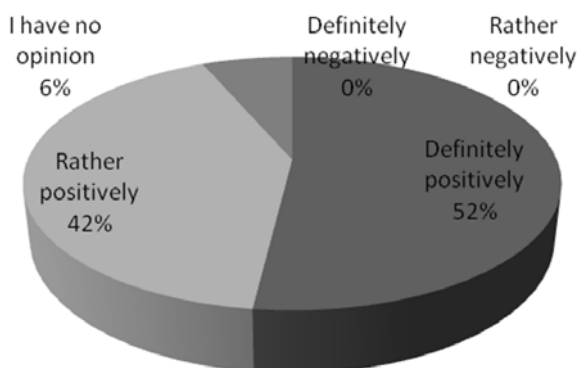
**Fig. 9.** How do you assess the reduction in VAT rates on cakes and confectionery to 5% since July 2020? Age of respondents

Source: Author's own elaboration on the basis of primary research.

**Fig. 10.** How will the VAT reduction on cakes affect your consumption of organic cakes?

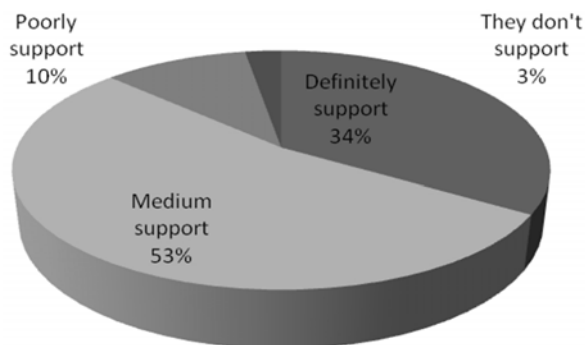
Source: Author's own elaboration on the basis of primary research.





**Fig. 11.** How do you assess the reduction of VAT rate on tropical fruit from 8 to 5% in July 2020?

Source: Author's own elaboration on the basis of primary research.

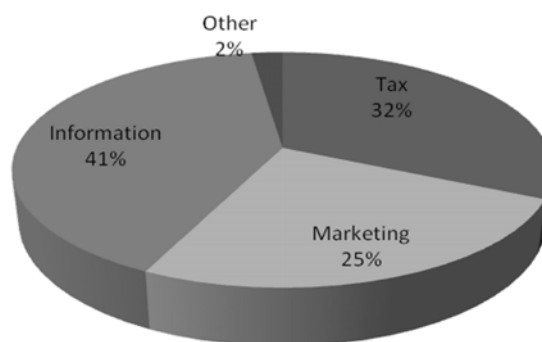


**Fig. 12.** The degree of support for organic farmers in Poland by public subsidies

Source: Author's own elaboration on the basis of primary research.

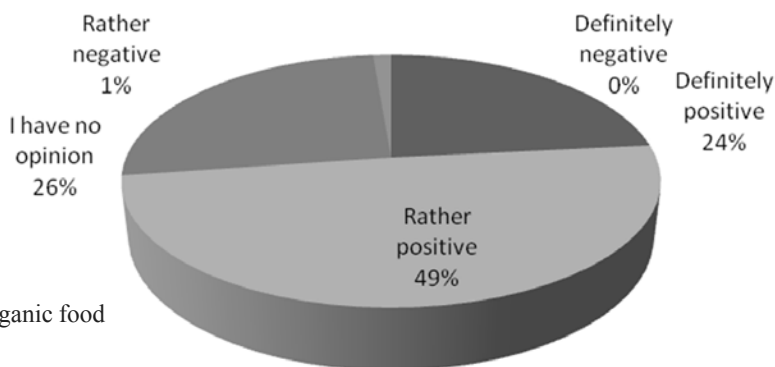
The respondents agreed that information is the most desirable tool for promoting organic food, and that this kind of instrument should be used by public authorities. Figure 13 illustrates the full structure. Tax tools took second place among the indications.

On the other hand, according to respondents, preferential VAT taxation of organic food would have a rather positive impact on the consumption of organic food. The remaining indications are reflected in Figure 14.



**Fig. 13.** Tools that should be used by public authorities to increase your consumption of organic food

Source: Author's own elaboration on the basis of primary research.



**Fig. 14.** The impact of preferential VAT on organic food on your organic food purchases

Source: Author's own elaboration on the basis of primary research.

## DISCUSSION

Looking at the results of the research, it should be stated that consumers mostly buy organic food and are aware of how organic food differs from that produced with traditional methods. Healthiness and lack of preservatives in bio food are, for consumers, the most important motives for its purchase. All the changes in VAT rates which were introduced in July 2020 met with a positive assessment from consumers. It is worth noting that all the questions concerned the reduction of VAT rates. Since July 2020, some food items have a higher VAT rate than before. However, these are products that are not purchased as often as bread, fruit or cakes, therefore, they were not included in the questionnaire. It applies in particular to some spices, ice for food purposes or lobsters, octopi, etc.

Another consideration to the undertaken research is the fact that a reduction in the VAT rate will not always result in a reduction of the product price. Retail chains can raise net prices and consumers will not notice the change in the portfolio. This consumer awareness has been verified by particular questions. As it turned out, equalization of the VAT rate on all types of bread will not be a motivator for consumers to buy organic bread. These results are not surprising because most often, bread with a short expiry date bought in bakeries has already had a 5% rate for a long time. Only the rate of bakery products that had an expiry date over 14 days was reduced. It is these items that have benefited from the change. Due to the fact that they are bought less often than traditional bread, this change will not affect the purchase of organic bread.

To a greater extent, respondents reacted to a reduction in the VAT rate on pastry goods. They assessed the change positively and expressed their willingness to buy organic cakes. Interestingly, the reduction of the VAT rate on tropical fruit was assessed particularly positively by consumers. Fruit is a frequently purchased food item among Polish consumers. However, it is worth noting that the majority of tropical fruit in Polish stores are also imported from countries outside the European Union. Such items are beyond EU legislation, which makes it difficult for consumers to verify whether they are purchasing certified organic food.

Consumers agreed that to a large and medium extent, public subsidies financially support organic farmers in Poland. However, respondents indicated marketing and tax instruments as the most effective government tools to support the consumption of organic food in Poland. There are a lot of campaigns promoting organic food, both commercial and governmental, on the Polish market. Confirmation of consumer interest in a lower VAT rate on organic food is the answer to the last question. The vast majority indicated a positive impact of this change on organic food purchases.

## CONCLUSIONS

The results of this survey have clearly demonstrated the impact of tax instruments on consumer purchasing decisions in the area of organic food, and the goal of the research project was accomplished. However, since the survey was carried out before the introduction of the new tax rates, it would be advisable to repeat the survey during the period of application of the changes.

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## ODDZIAŁYWANIE INSTRUMENTÓW PODATKOWYCH NA RYNEK ŻYWNOŚCI EKOLOGICZNEJ W POLSCE

### STRESZCZENIE

Niniejszy artykuł stanowi analizę i ocenę oddziaływania instrumentów podatkowych na rynek żywności ekologicznej w Polsce. Oceny dokonano na podstawie danych pierwotnych pozyskanych w ramach autorskiego badania ankietowego przeprowadzonego na mieszkańcach województwa śląskiego. W Polsce stawki podatku VAT na żywność różnią się w zależności od kodu klasyfikacji produktu: mogą być 23%, 8% lub 5%. Żywność ekologiczna nie została potraktowana wyjątkowo. Wprowadzone w lipcu 2020 roku zmiany w stawkach podatkowych ściśle określonych artykułów spożywczych są dosyć istotne. Ich wpływ na zakupy żywności ekologicznej określiły wyniki badania ankietowego. Celem artykułu jest zatem ocena oddziaływania stawki podatku VAT na rynek żywności ekologicznej w Polsce.

**Słowa kluczowe:** żywność organiczna, podatki konsumpcyjne, rynek żywności, VAT

## POVERTY IN RURAL AREAS: AN OUTLINE OF THE PROBLEM

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### ABSTRACT

This article is an attempt to determine the level of poverty in rural areas in Poland. The author reviewed the most important publications on poverty and the indicators that determine its scale. Relative, objective and subjective poverty lines were used to present the range of rural poverty against the background of total poverty. Analyses showed that the at-risk-of-poverty rate for rural areas in Poland amounted to 21.2%. This means that almost every fifth rural resident is at risk of poverty, whereas every tenth resident is at risk of extreme poverty. The article also presents the rural areas in Poland which are at the highest risk of social exclusion. These areas were distinguished on the basis of the number of registered families receiving social benefits. Both Eurostat (EU-SILC) and Local Data Bank of the Statistics Poland (BDL GUS) were used.

**Key words:** poverty, rural areas, social exclusion

**JEL codes:** I31, I32, D31, D63

### INTRODUCTION

Poverty and social exclusion have been the subjects of numerous empirical analyses [Rowentree 1901, Townsend 1979, Sen 1981, Atkinson 1987, Jarosz 2013, Tarkowska 2013, Galor et al. 2014, Golinowska 2018, Łuczak and Kalinowski 2020] due to the fact that a significant part of society is still unable to satisfy its basic needs. So far the authors of publications have recognised the following main groups of people to be threatened by poverty: the unemployed [Stiglitz 2009, Kryńska and Kwiatkowski 2010, ILO 2016, Quy 2016, Healy 2017], people with flexible forms of employment, known as the precariat [Standing 2014], the disabled [Emerson 2007, Kowalczyk et al. 2007, Golinowska and Sowa 2012], the poorly educated [Connelly et al. 2014, Serneels and Dercon 2014], elderly people [Kubicki 2013, Kałuża and Szukalski 2014], children [Warzywoda-Kruszyńska 2012,

OECD 2015, UNICEF 2016], women [Lister 2007, European Commission 2017] and the rural population [Kalinowski and Łuczka-Bakuła 2007, Binder 2014, Kalinowski 2015].

As poverty itself is a multidimensional phenomenon, it is extremely difficult to analyse. Depending on the assumed concept of the poverty line, different people may be below the threshold separating the poor from those who are not poor. However, the core of the groups usually remains the same. It is noteworthy that there is no single understanding of poverty. It varies depending on the context, place, or one's ability to cope with it.

The rural population is unquestionably one of the major groups at risk of poverty. All analyses indicate that this group satisfies its needs to a lesser extent than city dwellers, and rural inhabitants usually have lower expectations [Kalinowski 2016]. This group is particularly important for research on poverty, be-

cause about 40% of the Polish population lives in rural areas, i.e. about 15.3 million inhabitants. However, it is important to stress the diversity of rural areas themselves, which face different problems, depending on their functional type [Stanny et al. 2018]. The level of poverty and material deprivation is both demographically and spatially diversified. Therefore, the aim of the analysis was to indicate the extent of rural poverty and its diversity.

### **DEFINITION PROBLEMS AND METHODS**

Poverty is a social phenomenon which consists in a lack of adequate material resources to cover a certain level of expenditure on goods and services. As a result, people become marginalised and unable to use goods and services according to their needs. Poverty refers to the people who limit their expenses below the minimum accepted by the inhabitants of a particular country. In a narrower sense, it also refers to specific territories in a country (e.g. peripheral areas located far away from large urban agglomerations). The problem of poverty does not boil down only to a lack of cash or to a level of individual consumption below the assumed threshold. It is also a matter of consumer convention – objectively determinable deprivation of needs – which hinders one's participation in social life. Nevertheless, although the income dimension is not optimal, it is commonly used, and it is treated as the second-best solution. Clarity is an important advantage of poverty lines determined by means of specific income, because it enables easy separation of the poor subpopulation from the rest of society. However, it is important to stress the fact that having income is not necessarily synonymous with the ability to satisfy one's needs. Some studies point to the uneven distribution of income within a household, while others indicate the inconsistency of the objective and subjective dimensions of a life situation – the satisfaction paradox or dissatisfaction dissonance [Kalinowski 2016].

There are two approaches to defining poverty: broad and narrow. The first is characteristic of sociology, because it comprises research on this phenomenon not only in a sense of existence, but also on the

basis of multidimensional and descriptive statistics, which enables assessment of psychological, social and cultural aspects. The other definition is typical of economic research, which usually has a practical purpose, namely to identify the range of poverty and to determine the scale of measures that are necessary to eliminate it. In this case, poverty is defined by means of economic concepts, whereas the criteria and measures used in research are measurable and unambiguous [Panek et al. 1999]. According to Golinowska [1997], there is no universal concept of poverty. It has specific content, which is grounded in a broader economic and social context.

There are two approaches to identification of the poverty line in analyses of the standard of living: economic and multidimensional. The first approach is based on income, whereas the other one also takes non-economic factors into account. Determining the poverty line by means of income (in an objective approach) results from its symbolic nature. Although income is a means rather than an end, it can be used for gradation of the possibility to satisfy one's needs. However, it is noteworthy that high income is not necessarily reflected by high consumption, and vice versa. Although neither possession nor the lack of resources can be fully equated with the standard of living, numerous studies have confirmed the convergence of both categories. The objective approach includes absolute measures (social minimum, subsistence minimum, legal poverty) and the parametric approach (income median, income quantiles). Apart from objective lines, subjective lines are also significant, because they make it possible to determine respondents' attitudes to their own financial situation.

For further analysis, it is necessary to clarify what the definition of poverty is. Although there are many definitions of poverty, in the European Union countries, a standard methodology was adopted by Eurostat (Statistical Office of the European Union). People living in households whose disposable income is lower than the poverty line determined by 60% of the median income in a given country are considered to be at risk of poverty. A parametric approach to measuring poverty has been adopted, which is linked to the standard of living in individual countries. It should be

noted that poverty defines a group of people with the relatively most difficult situation in a given country. Thus, poverty in individual countries is not relevant to the level of income in other countries. It can be seen, therefore, that a poor inhabitant of the wealthiest countries can also be treated as a wealthy person in the poorest countries.

It should be noted that the article uses two concepts related to poverty. First is the risk of poverty or social exclusion, the second is the at-risk-of-poverty threshold. At risk of poverty or social exclusion (ARPE) corresponds to the sum of persons who are either at risk of poverty or severely materially deprived or living in a household with a very low work intensity. Persons are only counted once even if they are present in several sub-indicators. The ARPE rate, the share of the total population at risk of poverty or social exclusion, is the headline indicator to monitor the EU 2020 Strategy poverty target. The at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income after social transfers [Regulation EC 1177/2003].

It is also worth noting that material deprivation refers to a state of economic strain and durables, defined as the enforced (rather than voluntary) inability to pay unexpected expenses, afford a one-week annual holiday away from home, a meal involving meat, chicken or fish every second day, the adequate heating of a dwelling, durable goods like a washing machine, colour television, telephone or car, or being confronted with payment arrears (mortgage or rent, utility bills, hire purchase instalments or other loan payments). The severe material deprivation rate is an indicator in the EU-SILC that expresses as the enforced inability to pay for at least four of the above-mentioned items. The indicator distinguishes between individuals who cannot afford a certain good or service and those who do not have this good or service for another reason, e.g. because they do not want or do not need it.

The second of the sub-category of social exclusion is persons living in households with very low work intensity. This indicator is defined as the number of persons living in a household where the members of working age worked less than 20% of their total potential during the previous 12 months. Additionally, the work intensity of a household is the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period<sup>1</sup>.

The empirical data in the article come from the EU-SILC (European Union Statistics on Income and Living Conditions), which are contained in the Eurostat materials<sup>2</sup>. They are a reference point for comparing statistics on income distribution and social integration in the European Union. They have been used since 2003 (in the beginning in Austria, Belgium, Denmark, Greece, Ireland and Luxembourg, and since 2004 in all the EU member states) to monitor the social policy by means of the Open Method of Coordination (OMC). These surveys are a universal tool focused on income, especially personal income, poverty, social exclusion and living conditions. The EU-SILC surveyed all household members over the age of 16 in the individual countries. An employee's income was assumed to be the total remuneration paid to them in money or in kind in return for work done within a specific period of time.

At-risk-of-poverty thresholds (*ARPT*) broken down by each combination of dimensions (*k*) (*ARPT<sub>at,k</sub>*) is calculated as the percentage of people (or thousands of people) in each *k* who are at-risk-of-poverty (calculated for different cut-off points) over the total population in that *k*. The weight variable used is the Adjusted Cross Sectional Weight (*RB050a*).

$$ARPT_{at,k} = \frac{\sum_{i=j_{at,k}} RB050a_i}{\sum_{i_{at,k}} RB050a_i} 100$$

<sup>1</sup> Eurostat. Statistics Explained, [https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Persons\\_living\\_in\\_households\\_with\\_low\\_work\\_intensity](https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Persons_living_in_households_with_low_work_intensity)

<sup>2</sup> Eurostat. Income and living conditions (ilc), <https://ec.europa.eu/eurostat/web/income-and-living-conditions/data/database>



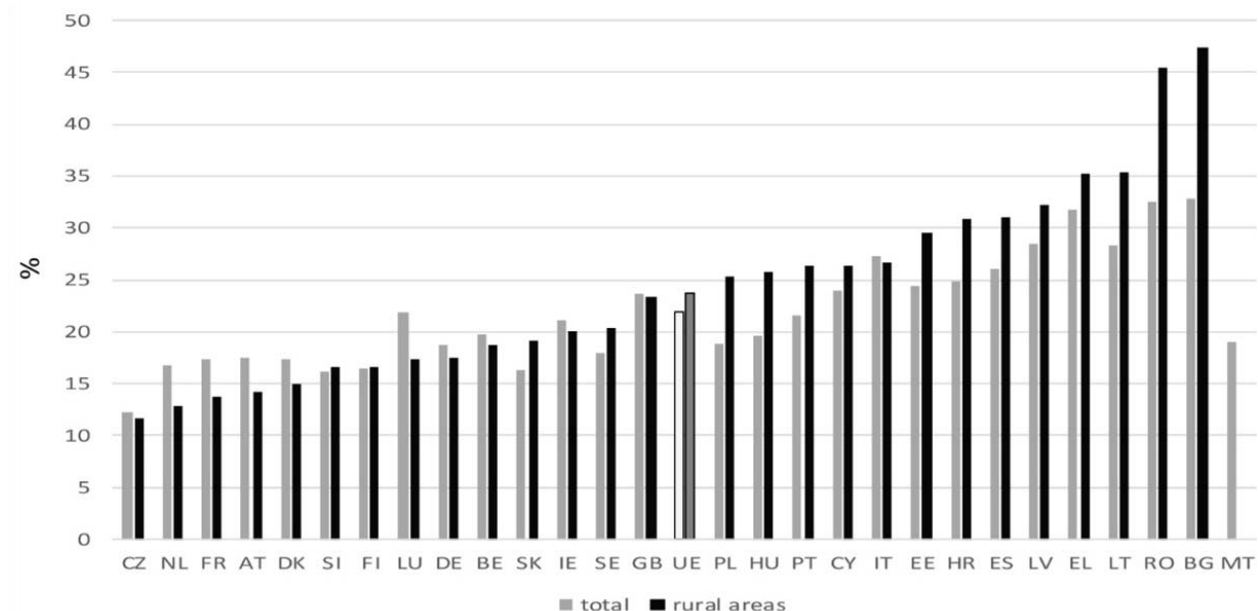
where  $j$  denotes the population or subset of the population, who is at risk of poverty. At-risk-of-poverty thresholds ( $ARPT_{XX}$ ) can be any of the following:  $ARPT_{40}$ ,  $ARPT_{50}$ ,  $ARPT_{60}$ ,  $ARPT_{70}$ , however, only the median threshold of 60% of the equivalent income is used in the research conducted in this article.

### RISK OF POVERTY OR SOCIAL EXCLUSION

Relative (parametric) measures are commonly used in the EU to separate the poor from those who are not poor. One of these measures is the at-risk-of-poverty rate, which refers to the share of people whose income is lower than 60% of the median equivalised income (having included social transfers). According to this approach, the poor are those whose income is lower than the income of other members of society. This measure determines the degree of income inequality rather than the extent of poverty. It is not difficult to notice that non-poor people may be below this line and vice versa. In research on poverty in the EU, the people who are experiencing severe material deprivation or

living in a household with low labour intensity are also included in the group at risk of poverty. On this basis, it is possible to say that in 2018, 21.9% of all inhabitants in the EU and 23.7% of rural inhabitants were at risk of poverty or social exclusion (Fig. 1). Detailed analysis showed that the situation of the rural population in Bulgaria, Romania, Lithuania, Greece and Latvia was the worst, whereas it was relatively the best in the Czech Republic, the Netherlands, France and Austria. In Poland the at-risk-of-poverty ratio was 25.3%, which was close to the EU average.

However, it is worth paying attention to changes in the extent of relative deprivation when only poverty is taken into account and non-income factors are eliminated. Then the percentage of people below the poverty line in the total population drops by 4.8 p.p., whereas the percentage in the rural population drops by 4.3 p.p. When non-income factors were eliminated, the rural inhabitants in Romania, Bulgaria, Lithuania and Latvia were still at the highest risk of poverty, whereas the rural inhabitants in the Czech Republic, the Netherlands and France were at the lowest risk (Table 1).



**Fig. 1.** The at-risk-of-poverty or social exclusion ratio in individual EU member states and in rural areas in 2018  
Source: Eurostat ilc\_peps01, ilc\_peps13.

**Table 1.** The at-risk-of-poverty rate in 2018 (total and rural areas)

| Specification  | Total | Rural areas |
|----------------|-------|-------------|
| European Union | 17.1  | 19.4        |
| Belgium        | 16.4  | 15.5        |
| Bulgaria       | 22.0  | 36.8        |
| Czech Republic | 9.6   | 9.2         |
| Denmark        | 12.7  | 11.3        |
| Germany        | 16.0  | 15.8        |
| Estonia        | 21.9  | 26.5        |
| Ireland        | 14.9  | 15.6        |
| Greece         | 18.5  | 22.5        |
| Spain          | 21.5  | 26.1        |
| France         | 13.4  | 10.6        |
| Croatia        | 19.3  | 25.9        |
| Italy          | 20.3  | 20.4        |
| Cyprus         | 15.4  | 18.1        |
| Latvia         | 23.3  | 27.3        |
| Lithuania      | 22.9  | 30.1        |
| Luxembourg     | 18.3  | 13.8        |
| Hungary        | 12.8  | 16.6        |
| Malta          | 16.8  | :           |
| Netherlands    | 13.3  | 10.4        |
| Austria        | 14.3  | 11.6        |
| Poland         | 14.8  | 21.2        |
| Portugal       | 17.3  | 22.5        |
| Romania        | 23.5  | 39.0        |
| Slovenia       | 13.3  | 13.4        |
| Slovakia       | 12.2  | 14.8        |
| Finland        | 12.0  | 12.8        |
| Sweden         | 16.4  | 19.3        |
| United Kingdom | 18.9  | 20.2        |

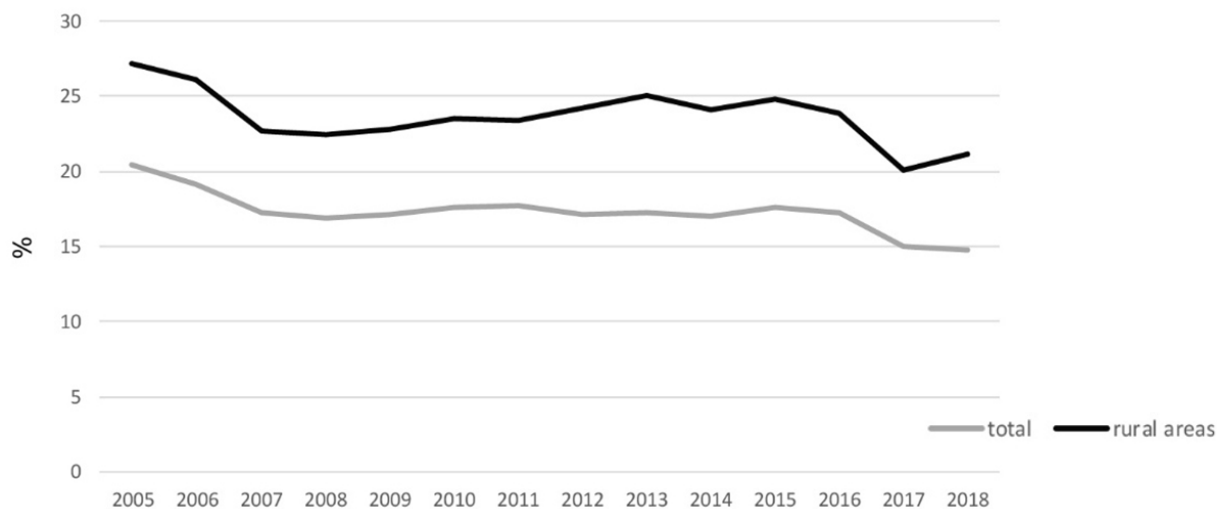
Source: Eurostat ilc\_li02.

## RISK OF RURAL POVERTY IN POLAND

It is worth analysing changes in the risk of relative poverty in Poland after its accession to the EU. While in 2005 almost every fifth Pole was at risk of poverty, in 2018 this percentage dropped by more than a quarter – from 20.5 to 14.8%. Rural inhabitants can also be satisfied with Poland's accession to the EU, because the poverty rate dropped from 27.2 to 21.2% (Fig. 2). At that time the poverty threshold per capita increased from PLN 6,880 to 16,790 (the threshold of 60% of the median equivalised income). In households with two adults and two children it increased from PLN 14,448 to 35,260. During the period under analysis the lowest relative poverty rate was in 2017, i.e. 20.1%, whereas a year later it increased by more than one percentage point (Fig. 2). This fact is intriguing because 2018 was unprecedented in the history of Poland in terms of social transfers (including the Family 500 Plus programme).

As mentioned before, relative poverty only partly shows people's actual deprivation of the ability to satisfy their needs. It is rather a determinant of economic inequality. In order to identify the people who are deprived of their needs the most it is important to indicate extremely poor people and those who are entitled to social benefits (legal poverty). Extreme poverty is particularly dangerous, because it indicates the number of people who are deprived of their needs to such an extent that it poses a threat to their lives or psychophysical state. The minimum subsistence is the line that enables identification of the number of people whose standard of living is below this level. When determining minimum subsistence, it is necessary to specify the content of the basket of goods that are indispensable for survival and cannot be purchased at a later date. In 2018 the minimum subsistence level for a household with one person employed was PLN 591.14, whereas for a household with two adults and two children the minimum subsistence level was PLN 503.57 per capita [Kurowski 2019].

The analysis of extreme poverty in Poland showed that in comparison with 2010, its level did not change much, although this change was noticeable over the years. It is noteworthy that the poverty rate was

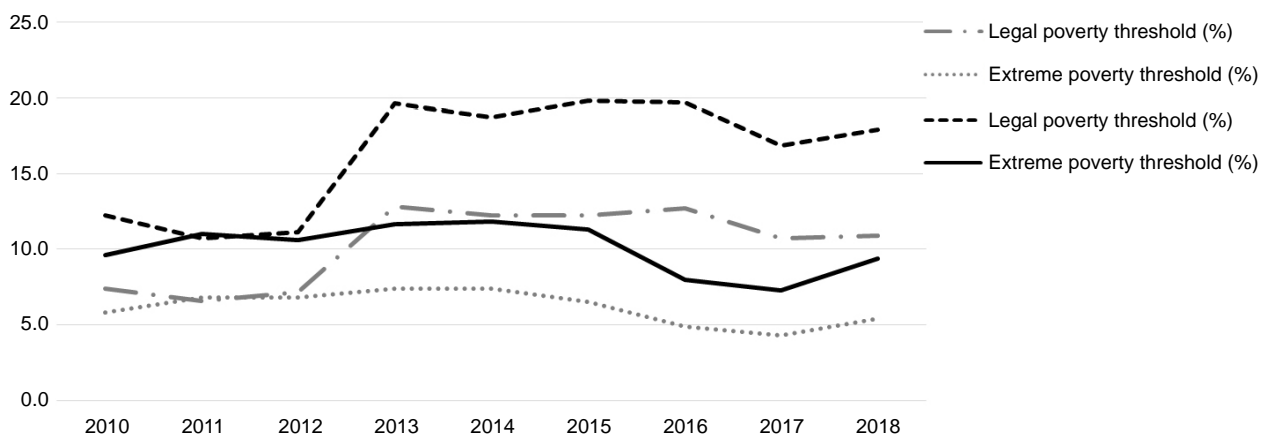


**Fig. 2.** At-risk-of-poverty rate in Poland in 2005–2018 (total and rural areas)

Source: Eurostat ilc\_li02.

increasing gradually until 2014, when it reached its highest level (11.8%). When the Family 500 Plus programme was introduced, the poverty rate was decreasing until 2017. However, in comparison with 2017, in 2018 extreme poverty in rural areas increased again and amounted to 9.4%. The range of poverty determined by means of a legal line was much greater due to

a higher threshold that was set for applicants for social benefits [Ustawa z dnia 12 marca 2004 r. o pomocy społecznej]. In 2018 it was PLN 701 for a household with one person and PLN 2,112 for a household with four people, i.e. PLN 528 per capita [GUS 2019]. In comparison with 2010 the percentage of people at risk of legal poverty increased by 5.7 p.p. (Fig. 3).



**Fig. 3.** Total extreme and legal poverty thresholds and extreme and legal poverty thresholds in rural areas in Poland between 2010 and 2018

Source: Local Data Bank of Statistics Poland.

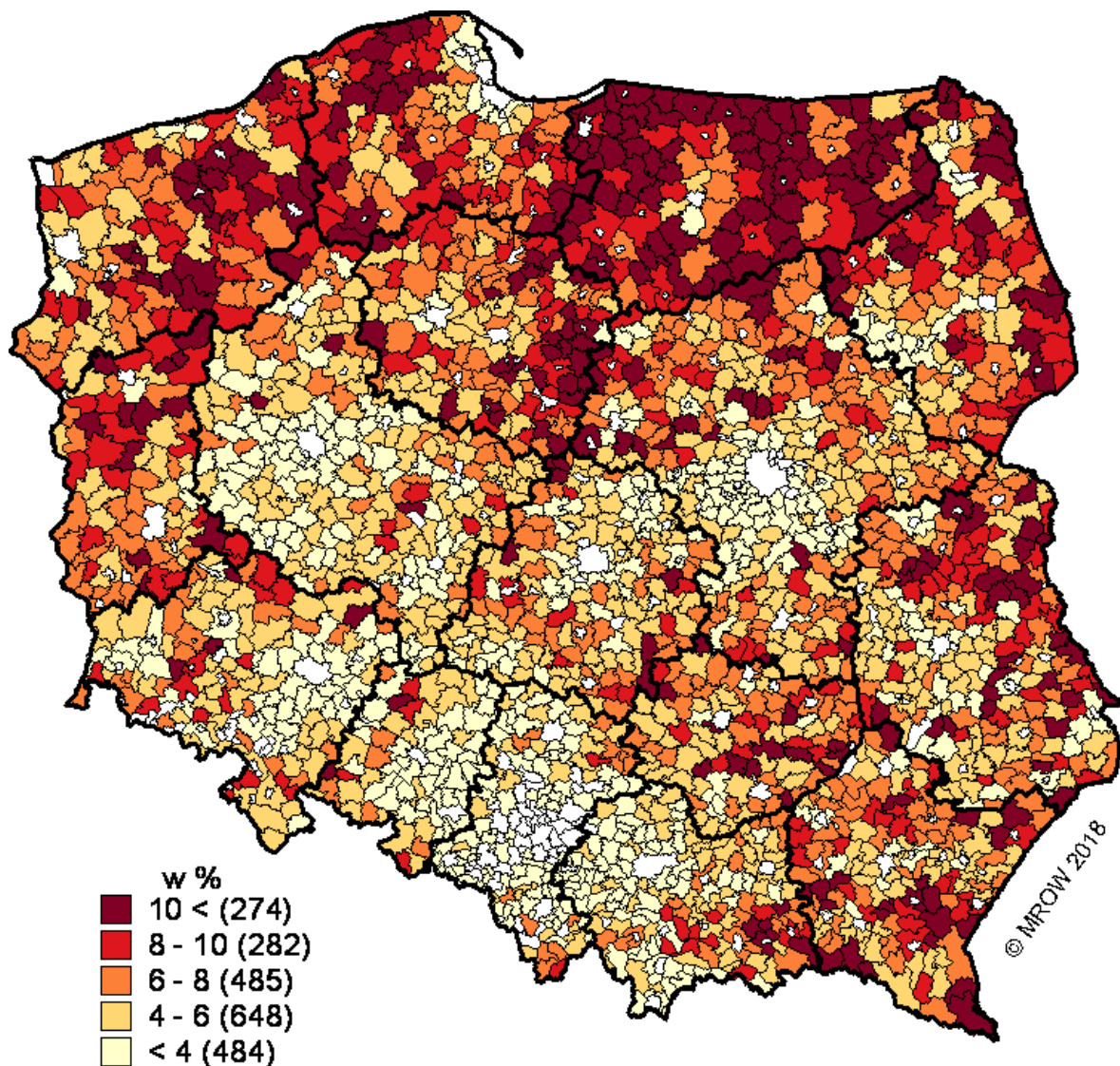
Apart from income, people’s behaviour is influenced by many other economic and non-economic factors with objective and subjective nature. It can be assumed that even wealthy rural inhabitants will not practise more sophisticated patterns of spending their free time due to infrastructural deficiencies rather than low standard of living. Also, participation in high culture is usually not their aspiration. Due to the lack of reference standards there is no need to follow them. On the other hand, the interconnection of services to infrastructure deprives a large group of people living in rural areas of the chance to use them. It also significantly differentiates the ability to consume services. These factors result in a sense of inability to satisfy one’s needs and translate into the level of subjective poverty. They are considered the most democratic methods of defining poverty by setting individual thresholds of satisfying one’s needs. The Statistics Poland (Główny Urząd Statystyczny – GUS) defines subjective poverty by individual assessment of one’s own situation and indicating whether it is very good, good, average, rather bad or very bad. This is the basis for separating the people who have the sense they can satisfy their needs from those who have difficulties achieving it. The analysis of data shows that rural inhabitants rate their own situation as very good or rather good less often than other inhabitants (Table 2).

From the point of view of social security tasks, it is important to differentiate the poverty level spatially. Such analysis enables differentiation of the level of assistance provided to individual areas so that it can be better targeted. The percentage of people in families covered by the social security system in the total population of a commune is the indicator that enables determination of the range of poverty. Although this indicator is not synonymous with poverty, it can be assumed to be adequate for spatial considerations. It can be assumed that this percentage coincides with poverty determined by means of the legal minimum. Figure 4 shows the areas whose inhabitants are at the highest risk of deprivation of their needs. Analyses showed that the inhabitants of rural areas in northern and eastern Poland benefited from social security the most. It is also noteworthy that the further away people live from large and significant urban agglomerations, the higher the significant risk of being below the legal poverty threshold is. Thus, it is possible to assume that the inhabitants of peripheral areas of voivodeships are at higher risk of the inability to satisfy their needs than those living close to cities. The research conducted by Chrzanowska and Pomianek [2018] also showed that living conditions in peripheral areas were worse. This statement is obvious in view of people’s migration opportunities and sustainability of the labour market.

**Table 2.** Inhabitants’ subjective rating of their situation in 2018

| Specification | Total | Rural areas |
|---------------|-------|-------------|
|               | %     |             |
| Very good     | 20.9  | 16.6        |
| Rather good   | 23.1  | 22.7        |
| Average       | 47.9  | 52.1        |
| Rather bad    | 6.2   | 6.9         |
| Bad           | 1.9   | 1.8         |

Source: Local Data Bank of Statistics Poland.



**Fig. 4.** The percentage of people in families covered by the social security system in the total population of communes  
Source: Stanny et al. [2019].

## CONCLUSIONS

Poverty in rural areas is an extremely broad issue. Due to such a broad approach to the problem and a high variety of factors affecting it, it is impossible to discuss it fully in an article. As there are so many approaches, only a few of them can be selected for analysis. It is obvious that this article cannot be treated as a review of the entire issue of rural poverty, but it can contribute to further analysis. The author

did not present solutions preventing poverty in the article, because that was not its goal.

The data presented in the article showed that:

- The scale of poverty in rural areas is larger than the scale of total poverty, regardless of the poverty line assumed (objective, relative, subjective). Although the article does not provide information about the scale of poverty in urban areas, it is possible to guess from the indicators for the total area of Poland that it is significantly lower.

- The at-risk-of-poverty rate in the countries that joined the EU before 2004 is much lower than in those that joined the community after that date. This observation also applies to rural areas.
- The inhabitants of peripheral areas are at higher risk of legal poverty than the people who live near major cities in provinces or close to larger towns in counties.
- Rural inhabitants in northern and eastern Poland are at higher risk of poverty than rural dwellers in other regions of Poland.

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## UBÓSTWO NA WSI. ZARYS PROBLEMU

### STRESZCZENIE

W artykule podjęto próbę określenia poziomu ubóstwa w Polsce. Przedstawiono przegląd najważniejszej literatury dotyczącej ubóstwa, a także wskaźniki, które stosowane są do określenia jego wielkości. Za pomocą ubóstwa relatywnego, obiektywnego i subiektywnego przedstawiono zasięg ubóstwa wiejskiego na tle ubóstwa ogółem. Na podstawie analiz zauważono, że wskaźnik zagrożenia ubóstwem na obszarach wiejskich w Polsce wynosi 21,2%, niemal co piąty mieszkaniec wsi zagrożony jest ubóstwem ustawowym, a co dziesiąty ubóstwem skrajnym. W artykule przedstawiono również obszary wiejskie w Polsce w największym stopniu zagrożone ekskluzją społeczną. Obszary te wyróżniono na podstawie zarejestrowanej liczby rodzin pobierających zasiłki z pomocy społecznej.

**Słowa kluczowe:** ubóstwo, obszary wiejskie, wykluczenie społeczne

## HEALTH POLICY PROBLEMS IN INDONESIA'S BORDER REGION

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### ABSTRACT

This paper aims to study health policy problems in Indonesia's border areas. It is especially focused on the case of health problems in Nusa Tenggara Timur Province. The research method used is a quantitative description approach. It is necessary to increase the development of health infrastructure and its supporters in border areas. It is also necessary to socialise and improve health insurance services from the government, as well as improve human resources in the health sector.

**Key words:** health policy, health problems, border area, Nusa Tenggara Timur

**JEL codes:** I18, O11

### INTRODUCTION

Health development is currently facing inequity and disparity, especially health services between regions and income groups in Indonesia. Access to primary health services is still limited, especially in the disadvantaged, border, and island areas. Geographical constraints cause limited access to health services in many areas. Quality of service is not optimal because many necessary health facilities do not meet service readiness standards and lack health service standards.

Essential health services are needed in order to achieve the Sustainable Development Goals (SDGs) 2030 targets. The success of critical health services by prioritising promotive and preventive services will reduce the burden of further assistance. Essential health services consist of several types of health services that are considered necessary for maintaining the health of a person, family, and community to live productively socially and economically.

In Indonesia, two provisions specify the types of essential services: the Minister of Health Regulation

43/2016 concerning Minimum Service Standards and the Minister of Health Regulation 75/2014 on Community Health Centres. Essential health services require promotive, preventive, screening, curative, and rehabilitative services. They must be provided comprehensively and holistically to both community groups and individuals, and cannot be partial.

Public issues arise in border areas because they are remote, often in the form of islands, and have extreme topography. Therefore, the role of infrastructure is also a significant physical component for the border regions. Systematic, consistent, and targeted infrastructure development will lead to an increase in the welfare of border communities. The primary health issue is the availability of health support services and facilities, which are still low because the distribution is uneven, only concentrated in big cities [Suharmiati et al. 2013].

This study aims to assess the problems of health policy in the border area. Specifically, as an example case, the health and nutrition problems in Nusa Tenggara Timur Province. The research method uses



a quantitative description approach. The researcher uses various literature reviews and several data sources as secondary data.

## **BASIC HEALTH SERVICES**

The spatial inequality of the social development process in marginalised areas is mostly rural. Peripherals are complex and multidimensional concepts with properties such as backwardness, dependence, marginalisation, and appropriation. Weak regions and boundaries, whose relations and interconnections lead to permanent exclusion and marginalisation, find it difficult to break away from “dependence”, without outside interference. On the other hand, it must be explained that spatial inequality is a feature of socio-economic development and is an inevitable phenomenon [Magnusson and Ottosson 2009]. High costs are a barrier to the transfer of quality human resources to the suburbs. In financial investment and worker training, prices are not enough to absorb innovation to improve the economy and society in border areas, including in essential health services [Klimczuk and Klimczuk-Kochańska 2015].

Basic health services are first-level health services and are the first contact of the population with the health service system, including promotive and preventive activities, health assessments, diagnosis and treatment for acute and chronic conditions, and rehabilitation services (Ontario Health Services Restructuring Commission, Primary Health Care Strategy). Basic health services are defined as a set of first-level services that are universally accessible that promote health, prevent disease, and provide diagnostic, curative, rehabilitative, supportive, and palliative services. Basic health services refer to approaches to the spectrum of services outside the traditional health service system, covering all functions that play a role in health, income, housing, education, and the environment [Muldoon et al. 2006].

Some countries recognise the vital role of essential health services to improve public health status and have made efforts to reform critical health services. In Turkey, health reform began in 2003 and brought significant changes in primary health care [Cevik et al. 2017]. The China National Roadmap 2030 emphasised

the vital role of primary health services, which must be supported by political commitments to strengthen the central health care system [Li et al. 2017]. Essential health services are an effective way to: (1) reduce social disparities and exclusions in health matters; (2) improve equity; (3) meet the needs and expectations of the people; (4) minimise poverty; (5) integrate health with other sectors; (6) encourage leadership that promotes cooperation and dialogue; (7) increase the effectiveness of the health budget; (8) increase accountability of health service facilities; and (9) increase the responsibility of state administrators [WHO 2012].

To overcome the unequal health status and access to health services in the world, the World Health Organization (WHO) in the Alma Ata Declaration of 1978 recommended two strategies, namely: (1) to approach Primary Health Care; and (2) to formulate a National Health System. In the declaration, Primary Health Care is translated as several “essential health services that are scientifically accountable, socially acceptable, accessible to every individual/family, organised with the participation of the community, economically can be borne by the town and country, accompanied by a spirit of independence (self-reliance and self-determination)”. Primary Health Care is the first level of the individual, family, and community contact with the national health system to bring health services as close as possible to the residence and workplace.

In the Alma Ata Declaration [WHO 1978] there are five basic principles for the fulfilment of primary health services, including: (1) equitable distribution of health efforts; (2) emphasis on preventive efforts; (3) the use of appropriate technology in health efforts; (4) community participation in the spirit of independence, and (5) cross-sectoral cooperation in developing health. In addition, the four pillars of basic health service reform that have been initiated by the WHO [2008] consist of:

- Health financing reform. Government funding is directed more at public health efforts and health services for the poor.
- Health policy reform. Health policy must be evidence-based.
- Health leadership reform. Health leadership must be inclusive, participatory, and able to move across sectors through advocacy competencies.

- Health service reform. Basic health services must develop a robust system in the context of the Community Health Centres with its network and with its supra system (district/city health office, and district/city hospital).

## **BORDER HEALTH ISSUES**

The border area should be the State Storefront or the forefront of the territory of the Republic of Indonesia, which should look good because it is located on the front. But so far, there has been a disparity in the border regions with neighbouring countries. They still have difficulty accessing basic needs, such as education, health, nutritional adequacy, and employment. Their condition is deplorable, not so with neighbouring countries. Therefore, the border area must become a standard interface space where the border community's cosmopolitanism is seen as the power to build a prosperous Homeland front page [Kennedy 2018].

Remote areas, borders and islands, have extreme topography. Besides, geographical conditions are still isolated due to limited road infrastructure, land transportation, rivers, and other public facilities. This condition impacts the health of social welfare, economy, education, and skills of border communities that are still lagging. Therefore the border area must be a top priority for infrastructure development. There is a significant correlation between the condition of infrastructure with the pulse of community socio-economic activities and the welfare of the people on the border. Infrastructure development will lead to an increase in the health of border communities [Shanteukie Word-Press 2011].

The availability of health services and supporting facilities in the disadvantaged areas, the border, and islands is still low. The available resources and the number of health workers needed in the field of promotive, preventive, curative, and rehabilitative efforts are always mostly concentrated in big cities. Even though the number of health workers is sufficient, their distribution is not evenly distributed. Optimisation of health workers is one effort to improve the availability, equity, and quality of health workers, especially in remote, disadvantaged, border, and island areas. Local

health workers' distribution must be optimised, especially in remote areas [Suharmiati 2013].

Primary health services in Indonesia's border regions are still low. Community Health Centre (Puskesmas), the primary function of the mainstay of service for the community, has not been able to provide maximum facilities for remote areas, especially in border areas. Due to the large working area of the Puskesmas, geographically, it is partly challenging to reach, the population is small, scattered in small groups that are far apart. Means of transportation are also minimal with expensive costs, land, river, sea, and air. One reason is because of severe geographical conditions and climate/weather that often changes. The status of public health and coverage of health services in remote border areas is still low. Society, in general, does not yet have the knowledge and behaviour of healthy living and unfavourable environmental conditions. Puskesmas services in remote border areas are affected, among other issues, by the affordability of services.

Access to health services is not only caused by distance problems, but there are two determinants, namely, the supply and demand factors. Determinants of supply consist of service organisations and physical infrastructure, place of service, availability, utilisation, distribution of officers, service costs, and service quality. The determinants of demand, which are user factors, include the low education and socio-cultural conditions of the community and the weak or inadequate level of community income. The primary need for sufficient access to services is the availability of facilities and staff, distance, and financially affordable and socio-cultural issues that users can accept [Timyan 1997].

The availability of frequently changing assignment doctors in border areas also affects the management of the Puskesmas. Doctors with a contract period of one year, were too short to manage the Puskesmas properly because, within that period, they had not mastered the Puskesmas program yet. Besides, doctors need to adapt to the environment, and it takes time for people to get to know them. Health centre resources, especially in remote border areas, still need to be improved, especially regarding the balance of work tenure, workload, and rewards for health workers.

The low number of patients visiting the Puskesmas shows that the main Puskesmas is challenging to reach by the community, due to geographical location, lack of transportation facilities, and the low ability to pay for transportation costs. The district expects those Puskesmas health workers to provide medical services at home or in places close to where they live. Therefore, the community tends to call health workers at home, considering the same costs if they have to go to the Puskesmas and is facilitated with a cell phone. This situation shows the high ineffectiveness of time spent by nurses and midwives in carrying out their duties at the health centre [Budiarto et al. 2007].

The number of health workers available at the Puskesmas have not been able to complete all mandatory health efforts carried out at the Puskesmas, especially services outside the building. This is due to the area of the Puskesmas and the difficulty in reaching the target. Therefore, the number of health service activities was reduced by the number of visits. As a result, the coverage of services outside the building was lower.

Meeting the health workers' needs in the Puskesmas in remote and border areas needs to consider the situation and condition of the local Puskesmas. In some Puskesmas, some officers were incompetent with their responsibilities. For example, drug services, health promotion, and eradication of infectious diseases was carried out by workers who only graduated from junior high or high school. Planning for staff needs at the Puskesmas should be carried out with a macro-level analysis of the long-term effects of various training strategies and employee recruitment. Furthermore, microanalysis of the profile of health workforce activities was also carried out. The macro analysis will determine the number of personnel to plan, while microanalysis will determine the type of health workers who should be recruited. The deployment of personnel began with assessing local service needs after going through functional analysis [Budiarto et al. 2005].

Drug acquisition is generally not under the request. Many health worker complaints about the discrepancy between the type and amount of drugs with cases of the disease being treated are things that need attention. In fulfilling drug needs, it should be adjusted to the

epidemiology in the Puskesmas area. The epidemiology of condition is essential in setting priorities and target populations. By studying the spread of disease in the Puskesmas area, it can be used to determine the focal point of service related to the type and amount of drugs and the types of health equipment [Baker and Reinke 1994].

Health equipment and health support facilities (laboratories) in the Puskesmas are inadequate. Lack of health equipment and health support facilities (laboratories) in Puskesmas often disappoints people who have to travel long and arduous trips. This situation further strengthened the interest of the community not to go to the Puskesmas. The availability of medical devices, consumables, and medicine needs to be increased according to the needs of each Puskesmas. Communication and transportation tools must be met to make public health centres affordable to the community. Therefore it is necessary to offer medical devices and consumables that support health services, especially for cases of the disease that often occurs in health centres. Many emergency cases require special equipment and skills, but in reality, they are still lacking. Since the Puskesmas and its network are the first targets for handling emergency cases, the provision of emergency equipment needs to be available in all Puskesmas systems. It is necessary to provide skills to the health workers [Ristrini et al. 2004, Handayani et al. 2006].

## **CASE OF NUSA TENGGARA TIMUR PROVINCE**

The Province of Nusa Tenggara Timur (referred to as NTT) is of interest. This region consists of 21 regencies/cities, with a population of 4,256,200 inhabitants. The number of poor people is around 66.54% of the total population in NTT Province. It is one of the areas that is not getting much attention. The more east, the more uneven development is so that development inequality is felt to impact social disparities. Poverty is assessed by several factors, namely: (1) education; (2) human resources; (3) income per capita and (4) access to health services [Triwahyuni 2010]. In fulfilling the basic rights of the community, one of the most important is access to health services. The limited access and the low quality of health

services will have implications for: (1) low endurance to work for a living; (2) limited ability of children from families to grow and develop, and (3) low levels of maternal health<sup>1</sup>.

The HDI value for NTT Province ranks third lowest nationally after Papua and West Papua. The NTT HDI growth is lower than the national rate in 2017, which amounted to 0.91% [RPJMN NTT 2018]. The HDI of NTT Province for the period 2013–2017 experienced an average increase of 1.86%. The NTT HDI continues to increase, namely from 2016 it amounted from 67.75 to 68.28 in 2017 or increased by 0.36 in three years. Based on the national average from 2005 to 2012, NTT is in the 31st position of 34 provinces. Although NTT HDI continues to increase nationally, it is still far behind. In 2012, HDI of NTT Province is 60.81, which lagged far back from the national (Indonesia) average HDI, which reached 67.70. Then it continued to lag until 2017 when the HDT NTT was 63.73, and the national average HDI had reached 70.81 [RPJMN NTT 2018].

Low HDI is mainly due to the per capita expenditure indicator, which is only 7.12 million and is the lowest per capita expenditure in Indonesia. The average ranking of education in NTT is the fourth-lowest in Indonesia, and life expectancy is also the sixth lowest compared to other provinces. The poverty rate shows as the third poorest province in Indonesia with a sparse population, reaching 22.01% of the people, far higher than the national of 10.7% [Bappenas 2017].

Life expectancy is used to assess health status. Besides, it is one indicator that is taken into account in evaluating the HDI. The description of NTT residents in 2015 has a life expectancy of 65.96, which means that children born in 2015 are expected to live on

average until the age of 66. In 2016 the life expectancy rate was 66.04, which means that children born in 2016 are expected to live on average until the age of 67 years, and in 2017 the life expectancy rate is 66.07. The life expectancy of the population every year is increasing but not too significantly, only around 1–5 months<sup>2</sup>.

For cases of infant mortality, children under five and toddlers in NTT show fluctuating numbers. The highest number of infant deaths occurred in 2016, as many as 1,689, the highest number of deaths of children under five were 449 in 2016, and the highest number of infant deaths was 1,174 in 2017. The highest number of infant deaths occurred in Kupang District in 2015 as many as 198. The highest number of child deaths under five years of age occurred in 2015 in South Central Timor District and the highest number of under-five deaths in the South. While maternal deaths cases in the province have decreased from year to year, in 2013, the number of maternal deaths was 176 cases, declining in 2014 by 158 cases, for 2016 and 2017 respectively it was 182 and 163 cases<sup>3</sup>.

From another health dimension, malnutrition is a condition in which a person is declared malnourished, or in other words, his nutritional status is below average standards. Nutrition in question can be in the form of protein, carbohydrates, and calories. In Indonesia, the case of Protein Energy Deficiency is one of the leading nutritional problems that are often found in toddlers [Ariesthi 2018]. The percentage of children under five years of age in the province of NTT declined from 2015 to 2017 but is still the highest in Indonesia. The increase occurred in the percentage of children under five and under five years old wasting and underweight<sup>4</sup>.

<sup>1</sup> Kementerian Perencanaan Pembangunan Nasional [Ministry of National Development Planning of the Indonesian Republic] website, [https://www.bappenas.go.id/files/5613/5229/8326/bab28\\_\\_20090202204616\\_\\_1756\\_\\_29.pdf](https://www.bappenas.go.id/files/5613/5229/8326/bab28__20090202204616__1756__29.pdf) [accessed: 26.08.2019].

<sup>2</sup> Badan Pusat Statistik Nusa Tenggara Timur – BPS NTT [East Nusa Tenggara Central Statistics Agency] website, <https://ntt.bps.go.id/pressrelease/2018/05/07/699/indeks-pembangunan-manusia-2017-mencapai-63-73.html> and <https://ntt.bps.go.id/pressrelease/2017/04/20/635/ipm-nusa-tenggara-timur-tahun-2016.html> [accessed: 26.08.2019].

<sup>3</sup> Sistem Informasi Pembangunan Daerah Provinsi Nusa Tenggara Timur – SIPD NTT [East Nusa Tenggara Regional Development Information] in Rencana Pembangunan Jangka Menengah Daerah provinsi Nusa Tenggara Timur – RPJMD NTT (2018). Nusa Tenggara Timur Province Medium Term Development Plan for period 2018–2023, Kupang.

<sup>4</sup> Kementerian Kesehatan [Minister of the Health of the Indonesian Republic] website, [https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/PROFIL\\_KESEHATAN\\_2018\\_1.pdf](https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/PROFIL_KESEHATAN_2018_1.pdf) [accessed: 26.08.2019].

In access to health services in NTT, Community Health Centre (Puskesmas) is the health facility most frequently used by the people of NTT. In general, outpatient care without medical treatment at Puskesmas is the most widely used treatment by the community in NTT. Still, the cost is more expensive than the national average. There is a gap in the number of medical staff when compared to the national scale. In NTT, there are 1.4 doctors per Puskesmas, which is lower than the national average of 1.8 doctors per Puskesmas. For midwives who work at the health centre in NTT are also more economical than the national average. The limited number of general practitioners, specialists, and dentists can reduce the quality of services provided to residents in Puskesmas working area. The province of NTT is also one of the regions with the highest number of malnutrition sufferers in Indonesia [Ramadhini 2015].

## CONCLUSIONS

Puskesmas is a leading health facility that provides primary health services to the community. However, since 2000, in the era of decentralisation and regional autonomy, the management and supervision of Puskesmas were left to the district/city government. Thus the development of Puskesmas varied and depended on local commitment and capacity.

Fulfilment of the availability of health service facilities and infrastructure in health centres and their networks in border areas is at least equivalent to the health services of neighbouring countries. There is a need to provide incentives to health care workers. Also, competent health workers need to be increased in their competence, such as conducting training towards better quality services. And they also need to meet the availability of transportation, such as motorcycles, four-wheeled vehicles, certain types of health vessels according to the existing regional topography.

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## PROBLEMY POLITYKI ZDROWOTNEJ W REGIONIE GRANICZNYM INDONEZJI

### STRESZCZENIE

Artykuł ma na celu zbadanie problemów polityki zdrowotnej na obszarach przygranicznych Indonezji. Badanie w sposób szczególny koncentruje się na problemach zdrowotnych w prowincji Nusa Tenggara Timur. Zastosowano metody opisowo-ilościowe. W wyniku analizy stwierdzono, że konieczne jest dalsze intensywne rozwijanie infrastruktury ochrony zdrowia na obszarach przygranicznych. Niezbędne są także uspołecznienie oraz usprawnienie usług ubezpieczenia zdrowotnego świadczonych przez rząd, a także poprawa zasobów ludzkich w sektorze zdrowia.

**Słowa kluczowe:** polityka zdrowotna, problemy zdrowotne, obszar przygraniczny, Nusa Tenggara Timur



## IMPACT OF IMPLEMENTED INNOVATIONS ON COMPETITIVENESS OF TOURISM COMPANIES IN THE WARMIŃSKO-MAZURSKIE VOIVODESHIP

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### ABSTRACT

The growing demand for tourism services has led to the establishment and development of many companies in the hospitality industry, which are driven by a need to stand out in the market and acquire new clients. To do this, they make efforts to improve their competitiveness by implementing specific innovations in hopes of strengthening their market position. The aim of this paper is to discuss the effect of innovations on the competitiveness of tourism and hospitality enterprises, using chosen companies from the Warmińsko-Mazurskie Voivodeship in Poland as a case study. The empirical part of the research consisted of one questionnaire addressed to the clients and the other one addressed to the employees and owners. Both questionnaires were conducted in three companies. The results of these surveys provided information which indicated that the most important assets that allowed companies to distinguish themselves on the market were the innovations that they implemented. In addition, over half of the employees in these companies declared that innovations had contributed to an increase in the number of customers.

**Key words:** tourism company, innovativeness, competitive position, competitive advantage, Warmińsko-Mazurskie Voivodeship

**JEL codes:** L83, O31, O32

### INTRODUCTION

Growing competition in the tourism services market forces companies to make efforts to attract new customers for their services and to retain their loyal customers. Most often, tourists take advantage of a variety of services offered by companies in the hospitality sector, including catering or accommodation [Rapacz 1994]. It may be possible to appeal to increasingly more demanding customers by implementing innovations, which are indicated as a factor with positive influence on the competitive capabilities of companies. Competitive capabilities arise from a company's innovative approach as well as effective performance,

entrepreneurship, flexibility and the ability to adjust to dynamic changes in the environment or the ability to gain an advantage in the market owing to innovations [Bossak and Bieniowski 2004].

Poland is a country with many tourist attractions, not only cultural but also natural [Ozimek et al. 2019]. Therefore, there are numerous tourism enterprises which compete with each other. Successfully implemented innovative solutions are an opportunity that seems particularly promising to tourism companies in the Warmińsko-Mazurskie Voivodeship. Tourism enterprises play a significant role in the hospitality business, which is among the most developed business sectors in this province, although the performance of

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tourism companies in this region largely depends on the profits gained in the summer, which – because of local climate conditions – is the most important but relatively short high season. The innovativeness of business enterprises attracts more interest among clients, who are then more willing to benefit from services that are also offered outside the high season. The question of innovations in the hospitality business is raised more and more often, being perceived as the future of all companies, which must adjust to a rapidly changing, competitive world. An example of a sudden change is the outbreak of the COVID-19 pandemic, when businesses involved in tourism needed to distinguish themselves in very unique ways to attract potential clients.

The purpose of this article is to discuss the effects of implemented innovations on the competitiveness of tourism companies in the Warmińsko-Mazurskie Voivodeship, based on a case study of the companies included in our research poll. The results allowed us to identify dependences between implemented innovations in tourism companies and their capabilities of operating and competing in a competitive market.

## METHODOLOGY

The research consisted of a theoretical and an empirical part. The theoretical part was developed on the basis of the available Polish and foreign subject literature. The empirical part contains results of two questionnaires: one addressed to clients (containing 13 questions) and the other to employees and owners of tourism companies (containing 12 questions). The questionnaires were composed of two different sets of questions: clients were asked how they perceived tourism companies from the point of view of someone outside these businesses, and employees and owners of such companies received a questionnaire with questions that required some experience in the hospitality sector, also including some detailed information about the given company and the entire sector. Three tourism companies operating in the Warmińsko-Mazurskie Voivodeship, which had implemented some innovations, were selected for the study. These were:

1. Strefa Przygody (where the questionnaire was returned by 44 clients and 6 employees).

2. Glendoria (where 42 clients and 8 employees answered the questionnaire).

3. Szarpie Travel (the questionnaire concerned the recreational centre called Kulka, and was returned by 30 clients, 19 employees and 1 co-owner).

The questionnaires, which were completed during the tourist season (i.e. August, September, October) of 2019, were delivered by the authors to companies as printouts and were filled in by a total of 150 persons, that is 50 respondents in each of the chosen locations. The respondents were a randomly chosen group from all clients and employees who consented to participating in the research.

The questionnaires were designed so as to ensure the effectiveness of the study; they were confidential, brief, clearly worded and had few “yes/no” questions [Majchrzak and Mendel 1999]. In addition to this, the questionnaires provided data on the person who carried out the survey and the survey purpose [Soloma 1999]. Most questions were close-ended (10 of the 13 questions in the questionnaire addressed to clients, 10 out of 12 questions addressed to employees and owners of the companies), with multiple- and single-choice answers, concerning such issues as the indication of the most attractive characteristics of the company in question according to its clients, or the effects of implemented innovations on the competitiveness of this company. Employees and owners were asked about the impact of innovations on the number of new customers or about plans to implement new solutions in the following two years, with a view to increasing the company’s innovativeness. The results are presented in graphs, tables and descriptively.

## INNOVATIONS AS A FACTOR OF INCREASING THE COMPETITIVENESS OF TOURISM COMPANIES

More and more businesses, including tourism companies, as a result of the widespread access to products and services on a mass scale, are forced to improve the attractiveness of their offers and to make themselves distinguished in the market [Kisiel et al. 2018]. The key contributors to the growth in competitiveness include innovations as well as the ability to consistently implement such innovations. Skillful implementation of innovative solutions is extremely important as the

only constant thing in the modern economy is constant change [Gunday et al. 2011].

Unique, cutting-edge solutions must be sought by companies in any branch of industry, so as to reinforce their model of performance and to increase the share in the market via innovation [Kisiel et al. 2017]. Therefore, innovation is believed to be a principal factor which decides an enterprises' competitive position in the twenty-first century [Gryszel et al. 2010]. This is particularly important in tourism and hospitality, where the acquisition of clients depends strongly on the offer proposed by tourism companies. Innovations attract the attention of tourists and may represent the key factor in deciding to select a given company over others [Kryk and Piech 2009].

The word "innovation" descends from the Latin *innovatio* which means to form something new [Peters and Pikkemaat 2006]. Innovation is believed to be a way of creative thinking and implementing ideas, it is altering advanced notions and knowledge into unique and newly created solutions. Therefore, innovativeness is often considered to be essential in building enterprises' competitive advantage [Roman et al. 2020].

Because different scientific disciplines suggest different definitions of innovation, it is difficult to phrase a precise definition thereof. R.W. Griffin faced this challenge and juxtaposed mutually excluding types of innovations. As a result, the following division was proposed [Georgescu-Roegen 1976]:

1. Radical innovations (these are newly developed technologies, products and services, the aim of which is to replace existing solutions) and gradual innovations (i.e. modifications to existing products, services or technologies).
2. Technological innovations (changes in the design of a product, service or production process) and management innovations (modifications in the management process regarding the planning, creating and distributing of goods and services).
3. Product innovations (rarely concerning the development of a new product or services, they more often entail changes in the biological, physical or chemical properties of existing products and services) and process innovations (i.e. implementation or improvement of existing production processes or services).

Tourism companies that wish to be competitive – to perform and compete well in a competitive environment in order to develop, gain benefits and profits, and secure a competitive advantage – are increasingly more willing to implement innovations [Gorynia 2002].

## RESULTS OF THE STUDY

Three tourism companies operating in the Warmińsko-Mazurskie Voivodeship were selected for the study. Clients (in total 116 persons, i.e. 77.3% of the respondents) and owners and employees (34 persons, i.e. 22.7% of the respondents) completed the questionnaires, which provided data for research analysis.

One of these companies was Glendoria, situated in the village Głędy in the Ostróda District. The innovative solution of this company was to offer accommodation in tented rooms (so-called glamping, the merger of "glamour" and "camping"). Glendoria offers five tents, each in a different style, waterproof, protected against insects, and set on wooden floors. Guests are also offered a roofed veranda, hammocks and a wood-fired stove. Another innovation implemented in Glendoria, a so-called Camp Spa, also attracts visitors. This is an open-air spa set in a pine forest, with timber buildings as well as a wooden bathtub, all ensuring close contact with nature. What makes the Camp Spa unique is that rather than being a single building, it is a complex of facilities and each treatment (e.g. a massage) is carried out in another part of the forest.

Another innovative company selected for the study was the travel agency Szarpie Travel, which offers holidays and camps for school pupils all around Poland, although the questionnaire pertained to the services offered at Kulka, which is the holiday resort owned by Szarpie Travel. It is situated in the Dźwierzuty Municipality, Szczytno District. The Kulka holiday resort is a pioneer in innovative solutions that ensure a variety of forms of relaxation for children, with unique types of activities using such modern equipment as dragon boats, Segway scooters and gyroscopes (e.g. a space flight simulator). Other unique attractions which allow children to spend their time actively on land, water or in the air are the so-called bambonada (DIY large size interlocking building sticks for making big

constructs), zorbing (rolling in a large plastic orb), quilling (creating 3-D art using special techniques and materials) or riding quads. All these original solutions, as well as a wide range of offered products such as green schools, camps or holidays for children, including “Little Cadet Adventures”, “Space Wars”, “Hero Camp” or “Four Elements”, have become a trademark of the Szarpie Travel and Kulka holiday resort.

The third company included in the study was Strefa Przygody (which literally means “adventure zone”) with has its office in Olsztyn. It organizes green schools, holidays, camps, events and parties for children with party entertainers (for example on St. Nicolas Day). The innovation implemented by the Strefa Przygody consists of their own programme of skill badges – unique badges which participants of camps, holidays or green schools can earn by performing special tasks. A child wins an award for earning all the badges (including “Rider”, “Strategist”, “Bowling Champion”, etc.). The aim is to encourage participants to gain new knowledge and skills, on each occasion ensuring the most joy from using the company’s services.

From the answers given in the questionnaires, it is apparent that respondents differed in their opinions about the extent to which the innovations influenced any increase in company competitiveness (Table 1). 44.8% concluded that innovations contributed substantially to growth in the competitiveness of the analysed companies. The frequency at which this reply was chosen suggests that more and more people pay attention to the uniqueness of an offer, which may be the key to building a competitive advantage that will have an impact on a company’s revenues. Higher competitiveness owing to innovations in the three companies was indicated by 33.6% of respondents, while

16.4% answered that such improved competitiveness was likely. 5.2% decided it was difficult to identify the dependence between the company’s competitiveness and its innovative offer, which is why they chose the answer “impossible to say”.

The questionnaire also asked clients to point out the three most attractive features of the company whose services they used. In Glendoria, these were the idea of glamping (32 persons), closeness to nature (30 persons) and Camp Spa (28 persons). The fact that the company’s innovative solutions were most often given in the answer to this question (unlike, for example, an opportunity to spend one’s free time actively, which was selected by just 2 persons) justifies the conclusion that atypical solutions are appreciated by tourists, and that they create an appealing image of the company in the eyes of clients. The innovations in the two other companies were also most often indicated as their assets. Thus, Kulka holiday resort (owned by Szarpie Travel) was appreciated by tourists because of unique forms of active relaxation (e.g. the space flight simulator), a diverse offer (e.g. green schools) and modern, innovative equipment. Strefa Przygody was mostly appreciated for Strefa Przygody badges, and for the holiday planner application, which enables clients to tailor a stay according to their expectations. These two assets were chosen by 19 and 17 respondents, respectively, who used the services of this company.

The questionnaire addressed to clients also contained a question of whether the company whose services they used was worth recommending. Out of 116 clients, nobody marked the answer suggesting the company should not be recommended (Table 2). Positive opinions reflect the satisfaction achieved by clients using the services of Glendoria, Szarpie Travel (in

**Table 1.** Effect of the innovative character of the analysed companies on their competitiveness

| Answers given                             | Results (%) |
|---|-------------|
| Difficult to say                          | 5.2         |
| Probably an increase in competitiveness   | 16.4        |
| Increase in competitiveness               | 33.6        |
| Definitely an increase in competitiveness | 44.8        |

Source: Authors’ elaboration based on own research poll.

**Table 2.** Answers of respondents on whether the company in question is worth recommending

| The company is worth recommending because:              | Results (%) |
|---|-------------|
| it has a unique and innovative offer                    | 45.7        |
| quality to price ratio for services offered is positive | 21.6        |
| services offered by the company meet expectations       | 21.6        |
| owners/staff are experienced and helpful                | 11.2        |

Source: Authors' elaboration based on own research poll.

Kulka) or Strefa Przygody. Despite a general agreement that the companies were worth recommending, the justifications to this reply were varied. Nearly 50% of respondents indicated the unique and innovative offer, which leads to the conclusion that innovations build a positive image of a company, owing to which business enterprises can attract new clients and improve their competitiveness. However, two other popular answers (indicated by 21.6% of the respondents, each) were the positive quality to price ratio regarding the services offered, and the fulfilment of customers' expectations. The least stated answer was the experience with the owners and employees of the company, and their helpful attitude (this justification was selected by 11.2% of respondents).

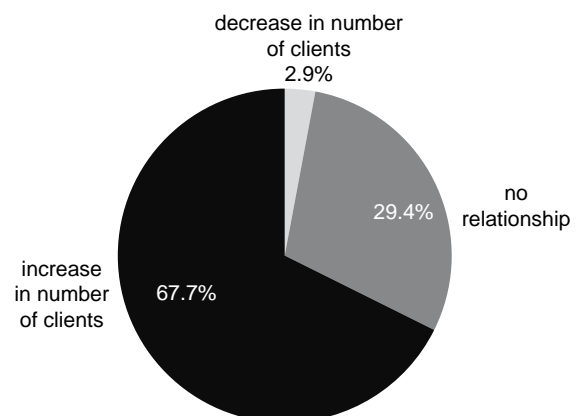
The clients, who represented 77.3% of the total number of respondents, were asked to evaluate the companies Glendoria, Szarpie Travel and Strefa Przygody relative to other tourism companies which they have used. This was an open-ended question and many persons (32.8%) declined to answer it, probably

because of the time it required to write the answers. However, the answers which were given were dominated by opinions about the outstanding position of the evaluated companies, owing to high quality and innovative offers. The clients also appreciated the location, helpful staff, personal approach and the service quality to price ratio. It is therefore evident that the tourists had a positive opinion about the companies they evaluated against the backdrop of other businesses in the hospitality sector, not only because of the prices and location, which for years have been pivotal to selecting service providers in the tourism market, but also because of the implemented innovations and the fact that the companies in question were able to create interesting and unique offers.

The second questionnaire was addressed to owners and employees of the three analysed companies. One of the questions was whether they noticed a change in the number of clients after implementing some innovations in their companies (Fig. 1). Well over half of the respondents (67.8%) agreed that innovations

**Fig. 1.** Effect of implemented innovations on the number of company clients

Source: Authors' elaboration based on own research poll.



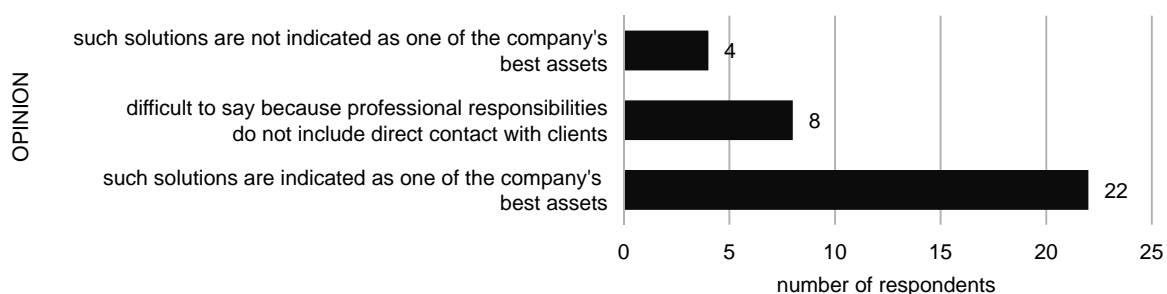
contributed to attracting more customers to Glendoria, Szarpie Travel or Strefa Przygody. Only one person (i.e. 2.9%) responded that innovations caused a decrease in the number of clients. In light of the replies, it can be concluded that the companies were able to improve their competitiveness by implementing certain innovations, as this gave them a more attractive offer and stood out among other companies operating in the hospitality business, in addition to which they could attract new clients and earn higher profits.

An example illustrating the important role played by innovations in creating the image of a company could be the fact that 22 persons employed in the three analysed companies pointed to the original and up-to-date solutions as being of special value to clients because such innovations, in their opinion, are among the essential attributes of tourism companies. Nevertheless, four of the employees claimed they were unaware of such opinions, and eight

respondents did not say whether innovations could be considered more interesting by clients because the nature of their work does not involve direct contact with clients (Fig. 2).

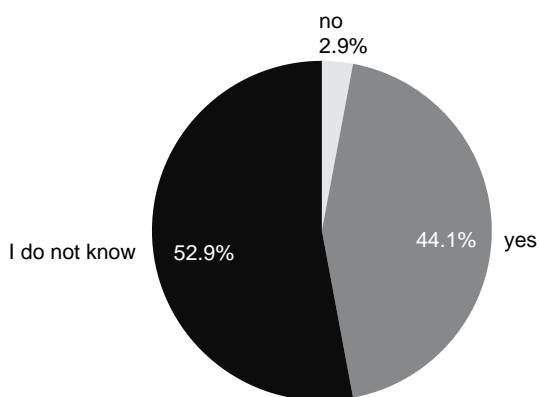
Over 44% of the employees declared that the companies they work for plans to take new measures aimed at increasing the innovativeness of their enterprise (Fig. 3). Over half of the respondents (52.9%) admitted they lacked sufficient knowledge to answer this question, while just one person (i.e. 2.9%) stated that the company would not seek to improve its competitiveness by implementing innovative solutions in the nearest future.

The intention of the companies to further invest in innovations reflects the belief held by the owners of the selected businesses that modern solutions, despite relatively high costs of their implementation, will not only offset these costs over time but will also generate higher revenues and will create opportunities for the company to grow.



**Fig. 2.** Opinions of clients about unique and modern solutions implemented in the company according to employees and owners

Source: Authors' elaboration based on own research poll.



**Fig. 3.** Plans of the company to take measures in the following two years in order to improve its innovativeness

Source: Authors' elaboration based on own research poll.

## SUMMARY

Tourism companies, especially ones which operate in areas with a limited high season, like the Warmińsko-Mazurskie Voivodeship, gain an opportunity for planned development by successfully implementing innovations based on their understanding and meeting of tourist expectations. Moreover, the consistent and innovative development of a company can lead to its building a competitive advantage or gaining a competitive position in the market.

## CONCLUSIONS

The research presented in this paper aimed to present the effect of innovations on the competitiveness of tourism companies and to learn opinions of clients, employees and owners of selected tourism companies that had implemented some innovative solutions while operating in the hospitality sector. The study involved 150 respondents, 77.3% of whom were clients and 22.7% were employees and owners of tourism companies.

Answers to the questionnaires and their detailed analysis led to the following conclusions:

1. Tourists are aware that the implemented innovations enable tourism companies to gain new clients and to adapt well to changes in their environment, which is evidenced by the fact that 44.8% of the respondents decided that the innovative character of the three companies in the study “definitely contributed” to an increase in their competitiveness. Moreover, as many as 33.6% of the respondents said that such innovative solutions “contributed” to the growing competitiveness of these companies.
2. Clients were asked to identify up to three of the most appealing characteristics of the company whose services they had used. The answers justified the conclusion that the innovations implemented in the companies were particularly appreciated by the respondents, as all three companies, i.e. Glendoria, Szarpie Travel and Strefa Przygody, were most often appreciated for their innovative solutions.
3. All 116 clients declared that they had been satisfied with the offer of the company they had used and would recommend this company to others. The

positive opinions were mostly (46.7%) based on the innovative offer that distinguished the company from others. In turn, 21.6% of the respondents attributed their positive opinion to the fact that the company had met their expectations regarding the services offered. Moreover, the same percentage (21.6%) of clients pointed to the positive quality to price ratio. The competitiveness of the analysed companies is further confirmed by the fact that many of their clients were willing to recommend them to others.

4. The answers given to the questionnaire addressed to employees and owners of tourism companies show that 67.8% of the respondents are of the opinion that the innovations their companies had implemented resulted in increasing numbers of clients. This finding justifies the conclusion that innovative solutions not only attract new clients but also enable companies to earn higher profits.
5. The three innovative tourism companies selected for this study have plans to take measures within the following two years in order to improve their innovativeness. This option was selected by 44.1% of employees and owners, who justified their answer by the company’s drive to attract new clients or to maintain its satisfying position in the increasingly competitive business sector. This is proof of the important role of innovation in the operation of tourism companies.

The results obtained in this study demonstrate that implementation of innovations is an opportunity for companies to stand out in the tourism market. However, it is recommended to introduce innovative solutions that will correspond well to the needs of clients of a given company and that will satisfy their expectations. In the current situation of the COVID-10 pandemic, innovations can be a key to attracting tourists, who are now much more careful in selecting destinations for their travel.

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## WPŁYW WDROŻONYCH INNOWACJI NA KONKURENCYJNOŚĆ PRZEDSIĘBIORSTW TURYSTYCZNYCH W WOJEWÓDZTWIE WARMIŃSKO-MAZURSKIM

### STRESZCZENIE

Rosnący popyt na usługi turystyczne przyczynił się do powstania oraz rozwinięcia się wielu przedsiębiorstw turystycznych, które dążąc do wyróżnienia swojej oferty na rynku oraz pozyskiwania nowych klientów, podejmują działania mające na celu zwiększenie swojej konkurencyjności. Skutecznym rozwiązaniem jest wdrażanie innowacji w przedsiębiorstwach, dzięki którym mogą umocnić swoją pozycję. Celem pracy jest przedstawienie wpływu innowacji na konkurencyjność przedsiębiorstw turystycznych na przykładzie wybranych podmiotów działających na terenie województwa warmińsko-mazurskiego, w związku z czym w trzech przedsiębiorstwach przeprowadzona została ankieta skierowana do klientów oraz ankieta skierowana do pracowników i właścicieli. Ich wyniki pozwoliły uzyskać informacje, zgodnie z którymi m.in. największymi atutami, dzięki którym badane podmioty pozytywnie odznaczały się na rynku, były innowacje. Ponadto więcej niż połowa zatrudnionych oznajmiła, iż innowacje przyczyniły się do wzrostu liczby klientów.

**Słowa kluczowe:** przedsiębiorstwo turystyczne, innowacyjność, pozycja konkurencyjna, przewaga konkurencyjna, województwo warmińsko-mazurskie

## USE OF DISCRIMINATORY MODELS TO VERIFY THE LIKELIHOOD OF CONTINUED ACTIVITIES FOR ENTERPRISES: CASE STUDY ON SELECT ENTERPRISES FROM THE AUTOMOTIVE INDUSTRY

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### ABSTRACT

The main aim of this article is to assess the use of discriminatory models to verify the likelihood that an enterprise's activities will continue, using a sample of enterprises from the automotive industry as a case study. The suitability of 10 models will be verified by a three-point credit assessment method. As seen in the research results, discriminatory models can be used to verify an enterprise's likelihood of continuing its activity. Taking into account the received values for discriminatory functions and banking methods over four years, a convergence of indications was demonstrated. In the vast majority of cases, the increase or decrease in the value of the functions was reflected in a corresponding change in the value of banking methods. Based on the conducted research, it should be stated that the most characteristic variables influencing the values of the discriminant function in the automotive industry concerned debt and profitability.

**Key words:** discriminant analysis, banking methods of assessing creditworthiness, financial condition of the enterprise, early warning models

**JEL codes:** G17, G32

### INTRODUCTION

Discriminant analysis models were developed to detect an enterprise's possible risk of bankruptcy. The first works in this area were carried out in the 1960s, when in the United States, Altman developed models enabling quick detection of threats to the functioning of enterprises [Altman 1968]. So far, a lot of research has been conducted on the financial condition of the automotive industry globally. It is worth mentioning here some specific works:

- The financial condition of the auto industry in India in 2003–2010 [Ray 2011];
- Re-evaluation of the bankruptcy reorganisation of Chrysler and General Motors [Adler 2010];

- Bankruptcy risk forecasting for the automotive parts manufacturing industry [Park and Han 2013];
- The financial condition of companies included in the BSE-GREENEX stock index in India [Swalih and Vinod 2017];
- The condition of selected Indian automotive companies [Kannan and Monisha 2016];
- Restructuring of bankruptcies of Chrysler and General Motors [Brubaker and Tabb 2010].

Correct assessment of a company's financial condition is of great importance for both internal stakeholders, i.e. owners and executives, as well as for external entities, i.e. financial institutions, competition, and co-operating entities. The aim of this article is to assess the use of discriminatory models to verify the likelihood



of an enterprise's continued business activities (case study: select automotive companies), and to determine which variables from accepted models have the greatest impact on the reduction of activities, and which increase the value of the function. In addition, the financial condition of the companies will be verified by a three-point credit worthiness evaluation method. The research sample will consist of 10 enterprises operating in the automotive industry on the Polish market in the years 2013–2017<sup>1</sup>. The sample consists of the companies with the largest total assets selected from the Emerging Markets Information Service (EMIS) database. Ten discriminatory models were verified, drawn from attempts on 35 discriminatory models, with the goal to present one primary model then tested by the author on a sample of manufacturing companies from several sectors. The research period is four years.

Taking into account the title of the article and the fact that the enterprises continue to operate, the following hypothesis was made: "The greatest potential for prediction with the correct classification of entities is found from variables concerning profitability".

### **THEORETICAL ASPECTS OF DISCRIMINANT MODELS AND CREDIT WORTHINESS ASSESSMENT METHODS**

Determining the value of the discriminant function leads to comparison with specific limit values, which allows the proper classification of the examined object to the group of objects at risk of bankruptcy or to the group with a stable financial condition [Janik 2018], moreover, these models are transparent and the obtained results are easy to interpret [Piróg 2016].

The linear discriminant function has the following form:

$$Z = a_0 + a_1X_1 + a_2X_2 + \dots + a_nX_n$$

where:

$Z$  – value of the discriminant function,

$X_i$  for  $i = 1, 2, \dots, n$  – explanatory variables (financial indicators),

$a_i$  for  $i = 1, 2, \dots, n$  – coefficients of the discriminant function,

$a_0$  – constant.

The result is interpreted on the basis of a comparison of the calculated  $Z$  value of the discriminant function with the limit value established by the author of the model. The classification of entities to separate groups is based on the value of  $Z$  [Zielińska-Sitkiewicz 2012].

The following models were used to assess the financial condition of enterprises<sup>2</sup>:

1. Model of E. Mączyńska [Mączyńska 1994].
2. Model INE PAN G [Mączyńska and Zawadzki 2006].
3. Model 1 of D. Appenzeller and K. Szarzec [Appenzeller and Szarzec 2004].
4. The "Poznań" model [Hamrol et al. 2004].
5. Model 1 of D. Hadasik [Hadasik 1998].
6. Model of T. Korol [Korol 2010].
7. Model of T. Maślanka a year before [Maślanka 2008].
8. Model of M. Tymoszuik [Tymoszuik 2013].
9. Model of B. Prusak [Prusak 2005].
10. Model 2 of J. Gajdka and D. Stos [Gajdka and Stos 1996].

The models selected for the assessment were tested by the authors on a sample of production companies operating on the Polish market. Models that apply only to the trade, construction and services sectors were excluded from the drawing. The models are different because in their construction from four to six different indicators of financial analysis were used. Some models do not include liquidity, e.g. E. Mączyńska

<sup>1</sup> The financial statements cover the following years: 2013–2016 (three companies), 2014–2017 (six companies), 2015–2017 (one company). Selecting a larger sample of enterprises would mean that the data would cover the years 2010–2012 and therefore would be too distant.

<sup>2</sup> Due to the specific length of the article and wide scope of available literature, some discriminant function designs and constructions of individual indicators are presented. The breadth of bank credit instructions also makes it impossible to present them.

and D. Hadasik, or activities, e.g. the “Poznań” model. However, some models mainly include activity indicators in their design, e.g. the model by D. Hadasik or profitability indicators, e.g. the models of Poznań, B. Prusak, J. Gajdka and D. Stos.

The advantage of one group of indicators over other groups or the lack of some categories of indicators affects the obtained function values. Therefore, 10 models were selected to ensure the greatest possible variety of the research sample. In most models, the cut-off point is “0”, therefore, it may be difficult to interpret when the obtained results are almost that value.

The main aim of modern bank information systems is to reduce risk, especially that which is undertaken in granting credit, because the most profitable bank assets in Poland are broadly understood to be the credit they have issued. Proper use of acquired information about customers is a fundamental premise of success, reflected in an increase in the effectiveness of a bank’s operations, the measurable expression of which is the increase in profit. Therefore, the assessment of creditworthiness by the bank is so important [Szustak 2014]. Estimating a company’s creditworthiness on the basis of banking methods is carried out by analysing the results obtained in individual years of operation. Due to the diversity of investment projects implemented by enterprises and often financed by banks, both banks and enterprises must use different methods of assessing the profitability of investment projects, which usually require both their own and external financing [Róžański 2001].

The scoring method of banking risk assessment belongs to the group of simple, but quite common methods of synthetic assessment of a company’s financial condition. It allows, without knowing the discriminant function, to reduce the assessment of 10 financial indicators to the “common denominator”. In the discussed method, some number of points are assigned to a given range of indicators, on a scale from one (the highest score) to five (the lowest score). This method does not take into account the criterion of the industry specificity of the surveyed company.

In the methods of assessing financial condition, the borrowers and some banks modified the assumptions of the scoring method for assessing banking risk as discussed above. While in the case of the assessment

of profitability, financial liquidity and debt indicators, they use these assumptions almost unchanged, in the case of the analysed activity indicators, a certain number of points is awarded depending on the shaping of a given indicator against the average for the industry [Kitowski 2012].

Three methods used by the largest banks in Poland will be used to verify the financial condition of enterprises. Due to the fact that banking procedures include both quantitative and qualitative assessment, in order to obtain full comparability of all the methods presented, this article does not attempt to perform a qualitative assessment. The article takes into account three methods used by banks in Poland.

- In Bank A, when the total score of a quantitative assessment is from 10 to 15, the financial condition is very good. But the more points, the worse the condition. When the total score of a quantitative assessment is from 56 to 59, the financial condition is very poor.
- In Bank B, it is possible to obtain a total of 45 points, of which a maximum of 30 points is allocated to the quantitative assessment.
- In Bank C, it is possible to obtain a total of 80 points, of which a maximum of 45 points is for the quantitative assessment.

According to the research conducted so far on the automotive industry:

- The capital structure of large- and medium-sized enterprises in the automotive industry in the Czech Republic was influenced by three dependent and five independent variables. The dependent variables are: total debt, long-term debt, and short-term debt ratios. The independent variables are: size, tangibility, profitability, liquidity and growth. Total debt was found to be positively related to tangibility and profitability and negatively to size and liquidity. Long-term debt is positively related to size and tangibility and negatively to profitability and liquidity. Short-term debt is positively related to tangibility and profitability and negatively to size and liquidity. Growth has little effect on all three debt measures. The results of the study show that the nature of the relationship largely depends on the choice of financial leverage. Larger firms prefer equity financing and tend to use long-term rather

than short-term debt. Firms with more assets tend to finance debt. More liquid companies prefer equity financing. More profitable companies are willing to raise equity and short-term debt [Pinková 2012].

- Enterprises decide on their capital structure on an ad hoc basis; they are primarily driven by the desire to maintain financial liquidity. The Polish economy is dominated by short-term liabilities in the structure of liabilities, the cost of which is high and the maturity date is short. The structure of capital is determined by the dominant factors: asset structure, current liquidity, profitability and size of the enterprise. Foreign capital is used only when the entity's own funds turn out to be insufficient to cover the financial needs. Enterprises are afraid of the costs of bankruptcy; they minimize the level of financial risk by limiting foreign capital [Wilimowska and Wilimowski 2010].
- Multiplier effects strengthen the rationale to rescue the automotive industry: stimulating vehicle demand is seen as an effective way to stimulate aggregate demand; stimulating vehicle demand has environmental benefits; helping car manufacturers help solve credit problems [Sturgeon and Van Biesebroeck 2009].

## **RESULTS OF THE ASSESSMENT OF THE FINANCIAL CONDITION OF COMPANIES AND DISCUSSION**

Table 1 presents the results of individual discriminant and scoring models of banking methods presented in the previous chapter.

The main aim of the article is to assess the possibility of using discriminant models to verify the likelihood of continuation of business operations on the example of a sample of enterprises in the automotive industry and to determine which variables of the adopted models had the greatest impact on the decrease and increase in the value of the function. Due to the fact that the companies on which the calculations were made are present on the market, discriminatory models should not indicate the risk of their bankruptcy or it should occur sporadically. Also, the number of points obtained on the basis of banking methods should not indicate a lack of financial condition, and

therefore should be at least 50% of the points that can be obtained in the quantitative assessment.

Based on the results presented in Table 1, it should be noted that almost none of the enterprises are threatened with bankruptcy. The exception is enterprise 4, whose results in 2016 were not optimistic and most of the methods indicated the risk of bankruptcy or a deteriorating situation. Due to the fact that all enterprises included in the research sample operated in the years that followed, it should be assumed that the indications of bankruptcy risk were incorrect. The correctness of indications of individual models in the four-year period, i.e. qualifying enterprises to the group with a safe financial condition, are shown in Table 2.

A very low number of points was awarded by bank B and bank C to enterprise 2 in 2015–2016 and enterprise 4 in 2014–2017. In contrast, the best scores were received by enterprises 3, 6 and 10. Taking into account the indications of each model, we note that the models of E. Mączyńska and INE PAN G do not indicate any risk of bankruptcy of the enterprises and the value of these functions are changing and almost converge with other indication banking models and methods. Other models subject to verification, which on the basis of the conducted research indicated a single and double risk of bankruptcy, are the “Poznań” model, as well as the D. Appenzeller and K. Szarzec models. These models indicated a risk of bankruptcy of company No. 2 in 2016, just like the other five models. A weaker situation was also indicated by bank B and bank C, which allocated respectively only 34% and 29% of the total points of quantification.

The models of D. Hadasik and T. Korol contain three indications of the risk of bankruptcy. The threat is also demonstrated by the methods of bank B and bank C and concerns enterprises 2 and 4.

The remaining discriminatory models indicated the risk of bankruptcy from five to 17 times. In these cases, it can also be observed that in those years where discriminatory models indicated the risk of bankruptcy of the enterprises, also banking methods allowed to adopt a similar position.

It is important to note that there are some exceptions. In the case of enterprise 10, banking methods indicate a good financial condition, however, the models

**Table 1.** Results of individual discriminant models for a selected sample of enterprises in four consecutive years

| Enterprese | Year              | E. Mączynska | D. Haadasik | INE PAN G | M. Hamrol | D. Appenzeller,<br>K. Szarzec | T. Maslanka | J. Gajdka,<br>D. Stos | B. Prusak | M. Tymoszuak | T. Korol | Bank A | Bank B | Bank C |
|------------|-------------------|--------------|-------------|-----------|-----------|-------------------------------|-------------|-----------------------|-----------|--------------|----------|--------|--------|--------|
| 1          | 2014              | 1.70         | 1.70        | 3.26      | 2.93      | 0.56                          | 2.25        | 0.56                  | 0.12      | 2.98         | -1.88    | 28     | 19     | 35     |
|            | 2015              | 1.87         | 1.80        | 3.39      | 3.46      | 0.45                          | 2.40        | 0.58                  | 0.11      | 3.13         | 1.95     | 26     | 21     | 35     |
|            | 2016              | 1.43         | 1.80        | 3.16      | 3.37      | 0.33                          | 2.15        | 0.61                  | -0.10     | 3.04         | 1.65     | 26     | 22     | 32     |
|            | 2017              | 2.05         | 1.73        | 3.59      | 3.61      | 0.49                          | 2.46        | 0.50                  | 0.11      | 2.96         | 1.95     | 28     | 21     | 37     |
| 2          | 2014              | 2.31         | 1.72        | 3.16      | 2.50      | 1.06                          | 2.06        | 0.64                  | 0.34      | 3.14         | 2.87     | 26     | 18     | 29     |
|            | 2015              | 1.18         | 1.24        | 1.45      | 0.58      | -0.01                         | 0.50        | 0.87                  | -0.41     | 0.27         | -0.03    | 33     | 11     | 17     |
|            | 2016              | 0.67         | 0.88        | 0.47      | -0.11     | -0.26                         | -0.48       | 1.04                  | -0.63     | -24.75       | 0.90     | 28     | 10     | 13     |
|            | 2017              | 1.75         | 1.20        | 2.02      | 1.35      | 0.18                          | 0.93        | 0.79                  | 0.07      | 0.17         | -1.69    | 30     | 13     | 20     |
| 3          | 2014              | 2.34         | 1.86        | 5.86      | 5.70      | 1.59                          | 4.33        | 0.53                  | 0.77      | 4.62         | -4.48    | 22     | 25     | 36     |
|            | 2015              | 2.68         | 1.92        | 6.17      | 7.12      | 1.78                          | 4.28        | 0.56                  | 1.09      | 4.92         | -5.36    | 22     | 26     | 40     |
|            | 2016              | 3.31         | 1.91        | 6.73      | 8.07      | 1.82                          | 4.40        | 0.42                  | 1.30      | 5.20         | 5.67     | 21     | 26     | 41     |
|            | 2017              | 2.51         | 1.78        | 5.34      | 6.31      | 1.66                          | 3.49        | 0.52                  | 0.87      | 4.53         | -4.69    | 24     | 26     | 37     |
| 4          | 2014              | 0.77         | -0.04       | 0.40      | 0.70      | 0.43                          | -0.21       | 1.00                  | -0.34     | -5.44        | -0.07    | 40     | 11     | 17     |
|            | 2015              | 0.53         | 0.02        | 0.25      | 0.29      | 0.19                          | -0.35       | 1.06                  | -0.39     | -7.07        | 0.29     | 44     | 8      | 12     |
|            | 2016              | 0.33         | -0.01       | 0.02      | 0.29      | 0.05                          | -0.64       | 1.07                  | -0.65     | -11.88       | 0.57     | 46     | 11     | 12     |
|            | 2017              | 0.48         | -0.17       | 0.50      | 2.40      | 1.28                          | -0.11       | 1.07                  | -0.03     | -7.60        | -1.14    | 41     | 12     | 20     |
| 5          | 2014              | 3.72         | 1.87        | 5.47      | 4.22      | 2.10                          | 3.70        | 0.24                  | 0.92      | 4.11         | -4.58    | 22     | 23     | 38     |
|            | 2015              | 5.16         | 2.04        | 7.35      | 5.22      | 2.61                          | 4.90        | -0.08                 | 1.50      | 5.20         | -6.32    | 20     | 26     | 42     |
|            | 2016              | 4.25         | 1.99        | 5.69      | 4.63      | 2.24                          | 3.51        | 0.01                  | 1.26      | 4.78         | -5.15    | 21     | 25     | 42     |
|            | 2017              | 4.29         | 1.83        | 4.95      | 4.16      | 2.08                          | 2.78        | -0.02                 | 0.84      | 4.27         | -4.10    | 22     | 22     | 39     |
| 6          | 2014              | 1.28         | 1.53        | 2.14      | 2.55      | 0.49                          | 1.42        | 0.78                  | 0.10      | 1.20         | -1.66    | 24     | 20     | 33     |
|            | 2015              | 1.66         | 1.69        | 2.64      | 3.18      | 0.67                          | 1.78        | 0.70                  | 0.30      | 2.39         | -2.50    | 22     | 21     | 34     |
|            | 2016              | 0.62         | 1.55        | 1.62      | 2.54      | 0.42                          | 1.12        | 0.95                  | -0.05     | 0.44         | -1.54    | 28     | 19     | 27     |
|            | 2017              | 1.44         | 1.58        | 2.09      | 2.67      | 0.53                          | 1.31        | 0.80                  | -0.05     | 1.54         | -1.87    | 25     | 20     | 33     |
| 7          | 2013              | 5.25         | 1.09        | 5.84      | 3.87      | 2.60                          | 4.72        | -0.11                 | 1.89      | 1.31         | -5.41    | 27     | 21     | 39     |
|            | 2014              | 3.69         | 1.10        | 3.93      | 2.88      | 0.82                          | 2.54        | 0.23                  | 0.83      | 1.20         | 2.37     | 31     | 19     | 34     |
|            | 2015              | 3.64         | 1.01        | 3.76      | 2.85      | 1.03                          | 2.43        | 0.27                  | 0.97      | 0.70         | -2.53    | 32     | 17     | 30     |
|            | 2016              | 4.39         | 1.12        | 4.78      | 3.22      | 1.20                          | 3.09        | 0.05                  | 1.30      | 1.64         | 3.35     | 31     | 20     | 34     |
| 8          | 2013              | 2.22         | 1.52        | 3.48      | 5.06      | 1.04                          | 2.05        | 0.44                  | 0.30      | 2.28         | 2.27     | 28     | 23     | 34     |
|            | 2014              | 2.07         | 1.49        | 3.14      | 3.50      | 0.64                          | 1.96        | 0.47                  | 0.06      | 2.26         | -1.57    | 26     | 20     | 37     |
|            | 2015              | 1.18         | 1.15        | 2.84      | 4.30      | 0.55                          | 1.74        | 0.70                  | -0.08     | 1.97         | -1.82    | 29     | 21     | 31     |
|            | 2016              | 0.93         | 1.54        | 1.52      | 2.43      | 0.40                          | 0.86        | 0.80                  | -0.23     | 0.00         | -0.87    | 35     | 18     | 32     |
| 9          | 2013              | 1.72         | 1.04        | 1.85      | 1.00      | 0.58                          | 0.90        | 0.90                  | 0.25      | -1.54        | -1.53    | 28     | 21     | 37     |
|            | 2014              | 1.85         | 1.02        | 2.07      | 1.16      | 0.64                          | 0.79        | 0.57                  | 0.07      | -1.38        | -1.01    | 28     | 19     | 35     |
|            | 2015              | 0.81         | 1.00        | 0.97      | 0.53      | 0.36                          | 0.29        | 1.07                  | -0.37     | -2.96        | -0.22    | 26     | 21     | 35     |
|            | 2016              | 1.35         | 1.02        | 1.29      | 0.99      | 0.52                          | 0.55        | 0.89                  | -0.09     | -2.20        | -0.53    | 26     | 22     | 32     |
| 10         | 2015 <sup>a</sup> | 1.85         | 2.10        | 4.04      | 6.15      | 3.57                          | 2.93        | 0.79                  | 1.15      | 3.74         | -5.38    | 22     | 24     | 31     |
|            | 2016              | 2.18         | 2.14        | 4.38      | 6.67      | 3.96                          | 3.17        | 0.82                  | 1.62      | 4.09         | -6.98    | 20     | 26     | 32     |
|            | 2017              | 1.28         | 2.02        | 3.55      | 5.56      | 3.21                          | 2.86        | 0.95                  | 1.23      | 3.12         | -5.60    | 21     | 24     | 30     |

<sup>a</sup> Due to the lack of data, the calculations were made for the period 2015–2017.

The research sample consisted of: 1 – Firma Oponiarska Dębica S.A.; 2 – Volkswagen Poznań Sp. z o.o.; 3 – Toyota Motor Manufacturing Poland Sp. z o.o.; 4 – Solaris Bus Coach S.A.; 5 – Sitech Sp. z o.o.; 6 – Trw Polska Sp. z o.o.; 7 – Hutchinson Poland Sp. z o.o.; 8 – Nexteer Automotive Poland Sp. z o.o.; 9 – Faurecia Wałbrzych S.A.; 10 – MAN Trucks Sp. z o.o.

Source: Author's own study.

**Table 2.** Correctness of indications of individual models over a four-year period

| Model (author)                                   | Forecast accuracy (%) |
|--|-----------------------|
| E. Mączyńska                                     | 100                   |
| INE PAN G (E. Mączyńska, M. Zawadzki)            | 100                   |
| D. Appenzeller and K. Szarzec (1)                | 97                    |
| “Poznański” (M. Hamrol, B. Czajka, M. Piechocki) | 97                    |
| D. Hadasik                                       | 92                    |
| T. Korol   | 92                    |
| T. Maślanka                                      | 87                    |
| M. Tymoszek                                      | 77                    |
| B. Prusak  | 67                    |
| J. Gajdka and D. Stos (2)                        | 56                    |

Source: Author’s own study.

of J. Gajdka and D. Stos indicate the risk of bankruptcy, which additionally increases in the following years.

Therefore it must be concluded that the assessment of the financial condition of a company should be done for at least a few models of discrimination, so as

to exclude their possible maladjustment to the subject under study.

As a result of the research, it should be noted that the following variables, indicated in Table 3, had the greatest impact on the value of individual functions:

**Table 3.** Variables in a given model that had the greatest impact on its value

| Model (author)                                      | Variables  |
|---|--|
| E. Mączyńska  | (profit before tax + amortisation) / liabilities      profit before tax / assets |
| INE PAN G<br>(E. Mączyńska, M. Zawadzki)            | equity/assets      (net profit + amortisation) / liabilities                     |
| D. Appenzeller and K. Szarzec (1)                   | current ratio      quick ratio   |
| “Poznański”<br>(M. Hamrol, B. Czajka, M. Piechocki) | quick ratio      permanent capital / assets                                      |
| D. Hadasik  | liabilities/assets      stock · 365 / income                                     |
| T. Korol  | profit on sale / assets      operating costs / short-term liabilities            |
| T. Maślanka   | equity / assets      (operating profit + amortisation) / liabilities             |
| M. Tymoszek   | equity / assets      EBIT / assets   |
| B. Prusak (3)                                       | profit on sale / assets      operating costs / short-term liabilities            |
| J. Gajdka and D. Stos (2)                           | liabilities / assets      net profit / assets                                    |

Source: Author’s own study.

## CONCLUSIONS

Evaluating the potential for discriminatory use of models to verify the likelihood of continued business activities for a sample of automotive enterprises, and comparing the results with those obtained using the bank methods, combined a variety of methods resulting from scientific research and practice. The aim of the study was achieved and it was shown that discriminatory models can be used to verify the likelihood of continued activities of enterprises from the automotive industry. However, it was shown that debt ratios had the greatest impact on the decrease and increase in the value of the function. This means that the hypothesis that variables related to profitability would have the greatest potential for prediction with the correct classification of entities, was not proven.

Based on the conducted research, it should be stated that:

- The most characteristic variables influencing the values of the discriminant function in the automotive industry concerned debt and profitability.
- There is a view in the literature that:
  - the dependent variables are total debt, long-term debt and short-term debt ratios but the independent variables are size, tangibility, profitability, liquidity and growth [Pinková 2012];
  - enterprises decide on their capital structure ad hoc, they primarily want to remain financial liquidity [Wilimowska and Wilimowski 2010];
  - if the results obtained with the use of banking methods proved the improving financial situation of enterprises, then the values of discriminatory functions increased (or decreased – the model of J. Gajdka and D. Stos);
  - in order to reduce the risk of incorrect diagnosis of financial condition, at least several models should be used;
  - 100% efficiency the discriminatory models of E. Mączyńska and INE PAN G;
  - the lowest efficiency was shown by the discriminatory models of J. Gajdka and D. Stos (56%), meaning they did not work for the evaluation of companies in the automotive industry.

Taking into account the above, it should be remembered that the conducted research contained certain limitations, i.e. a small number of examined entities and their deliberate selection in terms of the value of assets. Moreover, there was no bankrupt enterprise in the research group.

The issue of the financial condition of enterprises is still relevant. Therefore, this article can be used as a starting point for further research.

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## WYKORZYSTANIE MODELI DYSKRYMINACYJNYCH DO WERYFIKACJI PRAWDOPODOBIEŃSTWA KONTYNUACJI DZIAŁALNOŚCI PRZEDSIĘBIORSTW NA PRZYKŁADZIE PRÓBY PRZEDSIĘBIORSTW Z BRANŻY MOTORYZACYJNEJ

### STRESZCZENIE

Celem niniejszego artykułu jest ocena możliwości wykorzystania modeli dyskryminacyjnych do weryfikacji prawdopodobieństwa kontynuacji działalności przedsiębiorstw na przykładzie próby przedsiębiorstw z branży motoryzacyjnej. Ocena 10 modeli została zweryfikowana za pomocą trzypunktowych metod oceny zdolności kredytowej. Jak wynika z przeprowadzonych badań, modele dyskryminacyjne mogą zostać wykorzystane do weryfikacji prawdopodobieństwa kontynuacji działalności przedsiębiorstw. Biorąc pod uwagę otrzymane wartości funkcji dyskryminacyjnych i metod bankowych, na przestrzeni czterech lat uwidoczniła została zbieżność wskazań. W zdecydowanej większości przypadków wzrost lub spadek wartości modeli znajdował odzwierciedlenie w odpowiedniej zmianie wartości metod bankowych. Na podstawie przeprowadzonych badań należy stwierdzić, że najbardziej charakterystyczne zmienne wpływające na wartość funkcji dyskryminacyjnych w branży motoryzacyjnej dotyczyły zadłużenia i rentowności.

**Słowa kluczowe:** analiza dyskryminacyjna, bankowe metody oceny zdolności kredytowej, kondycja finansowa przedsiębiorstwa, modele wczesnego ostrzegania

# THE SHARE OF CROSS-BORDER SHOPPING IN POLAND'S TRADE TURNOVER OF FOOD PRODUCTS WITH NEIGHBOURING COUNTRIES ON THE EUROPEAN UNION EASTERN BORDER IN 2013–2018

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## ABSTRACT

Trade turnover of food products between Poland and its neighbouring countries on the external eastern border of the European Union (Ukraine, Belarus and Russia) is an important element of the international trade exchange of Poland. The registered trade turnover had an impact on the Polish economy, whereas, from the point of view of development of areas located within the border impact zone, the unregistered trade that is part of cross-border shopping was of great importance. The aim of the paper is to examine the dynamics and trends of changes in terms of the share of cross-border shopping in the total trade turnover of food products with the above-mentioned countries over the period 2013–2018. A case study analysis conducted in all three countries showed that there was a steady increase in the share of unregistered trade in the total trade volume throughout the entire research period.

**Key words:** food products, cross-border trade on the Polish eastern border, foreign trade

**JEL codes:** E26, F14, F31

## INTRODUCTION

A phenomenon accompanying international travels is the carrying of small quantities of goods (unregistered in the customs clearance documents) purchased by citizens in a country other than where they live. The phenomenon called cross-border shopping occurs on border sections where it is possible for people to move across the border, and where price differences and the quality of goods, as well as the level of supply in the neighbouring markets, are so high that the difficulties faced by the travellers in transporting goods to the neighbouring country can be economically compensated [Baruca and Zolfagharian 2015, Egresi and Arlstan 2016, Powęska 2016, Bygvra 2019].

Through the fact of buying and selling between the business entities located in the neighbouring countries, establishing international trade relations and the transfer of goods across the border, unregistered purchases made as part of cross-border shopping can be classified as part of international trade turnover, thus having some influence on its total volume [Rymarczyk 2017]. The dominant place of purchase and sale acts are bazaars and marketplaces, which from the theoretical point of view are classified as organized defective markets [Dudziński 2006]. At the same time, it should be noted that transactions made over the course of cross-border shopping are relatively low-value transactions. There are formal and legal differences between registered and unregistered trade; foremostly,

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the purpose of the transport of unregistered goods is to provide commodities to natural persons and their families, while in the registered trade, goods are carried in bulk quantities and they are further put into circulation on the market of a given country.

The effect of an increase in the volume of cross-border shopping is the development of some social and economic functions, primarily the growth of trade [Cyrek and Cyrek 2019]. Cross-border shopping plays a particularly important role in the regions located in the direct impact zone of the border, first of all in those areas where there are border crossings. Among citizens living at a distance of up to 30 km from the border line, purchases are very often the main reason for making a trip to a neighbouring country. Citizens coming from a neighbouring country to make purchases have a positive influence on the local market, primarily by increasing demand, stimulating local entrepreneurship and increasing the level of production, which consequently leads to the creation of new jobs. Therefore, cross-border shopping is treated by the communities of the peripheral self-government units, which are located at the border, as a stimulator of socio-economic development. On the other hand, there is a phenomenon of disregarding the norms and tariffs in terms of the amount of goods allowed to be transported across the border, which is why it is difficult to separate legal cross-border shopping from illegal trading activities (smuggling).

In the areas remaining in the impact zone of the Polish section of the external eastern border of the European Union, agriculture is an important socio-economic function, since agricultural production is of interest to the citizens of neighbouring countries who cross the border in order to make purchases. Taking all this into consideration, the main purpose of the paper is to examine the dynamics and trends of changes in the share of cross-border shopping in the total volume of trade turnover of food products in Poland's trade with the above-mentioned countries as well as to determine the value and share of food items in Poland's trade relations with eastern neighbours, that is to say Ukraine, Belarus and Russia, during the period 2013–2018. The paper is a continuation of the research carried out for the years 2010–2012 [Powęska 2014], which is why its summary shows the differences between these two research periods.

## RESEARCH METHODOLOGY AND SOURCES

Food products are often the main reason for crossing the border, and the most common destination of the shopping trips are commercial outlets situated in convenient locations in relation to the border crossing. This also takes place on the Polish section of the external border of the European Union. Thus, when citizens carry unregistered goods purchased abroad to their country of residence, they contribute to an increase in international trade turnover. Taking this into consideration, the following research questions were formulated in the study: what were the changes in the share of cross-border shopping (unregistered purchases) in the total volume of international trade turnover (registered and unregistered sectors, as well as services registered in the EBOPS system in total) of food products over the period 2013–2018 on the Polish section of the EU external border. By analysing the phenomenon for individual years, the trends of changes in the adopted research period were shown, and, taking into account the results of previous studies, long-term trends were indicated. The analysis was supplemented with characteristics of the dynamics in the pattern of registered foreign trade in food products. At both levels of analysis, the research on the exports and imports of goods was carried out separately.

Data relating to the value and pattern of cross-border trade was taken from the publication of the Centre of the Cross-border Areas Surveys and Statistics for Euroregions (Ośrodek Badań Obszarów Transgranicznych i Statystyki Euroregionalnej), which is a part of the Statistical Office in Rzeszów (Urząd Statystyczny w Rzeszowie) [GUS – US Rzeszów 2014, 2015, 2016, 2017, 2018, 2019], while the data on foreign trade registered in the customs clearance documents was available in the Yearbooks of Foreign Trade Statistics of the Statistics Poland (Główny Urząd Statystyczny) [GUS 2014, 2015, 2016, 2017, 2018, 2019].

For individual years covered by the study, the total volume of Poland's trade turnover with eastern neighbours was calculated by summing up the registered and unregistered turnover. In the registered turnover, both in exports and imports, the values of goods registered in customs clearance documents as well as expenses for services recorded in the EBOPS system were taken into consideration. Expenses for purchased services

were added to the Polish imports, while the value of the services provided was added to the Polish exports. The value of goods transported across the border as part of cross-border shopping was treated as unregistered turnover. In subsequent stages of the study, based on the statistical analysis, an assessment was made of: (1) the share of food products in unregistered turnover; (2) percentage of food products in the registered import and export to the particular countries; and (3) comparison of the registered and unregistered sector in the turnover of food products between Poland and each of the neighbouring countries at the external border of the EU. In addition, in the next part of the study an assessment was made of the value and commodity structure of the registered trade in food products with individual countries.

#### **THE SHARE OF CROSS-BORDER SHOPPING IN POLAND'S FOOD PRODUCTS EXPORT TO NEIGHBOURING COUNTRIES ON THE EU EXTERNAL BORDER IN 2013–2018**

In the years 2013–2018, there were diverse trends in the value and share of the food sector in Poland's exports to the individual countries located along the external border of the European Union (Table 1). In the case of Ukraine, there was an increase in unregistered exports, both in terms of the total volume of goods and in the value of foodstuffs.

The share of food commodities in the structure of unregistered exports tended to decline (from 12% to 11%), which points to the increasing dynamics of the unregistered export of non-food products. However, in the case of Russia, on the border with the Kaliningrad Region (Oblast), there was a slight decrease in the absolute value of unregistered turnover, both in the total volume of goods and in the value of foodstuffs. The share of food expenses in unregistered exports fell from 33% to 26% during this period. However, in the case of Belarus, the share of food products in cross-border shopping varied and it oscillated around 11–13%, remaining at the level of the highest values at the beginning and at the end of the research period.

As regards registered exports in terms of absolute value, trends varied greatly between individual countries. In the case of Ukraine, the values of registered exports to Ukraine varied with slight upward trends

(from PLN 1.9 PLN billion in 2013 to PLN 2.1 billion in 2018), with the lowest value being recorded for the year 2015, when the value of foodstuffs exported to Ukraine amounted to PLN 1.2 billion. In the case of Belarus, throughout the research period the absolute value of registered exports remained at a similar level with a slightly decreasing trend (from PLN 1.2 billion in 2013 to around PLN 1 billion in 2018). However, in the case of Russia, this decline was more marked (from PLN 5.2 billion to PLN 2.1 billion).

When analysing the share of cross-border shopping in the total value of food sales, in the case of all three countries, an increase in the share of unregistered sales was recorded. The largest share and growth dynamics took place in Poland's trade relations with Ukraine (increase from 22.7% to 28.8%). In the case of Belarus the share of unregistered trade in foodstuffs in the total volume of trade in these items remained at a similar level (it totalled from 24.9% in 2013 to 25.4% in 2018). However, in the case of Russia the share of unregistered trade in food products increased from 3.6% in 2013 to 6.3% in 2018.

Most purchases of food items were made by foreigners who were cross-border shoppers on the Polish-Ukrainian border (from around PLN 560 million in 2013 to more than PLN 830 million in 2018). Despite the increase in the absolute value of sales within the cross-border trade, there was a decrease in the share of food products in unregistered sales, which indicates that during this period non-food products, including alcohol and industrial products, became increasingly important. On the Polish-Belarusian border there was a decrease in the absolute value of goods exported from Poland by foreigners (from around PLN 400 billion in 2013 to PLN 330 million in 2018); at the same time, the share of food products remained unchanged and amounted to some 13% throughout the research period, which allows us to conclude that the value of industrial goods and alcohol decreased in favour of food products. As regards Russia, the value of the goods exported in an unregistered manner decreased during the period under consideration from almost PLN 200 million to PLN 140 million. Similar trends were observed in the share of food products in unregistered trade (decrease from 33% to 26%). However, the importance of industrial goods in unregistered turnover increased significantly on this border section.

**Table 1.** Share of food items in Poland's exports to eastern neighbours while taking into account the unregistered sector (cross-border shopping) and the registered sector (the values of goods registered in customs clearance documents and EBOPS) in the years 2013–2018

| Year    | Expenditures in Poland of cross-border shoppers from neighbouring countries on the Polish section of the EU eastern border |   |            | Export value from Poland (the values of goods registered in customs clearance documents) and the value of services delivered by Poland (EBOPS) to neighbouring countries on the Polish section of the EU eastern border |                     |            | Unregistered expenditures of foreign consumers in Poland on food items (cross-border shopping) and Poland's exports of food items to neighbouring countries in customs clearance documents |  |
|---------|--|---|------------|---|---------------------|------------|--|--|
|         | total  | of which expenditures on food commodities |            | total   | share of food items |            | share of cross-border shopping in Poland's sales of food items   | share of food items in sales to neighbouring countries |
|         |  | thous. PLN                                | thous. PLN |   | % of total          | thous. PLN |  |  |
|         | 1  | 2   | 3          | 4   | 5                   | 6          | 7  | 8  |
| Ukraine |  |   |            |   |                     |            |  |  |
| 2018    | 7 481 067.3  | 830 135.0                                 | 11.10      | 32 809 363.5  | 2 056 270.0         | 6.27       | 28.76  | 7.16   |
| 2017    | 7 699 057.8  | 852 301.2                                 | 11.07      | 18 184 917.4  | 1 721 458.0         | 9.47       | 33.12  | 9.94   |
| 2016    | 7 148 199.2  | 764 653.9                                 | 10.70      | 15 059 264.4  | 1 419 767.0         | 9.43       | 35.00  | 9.84   |
| 2015    | 6 483 253.4  | 682 943.5                                 | 10.53      | 12 446 346.7  | 1 245 464.0         | 10.01      | 35.41  | 10.19  |
| 2014    | 5 679 321.0  | 762 674.9                                 | 13.43      | 17 768 319.3  | 1 496 402.0         | 8.42       | 33.76  | 9.63   |
| 2013    | 4 616 050.1  | 563 130.3                                 | 12.20      | 24 342 306.2  | 1 910 940.0         | 7.85       | 22.76  | 8.54   |
| Belarus |  |   |            |   |                     |            |  |  |
| 2018    | 2 431 662.3  | 334 196.7                                 | 13.74      | 6 133 739.4   | 982 883.6           | 16.02      | 25.37  | 15.38  |
| 2017    | 2 458 702.7  | 333 039.8                                 | 13.55      | 5 634 093.8   | 126 2356.0          | 22.41      | 20.88  | 19.71  |
| 2016    | 2 328 802.1  | 299 278.6                                 | 12.85      | 5 312 009.1   | 145 4516.0          | 27.38      | 17.06  | 22.95  |
| 2015    | 2 555 248.2  | 307 856.2                                 | 12.05      | 4 997 068.4   | 974 393.3           | 19.50      | 24.01  | 16.98  |
| 2014    | 3 101 506.5  | 338 423.7                                 | 10.91      | 10 263 504.7  | 1 141 534.0         | 11.12      | 22.87  | 11.07  |
| 2013    | 2 972 772.3  | 406 379.5                                 | 13.67      | 11 699 565.4  | 1 223 236.0         | 10.46      | 24.94  | 11.11  |
| Russia  |  |   |            |   |                     |            |  |  |
| 2018    | 552 159.8  | 143 841.1                                 | 26.05      | 33 262 998.2  | 2 154 770.0         | 6.48       | 6.26   | 6.80   |
| 2017    | 568 765.3  | 149 826.7                                 | 26.34      | 30 186 231.0  | 1 969 410.0         | 6.52       | 7.07   | 6.89   |
| 2016    | 484 287.3  | 130 923.1                                 | 27.03      | 26 566 878.2  | 1 606 976.0         | 6.05       | 7.53   | 6.42   |
| 2015    | 581 922.7  | 165 656.9                                 | 28.47      | 25 388 139.6  | 1 669 076.0         | 6.57       | 9.03   | 7.06   |
| 2014    | 842 417.9  | 204 292.8                                 | 24.25      | 34 164 847.4  | 3 679 519.0         | 10.77      | 5.26   | 11.09  |
| 2013    | 583 922.8  | 196 517.4                                 | 33.65      | 39 242 372.8  | 5 255 260.0         | 13.39      | 3.60   | 13.69  |

Column 8 calculated by equation  $[3 : (3 + 6)] \cdot 100$ ; Column 9 calculated by equation  $[(3 + 6) : (2 + 5)] \cdot 100$ .

Source: Author's own elaboration based on Yearbooks of Foreign Trade Statistics of Poland of the period 2014–2019 [GUS 2014, 2015, 2016, 2017, 2018, 2019] and annual reports on turnover of goods and services in border traffic on the EU external border in Poland in the period 2013–2018 [GUS – US Rzeszów 2014, 2015, 2016, 2017, 2018, 2019].

Unregistered purchases of food products in Poland made by foreign consumers crossing the external eastern EU border into Poland are an important supplement to registered sales made as part of exports. With the entire spectrum of political conditions<sup>1</sup> adversely affecting trade relations with the East, the share of unregistered trade increased during the entire research period, which positively influenced business relations

and which was important for Polish agriculture. This was of particular importance in relation to Ukraine, where there was an increase in the absolute value of unregistered expenses for food products throughout the entire research period.

One should point to the commodity pattern of the registered export of food products (Table 2), which is very diverse depending on the country. In the case of

**Table 2.** The value and structure of exports of food products registered in customs clearance documents from Poland to neighbouring countries on the Polish section of the EU external border

| Year    | Live animals and animal products |            | Vegetable products |            | Prepared foodstuffs |            | Fats and oils |            | Total food products |            |
|---------|----------------------------------|------------|--------------------|------------|---------------------|------------|---------------|------------|---------------------|------------|
|         | thous. PLN                       | % of total | thous. PLN         | % of total | thous. PLN          | % of total | thous. PLN    | % of total | thous. PLN          | % of total |
| Ukraine |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 504 742.1                        | 24.55      | 425 219.9          | 20.68      | 1 108 212.1         | 53.89      | 18 095.7      | 0.88       | 2 056 269.8         | 100.00     |
| 2017    | 406 393.7                        | 23.61      | 470 181.9          | 27.31      | 829 047.3           | 48.16      | 15 835.1      | 0.92       | 1 721 458.0         | 100.00     |
| 2016    | 309 581.5                        | 21.81      | 379 686.7          | 26.74      | 720 237.4           | 50.73      | 10 261.1      | 0.72       | 1 419 766.7         | 100.00     |
| 2015    | 269 379.5                        | 21.63      | 395 431.8          | 31.75      | 565 860.5           | 45.43      | 14 791.8      | 1.19       | 1 245 463.6         | 100.00     |
| 2014    | 328 242.2                        | 21.94      | 521 970.8          | 34.88      | 639 772.2           | 42.75      | 6 416.5       | 0.43       | 1 496 401.7         | 100.00     |
| 2013    | 492 024.7                        | 25.75      | 678 462.3          | 35.50      | 730 197.6           | 38.21      | 10 255.4      | 0.54       | 1 910 940.0         | 100.00     |
| Belarus |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 85 602.5                         | 8.71       | 721 834.8          | 73.44      | 171 224.6           | 17.42      | 4 221.7       | 0.43       | 982 883.6           | 100.00     |
| 2017    | 54 751.7                         | 4.34       | 1 034 273.6        | 81.93      | 173 330.9           | 13.73      | –             | –          | 1 262 356.2         | 100.00     |
| 2016    | 210 314.0                        | 14.46      | 1 100 922.1        | 75.69      | 143 280.2           | 9.85       | –             | –          | 1 454 516.3         | 100.00     |
| 2015    | 144 083.5                        | 14.79      | 681 102.4          | 69.90      | 147 664.2           | 15.15      | 1 543.2       | 0.16       | 974 393.3           | 100.00     |
| 2014    | 181 183.4                        | 15.87      | 79 7693.6          | 69.88      | 160 438.4           | 14.05      | 2 218.7       | 0.19       | 1 141 534.1         | 100.00     |
| 2013    | 554 685.4                        | 45.35      | 513 009.6          | 41.94      | 155 541.1           | 12.72      | –             | –          | 1 223 236.1         | 100.00     |
| Russia  |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 12 135.4                         | 0.56       | 276 844.7          | 12.85      | 1 830 441.1         | 84.95      | 35 348.6      | 1.64       | 2 154 769.8         | 100.00     |
| 2017    | 7 470.4                          | 0.38       | 270 858.5          | 13.75      | 1 644 545.8         | 83.50      | 46 534.8      | 2.36       | 1 969 409.5         | 100.00     |
| 2016    | 46 431.0                         | 2.89       | 252 119.6          | 15.69      | 1 308 425.0         | 81.42      | –             | –          | 1 606 975.6         | 100.00     |
| 2015    | 57 412.3                         | 3.44       | 249 243.4          | 14.93      | 1 334 575.8         | 79.96      | 27 844.0      | 1.67       | 1 669 075.5         | 100.00     |
| 2014    | 548 214.1                        | 14.90      | 139 9576.3         | 38.04      | 1 708 507.6         | 46.43      | 23 220.9      | 0.63       | 3 679 518.9         | 100.00     |
| 2013    | 1 350 771.5                      | 25.70      | 2 336 708.8        | 44.46      | 1 548 055.0         | 29.46      | 19 725.1      | 0.38       | 5 255 260.4         | 100.00     |

Source: Author's own elaboration based on Yearbooks of Foreign Trade Statistics of Poland of the period 2014–2019 [GUS 2014, 2015, 2016, 2017, 2018, 2019].

<sup>1</sup> On 7 August 2014, the Russian government introduced a ban on the imports of some agricultural products, including fruits and vegetables, from the European Union to the Russian Federation. In June 2015, the Russian authorities decided to continue the embargo until August 2016. On 29 June 2016, the ban was extended until the end of 2017, while in June 2017 – till the end of 2018.

Ukraine, over the period analysed there was a decline in the share of plant products and an increase in food preserves. Nevertheless, the share of live animals and animal products remained at a similar level in the period under consideration. In the case of Belarus, during the period analysed there was a decline in the share of live animals and animal products as well as an increase in plant products, while food preserves remained at a similar level throughout the considered period. In the case of Russia, during the period under consideration there was a decrease in the share of live animals and animal products, as well as of plant products, while a clear increase was noted with regard to food preserves. Trends in export dynamics were the reflection of political conditions.

#### **THE SHARE OF CROSS-BORDER SHOPPING IN FOOD PRODUCTS IMPORT TO POLAND FROM NEIGHBOURING COUNTRIES ON THE EU EXTERNAL BORDER IN 2013–2018**

In the years 2013–2018, varied trends were noted in the value and share of the food sector in Poland's imports from, neighbouring countries located at the external eastern border of the European Union (Table 3). In the case of Ukraine, there was a drop in the value of unregistered imports, both in the total volume of goods and in the value of foodstuffs. Yet the share of food products in the structure of unregistered purchases tended to increase (from 10% to 11%), which indicates that declines in the value of unregistered purchases of industrial goods were greater than those recorded in the case of food products. Similar trends were noted with regard to Russia. During the period 2013–2018, there was a clear drop in the value of unregistered purchases, both in the total volume of goods and in the group of food products. At the same time, there was an increase in the share of food products in the general structure of unregistered purchases made by Polish citizens in Russia (mainly in the Kaliningrad Oblast), which indicates that declines in the value of non-food products were greater than those in the value of foodstuffs. In the case of Belarus, there was an increase in both the absolute value of the total volume of goods brought by cross-border shoppers and in the value of food products brought to Poland. The share of food expenses in unreg-

istered purchases increased from 3% to 5.5% during this period. It is worth noting that regardless of the trends in the absolute value of unregistered purchases, in the case of all three countries there was an increase in the share of food products in the pattern of cross-border trade.

As regards the imports registered in custom clearance documents, in terms of the absolute value the trends varied widely between individual countries. In the case of Ukraine, a steady upward trend was recorded (from PLN 1.4 billion in 2013 to PLN 2.4 billion in 2018). Throughout the entire research period, the share of food products in the registered trade with Poland's south-eastern neighbour was at the level of 18–21%, with the highest rates recorded in the years 2015–2016 (over 20%), and with the lowest rates noted in the years 2013–2014 (17–18%). In the case of Belarus and Russia, the share of food products recorded in the customs clearance documents was much lower and totalled around 2% and 1%, respectively. As regards the value of the registered import of food products from these countries to Poland, an upward trend was recorded. In addition, in relation to the total value of imports, food products took low import positions.

By treating food imports with the countries neighbouring Poland in the east as the total value of the registered imports as well as of unregistered purchases made by cross-border shoppers, we can point out that the greatest share of foodstuffs was noted on the border with Ukraine; it totalled from 17% to 21%, and in the years 2013–2018 it grew slowly, while from 2015 to 2018, there was a downward trend. However, the imports of food products from Belarus and Russia were relatively smaller, and the share of this group of commodities amounted to 2% and 0.5–1%, respectively. The share of cross-border shopping in the import of goods was the highest on the border with Belarus, and it was slightly smaller, even minimal, on the border with Ukraine and Russia.

In the structure of the import of food products to Poland from neighbouring countries on the external section of the eastern border of the European Union, registered in customs clearance documents (Table 4), the relatively highest values were recorded in trade with Ukraine. Plant products played an important role in this field, although during the period under consideration their share tended to decline from almost 50%

**Table 3.** Share of food items in Poland's imports from eastern neighbours while taking into consideration the unregistered sector (cross-border shopping) and the registered sector (the values of goods registered in customs clearance documents and EBOPS) in the years 2013–2018

| Year    | Expenditures of Polish cross-border shoppers in neighbouring countries on the Polish section of the EU eastern border |                     |            | Imports of Polish goods registered in customs clearance documents and expenditures on services purchased by Polish citizens (EBOPS) in neighbouring countries on the Polish section of the EU eastern border |                     |            | Unregistered Polish consumer expenditures on food items in neighbouring countries on the Polish section of the EU eastern border (cross-border shopping) and Poland's imports of food items from neighbouring countries in customs clearance documents |   |
|---------|---|---------------------|------------|--|---------------------|------------|--|---|
|         | total   | of which food items |            | total  | of which food items |            | share of cross-border shopping in Poland's imports of non-food items from neighbouring countries   | share of food items in Poland's imports from neighbouring countries |
|         |   | thous. PLN          | % of total |  | thous. PLN          | % of total |  |   |
|         | 1   | 2                   | 3          | 4  | 5                   | 6          | 7  | 8   |
| Ukraine |   |                     |            |  |                     |            |  |   |
| 2018    | 205 143.4   | 22 586.2            | 11.01      | 12 711 417.8   | 2 429 905.1         | 19.12      | 0.92   | 18.99   |
| 2017    | 212 596.5   | 22 619.9            | 10.64      | 11 025 435.8   | 2 170 821.3         | 19.69      | 1.03   | 19.52   |
| 2016    | 225 615.8   | 23 749.6            | 10.53      | 9 314 528.2  | 1 919 892.4         | 20.61      | 1.22   | 20.37   |
| 2015    | 213 781.9   | 23 099.0            | 10.80      | 7 513 637.1  | 1 605 988.0         | 21.37      | 1.42   | 21.08   |
| 2014    | 203 267.4   | 21 344.0            | 10.50      | 8 045 023.2  | 1 506 714.4         | 18.73      | 1.40   | 18.53   |
| 2013    | 241 338.0   | 24 203.9            | 10.03      | 8 244 281.6  | 1 463 457.3         | 17.75      | 1.63   | 17.53   |
| Belarus |   |                     |            |  |                     |            |  |   |
| 2018    | 93 329.4  | 5 100.4             | 5.46       | 7 781 991.5  | 142 555.7           | 1.83       | 3.45   | 1.87  |
| 2017    | 91 468.0  | 4 881.7             | 5.34       | 5 572 296.9  | 57 004.4            | 1.02       | 7.89   | 1.09  |
| 2016    | 79 065.2  | 4 232.9             | 5.35       | 3 714 238.2  | 51 336.8            | 1.38       | 7.62   | 1.46  |
| 2015    | 79 042.7  | 4 254.0             | 5.38       | 7 130 187.5  | 84 291.4            | 1.18       | 4.80   | 1.23  |
| 2014    | 90 432.8  | 4 739.3             | 5.24       | 3 213 878.5  | 36 124.0            | 1.12       | 11.60  | 1.24  |
| 2013    | 79 535.6  | 2 463.9             | 3.10       | 3 072 770.1  | 63 209.2            | 2.06       | 3.75   | 2.08  |
| Russia  |   |                     |            |  |                     |            |  |   |
| 2018    | 206 394.2   | 4 563.4             | 2.21       | 74 294 374.9   | 530 697.0           | 0.71       | 0.85   | 0.72  |
| 2017    | 224 865.6   | 4 492.3             | 2.00       | 58 290 292.2   | 343 686.7           | 0.59       | 1.29   | 0.60  |
| 2016    | 283 008.9   | 3 912.8             | 1.38       | 46 825 223.8   | 637 315.9           | 1.36       | 0.61   | 1.36  |
| 2015    | 443 803.5   | 6 067.6             | 1.37       | 55 506 576.0   | 751 323.9           | 1.35       | 0.80   | 1.35  |
| 2014    | 454 722.2   | 6 556.5             | 1.44       | 74 793 888.6   | 673 159.1           | 0.90       | 0.96   | 0.90  |
| 2013    | 377 539.5   | 7 309.9             | 1.94       | 81 728 469.9   | 376 067.0           | 0.46       | 1.91   | 0.47  |

Column 8 calculated by equation  $[3 : (3 + 6)] \cdot 100$ ; Column 9 calculated by equation  $[(3 + 6) : (2 + 5)] \cdot 100$ .

Source: Author's own elaboration based on Yearbooks of Foreign Trade Statistics of Poland of the period 2014–2019 [GUS 2014, 2015, 2016, 2017, 2018, 2019] and annual reports on turnover of goods and services in border traffic on the EU external border in Poland in the period 2013–2018 [GUS – US Rzeszów 2014, 2015, 2016, 2017, 2018, 2019].

**Table 4.** The value and structure of imports of food products as registered in customs clearance documents from Poland to neighbouring countries on the Polish section of the EU external border

| Year    | Live animals and animal products |            | Vegetable products |            | Prepared foodstuffs |            | Fats and oils |            | Total food products |            |
|---------|----------------------------------|------------|--------------------|------------|---------------------|------------|---------------|------------|---------------------|------------|
|         | thous. PLN                       | % of total | thous. PLN         | % of total | thous. PLN          | % of total | thous. PLN    | % of total | thous. PLN          | % of total |
| Ukraine |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 304 331.9                        | 12.5       | 855 756.2          | 35.2       | 721 004.3           | 29.7       | 548 812.7     | 22.6       | 2 429 905.1         | 100.0      |
| 2017    | 155 347.0                        | 7.2        | 767 384.3          | 35.3       | 683 722.4           | 31.5       | 564 367.6     | 26.0       | 2 170 821.3         | 100.0      |
| 2016    | 119 971.0                        | 6.2        | 838 128.8          | 43.7       | 613 991.3           | 32.0       | 347801.3      | 18.1       | 1 919 892.4         | 100.0      |
| 2015    | 72 221.1                         | 4.5        | 717 443.1          | 44.7       | 600 004.5           | 37.4       | 216 319.3     | 13.5       | 1 605 988.0         | 100.0      |
| 2014    | 86 032.6                         | 5.7        | 724 878.7          | 48.1       | 500 626.6           | 33.2       | 195 176.5     | 13.0       | 1 506 714.4         | 100.0      |
| 2013    | 67 084.0                         | 4.6        | 721 354.0          | 49.3       | 473 084.1           | 32.3       | 201 935.2     | 13.8       | 1 463 457.3         | 100.0      |
| Belarus |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 7 303.7                          | 5.1        | 71 210.5           | 50.0       | 24 123.8            | 16.9       | 39 917.7      | 28.0       | 142 555.7           | 100.0      |
| 2017    | 5 697.1                          | 10.0       | 44 372.3           | 77.8       | 6 935.0             | 12.2       | –             | –          | 57 004.4            | 100.0      |
| 2016    | 3 017.3                          | 5.9        | 42 104.4           | 82.0       | 6 215.1             | 12.1       | –             | –          | 51 336.8            | 100.0      |
| 2015    | 1 201.7                          | 1.4        | 45 199.5           | 53.6       | 10 635.4            | 12.6       | 27 254.8      | 32.3       | 84 291.4            | 100.0      |
| 2014    | 454.6                            | 1.3        | 17 375.2           | 48.1       | 14 821.6            | 41.0       | 3 472.6       | 9.6        | 36 124.0            | 100.0      |
| 2013    | 414.3                            | 0.7        | 48 334.6           | 76.5       | 14 460.3            | 22.9       | –             | –          | 63 209.2            | 100.0      |
| Russia  |                                  |            |                    |            |                     |            |               |            |                     |            |
| 2018    | 126 665.6                        | 23.9       | 124 192.1          | 23.4       | 261 336.2           | 49.2       | 18 503.1      | 3.5        | 530 697.0           | 100.0      |
| 2017    | 80 674.3                         | 23.5       | 109 436.5          | 31.8       | 137 812.5           | 40.1       | 15 763.4      | 4.6        | 343 686.7           | 100.0      |
| 2016    | 302 384.1                        | 47.4       | 110 382.5          | 17.3       | 224 549.3           | 35.2       | –             | –          | 637 315.9           | 100.0      |
| 2015    | 248 897.4                        | 33.1       | 167 273.1          | 22.3       | 317 601.8           | 42.3       | 17 551.6      | 2.3        | 751 323.9           | 100.0      |
| 2014    | 217 331.5                        | 32.3       | 104 010.5          | 15.5       | 337 845.8           | 50.2       | 13 971.3      | 2.1        | 673 159.1           | 100.0      |
| 2013    | 170 408.6                        | 45.3       | 66 353.5           | 17.6       | 118 903.2           | 31.6       | 20 401.7      | 5.4        | 376 067.0           | 100.0      |

Source: Author's own elaboration based on Yearbooks of Foreign Trade Statistics of Poland of the period 2014–2019 [GUS 2014, 2015, 2016, 2017, 2018, 2019].

in 2013 to some 35% in 2018. Throughout the entire research period, food preserves accounted for about 30%, and their share tended to vary. However, the import of live animals and animal products gradually increased – from 5% to 12%, and the import of oils and fats – from 13% to 22%. To sum up, in the case of Ukraine during the period under consideration there was a decrease in the share of plant products as well as an increase in the share of food preserves and fats.

Both in the case of Russia and Belarus the value of the registered import of food products in 2018 was higher than in 2013. However, as regards Belarus there was a steady upward trend, whereas for Russia the

years 2013–2016 were the period of the most dynamic changes, and this value declined. In the imports from Belarus, plant products had the largest share in the trade pattern (from over 70% in 2013 to about 50% in 2018, and to more than 80% in 2017). Of the remaining groups of goods, food preserves were of significant importance (over 10–15%), but their share declined over the whole period under study. Live animals and animal products were relatively the least important. In the structure of the registered import of food products from Russia, two groups of goods were of great importance: animal products and live animals, as well as food preserves. The share of the first of the above-mentioned

groups of goods systematically decreased (from 45% to 24%), while the share of the second group grew (from 31% to 49%). Plant products were of minor importance; however, the steady growth of this group of goods was worth noting (from 17% to 23%) in the structure of imports of food products from Russia to Poland.

## CONCLUSIONS

As a result of the analysis conducted in the study, it was found that over the period 2013–2018 the international trade in food products between Poland and its eastern neighbours underwent significant changes. However, some similarities were noted in the Belarusian and Russian direction, whereas trade in food products with Ukraine had a distinctly different character. Exports in absolute values (both registered and unregistered sales) of food products from Poland to the Russian and Belarusian markets in the years 2013–2018 were much greater than the import of food products from these countries. However, in the case of Ukraine, in the early years of the research period exports exceeded imports, whereas from 2014 onwards, the reverse trend was observed and the import of food products from Ukraine exceeded exports. This tendency continued until the end of the period under consideration. There was also a steady increase in unregistered trade contacts on the border with Ukraine, and a decline in these contacts on the Russian and Belarusian border sections was noted. Regardless of the absolute values, in the case of all three countries there was a steady increase in the share of unregistered trade in the total volume of trade turnover throughout the whole research period.

When comparing the period 2013–2018 with the years 2010–2012, some similarities should be noted with regard to the Polish trade turnover with neighbours located on the eastern side of the EU border. First of all, there was a continuation of the trend showing that the export (comprising registered and unregistered sector together) of Polish food products to the Russian and Belarusian markets was much greater than the import of food items from these countries. However, in trade with Ukraine, differences in the values of imports and exports were smaller, whereas in the case of Russia and Belarus exports definitely exceeded imports, which was recorded both in the registered and unregistered sector.

The trend regarding the absolute value of unregistered food purchases made within the cross-border trade in Poland also changed. During the period 2013–2018, the value of purchases made by Belarusian citizens increased, while the value of purchases made by Ukrainian and Russian consumers decreased. On the other hand, in the years 2010–2012, there was an increase in the absolute value of purchases of food products made by the citizens of all three countries in Poland, and the value of unregistered purchases of food products made by Polish citizens in the neighbouring countries declined. This trend continued for Russia and Belarus, while in Ukraine in the years 2013–2018 Polish cross-border shoppers bought more and more goods.

All in all, in the years 2013–2018 trade turnover of food products between Poland and its neighbouring countries on the external border of the European Union was an important element of Poland's international trade. Registered turnover had an impact on Poland's economy, whereas from the point of view of the development of areas located in the border impact zone the unregistered turnover that was part of cross-border trade played an important role.

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## **UDZIAŁ HANDLU PRZYGRANICZNEGO W OBROTACH HANDLOWYCH ARTYKUŁAMI ŻYWNOŚCIOWYMI POLSKI Z KRAJAMI SĄSIADUJĄCYMI NA ZEWNĘTRZNEJ GRANICY UNII EUROPEJSKIEJ W LATACH 2013–2018**

### **STRESZCZENIE**

Obroty handlowe artykułami żywnościowymi między Polską a krajami sąsiadującymi na zewnętrznej granicy Unii Europejskiej (Ukraina, Białoruś, Rosja) stanowią istotny element międzynarodowej wymiany handlowej naszego kraju. Rejestrowane obroty miały wpływ na gospodarkę Polski, z punktu widzenia rozwoju obszarów położonych w strefie oddziaływania granicy ważną rolę odgrywały obroty nierejestrowane dokonywane w ramach handlu przygranicznego. Celem artykułu jest zbadanie dynamiki i tendencji zmian w zakresie udziału handlu przygranicznego w globalnych obrotach handlowych artykułami żywnościowymi z wymienionymi krajami w latach 2013–2018. W wyniku przeprowadzonej analizy przypadku wszystkich trzech krajów odnotowano stały wzrost udziału handlu nierejestrowanego w ogólnej puli obrotów handlowych przez cały okres badawczy.

**Słowa kluczowe:** artykuły żywnościowe, handel przygraniczny na wschodniej granicy Polski, handel zagraniczny

## EUROPEAN UNION FUNDING FOR PRESERVATION OF RELIGIOUS CULTURAL HERITAGE IN POLAND

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### ABSTRACT

As there is a dynamic relation between religious cultural heritage, tourism and local development, the European Union supports preservation of religious heritage through regional policy funds available in Poland under operational programmes. The aim of the research was to define and look into the main outcomes of this support, based on qualitative and quantitative data from SIMIK 2007–2013 and central teleinformation system (CTS) SL2014 for 2014–2020. Findings show that the 618 projects for the preservation of religious cultural heritage in Poland comprised a very small share of all investments under operational programmes. They were also a very small share of the total value of all projects and of EU funding co-financing them. However, comparing the financial perspective of 2007–2013 and 2014–2020, there is an increase in the number of these investments and in the number of projects that obtained the best relation of EU funding to their total value, i.e. 85%.

**Key words:** religious cultural heritage, EU funding, local development, tourism

**JEL codes:** Z32, L83, Z12

### INTRODUCTION

Religious heritage is a significant element of cultural heritage in many social and economic contexts [Smith 2009, Fadare and Benson 2015]. Because of Polish history, tangible religious heritage, including sacral historical objects and their contents, composes a significant part of the national, regional and local cultural heritage [Rohrscheidt 2011]. Bearing the same qualities as cultural heritage, i.e. aesthetic, spiritual, social, and historical values, as well as symbolic and educational values [Cohen 2006, Throsby 2016], religious heritage is crucial for maintaining identity and traditions of local communities [International Council of Monuments and Sites 1999]. It is also a fundament for developing pilgrimage and religious tourism [Jackowski 2005,

Sołjan 2007, Kowalski and Ruszkowski 2011], which can stimulate local and regional economies – giving them momentum and further contributing to their development [Vukonić 1998, Richards 2001, Vukonic 2002, Małek 2003, Pytel 2010, Hełpa-Liszkowska 2013, MSiT RP 2015]. On the other hand, due to its growing commercialisation and environmental impact [McKercher and du Cross 2012, Raj and Griffin 2015], religious tourism can generate adverse effects, putting religious heritage at risk of being damaged or destroyed.

All the above-mentioned characteristics make religious heritage an important but rather fragile factor of tourism development, requiring support, protection and preservation. As there is a dynamic relation between religious heritage, tourism and development,

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the European Union provides support through its regional policy funding, available under operational programmes in eligible regions of the EU member states. Poland has obtained the biggest share of EU regional policy funding for eligible member states in financial perspectives of 2007–2013 and 2014–2020. However, no exact amount of EU funding was assigned to any particular category of beneficiaries, e.g. only churches or religious associations. There was also no funding allocated specifically to support projects connected with preservation of religious heritage. The funding was addressed to a wider range of beneficiaries and assigned to more general categories of investments. That is why there is a question as to the outcome of EU funding support for the preservation of religious heritage.

## AIM AND METHOD

The main aim of the research was to define the outcome of EU funding support for the preservation of religious heritage in Poland under operational programmes 2007–2013 and 2014–2020. The main aim was supplemented by answers to the following sub-questions: How many and what kind of projects connected with the preservation of religious heritage were co-financed from EU funding? Under which programmes and actions were they co-financed? Who were the beneficiaries? Were there any regional differences?

Since the analysed investments required that the beneficiaries match with a domestic contribution to eligible costs and funds covering non-eligible costs in full if they occurred, the next question was: To what extent did the EU funding financially support realisation of the analysed projects? Were there any correlations between the total value of the projects and EU funding?

Due to its aim, the research is of explorative character. It is based on secondary, qualitative and quantitative data from the Ministry of Development databases SIMIK 2007–2013 (as of 31 December 2015) and SIMIK 2014–2020 (as of 30 September 2020), which look at EU funding in Poland. Methods of qualitative data analysis were applied to extract and analyse data on the character of the projects, while descriptive statistics were used to analyse the following categories

of financial data: total value of projects, eligible costs, value of EU funding, and their relationships.

## RESULTS AND DISCUSSION

Since 2007, 618 projects resulting in preservation of religious cultural heritage have been carried out in Poland with the support of EU regional policy funding. They comprised a very small share of all projects carried out in 2007–2013 and 2014–2020 financial perspectives (0.2% and 0.5% respectively), and a very small share of total EU funding absorbed by Polish beneficiaries under operational programme 2007–2013 and 2014–2020 (0.3% and 0.4%, respectively).

Although the financial perspective of 2014–2020 is not yet over, most of the analysed projects were co-financed by EU funding under operational programmes 2014–2020 (60%). And as this financial perspective is still on-going, this share will increase. In both financial perspectives investments in preservation of religious heritage were co-financed under Operational Programme Infrastructure and Environment (OP I&E) and Regional Operational Programmes (ROP). Due to the general assumptions of EU regional policy, both OPs Infrastructure and Environment covered the whole country and were designed to co-finance projects of high total value, while ROPs were designed for each region individually and had no assumption on the total value of projects. Both OP I&Es and ROPs could support investments up to 85% of their eligible costs.

Considering OP E&Is, there was a significant increase in the number of the analysed projects carried out in 2007–2013 and 2014–2020. All investments in preservation of religious heritage in 2007–2013 and nearly all (except 2) in 2014–2020 were carried out by the Catholic Church. European Union structural funds were obtained for renovation and/or conservation of, for example: revalorization of the Krzeszów Cistercian Abbey with its surroundings; Bernardine monastery complex with the Basilica of the Assumption of the Blessed Virgin Mary in Leżajsk; the interior of the pearl of early Gothic sacral architecture – the Cathedral Basilica of the Nativity of the Blessed Virgin Mary in Sandomierz; the Jasna Góra Pauline Monastery in Częstochowa; the Basilica of the Dominican Order of St. Stanislaus in Lublin; objects of sacral wooden

**Table 1.** Descriptive statistics for EU funds supporting projects to preserve religious heritage under operational programmes 2007–2013 in Poland

| Source of EU funds 2007–2013      | Number of projects | EU funds total value (million PLN) | EU funds per project (million PLN) |       |       |       |       |       |
|-----------------------------------|--------------------|------------------------------------|------------------------------------|-------|-------|-------|-------|-------|
|                                   |                    |                                    | min                                | max   | range | AVG   | M     | SD    |
| OP Infrastructure and Environment | 3                  | 71.62                              | 20.55                              | 26.15 | 5.60  | 23.87 | 24.92 | 2.94  |
| ROP Dolnośląskie                  | 25                 | 50.77                              | 0.06                               | 13.69 | 13.64 | 2.03  | 0.90  | 2.94  |
| ROP Kujawsko-pomorskie            | 8                  | 13.94                              | 0.20                               | 9.48  | 9.29  | 1.74  | 0.69  | 3.14  |
| ROP Lubelskie                     | 26                 | 93.51                              | 0.66                               | 10.00 | 9.34  | 3.60  | 2.43  | 2.70  |
| ROP Lubuskie                      | 1                  | 5.14                               | –                                  | –     | –     | 5.14  | –     | –     |
| ROP Łódzkie                       | 3                  | 64.49                              | 2.04                               | 40.19 | 38.15 | 21.50 | 22.26 | 19.09 |
| ROP Małopolskie                   | 12                 | 41.02                              | 0.84                               | 8.87  | 8.03  | 3.42  | 2.49  | 2.81  |
| ROP Mazowieckie                   | 27                 | 73.97                              | 0.37                               | 17.77 | 17.40 | 2.74  | 0.74  | 4.49  |
| ROP Opolskie                      | 9                  | 11.42                              | 0.34                               | 3.06  | 2.72  | 1.27  | 0.87  | 1.00  |
| ROP Podkarpackie                  | 26                 | 72.40                              | 0.08                               | 24.28 | 24.20 | 2.78  | 1.86  | 4.68  |
| ROP Podlaskie                     | 9                  | 45.85                              | 0.28                               | 11.59 | 11.30 | 5.09  | 5.00  | 3.88  |
| ROP Pomorskie                     | 14                 | 33.06                              | 0.07                               | 5.36  | 5.29  | 2.36  | 3.10  | 1.83  |
| ROP Śląskie                       | 24                 | 95.75                              | 0.19                               | 26.40 | 26.22 | 3.99  | 1.76  | 5.62  |
| ROP Świętokrzyskie                | 32                 | 22.06                              | 0.09                               | 3.84  | 3.75  | 0.69  | 0.43  | 0.77  |
| ROP Warmińsko-mazurskie           | 9                  | 8.41                               | 0.15                               | 2.33  | 2.18  | 0.93  | 0.72  | 0.66  |
| ROP Wielkopolskie                 | 10                 | 53.04                              | 1.22                               | 9.65  | 8.43  | 5.30  | 4.57  | 3.32  |
| ROP Zachodnio-pomorskie           | 10                 | 17.64                              | 0.63                               | 3.86  | 3.22  | 1.76  | 1.49  | 0.95  |
| All OPs                           | 248                | 774.08                             | 0.06                               | 40.19 | 40.13 | 3.12  | 1.49  | 4.99  |

Source: Author's elaboration based on SIMIK 2007–2013 data.

architecture of the Wielkopolska region and the Kalisz Diocese; the complex of the three oldest churches in Gniezno; the Cathedral Basilica of the Assumption and historic post-Cistercian buildings in Pelplin; the 14th-century defensive and cathedral complex in Frombork; the historic Church of the Holy Spirit and All Saints Church in Warsaw; a wooden UNESCO monument – Church of the Holy Trinity (Church of Peace) in Świdnica; the largest Baroque Franciscan church in Poland – Church of the Annunciation to the Blessed Virgin Mary in Zamość; the monastery complex of St. Joseph in Gdańsk; wooden monuments of the Archdiocese of Gniezno; the Primatial Cathedral Basilica of the Assumption of the Blessed Virgin Mary and

Shrine of St. Adalbert (Royal Gniezno Cathedral) in Gniezno; wooden monuments of the Lubawa Region; the Basilica of the Holy Trinity in Kraków; the Gothic Basilica of St. James and St. Agnes in Nysa; Church of Our Lady Assumed into Heaven (St. Mary's Basilica) in Gdańsk; the cultural heritage of Western Pomerania; newly discovered, unique polychromes in the crypt of the Church of the Piarist Order of the Transfiguration of Christ; the historic collegiate Church of the Blessed Virgin Mary, Queen of the World in Stargard.

Other beneficiaries carried out only two projects preserving their religious heritage. Those were: Evangelical-Augsburg parish in Świdnica, who did the conservation and renovation of the wooden the Church of

**Table 2.** Share of EU funding in total value of projects to preserve religious heritage under operational programmes 2007–2013 in Poland

| Source of EU funds 2007–2013      | Projects total value (million PLN) | EU funds total value (million PLN) | Share of EU funds in total value (%) |     |       |     |    |    |
|-----------------------------------|------------------------------------|------------------------------------|--------------------------------------|-----|-------|-----|----|----|
|                                   |                                    |                                    | min                                  | max | range | AVG | M  | SD |
| OP Infrastructure and Environment | 86.4                               | 71.62                              | 80                                   | 85  | 5     | 83  | 84 | 3  |
| ROP Dolnośląskie                  | 76.6                               | 50.77                              | 38                                   | 70  | 32    | 64  | 69 | 10 |
| ROP Kujawsko-pomorskie            | 23.8                               | 13.94                              | 23                                   | 84  | 61    | 60  | 67 | 19 |
| ROP Lubelskie                     | 140.2                              | 93.51                              | 32                                   | 85  | 53    | 67  | 70 | 12 |
| ROP Lubuskie                      | 5.14                               | 5.14                               | –                                    | –   | –     | –   | –  | –  |
| ROP Łódzkie                       | 81.0                               | 64.49                              | 72                                   | 85  | 13    | 78  | 79 | 7  |
| ROP Małopolskie                   | 73.8                               | 41.02                              | 33                                   | 64  | 31    | 52  | 50 | 11 |
| ROP Mazowieckie                   | 95.3                               | 73.97                              | 55                                   | 85  | 30    | 77  | 79 | 9  |
| ROP Opolskie                      | 16.0                               | 11.42                              | 35                                   | 85  | 50    | 75  | 81 | 17 |
| ROP Podkarpackie                  | 94.5                               | 72.40                              | 11                                   | 85  | 78    | 74  | 83 | 18 |
| ROP Podlaskie                     | 58.4                               | 45.85                              | 64                                   | 85  | 21    | 76  | 75 | 7  |
| ROP Pomorskie                     | 41.9                               | 33.06                              | 74                                   | 85  | 11    | 80  | 80 | 5  |
| ROP Śląskie                       | 117.7                              | 95.75                              | 74                                   | 85  | 11    | 80  | 80 | 5  |
| ROP Świętokrzyskie                | 37.1                               | 22.06                              | 28                                   | 85  | 57    | 78  | 83 | 13 |
| ROP Warmińsko-mazurskie           | 12.6                               | 8.41                               | 46                                   | 60  | 14    | 59  | 60 | 3  |
| ROP Wielkopolskie                 | 79.6                               | 53.04                              | 51                                   | 81  | 30    | 66  | 67 | 9  |
| ROP Zachodnio-pomorskie           | 28.9                               | 17.64                              | 55                                   | 72  | 17    | 67  | 70 | 5  |
| All OPs                           | 1070.2                             | 774.08                             | 41                                   | 75  | 34    | 62  | 68 | 15 |

Source: Author's elaboration based on the SIMIK 2007–2013 data.

the Holy Trinity (Church of Peace) – UNESCO heritage site, and the Orthodox Lublin-Chełm Diocese who did conservation, renovation and digitization of wooden churches and their equipment in the Małopolska, the Podkarpacie, the Lubelszczyzna and the Podlasie regions.

The total value of individual projects under both OPI&Es ranged from PLN 7.8 million to PLN 31.2 million with a mean of 19 million. In general, the value of EU funding per project ranged from 6.6 million PLN to 26.2 million PLN, and the mean equalled nearly 20 million; however, these values varied if considered separately for 2007–2013 and 2014–2020 (Tables 1 and 3). The share of EU funding in the total value

of projects ranged from 67% to 85% (Tables 2 and 4); however, most of the projects aimed at preservation of religious heritage (22 out of 40) were supported to the maximum level, i.e. 85% of eligible costs, and at the same time 85% of total costs, as there were no non-eligible costs in those projects.

Since 2007 the majority of projects aimed at preservation of religious heritage were co-financed by EU funding under regional operational programmes. All the projects aimed at renovation, restoration or conservation of religious heritage, its digitalization or increasing its accessibility to visitors, similarly to projects listed above as examples for the OP I&E. However, some of the projects under the ROPs also

**Table 3.** Descriptive statistics for EU funds supporting projects to preserve religious heritage under operational programmes 2014–2020 in Poland

| Source of EU funds 2014–2020      | Number of projects | EU funds total value (million PLN) | EU funds per project (million PLN) |       |       |       |       |       |
|-----------------------------------|--------------------|------------------------------------|------------------------------------|-------|-------|-------|-------|-------|
|                                   |                    |                                    | min                                | max   | range | AVG   | M     | SD    |
| OP Infrastructure and Environment | 37                 | 560.78                             | 6.55                               | 23.71 | 17.16 | 15.16 | 15.99 | 3.86  |
| ROP Dolnośląskie                  | 21                 | 33.49                              | 0.17                               | 5.43  | 5.26  | 1.59  | 1.00  | 1.51  |
| ROP Kujawsko-pomorskie            | 8                  | 1.38                               | 0.09                               | 0.30  | 0.21  | 0.17  | 0.10  | 0.10  |
| ROP Lubelskie                     | 29                 | 55.16                              | 0.36                               | 6.98  | 6.62  | 1.90  | 1.56  | 1.48  |
| ROP Lubuskie                      | –                  | –                                  | –                                  | –     | –     | –     | –     | –     |
| ROP Łódzkie                       | 6                  | 25.75                              | 0.71                               | 14.78 | 14.07 | 4.29  | 2.28  | 5.27  |
| ROP Małopolskie                   | 12                 | 52.71                              | 0.87                               | 7.24  | 6.37  | 4.39  | 5.29  | 2.75  |
| ROP Mazowieckie                   | 30                 | 49.39                              | 0.20                               | 8.38  | 8.17  | 1.65  | 1.01  | 1.69  |
| ROP Opolskie                      | 14                 | 22.72                              | 0.29                               | 3.99  | 3.70  | 1.62  | 1.31  | 1.26  |
| ROP Podkarpackie                  | 33                 | 60.87                              | 0.26                               | 3.86  | 3.60  | 1.84  | 1.99  | 0.88  |
| ROP Podlaskie                     | 50                 | 28.35                              | 0.06                               | 6.28  | 6.22  | 0.57  | 0.20  | 1.13  |
| ROP Pomorskie                     | 8                  | 88.47                              | 0.68                               | 27.50 | 26.82 | 11.06 | 8.29  | 10.76 |
| ROP Śląskie                       | 31                 | 120.67                             | 0.15                               | 18.26 | 18.11 | 3.89  | 2.00  | 4.57  |
| ROP Świętokrzyskie                | 10                 | 6.90                               | 0.28                               | 2.78  | 2.51  | 0.69  | 0.48  | 0.74  |
| ROP Warmińsko-mazurskie           | 47                 | 84.23                              | 0.07                               | 12.29 | 12.22 | 1.79  | 0.70  | 2.48  |
| ROP Wielkopolskie                 | 15                 | 63.41                              | 0.09                               | 12.23 | 12.14 | 4.23  | 2.99  | 3.53  |
| ROP Zachodnio-pomorskie           | 19                 | 34.56                              | 0.10                               | 3.00  | 2.90  | 1.82  | 2.46  | 1.08  |
| All OPs                           | 370                | 1 288.83                           | 0.06                               | 27.50 | 27.44 | 3.48  | 1.45  | 5.12  |

Source: Author's elaboration based on SIMIK 2014–2020 data.

included installation of renewable energy sources at religious heritage sites.

Their total value ranged from PLN 0.7 million to PLN 40 million, and the share of EU funding in total costs ranged from only 11% to 85%. The number, total cost of projects and the value of EU funding varied significantly in Polish regions. In 2007–2013 most projects for preservation of religious heritage were carried out in the Świętokrzyskie; however, the biggest value of EU funding was obtained by projects in the Śląskie. Beneficiaries in both these regions gained the best relation of EU funding to total costs of projects (Tables 1 and 2). The fewest projects were co-financed in the Lubuskie and the Łódzkie.

In 2014–2020 the biggest number of projects under ROPs was carried out in the Warmińsko-Mazurskie and the Podlaskie (47 and 50, respectively). Beneficiaries from the Śląskie obtained the highest total value of EU funding – PLN 120 million, while projects in the Pomorskie had the highest mean of EU funding per investment, i.e. PLN 11 million. There were no projects of this kind in the Lubuskie (Tables 3 and 4).

Taking into consideration who carried out the projects, the majority of investments in preservation of religious heritage were carried out by the Catholic Church and its institutions: in 2007–2013 they did 95% of all projects, and in 2014–2020 – so far – 92%. Other beneficiaries were (in order by decreas-

**Table 4.** Share of EU funding in total value of projects to preserve religious heritage under operational programmes 2014–2020 in Poland

| Source of EU funds 2014–2020      | Projects total value (million PLN) | EU funds total value (million PLN) | Share of EU funds in total value (%) |     |       |     |    |    |
|-----------------------------------|------------------------------------|------------------------------------|--------------------------------------|-----|-------|-----|----|----|
|                                   |                                    |                                    | min                                  | max | range | AVG | M  | SD |
| OP Infrastructure and Environment | 674.83                             | 30.72                              | 67                                   | 85  | 18    | 83  | 85 | 4  |
| ROP Dolnośląskie                  | 48.81                              | 15.32                              | 11                                   | 85  | 74    | 73  | 82 | 21 |
| ROP Kujawsko-pomorskie            | 2.21                               | 5.60                               | 47                                   | 85  | 38    | 70  | 74 | 16 |
| ROP Lubelskie                     | 73.08                              | 21.64                              | 62                                   | 85  | 23    | 75  | 73 | 7  |
| ROP Lubuskie                      | –                                  | –                                  | –                                    | –   | –     | –   | –  | –  |
| ROP Łódzkie                       | 38.42                              | 3.88                               | 56                                   | 69  | 13    | 65  | 68 | 6  |
| ROP Małopolskie                   | 84.16                              | 7.54                               | 45                                   | 70  | 25    | 63  | 65 | 7  |
| ROP Mazowieckie                   | 73.50                              | 21.04                              | 48                                   | 80  | 32    | 70  | 75 | 10 |
| ROP Opolskie                      | 31.46                              | 10.09                              | 38                                   | 85  | 47    | 72  | 77 | 15 |
| ROP Podkarpackie                  | 74.11                              | 27.04                              | 71                                   | 85  | 14    | 82  | 83 | 3  |
| ROP Podlaskie                     | 42.16                              | 37.52                              | 21                                   | 85  | 64    | 75  | 78 | 13 |
| ROP Pomorskie                     | 126.27                             | 5.56                               | 46                                   | 85  | 39    | 69  | 69 | 15 |
| ROP Śląskie                       | 147.77                             | 25.38                              | 66                                   | 85  | 19    | 82  | 85 | 5  |
| ROP Świętokrzyskie                | 9.94                               | 6.89                               | 44                                   | 75  | 31    | 69  | 74 | 10 |
| ROP Warmińsko-mazurskie           | 112.25                             | 6.89                               | 44                                   | 75  | 31    | 69  | 74 | 10 |
| ROP Wielkopolskie                 | 45.17                              | 11.65                              | 33                                   | 85  | 52    | 78  | 82 | 13 |
| ROP Zachodnio-pomorskie           | 78.56                              | 14.93                              | 45                                   | 85  | 40    | 79  | 85 | 12 |
| All OPs                           | 1 662.72                           | 282.12                             | 11                                   | 85  | 74    | 76  | 80 | 12 |

Source: Author's elaboration based on SIMIK 2014–2020 data.

ing number of projects in 2007–2013 and 2014–2020, jointly): Evangelical Church of the Augsburg Confession in Poland parishes (19), parishes and institutions of the Polish Autocephalous Orthodox Church (17), Baptist Union of Poland (4), Muslim Religious Community in Kruszyniany (1) and Benchen Karma Kamtsang Buddhist Association in Poland (1). Within this group of beneficiaries there was a significant increase in the number of investments by the Polish Orthodox Church only. The character of projects was the same for different groups of beneficiaries, which resulted from the aims of operational programmes.

From the point of view of the beneficiary the best relation of the obtained EU funding and the total

value of the project is when EU funds comprise 85% of the total value. This optimal result was obtained by 65 projects in 2007–2013 (23% of all) and by 232 in 2014–2020 (63% of all projects). Consequently, the mean value of EU funding per project in religious heritage increased from 3.12 to 3.48 million PLN and the mean share of EU funding per projects from 62% in 2007–2013 to 72% in 2014–2020. On the other hand, many projects obtained EU funding for a smaller share of the total value of projects, thus Pearson's correlation coefficients between the total value of projects and the share of EU funding in the total value is positive and weak  $r_{xy} = 0.11$  ( $p = 0.004$ ;  $\alpha < 0.005$ ).

## CONCLUSIONS

European Union funding is a source of co-financing that does not need to be paid back, addressed to a wide range of beneficiaries carrying out projects aimed at local and regional development. The dynamic relation between religious heritage, tourism and development is the reason why the EU also supports preservation of religious heritage.

In consecutive financial perspectives of 2007–2013 and 2014–2020, Polish beneficiaries carried out 618 projects resulting in preservation of religious cultural heritage and co-financed by EU funding under operational programmes. Although these projects comprise a very small share of all projects co-financed by EU structural funds, we can observe an increase in the number of these investments in consecutive financial perspectives. There is also a significant increase in the number of projects that obtained the best relation of EU funding to their total value, i.e. 85%.

All the projects were aimed at renovation, restoration or conservation of religious heritage, its digitalization or increasing its accessibility to visitors. However, some of the projects under ROPs also included installation of renewable energy sources at religious heritage sites.

The number, total cost of projects and the value of EU funding varied significantly in Polish regions, from the poorest outcome in the Lubuskie with only one project, to the best outcome in the Podlaskie with 59 projects.

The majority of projects were carried out by the Catholic Church and its institutions, less than 4% of projects by the parishes of the Evangelical Church of the Augsburg Confession in Poland, parishes and institutions of the Polish Autocephalous Orthodox Church, Baptist Union of Poland, and single projects by Muslim Religious Community and Benchen Karma Kamtsang Buddhist Association in Poland.

Summing up, although the projects aimed at preservation of religious heritage still make a very small share of all investments under operational programmes, their increasing number and improving relation between EU co-funding and total value of projects prove that more and more beneficiaries have been using this source in an increasingly effective way.

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## FUNDUSZE UNII EUROPEJSKIEJ DLA ZACHOWANIA RELIGIJNEGO DZIEDZICTWA KULTUROWEGO W POLSCE

### STRESZCZENIE

Ze względu na istnienie związku między religijnym dziedzictwem kulturowym, turystyką i rozwojem regionalnym Unia Europejska wspiera zachowanie religijnego dziedzictwa kulturowego poprzez udostępnianie funduszy polityki regionalnej realizowanych w ramach programów operacyjnych. Celem badań było określenie i analiza głównych efektów tego wsparcia na podstawie danych jakościowych i ilościowych z bazy SIMIK 2007–2013 oraz centralnego systemu teleinformatycznego (CST) SL2014 na lata 2014–2020. Wyniki wskazują, że 618 projektów mających na celu zachowanie religijnego dziedzictwa kulturowego w Polsce miało bardzo mały udział w liczbie wszystkich inwestycji w ramach programów operacyjnych. Miały też niewielki udział w całkowitej wartości wszystkich projektów i w całkowitej wartości pozyskanych środków UE. Porównując jednak perspektywę finansową 2007–2013 oraz 2014–2020, obserwuje się wzrost liczby takich projektów oraz odsetka tych, które uzyskały najlepszą relację środków unijnych do ich całkowitej wartości, tj. 85%.

**Słowa kluczowe:** religijne dziedzictwo kulturowe, fundusze unijne, rozwój lokalny, turystyka

## IMPACT OF CORONAVIRUS COVID-19 ON THE FOOD SYSTEM

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### ABSTRACT

The article contributes to the theory of sustainability. It aims to analyse the impact of COVID-19 on global food security and its role in changing food supply chains, with a particular focus on international chains. The research is presented in several sections. The analytical portion discusses the impact of the SARS-CoV-2 epidemiological crisis on the global food market. The state of food safety is then presented, taking into account the quantitative and qualitative aspects. Next, the aspect of the economic availability of food is examined, as well as the important role that international food chains play in shaping food safety. All sections include the results of an analysis of international secondary data on food security under the influence of an ongoing pandemic. The stated objective of the work was achieved and the questions that formulate the research problem were answered. Finally, the need for further normative studies was identified.

**Key words:** food systems, COVID-19, supply chains, food security, world trade

**JEL codes:** I31, Q17, Q18

“For too long, world leaders’ approaches to health emergencies have been characterized by a cycle of panic and neglect. It is high time for urgent and sustained action” [Brundtland 2019]

### INTRODUCTION

In 120 years, the world economy has been ravaged by two world wars, several economic crises (1929–1932, 2002–2004, 2008–2011), the fuel crisis (1969–1970) and several pandemic events (Spanish influenza 1918–1920; Hong Kong influenza 1968; SARS 2002, EVD 2013–2014). Humanity is currently struggling with the COVID-19 pandemic. Each pandemic has always caused panic, then mobilisation to fight at the medical and economic level, and then relaxation. We are now at the beginning rather than closer to the end. If we take into account the still frequent political instability, wars (e.g. Syria, Libya, Iraq), as well as environmental disasters (floods, fires, volcanic eruptions, water poisoning,

droughts, etc.), we are faced with constant crises and struggles of food systems in the implementation of the food security of societies [Zukrowska 2018].

According to Gołębiewski, “The food system covers the movement of raw materials and products from the supplier of raw materials for agricultural production and the farm, through food industry enterprises (primary and secondary processing), distribution sectors (wholesalers and retail stores), to final consumers [Gołębiewski 2019, p. 39]. In this paper, the subject of scientific research and reflection is the flow of food products from field to consumer during the pandemic period of COVID-19. The research problem of this work, on the other hand, is the question: In what links in the food chains are found the greatest threats to food

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safety? What is the role of institutional links in food systems in shaping food safety? Does the reduction in international trade flows of goods and services during the pandemic also affect food trade? The aim of the article is to conduct a preliminary analysis of the effects of COVID-19 on shaping global food security and the role of changes in food supply chains in this process, with a particular focus on international chains. To this end, literature on the subject and other secondary sources were analysed, and comparative, description, and simple statistical techniques were used. The limitation for studies and inferences was the short analysis period, and the fact that little to no 2020 data is yet available.

### THE IMPACT OF COVID-19 ON GLOBAL FOOD TURNOVER

Coronavirus COVID-19 hit China in the autumn of 2019 and spread speedily all over the world. It has brought considerable suffering for many people and huge economic disorder: quarantines, restrictions on travel, factory lockdowns, declines in many service sector activities. All of this has speedily and strongly affected national economies and the global economy. It is impossible at this time to assess the economic consequences of the pandemic, because the situation is evolving by the day and a second wave is very plausibly on its way, soon [OECD 2020]. According to Boone et al., “The main question for the economic outlook is for how long and how widely the virus will spread, and with it the containment measures. At this stage, there is little certainty on this, so we draw a best-case scenario and a downside scenario” [Boone et al. 2020, p. 37]. Note that the COVID-19 pandemic is all-encompassing in its vastness, its pace of spread, its surprise at the lack of preparation of such a scenario, and thus its inability to counter act in a short period of time and the limitedness of defence resources. It is called in the literature “black swan” because of a sudden, not foreseen event, the appearance for the first time and having catastrophic consequences [Mączyńska 2020, Romanowska 2020]. Moreover, it is difficult to predict its end and consequences, much less accurately counteract it. Its social and economic impact is unknown.

In the example of previous experience, it is known that a pandemic, like many other economic phenomena (e.g. demand curve) and physical phenomena, has as

a function of time as a single-modal curvilinear course, the bell shape. However, its course in the form of local increases or decreases is influenced by external factors [Osenton 2004]. In the case of a pandemic, these are deliberate actions such as isolation, social distance, prevention, treatment, social discipline, etc. Each action also has a different geographical dimension and inequality over time. The current pandemic has had a huge impact on the functioning of humanity. In this article, we will highlight aspects related to food safety that we understand as “food safety” and “food security”. The specific significance of the work and the research problem is due to the high imbalance between global economies in terms of food safety as demonstrated by the Global Food Safety Initiative – GFSI (Table 1). Of the 113 countries surveyed by the GFSI, 88% say they have sufficient food supply. However, in 44 countries, 12% of the population suffers from malnutrition [Economist Intelligence Unit 2019]. There is a worrying assumption that COVID-19 will exacerbate these disparities.

The overall score for GFSI (0–100) is calculated as a weighted average of three categories: affordability, availability and quality plus safety.

**Table 1.** Global Food Security Index 2019 for the countries with the highest and lowest supply

| Rank | Country                          | Score |
|------|----------------------------------|-------|
| 1    | Singapore                        | 87.4  |
| 2    | Ireland                          | 84.0  |
| 3    | United States                    | 83.7  |
| 4    | Switzerland                      | 83.1  |
| 5    | Finland                          | 82.9  |
| 5    | Norway                           | 82.9  |
| ...  |                                  |       |
| 108  | Madagascar                       | 37.9  |
| 109  | Chad                             | 36.9  |
| 110  | Democratic Republic of the Congo | 35.7  |
| 111  | Yemen                            | 35.6  |
| 112  | Burundi                          | 34.3  |
| 113  | Venezuela                        | 31.2  |

Source: Global Food Security Index database.

## **FOOD SAFETY, PRODUCTION VOLUME AND QUALITY**

Food safety and food quality are now, in the time of COVID-19, at the centre of interest. This is in line with the growing position of safety in other areas such as workplace safety or environmental protection. Both safety and quality, are, in this case, inseparable. The term “food safety” from the position of natural or medical sciences, food technology or quality management describes various aspects of health: probability of illness, poisoning or injury as a consequence of consuming a particular food [FAO/WHO 2003]. The meaning of food safety from the perspective of economy (social science) is understood mainly as security of production, supply chain coordination, food availability, continuity and sufficiency for consumer.

The issues connecting food safety and food security, as non-separable parts of the food system, were separated by the Food and Agriculture Organization of the United Nations into four pillars: (1) availability (e.g. food supply); (2) access (economic and physical); (3) utilisation (e.g. biological processing influencing nutritional and dietary properties) and (4) stability over time [FAO 2008, Devereux et al. 2020]. Food is a necessary everyday commodity and its parameters are evaluated from the position of both the customer (subjective quality, narrow sense of safety) and the producer/supplier (objective quality, broad sense of safety). Food safety policy has been described as a construct of voluntary, mandatory and supplementary systems acting along the food value chain and being under the impact of world institutions (e.g. UN, WTO, FAO, ISO, government institutions, official food control). The food system is very flexible and can be shaped by actual needs and requirements. The role of official control authorities who can mould the shape of the system in a given country is very important.

The food chain has been described as combination of security of production, security of supply chain coordination, availability, continuity and sufficiency for the consumer and the industry. Various available data strongly suggest the need to reduce the amount of food losses and waste in various links of the food production chain. In addition, construction of sustainable food systems on local, regional and global levels is strongly recommended. Food safety and a sustainable

food system all belong to so-called wicked problems [Dentoni et al. 2012], which are composed of many independent and dependent variables being in a certain state of equilibrium. The task for the future is to try to modify and improve the relations between these variables at the most desirable level. The following is the impact of COVID-19 on market phenomena that directly and indirectly shape food security (Table 2).

Food chain models and institutions of policy intervention are important in each country. These chains “cover three sectors of the economy, i.e. agriculture, food industry and retail [own translation]” [Gołębiewski 2019, p. 156]. As Gołębiewski points out, consolidation in food supply chains, and in particular in some sectors of the processing industry and trade, has played an increasing role in shaping it, which has fostered their lengthening and internationalisation (KTN share) [Gołębiewski 2019]. The participating entities benefited from a cost competitive advantage resulting from the scale of turnover. This has led to increased risks for operators and destabilisation of food markets, large food losses during transport, storage and bacteriological or viral disturbances [Smoczyński 2020] and reduced consumer confidence. Food chain models and national policy intervention institutions are important in each country.

Alternative food systems, based on a close link between food production and the local, cultural and social environment, play a major role in the epidemiological crisis. Then there are shorter supply chains in terms of geographical distance and number of links present. This increases the speed of supply, the diversity and freshness of products and reduces their contamination as well as losses. It also creates a lower burden on the environment by saving the consumption of resources (energy, transport), and promotes the development of organic food production and its waste reduction [Gołębiewski 2019]. The “larger the scale of production, the greater the ecological costs [own translation]” [Sadowski 2018, p. 107]. This also increases the share of local product brands in sales, which positively affects their recognition and consumer loyalty, thereby stimulating producers to invest more in shaping a qualitative competitive advantage.

Supply chains are fundamentally influenced by consumer preferences. There is a significant shift in consumer behaviour on the world market towards the

**Table 2.** Manifestations of COVID-19's impact on the food market in the first half of 2020 (March–August)

| Phenomena that shape demand in the food market   | Phenomena that shape supply in the food market  |
|--|---|
| Decrease in the degree of professional activity  | Violence in food production   |
| Increase in the unemployment rate  | Changing the supply structure of food products  |
| – Reduced availability of jobs<br>– Reducing the income of the population  | Changing supply chains (shortening their length, changing the supply structure for domestic benefit)  |
| Increase in food cost inflation  | Reduction of expenditure on food quality in the logistics chain (warehousing, transport, limited quality control)   |
| Decrease in purchasing power of the population   | Failure to meet delivery deadlines (broken contracts, bankruptcy of companies in the distribution chain, etc.)  |
| – Changing consumer patterns and attitudes<br>– Increased demand for organic, fresh and healthy products                                 | Reducing the use of resources (human, building surface) for the applications of modern technologies   |
| Trust as the first criterion for the choice of food products by consumers (preferred quality, reliable origin, low environmental burden) | Broken traditional supply chains and re-modified  |
| Availability of modern technologies as a condition for on-line purchases   | The increasing importance of Corporate Social Responsibility (CSR) in shaping the competitive advantage of enterprises in building partnerships in logistics chains |

Source: Authors' own elaboration.

preference of organic and fresh products, which favourably modifies the pattern of trade supply for plant products. The structure of the links in the supply chain has changed. The importance of cargo carriers has increased. These chains have become shorter, they are managed flexibly in response to adapting to changes,

and affect the availability of markets in the geographical space. Another issue is the increased turnover of international trade in the financial expression, as their main cause is the inflationary increase in the prices of agricultural raw materials and industrial food processing products in all countries (Table 3).

**Table 3.** FAO Food Price Index<sup>a</sup>

| Year      | Index | Meat  | Dairy | Cereals | Vegetables |
|-----------|-------|-------|-------|---------|------------|
| 2008      | 117.6 | 90.2  | 133.3 | 137.6   | 141.0      |
| 2010      | 106.7 | 91.0  | 111.9 | 107.5   | 121.9      |
| 2014      | 115.0 | 112.2 | 130.2 | 115.8   | 110.8      |
| 2015      | 93.1  | 96.7  | 87.1  | 95.6    | 90.0       |
| 2016      | 91.9  | 91.0  | 82.6  | 88.3    | 99.4       |
| 2019      | 95.0  | 100.0 | 102.8 | 96.4    | 83.3       |
| 2019 Nov. | 98.6  | 106.5 | 102.5 | 95.4    | 93.2       |
| 2019 Dec. | 101.0 | 106.6 | 103.5 | 97.2    | 101.5      |
| 2020 Jan  | 102.5 | 103.8 | 103.8 | 100.5   | 108.7      |
| 2020 Mar  | 95.1  | 99.5  | 101.5 | 97.7    | 85.5       |
| 2020 Aug  | 96.1  | 93.2  | 102.0 | 98.7    | 98.7       |

<sup>a</sup> Weighted with the average export shares of each of the groups for period 2014–2016.

Source: FAO Food Price Index database.

We conclude that a return to national sources, and from there to local, traditional and therefore internal market attitudes, taking into account cultural conditions in management, is an important direction for changes in supply and supply chains. On the demand side, an important direction of change is the widespread increase in value in health-promoting, organic and fresh products from local, culturally close supplies [Shan and Yang 2020, Wiatrak 2020].

### **FOOD AVAILABILITY: PHYSICAL AND ECONOMICAL**

To date, there is no information on serious disturbances in access to food on the market caused, for example, by a drastic decline in its production and a shortage on the world market. In highly developed countries, this production is large-scale, mechanised, saturated with harvesting, storage and transport facilities and is sufficient. The obstacles resulting from the need to maintain social distance are not so severe, although they introduce organisational changes. Some difficulties in the labour market during the initial pandemic resulted from the closure of borders and the departure of some seasonal workers or foreigners to their families. “Global food supply depends on millions of migrant workers. In many countries, especially in developed economies, migrant workers play a critical role in agriculture and food production” [IOM 2020]. Data published by the World Trade Organization show that some countries are introducing import facilitations on food by changing certification procedures, relaxing technical standards and exaggerating the level of risk in international trade [WTO 2020]. According to the WTO, information in the first half of 2020, agricultural and food exports increased by 2.5% during the first quarter of the year compared to the same period in 2019 [WTO 2020]. The COVID-19 pandemic restricts access to food mainly due to lower incomes, reduced demand due to lockdowns or job losses for a significant part of the population. In some countries or social groups, around 70% of income is spent on food [Laborde et al. 2020]. Temporary state aid only for a short period of time closes this gap. In its published forecast, the

International Monetary Fund predicts a 5% contraction of the global economy in 2020 [IMF 2020]. This heralds a global recession deeper than in 2008–2009. The OECD, on the other hand, forecasts a 13% reduction in GDP in 2020 and notes that “keeping trade flowing requires co-operation and trust – for example, that the market will supply essentials, that countries will not impose export restrictions, and that imports do not pose health risk” [OECD 2020, p. 2]. According to the World Bank data, by June 2020 there were few interruptions in food production [World Bank 2020]. However, due to the deteriorating financial situation of households, especially in underdeveloped countries, the number of malnourished people may increase.

Food prices have risen from 3 to 15% in many countries since the beginning of 2020 and are likely to peak in the second quarter of 2020. They are forecast to decline slowly in subsequent periods<sup>1</sup>. It should be noted, however, that there are also quite a few countries where food price growth exceeded 20% in Q2 2020 (e.g. Ethiopia, Iran, Liberia, Haiti) and even more (Argentina 46%, Suriname 56%). Absolute exceptions include hyperinflation in Zimbabwe with an increase of 836%, and Venezuela with 2,200%).

Overall, the food price increases in European Union countries in April 2020 were unusually strong and reflected an unprecedented combination of demand and supply influences. However, the Harmonised Index of Consumer Prices (HICP) for food in May and June signalled signs of normalisation in price changes as lockdowns eased and activity resumed [Rubene 2020]. Monthly price developments in consumer food prices during the COVID-19 lockdown in the euro area significantly differs. The highest in April were observed for unprocessed food 4%, vegetables 8%, fish 4% and fruit 3%. In the processed goods group, the increases were much smaller (e.g. bread and pasta by 0.9% and processed meat by 0.4%). Preliminary data for June suggests a slight fall in prices, which means that annual inflation for unprocessed food of 7.6% in April fell to around 5.9% in June. It can be assumed that some of the reasons for these changes in the euro area was seasonality, shock resulting from lockdown, increased hygiene restrictions, surge of retail sales, etc.

<sup>1</sup> Trading Economics. Food Inflation – Forecast 2020–2022. Retrieved from <https://tradingeconomics.com/forecast/food-inflation> [accessed 27.09.2020].

## INTERNATIONAL SUPPLY CHAINS

Supply chains are another source through which COVID-19 introduces tensions and threats to food exports and imports between countries. Extending or interrupting them disrupts supplies to food processing or trade companies and increases costs. In marginal cases, it prevents the continuation of production and forces the search for alternative suppliers. Such events undermine the effectiveness of a just-in-time strategy to minimise staple foods in the processing industry (e.g. feed, food oils). At the same time, it leads to disorganisation of markets e.g. vegetables, fruits, fish and other sensitive products. It is likely that such experiences will be used in the future to change the strategy between efficiency and resilience [Fernandes 2020].

To date, there is no information on serious disruptions in the supply of basic agricultural raw materials and food. However, there is no record or certainty that “green lines” have not been introduced in some countries, which have lowered the recommended levels of sanitary and phytosanitary and technical standards for transport, production processes and distribution of agricultural raw materials and food. The OECD document draws attention to the fact that “keeping trade flowing requires co-operation and trust [...] that countries will not impose export restrictions, [...] that imports do not pose health risks [...] avoid escalation of the current trade tensions” [OECD 2020, p. 2]. These chains are most often complex, multi-stage, and in normal times there have been many losses (food waste and food losses) [Hegenshol et al. 2018]. They are estimated to be worth USD 1,200 billion a year and 1,500 million t.

A significant number of interruptions are created in the early stages of the chain and in countries with labour-intensive, traditional and weak agrarian, industrial and transport infrastructure [Tamru et al. 2020]. However, it turns out that also in highly developed countries, supply chains have been disrupted by the epidemic. In Germany (Berlin), more than 3,000 workers in the meat industry (slaughterhouses) have contracted COVID-19, which has made it necessary to reduce production or close down firms completely. This caused considerable market turbulence.

The very significant restrictions on international passenger flights have resulted in the disruption or

weakening of numerous food supply chains. For example, the export of flowers from African countries to Europe has ceased altogether, resulting in an increase in female unemployment [Bhalla and Wullbercq 2020]. A similar phenomenon occurred in the export of vegetables, herbs and other goods. According to the International Air Transport Association, air cargo in November 2019 (compared to January 2018, assumed to be 100%) decreased to 95%, and in February 2020 it decreased to 88%. Global demand fell by 13.5% in July 2020 (15.5% for international operations) compared to the previous year. That is a modest improvement from the 16.6% year-on-year drop recorded in June. Seasonally-adjusted demand grew by 2.6% month-on-month in July [IATA 2020].

The Institute of Shipping Economics and Logistics reports that maritime transport, which since January 2015 (assumed to be 100%), in September 2019 had increased to around 116% and decreased in February 2020 by 106%, while in summer it returned to 116% [ISL 2020].

For many recent years, modern food systems based on new technologies and techniques, food supply chains and logistics systems have been developing, including: transport, storage and material handling, order handling, stock management [Przybyłowski et al. 1998]. Their operation was possible, on the one hand, through the development of means of transport from road, sea to air, construction of warehouses, cold storage and reloading bases. New technologies and transport equipment were introduced to transport cargo in a wide range of temperatures and humidity. The development of information technologies, especially the Internet of Things (IoT) allowed to optimise conditions and time of transport. Startups play a growing role in handling the food chain [Skawińska and Zalewski 2020]. Despite this, the complex system was quickly infected by COVID-19. Some unfavourable changes are shown in Table 4.

## SUMMARY AND CONCLUSIONS

A preliminary analysis of the effects of COVID-19 on food systems to date suggests that threats to the global food safety system have increased. The main sources of this phenomenon are in the organisation

**Table 4.** Restrictions due to COVID-19 affecting transport

| Restrictions / Obstacles  | Impacts  |
|---|--|
| Restrictions on passenger flights have reduced the availability of air cargo  | Price increases between 30 and 60% [Curran 2020]   |
| Important ports for trade have reduced transshipment by 10–20% [Baschuk 2020] | <ul style="list-style-type: none"> <li>– Change of organisational processes</li> <li>– Bureaucracy</li> <li>– Speeding up certain procedures, e.g. customs [Baschuk 2020]</li> </ul>                                       |
| A significant proportion of containers have been blocked in Chinese ports     | <ul style="list-style-type: none"> <li>– Shortage of containers in other ports</li> <li>– Delay of deliveries</li> <li>– Increase in prices of transport services, increase in prices of goods for the customer</li> </ul> |
| Lockdown and/or limits on mobility  | <ul style="list-style-type: none"> <li>– Decreasing labour force</li> <li>– Raising cost due to protective measures</li> <li>– Difficulties in inspecting goods (e.g. SPS, TBT, anti dumping etc.).</li> </ul>             |

Source: Authors' own elaboration.

of the market, and these are: unstable supply chains, an increase in the rate of cost inflation, a reduction in people's purchasing power, as well as tolerating the failure to comply with quality standards at links in the supply chains. This has resulted in a deterioration in the availability and quality of food for many sections of society. In the absence of food self-sufficiency in many countries, international food supply chains and logistical systems that have been disrupted by the epidemic are very important.

The conclusions of the study, which have been included as sources of threats and opportunities to food security, are presented further.

The greatest risks have occurred:

- in the supply chains as a result of their interruption and change of cooperation partners in transport and in formal institutions connecting the various links in the food chain, which, among other things, prolonged the delivery process;
- in the deterioration of the quality of raw materials and finished products, as a result of time-consuming logistic chains and the lack of rigorous compliance with applicable standards, e.g.: temperature, humidity as good practices in cold chain.

The sources of opportunities should be seen in the following:

- increased rational use of national resources;

- to adapt food production to consumer preferences without burdening the environment;
- the development of innovative regional specialisation in food products.

Eliminating threats and barriers related to food safety requires the use of many tools and instruments in individual national economies and groups of countries with different degrees of integration, e.g. in the EU, as well as at the global level, represented by international organisations [Skawińska and Zalewski 2017]. This direction of ex-post and ex-ante research is urgently awaited as a normative platform. There are voices of prominent economists in the literature to finally include the “brain opener” as early warning thinking [Mączyńska 2020].

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## WPŁYW KORONAWIRUSA COVID-19 NA SYSTEM ŻYWNOŚCIOWY

### STRESZCZENIE

Artykuł wpisuje się w teorię zrównoważonego rozwoju. Jego celem jest analiza skutków COVID-19 na bezpieczeństwo żywnościowe na świecie oraz roli w tym procesie zmian w łańcuchach dostaw produktów żywnościowych, ze szczególnym uwzględnieniem międzynarodowych. W jego realizacji zastosowano metody studiów literatury przedmiotu i innych źródeł wtórnych, porównawczą oraz opisu, proste techniki statystyczne, wizualizacji i dedukcji. Struktura pracy składa się z czterech części merytorycznych, wstępu i podsumowania. W pracy najpierw przedstawiono problem badawczy, wagę problemu i rozumienie przyjętych w pracy podstawowych kategorii ekonomicznych. Dalej omówiono wpływ kryzysu epidemiologicznego COVID-19 na światowy rynek żywności. W kolejnej części zawarto stan bezpieczeństwa żywności, biorąc pod uwagę aspekty ilościowy i jakościowy, a dalej aspekt dostępności ekonomicznej żywności. Istotną rolę w systemach żywności odgrywają międzynarodowe łańcuchy żywności przedstawione w kolejnej części artykułu. W wymienionych częściach zawarto wyniki analizy danych wtórnych dotyczących bezpieczeństwa żywnościowego pod wpływem trwającej epidemii. Zakończenie zawiera podsumowanie i wnioski. Sformułowany cel pracy został zrealizowany i uzyskano odpowiedzi na postawione w problemie badawczym pytania. Na końcu wskazano na potrzebę prowadzenia dalszych badań o charakterze normatywnym.

**Słowa kluczowe:** system żywnościowy, COVID-19, łańcuch dostaw, bezpieczeństwo żywności, handel światowy



## SELF-GENERATED ECONOMIC ACTIVITY AS A FORM OF EMPLOYMENT FOR PEOPLE WITH DISABILITIES

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### ABSTRACT

The article presents the factors that limit starting one's own business. Self-employment is one way to integrate disabled people into the labour market and to utilize resources from the labour force of disabled people. The results are obtained on the basis of a study conducted by the author in the Mazowieckie Voivodeship among people with disabilities. The conducted research shows that self-employment is not willingly chosen by people with disabilities. People with disabilities see many negative factors (reasons) that make it difficult to set up and run their own businesses. Their state of health and a lack of resources are the main hindrances to starting a business. The tools/instruments used by the state to facilitate self-employment are also indicated. Through self-employment people with disabilities create a workplace (position) for themselves and decide to enter or return to the labour market. Bureaucratic support and appropriate motivation to take up professional activity is also very important as it reduces the number of those who remain unemployed.

**Key words:** self-generated business activity, labour market, disabled people, self-employment, PFRON

**JEL codes:** J2, J6

### INTRODUCTION

Nations and their citizens strive for the highest possible employment and try to counteract unemployment. An important element of human life is work [Jabłońska-Porzuczek 2019]. Self-employment is one way to offset the negative phenomenon of unemployment and to activate people in the labour market. Disabled people are one of the most difficult social groups in terms of professional activation. One of the basic challenges in researching the situation of people with disabilities in the labour market is the wide variance in definitions of disability, and in the criteria. Disability is a multiform, diverse and dynamic phenomenon, therefore it is difficult to define it unequivocally [Kołaczek 2006]. Without having a single definition of disability,

it is not easy to assess the phenomenon of disability [Golinowska and Sowa 2012].

In economics, disability means limited earning capacity, in medicine it means limitation of the body's efficiency, and for a sociologist – difficulties in social adaptation [Garbat 2013b]. Employers prefer people who show great independence, the ability to cope with problematic situations, who are able to work under time pressure.

In economics work is understood as activities performed in the production process in order to produce goods to satisfy people's needs [Lange 1966]. Smith and Ricardo recognized work as one of the three basic (apart from land and capital) factors of production [Jagoda and Klimeczak 2011]. Marx and Engels [1968] claimed that: "The labour process is a deliberate

activity aimed at creating use values, adapting what nature provides to human needs, it is a general condition for the exchange of matter between man and nature, the eternal natural condition of human life therefore a process independent of any form of this life, rather a common process of all its social forms [own translation]”. Economic sciences deal with labour issues in the context of the labour market where entities willing to recruit an employee report demand for labour and people ready to undertake it represent the supply side. According to Rajkiewicz [1958], the labour market is a place that characterizes the relationship between the supply of labour and the demand for labour. It is the willingness to work offered and the demand for this work and not for an exchange of goods. In the labour market work is a commodity which can be understood as labour potential (labour power) or as work performance (i.e. labour service). According to Marx, the labour power is “the aggregation of the physical and mental capabilities existing in a human being, which he exercises whenever he produces a use-value of any description”. Work is a specific commodity because it is connected with human consciousness [Unolt 1996].

Employment can be understood as the involvement of human strength and skills in the work process. Its purpose is to meet human needs. In a broader sense, it includes subordinated and self-employed persons, while in narrow terms it covers only self-employed persons. This is also related to the concept and aspects of self-employment. According to Eurostat, a self-employed person is a person running his or her own business, farm or professional practice without hiring any employees [Eurostat 2011]. Blanchflower [2000] considers self-employment to be the simplest form of entrepreneurship.

Self-employment for disabled persons allows them to use their opportunities optimally and to create appropriate working conditions adapted to their limitations. Self-employment is vital to the economy. It is often considered as a way to counter unemployment for people who return to work. It should be highlighted that running a business is working for oneself, which is associated with various consequences and responsibility, as well as bearing risk in the event of failures. Self-employment is characterized by lower employment stability than full-time employment, among other

reasons, because in the case of sickness or sick leave a person does not work and thus does not earn money, the same is in the case of holidays.

Professional activity gives people with disabilities a sense of self-fulfilment, financial independence, and in particular it prevents social exclusion. As emphasized by Kalinowski [2018], social exclusion causes many types of needs to be unsatisfied, including health protection, education or living conditions as well as leisure and access to culture.

## **MATERIAL AND METHODS**

The data was collected by the use of a questionnaire, which was directed to people with disabilities living in the Mazowieckie Voivodeship via the Internet, public institutions and non-governmental organizations. People from the following poviats constituted the greatest number of respondents: Makowski, Legionowski, Plock, Warsaw, Pułtusk and Mława. In total, the respondents came from 24 poviats of the Mazowieckie Voivodeship. The time scope of the research covered the years 2004–2018, and 301 people took part in the study.

The study group consisted of women and men aged 18–64. The study covered the disabled people who had a document confirming their disability issued by an appropriate body and who had a certified degree of disability. The questionnaire contained, inter alia, questions on running their own business.

## **RESULTS AND DISCUSSION**

The professionally active people who took part in the study are mainly employees employed under an employment contract. A very small percentage of the respondents (less than 4%, i.e. 12 people), ran their own business and only 39 people declared that they thought about this form of employment. Despite that self-employment is one of the ways of starting work and getting out of unemployment, it is not a form of employment preferred by people with disabilities. People with disabilities less often than others decide to start and run their own business [Gittlieb et al. 2015].

The table presents the most important information about persons who expressed interest in starting their own business in the future. Men (54%) were more

**Table.** Characteristics of the respondents answering the question: “Have you thought of starting your own business”?

| Category   |   | Yes      | No  |
|--|---|----------|-----|
|  |   | <i>n</i> |     |
| Sex  | woman   | 18       | 131 |
|  | man   | 21       | 121 |
| Place of residence:  | village   | 10       | 124 |
|  | city up to 5 000 inhabitants  | 0        | 42  |
|  | city of 5 000–10 000 inhabitants  | 3        | 11  |
|  | city of 11 000–20 000 inhabitants   | 4        | 14  |
|  | city over 20 000 inhabitants  | 22       | 61  |
| Education  | incomplete / incomplete primary   | 0        | 13  |
|  | primary   | 0        | 70  |
|  | gymnasium   | 1        | 9   |
|  | vocational  | 1        | 55  |
|  | secondary general education   | 5        | 26  |
|  | secondary vocational  | 5        | 14  |
|  | post secondary  | 4        | 16  |
| By which authority is your certificate of disability / incapacity for work issued? | higher (different faculties)  | 23       | 49  |
|  | issued by the ZUS certifying physician  | 8        | 84  |
|  | issued by the KRUS <sup>c</sup> certifying physician  | 0        | 0   |
| Degree of disability / incapacity acc. to the ZUS <sup>a</sup>                     | poviat / municipal disability adjudication teams  | 31       | 168 |
|  | certificate of total incapacity to work and live independently  | 2        | 18  |
|  | certificate of the inability to exist independently   | 2        | 6   |
|  | certificate of total incapacity for work  | 1        | 28  |
|  | certificate of partial incapacity for work  | 3        | 32  |
| Degree of disability / incapacity acc. to PCPR <sup>b</sup>                        | certificate of incapacity to work on a farm   | 0        | 0   |
|  | considerable degree / disability group I  | 11       | 45  |
|  | moderate degree / disability group II   | 19       | 116 |
| Type of disability   | light degree / disability group III   | 1        | 7   |
|  | motor disability  | 19       | 77  |
|  | intellectual disability, e.g. mental retardation and mental illness   | 3        | 99  |
|  | disability related to neurological diseases   | 13       | 77  |
|  | disability of the organs of sight, hearing and speech   | 12       | 34  |
|  | disability related to diseases of internal organs, e.g. respiratory and circulatory systems; digestive system, etc. | 2        | 33  |
|  | different, other  | 0        | 5   |

<sup>a</sup> Social Insurance Institution (Zakład Ubezpieczeń Społecznych).

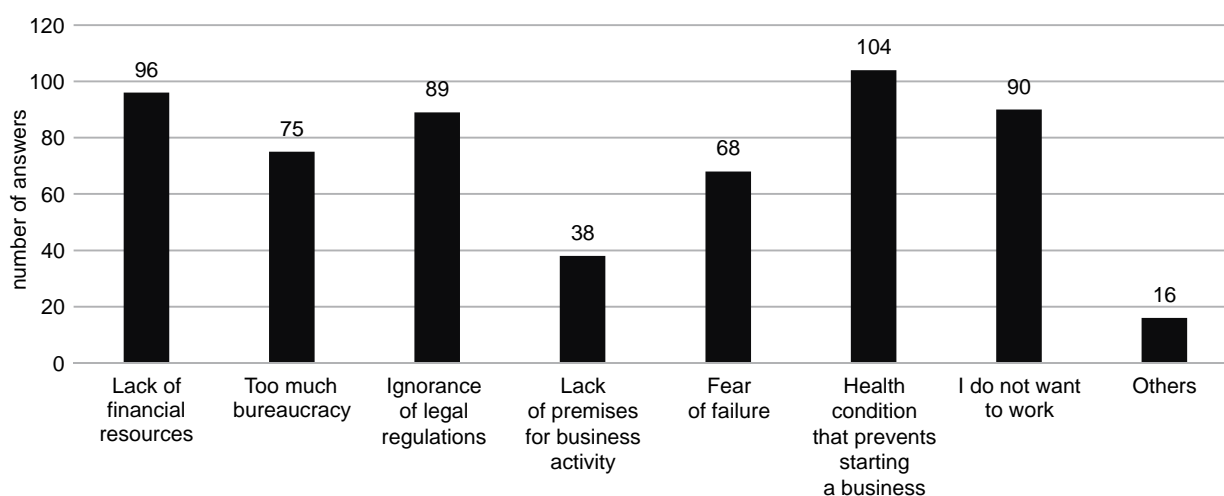
<sup>b</sup> County family assistance centres (powiatowe centra pomocy rodzinie).

<sup>c</sup> Agricultural Social Insurance Fund (Kasa Rolniczego Ubezpieczenia Społecznego).

Source: Author’s own study based on author’s research.

interested in starting their own business than women (46%). Self-employment was considered mainly by people living in cities with more than 20,000, 56% of the population, as well as people with higher education (59%). Mostly people with moderate (disability group II) and significant (disability group III) disability issued by the county family assistance centres considered starting their own business in the future. Almost half (49%) with a moderate disability and less than 29% with a significant one seek/think of self-employment. About 22% of the respondents intending to undertake such activity had a different degree of disability than those above. Analysing the willingness to self-employment in terms of the type of disability, it can be observed that the greatest number of applicants are with motor disabilities and neurological diseases as well as with problems related to the organs of hearing, speech and sight. As other studies show, the level of education has an impact on self-employment. Self-employed persons were characterized by higher education [Kmieć 2017]. Women often take up this form of employment due to the lack of full-time employment and the fact of combining work with family responsibilities. The decision to take up a job is influenced by many factors, including socio-economic characteristics such as health, age, sex, education, skills and experience [Kukulak-Dolata 2006, Drejerska 2010, 2018].

People declaring their willingness to be self-employed saw many problematic aspects related to economic activity, ranging from lack of health to, for example, a shortage of time (indicated by the respondents). In the first place, the respondents indicated that poor health (19%) does not allow them to set up and run their own business (the figure). The lack of financial resources made it impossible for 17% to take up this form of work. Another problem was the lack of knowledge of legal aspects (16%). In addition to legal issues, business activity is associated with broadly understood bureaucracy, which was indicated by 13% of respondents in this group. Without giving a reason, 16% of respondents did not want to start their own business. For 12% of respondents, significant was the fear of failure and the lack of faith in their own abilities to create a prospering business. The category “others” included such problematic issues as lack of experience and idea, “medical certificate disqualifies taking up a job”, education, and one of the answers was also lack of time. An important aspect that people with disabilities pay attention to when taking up professional activity is the condition of the technical infrastructure. Poland is diversified in terms of its condition and technical infrastructure, the development of technical infrastructure in the Mazowieckie Voivodeship has increased [Pomianek 2020].



**Fig.** Reasons for not starting one’s own business  
Source: Author’s own study based on author’s research.

Other studies confirm that many factors influence the professional activity of disabled people in relation to starting a business. Disabled entrepreneurs see the most important barriers in the technical infrastructure, legal aspects and insufficient financial support. A significant determinant of running a business are issues related to disability that is poor health [Garbat 2013a].

Kobus-Ostrowska [2014] focuses her considerations on the forms of alternative support that a disabled or unemployed person can receive on the labour market. She pays great attention to the possibility of receiving support, e.g. for starting one's own business, social cooperative and financing social security contributions. She lists various forms of support for professional activation, e.g. internships, vocational preparation, trainings and courses. Support related to starting one's own business in the studied sample does not seem to be of great importance, because only less than 13% of people are interested in starting their own business, with courses and training showing more interest.

There are many forms of support for people with disabilities and for setting up a business by people with disabilities. Schools, courses and various work preparation projects ignore the fact that acquiring basic skills in a given field will not guarantee the acquisition of a client. It is not sufficient for a disabled person to gain basic knowledge of creating websites [Panek 2020]. An important form of supporting the entrepreneurship of disabled people is the refund of some social security contributions, since disabled people or entrepreneurs, like others, are obliged to pay contributions for running a business [Politaj and Koza 2016]. This assistance can be obtained from the State Fund for Rehabilitation of Disabled Persons (Państwowy Fundusz Rehabilitacji Osób Niepełnosprawnych – PFRON). In order for a person to be able to apply for funds for their own business activity, they should be registered in the poviats labour office as an unemployed person or a jobseeker and should not have any financial arrears towards PFRON. In this regard, PFRON offers, among others, funds to start one's own business and reimbursement of social security contributions ([www.pfron.org.pl](http://www.pfron.org.pl)).

The amount of the subsidy for starting one's own business depends on the period of commitment to run a business by disabled people [Politaj and Koza 2014]. In the case of a minimum of 12 months, the amount of

the subsidy cannot exceed six times the average salary. If the entrepreneur undertakes to conduct business for a minimum of 24 months, then the amount of the grant will be from six to 15 times the average salary. The other form of assistance that can be obtained from the PFRON as part of co-financing for business activity is the reimbursement of the ZUS contributions (pension scheme and disability insurance). The amount of co-financing (refund) of contributions depends on the degree of disability. A person running a business with a significant disability receives the reimbursement of 100% of the amount of compulsory contributions for retirement and disability insurance. In the case of a moderate disability, the refund is 60% of the amount of compulsory contributions, and 30% for a light disability.

A person applying for a contribution refund is required to register in the PFRON system for handling subsidies and refunds – SODiR (<https://www.sod.pfron.org.pl>). The minimum amounts of co-financing for contributions in 2020 are: in the case of the pension contribution PLN 612.19, the disability insurance PLN 250.90. For the first two years, the amount of these contributions is respectively the pension insurance amounting to PLN 152.26, while the disability insurance is PLN 62.40 [PFRON 2020]. Contributions are calculated and paid according to the rules specified in the Social Insurance Act of 13 October 1998 (Art. 8 sec. 6). The PFRON grants reimbursement of contributions on the basis of declarations indicated in the relevant applications and after verification of all data contained therein.

## CONCLUSIONS

The conducted research shows that people with disabilities choose other forms of professional activity and income than running their own business. A very low percentage of respondents currently run their own business and also few people declared interest in this form of employment and earning money.

People with higher and university education, as well as living in larger cities with more than 50,000 residents, showed a greater willingness to self-employment. This was also influenced by the degree and type of disability the person had. People with a moderate disability and physical disability are planning



to take up self-employment in the future. This may prove that such people know their limitations and can adjust the type of work and other conditions related to professional activity to their disabilities (imperfections). Self-employment also provides the individual the opportunity for self-realization and personal development, and allows one to arrange work according to their needs. At the same time, it should be noted that it is also associated with self-discipline and organization, as well as other duties that are not applicable in the case of working for another employer.

The main reasons for not taking up this type of employment are poor health and lack of financial resources. There are also legal aspects that disabled people are not familiar with, and their reluctance to work. There is no adequate system of motivating people with disabilities to take up employment and professional activity, which also influences the commencement of self-employment, as it provides lower job stability and requires greater creativity and willingness to work.

For enterprising people with disabilities, running a business is not only a source of income, but also a way to avoid marginalization and return to full social life.

In order to activate the professionally inactive community, it is important to identify the reasons for their inactivity and to take actions increasing the chances of their entering the labour market and preventing the occurrence of exclusion. The constant mismatch between the demand and supply of labour is a permanent negative phenomenon which, if possible, should be limited and counteract low professional activity among disabled people.

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## **WŁASNA DZIAŁALNOŚĆ GOSPODARCZA JAKO FORMA ZATRUDNIENIA OSÓB NIEPEŁNOSPRAWNYCH**

### **STRESZCZENIE**

W artykule przedstawiono czynniki ograniczające zakładanie własnej działalności gospodarczej. Własna działalność gospodarcza stanowi samozatrudnienie, które jest jednym ze sposobów włączenia osób niepełnosprawnych do rynku pracy i wykorzystania zasobów siły roboczej, którą one dysponują. Wyniki opisane w pracy uzyskano na podstawie badania własnego przeprowadzonego w województwie mazowieckim wśród osób niepełnosprawnych. Z przeprowadzanych badań wynika, że osoby niepełnosprawne niechętnie decydują się na samozatrudnienie, gdyż dostrzegają wiele czynników utrudniających rejestrację i funkcjonowanie takiej formy działalności gospodarczej. Dotyczy to przede wszystkim stanu ich zdrowia oraz braku środków. W pracy przedstawiono także narzędzia/instrumenty stosowane przez państwo, które mają ułatwiać rozpoczęcie własnej działalności gospodarczej. Poprzez samozatrudnienie osoby niepełnosprawne tworzą dla siebie miejsce (stanowisko) pracy i decydują się na włączenie do rynku pracy lub powrót na ten rynek. W tym procesie istotne jest wsparcie w zakresie radzenia sobie z biurokracją i odpowiednie zmotywowanie do podjęcia tej formy aktywności zawodowej.

**Słowa kluczowe:** własna działalność gospodarcza, rynek pracy, osoby niepełnosprawne, samozatrudnienie, PFRON



## THE FLU: AN ANALYSIS OF ECONOMIC COSTS AND MORBIDITY RATES IN POLAND IN THE PERIOD 2013–2019 USING ADAPTIVE PREDICTION METHODS

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### ABSTRACT

The flu is one of the most common human illnesses in the world. The number of infections is increasing year after year, and a flu pandemic could cause significant losses in the global economy. The aim of the study is to analyse the economic costs of the flu in Poland and to investigate the number of flu cases with the use of selected adaptive prediction methods. The research was conducted using monthly data collected by the National Institute of Public Health – National Institute of Hygiene for the period from January 2013 to December 2019. Three forecasting methods were used to perform the analyses: the moving average model, the Winters multiplicate model and the creeping trend model. The research results indicate that it is possible to use the creeping trend model to generate short-term prognoses for the flu. In addition, implementing programs to improve the effectiveness of flu prevention in Poland will help reduce the negative health, social and economic effects it creates.

**Key words:** flu, cost, prediction, creeping trend model

**JEL codes:** C53, H51, I15, I18

### INTRODUCTION

The flu (short for influenza) is the most common infectious disease in Poland. Flu epidemics vary in severity every season and generate broad costs to the economy. The danger of viruses that spread rapidly and easily, and the severity of their financial and social costs, has been starkly displayed during the current COVID-19 pandemic. Every fall season, the number of flu cases increases exponentially, and the virus devastates not only organisms but also the economy. According to experts from Ernst & Young, Poland loses about PLN 1.5 billion every year (at most PLN 4 to USD 1, this equals USD 387 million), and during

epidemic seasons this amount may increase to over PLN 4 billion (over USD 1 billion). The reduction of these costs is influenced by prevention, vaccinations and accurate prediction. The quality of morbidity predictions determines whether decisions based on the prognosis process can reduce the economic impact of viral diseases.

The aim of the study is to assess the economic costs of the flu and to analyse flu morbidity in Poland in the seasons from 2012/2014 to 2018/2019, using selected adaptive prediction methods to test their usefulness in predicting the disease.

Flu, as defined by the State Sanitary Inspectorate [Państwowa Inspekcja Sanitarna], is an acute respira-

tory disease caused by the flu virus. It is transmitted mainly by direct contact with an infected person or with contaminated surfaces, and by droplets, when viruses are released in microparticles of secretions from the upper respiratory tract [Państwowa Inspekcja Sanitarna 2009]. The flu virus belongs to the class of RNA viruses and it has three types in humans:

- Type A is able to infect not only humans, but also other mammals and birds. This virus is responsible for the occurrence of repeated infections taking the form of an epidemic or a pandemic;
- Type B causes infections only in humans, which are mild, but can turn into more severe conditions;
- Type C, although it attacks quite often, mainly causes mild illnesses among children [Blank et al. 2016].

Flu viruses are microorganisms that rapidly undergo antigenic changes through the antigenic shift mechanism, i.e. spontaneous point mutations (“mistakes”) in the process of viral replication. The frequency and ease of these changes causes annual epidemics of the disease because a past infection does not provide immunity.

The second way to create a new strain is gene reassortment (antigenic shift), which consists in mixing the genetic material of viruses of different strains. This situation occurs when one cell is attacked by two or more different viruses [Lifschitz 2011]. The resulting varieties are particularly dangerous because they can transmit new viruses to humans that previously infected only animals and vice versa. For example, in 1997, an avian influenza virus labelled (A/H5N1) became dangerous to humans and received a new designation HPAI – “highly pathogenic avian influenza

virus”. This type of gene shuffling is responsible for pandemics that occur every 10–50 years [Makowiec-Dyrda et al. 2016] – Table 1.

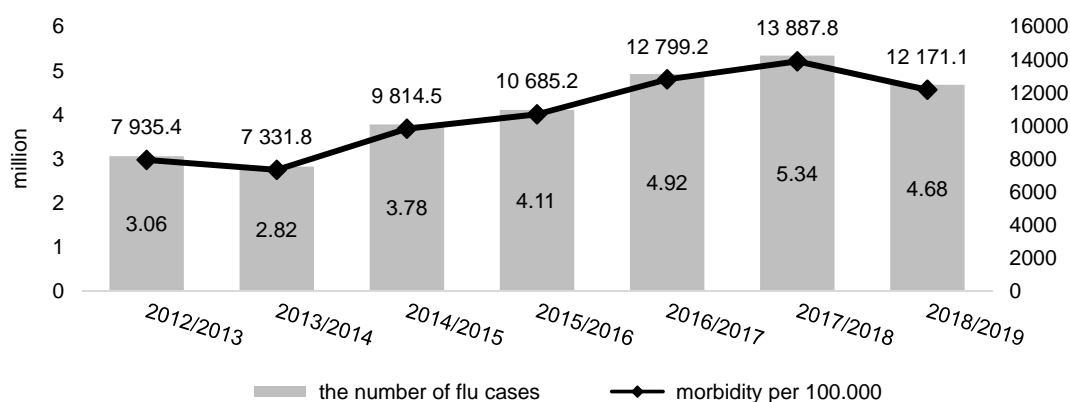
According to estimates by the World Health Organization, 5–10% of the adult population and 20–30% of children are infected with the flu virus worldwide each year. Acute disease symptoms are registered in 3–5 million people. Flu epidemics cause between 290,000 and 650,000 deaths globally and an average of 38,500 deaths in Europe. Type A viruses (mainly A/H1N1 and A/H3N2) may cause a pandemic as a result of an antigenic jump, while type B viruses cause an epidemic every 2–4 years [Antczak et al. 2017].

Flu is a notifiable disease to the National Institute of Public Health – National Institute of Hygiene (Narodowy Instytut Zdrowia Publicznego – Państwowy Zakład Higieny). Epidemiological data is related to the number of influenza and influenza-like illnesses and is collected by the Department of Epidemiology and Surveillance of Infectious Diseases (Zakład Epidemiologii Chorób Zakaźnych i Nadzoru). This data show quite different levels over the last ten years and, according to experts, indicates a clear underestimation of the problem due to the limited number of cases that are actually reported. Flu is usually self-limiting and is treated on an outpatient basis. The diagnosis of flu is made primarily on the basis of clinical symptoms, and virus identification tests are seldom ordered. In Poland, in recent years, the incidence of flu has ranged from 7,332 to 13,888 cases per 100,000 per season, which gives an average of about 4 million registered cases per season (from October to September) – Figure 1.

**Table 1.** Major flu pandemics of the 20th century

| Period    | Virus strain           | Estimated number of deaths |
|-----------|------------------------|----------------------------|
| 1918–1919 | Spanish flu (A/H1N1)   | 50–100 million             |
| 1957–1958 | Asian flu (A/H2N2)     | 1–4 million                |
| 1968–1970 | Hong Kong flu (A/H3N2) | 1–4 million                |

Source: Ernst & Young et al. [2003], WHO [2009a, b].



**Fig. 1.** The number of flu cases and morbidity per 100,000 in Poland

Source: Author's presentation based on National Institute of Public Health – National Institute of Hygiene data.

## THE ECONOMIC ASPECT OF INFLUENZA

The flu not only wreaks havoc on the body, it also negatively affects the economy. The amount that Poland loses from influenza depends, of course, on the number of sick people, but there are also other factors. The economic problem of the flu was analysed by Ernst & Young, which – in cooperation with the National Institute of Public Health – National Institute of Hygiene, the Institute for Flu Research (Zakład Badania Wirusów), the National Flu Centre (Krajowy Ośrodek ds. Grypy) and the Polish Society for Health Education (Polskie Towarzystwo Oświaty Zdrowotnej) – undertook the task of estimating the cost of the flu in Poland and publishing a special report.

The costs associated with the onset of the disease have been divided into three main types:

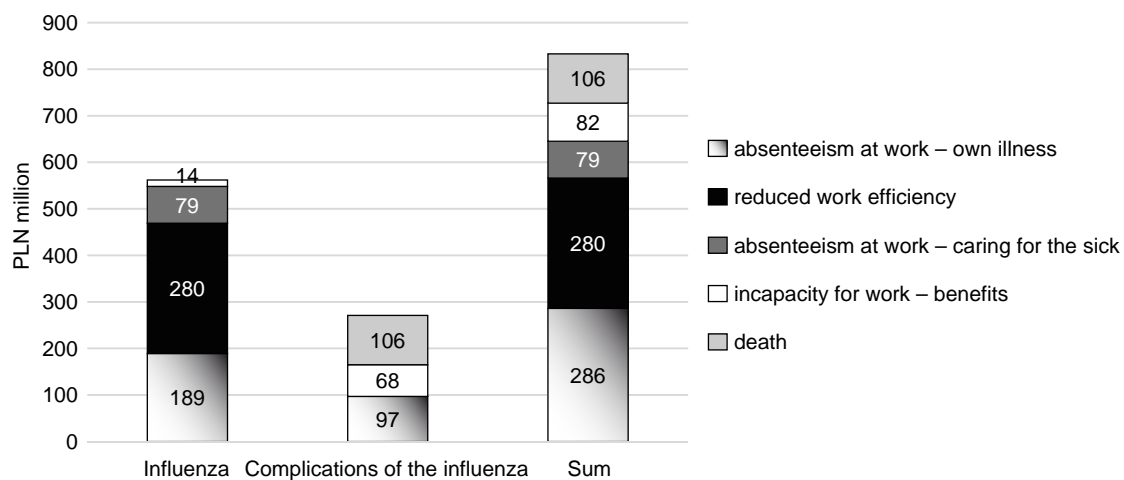
- Direct costs, understood as all inputs incurred as the result of a medical intervention or treatment of a given disease unit. Direct costs are relatively the most easily identifiable cost category, which allows for relatively accurate estimation of their value. This group includes the costs of: treatment (symptomatic), medical visits, treatment of complications after flu, specialist examinations and hospitalization.
- Indirect costs, i.e. loss of productivity resulting from illness, in particular: costs of absenteeism or long-term absence from work due to one's own ill-

ness or to care for a sick person, and a decrease in the work efficiency of sick people who are not on sick leave.

- Intangible costs, which are difficult to describe in economic terms, such as: deterioration of the quality of life (e.g. due to pain), loss of free time, limited possibilities of functioning (e.g. social activity).

In the report, direct costs were estimated on the basis of available National Health Fund (Narodowy Fundusz Zdrowia) data on expenses for the treatment of flu itself, some complications, estimates of the valuation of services in primary healthcare facilities, and a basket of medications for flu constructed by experts, along with the most common complications of respiratory diseases. For the year without an epidemic, direct costs amounted to approximately PLN 43.5 million, and were nearly PLN 730 million in the scenario for the year with an epidemic. However, indirect costs in the year without an epidemic were estimated at about PLN 836 million, while reaching PLN 4,302 million in the year with an epidemic [Ernst & Young et al. 2013].

In total, over 60% of indirect costs are related to absenteeism or reduced productivity. This is due, in part, to the high reliance on labour productivity found in the economies of less-developed countries, such as Poland. The absence of an employee (estimated cost – PLN 286 million – Fig. 2) or his/her lower efficiency (estimated cost – PLN 280 million – Fig. 2) strongly affects the financial results of companies and the entire



**Fig. 2.** Share of individual cost groups in total flu costs – indirect costs (season without epidemics)

Source: Ernst & Young et al. [2013].

economy, which can be seen in the current COVID-19 pandemic.

It may be argued whether these economic cost estimates for flu are overestimated, as the National Institute of Public Health – National Institute of Hygiene data on which the report is based includes both flu cases and suspected flu cases. However, it is obvious that the flu generates a range of costs for the economy, and the amounts presented in the report are impressive.

The Ernst & Young analysis clearly indicates that prevention and raising the number of vaccinations are measures that reduce the financial burden on the economy. The effectiveness of vaccines for the entire population depends significantly on the scope of the vaccination program, and unfortunately, in Poland only 3–5% of Poles are vaccinated against the flu. For comparison, in the Netherlands and the United Kingdom, the vaccination coverage level in the population is close to 75%. According to experts, the optimal level of vaccination that maximizes savings is around 45% and in a season without a flu epidemic may bring savings of PLN 500 million (almost 70% of costs) [Ernst & Young et al. 2013]. Taking into account the current costs of the vaccine (about PLN 30), this is the same amount that the government would have to spend on the purchase of vaccines for over 17 million citizens. However, when considering a widespread epidemic season, and potential savings of PLN 3 billion, the

amount of expenditure on vaccines does not seem so high, especially as it would greatly contribute to the underlying health and quality of life for the country's population and economy.

## ADAPTIVE PREDICTION METHODS

Adaptive forecasting models are characterised by high flexibility and adaptability in the case of irregular changes in the direction or speed of the trend or distortions in periodic fluctuations. It makes adaptive models a convenient tool for short-term economic forecasts [Zeliaś et al. 2003].

In the study of the possibility of predicting the number of flu cases, after the graphical analysis of the data and taking into account the observed seasonality, the following prognostic methods were used: unweighted moving average with  $k = 3$ , Winters multiplicative model and creeping trend model with  $k = 3$ .

The moving average and the Winters methods are widely described in the literature on the subject [Zeliaś et al. 2003, Cieślak 2005]. The crawling trend model was introduced by Z. Hellwig [1970] following the principle characteristic of adaptive methods – greater impact on the forecast value from newer data than from older data. The creeping trend is used to describe the shaping of a phenomenon characterised by irregular fluctuations, such as the number of flu cases.

The procedure of determining the creeping trend consists of smoothing the time series  $y_1, \dots, y_n$  with an arbitrarily selected smoothing constant  $k$ , so that random fluctuations are eliminated. The linear trend equations are determined using the method of least squares on the basis of  $k$  successive observations, i.e. the parameters of  $n - k + 1$  segmental equations are estimated as:

$$\hat{y}_{ij} = a_{0j} + a_{1j}t$$

$$(j = 1, \dots, n - k + 1, t = j, \dots, j + k - 1)$$

where:

- $k$  – smoothing constant is the number of cases for each partial trend,
- $j$  – number of partial trend equation,
- $\hat{y}_{ij}$  – determined smoothed value; for a given  $t$  from 2 to  $n - 1$ , there is a set of approximants calculated from the partial trend equations,
- $a_{0j}, a_{1j}$  – estimated values of the partial trend equations.

The creeping trend is computed according to the formula

$$\hat{y}_t = b_{0t} + b_{1t}t$$

and the following calculation can be used to obtain the estimates:

$$b_{0t} = \frac{1}{m} \sum_{j=j_0}^{j_0+m-1} a_{0j}$$

$$b_{1t} = \frac{1}{m} \sum_{j=j_0}^{j_0+m-1} a_{1j}$$

where:

- $\hat{y}_t$  – determined smoothed value (fitted value) for period  $t$ ,
- $b_{0t}, b_{1t}$  – estimated values being mean values of estimates of the partial trend equations for  $t \in \langle j, j + k - 1 \rangle$ ,
- $m$  – number of the partial trend equations for  $t \in \langle j, j + k - 1 \rangle$ ,
- $j_0$  – number of the first partial trend equation for  $t \in \langle j, j + k - 1 \rangle$ .

By combining successive points  $(t, \hat{y}_t)$ , the development trend of the time series is obtained in the form of a segment, the so-called creeping trend. Let us note the series of predictions is exactly the same length as the output series of real observations.

## RESULTS OF THE STUDY

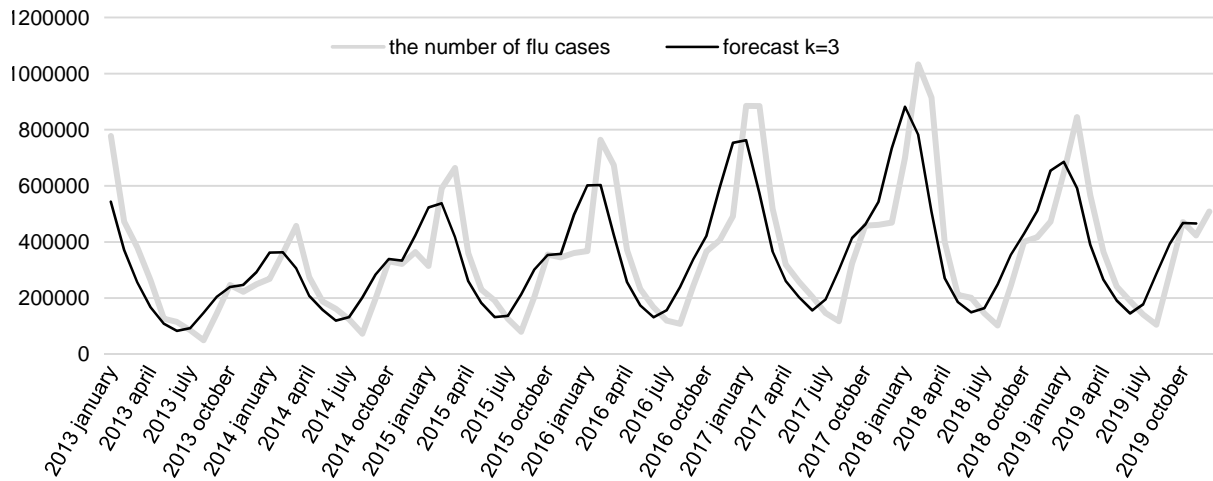
The data used in the study come from the Laboratory of Monitoring and Epidemiological Analysis (Pracownia Monitorowania i Analizy Sytuacji Epidemiologicznej) located in the Department of Epidemiology and Surveillance of Infectious Diseases, which is part of the National Institute of Public Health – National Institute of Hygiene. The time series included observations corresponding to the number of cases in the months from January 2013 to December 2019.

In order to check the suitability of the following models: the unweighted moving average model with  $k = 3$ , the Winters multiplicative model and the creeping trend model with  $k = 3$  for short-term prediction of the number of flu cases, their accuracy was tested by preparing expired forecasts for 2013–2019. The analysis of ex post errors was used to determine the admissibility of forecasts; moreover, it was assumed that the length of the verification interval for expired forecasts will be seven years. The comparison of the predicted disease values for the past with the observed actual values for the same period allowed for the formulation of conclusions as to the usefulness of the three prediction algorithms used. Moreover, it provided the basis for determining the scale of error between the forecasts and the actual state of cases.

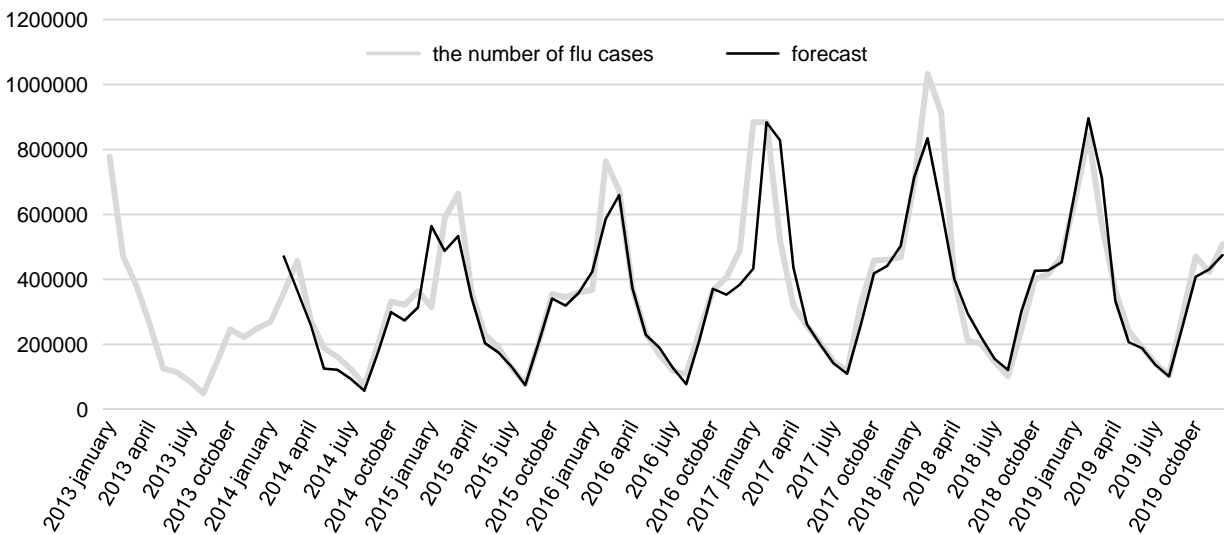
Figures 3 and 4 show the actual and forecast numbers of flu cases obtained by the moving average model and the Winters multiplicative model, respectively.

On the basis of Figures 3 and 4, it can be concluded that the two selected adaptation models did not work well in terms of a good adjustment of forecasts to actual data. The values of standard deviations of the *RMSE* forecast errors and the *MAE* absolute errors prove that the obtained predicted numbers of flu cases strongly deviate from the actual values, and the *MAPE* error levels indicate that the forecasts are not acceptable. Figure 5 presents the actual incidence and expired forecasts obtained from the creeping trend model.

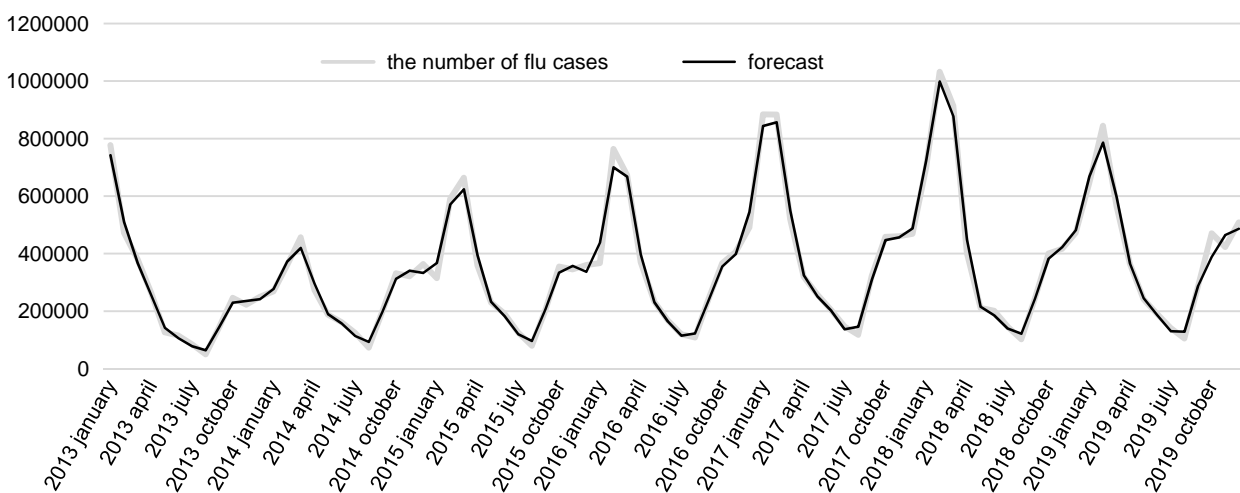




**Fig. 3.** Real and forecast number of flu cases – the moving average model with smoothing constant  $k = 3$   
 Source: Author's calculations.



**Fig. 4.** Real and forecast number of flu cases – the Winters multiplicative model  
 Source: Author's calculations.



**Fig. 5.** Real and forecast number of flu cases – the creeping trend model with smoothing constant  $k = 3$   
 Source: Author's calculations.

The crawling trend model with greater weight takes into account observations closer to the forecast values, which has worked well for quite large distortions of random fluctuations in the number of flu cases.

The values of standard deviations of the *RMSE* forecast errors and the *MAE* absolute errors indicate that the forecasts of the number of flu cases differ from the actual levels by about 20,000 infection cases. The *MAPE* value allows for the recognition of expired forecasts as acceptable and almost accurate (Table 2).

confirms the threats described in the report – reduced labour supply, limited economic activity, lower tax revenues and increased state spending, and consequently growing public debt. The government should take measures to raise public awareness of the key role of hygiene in public health, the increased risk of epidemics in the modern globalised world and the importance of flu prevention. Flu vaccination coverage in Poland is alarmingly low at 3–4%. The threats or negative side effects resulting from vaccination are

**Table 2.** Values of the different accuracy measures

| Forecast model                    | <i>RMSE</i> | <i>MAE</i> | <i>MAPE</i> (%) |
|-----------------------------------|-------------|------------|-----------------|
| Moving average model with $k = 3$ | 59 684.81   | 42 387.69  | 14.73           |
| Winters multiplicative model      | 89 544.16   | 43 614.02  | 9.75            |
| Creeping trend model with $k = 3$ | 25 641.93   | 19 040.62  | 5.15            |

Source: Author's calculations.

## CONCLUSIONS

In forecasting the number of flu cases in Poland, the best results, understood as the lowest values of the average relative errors of ex-post forecasts, were obtained for forecasts determined using the crawling trend model with short segments ( $k = 3$ ). This result can be explained by a good adaptation of the method to the variability of the studied phenomenon, which was characterised by irregularities and trend breaks. The effects of the crawling trend model with linear regression turned out to be satisfactory and may suggest the usefulness of this method for short-term prediction of the number of flu cases as a supplement to the epidemiological models already used. However, the presented results should not be treated arbitrarily, because in the case of a different type of time series with a different course, trend breaks and a large share of random fluctuations, better results can be obtained using other models.

The analysis of the economic costs of the flu from the Ernst & Young report reveals their scale and consequences for the economy. The current coronavirus pandemic, severely affecting society as a whole,

not confirmed by countries with very high vaccination coverage of the flu, on the order of 75% – such as Great Britain or the Netherlands. And at the level of 22% of vaccination coverage, the Polish economy can achieve benefits of PLN 100 million, not to mention the positive health effects. It should be remembered that due to the ease of spreading the flu virus, its frequent mutations, as well as non-specific clinical symptoms and the risk of developing health and life-threatening complications after the flu, flu epidemics and pandemics pose a significant social danger.

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## **EKONOMICZNE KOSZTY GRYPY I ANALIZA ZACHOROWALNOŚCI NA GRYPĘ W POLSCE W LATACH 2013–2019 Z WYKORZYSTANIEM ADAPTACYJNYCH METOD PREDYKCJI**

### **STRESZCZENIE**

Grypa jest jedną z najczęstszych przyczyn zachorowalności ludzi na świecie. Liczba infekcji z roku na rok jest coraz większa a potencjalna pandemia może spowodować znaczące straty w światowej gospodarce. Celem opracowania jest analiza ekonomicznych kosztów grypy oraz zbadanie liczby zachorowań na grypę w Polsce z wykorzystaniem wybranych adaptacyjnych metod predykcji. Badania przeprowadzono, wykorzystując dane miesięczne gromadzone przez Narodowy Instytut Zdrowia Publicznego – Państwowy Zakład Higieny z okresu od stycznia 2013 roku do grudnia 2019 roku. Do wykonania analiz wykorzystano trzy metody prognozowania: model średniej ruchomej, multiplikatywny model Wintersa oraz model trendu pełzającego. W świetle wyników badań okazało się, że jest możliwe wykorzystanie modelu trendu pełzającego do generowania krótkoterminowych prognoz zachorowań na grypę. Ponadto wdrażanie programów poprawiających efektywność profilaktyki grypy w Polsce pomoże ograniczyć jej zdrowotne, społeczne i ekonomiczne.

**Słowa kluczowe:** grypa, koszt, predykcja, trend pełzający

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