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Economics and management under conditions of uncertainty – the Polish and Ukrainian experience

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Ekonomia i zarządzanie w warunkach niepewności – doświadczenia Polski i Ukrainy

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Wiesława Caputa i Lyubomyr Sozanskyy

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Introduction

Nowadays, there are many unexpected changes in the business environment, some of which caused by the COVID-19 pandemic. These changes affect all market participants to a greater or lesser extent, increasing the scope of uncertainty but also creating new opportunities. Many business and non-business entities are developing their online presence, while more employees are able to work remotely. There is a growing awareness of cybersecurity in business and non-business relations. As the amount of business activity conducted in the virtual space is increasing, the demand for new solutions in the areas of business, science, education and culture is on the rise.

The articles presented in this volume show how some of these challenges are addressed in Poland and Ukraine.

In the article entitled *Analysis of travel insurance conditions in Poland during the pandemic*, Roman Garbiec analyses changes in the tourism industry and in travel insurance in Poland caused by the pandemic, based on documents and information from insurance companies as well as data published by Statistics Poland. Faced with the collapse of the tourism market brought about by the pandemic and the government restrictions, insurance companies started offering travellers policies to cover the risk of infection with the coronavirus. However, with tourist traffic not likely to recover quickly in the near future, the demand for travel insurance will be relatively low.

In her article entitled *Green bonds and Eurobonds – modern forms of bonds as a source of capital accumulation used by Polish companies*, Małgorzata Lipowicz notes that while Polish companies have not been making much use of new forms of bonds, their role in the accumulation of debt capital can be expected to grow in the future.

Paulina Zielińska's article entitled *The impact of the COVID-19 pandemic on the operations of insurance companies PZU and ERGO Hestia*, analyses how two leading insurance companies in Poland reacted to the pandemic. The

author concludes that both insurers quickly adapted to the sudden change in circumstances by offering special insurance protection for customers and their relatives and by taking steps to promote safety, psychological support and limit direct personal contacts. Despite slight declines in some performance indicators as a result of the pandemic, the general financial standing of both insurance companies was satisfactory.

In his article entitled *Rational and behavioral causes of the emergence and enhancement of the momentum effect*, Marcin Fuksiewicz notes that despite continuing evidence confirming the validity of the efficient market hypothesis, there exist anomalies that violate its assumptions. One of them, known as the momentum effect, is particularly important because of its widespread occurrence in various markets and the fact it can be used to build investment strategies. The authors analyses two categories of causes of the momentum effect: one based on rational reasoning and the other one including behavioral factors, connected with actual, often irrational behaviours of investors, and, more generally, capital markets.

The article entitled *Application of the expert evaluation method in the analysis of trends and priorities of the educational process* by Yulia Poliakova and Zoriana Novosad explores how the method of expert assessment can be used to identify trends in the development of the educational space in Ukraine and determine how it should be adapted to internal conditions and global challenges. The authors discuss key aspects of the development of higher education in the globalised educational space and demonstrate that the expert method can be used to evaluate how various factors affect the process of training undergraduate in educational and professional programmes. Results of such evaluations can then be used to improve the quality of the educational process.

Svitlana Ishschuk's article entitled *Current problems faced by Ukraine's regions with regard to economic specialization*, investigates the impact of external factors on the indicators of Ukraine's socio-economic development. The author proposes her own typology of regions depending on the level of their economic specialization and creates a ranking showing each region's contribution to the country's GDP.

In their article entitled *The global experience of state support for industrial production in the context of the transition to industry 4.0 and digitalization*, Ivan P. Buleev, Oleksandra Chorna and Yaroslav Bryukhovetsky analyse government initiatives around the world aimed at encouraging the modernisation of industrial production according to the principles of industry 4.0. They conclude that public-private partnerships are a useful tool of state support for industrial production to stimulate digitalization and the transition towards industry 4.0 as well as the creation of knowledge platforms. They also point out that the manufacturing sector in Ukraine needs to manage its digital transformation, show greater concern for the environment and improve energy efficiency to become more competitive.

Challenges facing Ukraine's industrial sector are also the subject of the article written by Lyubomyr Sozanskyy and entitled *Problems of the development of the Ukrainian automobile manufacturing*. The author demonstrates the effectiveness of tools of state protectionism in supporting the Ukrainian automobile industries and identifies the causes of destructive transformations in Ukrainian mechanical engineering, outlining directions for their elimination.

Although the articles presented in the current volume address only some of the problems related to the main subject, they provide an interesting overview and present findings that may be of interest not only to scientists and students, but also to entrepreneurs.

Wiesława Caputa, PhD

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Analysis of travel insurance conditions in Poland during the pandemic

Abstract. *The global pandemic of the SARS CoV-2 virus has affected the world economy and individual countries, including Poland: with its economy in a state of 'deep freeze' and subsequent lockdowns, many service activities came to a practical standstill. As a result of preventive measures such as isolation of the infected, quarantine for people in contact with the infected, tourism services in Poland were officially suspended (except for business trips). This situation had an effect on travel insurance, causing the demand for travel insurance to plummet. Consequently, insurance companies were forced to modify their offering. This article presents changes in tourism and in travel insurance in Poland caused by the pandemic. The study is based on the analysis of documents and information from insurance companies and data published by Statistics Poland.*

Keywords: *pandemic, corona virus, SARS CoV-2, tourist traffic, travel insurance, insurance companies, general insurance conditions*

1. Introduction

Polish insurance system solutions place travel[1] insurance in the sector of obligatory and voluntary business insurance. Dual character of the freedom of in-

[1] Travel insurance serves to meet the financial needs (households and businesses) that arise from the realization of risks specific to the entity undertaking tourism and recreation activities. Insurance in tourism and recreation includes a wide variety of products aimed at both businesses operating in the broadly defined tourism industry, as well as individuals, which include participants in organized events and individuals meeting the needs for tourism and recreation individually (Gasińska, 2013, pp. 54-55).

surance choice results from legislative solutions which oblige tour operators and travel agents to obligatorily insure their clients in case of their bankruptcy. Freedom of choice of travel insurance is guaranteed to customers of tour operators who, in the form of voluntary insurance, can protect themselves during the trip against specific risks (determined by individual insurance companies).

The functioning of the tourist services market in Poland until 2019 was developing intensively, Unfortunately, the time of the pandemic radically changed the existing state of affairs. Unfortunately, the time of the pandemic has radically changed the status quo. Blocking of tourist traffic, obligatory quarantines or freezing of the economy in the form of lock downs, especially in the gastronomy and hotel sectors closely related to tourist traffic and closure of all accommodation facilities have caused the number of people travelling in Poland and abroad to drastically decrease, leading to bankruptcy of tourist companies. These circumstances have a decisive impact on the functioning of travel insurance companies in Poland during the pandemic.

The main idea of this article is to present the changes in the scope of travel insurance in Poland in the period of economic freeze, partial closure or in certain periods of time the entire travel services sector. The basic aim of the analysis is to present the types of reactions of travel insurance companies during the COVID-19 pandemic in Poland. An additional objective is to present changes in the volume of tourist traffic during this time. The primary objective implies the question: how did Polish insurance companies respond to the changes in tourist traffic caused by the pandemic?

As a working hypothesis in the analysis it was assumed that the decrease in tourist traffic during the pandemic resulted in changes in insurance conditions aimed at increasing the scope of coverage in the travel insurance sector.

As a research tool, the method of analyzing documents and information from insurance companies (general insurance conditions) and information and documents of the Central Statistical Office was used.

1. Legal basis of travel insurance in Poland

Anything that can become an object of market exchange, anything that can be sold and bought is a product. Products are not only physical goods but also services, places, organizations, industries, etc. Insurance being a de facto service is also a product (in insurance theory). The providers of insurance services are insurance companies. The buyers of insurance services are policyholders. The insurance service is purchased by the policyholders in exchange for a premium, which is the price of insurance. The formulation of the content of the insurance relationship and the conclusion of the insurance contract would be impossible

without the participation of the insurance company and the policyholder (buyer), as parties to the insurance contract. Relations between the insurance company and the policyholder are formal relations, as they are based on a contractual relationship (Handschke, 1998, pp. 60-64).

The policyholder can be both a legal person (e.g. an employer insuring its employees) and a natural person. The policyholder can conclude a contract on his own behalf (the insurance then protects his own financial interest of the policyholder, who is then also the insured). In these most common cases, the policyholder is not only obligated to the insurer, but is also the person entitled to compensation or benefits. In the context of insurance in tourism, it is particularly important to distinguish insurance for the benefit of a third party because of the obligations imposed by the legislator on tour operators and travel agents with regard to insurance as one of the forms of financial security and with regard to the conclusion of certain insurance agreements for the benefit of customers. While discussing the essence and scope of insurance in tourism, it is necessary to mention the injured party as a specific subject of the insurance relation appearing next to the insurer and the policyholder in civil liability insurance. The insurance company undertakes to pay compensation specified in the agreement for damage caused to third parties for which the policyholder or the person in whose favour the insurance agreement was concluded is responsible. Referring to the practical dimension of liability insurance (OC) in tourism, one should mention the principle of *actio directa*, according to which "the person entitled to compensation in connection with the event covered by the liability insurance contract may pursue a claim directly against the insurance company" of the perpetrator of the damage. Thus, the tourist organizer or other business entity providing services related to tourism and recreation, as well as a natural person benefiting from the third party insurance coverage may count not only on the payment of compensation or other benefits to the injured party, but also on the insurance company taking over the duties related to the claim handling (including legal services) (Gasińska, 2013, p. 50).

Poland (after France, where there are over 200 types of compulsory insurance; Kowalewski, 2010a, p. 12) is one of the countries that have introduced the largest number of compulsory insurances in the business insurance sector. Leaving aside social insurance and public health insurance, there are about 160 examples of "compulsory" or "forced" insurance, which is criticised in the literature (Łopuski, 2008; Kowalewski, 2010a, 2010b[2]) and is sometimes called "compulsory inflation" (Mogilski, 2009, p. 184) or even "legislative schizophrenia" (Kowalewski, 2010b, pp. 61-63).

The catalog of obligatory business insurance in Poland includes:

[2] For example, a strong opponent of the multiplication of the catalog of compulsory insurance in the German science of insurance law is J. Basedow (2003, pp. 505-506).

1. General insurance: civil liability of drivers, civil liability of buildings, civil liability of farmers,

2. Special insurance, which refers to specific professional groups, such as: doctor, insurance broker, auditor, architect, veterinarian, nurse, financial advisor, pharmacist, construction engineer, lawyer, organizer of mass events, legal advisor, tour operator and travel agent.

Tour operator or tour operator insurance covers:

– the costs of the return of customers from the tourist event to the place of departure or the planned return from the tourist event in case the tour operator or tour operator intermediary, against its obligation, does not ensure this return;

– reimbursement of payments made by customers to pay for a tourist event in case when, for reasons attributable to the tour operator or tour operator intermediary and persons acting on their behalf, the tourist event is not carried out;

– refund of part of the payment made by customers for a tourist event, corresponding to the part of the tourist event which was not carried out for reasons attributable to the tour operator or tour operator and persons acting on their behalf.

The insurance covers all losses in the above scope, with reference to contracts for provision of tourist services concluded during the insurance period, even if their performance did not take place during that period, without the possibility of contractual limitation of the insurer's liability.[3]

The entrepreneur (who may choose another insurance product) conducting business activity in the scope of organizing tourist events and mediating in concluding tourist service agreements on behalf of clients is obliged to ensure clients, in case of his insolvency coverage of the costs of the return of customers from the tourist event to the place of departure or the planned return from the tourist event in case the tour operator or tour operator intermediary, against his obligation, does not provide this return, as well as provide customers with a refund of payments made for payment for the tourist event in case when, for reasons related to the tour operator or tour operator intermediary and persons who act on their behalf, the tourist event will not be carried out, as well as to ensure customers a refund of a part of payments made for a tourist event, corresponding to the part of the tourist event that will not be carried out for reasons related to the tour operator or tour

[3] Ordinance of the Minister of Finance of 22 April 2013 on compulsory insurance for the benefit of customers in connection with the activities carried out by tour operators and tour intermediaries (Journal of Laws of 2013, item 510) amended by the Ordinance of the Minister of Development and Finance of 21 November 2016 amending the Ordinance on compulsory insurance for the benefit of customers in connection with the activities carried out by tour operators and tour intermediaries, (Journal of Laws of 2016, item 1891).

operator and persons who act on their behalf, by concluding an insurance contract in favor of customers[4] (Kowalewski, 2010b, pp. 11-32).

On the other hand, from the financial point of view in Poland, the security system in travel insurance in case of insolvency of tour operators or tour intermediaries consists of two pillars:

– pillar I forms the financial security in the form of a bank or insurance guarantee, an insurance contract for the benefit of the offices' clients or the acceptance of payments into an escrow account,

– pillar II consists of funds collected in the Tourist Guarantee Fund (TFG) (Stokłosa, 2018, p. 56).

2. Types of risk in tourism

Identification and assessment of risks occurring in tourism and recreation is one of the important determinants of optimal economic decisions (companies and individuals) and a prelude to an active approach to risk. In this process, proper recognition of the specifics of tourism and recreation as a potential source of damage generating events (losses and extraordinary expenses) is of particular importance (Gasińska, 2013, p. 49). Firstly, it is about the awareness of risks (risks and possible events) accompanying the trips. It should be assumed that in this case an insurable risk is any threat of a negative "tourist" event ("travel"), the occurrence of which causes a loss and the necessity for us to cover costs related to this event (risk occurrence).

First of all, it is necessary to pay attention to the variety of threats (risks) against which insurance protection may be applied:

– the risk of having to cancel a tourist event (departure), for reasons such as illness, death of a loved one;

– risk of having to change the reservation of ticket for travel (e.g. due to delays in means of transport, failure to arrive at the airport);

– risk of having to interrupt the trip (stay) and return to the country, for such reasons as illness, death of a loved one;

– risk of civil liability for damage caused to someone;

– risk of illness requiring medical services, treatment;

– risk of personal accident consequences (NNW);

– risk of necessary transportation of a person from abroad to the country;

[4] Ordinance of the Minister of Sport and Tourism of 21 April 2011 on specimens of forms of bank guarantee agreement, insurance guarantee agreement and insurance agreement in favour of customers required in connection with activities carried out by tourism organisers and tour operators (Journal of Laws of 2011, No. 88, item 499) repealed by the Act of 24 November 2017 on tourist events and related tourist services. (Journal of Laws of 2017, item 2361)

– risk of indispensable rescue service;
– risk of necessary assistance (e.g. assistance – in case of a car breakdown);
– risk of non-delivery (delay in delivery) of baggage;
– risk of damage to, destruction or loss (theft) of baggage;
– risk of damage to, destruction or loss (theft) of sports equipment;
– risk of hindering the achievement of the purpose of the trip (e.g. due to bad weather conditions) (Travel insurance).

The risk assessment of a tour operator, on the other hand, should focus on and first take into account the prerequisites related to specific circumstances that may occur in the entity's operations. These are:

– assessment of the applicable legal standards to which the company is subject,
– assessment of the average risk for a given type of enterprise on the basis of typical choices and economic behavior of other participants of economic turnover,
– assessment of the likelihood of losses at the time of action relative to the possible economic benefits to be achieved,
– assessment of the nature of the means and methods chosen by the decision-maker to achieve a particular economic objective,
– assessment of possible actions with a lower degree of risk,
– analysis of the possibility of protecting the enterprise from the negative consequences of the risk taken (Sobolewski & Bober, 2015, pp. 253-264).

3. Scope and types of insurance in tourism

The activities of tour operators, through no direct fault of their own, can cause unforeseen negative consequences, affecting not only the tourists or cooperating companies, but also the wider tourist reception areas. Therefore, in order to minimize such negative incidents, the activities of tourism businesses must be closely linked to insurance. This insurance activity must also develop almost at the same rate as the tourist traffic (Sobczyk, 2013, p. 234).

In Poland, insurances related to tourist activities include, among others: motor vehicles, medical expenses and accident consequences, travel luggage, yachts and floating equipment, tourist equipment, assistance, cancellation or interruption of participation in a tourist event, traveler's liability insurance for damage caused, legal protection abroad, liability insurance of travel agencies (tour operators and tour agents), hotels, tour guides (Nesterowicz, 2012, p. 208).

Using the third party liability insurance, the tour operator or other business entity providing services related to tourism and recreation, as well as an individual can count not only on the payment of compensation or other benefits to the injured

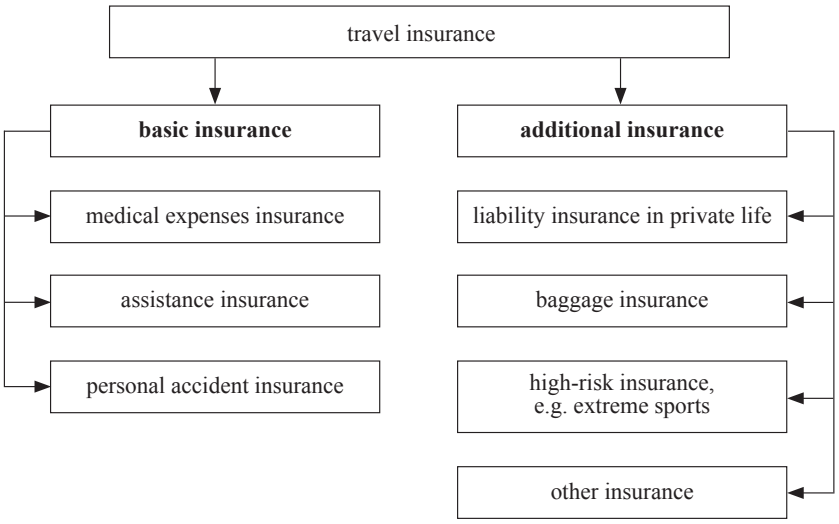

Fig. 1. Types of business insurance offered by Polish insurance companies

Source: own elaboration based on the analysis of insurance companies' offers.

party, but also on the assumption by the insurance company of responsibilities related to the claim handling (such as legal services).[5]

Insurance in tourism and recreation, therefore, includes a wide variety of products aimed at both businesses operating in the broadly defined tourism industry, as well as individuals, which include participants in organized events and in-

[5] For example, in the compulsory insurance for clients in connection with the activity conducted by tour operators and tour operators' agents, there are several risk factors (destination, means of transport, fact and date of collecting prepayments for future tour events or services) that have a direct impact on the amount of the minimum sum insured, and thus on the amount of the premium. In popular, foreign travel-related voluntary insurance, very often the destination is a factor that differentiates the insurance premium. This is done by identifying "geographic zones" that, according to the insurance company, generate different levels of risk. In this context, insurance companies use the category of premium rate, as a due premium for each 1/1000 (per mille) or 1/100 (per cent) of the amount corresponding to the sum insured (guarantee amount in liability insurance) in a year. In practice, insurance companies prepare premium tariffs that include all the parameters for determining individual premium, and among them, in addition to the basic ones related to the specificity of the subject of insurance, e.g.: discounts for the continuation of insurance, no-fault course of insurance, concluding at the same time several agreements with the same insurer. These insurances serve to satisfy the financial needs (of households and enterprises), which arise in connection with the implementation of the risk specific to the entity undertaking activity in the field of tourism and recreation.In turn, in the insurance practice terms and concepts referring directly to the group of products having direct or indirect relationship with tourism are useful. This way of defining makes it easier for interested parties to design insurance coverage and choose products adapted to the type and level of risk (Gasińska, 2013, pp. 52-53).

Table 1. Criteria for breakdown and classification of insurance in tourism

Criteria	Types and examples	
Type of entity	Insurance for operators: tourism organisers, tour operators, hoteliers, organisers of mass events, hunters, owners of agro-tourism farms, etc.	
	Insurance for individuals (households), related to individual and organised tourism, leisure activities, etc., comprehensive insurance for cyclists (third-party liability, personal accident, casco, travel baggage, bicycle spare parts).	
Type of insurance	Personal insurance, e.g. travel accident and sickness insurance.	
	Property insurance	Property insurance: e.g. luggage insurance, hotel insurance, insurance of sports equipment for tourism and leisure.
		Liability insurance: e.g. tour operator's contractual and tort liability insurance, tour operator's liability insurance for recreational sports e.g. skiing, tour guide's liability insurance, tour leader's liability insurance.
Scope of insurance protection	Non-specific insurance: e.g. insurance of the tour operator's property (e.g. head office, branches) against fire and other fortuitous events, including burglary and robbery, glass breakage and devastation, damage associated with transport of property, electrical damage to electrical and electronic machinery and equipment, malfunction of electronic equipment, loss of data and software, as well as third-party liability insurance for the possession and use of property; comprehensive home insurance (damage caused by fire and other events, burglary, robbery, devastation).	
	Specific insurances: e.g. insurance for a yacht charter company (fire and other elements, theft devastation, etc., and liability for the ownership and use of yachts); insurance for participants in a social cruise (for NW and OC).	
Spatial nature of the risk	Foreign travel insurance: e.g. insurance on behalf of clients for tour operators and tour agents offering foreign tourism services; insurance for individual travellers abroad; insurance for foreign business travel.	
	Domestic travel insurance: e.g. domestic travel insurance, farm insurance.	
Party autonomy	Compulsory insurance: e.g. compulsory third-party liability insurance for the organiser of mass events, compulsory insurance for the benefit of customers in respect of the activities carried out by tour operators and tour operators' agents, third-party liability insurance for vehicle owners for damage caused by the use of these vehicles.	
	Voluntary insurance: e.g. voluntary travel assistance professional liability insurance (aimed at tour guides, mountain and tourist guides, lifeguards, camp educators), voluntary insurance for cancellation/cancellation costs.	
Legal sources	Marine insurance: e.g. liability insurance for ship owners related to the operation of sea-going vessels, insurance for personal effects of sea-going crews.	
	Land insurance: e.g. insurance for organisers of balloon flights (equipment, crew, passengers, organiser's liability); insurance for organisers of inland yachting trips; insurance for skiers; NW insurance for mountain tourism.	
Industry (by division, group and type of insurance as defined in the Act on Insurance Activity)	Division I: e.g. accident insurance, hospitalisation insurance as a supplement to life insurance.	
	Division II: e.g. accident insurance for tourists (taken out under Group 1 – accident insurance including accidents at work and occupational diseases); CASCO insurance for water tourism organisers (taken out under Group 6 – marine and inland waterway insurance, covering damage to marine and inland waterway vessels).	

Source: own elaboration based on Gasińska, 2013, p. 55.

dividuals who individually meet the needs of tourism and recreation. The division of these products is based on several classification criteria, among which we can distinguish the criterion: subjective, objective, related to the construction of the insurance programme, related to the spatial character of risk, related to insurance compulsion or freedom of contract, legal regulation, industry criterion (Gasińska, 2013, p. 55).

Practically, insurance companies offering travel insurance most often offer basic and additional types of insurance to their clients which are presented in the Figure 1.

However, more detailed divisions of travel insurance are presented in the literature. Divisions and examples of travel insurance products realized in Poland are presented in Table 1.

4. Tourism in Poland during the pandemic

Tourism is one of the sectors directly affected by the current crisis resulting from the corona virus pandemic. Due to the declaration of an epidemic emergency in Poland from March 14, 2020. state of epidemic emergency, activities related to the operation of tourist accommodation facilities and places of short-term accommodation, as well as spa treatment activities, among others, have been restricted. The introduced restrictions on the movement of people resulted in a decrease in the number of tourists using accommodation in tourist accommodation facilities in March 2020, although the first half of the month was still a period of normal operation of a large number of facilities. Declines in occupancy were recorded in all types of tourist accommodation establishments surveyed, including hotels regardless of the fact that their operations were not formally restricted until early April 2020. According to the data, in March 2020 about 935,000 tourists, including about 165,000 foreign tourists and about 770,000 domestic tourists, used accommodation in tourist facilities with 10 or more beds. Compared to the same month last year (2019), the number of total tourists was lower by 65%. The decrease in the number of tourists in accommodation facilities exceeding the average for the whole country was recorded in 6 provinces: Lubelskie, Łódzkie, Małopolskie, Mazowieckie, Świętokrzyskie and Warmińsko-Mazurskie. The lowest decreases (about 60%) occurred in the provinces of Podkarpackie and Śląskie. Domestic tourists were down by 63%, while foreign tourists were down by 69%. In March 2020, the number of accommodation facilities advertising on popular booking portals decreased. As of March 31, 2020, their number decreased by about 39% compared to the same day last year. According to estimates, in the first quarter of 2020, travel-related expenditures of domestic and foreign tourists in Poland amounted to about PLN 10.4 billion (taking into account the growth rate of spend-

ing in the first quarters of the last three years and estimated data on the number of people using tourist accommodation facilities) and were lower by about 17% compared to the same period of the previous year. In the case of the so-called one-day visitors – their spending in Poland amounted to about PLN 6.6 billion and was lower by about 14% than in the previous year (GUS, 2020).

In 2020, the number of people crossing the Polish border was 183.6 million. Compared to the previous year, there was less border traffic of both foreigners (by 42.1%) and Poles (by 36.9%). On the other hand, in the fourth quarter of 2020, the number of Polish border crossings amounted to 40.5 million people, of which 53.9% were foreigners (non-residents) and 46.1% were Polish residents (residents). Border traffic (from and to Poland) was lower than in the corresponding period of the previous year by 31.3 million (i.e. by 43.6%). Both foreigners and Poles crossed the Polish border less by 47.9% and 37.5% respectively. Compared to the previous quarter (Q3), the number of crossings was also lower – by 30.0% for foreigners and by 25.2% for Poles (GUS, 2021a).

In January 2021, tourist accommodation facilities were used by 213.1 thousand tourists, who were provided with 695.5 thousand overnight stays. Compared to January 2020, this was a decrease of 90.7% and 88.2% respectively. A significant decrease in the number of tourists, compared to the same month of the previous year, was also recorded in February 2021; according to estimates, the number of overnight stays was 73.0% lower. The results of the tourist accommodation survey showed that 213.1 thousand tourists stayed in accommodation facilities in January 2021. Compared to the same month of 2020, when 2.3 million people were recorded, there were 90.7% fewer tourists. Of the total tourists, 88.3% were domestic tourists (188.3 thousand), while 11.7% were foreign tourists (24.9 thousand). Compared to January 2020, this was less by 89.9% and 94.3% respectively.

Among foreign tourists, the most frequent users of accommodation facilities were visitors from Ukraine, who accounted for 26.2% of all foreign tourists; however, they were 85.8% less than the year before. Also numerous were visitors from Germany (13.6%) (GUS, 2021b).

5. Polish travel insurance in the pandemic period

The global pandemic has caused specific changes in the behavior of customers of insurance agents and tour operators. The corona virus causing the COVID-19 disease led to the introduction of economic and legal restrictions in many countries, resulting in, among others, temporary closure of selected borders and air traffic. This in turn has resulted in a "freeze" on tourism. People who had bought holidays or excursions during this period started to cancel them (during or before

the trip) and demanded refunds from insurers or advance payments for fees or insurance (*Ubezpieczenia turystyczne*, 2020).

Changes in the volume of tourist traffic within Poland during the pandemic had a significant impact on the operations of insurance companies. When WHO announced that the SARS CoV-2 virus was a pandemic the Chief Sanitary Inspectorate (GIS) and the Ministry of Foreign Affairs (MFA) advised against any travel that was not necessary. Also some insurance companies have adjusted their regulations to the situation. Currently, the pandemic as a liability exclusion is only present with a few insurers. However, this does not mean that other insurance companies provide such coverage during a pandemic. Virtually every insurer states in its General Terms and Conditions (GTC) that an epidemic is among its general exclusions of liability. Thus, if such a state is declared in a particular country or area, the insurance company does not have to cover the cost of treatment related to the virus infection or pay the appropriate NNW (personal accident insurance) compensation. Polish insurance companies have reacted to the existing state of affairs (pandemic) by introducing an additional insurance option either in the form of an extension of coverage or in the form of additional assistance insurance. The assistance services provided by Polish insurance companies to customers affected by the corona virus include:

– organising return transport to the country or to a place from where the journey can be continued,
– organization of accommodation for the time of recovery,
– arrangement of transportation of the deceased or funeral abroad,
– arrangement of accommodation and return for travelling companions,
– transmitting urgent information (e.g. to family or third parties),
– supplying medication,
– financial assistance.

The unstable situation in the world related to the spread of the corona virus makes many people wonder whether they should plan further travels. Support in such a situation can be cancellation insurance. Thanks to this you will receive a refund of costs incurred for the cancellation of a trip from a travel agency, ticket, accommodation or other event, previously paid. Insurers in this regard distinguish two types of contracts:

– the company is liable for the risks listed in the T&Cs (and here usually the epidemic is an exclusion of liability),
– the company offers an "all risk" option, where all reasons for trip cancellation that can be documented are covered.

Nevertheless, in the current situation, insurers may change provisions also in this type of insurance (Kajzer, 2021). A synthetic summary of insurance companies' reactions to a pandemic is presented in Table 2.

Table 2. Examples of insurance companies' reactions to an epidemic or pandemic in Poland

Insurance companies	Travel insurance	Pandemic as an exclusion of liability insurance company	Cancellation of insurance
Allianz	YES	Travel insurance covers medical costs associated with contracting COVID-19 while travelling abroad up to the sum insured and the cost of returning home if the original means of transport could not be used owing to contracting COVID-19.	
Uniqa	YES		YES – in the case of being infected in Poland. NO – in the case the trip has been cancelled for fear of contracting COVID-19
Axa Assistance	YES	The company covers COVID-19-related medical costs up to the sum assured	NO – the sale of policies has been stopped
Aviva	YES	COVID-19 cover is provided for policies taken out from 16.07.2020, for a period of up to 21 days. The company points out that the insurance will be void if the policy has been extended to cover heavy physical work and for travel outside Europe and the Mediterranean.	
Generali	YES	From 2.04.2020 onwards, in travel insurance for international travel, it will also cover the costs of medical treatment and assistance services in the event of contracting a coronavirus. The upper limit of liability for medical assistance will be the sum insured for medical expenses as indicated in the policy.	

Europa Ubezpieczenia-	YES	Provides cover in the event of a COVID-19 illness up to the sum assured for medical expenses.	YES – at an additional premium.
Nationale-Niderlanden	YES	From 4.08.2020, events arising from the epidemic have been included in travel insurance cover, including costs associated with medical assistance provided in the event of contracting the virus, but excluding costs arising from actions against local laws, prohibitions and orders of local authorities or costs associated with a stay in quarantine, e.g. the cost of a hotel.	NO
Proama	YES	Regarding foreign travel, it will also cover costs of medical treatment and assistance services in the event of contracting a coronavirus. The upper limit of liability for medical assistance will be the sum insured for medical expenses as indicated in the policy.	
PZU	YES – for trips of up to 30 days	Covers sickness from the corona virus for trips of less than 30 days, up to the sum assured for medical expenses.	
Signal Iduna	YES	From 8.05.2020, the costs of treatment as a result of contracting SARS-CoV-1, SARS-CoV-2 with their mutations are covered.	YES
Wiener	YES	It does not provide assistance in countries where the state of emergency has been declared.	
Warta	YES	The epidemic is an exclusion for travel car insurance only. Covid-19 illness will be covered up to the sum assured of the insurance.	

Source: own elaboration based on Kajzer, 2021 and own research.

On the basis of the summary it can be concluded that the presented insurance companies did not treat a pandemic as an argument to apply an exemption in the general insurance conditions or possibly to launch an additional insurance option in the form of additional insurance. What is important, in the majority of the surveyed insurance companies there was no possibility to resign from insurance in case of a pandemic in a destination. This trend can be explained by a radical reduction in tourist traffic, as a consequence of which the demand for insurance will decrease.

6. Conclusion

On the basis of the analysis carried out, it can be concluded that the pandemic and governmental actions aimed at combating it have caused a collapse in the functioning of services, especially in the field of tourism, and with it catering and hotel services. The need for further lock downs in the economy, bans on movement, direct communication introduced in the spring and autumn of 2020 and in the spring of 2021, along with further waves of growth of the pandemic threat have put many companies operating in the service sector on the verge of bankruptcy or caused their disappearance from the market. An indirect effect of these actions was changes in the scope and scale of insurance services.

It is difficult in the current situation to talk about strategic management of an insurance company, especially in the field of travel insurance protection. All strategic decisions in the management of an insurance company are based mainly on retrospective analysis and only then on forecasts for the next years. Making strategic decisions in this area in the period of pandemic may unfortunately turn out to be decisions concerning to be or not to be of the company on the travel insurance market.

To sum up, the decrease in tourist traffic in Poland during the pandemic period resulted in changes in terms and conditions of travel insurance aimed at increasing the scope of pandemic protection. Companies offered to cover the risk of contracting the corona virus with travel insurance. However, this was not the only form of reaction of insurance companies to the pandemic. Another reaction of insurance companies was the introduction of the possibility to resign from insurance (25% of presented companies).

A return to pre-pandemic levels of tourist traffic in Poland is a distant prospect. Until the general vaccination against the corona virus is completed (expected in Poland in 2022?), many travel agents and organizers are not able to function normally which automatically results in lack of demand for travel insurance. Tourism currently observed in Poland develops in the "grey zone," where the use of accommodation facilities, hotels and catering services is concealed (it is actually

illegal). People who use this form of tourism will certainly not use the offers of insurance companies in the field of protection against the consequences of contamination with the corona virus (because theoretically they do not use catering and accommodation offers, so there is no reason to use the offers of insurance companies)), which significantly affects their offer and limits development. Only by waiving the rigors of shuffling, unfreezing (launching) food and lodging services will there be more interest in insurance services. The development of the COVID-19 pandemic shows that we have to expect similar epidemics in the years to come, and the effects of the current one on the global economy are already enormous. With the next pandemic it could be even worse especially with all tourism, catering, hospitality and insurance services.

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Rozporządzenie Ministra Sportu i Turystyki z dnia 21 kwietnia 2011 r. w sprawie wzorów formularzy umowy gwarancji bankowej, umowy gwarancji ubezpieczeniowej oraz umowy ubezpieczenia na rzecz klientów, wymaganych w związku z działalnością wykonywaną przez organizatorów turystyki i pośredników turystycznych (Dz. U. Nr 88, poz. 499) [Ordinance of the Minister of Sport and Tourism of 21 April 2011 on specimens of forms of bank guarantee agreement, insurance guarantee agreement and insurance agreement in favour of customers required in connection with activities carried out by tourism organisers and tour operators (Journal of Laws of 2011, No. 88, item 499)].

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Analiza warunków ubezpieczeń turystycznych w Polsce w okresie pandemii

Streszczenie. *Ogólnoświatowa pandemia koronawirusa SARS CoV-2 zachwiała funkcjonowaniem zarówno gospodarki światowej, jak i poszczególnych państw, w tym Polski: zamrażanie gospodarki, ogłaszanie kolejnych lockdownów przez polskie władze spowodowały praktycznie upadek dotychczasowej działalności usługowej. Dodatkowe działania prewencyjne w postaci izolowania zakażonych, kwarantanny dla osób stykających się z zarażonymi sprawiły, że usługi turystyczne w Polsce przestały oficjalnie (z wyjątkiem wyjazdów służbowych) funkcjonować. Taki rozwój sytuacji miał ogromny wpływ na funkcjonowanie ubezpieczeń turystycznych, powodując drastyczny spadek popytu na tego rodzaju polisy. W związku z tym zakłady ubezpieczeń były zmuszone dostosować swoje oferty ubezpieczeniowe. Niniejszy artykuł przedstawia zmiany w funkcjonowaniu ruchu turystycznego oraz w ofercie ubezpieczeń turystycznych w Polsce podczas pandemii. Badanie opiera się na analizie dokumentów i informacji z zakładów ubezpieczeń oraz danych publikowanych przez Główny Urząd Statystyczny.*

Słowa kluczowe: *pandemia, koronawirus, SARS CoV-2, ruch turystyczny, ubezpieczenia turystyczne, zakłady ubezpieczeń, ogólne warunki ubezpieczeń*

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Green bonds and Eurobonds – modern forms of bonds as a source of capital accumulation used by Polish companies

Abstract. *The article is devoted to analysing green corporate bonds, which are used by companies to accumulate considerable capital. Nowadays, developed financial markets offer modern forms of bonds, which meet the needs of companies and reflect new trends in finance, such as green finance. Polish companies use new forms of bonds, such as Eurobonds or green bonds, but only to a limited extent. The emerging Polish bond market, called Catalyst, is dominated by treasury bonds. However, the role of Catalyst in the accumulation of debt capital can be expected to grow in the future. The article discusses the main idea behind modern forms of bonds, with emphasis on green bonds, and identifies their potential for companies seeking capital. It also presents experiences of Polish companies in raising funds through the issuance of modern forms of bonds.*

Keywords: *Eurobonds, finance, green bonds, issue process, bond market*

1. Introduction

The raising of capital by companies for their business activities is an extremely important decision-making process, requiring the managers to be familiar with the financial processes of the company and to keep track of innovative instruments on the financial market. Opportunities in the form of innovative financial instruments offered by the domestic and, in particular, the global market expand the ways of raising capital, including debt capital. It is worthy of attention to verify whether companies actually take advantage of the opportunities presented by the innovative financial market.

The process of globalization[1] of financial markets has contributed to increased interest of entrepreneurs in the issues of equity and debt securities placed on global markets. The theory and practice has not developed one, generally accepted division of the world bond market, which requires a broader analysis of the terms used in this area. The Polish debt securities market, being a segment of the broadly defined financial market, draws innovative instruments from the markets of highly developed economies, as it itself, due to its short history and size, does not yet create recognized instruments on the global financial market.

The place of trading in debt securities in Poland is the Catalyst[2] market, which since its establishment in 2009 has been trying to follow global trends, although it is not yet a liquid market and is fully utilized by Polish and foreign companies. When considering issues related to the global bond market we talk about two types of bond market: internal and external. The internal market is called the domestic market, which is divided into the domestic bond market and the foreign bond market. Issuers in the domestic bond market are entities which have their seat in the country of issue (placement of securities). The external market is called the international (off shore) market. The presented nomenclature is not absolutely accepted and it may happen that the external market will be understood as the market of foreign bonds, Eurobonds and global bonds.

It is worth considering whether, despite the large diversity of bond forms, they are willingly used to raise capital by Polish companies.

2. Modern forms of bonds

Due to the increased activity of companies on the global market, new types of bonds have appeared on the financial markets. Polish companies can benefit from a wide range of bond types, which are used with great interest by companies on developed financial markets. It is worth noting the following types of bonds, which can potentially be used very successfully by Polish companies. These bonds are: Eurobonds and green bonds, which only recently have enriched the debt financial instruments market.

On the Polish financial market the debt instruments market has been functioning only for a decade, the interest in the possibility of gaining capital by means of it on the part of entrepreneurs is rather small. This is illustrated in Chart 1.

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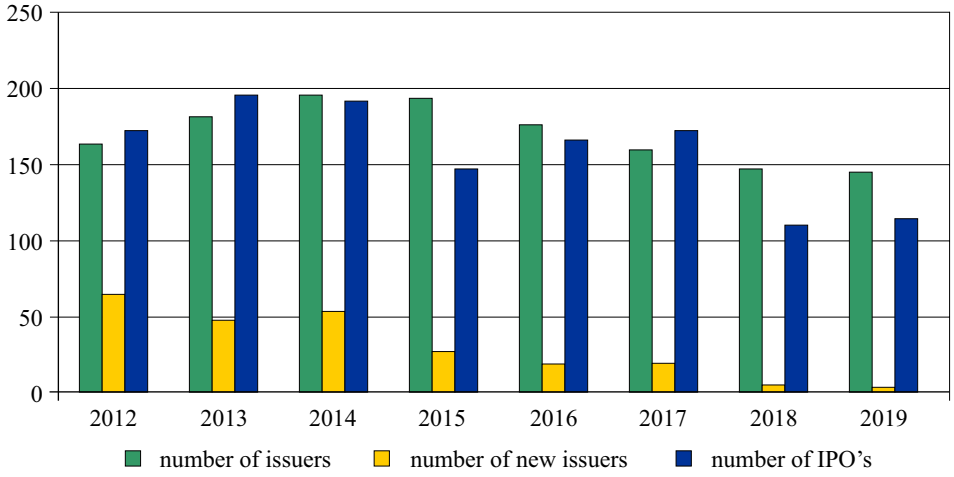
[1] The concept of globalization in relation to financial markets means "[...] a phenomenon in which the financial systems of individual countries are subject to far-reaching integration, creating a common global market" (Opacka, 2005, pp. 164-165).

[2] Market of debt financial instruments in Poland. It started operation on 30 September 2009. It is operated on the trading platforms of the Warsaw Stock Exchange and BondSpot, two platforms each in the formula of a regulated market and an ATS (Catalyst, 2020).

Chart 1. Size of the corporate bond market in Poland on the example of issuers and debuts



Source: own elaboration based on Catalyst's annual reports and statistics.

According to the law, Polish companies may use the placement of bonds on the foreign market. The use of the international financial market to raise capital by companies in the form of bonds has become possible thanks to the greater understanding of the processes occurring on other financial markets by investors. This applies in particular to problems associated with exchange rate risk and taxation of capital gains (Radabaugh, 2007, p. 95) (Fig. 1).[3]

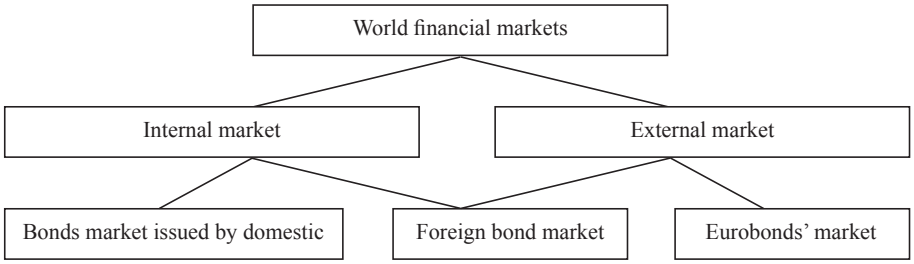


Figure 1. Classification of global corporate bond markets

Source: own elaboration**.**

The division of bonds outside the domestic market, i.e. the off shore market, was made by Eugeniusz Najlepszy (2000). The division of the debt securities mar-

[3] Law of August 21, 1997 on Public Trading in Securities and Law of January 15, 2015 on Bonds (Journal of Laws 2015 item 238).

ket is also the subject of studies by Danuta Dziawgo (1998). The author proposed the division of the market, which is presented below. It also contains information about the adopted terminology (Fig. 2).

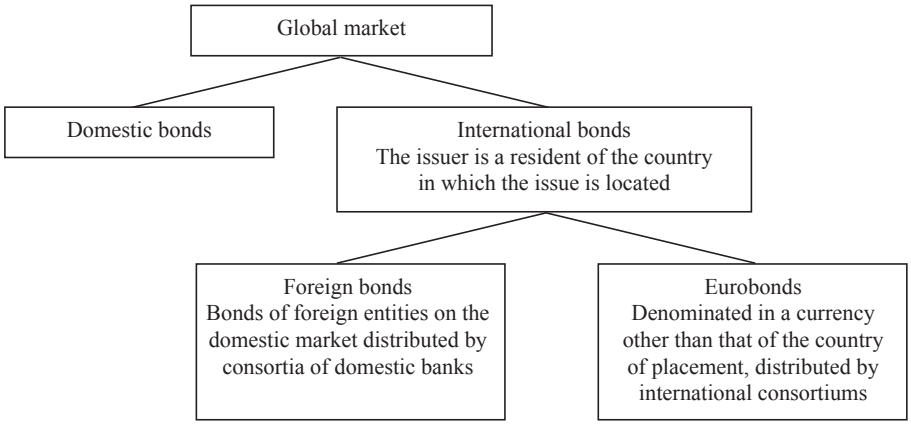


Figure 2. Division of global debt securities market

Source: Dziawgo, 1998, p. 49.

Bonds placed outside the domestic market, i.e. in the so-called off shore market have the following characteristics (Najlepszy, 2000, p. 400):

- they are guaranteed by an international syndicate,
- the issue offer is addressed simultaneously to investors in several countries,
- the issuance takes place outside the jurisdiction of any country,
- they are not registered.

Eurobonds are distinguished from other types of bonds by: underwriting by an international consortium, distribution in several countries simultaneously, outside the jurisdiction of any country, no registration (Fabozzi, 2000, pp. 243-244). They are defined as: "Eurobonds are unsecured debt instruments, usually in bearer form, issued by governments, banks, companies and supranational organizations outside the market for the currency in which they are denominated" (Reuters, 2001, p. 59).[4]

Global bonds, on the other hand, are defined by the characteristics that the entity issuing them should meet. These include: a logical capital requirement of approximately billion USD and the issuer should have a high investment grade rating (Fig. 3).

[4] Eurobonds are "a security issued to bearer, a type of bond, issued in a currency other than the national currency of the issuer and tradable on the so-called Eurocurrency market, they differ from ordinary bonds in that the banking consortium distributing Eurobonds denominated in different so--called Eurocurrencies has an international scope."

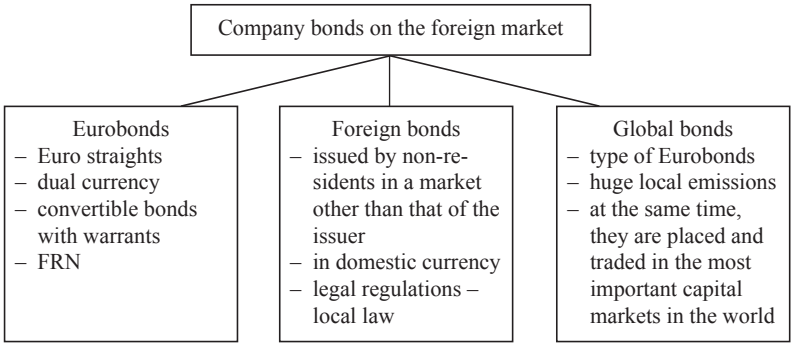


Figure 3. Corporate bonds in the off shore, non-domestic market

Source: own eaboration based on Najlepszy, 2000, p. 400.

3. Eurobonds – a modern form of bonds with potential in foreign markets

When issuing Eurobonds, it is worth noting that they are often issued under a Euro Medium Term Note ("EMTN") program. The program determines the total amount of debt and the maturity dates of individual tranches, most often taking values from 5 to 10 years (Mazurek, 2020). The programme is registered on one of the leading international stock exchanges in Europe, i.e. the London Stock Exchange and the Luxembourg Stock Exchange.

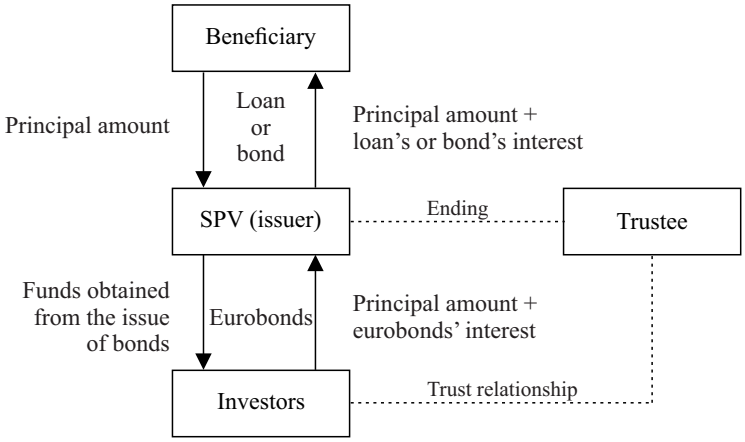


Figure 4. Indirect issuance, with limited recourse to the beneficiary

Source: Namiotkiewicz, 2013.

In the placement process, Polish companies use one of the issue structures listed below:

1. direct issues – tax exempt or addressed to a selected group of investors,
2. indirect issues – made by SPVs,
3. indirect issues, with the use of guarantees,
4. indirect emissions, with the use of deposits
5. indirect issues with limited recourse to the Beneficiary (Namiotkiewicz, 2013).

The most elaborate structure of Eurobond issuance is shown in Fig. 4. It involves the use of an SPV, which is also the issuer. The process also introduces the role of a trustee of the bond obligation.

Eurobond issues realized by Polish corporate entities are presented in Table 1.

Table 1. Eurobond issues of Polish companies

Company	Type of bonds	Amount in millions	Currency	Year (date) of issue	Year of redemption	Stock market
Tauron	eurobonds	500	euro	2017	2027	LSE
Capital Park	eurobonds	18	euro	2017	2020	private offer
Orlen	eurobonds	750	euro	2016	2023	Ireland
Orlen	eurobonds	850	euro	2014	2019	Ireland
PZU	eurobonds	850	euro	2014	2019	Ireland
Ciech	eurobonds	245	euro	2012	2019	Frankfurt
Energa	eurobonds EMTN	1250	euro	2012	2033	Luxembourg
PKP	eurobonds	180	euro	2011	2016	Luxembourg
PGNiG	eurobonds EMTN	1500	euro	2011	2026	Luxembourg
Polkomtel	eurobonds	1000	euro	2010	2015	Luxembourg
TVN	eurobonds	405	euro	2009	2017	Luxembourg
Netia	eurobonds		euro	2002	2003	n/a
PGNiG	eurobonds	800	euro	2001	2006	Luxembourg
Elektrownia Turów	eurobonds	1400	euro	2001	2011	LSE

Source: own eaboration based on data from annual reports of companies issuing Eurobonds.

Eurobonds are bonds issued in domestic currency in many different foreign markets simultaneously. For example, a company based in the U.S. issues dollar-denominated bonds in the U.S. and in Europe at the same time. Depending on the currency in which the bonds are denominated they have different names, e.g. Eurodollar bonds are denominated in dollars, while yen-denominated bonds are euro-yen bonds (Damodaran, 2007, p. 765).

The internal diversity of the Euorobond market is a great advantage for both issuers and potential investors. There are instruments traded with very different

characteristics. Therefore, from the investor's point of view, it is necessary to get acquainted with the description of the individual parameters of the selected Eurobond, so as to choose the security that will meet his expectations. For the issuer, such diversity is a great asset, because it makes it possible to raise capital on the issuer's terms and conditions, corresponding to its current financial situation.

4. Green bonds – the latest form of bonds on the financial market

Among the innovative instruments on the financial market there is a variety of bonds called green bonds. Their name is related to the purpose for which the funds raised by the company will be used. They are used to carry out ecological projects. Green bonds (GB) are part of the rapidly developing Green Finance.[5]

The financial market has not yet formed a uniform definition of green bonds. In Polish law, i.e. the current legal order, green bonds have not yet been included as a separate type. On the international financial market, ICMA International Capital Market Association is responsible for the certification of green bonds. It issues guidelines for the process of issuing green bonds. These are intended to provide transparency, disclosure and reporting to promote consistency in the Green Bond market. ICMA indicates that the purpose of the "GBP is to improve access to information for market participants and to encourage the financing of green projects through the issuance of Green Bonds." The published principles serve and assist "issuers in the process of transforming business models to be more environmentally sustainable through specific projects."[6]

The financial market analyzes financial instruments that are used to finance green projects (Więckowska, 2013, p. 455).

Due to the fact that ICMA is an international institution with a recognized reputation, issuing guidelines that are accepted by market players, it seems appropriate to adopt them as a valid definition of green bonds (Grabowski, 2019). The definition reads as follows: "Green bonds are bonds that meet the four basic criteria of GBP and the proceeds of which are used exclusively for the full or partial financing or refinancing of new and/or existing projects that qualify as green projects." The definition mentions components, these are:

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[5] Citing a definition that reads: "green finance – financial market-related activities where allocations are made to directly advance pro-environmental investments and initiatives aiming at climate improvement and environmental protection" (Pawłowski, 2017, p. 221).

[6] Green Bond Principles Voluntary Process Guidelines for Issuing Green Bonds or Green Bond Principles (GBP), Non-binding process guidelines for issuing Green Bonds, June 2018. The regulation has been published by ICMA. The definitions, types, characteristics and other descriptions of Green Bonds quoted are from the document cited or the regulations published by ICMA (2020).

1. Use of Funds for one of the identified sectors,
2. the Project Appraisal and Selection Process,
3. management of funds,
4. reporting.[7]

Table 2. Categories eligible for green bonds

Category of classification to green bonds	Subcategories
Renewable energy	Wind, solar, geothermal, biomass, energy using waste, sea tides, small (< 25 MW), biogas, biofuels (I i II genertion)
Energy efficiency	Energy Demand Management, battery, fuel cell / hydrogen systems, smart grid, other ways of storing energy, superconductors, combined energy and heating systems based on natural gas, LED lighting, compact fluorescent lighting, clean transport infrastructure, industrial automation, optimization of services and infrastructure of electronic technologies
Pollution prevention and control	Ecological reclamation, waste management (excluding landfills and incinerators), low toxicity / volatile organic pollutants, conventional pollution control
Sustainable water and wastewater management	Water infrastructure and distribution (with an emphasis on water quality and access), collecting rainwater, smart meters, drought-resistant seeds, desalination, wastewater management, water recycling equipment and services, water protection activities
Green buildings	Green-certified residential and commercial construction in line with local environmental standards, green-certified residential and commercial construction in line with local green building standards, uncertified green construction investments (up to 15% energy efficiency on the local market)

Source: Brzozowska, 2017, p. 74.

Classification of bonds as green bonds occurs on the basis of allocation, the use of capital raised by their issuance. The capital allocation catalog includes the following project areas that qualify as green. A catalog of these in alphabetical order is provided below:

– renewable energy,
– clean transport,
– climate change adaptation,
– energy efficiency,
– protection of terrestrial and aquatic biodiversity,

[7] ICMA recommends that issuers follow the guidelines provided by this organization, this will enable the reduction of information asymmetry between entities in the green bond market. The importance of transparency, reliability and completeness of disclosures is often emphasized, and evaluation of potential investments is possible through standardized reporting. The form and layout of the components are given after the Polish translation of the English version of the ICMA document, p. 3.

– eco-efficient products, production technologies and processes and/or adaptation to a closed loop economy,

– pollution prevention and control,

– green buildings that meet standards and certification requirements set at regional, national and international level,

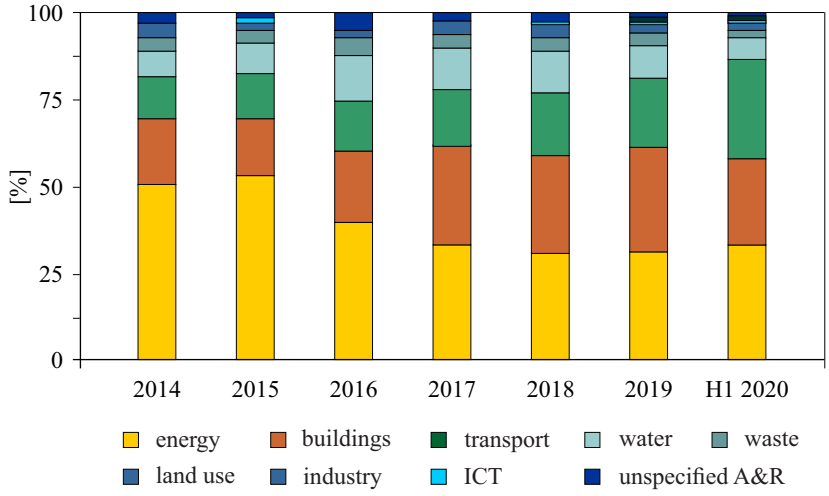
– sustainable management of water resources and waste water,

– sustainable management of living natural resources and land use.

The presented catalog presents areas of projects eligible for green investments. It is also worth mentioning the division according to the categories qualifying for the issuance of green bonds. This division approximates the range of activities that can be financed with these securities (Table 2).

The largest share of green bond issuance is the alternative energy category, however its share is currently smaller than in 2014-2015. Construction and sustainable transport are gaining in importance. The category covering sustainable water projects remains relatively constant. An illustration of the category's share of total green bond issuance is presented in Chart 2.

Chart 2. Share of different categories of green bonds in total issuance[8]



Source: Sustainable Debt Global State of The Market H1, 2020.

[8] The division of green bonds used by Climate Bonds INITIATIVE refers to the projects implemented from the funds raised. It is more precise than the capital allocation catalog used by GBP. The division of green bonds used in the report was adopted in January 2020 and published in the document Climate Band Taxonomy, available at https://www.climatebonds.net/standard/taxonomy. The ICT (Information & communications technology) abbreviation used stands for the category GBP defines as – climate change adaptation, and includes information and support systems such as climate observation and early warning systems.

Data on green finance market activity for green bonds is collected by Climate Bonds INITIATIVE, publishes information based on collected data provided by green bond issuers and other financial institutions.

Companies that use green bonds have the option to choose a convenient form of bond from the following types of bonds such as standard, revenue, project and securitized. In the following section, their basic features are presented.

Standard Green Use of Proceeds Bond is a standard bond that is GBP compliant, with recourse to the issuer.

1. The Green Revenue Bond is a bond issued under GBP rules with no recourse to the issuer. The credit risk involved relates to declared cash flows, fees, taxes and more. The funds go to green projects, which may or may not be related.

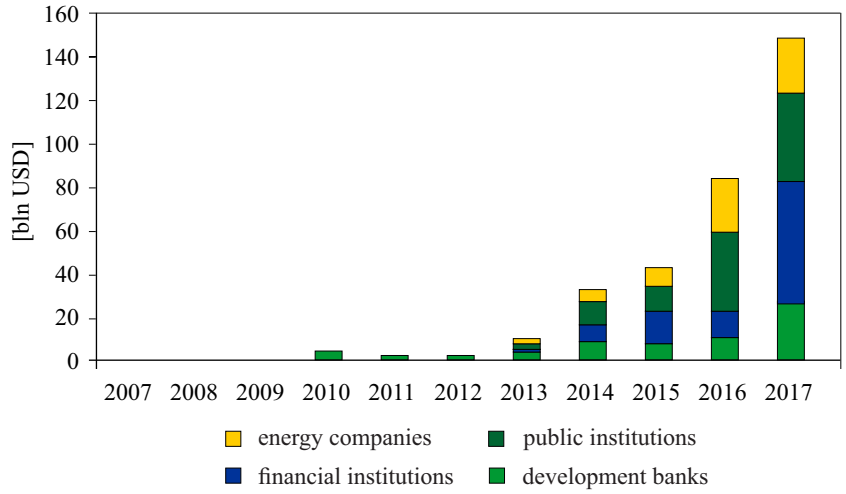
2. A Green Project Bond is a project bond (with or without recourse) that follows GBP rules. Such bonds are issued to finance one or more green projects. With this issue, the investor bears the project risk.

3. A Green Securitised Bond is a bond that is GBP-compliant. It is characterized by being secured by one or more green projects, and can be covered bonds, asset-backed securities (ABS), mortgage-backed securities (MBS) and other structures.

One of the most developed green bond markets is the US market. The interest of issuers as well as bondholders is confirmed by data collected by the audit and consulting firm Deloitte, presented in Chart 3.

The development of the green bond market has been very dynamic. In 2014, the first green bond indices were launched to facilitate the decision-making of

Chart 3. Green bond issues in the USA



Source: Deloitte, 2019-2020.

potential investors and to narrow the information gap. The following green bond indices can be found in the financial market: Bank of America Merill Lynch Green Bond Index, Barclays MSCI Green Bond Index, S&P Green Bond Index and Green Project Bond Index and Solactive Green Bond Index.

There has been only one[9] green bond issue in the Polish market, by Cyfrowy Polsat. The company issued 7-year unsecured bonds.[10] The purpose of the green bond issue is to refinance the costs incurred by the issuer and the issuer's subsidiaries in 2017-2019 related to their improvement of energy efficiency and reduction of the use of electronic components. The chosen objective is to reduce the entity's carbon footprint as a result. The description of the issuance process and its conditions are published in the Green Bond Framework[11] available on the issuer's website. The entire process has received a positive Second Party Opinion in terms of compliance with the Green Bond Principles 2018. In the GBF, Cyfrowy Polsat has indicated selected categories of projects that will be implemented under the categories qualifying as green, and these are: energy efficiency, renewable energy, pollution prevention and control, green buildings and products, production technologies and processes that are environmentally efficient and/or adapted to a closed loop economy.[12]

It seems that Polish companies are beginning to recognize the benefits of issuing green bonds. One of them is obtaining capital for environmentally beneficial activities, but thanks to such an issue it is possible to improve the image and strengthen the position of the company within the CSR framework. The issue of green bonds has been announced by New Energy Investments (NEI), a subsidiary of Columbus[13] and PKN Orlen[14] .

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[9] Data as of September 2020 from company source documents published on the websites in the Investor Relations section.

[10] Cyfrowy Polsat commits to pay WIBOR 6M plus 1.65 pct Green Bond Framework, Cyfrowy Polsat S.A. Capital Group

[11] Green Bond Framework (GBF) Cyfrowy Polsat S.A. Capital Group, documents published on https://grupapolsat.pl/pl/relacje-inwestorskie, https://grupapolsat.pl/pl/relacje-inwestorskie/obligacje et seq.

[12] Funds from the green bond issue will contribute to the implementation of projects that can be classified as GBF. The Issuer, Cyfrowy Polsat S.A. Group indicates that there may be deviations from the GBF assumed values of the impact of the effects of the implemented projects.

[13] FORSAL.PL Columbus has adopted a green bond program for up to PLN 500m. According to press releases, the value of the issue will be PLN 500 million for a period of 15 years under a "green project" meaning projects that contribute to ecologically sustainable development, among others, photovoltaic farm projects, as defined by international regulations and standards developed by ICMA and GBP. https://forsal.pl/biznes/aktualnosci/artykuly/7817723,spolka-columbusa-przyjela-program-zielonych-obligacji-na-maks-500-mln-zl.html

[14] Parkiet, PKN Orlen wants to be climate neutral. The company intends to allocate PLN 25 billion for investments reducing CO2 emissions in the time horizon until 2030. These will be co-financed by issuing sustainable development bonds and green bonds. The company will issue these bonds on the European capital market.

It is worth noting the ongoing work by the Technical Expert Group on Sustainable Finance (TEG),[15] which published a report with recommendations to the European Commission on the draft taxonomy of sustainable finance (Bacia, 2020).

The analysis of the innovative instrument green bonds points out the following:

– green bonds are a specialized instrument that can be used by developed companies,

– lack of experience, which is helpful in implementation of financial undertakings on such a large scale and with such large values,

– lack of market data,

– regulatory uncertainty,

– political unpredictability,

– lack of support from states.

ICMA notes that more types of green bonds may emerge in the market as the market develops. These will then be added to the GBP rules as part of an annual update.[16]

The idea of introducing development bonds has emerged in the Polish financial market (Parkiet.com, 2020). The characteristic features of this instrument are: having investment grade rating, fixed interest rate and maturity of at least five years. The advantage of development bonds is to be the exemption of investors from capital gains tax. However, in order for such an instrument to appear on the Polish financial market, it is necessary to introduce appropriate provisions in the applicable legal regulations.

5. The value of the corporate bond market in Poland

Polish companies are still more willing to use loans than other forms of debt capital to finance their operations with foreign capital. The value of corporate bond issues in Poland is growing dynamically. However, in 2014, the share of corporate bonds in Poland accounted for more than 12% of corporate financial liabilities, compared to 19.5% in the euro area and 83% in the United States (Gałka, 2015). The actual picture of the debt structure of Polish companies, bearing in mind the values of capital raised through the issuance of debt securities, will be

[15] Technical expert group on sustainable finance – TEG, a group established by the European Commission, consisting of experts representing various circles of financial market stakeholders. The TEG's mandate is to "develop recommendations on technical criteria for the control of economic activities that can make a significant contribution to climate change mitigation or adaptation, while avoiding significant harm to the environmental objectives extracted in the taxonomy." The term taxonomy also needs clarification, which here means a sort of matrix of sustainable economic development goals derived from the Paris Agreement.

[16] ICMA International Cepital Market Association, Appendix 1, p. 10 et seq.

Table 3. Size of the Catalyst market in 2012-2019

Year	2012	2013	2014	2015	2016	2017	2018	2019
Session turnover value (mln PLN)	1 665,95	2 757,18	2 327,83	2 154,63	2 351,92	2 393,76	2 171,25	2 742,89
Number of session transactions	42 323	60 101	64 084	65 835	68 622	81 030	87 173	80 683
The value of turnover in block trades (mln PLN)	1 355,77	1 573,21	788,20	366,98	779,10	389,23	399,34	168,95
Number of block trades	213	395	268	191	127	107	99	49
Number of series	384	467	526	535	566	609	575	562
Value of the issue (mln PLN)	567 364,66	619 218,93	544 588,06	613 147,67	707 435,25	751 720,03	777 222,02	796 891,30
Number of sessions	249	247	249	251	251	250	247	248

Source: own eaboration based on data published on Catalyst, 2020.

possible to analyze only after collecting full data from the financial market. The law introduced on November 9, 2018, amending certain laws in connection with the strengthening of supervision over the financial market and the protection of investors in this market, imposes on the issuers of bonds, mortgage bonds, investment certificates or entities keeping records of such securities the obligation to provide the NDS with information on the issue of bonds, mortgage bonds and investment certificates issued before July 1, 2019 by March 31, 2020 as at December 31, 2019. The referred regulation will reveal the actual size of the debt market of Polish companies (Table 3).

6. Summary

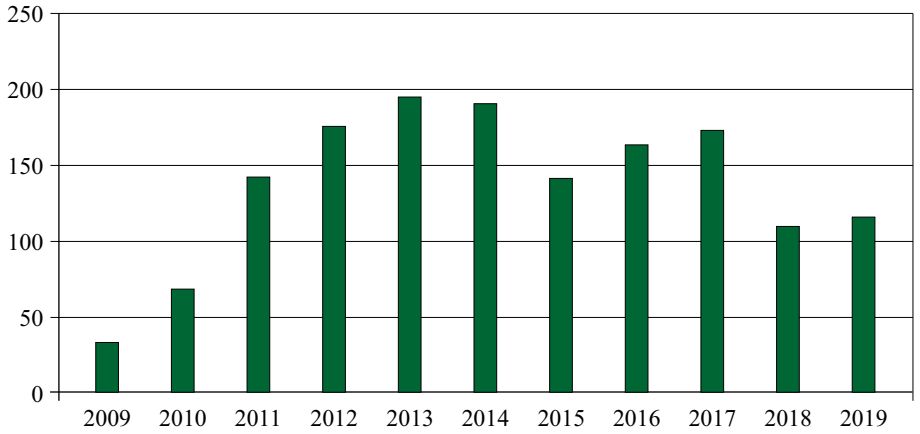
Polish corporate bond market is not fully developed. Polish companies do not use modern forms of debt securities, they rely mostly on their basic form. Only one issue of green bonds has been carried out. If we analyze the whole bond market, i.e. corporate, treasury and municipal bonds together, the value of funds obtained in this way will be satisfactory.[17] The small propensity of Polish enterprises to use bonds should be analyzed. Internal information of one of the banks, in the organizational structure of which the Debt Securities Issuance Department is located, indicates that "in 2014 the current value of the corporate bond market amounted to about 2.6% of GDP, while in the USA the size of this market segment is about 55%". Practitioners of the banking market point out the benefits of using bonds for businesses over loans. They point to bonds as a form of diversification of financing sources, e.g. becoming independent from financing in one bank (Gałka, 2015, p. 3).[18]

[17] In 2014, cash was raised using bonds with a total value of 480,506 million, of which corporations raised only 60,867 million. Available statistics are reported with a lag, hence the indication of the 2014 period.

[18] The analysis of the corporate bond market also included an indication of the benefits of raising capital from bonds in relation to loans. It is worth quoting these benefits due to the fact that they are mentioned by bank analysts who know the loan market as well as the primary bond market very well. Here are the indicated benefits of bonds: Lower level of contractual restrictions than with loans. Ability to finance despite concentration of bank exposure on the issuer's group. Financial risk based on credit/rating capacity as assessed by institutional investors. Flexibility of financing (no drawing and repayment schedule, no need for detailed cash-flow planning) dependent on the situation on financial markets. Ability to make bullet payments(repayment of principal on the bond redemption date rather than repayment in installments). Possibility of financing sectors that are difficult to finance in banks, e.g. medical companies, debt collection companies, property development companies. Possibility of issuing bonds in the case of collateral which is unsatisfactory for banks or lack of collateral. Possibility of financing acquisitions, which cannot be financed in banks. Possibility of gaining funds for realization of an intensive investment program when CF does not allow for linear amortization of an investment credit. Marketing effect for bonds listed on Catalyst, the appearance of the company on the capital market before the planned "entry" of the company on the

Polish companies underestimate the potential of bonds. As an instrument of a very diverse nature in its construction, it allows companies to raise capital in an amount and on terms which are convenient for the company. The capital possibilities of the international market, or even more broadly of the global market, are unlimited. Also the new forms of bonds, ranging from global bonds through Eurobonds or green bonds, offer companies capital in amounts and forms fully suited to their needs.

Chart 4. Number of new listings of Polish companies on Catalyst



Number of debuts on the Catalyst market since the beginning of its operation, i.e. since 2009. Due to the lack of data for the first years of the market's operation, other analyses start from 2012, presented in Chart 1.

Source: own elaboration based on data provided by Catalyst, 2020.

The lack of interest of Polish companies in bonds is also confirmed by the Catalyst market. In recent years, i.e. after more than a decade since its launch, there has been a disturbing phenomenon of a gradual, period-by-period decrease in the number of issuers.[19] The number of debuts of bond issues, in turn, does not show a stable trend, after an upward period in 2015-2017, the value of the number of debuts in 2018 was the lowest since 2012. In turn, the number of issuers in 2019 was the lowest in the studied period – 145 issuers, against 196 in 2014 (cf.

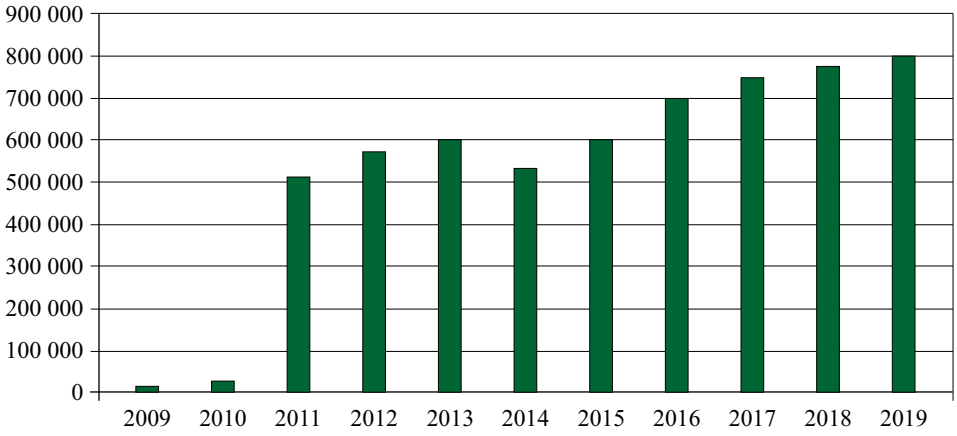
public market and the issuance of shares. Higher cost of financing compared to a bank loan. Shorter financing period – 5-7 years for the so-called Blue Chips, for other companies the average financing period is 2-3 years. The quoted conclusions come from the quoted mBank document.

[19] Parkiet, 6.05.2020. The primary bond market does not exist, interview with the Manager of Debt Markets Team at Haitong Bank, Branch in Poland. Previously, the possible profits achieved by investors in the debt securities market, the information was published on the pages of Haitong Bank – *Haitong Bank: Which bonds are worth investing in?* https://www.haitongib.com/en/news/warsaw/haitong-bank-which-bonds-are-worth-investing-in

Chart 1). In the number of debuts, it is difficult to find a regularity with respect to companies willing to raise capital using bonds. The year 2015 started an upward trend, unfortunately ending with a collapse in 2018 (Chart 4).

An optimistic signal coming from the Catalyst market regarding entrepreneurs' interest in bonds is the value of bond issues. We observe a systematic increase in value since 2014 (Chart 5).

Chart 5. Value of bond issues in PLN million on the Catalyst market



Source: own elaboration based on Catalyst, 2020.

The lack of interest in the domestic corporate bond market translates into negligible use of new forms of bonds constructed and used on international financial markets. Signs of hope are manifested in individual ventures that follow the novelties of the financial market including green finance. As presented in the article, Polish companies rarely use debt securities, but there are single issues of modern forms of bonds, which set the direction for companies, encouraging them to use modern instruments of the financial market.

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Zielone obligacje i euroobligacje jako nowoczesne instrumenty pozyskiwania kapitału przez polskie przedsiębiorstwa

Streszczenie. *Artykuł prezentuje tematykę zielonych obligacji korporacyjnych, które umożliwiają przedsiębiorstwom gromadzenie znacznych kapitałów. Współczesne rozwinięte rynki finansowe oferują nowoczesne formy obligacji, które są odpowiedzią na zgłaszane zapotrzebowanie ze strony firm, jak również odzwierciedlają nowe tendencje w finansach, np. zielone finanse. Polskie firmy tylko w niewielkim stopniu korzystają z nowych form obligacji, którymi są np. euroobligacje czy zielone obligacje. Rozwijający się polski rynek obligacji, Catalyst, jest zdominowany przez obligacje skarbowe. Można jednak oczekiwać, że w przyszłości rola rynku Catalyst w gromadzeniu kapitału dłużnego będzie rosła. W artykule przybliżono istotę nowoczesnych form obligacji, ze szczególnym uwzględnieniem zielonych obligacji oraz ich potencjału dla przedsiębiorstw poszukujących kapitału. Przedstawiono również doświadczenia polskich firm w pozyskiwaniu środków poprzez emisję nowoczesnych form obligacji.*

Słowa kluczowe: *euroobligacje, finanse, obligacje zielone, proces emisji, rynek obligacji*

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The impact of the COVID-19 pandemic on the operations of insurance companies PZU and ERGO Hestia

Abstract. *The COVID-19 pandemic affected every sphere of life, including the economy. The presence of the virus poses a risk to health and calls for new solutions in the field of life insurance in Poland and in the world. The article analyses how two leading insurance companies in Poland – Powszechny Zakład Ubezpieczeń (PZU) and ERGO Hestia – functioned during the pandemic. The author compares the operations of both companies in the period before and during the pandemic, taking into account their key financial indicators. Both companies demonstrated awareness of the sudden change in circumstances by offering special insurance protection for customers and their relatives and by taking steps to promote safety, psychological support and limit direct personal contacts. However, the insurance sector, like other industries, was negatively affected by the pandemic, which cause a decline in the claims ratio, particularly as regards motor third party liability insurance. However, despite slight declines in some indicators, the general financial standing of both insurance companies, was satisfactory.*

Keywords: *COVID-19 pandemic, life insurance, PZU, ERGO Hestia*

1. Introduction

The unexpected presence of the Sars-Cov-2 virus causing the COVID-19 global pandemic undoubtedly had a significant impact on the activities of the Polish and global economy, as well as the insurance sector. Using the definition of insurance indicated by Roman Garbiec, this concept can be characterized as an action consisting in assuming the risk associated with a widely understood insurance accident by the insurance company through paying an appropriate fee in the form of regular premiums and concluding an adequate contract (Garbiec, 2016,

p. 29). The market in the aspect of insurance has repeatedly shown that in crisis situations it is able to flexibly adapt to changes and during this continue to surround its customers with insurance protection, reaching beyond typical insurance contracts. The priority is to assess the scale of the economic threat in order to adjust the system to protect households against negative consequences of the weakening economy (Myck, Oczkowska & Trzciński, 2020, p. 1). The key element is therefore to offer assistance to clients. The most popular solution, characterized by convenience and security, is to offer insurance services in a remote manner for collective clients, companies as well as individual customers. Another issue that improves the operation is a kind of convenience in the payment of premiums manifested in installments or suspension of premiums and the continuation of coverage. The research tool used in this article is a comparative analysis based on documents – reports of the Polish Insurance Association and official websites with PZU and ERGO Hestia data.

The research problem posed in this article concerned the question of how the COVID-19 pandemic affected the operations of insurance companies PZU and ERGO Hestia. The selected insurance companies form the research basis as they are predominant in terms of the number of customers served who are interested in insurance. In addition, PZU has a high equity capital and ERGO Hestia is a suitable comparative base due to its smaller amount of equity capital.

The hypothesis posed in this paper is the expression: The COVID-19 pandemic significantly reduced the scope of services provided and the financial influence of insurance companies PZU and ERGO Hestia in Poland.

2. Customer-facing activities

Pandemics carry a huge risk on a global scale, given the global threat. They have a high mortality rate, but also an economic impact on a negative level (Sieroń, 2020, p. 31). The presence of the SARS-CoV-2 virus has caused a change in the way of economic activities – they have moved to the virtual world. Migration to the virtual world has caused a shift from traditional ways of modeling behavior, also in the sphere of business insurance (Przybytniowski, Grzebieniak & Pacholarz, 2021, p. 35). The existence of the virus among the citizens of the country caused the regression of economic growth and progressive inequality of opportunities and income, or low stability of the financial department in Poland. The above mentioned elements define the concept of crisis (Czech et al., 2020, p. 11).

The insurance company PZU, out of concern for its customers, offered to contact them via the website, the mobile application mojePZU, or the form on the website pzu.pl and the infoline. What is also important in unexpected conditions of a pandemic is assistance offered remotely, either by phone or via the Internet, by

about 5,600 PZU insurance agents across the country. A solution that was undoubtedly beneficial to the insurance company's customers was the modern ability to conclude insurance contracts by telephone, aimed at managing Employee Capital Plans. The capacity of the mojePZU website was also increased, which resulted in more customers using this of the website by a larger number of customers.

The second surveyed insurance company – ERGO Hestia, from the beginning of the pandemic started to operate in the least risky way in terms of customer infections. The overriding aspect was the sector of communication with the insurance clientele and supporting them with relevant knowledge about insurance in Poland. For this purpose, the action "Caring for common safety" was created, suggesting to the employees of the company – their insurance agents to start working remotely, without exposing both the customers and their loved ones. This was well received, as the employees liked the idea and had special equipment for this purpose. It was extremely important, because the potential customer could carry out their plans, intentions without leaving home, which is extremely comfortable and saves time, which everyone today needs as much as possible. The Help Online application allowed for specialized activities in the insurance area, such as video-assessment in the aspect of claims handling, which would reduce direct contact between the liquidator and the customer, without reducing the rank of services provided by the ERGO Hestia company. Taking into account another scope – insurance service, the modernization consists in access to a specialized iAccount, which is to enable the client to have a constant insight into the supervision of policy aspects. Taking into account the difficulty of isolation, the employees have introduced activities known as softwares to facilitate the insurance process. Namely, the company decided to join the #stayathome campaign, which manifests itself in the regular publication of customer-interest and useful articles that relate to keeping in shape in conditions of isolation, or initiatives on how to spend free time in the comfort of your own home. An innovative, groundbreaking, but also undoubtedly eye-catching idea was the one-and-a-half-hour conversation held regularly every week with a specialist discussing the coronavirus topic on an ongoing basis. Support from the ERGO Hestia facility is also the presence of virologists and a social psychologist (Durska, 2020).

The above-mentioned situations illustrate the scale of social commitment of the insurance company, which has a significant impact on the choice of the company in obtaining insurance by customers and gains an advantage in psychological terms. This is because during the crisis Poles especially paid attention to forbearance or empathy on the part of both the other person and the institution of economic life.

Moreover, the aforementioned insurance companies took part in a nationwide campaign providing funding for the work of over 100 call center consultants who helped the Chief Sanitary Inspectorate in 2021. The help consisted in taking ques-

tions from people suspected of being infected or infected with Sars-Cov-2 with 24/7 availability. The organization was undertaken by the Polish Insurance Association, and 18 insurance companies took part in this initiative, such as AXA or Credit Agrecole, pioneers on the market.

An important activity is the support during the coronavirus through subsidies, providing medical equipment, protective measures, as well as help for the elderly, assistance in legal issues for entrepreneurs or psychological support for customers (Prądzyński, 2020).

3. Modifications of offers

Shortly after the emergence of the pandemic, in 2020, the Polish Insurance Association created the so-called recommendations of pro-customer activities offered to companies in the insurance sector in Poland. This manifested itself in the simplification of procedures for entering into and renewing insurance contracts, or in the introduction of remote loss adjustment on a larger scale than was the case before the COVID-19 pandemic. Maintaining protection in a crisis is indeed important for insurance companies.

Focusing on the insurance offer of PZU in the aspect of COVID-19 it should be mentioned, that insurance in PZU Życie protects the insured also during coronavirus infection or in the aftermath of an illness. These elements constitute the basis for the insurance coverage provided to the customer. The PZU Życie insurance company – dealing with life insurance – concerning the customer's life and health, is obliged to pay the benefit for a hospital stay, while fulfilling the contractual elements, such as:

- documentation of the stay,
- diagnosed disease,
- hospital treatment,
- minimum period of hospitalization.

This company also pays the benefit due to death caused by infection with the SARS-CoV-2 virus. It is important to note that no benefit will be paid in this case taking into account serious illness, as it is not an insurance basis in this case (PZU, 2020).

Analyzing the activities of the ERGO Hestia group under the conditions of the health crisis, one can notice the involvement of the employees in the pandemic conditions that occurred. The company bought itself on the scope related to tourism. This concept means personal activities travelling and staying for leisure, business trips, not longer than a calendar year, disregarding trips taking into account gainful activity (Widomski, 2020, p. 771). The degree of activity in terms of tourism in Poland or abroad accounts for about 60% of Poles. The scale of the

tourist economy's contribution to Poland's GDP is about 6% (Panasiuk, 2020, p. 57). There is, in fact, a special package called ERGO Travel, which protects its insurance customers during their travels, offering care in the form of coverage for medical expenses in the event of the insured's COVID-19 illness by drawing funds from the policy without the need to purchase another claim. When analyzing this insurance package, one can see that this company covers clients with infections in every type of insurance. It is not necessary to purchase additional protection and has no ceilings that limit the area of the country. The insured customer is entitled to medical assistance up to the insurance amount, as specified in the insurance options.

These are the amounts of 200,000 PLN, 500,000 PLN and 1,000,000 PLN. The cost of transporting the ill insured to the country does not consume the insurance amount allocated for treatment (ERGO Hestia, 2020).

ERGO Hestia indicates the ERGO 4 package – individual life insurance offering protection after such events as an accident or serious illness – as the basic way to protect the client and his or her loved ones. This insurance offers four basic elements: life, bodily injury, serious illness, child's health.

Compromise of adjusting the insurance area to the personal needs of a potential client interested in insurance protection offered by ERGO Hestia, the possibility of providing such protection to the entire family, including children, the option to conclude an insurance contract remotely – online, initiating insurance protection immediately, 24 hours a day, and, what is important, available worldwide, as well as solutions addressed to borrowers, are the advantages of this package, thanks to which it gains the interest of insurance companies' clients in Poland.

4. Changes in the financial services sector

The negative results following the outbreak of the COVID-19 pandemic in 2020 are also being felt in this sphere of economic life. It is worth noting that the insurance industry recorded a lower level of claims, also including PZU and ERGO Hestia. Third party liability (OC) insurance showed a decreasing trend due to the fact that the number of claims occurred on that account. This factor resulted in the decrease of claims by 50%-70% during the pandemic compared to the period before its outbreak. The level of damage improvement was reduced by escalating damage at the average level. Factors influencing this were:

– reduction in the proportionality of minor damages,
– escalation of prices due to stoppage of supply chains and shortage of spare parts,
– appreciation of the euro exchange rate,
– increased time of use of replacement vehicles.

The reduction in claims reached approximately 30% in the case of accident and breakdown (AC) insurance. In this case, it was the consequence of a lower frequency of events, thus taking into account the progression of damage at an average level.

An unusual type of insurance with limited mobility is the travel insurance aspect. In the initial phase of this pandemic phenomenon the most probable and expected result was observed – claims disturbance of this type of insurance in Poland. The factor which significantly disrupted the travel cycle was the restriction of long-distance travel. This resulted in a kind of blockade of this product sector.

Analyzing another insurance sector – property insurance, one can create a conclusion, that there was an escalation of loss ratios taking into account products related to. The loss ratios have escalated for products related to telemedicine and weakened in the sector of small and medium companies (SME). The home insurance sector is ambiguous, as a progression can be observed, but a weakening has occurred in the assistance sector.

Considering life insurance, the trend was downward in the health sector as and also in the group sector. An important statement regarding this state of affairs is the information. The important statement about this state of affairs is that it was caused by such elements as a reduction in the number of procedures.

The important statement regarding this state of affairs is that it was caused by elements such as a reduction in the number of procedures offered, a reduction in the number of accidents during lockdown. It is also worth taking into account the lower number of severe influenza illnesses, despite the pandemic element introducing a significant increase in the incidence of the disease, there were fewer deaths caused by such illnesses in the population.

5. Pandemic outlook

With a pandemic occurring all over the world it can be concluded that it poses a unique challenge to the insurance market both in Poland and globally. This raises the question of the risk of increased claims in such aspects of life as unemployment insurance, liability insurance, auto-insurance, travel insurance and telemedicine. A key element in this position will be the level of insurance premiums and their adjustment to varying degrees of risk. So it does not have to mean weakening of financial results of insurance companies in Poland. The unclear issue is the determination of premiums as well as

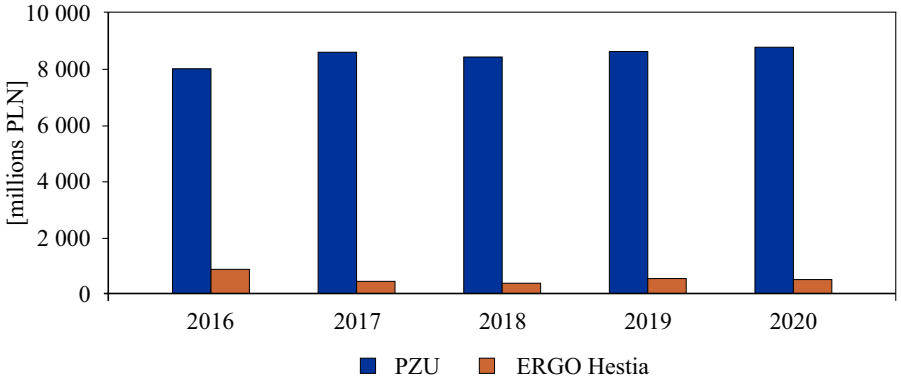
It is unclear how to calculate premiums as well as technical provisions in such a fast changing environment. Weakening performance in the economic space also does not contribute positively to the insurance market in times of pandemics. The

result is regressive interest rates, escalating national unemployment levels, and regression in the demand for group insurance. However, in addition to the negative views, there are also positive views directed at the insurance market. There is a great chance to expand the offer and develop activity.

There is a great chance to expand the offer and develop the business of health insurance and life insurance. The high health risk of Poles indicates the need for modernization of insurance elements both at home and abroad. The presence of pandemics all over the world and accompanying risks, uncertainty about the future causes an escalation of knowledge of insurance companies' clientele regarding the necessity of having protective insurance in a wide range. The public's fears work in favor of this notion. Adding to this specialized marketing activities of insurers, this phenomenon can remain on the market for a longer period of time and strengthen the position of life insurance. It would be reasonable to return to the basic meaning of protection activities in terms of business insurance in Poland. A positive premise for insurance activities is the increase of product offer, especially in the most desired aspect – telemedicine. It is very positively received by the customers who appreciate time saving, comfort and reduction of personal contacts in a direct way. Taking advantage of the good moment, insurers should also rethink development and marketing issues of loss of earnings (BI) insurance. The use of simplified underwriting procedures when concluding contracts between the customer and the insurance company will undoubtedly affect the interest in the offer. The society expects clarity, transparency and concreteness of contract terms. This could affect the procedure of facilitating general insurance conditions (GICs) and gradual elimination of the cheapest solutions that are often not properly tailored to the customer, which would have a beneficial effect on the insurance sector in Poland. Increased technological innovation may also be beneficial in the long term. Although previously the insurance sector did not use such solutions, the pandemic time has imposed automation or elements of technological development. A way of doing work remotely in insurance companies, such as remote inspection or loss adjustment. This has already impacted for years, the operations of insurance companies in a beneficial way.

Analyzing Chart 1 showing insurance premiums obtained from customers using from insurance companies in exchange for insurance coverage during the time before and during the COVID-19 pandemic, one can see a slight upward trend compared to each previous year examined, excluding 2018, taking into account PZU. ERGO Hestia's activity in this regard looked slightly different. Powszechny Zakład Ubezpieczeń, as a pioneer in the insurance market in Poland, outperforms ERGO Hestia. PZU recorded the highest values just in the year of the pandemic – 2020 and reached values of PLN 8752 million, while in ERGO Hestia it was 2017 – PLN 419 million. The overall progression of PZU in relation to both insurance companies testified to the good condition of the companies despite the severe pan-

Chart 1. Premiums of PZU and ERGO Hestia insurance companies in 2016-2020

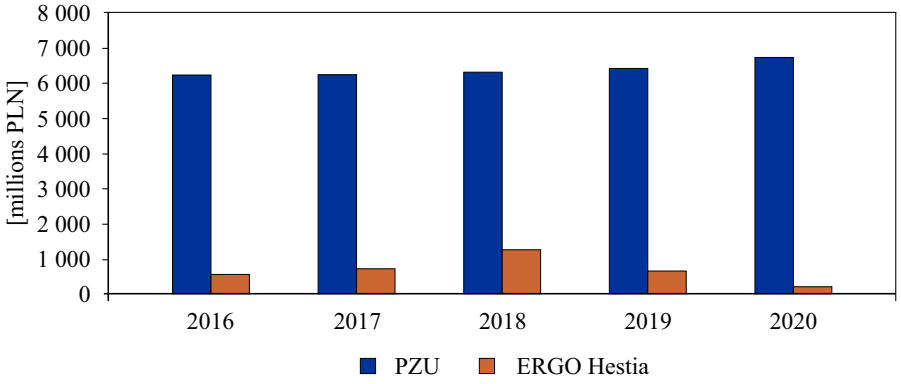


Source: own compilation based on the PIU report for 2016-2020.

demic conditions. However, ERGO Hestia's regression, with a particular decline in 2017, testifies to a decrease in interest in this company's offer, which could indicate an increase in business efficiency at its competitors. The presented situation of PZU may be due to the desire to protect itself against the negative effects of COVID-19, which made customers more interested than usual in the insurance offer. It may also result from the progressive inflation in the country, which causes the loss of value of money, and thus increase prices in the market.

When analysing Chart 2 illustrating the compensation paid to the clients of PZU and ERGO Hestia, conclusions can be drawn about the progressive tendency of PZU and a progressive-regressive trend of ERGO Hestia. This is a consequence of the increased number of insurance accidents concluded in contracts between

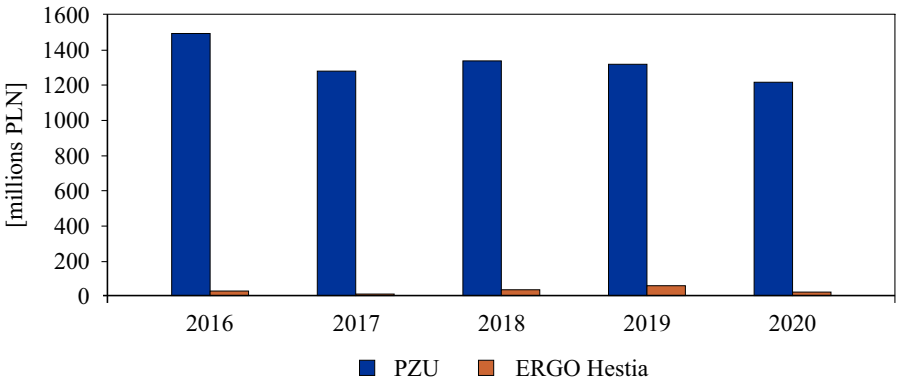
Chart 2. Damages paid by PZU and ERGO Hestia insurance companies in 2016-2020



Source: own compilation based on the PIU report for 2016-2020.

the customer and the PZU company. The company reached a significant upward peak in 2020, when it paid out over PLN 400 thousand more than in previous years. In ERGO Hestia, on the other hand, the situation looked slightly different. The progressive tendency in relation to previous years until 2018, testified to a higher accident rate, taking into account the events included in ERGO Hestia's contracts. Then, the regression was caused, among other things, by a decrease in the accident rate of this company's clientele. In 2019, values halved compared to 2018, and amounts in 2020 were about 1/3 of 2018 values, so regression occurred proportionally. For claims, Universal Insurance Company was also the dominant company.

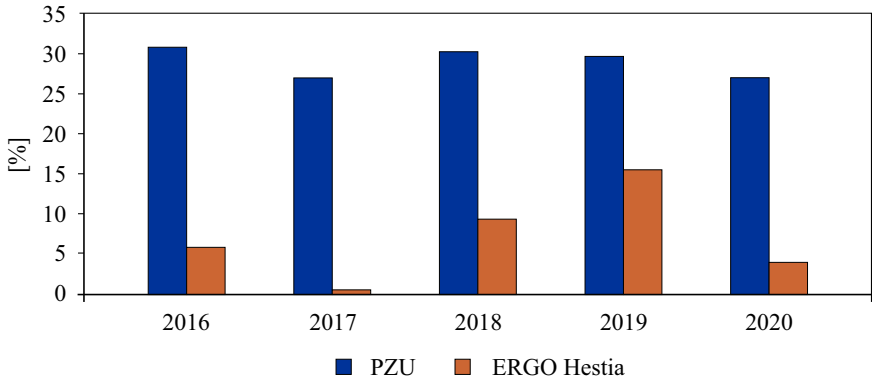
Chart 3. Net financial result of insurance companies PZU and ERGO Hestia in 2016-2020



Source: own compilation based on the PIU report for 2016-2020.

In Chart 3 defining the net financial result of the establishments, one can notice an increasing and decreasing trend of PZU company and a decrease, an increase and then a decrease of values recorded in ERGO Hestia. The regression of the first described company in terms of financial result may indicate a probable increase in costs or decrease in revenue of the company over the 5 examined years. A peak with an increase was recorded in 2018, which indicates an improvement in the financial situation of this establishment. The trend is slightly but gradually continuing. The trend of the second insurance company presented looked slightly different from the previously described elements characterizing the compared insurance companies. The first noticeable change is a decrease in value by more than half to PLN 1.2 million, followed by a significant increase in 2018 to PLN 21.4 million, then in the following year to PLN 39.4 million, and a decrease was recorded in the year starting the pandemic by more than two times to the amount of PLN 11.2 million. Universal Insurance Company also dominated in this case, taking into account the value of the financial result.

Chart 4. Profitability of insurance companies PZU and ERGO Hestia in 2016-2020



Source: own compilation based on the PIU report for 2016-2020.

Focusing on the data determining the profitability of the compared insurance companies in the years 2016-2020, one should point out a downward trend in the matter of Powszechny Zakład Ubezpieczeń with an increase in 2018 and a decrease, followed by an increase and finally a decrease in the value within ERGO Hestia (Chart 4). The same trend was present in the above examined element – net financial result. Efficiency of operations is significantly dominant in the case of PZU, although it declined slightly year-on-year with an upward peak in 2018, indicating a decline in company profitability. ERGO Hestia's profitability less than halved year-on-year in 2019 and then declined by more than three times year-on-year in 2019, possibly indicating slight fluctuations in betting activity.

5. Conclusions

Performing a comparative analysis of the baseline and superior values reflecting the financial situation of insurance companies PZU and ERGO Hestia in 2018-2020, it can be concluded that the COVID-19 pandemic slightly affected the deterioration of business performance. Such a research result constitutes verification of the hypothesis and not confirmation of it. Insurance companies suffered an insignificant loss due to the presence of COVID-19 pandemic in Poland, therefore the hypothesis was rejected. Insurance companies were characterized by adequate ability to regulate their own liabilities, their solvency remained stable. Powszechny Zakład Ubezpieczeń and ERGO Hestia, despite the imbalance of the market economy caused by the increased incidence of SARS-CoV-2, did not record a significant decrease in interest in their own offer by customers in Poland.

It can be pointed out that the pandemic has made Poles realize how important it is to protect the life and health of one's own and one's closest ones, because crisis situations may occur unexpectedly and one should and one should prepare for them as much as possible. Insurance companies have been very flexible and helpful to their clients in Poland during this worldwide crisis. Slight fluctuations of financial values indicated a stable overall situation considering the economy of the surveyed insurance companies.

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Wpływ pandemii COVID-19 na działalność zakładów ubezpieczeń PZU i ERGO Hestia

Streszczenie. *Pandemia COVID-19 wpłynęła na każdą sferę życia, w tym na gospodarkę. Obecność wirusa stanowi zagrożenie dla zdrowia, dlatego wymaga wprowadzania nowych rozwiązań w zakresie ubezpieczeń na życie tak w Polsce, jak i na świecie. W artykule dokonano analizy działalności dwóch wiodących zakładów ubezpieczeń w Polsce – Powszechnego Zakładu Ubezpieczeń, działającego pod skrótem PZU, oraz ERGO Hestii – w warunkach pandemii. Autorka porównała funkcjonowanie obu firm w okresie przed i w trakcie pandemii, biorąc pod uwagę najważniejsze wskaźniki świadczące o ich kondycji finansowej. Firmy te wykazały znaczne zrozumienie dla nagłej zmiany okoliczności, oferując specjalną ochronę ubezpieczeniową dla klientów i ich bliskich oraz podejmując działania w celu poprawy bezpieczeństwa, wsparcia psychologicznego oraz ograniczenia bezpośrednich kontaktów osobistych. Jednak także sektor ubezpieczeń odczuł negatywne skutki pandemii, która doprowadziła do spadku współczynnika szkodowości. Było to szczególnie widoczne w obszarze ubezpieczeń komunikacyjnych, zwłaszcza ubezpieczeń OC. Jednak pomimo niewielkich spadków niektórych wskaźników ogólna sytuacja finansowa obu firm była zadowalająca.*

Słowa kluczowe: *pandemia COVID-19, ubezpieczenia na życie, PZU, ERGO Hestia*

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Rational and behavioral causes of the emergence and enhancement of the momentum effect

Abstract. *The efficient market hypothesis (EMH) is widely recognized as true not only in capital markets but also in currency and real estate markets. Despite continuing evidence confirming the hypothesis, there are cyclical anomalies that violate its assumptions. The most important of these anomalies is the correlation of past and future rates of return (from 1 to 12 months), also known as the momentum effect. The significance of this anomaly lies in its widespread occurrence in various markets and the fact it can be used to build investment strategies. Consequently, it is extremely important to know what causes the anomaly and what factors can strengthen or weaken it. The aim of this article is to present two groups of causes of the momentum effect. The first group of causes is based on rational reasoning. The second one includes behavioral factors, connected with actual, often irrational behaviours of investors, and, more generally, capital markets.*

Keywords: *momentum effect, market anomalies, efficient market hypothesis, behavioral finance, neoclassical finance*

1. Meaning of efficient market hypothesis

Half a century has passed since the emergence of Eugene Fama's efficient market hypothesis. This theory, widely recognized by classical economics, is considered to be one of the best describing capital markets. It was created as a development of the concept of 19th century capital market researchers and practitioners, among others Jules Regnault and Louis Bachelier. The first information, that laid the foundations for the creation of the EMH was the statement, that the prices of financial instruments are the carrier of their real value and they discount all past,

present and even future information. At the same time, it was emphasized, that this information often did not have much to do with current prices (Buła, 2014b, p. 12).

The efficient market hypothesis is currently the basic theory of modern finance and serves primarily to describe capital markets (De Bondt et al., 2008, pp. 1-2). Today's model of EMH is based on the basic assumptions of efficiency: allocative, transactional and the most important, informational. Informational efficiency presupposes, that stock prices quoted on stock exchanges accurately reflect all the information, that affects them. At the same time, it is assumed, that these prices cannot be predicted in the future, and that they are subject of a random walk. The concept of informational efficiency implies, that already existing, emerging public or private information about a given security is immediately reflected in its price. In a broader scope, one can refer to the informational efficiency of individual capital markets (Ciołek, 2019). The information that appears should increase the price of a given item if it is favorable. If the information is negative, the market reaction should be opposite and its price usually falls. The result should be an immediate adjustment of the price of the given asset to all public and non-public information (Shleifer, 2000). On this basis, it is assumed, according to the definition, that a given capital market is informational efficient (one of the assumptions) if information is immediately communicated to all market participants, and these are immediately included in the prices of securities quoted on them (Czerwonka & Gorlewski, 2012, p. 125). The very changes in the prices of the securities quoted on them are random, which means, that the investors themselves are theoretically unable to achieve cyclically above-average profits using a number of different investment methods.

The first holders of information about a given share are usually a small group of company managers (insiders). In the next step, if the information is to be made public, it is communicated to a wider range of market participants and investors. It then becomes public information (Buzała, 2015, p. 98).

2. Real efficiency of capital markets

Since the formulation of the efficient market hypothesis by E. Fama, there has been a continuous discussion among investors and other participants of capital markets regarding their actual effectiveness (Rouwenhorst, 1999). The main question that arises is, whether they are informational effective, is the information immediately and fully reflected in the prices of the quoted securities? If the answer were true, it would have a number of consequences for the markets themselves and their participants.

The form of market efficiency is also important. From this point of view, markets are identified as weak, semi-strong or strong. The specific form should be reflected in the effectiveness of investment profitability assessment methods, including technical and fundamental analysis.

1. Weak form of the market. This form relates directly to information on the past of a given share, including, for example, their prices or turnover levels, and assumes, that they are already reflected in the current prices of the listed shares. It excludes any dependence between historical and future turnover and prices of a given stock. With weak market efficiency, the use of technical analysis should not give results in the form of cyclically recurring above-average profits.

2. The semi-strong form of the market, describes a state of the market where the prices of quoted securities reflect all publicly available information at a given moment. It also contains historical information about the given values, characteristic of the weak form. The semi-strong form of the market is not only about information on prices and turnover of individual stocks in the past, but also public information, the source of which is: the press, company reports, industry information or macroeconomic data. A market characterized by a semi-strong form of efficiency should preclude the effectiveness of both fundamental and technical analysis group methods. These methods should not systematically give above-average profits.

3. Strong form of the market (strong form). This form refers to markets on which it is impossible to achieve above-average profits, despite having information reserved only for authorized entities (Ciołek, 2019).

Particular types of market informational efficiency are subject to a characteristic dependence. It consists in the fact, that an efficient market in a strong form is effective in a semi-strong and a weak form at the same time, while a semi-strong market is also effective in a weak form (Buła, 2014a, p. 154).

Research on their information effectiveness is commonly conducted on the world's capital markets, but the results are inconclusive (Janicka, 2008, p. 169; Niederhoffer & Osborne, 1966; Lo & MacKinlay, 1988; Worthington & Higgs, 2007; Halmos, 2008). They confirm that capital markets are partially information-efficient in general (Rouwenhorst, 1999). The Polish capital market is highly effective in its weak form. For the sector of small and medium-sized companies, the effectiveness of the semi-strong form is low. For large companies is medium and large (Buczek, 2005b, p. 195).

Research shows that the EMH should be treated rather as a theoretical structure and not be empirical for its justification (Janicka, 2008, p. 176). The EMH model is simple and understandable; proving its individual assumptions, however, may be difficult or impossible. It may also turn out, that the results are inconclusive in this area (Titan, 2015).

Despite the lack of strong, real and unambiguous evidence supporting the truthfulness of EMH, the practice of capital markets around the world shows, however, that the classical methods of assessing the profitability of investing in stocks are only partially effective. This mainly includes a wide variety of technical analysis methods (Kwiecień, 2015, p. 162). However, a similar objection also applies to the methods of fundamental analysis (Petrusheva & Jordanoski, 2016, p. 30).

The reality of capital markets and a number of studies show, however, that although EMH is widely recognized as real, there are frequent and importantly, repetitive deviations from it (Jensen, 1978). This is in line with the assumptions of behavioral finance, that commonly criticize this theory (Simon, 1955). Its supporters note, that in fact, the information that appears is not immediately reflected in the price of a given stocks. There is always an overreaction or insufficient market reaction. This delay or acceleration of the response over time can result in characteristic price patterns. This undermines the EMH assumption of a random walk in quoted stock prices, creating the possibility of price anomalies.

3. Types of anomalies

After moment when E. Fama announced the EMH, a series of studies by economists confirmed the truth of this theory. It was treated as one of the greatest achievements of the 20th-century economy. It was believed, then that it had the most reliable confirmation in empirical research from the American, English or German stock markets. Despite this fact, however, more and more evidence has been exposed that the EMH is not completely coherent (Jensen, 1978). Research conducted on markets around the world began to reveal a number of, importantly, recurring discrepancies, that violate the principles of this theory. These exceptions are called anomalies. They indicate significant deviations from the model resulting, in this case, from the EMH (Buczek, 2005a, p. 39). Since then, various types of price anomalies, that violate its principles have become increasingly widely observed and investigated (Pawłowska, 2015, p. 447). Currently, a number of examples can be distinguished, such as:

– positive and negative correlations of rates of return between the past and the future,
– informational price drift,
– group calendar effects anomalies,
– excessive stock exchange turnover,
– the puzzle of closed investment funds,
– anomalies related to emission of shares,
– anomalies related to fundamental values,
– the effect of a low share price,

- the puzzle of closed investment funds,
- anomalies related to the popularity of companies (blue chips),
- anomalies related to the information about the share buyback,
- anomalies related to the change in dividend policy,
- anomalies related to the issuance of debt by the company,
- anomalies related to mergers and acquisitions,
- the effect of total share prices,
- other.

The sources of the lack of confirmation of EMH can be sought in a number of aspects, including, in particular, the behavior of investors themselves, which are often characterized by a full range of cognitive and emotional errors, conformisms, and simplifications in operation, which make the markets irrational.

4. The nature of the momentum effect

One of the strongest and most common anomalies, not least in the capital markets, is that based on the continuation of changes in past returns over a period of 1 to 12 months; for the same period in the future. This anomaly is called: momentum effect.

On stock exchanges, the momentum effect is expressed in the fact, that stocks of companies whose prices have recorded positive or negative past rates of return in the period from 1 to 12 months; tend to maintain the direction of price changes for the period of 1 to 12 months into the future (Kahneman & Tversky, 1979). Stocks whose prices have increased or decreased over the past 1 to 12 months should respectively increase or decrease in value in the same period in the future (Wójtowicz, 2011, p. 63). The momentum effect is a relatively new anomaly. It was first extensively researched by Narasimhan Jegadeesh and Sheridan Titman (1993). Its presence has been confirmed and is constantly confirm on the capital markets of Europe, the Far East, as well as in Poland (Pawłowska, 2015). This anomaly contradicts the efficient market hypothesis in its weak form, which states that concerning on the basis of historical data, share prices, it is not possible to predict their future levels (Fama, 1970). The momentum effect is one of the strongest anomalies in capital markets today (Jegadeesh & Titman, 1993).

The momentum effect as a relatively recently discovered phenomenon is probably not yet fully understood. There are other aspects, that require further research and description, and the existing ones require further confirmation. Currently, the possibility of more efficient data processing gives the possibility of creating new investment methods, also based on the structure of this anomaly. For this reason, the reasons for its formation seem to be particularly important. The reasons, that initiate, strengthen and extinguish it, determine its strength.

5. What causes the momentum effect?

It seems, that when looking for the causes of the momentum effect, two points of view should be indicated. On the one hand, these will be theories based on the principles of correct, logical thinking and related effective action. The second point of view should be based on irrational behavioral premises.

5.1. Rational approach

In the common sense, rational action is based on principles based on logic. Classical economics with the model of rational man, homo-oeconomicus, comes to explanation here. In this approach, a person who is able to consistently, repetitively, along with the information, that he processes, to predict future events based on his preferences can be considered rational (Czerwonka & Gorlewski, 2012, pp. 12-13). At the same time, it maximizes its individual, expected utility, that is expresses its preferences in a consistent manner; at the same time correctly estimates the probability of specific investment events in the future (Zielonka, 2017, pp. 9-11, 29-34).

From the point of view of rational premises and rational behavior of investors, the following factors can be distinguished, that initiate, strength the momentum effect:

1. Informational noise. Informational noise is a common phenomenon in the world of economics. It can be defined as a numerically large, significant influence of independent and very insignificant events. The source of information noise is the operation of independent, often unrelated entities. The meaning of the information creating information noise is often unknown (Babik, 2014, pp. 69, 71). It does not change the fact, that it can create business cycles. In capital markets, this phenomenon may be created by collective actions of individual investors, completely independent to each other. Information noise is the basis of liquid markets, which can generate trends and the possibility of a momentum effect (Black, 1986).

2. The risk factor in momentum strategies. When applying an investment strategy based on the momentum effect, risk factors are distinguished that affect the level of profits. First of all, it concerns the risk of low liquidity and the risk of bankruptcy of companies included in the portfolio based on the momentum effect. Both of these factors, when using short selling, reinforce this anomaly during the continuation of the downward trend. The most obvious example is when the prices of a publicly traded company, that goes to bankruptcy. No investor in such situation wants to take a long position on such stocks. This deepens the clear downward trend. The strengthening of the momentum effect in this situation may be apparent, caused by the lack of liquidity, when it is not possible to execute the

transaction (on the occasion of a short sale) (Avramov, Cheng & Hameed, 2013). Nevertheless, it should be stated that the higher the share of bankruptcy companies in the momentum portfolio, the stronger this anomaly is, at least in theory (Eisdorfer, 2008).

3. Positive feedback. Another factor that may explain the emergence and amplification of the momentum effect is positive feedback. They can be defined as a self-reinforcing investment pattern, the end result of which strengthens the initial state (Ganti, 2021). Positive feedback can be defined, for a rising market, as the expectation that prices will continue to rise as they have already risen (Stöttner, 1998, p. 87). The sources of this phenomenon can be found in the rational effect called window dressing. This effect arises when information appearing in the media distorts the reality of the value of listed companies. It is shown picture of stocks still undervalued, that can be bought. This causes the prices of these stocks to increase even more, causing a price bubble (Brunnermeier & Nagel, 2004). The continuation of this trend strengthens the momentum effect.

4. The Impact of Short Selling investment method. A factor that has already been mentioned as creating and enhancing the momentum effect is short selling. It is commonly indicated in the literature, that there is a positive correlation between the use of short selling of shares and the strength of the momentum effect. The fact is that most of the gains from a momentum strategy come from short selling rather than long positions (Ali & Trombley, 2006).

5. Using confidential information prior to acquisitions. Certain specific situations can also contribute to creating a momentum effect. It is about confidential information transferred between insiders (Doffou, 2003). In fact, this topic appears cyclically in the media, which often reveal criminal behavior of managers or officials working on takeovers of companies. The conducted research shows a significant correlation between the volume of insider purchases and the situations in which the companies are taken over. The increase in purchases among managers, directors, officers handling acquisitions of companies, estimated at 50% compared to typical periods, may strengthen trends, that are the source of the momentum effect (Agrawal & Nasser, 2011, p. 1).

6. Delegating portfolio management. Most of the assets invested in the stock markets are made by handing them over to professional investment funds for management (Analizy.pl, 2019). Research has shown that such behavior significantly contributes to the formation and enhancement of the momentum effect (Menkhoff, 2010, p. 8). This strengthening is related to the fact, that it is possible to invest more capital, which may artificially create positive feedback loops (described earlier) and generate the momentum effect (Coval & Stafford, 2007).

7. Leverage of foreign capital and cyclical feedback. Another factor influencing the emergence and maintenance of the momentum effect is the phenomenon of a situation in which, in a boom in a given market, capital introduced and lever-

aged by foreign investors causes an increase in share prices. Additional increases lead to the formation of price bubbles, which, at least for some investors, lead to losses (Blair, 2010). However, this does not change the fact, that a financial system based on a leverage mechanism can cause positive long-term feedback loops. Strengthening the trends, that arise in this way should generate a momentum effect (Gränitz, 2014, p. 54).

8. Fundamental data. The factor behind the momentum effect is related to what is known as earnings momentum (Ball & Brown, 1968). It relates to the size of companies' profits, but also indirectly influences the formation of share prices. It is a situation when the profit recorded by a given company increases or decreases in a given year or quarter in relation to the previous financial year or quarter. Growing profits are usually associated with an increase in margins, sales, and a decrease in costs, which take on the nature of a certain trend (Paździor, 2010). Of course, this effect can also be negative. Thus, the earnings momentum phenomenon generates clear positive or negative fundamental signals for the market. Assuming a continuation of this positive or negative trend in earnings levels, investors buy or sell company stocks. The emerging upward or downward trend, being a response to information emerging from companies, creates a momentum effect on capital markets (Chordia & Shivakumar, 2006).

9. Profit Indicator. Indirectly related to fundamental data, and influencing the emergence of the momentum effect, is also the factor known as the profit indicator (Chen, Moise & Zhao, 2009). It concerns the ratio determining the amount of profit per share (EPS). It is also known as price to earning (P/E). Investors who know the value of this indicator know, how many years they are able to cover the market price of the stock, not counting taxes, or how much they have to pay for one for instance euro of the company's profit. Investors selecting stocks to buy use this indicator, although its value over a long period of time may not be true. A positive image of the company resulting from this indicator may cause the emergence of price trends and thus create or strengthen the momentum effect. Of course, the volatility of the economic situation may cause sudden drops in the P/E ratio, which may rapidly change the trend of the stocks (Marecki, 2002).

The rational approach may be one of the directions explaining the emergence of amplification or extinction of the momentum effect. The behavioral approach seems to be different, as it recognizes a number of cyclical errors made by investors when making decisions. The irrationality of such phenomena may affect the market dynamics of the momentum effect.

5.2. Behavioral approach

The reality of capital markets is more complex than neoclassical economic models, that assume only rational investor behavior. This rationality occurs only

under certain specific conditions is limited and relative. The behavioral approach to investment, which captures the real behavior of its participants, may explain the emergence, enhancement or weakening of the momentum effect on the basis of human behavior different from rational (Jajuga & Jajuga, 1998). The following factors can be mentioned in the set of behavioral sources of the momentum effect:

1. Information processing errors. These cyclical cognitive biases affect all market participants who process the information they receive. The way of information's interpretation may lead to an overreaction or insufficient market response. Such behavior translates into stock price levels and thus strengthens or weakens the momentum effect. Within the group of phenomena belonging to cognitive biases, there are many theories explaining this type of deformation. They are often the basis for the created investment strategies (Jegadeesh & Titman, 2011). There are characteristic information processing errors, that enhance the momentum effect:

– Paying attention to the strength, not the real meaning of the information. This error concerns a situation in the processing of information reaching investors, in which they pay attention to the force, not its actual importance. This misinterpretation of information may lead to an under-market or over-market that may create new trends or reverse existing ones (Barberis, Shleifer & Vishny, 1998, pp. 309-310);

– Too slow or fast reaction to the information. An error in processing information may also apply to a too slow or excessively quick reaction to the information flowing in from the market. The result may be a faster or slower reaction or an overreaction of the market, which may translate into the end or continuation of an existing stock price trend, while influencing the shaping of the momentum effect (Szyszka, 2006, p. 39).

2. Overconfidence and Self Attribution. If investors behave overconfident in the market, this may lead to an overreaction of the market, which will lead to a continuation of the trend and thus create or strengthen the momentum effect. Of course, situations may also have a negative tinge, resulting in a weakening of the momentum effect (Smith, 1776). Another bias that can contribute to this anomaly is a phenomenon called Self Attribution. It consists in the fact that the successes achieved by investors attribute to their own skills, and failures to external factors independent of them (Daniel, Hirshleifer & Subrahmanyam, 1998). Both of the indicated phenomena may cause an excessive or insufficient reaction, influencing the development of this anomaly.

3. Disposition effect. Another phenomenon, that explains the emergence of the momentum effect results from the asymmetry in the perception of profits and losses by investors. It is described by the disposition effect. It indicates among others, in the capital markets, investors tend to sell assets, that grew or rising too quickly. It also explains why stocks are held when prices are falling or have fallen.

The disposition effect results directly from the prospect theory. The nature of the disposition effect creates a momentum effect as a result of a systematic insufficient response or overreaction of investors (Kahnemann & Tversky, 1979).

4. Companies not of interest to professional analysts. Another irrational reason for the emergence of the momentum effect is the hypothesis, that the momentum effect affects much more often companies that are more rarely in interest to professional analysts. This dependence can be explained by less access to the fundamental information of these companies. This lack of interest and the resulting lower propensity to invest by investors causes a delayed response to the information that appears, and thus may generate a momentum effect (Szyszka, 2006, p. 39).

5. The effect of behavioral finance. As mentioned earlier, behavioral finance covers the actual behavior of people in the financial world; series of theories, describes successive cyclic errors (bias). From the point of view of the momentum effect, the following phenomena can be distinguished:

– One of them is the phenomenon commonly known as the Endowment-Effect. It is based on the fact, that people value the goods they own more, than the goods that do not belong to them, even if they are identical. By transferring this phenomenon to capital markets, it may lead to a situation of overvaluation of specific stocks without rational premises, in relation to others. This may cause their prices to deviate from their fundamental values for a long time (Thaler, 1980).

– Another effect from the group of behavioral finance that may influence the shaping of the momentum effect is the Status Quo effect. In relation to investors, this phenomenon consists in not making any decisions and not making any moves, e.g. investment moves, or upholding previously made decisions. Research shows that this type of behavior is commonly used in a number of investment projects, including those managing large pension funds (Samuelson & Zeckhauser, 1988).

– Another phenomenon in the area of behavioral finance is the Breakevent-Effect theory. It is a situation where investors are able to take greater risk on stocks that they have made a profit in the past. However, it is relatively easy to them to get rid of stocks, that had previously brought them a loss. The impact of such behaviors on creating the momentum effect is obvious (Thaler & Johnson, 1990).

– Another factor that should be highlighted and which influences the strength of this anomaly is the importance of attention paid to the investment. This can explain an overreaction as well as an inadequate reaction. This relationship can be related to the attention paid to investments. There is an obvious correlation, that insufficient attention to investment causes insufficient response, and excessive market overreaction (Chen & Yu, 2013). The resulting changes in price levels influence the strength of the momentum effect.

6. Effects based on incorrect statistical estimation. When looking for irrational factors of the momentum effect, it is impossible not to notice behaviors based on wrong statistical judgments (Ellsberg, 1961). An example would be the representativeness heuristic. It concerns the phenomenon of overestimating the probability of some events, and underestimating relatively probable or easily recalled events. The resulting incorrect assessment of the situation may lead investors to behavior inconsistent with rationality, creating irrational price trends. Ultimately, it may strengthen or weaken the trends contributing to the creation of this anomaly.

7. Cyclical behavioral effects. The reality of the markets indicates other types of behavior, that may influence the shaping of the momentum effect. It is about extreme situations that appear cyclically on the market, which evoke strong emotions, such as panic or euphoria. As a rule, both are heavily emphasized in the media. In the event of euphoria, the emerging information activates other market participants, who previously did not participate in investments or took a pending position. A similar course, but in the opposite direction, applies to panic situations. These cyclical phenomena periodically increase the imbalance between supply and demand for shares. This causes a temporary irrational overestimation or underestimation of the value of specific stocks (Keynes, 1936). This trend, creating upward and downward trends, influences the emergence of market anomalies, including the momentum effect.

6. Conclusions

Characterization of the efficient market hypothesis provided the basis for considering anomalies, that break its assumptions, which appear in the markets. One of the strongest of them, commonly known as the momentum effect, as practically common in various markets, required wider attention. The question that should have been asked is about the causes of its formation, amplification and extinction. The answer has been systematized under two current: rational and behavioral directions. This provided a picture of the factors contributing to the creation, enhancement and extinction of the momentum effect. Of course, this does not exhaust all the considerations on this subject. Probably over time, other identified factors that affect the formation, strengthening or weakening of this anomaly will appear.

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Racjonalne i behawioralne przyczyny powstawania i wzmacniania efektu momentum

Streszczenie. *Hipoteza rynku efektywnego (EMH) jest teorią powszechnie uznawaną za prawdziwą na rynkach kapitałowych, a także walutowych i nieruchomości. Mimo jej ciągłego potwierdzania zauważalne są cykliczne anomalie łamiące jej założenia. Najważniejsza z nich, korelacja przeszłych i przyszłych stóp zwrotu (od 1 do 12 miesięcy), nazywana jest efektem momentum. Istotność tej anomalii polega na jej powszechnym występowaniu na różnych rynkach oraz możliwość jej wykorzystania do budowy strategii inwestycyjnych. W tym świetle niezwykle ważne jest poznanie przyczyn jej powstawania, wzmacniania czy osłabiania. Celem niniejszego artykułu jest prezentacja dwóch grup przyczyn wpływających na efekt momentum: pierwszy, racjonalny, oparty jest na ogólnie pojętej logice, drugi, behawioralny, uwzględnia rzeczywiste, często nieracjonalne zachowania inwestorów, a tym samym rynków kapitałowych.*

Słowa kluczowe: *efekt momentum, anomalie rynkowe, hipoteza rynku efektywnego, finanse behawioralne, finanse neoklasyczne*

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Application of the expert evaluation method in the analysis of trends and priorities of the educational process

Abstract. *The article is devoted to the possibility of using modern scientific methods, in particular the method of expert assessment, to identify trends in the development of the educational space in Ukraine and determine how it should be adapted to internal conditions and global challenges. The author discusses key aspects of the development of higher education in the globalised educational space. The analysis is based on results of a study involving the process of training undergraduate (bachelor's) students of Lviv Trade and Economics University in three educational and professional programmes: Marketing, Advertising in business and Law. The aim of the study was to determine to what extent learning and teaching methods were consistent with the principles of academic freedom and the student-centred approach.*

Keywords*: higher education, globalization, educational and professional program, expert evaluation method, questionnaire*

1. Formulation of the problem

Today, the importance of the development of national education systems for most countries of the world is growing, primarily in view of the impact of integration and globalization processes. The field of education acquires characteristic features of the globalization of the educational space, including the growth of demand for quality education, the unification of knowledge resources, the desire to achieve high indicators of the quality of education, diversification, the introduction of innovations, the growth of educational budgets, etc. The importance of higher education is revealed in the perspectives of society's development, as

it contributes to the growth of human capital, the generation of new intellectual ideas, the introduction of innovations and technologies, and ultimately determines the level of socio-economic development of the state and its competitiveness. Changes in the higher education system are caused by both internal and external factors. Under such conditions, higher educational institutions faced new challenges – to keep up with the demands of the times in order to successfully compete in the market of educational services, which has long been no longer limited by national borders, while being responsible for the educational process and adaptation of young people in rapid socialization. The community of higher education is able to some extent to adapt to the changes taking place by raising the educational level, forming directions for the future development of educational policy, and determining opportunities for the long term perspective.

In this regard, the issue of using a complex of modern methods of scientific knowledge in the analysis of processes taking place in the development of educational activity for adopting of well-founded decisions is brought up to date.

2. Aims and methodology of the study

The purpose of the article is to find out the possibilities of using modern scientific methods of scientific knowledge, in particular the method of expert evaluations, in identifying trends in the development of the educational space in Ukraine and developing directions for its adaptation to internal conditions and global challenges.

3. Main results of the study

The strategy for the development of higher education in Ukraine for 2022-2032, adopted in Ukraine, provides for consideration of Ukraine's desire to become an equal member of the European community. The goal of higher education in Ukraine is defined as the intellectual, cultural and professional development of the individual, the formation of high-quality human capital and the consolidation of society for the establishment of Ukraine as an equal member of the European community, the development of an effective innovative competitive economy and ensuring of high standards of quality of life. This program document provides for the achievement of five strategic goals: the effectiveness of management in the system of higher education, which is socially responsible; trust of citizens, the state and business in the educational, scientific, and innovative activities of higher education institutions; ensuring high-quality educational and scientific activities, competitive higher education, which is accessible to various segments of the population; internationalization of higher education of Ukraine; attractiveness of

higher education institutions for study and academic career (Government portal, 2022).

Both the development of the higher education system, its harmonization to European standards, and the formation of directions for the future development of educational policy in the conditions of globalization require the adoption and implementation of appropriate decisions.

Modern conditions of the development of social and economic processes demonstrate that the decision-making process is constantly becoming more complicated, because the number of influencing factors, the amount, content and importance of information is increasing, which causes the fact that the application of mathematical methods, despite their objectivity, is is already insufficient. Experts believe that they should be combined with the use of expert assessments. The advantage of this method is that it allows you to make decisions when objective methods cannot give the desired result, and the conditions require making highly effective management decisions taking into account the specifics of development and priorities of activity (Shapochka & Makariuk, 2006).

At the same time, among the most important advantages of an expert survey can be considered the optimal opportunity to get a complete real picture of the predicted results of the future implementation of management decisions, both at the level of individual subjects and on a more global scale. In the future, justified alternative options can serve as a starting point for the development of a system of planned sequential management decisions, which provide for a defined set of actions, approaches and measures that will need to be managed, for example, when the circumstances of the external and internal environment change, problems, risks and threats arise (Oleksiienko & Donets, 2021), which, in our opinion, is inherent in globalization manifestations. The role of expert evaluation methods in economic research is also growing, for the development of medium- and long-term forecasts, forecasting of future events, if statistical data are absent or not enough (Martynova & Shevchenko, 2021, p. 260).

Thus, when solving various economic, technical, as well as scientific problems, situations sometimes arise when, for various reasons, largely due to the lack of reliable information, it is impossible to apply statistical methods or their application is unjustified from an economic point of view. Such a problem appears when, during research of some characteristic of data set, there are cases in which it is impossible to obtain observation (x_1, x_2,..., x_n) by selection of various types of measurements or other methods. Examples of such characteristics, which are called qualitative, can serve as mental and other abilities of people, the consumer properties of goods, the level of some services and others.

In some cases, methods that use the results of experience and intuition are widely used, that is, heuristic methods, which lack strict mathematical proofs of the optimality of the obtained solutions. The general orientation of such

procedures is the use of a person as a "measuring device" to obtain quantitative estimates of processes that, due to the incompleteness and unreliability of the available information, cannot be directly measured. Specialists who use heuristic methods in their research are called experts, the methods themselves are called expert methods, and the evaluations obtained with their help are called expert evaluations.

Therefore, expert methods are understood as a complex of logical and mathematical procedures, the purpose of which is as follows:

– receiving information from experts on the issue being studied;

– elaboration of the received information using methods of mathematical statistics and selection based on the elaboration of optimal solutions.

Expert methods or methods of expert evaluations are scientific methods of analyzing the reasoned opinions of experts.

Note that the expert assessment is not the true value of the evaluated parameter, but some collective point of view about it. Thus, given the great convention of expert methods, some specialists distrust them, believing that there is no guarantee that the obtained estimates are reliable. Indeed, it is impossible to accurately assess the reliability of the obtained results. At the same time, the existing methods of determining the reliability of expert assessments are based on the assumption that in the case of consistency of the experts' actions, the reliability of the assessments is guaranteed.

In practice, this is not always the case, and examples can be given when individual experts, who did not agree with the opinion of the majority, gave correct assessments. However, as the practice of using expert methods has shown, in most cases, when experts' opinions are consistent, their assessments were correct.

The characteristic features of expert methods and models of their realization as an instrument of scientific solution of complex non-formalized problems are, firstly, the scientifically based organization of all stages of expertise, which ensures the efficiency of work at each of the stages, and, secondly, the use of quantitative methods as in the organization expertise, as well as when evaluating the opinions of experts based on the formal processing of the results of their opinions. These features distinguish expert methods from the usual long-known expertise, which is used in various spheres of human activity.

Expert methods are widely used in various fields of activity and on these basis important and capital-intensive measures are implemented. One of the areas of their application is the qualitative analysis and quantitative assessment of economic risk.

Thus, with the help of the "brainstorming" method, a number of risk management problems can be successfully solved:

– identification of sources and causes of risk, establishment of all possible risks;

– choice of directions and ways of risk reduction;

– formation of a complete choice and qualitative assessment of options that use different methods of risk reduction.

Conditions for overcoming subjectivism in the preparation of management decisions are methods of operations research and expert methods. In particular, their application is most effective in solving the following production management problems:

– forecasting trends in the development of the production system and the interaction of the external environment with it;

– determination and ranking according to a given criterion of the most significant factors that affect the functioning and development of the production system;

– identification and assessment of qualitative and quantitative criteria necessary for choosing a management decision;

– assessment of alternative solution options and identification of the most promising ones.

We will apply the method of expert evaluations on the example of the educational process at the Lviv University of Trade and Economics.

The method of group expert evaluation, taking into account the competence of experts, is used to identify the most significant (priority) issues for improving activities in the field of education. We will show its application on the example of the educational process of students of higher education of the first bachelor's level in the three educational and professional programs: Marketing, Advertising in Business and Law of the Lviv University of Trade and Economics. A special survey questionnaire with a wide list of questions and proposed answers was used to implement the methodology, and a point scale was established for the possibility of processing the received data (Lviv University of Trade and Economics, 2022).

Therefore, during research of the factors influencing learning in educational programs, a questionnaire was conducted among students of the Lviv University of Trade and Economics in 2021-2022 on the subject of determining the degree of compliance of forms, methods of learning and teaching with the principles of academic freedom and student-centered approach during education. The results of a questionnaire of students of the first bachelor's level of three educational and professional programs Marketing, Advertising in business, Law were taken for the calculation of expert evaluation. To process the received assessment data, we used the universal Microsoft Excel software package. Table 1 shows the point estimates of indicators and the calculated weighting coefficients of each risk factor.

The fourth factor (excessive amount of educational load) is the most important, since the coefficient of importance is the largest here $k_4 = 0.228$, and the least important are two factors: insufficient provision of educational and methodical literature $k_2 = 0.038$ and lack of interest in learning $k_8 = 0.038$.

Table 1. Scores of indicators and calculated weighting coefficients for each risk factor

Indicators (factors affecting study in the educational program)	The estimation of the indicators given by students			Total	Coefficient of importance
1. Insufficient level of training at school	4	4	4	12	0.065
2. Insufficient provision of educational and methodical literature (textbooks, study guides, methodical instructions)	2	3	2	7	0.038
3. Inconvenient schedule	15	14	3	32	0.174
4. Excessive amount of educational load	16	23	3	42	0.228
5. The need to combine study and work	6	10	16	32	0.174
6. Disappointment in the educational and professional program	3	1	5	9	0.049
7. Personal disorganization	5	8	2	15	0.082
8. Lack of interest in learning	2	3	2	7	0.038
9. The influence of other students, which hinders the manifestation of the student's abilities during training sessions	2	2	15	19	0.103
10. Lack of employment prospects	3	4	2	9	0.049
Total	58	72	54	184	1

Source: own elaboration.

Table 2. Ranks for each factor and calculated resulting ranks

Indicators (factors affecting study in the educational program)	Ranks of indicators			Total	The resulting rank
1. Insufficient level of training at school	5	5	4	14	4
2. Insufficient provision of educational and methodical literature (textbooks, study guides, methodical instructions)	10	8	10	28	10
3. Inconvenient schedule	2	2	5	9	3
4. Excessive amount of educational load	1	1	6	8	2
5. The need to combine study and work	3	3	1	7	1
6. Disappointment in the educational and professional program	6	10	3	19	6
7. Personal disorganization	4	4	7	15	5
8. Lack of interest in learning	8	7	8	23	9
9. The influence of other students, which hinders the manifestation of the student's abilities during training sessions	9	9	2	20	7
10. Lack of employment prospects	7	6	9	22	8

Source: own elaboration.

Table 2 assigns ranks to each factor and calculates the resulting ranks to assess the agreement of the opinions of all possible pairs of experts (representatives of each specialty) using the Spearman rank correlation coefficient and to assess the agreement of the opinions of three experts using the Kendall concordance coefficient.

The resulting rank 1 was given to the fifth factor – the need to combine study and work, and the 10th place – insufficient provision of educational and methodical literature.

Consistency of experts' opinions is evaluated as the relationship between their assessments and is based on non-parametric methods for assessing the closeness of the relationship. We obtained the following Spearman rank correlation coefficients: $\rho_{12} = 0.87$, $\rho_{13} = 0.33$, $\rho_{23} = 0.03$. The proximity of the coefficient ρ_{12} to unity indicates a close relationship between the assessments of the first and second experts. The connection between the opinions of the first and third experts is moderate. The proximity of the coefficient ρ_{23} to zero indicates a very weak relationship between the assessments of the second and third experts, opinions almost diverge.

The value of the concordance coefficient (Kendall coefficient) $W = 0.607$ indicates the average consistency of the assessments of three experts for three educational and professional programs: Marketing, Advertising in business and Law.

Within the framework of the questionnaire on training in educational and professional programs in the higher educational institution of the LTEU, the most frequently received response from students under the educational and professional programs: Marketing and Advertising in business is an excessive volume of educational load, although students under the educational and professional program Law do not think so, the next variant is not convenient for the number of answers received. An interesting fact is that students on the educational-professional program Law in comparison with students of the other two programs have given preference to the indicator of influence on the part of other students, which is contrary to the manifestation of the student's abilities during the training. The obtained results made it possible to clarify that, on average, according to the number of answers for students in three educational programs, there is a factor of the need to combine study and work.

According to the results of the conducted expert assessment of training in the educational and professional programs Marketing, Advertising in business and Law, the following issues were prioritized for further analysis:

– the need to combine study and work (resulting rank 1);
– excessive amount of educational load (2);
– inconvenient schedule (3),

At the same time, the questions do not have primary or any importance for their further analysis:

– insufficient provision of educational and methodical literature (textbooks, manuals, methodical instructions) (10);

– lack of interest in learning (9);

– lack of employment prospects (8).

Thus, a qualified survey of students of higher education will contribute to the assessment of their intentions and the determination of priorities for the further development of educational activities, especially in conditions of uncertainty caused by factors of both internal and external origin.

4. Conclusions

A strategic task for domestic higher education is full and equal integration into the world educational space. Since various factors have a significant on the domestic education systems of all countries, on the one hand, it is an opportunity to adapt positive experience of the best educational institutions, and on the other – to offer our own achievements and approaches.

In modern society, to solve certain questions or problems in many spheres of activity, the opinion of leading specialists and experts is increasingly taken into account, involving them in various expert evaluations. It is obvious that the reliability of such evaluations depends on the correct approach to the selection of experts who posses special skills or knowledge in a specific field of activity and who are involved for research or conducting expertise on certain issues.

The use of universal statistical packages of programs allows to carry out a quantitative assessment of the level of influence of factors on the education of students in educational and professional programs. Such evaluation can become the basis for further improvement of the training system. The consequence of such an assessment is the provision of proper professional educational conditions in a higher educational institution.

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Zastosowanie eksperckiej metody oceny do analizy trendów i priorytetów w procesie kształcenia

Streszczenie. *Artykuł poświęcony jest poznaniu możliwości wykorzystania nowoczesnych metod naukowych, w szczególności metody ocen eksperckich do identyfikacji trendów rozwoju przestrzeni edukacyjnej na Ukrainie oraz wskazanie obszarów, które wymagają dostosowania do warunków wewnętrznych i wyzwań globalnych. Autorka omawia charakterystyczne cechy rozwoju szkolnictwa wyższego w zglobalizowanej przestrzeni edukacyjnej. Przeprowadzone badanie dotyczyło procesu kształcenia studentów studiów wyższych I stopnia (licencjat) na Lwowskim Uniwersytecie Handlowo-Ekonomicznym w ramach trzech kierunków edukacyjno-zawodowych: marketing, reklama w biznesie i prawo. Celem badania było określenie, do jakiego stopnia stosowane metody uczenia się i nauczania są zgodne z zasadami wolności akademickiej i podejścia skoncentrowanego na uczniu.*

Słowa kluczowe: *szkolnictwo wyższe, globalizacja, program edukacyjno-zawodowy, ekspercka metoda oceny, ankieta*

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Current problems faced by Ukraine's regions with regard to economic specialization

Abstract. *The article addresses the impact of external factors on the indicators of Ukraine's socio-economic development. The author analyses changes in the index of the gross regional product of Ukrainian regions in the period 2012-2020 to create a ranking showing each region's contribution to the country's GDP. The author proposes her own typology of regions depending on the level of their economic specialization, which is based on the share of key types of economic activity in the gross added value. The contribution (taxes and fees) of each region to Ukraine's state budget was also calculated.*

Keywords: *gross added value, gross regional product, economic specialization, industrial regions, innovative products*

1. Introduction

Over the past eight years, Ukraine has been in an extremely difficult geopolitical and socio-economic situation. The problems began in 2014 after the occupation by the Russian Federation (RF) of 7% of the territory on which 13% of the population of Ukraine lived (2 million people in Crimea and about 4 million people in the occupied territories of Donetsk and Luhansk regions) and formed 13.7% GDP (in 2013) (Eurasia Center, 2017). Ukraine's losses from the occupation of these territories (assuming they are lost forever) are estimated at $98.8 billion. USA, which accounted for 88.1% of Ukraine's GDP in 2017 (Aslund, 2018). As a result, Ukraine's gross external debt has been forced to increase from 76.6% of GDP in

2012 to 130.5% in 2015. In addition, ties between domestic business entities and business partners in the CIS countries, and most notably in the Russian Federation, were severed. The influence of these and other factors had a negative impact on the dynamics of indicators of the state of the macroeconomic environment, the main of which are inflation, the exchange rate, the NBU discount rate, GDP, etc. According to estimates of Centre for Effective Dispute Resolution (CEDR), the war with the Russian Federation in 2014-2020 cost Ukraine $280 billion (Amelin, 2022). As a result, this created new challenges for the development, in particular, of the eastern regions of Ukraine and, at the same time, determined new priorities for such development.

The scale of the national economy and, at the same time, its deep regional heterogeneity, which is deepening under the influence of threatening destructive factors (military aggression by the Russian Federation), determine the relevance of scientific research in this thematic direction.

2. Analysis of research and publications

In-depth comprehensive studies of the socio-economic development of the regions of Ukraine are conducted, in particular, in the institutes of the National Academy of Sciences. Thus, a team of scientists under the leadership of academician of NASU E.M. Libanova and Academician of the National Academy of Sciences M.A. Khvesyk developed a methodology for the formation of a system of indicators of the effectiveness of the development of regional socio-economic systems and proposed conceptual and scientific-methodical approaches to assessing the social potential of the state and its regions, as well as formulated basic imperatives and strategic directions for the rationalization of all spheres of resource use in Ukraine (Libanova & Khvesyk, 2014). Scientists of the Institute of Economic and Legal Research of the National Academy of Sciences of Ukraine deal with issues of interregional cooperation and, in particular, the reintegration of temporarily occupied territories. They formed an approach to the analysis of the state and development trends of interregional cooperation in Ukraine, which promotes effective interregional interaction of state, public institutions and business entities of partner regions (Zablodska et al., 2015); an example and guidelines for documenting the process of monitoring the implementation of a dominant strategy for the development of interregional economic cooperation are proposed and the stages of monitoring such a strategy are outlined (Rohozian, 2019); strategizing regional development was carried out on the example of Donetsk region (Zablodska et al., 2016).

The purpose of the article is to evaluate the economic specialization of the regions of Ukraine and the trends of their further development in the context of the latest challenges.

3. Results of the research

One of the main problems of the national economy was (and remains) its high level of import dependence, in particular, in the segment of consumption of industrial products, which dominates Ukrainian imports with a share of about 80%. Thus, the share of imports in the total consumption of industrial products in Ukraine is 45% (against 30% in Poland and 25% in Germany), and the products of processing industries – more than 50%, in particular in intermediate consumption – 52%, and in the gross accumulation of fixed capital – 85% (Ishchuk & Sozanskyy, 2020).

Price of imports, in particular domestic products with a high share of imported components, primarily mechanical engineering (the dependence on imports of which is on average more than 80%), as well as products of light (>60%) and chemical (>80%) industries, causes an increase in the consumer price index in Ukraine. The latter, in its turn, leads to a decrease in the purchasing power of the population, and therefore, to a decrease in domestic demand for goods for production and consumer (or non-production) purposes. Thus, as a result of the fall in production volumes (industrial, agricultural, construction), the index of the physical volume of Ukraine's GDP decreased by 10 p.p. during 2013-2015 – up to 90.2% against 100.2% in 2012.

Since 2016, the situation on the world markets of grain crops and ferrous metals (which accounted for ≈35% of domestic commodity exports) began to improve, which created favorable conditions for increasing the level of socio-economic development in Ukraine. The result of the growth of the national economy was a significant decrease in the gross domestic debt of Ukraine (relative to GDP) – to 103.8% in 2017 (against 130.5% in 2015) and a decrease in inflation to 113.7% (against 143.3%). In 2016-2017, the index of the physical volume of Ukraine's GDP was stable at the level of 102.4%, and in 2018 it reached 103.5%, while the consumer price index decreased to 109.8%.

Regionally, in the crisis year for Ukraine in 2015, the economy of Vinnytsia region experienced the smallest decline – the index of the physical volume of its gross regional product (GRP) decreased by 2.9 p.p., while that of Donetsk region – by 38.7 p.p., and Luhansk – by 52.3 p.p. (Table 1). In 2016, 17 regions showed a positive value of this indicator (>100%), and in 2019, their number increased to 23, that is, all regions, except Volyn, achieved an increase in GRP. However, in 2020, as a result of the negative impact of the COVID-19 pandemic, there was a significant reduction in business activity. As a result, Ukraine's GDP decreased by 3.8%, and only three regions – Sumy, Lviv, Luhansk and Khmelnytsky – maintained economic growth.

Table1. Index of the physical volume of GRP of the regions of Ukraine

Region	2012	2013	2014	2015	2016	2017	2018	2019	2020
Ukraine	**100.2**	**100.0**	**93.4**	**90.2**	**102.4**	**102.4**	**103.5**	**103.2**	**96.0**
Vinnytsia	103.7	104.8	104.6	97.1	106.5	101.8	105.0	108.6	93.6
Volynsk	104.8	99.3	101.1	95.3	108.2	105.3	103.8	94.2	96.9
Dnipropetrovsk	97.5	99.3	95.1	90.3	98.4	102.1	102.5	103.7	91.0
Donetsk	97.1	94.7	67.1	61.3	99.1	95.2	100.5	101.7	95.8
Zhytomyr	109.4	101.9	103.6	98.1	105.2	105.0	104.8	100.5	94.8
Zakarpattia	103.0	100.6	102.8	93.5	97.3	103.1	104.0	101.5	94.2
Zaporizhzhia	97.8	99.3	100.4	94.7	99.7	103.1	100.6	102.6	93.6
Ivano-Frankivsk	103.3	97.7	97.6	92.0	99.0	107.1	105.7	106.1	94.7
Kyivska	101.9	93.4	99.4	94.0	105.7	104.6	106.9	104.1	96.7
Kirovohradsk	100.7	109.5	100.6	91.7	105.0	98.6	107.0	106.2	89.2
Luhansk	99.1	92.2	61.0	47.7	118.0	83.8	98.7	104.3	100.6
Lviv	102.0	98.8	100.9	95.2	99.3	103.8	105.7	104.6	101.8
Mykolayivska	96.1	104.4	98.4	95.3	105.6	99.1	103.1	106.6	91.5
Odesa	96.8	105.7	98.3	95.8	104.2	104.2	101.8	103.4	95.8
Poltava	97.8	94.4	96.0	93.8	97.9	97.2	103.8	101.0	97.4
Rivne	103.3	96.9	102.6	93.4	100.3	103.5	101.5	107.1	98.9
Sumy	101.7	102.7	100.4	96.7	96.6	100.2	105.5	101.9	103.3
Ternopilsk	109.0	96.6	108.0	93.7	98.5	105.6	103.3	103.6	96.1
Kharkivska	98.4	98.8	97.9	90.9	102.1	101.4	102.4	101.4	96.2
Khersonsk	100.2	101.1	99.7	98.7	102.8	100.8	99.9	104.6	94.8
Khmelnytska	109.0	96.9	102.3	92.2	104.7	106.4	101.9	100.7	100.0
Cherkassy	100.9	100.7	98.9	95.0	101.8	98.3	108.8	103.7	93.0
Chernivtsi	106.1	101.5	98.3	94.7	99.4	103.5	104.6	105.1	93.1
Chernihivska	104.0	95.8	100.5	93.4	100.6	102.2	104.2	101.7	98.0

Source: own elaboration based on State Statistics Service of Ukraine, 2022.

In 2021, when quarantine restrictions were significantly relaxed, and world prices for the main items of domestic exports (grains, iron ore and metal) were at a relatively high level, the national economy resumed growth – according to the State Statistics Service of Ukraine, GDP growth amounted to 3.4%.

Despite the annual decline during the analyzed period (with the exception of 2017-2019) of economic growth in Dnipropetrovsk Oblast, it remains the leader in the ranking of regions in terms of GRP after Donetsk Oblast moved to 5th position as a result of its share in Ukraine's GDP decreasing by more than two times – by 6.5 p.p. (Table 2).

The Lviv region is actively increasing its economic potential, which rose from the 7th position to the 4th position in the rating (+1.1 p.p. in the structure of the GDP of Ukraine, compared to 2012). Similar trends were characteristic of the Mykolaiv and Volyn regions. Instead, Luhansk Oblast experienced the biggest drop in the

Table 2. Ranking of regions by share in the GDP of Ukraine (in %)

2012		2016		2017		2018		2019	
Region	Share in GDP	Region	Share in GDP	Region	Share in GDP	Region	Share in GDP	Region	Share in GDP
Donetsk	11.7	Dnipropetrovsk	10.2	Dnipropetrovsk	10.5	Dnipropetrovsk	10.3	Dnipropetrovsk	9.8
Dnipropetrovsk	10.1	Kharkivska	6.5	Kharkivska	6.3	Kharkivska	6.6	Kharkivska	6.2
Kharkivska	5,6	Donetsk	5.8	Donetsk	5,6	Kyivska	5,6	Kyivska	5.5
Kyivska	4.8	Kyivska	5.4	Kyivska	5.3	Donetsk	5.4	Lviv	5.4
Odesa	4.4	Odesa	5.0	Poltava	5.1	Lviv	5.0	Donetsk	5.2
Lviv	4.3	Poltava	4.9	Odesa	5.0	Odesa	4.9	Odesa	5.0
Luhansk	4.0	Lviv	4.8	Lviv	4.9	Poltava	4.9	Poltava	4.7
Poltava	3.9	Zaporizhzhia	4.4	Zaporizhzhia	4.4	Zaporizhzhia	4.1	Zaporizhzhia	3.9
Zaporizhzhia	3.8	Vinnytsia	3.1	Vinnytsia	3.1	Vinnytsia	3.1	Vinnytsia	3.3
Vinnytsia	2,3	Mykolayivska	2.5	Cherkassy	2.5	Cherkassy	2.6	Cherkassy	2.6
Ivano-Frankivsk	2,2	Cherkassy	2.5	Mykolayivska	2,3	Zhytomyr	2,2	Mykolayivska	2,3
Cherkassy	2.1	Ivano-Frankivsk	2,2	Zhytomyr	2.1	Ivano-Frankivsk	2,2	Ivano-Frankivsk	2,2
Mykolayivska	2.0	Zhytomyr	2.0	Ivano-Frankivsk	2.1	Mykolayivska	2,2	Zhytomyr	2.1
Khmelnytska	1.8	Khmelnytska	2.0	Khmelnytska	2.1	Khmelnytska	2.1	Khmelnytska	2.1
Zhytomyr	1.7	Kirovohradsk	1.9	Sumy	1.9	Chernihivska	2.0	Chernihivska	2.0
Sumy	1.7	Sumy	1.9	Chernihivska	1.9	Sumy	1.9	Volynsk	1.9
Chernihivska	1.6	Chernihivska	1.8	Kirovohradsk	1.8	Kirovohradsk	1.8	Sumy	1.9
Zakarpattia	1.5	Rivne	1.7	Volynsk	1.7	Volynsk	1.7	Kirovohradsk	1.8
Kirovohradsk	1.5	Khersonsk	1.6	Rivne	1.6	Rivne	1.6	Rivne	1.7
Rivne	1.5	Volynsk	1.5	Khersonsk	1.6	Zakarpattia	1.5	Khersonsk	1.6
Volynsk	1.4	Zakarpattia	1.4	Zakarpattia	1.4	Khersonsk	1.5	Zakarpattia	1.5
Khersonsk	1.3	Luhansk	1.3	Ternopilsk	1.4	Ternopilsk	1.4	Ternopilsk	1.4
Ternopilsk	1,2	Ternopilsk	1.3	Luhansk	1.0	Luhansk	1.0	Luhansk	1.0
Chernivtsi	0.9	Chernivtsi	0.9	Chernivtsi	1.0	Chernivtsi	1.0	Chernivtsi	1.0

Source: own elaboration based on State Statistics Service of Ukraine, 2022.

rating (by 16 positions) during the analyzed period, whose share in Ukraine's GDP decreased by 3 p.p. In addition to it, Zakarpattia (three positions), Ivano-Frankivsk (one position), Odesa (one position) and Sumy (one position) regions also lost positions in the rating during this period.

In general, it can be stated that there are significant disparities in the economic development of the regions of Ukraine. Thus, in 2019, five regions formed almost a third (32.1%) of Ukraine's GDP. However, these disproportions tend to decrease. For comparison, in 2012, the five leaders of this rating accounted for 36.6% of Ukraine's GDP. During the analyzed period, the number of regions whose share in Ukraine's GDP exceeded 5% doubled (from 3 to 6). However, it is important to emphasize that such changes are largely caused by the external systemic influence of a set of socio-political and socio-economic changes that have taken place in Ukraine and the world over the past 8 years.

On the other hand, the explanation of the differences in the economic potential of the regions, in particular according to the indicator of their contribution to the GDP of Ukraine, lies in the plane of the formation of the structure of the national economy and the peculiarities of its development at the meso level. Thus, the economy of Ukraine is characterized by a relatively low degree of diversification – almost 50% of the gross value added (GVA) is formed by three basic types of economic activity (VED): industry, agriculture (hereinafter: agriculture), and wholesale and retail trade; repair of motor vehicles and motorcycles (further: trade). Among them, the leading FDI is industry with a share of 23.2% of Ukraine's GDI in 2019 (Table 3).

Table 3. The share of basic foreign trade in the main indicators of the socio-economic development of Ukraine (in %)

VED	Gross value added	Number of employees	Export of goods and services	Capital investments
Industry	23.2	28,44	54.73	36.52
Agriculture	10.4	7.10	20.24	8.68
Trade	15.4	21.83	0.11	7.31

Source: own elaboration based on State Statistics Service of Ukraine, 2022.

Despite significant (≈25%) layoffs over the past 8 years, industry remains the leader in terms of the number of employees – more than 28% of the total indicator in the economy. At the same time, the industrial sector of the economy accounts for more than ½ of the domestic export of goods and services, as well as the most (more than a third) of capital investments.

Traditionally, the economy of the vast majority of Ukrainian regions (15 in 2012) specialized in industrial production. However, under the influence of many factors, in particular social and political, in 2016-2018 the number of regions in

Table 4. Economic specialization of the regions of Ukraine (by share in the Airborne Forces) (in %)

Region	Industry					Agriculture					Trade				
	2012	2016	2017	2018	2019	2012	2016	2017	2018	2019	2012	2016	2017	2018	2019
Vinnytsia	18.3	22.1	21.4	19.8	20.5	22.4	31.8	28.1	28.5	24.5	10.8	8.6	8,9	9.9	10.3
Volynsk	16.4	17.9	15.4	15.5	14.6	16.6	20.5	17.2	16.2	13.9	15.3	15.7	25.5	23.3	28.1
Dnipropetrovsk	47.3	46.7	48.2	47.7	44.1	4.9	8.5	7.3	7.0	6,7	12.9	10.9	11.4	10.4	11.6
Donetsk	39.9	45.3	49.9	53.2	49.9	4.2	7.7	7.2	6.2	6.2	16.2	10.1	8.0	7.2	7.1
Zhytomyr	22.7	19.9	19.0	19.8	18.4	19.2	25.3	23.5	23.1	20.6	10.6	10.5	10.7	10.0	10.9
Zakarpattia	20.2	16.7	15.1	14.7	13.1	14.2	17.1	15.2	14.6	13.9	17.4	11.7	12.4	13.9	12.8
Zaporizhzhia	43.9	41.4	42.4	43.5	39.0	8.5	13.9	12.0	9.8	10.2	11.6	10.4	10.7	10.5	12.4
Ivano-Frankivsk	30.2	26.4	28.0	31.2	29.3	12.2	14.4	14.4	13.1	12.4	13.7	13.6	11.6	11.2	11.0
Kyivska	18.2	22.2	21.5	20.4	19.2	13.5	16.0	14.3	14.9	12.0	18.6	15.4	16.3	16.6	16.0
Kirovohradsk	22.2	20.6	19.1	19.0	19.0	23.2	36.8	31.3	33.0	29.2	11.5	8.3	10.4	10.2	10.9
Luhansk	45.2	34.5	23.1	20.7	18.3	6.3	20.9	21.3	21.7	19.6	10.5	4.8	6,7	8.0	9.9
Lviv	17.9	22.7	22.9	22.1	20.0	9.0	10.2	9.6	9.1	8.0	17.7	12.6	15.5	15.6	14.6
Mykolayivska	25.7	20.6	21.1	21.1	20.7	16.3	25.6	21.9	21.0	18.2	12.9	11.5	12.5	12.8	13.0
Odesa	13.1	13.7	12.5	12.2	11.7	7.4	13.3	11.5	11.0	8.4	14.9	13.3	14. 6	14.0	13.3
Poltava	44.2	50.5	54.1	49.4	47.6	14.2	19.6	14.3	16.8	14.4	8.0	6.4	6.9	7.5	9.0
Rivne	26.2	26.1	24.5	24.1	23.7	17.1	20.6	19.9	19.1	17.0	11.1	13.7	11.6	10.7	11.0
Sumy	27.3	24.6	22.5	23.2	23.1	16.2	28.0	26.1	26.4	22.8	15.0	11.2	9.7	9.6	10.0
Ternopilsk	13.6	15.0	14.2	13.6	13.0	24.2	28.9	28.1	25.6	22.4	12.3	10.8	10.6	10.8	11.8
Kharkivska	21.3	31.0	31.0	33.1	28.3	8.8	13.4	11.1	10.2	9.4	15.3	11.7	11.7	10.6	10.9
Khersonsk	16.0	15.1	15.1	14.7	14.6	24.2	36.5	33.0	30.1	26.9	12.1	9.4	10.5	10.9	11.2
Khmelnytska	20.3	19.5	17.5	16.3	15.1	22.1	31.8	31.1	29.5	25.4	10.0	9.3	10.3	11.2	11.1
Cherkassy	24.3	25.9	25.2	24.1	24.0	21.8	26.5	21.8	23.2	20.0	12.8	11.3	13.9	14.2	15.0
Chernivtsi	9.9	11.7	10.7	10.5	10.9	20.2	24.9	22.3	21.1	18.0	12.2	10.7	13.1	13.5	12.5
Chernihivska	24.9	20.4	20.5	21.1	20.0	20.8	31.2	28.2	28.0	24.2	11.0	9.5	8.8	8.6	8.5

Source: own elaboration based on State Statistics Service of Ukraine, 2022.

which industry was the leading type of economic activity (with the highest share in the Airborne Forces) decreased to 11, but in 2019 it increased to 12 you (Table 4).

Donetsk region is the most „industrial" – the share of the industrial sector of the economy in the GDP of this region is at the level of 50%. Poltava, Dnipropetrovsk, and Zaporizhia regions also belong to the „highly industrial" regions. In the Kyiv region, industry has become the leading FDI, as opposed to trade. Instead, industrial specialization was replaced by agricultural specialization in Zhytomyr, Zakarpattia, Luhansk and Chernihiv regions. Vinnytsia, Kirovohrad, Ternopil, Kherson, Khmelnytskyi and Chernivtsi regions are invariably "agrarian."

In general, it is possible to distinguish five types of economy of the regions of Ukraine:

– industrial – the largest share in the region's air traffic control over a certain period (at least 4 years) is invariably occupied by industry;

– agrarian – the largest share in the region's GDP over a certain period (at least 4 years) is stably occupied by agriculture;

– commercial – the largest share of the region's air traffic over a certain period (at least 3 years) is stably occupied by trade;

– diversified – in the structure of the regional air defense industry, the share of none of the foreign economic activities is dominant (or is <20%);

– variable – the dominance of one or another VED in the structure of the region's VED alternates periodically.

According to the proposed classification, according to the type of economy, the regions of Ukraine can be divided as follows:

– 1st type: Dnipropetrovsk, Donetsk, Zaporizhzhya, Ivano-Frankivsk, Kyiv, Lviv, Poltava, Rivne, Kharkiv regions;

– 2nd type: Vinnytsia, Zhytomyr, Kirovohrad, Ternopil, Kherson, Khmelnytskyi, Chernivtsi and Chernihiv regions;

– 3rd type: Volyn region;

– 4th type: Zakarpattia and Odesa regions;

– 5th type: Luhansk, Mykolaiv, Sumy and Cherkasy regions.

It is worth paying attention to the last of the given list of oblasts (Odesa), in the structure of the VDA in 2019, with a share of 18% (compared to 16.8% in 2014), such foreign industries as transport, warehousing, postal and chicken dominated business activity (further: transport). During 2015-2019, the share of this FDI also increased (in contrast to the rest of the regions, where it decreased) in the economy of Vinnytsia, Zakarpattia and Ternopil regions.

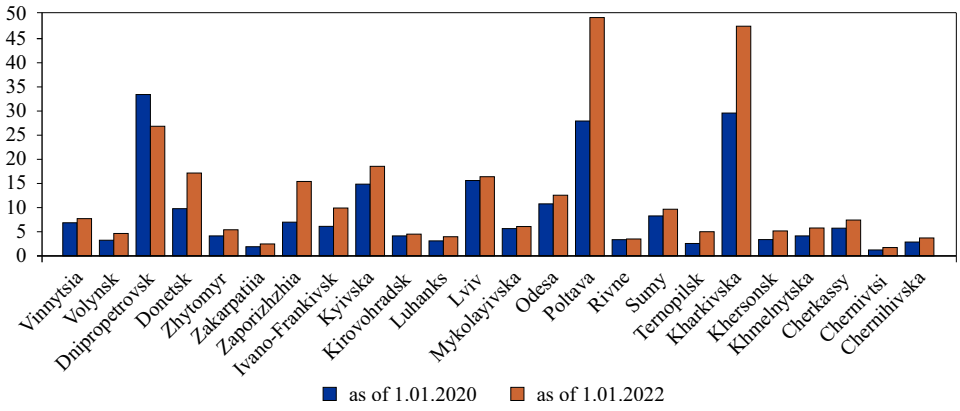
During the analyzed period, Kharkiv region increased its industrial potential most intensively – in 2018, industry accounted for 33.1% of the FDI output of this region (compared to 21.3% in 2012). Accordingly, the Kharkiv region has the largest number of innovatively active enterprises among the regions – more than

23% of their total number in the region, and, in particular, technologically innovative enterprises – more than 18%. The current level of product innovation in the Kharkiv region is also significantly higher than in Ukraine. In 2019, the share of innovative products in the volume of products sold (goods, services) by industrial enterprises of this region exceeded the average Ukrainian indicator by 2.3 times or by 1.7 p.p., and the share of products new to the market in the volume of sold innovative products – 2.3 times or by 27 p.p. Similar was the advantage of the Kharkiv region in terms of indicators in the processing industry – a type of industrial activity that accumulates the highest potential for innovation.

The economic leader among the regions of Ukraine – the industrial Dnipropetrovsk region – demonstrates the highest indicators of the financial result before taxation (68,227.2 billion UAH in 2019) in general and, in particular, in industry (31,707.8 billion UAH) and trade (19,275.5 billion UAH). At the same time, the industrial Poltava region achieved the largest financial result among the regions in rural areas (5,440.7 billion hryvnias).

Odesa region, in the structure of the Air Force, which is dominated by transport, demonstrated the highest value of the financial result before taxation of this FDI (9443.2 billion hryvnias), ahead of Dnipropetrovsk region by 2.87 times according to this indicator. Odesa region also leads in terms of profitability of information and telecommunications (1461 billion hryvnias). Donetsk (701.6 billion hryvnias), Kharkivsk (469.8 billion hryvnias), Lviv (404 billion hryvnias) and Dnipropetrovsk (374.9 billion hryvnias) achieved comparatively high financial results of the operation of this promising foreign trade) region. It is worth emphasizing that these regions are among the largest payers of taxes and fees to the State Budget of Ukraine (Chart 1). Also, the contribution to the State Budget of Odesa

Chart 1. Proceeds to the State Budget of Ukraine (taxes and fees) by region (UAH billion)



Source: own elaboration based on Derzhavna fiskalna sluzhba Ukrainy, 2022.

Oblast, whose economy belongs to a diversified type, is relatively significant. Among the agricultural regions, Vinnytsia region provided the most revenues to the state budget in the analyzed period (2019-2021).

In 2021, compared to 2019, the amount of taxes and fees to the State Budget increased in all regions except Dnipropetrovsk region, and the most: Zaporizhzhya (by 1.9 times), Ternopil (by 1.78 times), Poltava (by 1.77 times), Donetsk (1.76 times), Ivano-Frankivsk (1.63 times), Kharkiv (1.6 times) and Kherson (1.55 times) regions. On the other hand, receipts from the Dnipropetrovsk region (the leader in this indicator in 2019) decreased by 19.34%.

In industrial regions, a high level of average wages is maintained, which is provided primarily by such types of industrial activity as the extractive industry and the development of quarries and supplies electricity, gas, steam and air conditioning. The highest indicator of the average salary (higher than the average in Ukraine both in 2014 and in 2019) is invariably characteristic of the Dnipropetrovsk, Donetsk and Kyiv regions. A relatively high value of this indicator (over UAH 9.0 thousand) in 2019 was also achieved in the rest of the industrial regions, as well as in the Vinnytsia, Zakarpattia, Mykolaiv and Odesa regions. In Ukraine, the highest salary is traditionally in financial and insurance activities – in 2019, it exceeded the average indicator by 1.82 times (against 2.03 times in 2014). However, the share of this FDI in the structure of VDV is insignificant, and during 2015-2018 it decreased from 5.1% to 3.2%. On the other hand, the share of information and telecommunications (the second VED in terms of wages) for the specified period reached 4.6%. The highest level of wages in this VED in 2019 was observed in Kharkiv (16,680 thousand UAH), Donetsk (15,135 thousand UAH), Vinnytsia (12,111 thousand UAH), Odesa (10,788 thousand UAH), Lviv (10,622 thousand UAH) and Kyiv (10,455 thousand UAH) regions.

The tendency to increase the role of information and telecommunications in the national economy is very positive, especially in the conditions of the global spread of digital technologies and the transition to Industry 4.0. The share of this FDI in the structure of the Air Force during the analyzed period increased in all regions (except Dnipropetrovsk and Odesa), and the most – in Kharkiv (by 3.2 p.p.) and Lviv (by 1.9 p.p.).

4. Conclusions

The results of the conducted meso-level assessments give reasons to state that the most productive (from a financial and social point of view) there is the economy of powerful industrial regions (primarily Dnipropetrovsk, Donetsk, Kyiv, Lviv, Poltava, and Kharkiv regions), as well as the economies of regions that belong to variable (in particular, Mykolaiv and Sumy regions) and diversified (Odesa

and Zakarpattia regions) types. Among the agricultural regions with in 2015, the economy of the Vinnytsia region operated most efficiently. It is also worth emphasizing the growth of innovation potential in such a traditionally industrial (with a clear tendency to strengthen the aforementioned specialization) region as the Kharkiv region.

Unfortunately, the delayed (by two years) publication of official statistical information, in particular regarding the GRP indicator, as well as GVA in terms of FDI, does not allow for operational analytical reviews and building objective forecasts of the socio-economic development of Ukraine at the regional level. Under these conditions, the prospects for further author's scientific research are seen in the plane of deepening comprehensive assessments of the state, key trends, relationships and results of the functioning of the national economy, in particular under the influence of global instability, with further extrapolation of the obtained results to the meso-level.

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Współczesne problemy w zakresie specjalizacji gospodarczej regionów Ukrainy

Streszczenie. *W artykule badaniu poddano wpływ zewnętrznych czynników na wskaźniki społeczno-ekonomicznego rozwoju Ukrainy. Przeanalizowano dynamikę indeksu PKB Ukrainy w latach 2012-2020 w przekroju regionalnym. Stworzono ranking ukraińskich regionów na podstawie ich wkładu w PKB. Autorka zaproponowała własną typologię regionów według poziomu ich specjalizacji gospodarczej na podstawie udziału kluczowych rodzajów działalności gospodarczej w wartości dodanej brutto. Określono wkład (sumę podatków i opłat) każdego z regionów do budżetu Ukrainy.*

Słowa kluczowe: *wartość dodana brutto, produkt regionalny brutto, specjalizacja gospodarcza, regiony przemysłowe, produkty innowacyjne*

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The global experience of state support for industrial production in the context of the transition to industry 4.0 and digitalization

Abstract. *The article provides an overview of government initiatives around the world aimed at encouraging the modernisation of industrial production. Government policies in this regard have been pursued in many countries with an emphasis on digital technology, innovation, and collaboration between government, business and science. The article presents various measures of state support for industrial production in the context of the transition to industry 4.0 and digitalization, including public-private partnerships. Today, the Ukrainian industry is in crisis. The manufacturing sector needs to manage its digital transformation, show greater concern for the environment and improve energy efficiency in order to compete in the domestic and foreign markets with new, more efficient players. What is required to accelerate the shift towards Industry 4.0 and the process of digitalisation are effective tools and government support as well as the platforms of understanding between representatives of government, business, science, educational institutions and other stakeholders.*

Keywords: *modernization of enterprises, industrial production, digitalization, enterprise development, public support*

1. Formulation of the problem

The rapid development of information and communication and digital technologies requires deepening the intellectualization of industrial enterprises, the transition to Industry 4.0 and digitalization. Enterprises can work more resource- and energy-efficiently, quickly, environmentally and on a large scale with the help of digital technologies.

Despite the positive aspects of the development of "smart" plants and the smart industry, there are some risks. There is rising unemployment, the likelihood of losing jobs in certain industries and sectors and the revival of cybercrime. Therefore, the role of the state is the most important, especially in institutional and legal support, as well as in informing the public about existing risks, advisory support to entrepreneurs, technological support in the implementation and use of reliable information and communication systems, infrastructure and platforms.

In Ukraine a system of stimulating industrial enterprises to deepen intellectualization at the state level together with business initiatives in building modern ecosystems – innovation park Unit.city (Unit.city, 2022), LvivTech.City (LvivTech.City, 2022), etc., that creates space for the development and implementation of technology and entrepreneurship – is being formed. To date, such state projects as "Ukrainian Foundation of Startups" (Ukrainian Foundation of Startups, 2022), national "Diia. Business" (Online platform "Diia. Business," 2022), that were created to stimulate and develop entrepreneurship have been launched.

Developed economies of the world show high rates of digital transformation, which can not be ignored in the economic policy development in Ukraine. Thus, it is known that the introduction of digital technologies creates the basis for the development of modern intellectualized industries in the world. According to the World Economic Forum (WEF) (Ikayev, 2021), China is taking the lead in Industry 4.0, with China accounting for a third of all advanced enterprises built worldwide. According to a new report published by the WEF in cooperation with McKinsey, there are 69 smart companies in the world, China owns 20 of them; EU – 19, US – 7, Japan – 5. Among the new Chinese plants that have automated and modernized most of their production are: Bosch Automotive Components Plant, Foxconn Technology Group Campus, Tsingtao Brewery, Midea Shunde Electronics Developers and Wistron InfoComm Manufacturing.

Ukraine is interested in the development of modern industry. This is confirmed by many documents, in particular in the Decree of the President of Ukraine "On Sustainable Development Goals until 2030" 17 goals were proclaimed (Decree of the President of Ukraine 22722/2019; Ministry of Economic Development and Trade of Ukraine, 2017), among them the following four are identified for the development of industry based on new economic concepts: promoting sustain-

able, inclusive and sustainable economic growth, full and productive employment and decent work for all; creating sustainable infrastructure, promoting inclusive and sustainable industrialization and innovation; ensuring the transition to rational models of consumption and production; strengthening the means to implement and intensify work in the framework of the global partnership for sustainable development. Therefore, support and encouragement of the intellectualization the industrial production in Ukraine by the state on the basis of foreign mechanisms of state support, which have proven their effectiveness, is an urgent issue. To date, systemic state support for industrial enterprises, stimulating their intellectualization, in particular in the direction of Industry 4.0 has just being formed.

International experience shows that the state can significantly accelerate the process of deepening the intellectualization of industrial enterprises in the direction of Industry 4.0 and digitalization, it requires a detailed study of world experience and finding appropriate mechanisms and effective tools to promote digital transformation.

Purpose of the study is comparison of international experience and identification of acceptable mechanisms of state support for industrial production and transition industrialization to Industry 4.0 and digitalization.

2. Literature review. Setting objectives

Scientists from foreign countries are actively researching the digital transformation processes of industry. Dani Rodrick speaks of the positive importance of sound industrial policy, when the government selects certain industries and subsidizes them through a number of instruments (loans, subsidies, tax breaks, etc.). On the other hand, it emphasizes the importance of industrial policy as a process in which the state and the private sector work together in partnership to find the right solutions for industrial development (Rodrik, 2006). The principles of industrial policy development are highlighted in his work (Rodrik, 2004).

The importance of effective relations between industry and science with the participation of the state emphasizes John W. Fairclough (1991). He rightly believed that "one of the most effective ways for governments to stimulate technological innovation is to create a favorable institutional climate. Regulation is designed to protect people, ensure effective competition and control the social consequences of production processes. [...] In an ideal world, governments will not try to choose technological or industrial winners. They will sponsor high-quality academic science and provide financial incentives for industry investment. The relationship between industry and academia, including public investment, needs to be encouraged and strengthened" (Fairclough (1991, p. 58).

Rainer Darth and Alexander Horch (2014) highlight the ideas of Industry 4.0, the basic requirements for the industry in modern conditions and the challenges facing businesses today.

The state policy projects of different countries over the world on the development of Industry 4.0 and the formation of partnerships between government, science and business in the industrial sector are covered by Yongxin Liao et al. (2017). Stimulating the development of industrial enterprises on the basis of state and local tax benefits in the United States are studied by Cailin Slattery and Owen Zidar (2020).

World Economic Forum investigates the development of modern production in the direction of Industry 4.0. In particular, it should be noted "Readiness for the Future of Production Report" (World Economic Forum & Kearney, 2018), that presents a methodology for assessing the readiness of countries for modern industry.

Specialists in the field of Industry 4.0 development in Europe, the Middle East and Africa, partners of the international consulting company Pricewaterhouse-Cooper (PwC) Reinhard Geissbauer, Jesper Vedsø, Stefan Schrauf substantiate the principles of innovative development of enterprises 4.0 in Industry in their study (Geissbauer, Vedsø & Schrauf, 2016).

Specialists in the fields of digitalization, personnel development and advanced technologies Stephen Laaper et al. (Deloitte, USA) in the study "Implementing the smart factory. New perspectives for driving value" identified the main challenges facing companies implementing the latest technologies (Laaper et al., 2020).

In Ukraine, a number of studies have been devoted to various aspects of the development and promotion of modern industry.

In a scientific report edited by Valery Geets (2015) assessed the state of the innovation sphere in Ukraine, identified the most pressing problems and barriers that hinder innovation and innovation activity of enterprises, substantiated strategic directions of innovative development of the state and developed proposals to stimulate it in conditions of further integration of Ukraine into the world economic and scientific-technological space.

Andrey Gritsenko (2018) identified the essence of the digital economy as a system of economic relations and identified the challenges of digital development facing society.

The Industrial Economics Institute of the National Science Academy of Ukraine has proved that readiness for Industry 4.0 is an important aspect of its secure future for Ukraine. It has been established that Ukraine has almost lost its industrial platform to develop innovative economy. It is proposed to legislate the ideology of industrial development at the state and regional levels through the development and adoption of the Law Ukraine "On Modernization of Industrial Regions" (Amosha et al., 2019).

In the article Oleksandr I. Amosha and Vira A. Nikiforova (2019) studied the world experience of metallurgical "smart"-productions development and found that the processes of digitalization have been rapidly implemented in the organizational and economic sphere, changing business model, the slowest – in production processes.

Current issues of "smart" industry development in the conditions of Industry 4.0 are covered in the collective monograph, ed. Valentyn P. Vyshnevsky (2018). It addresses a number of smart industry formation issues, in particular, developed a set of recommendations on fiscal and financial-credit mechanisms for the of smart industry development in Ukraine.

Features of modern information and communication technologies and their role in the development of digital economy are studied in a collective monograph edited by Valentyn P. Vyshnevsky and Sviatoslav I. Knyazev (2020). The monograph identifies the factors influencing digitalization processes on the results of economic activity, constructs the dependence functions of digital costs and real results and quantifies the transformational potential of digitalization of Ukraine's economy.

Trends in the digital economy were studied by Viacheslav I. Lyashenko and Oeksandr S. Vyshnevsky (2018). They proved that modern processes of digital economy transformation are associated with the development of business models that use digital platforms.

Yulia O. Mazur (2020) studied the state instruments for stimulating innovative technologies in the context of global digitalization, in particular tax incentives for their innovative activity. She believes that "it is important to stimulate digital transformations, as the lag in the development of digital technologies, especially in production and management, poses major problems for the country due to reduced quality of production and human capital, reduced economic competitiveness and declining economic well-being."

Natalia Ryvak and Anna Kernytska (2020) studied the national policies of countries related to the development of Industry 4.0 and believe that industrial transformation in Ukraine needs government support and cooperation between stakeholders involved in the implementation of Industry 4.0. According to them, it is necessary to create national and regional platforms, following the example of EU counries, that would unite government agencies, businesses and scientists.

Taras Vasyltsiv et al. (2020) note that it is necessary for state regulation of the digital economy. They believe that a number of projects should be implemented at the national level, that should be developed during the development of the digital economy: the creation of a hard and soft national infrastructure for the development of the digital economy; digitalization of social infrastructure facilities; development of e-government; creation of "smart" cities; modernization of customs on the basis of formation of electronic customs; transition to Industry 4.0;

full-scale digitalization; creation of high-tech clusters; stimulating inter-corporate electronic interaction and creating industry-leading digital platforms.

However, despite the positive changes in the development of Industry 4.0 and digitalization in Ukraine, the methods issues of stimulating industries and industrial enterprises to deepen intellectualization in Industry 4.0, improving the legal framework, new challenges and realities, forming stable development institutions remain unresolved. The Law "On State Industrial Policy" has not been adopted yet. Many domestic studies rightly state that the development of Ukraine's economy is slow and unstable. Digitalization of society and economy is accompanied by technical and technological, social, spiritual problems (Buleev, 2019, 2020; Buleev, Bryl & Bryukhovetskiy, 2021); difficulties of industrial development in the conditions of Industry 4.0. and digitalization, insufficient readiness of domestic industrial enterprises to implement modern digital production technologies (Bryukhovetskaya & Chorna, 2019; Bryukhovetskaya & Chernykh, 2020); development of intellectual capital enterprises in the context of the economy digitalization (Korytko & Bryl, 2021).

3. International experience of government initiatives to encourage the development of industrialization in the direction of Industry 4.0

Under the intellectualization of the enterprise in the study means the process of increasing the role, application and use of knowledge, innovative information in the operation of the enterprise and its use in its activities to achieve goals: advanced technologies (developed and/or acquired), including automation and robotization, digitization, artificial intelligence, Internet technologies; highly qualified and motivated staff (actually trained and/or involved from outside), intangible assets (created and/or acquired), etc. The tasks of enterprise intellectualization are permanent modernization in the direction of modern technologies, continuous training of personnel, increase of intellectual component of production, manufactured products, provided services (complexity, innovation, used know-how) to increase added value, profit and gain sustainable competitive advantages domestically and externally. markets (Bryukhovetskaya & Chorna, 2019). The solution of these problems is achieved by the implementation of public policy, public-private partnership (PPP) (Table 1).

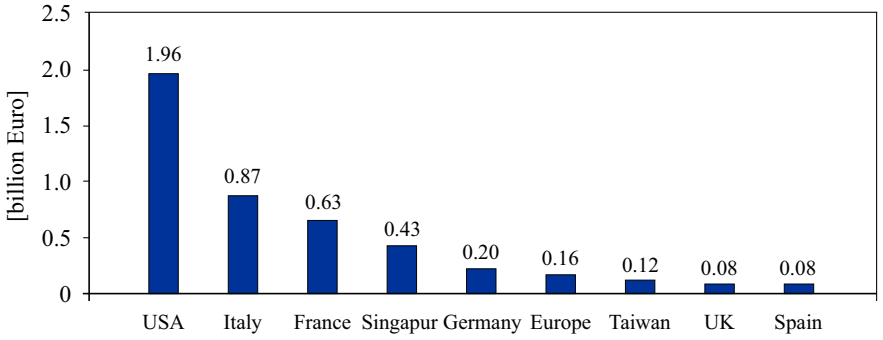
Public investment in Industry 4.0 is reported in Germany, Italy, Spain, the United Kingdom, France, Singapore, the United States, Taiwan and the EU (Liao et al., 2017, p. 9). Thus, about 500 million Euro a year are invested in the development of Industry 4.0 by Singapore, Germany, Europe, Taiwan, Great Britain and

Table 1. Official documents for the implementation of state policy in several countries over the world to deepen intellectualization in the direction of Industry 4.0 and the formation of partnerships between government, science and business in the industrial sector

Countries	Projects and decisions (name, initiator, year of launch)
Europe	– Germany – "Industrie 4.0." (National Academy of Sciences and Technology, 2013) – France – "La Nouvelle France Industrielle" (National Council of Industry, 2013), Alliance pour l'Industrie du Futur (2015) – Great Britain – "Future of Manufacturing" (State Administration of Science, 2013) – Sweden – Smart Industry (Ministry of Entrepreneurship and Innovation, 2016) – Spain – Industry 4.0 / Industria Conectada 4.0 (Ministry of Industry, Energy and Tourism, 2014) – Netherlands – Smart Industry (Government, 2014) – Italy – "National Industry Plan 4.0" / "Piano Nazionale Industria 4.0" (Ministry of Economic Development, 2016) – Austria – Industrie 4.0 Oesterreich (2015) – Belgium – Made different – Factories of the future – Czech Republic – Průmysl 4.0 (Ministry of Industry and Trade, 2016) – Denmark – Manufacturing Academy of Denmark (MADE, 2014) – Hungary – IPAR4.0 National Technology Initiative (2016 under the auspices of the Institute of Computer Science and Control (SZTAKI), Hungarian Academy of Sciences, with the participation of research institutions, companies, universities, with the full support of the Hungarian government, in particular). under the auspices of the Ministry of Innovation and Technology); – Lithuania – Pramonė 4.0 (Ministry of Economy and Innovation, 2017) – Luxembourg – Digital For Industry Luxembourg – Poland – Initiative and Platform Industry 4.0 (Ministry of Development and technology) – Portugal – Indústria 4.0 (Government of Portugal) – EU – "Factories of the future" (European Association for the Study of Future Factories, 2013)
North America	– USA – Advanced Manufacturing Partnership (Council of Presidential Advisers on Science and Technology, 2011, 2014) – Canada – Industrie 2030 / Industrie 2030 (Canadian Manufacturers and Exporters, 2016) – Mexico – "Crafting the Future" (Ministry of Economy, 2016)
Asia	– China – "Made in China 2025" (State Council of China, 2015) – South Korea – "Manufacturing Innovation 3.0" (Ministry of Trade, Industry and Energy, 2014) – Japan – "Super Smart Society" (Council for Scientific Technology and Innovation, 2015) – Singapore – "Plan, Research, Innovation and Entrepreneurship until 2020" / "Research, Innovation and Enterprise 2020 Plan" (National Research Fund, 2016) – Taiwan, Province of China – Taiwan Productivity 4.0 Initiative (Yuan Executive, 2015) – India – "Made in India" (Department of Industrial Policy and Development, 2014) – Malaysia – Eleventh Malaysia Plan (Economic Planning Division, 2015)

Source: own elaboration according to Liao et al., 2017; European Commission, 2019.

Chart 1. Annual investment in Industry 4.0 initiatives (billion Euro)



Source: Liao et al., 2017, p. 9.

Spain, 870 – by Italy, 630 million Euro a year is invested by France. The United States is the only country to invest about 2 billion Euro a year (Chart 1).

Content analysis of programs and projects of world state policy to deepen industry intellectualization in the direction of Industry 4.0 revealed some common goals and objectives (Fig. 1).

Thus, government policy to deepen intellectualization towards Industry 4.0 is on the agenda in many countries over the world that have already focused on digital technologies and innovations.

4. Mechanisms of public-private partnership in stimulating intellectualization in the conditions of Industry 4.0 in the countries over the world

Today, the EU is stimulating the digitalization of European industry, paying particular attention to traditional sectors. In April 2016, the first EU sectoral initiative "Digitalization of European Industry" (DEI) was launched under the "Digital Single Market" package. The aim of this initiative is to provide businesses of all sizes and sectors in Europe with the opportunity to take full advantage of digital innovation. Up to € 50 billion in public and private investment has been provided to support the industry digitalisation.

In addition to the comprehensive initiative, EU Member States are adopting concept papers at national and regional levels to support the digitization of traditional industries. For example, the Digital Agenda of the Federal Government of Germany is complemented by the Digital Strategy of the Federal Ministry of Economics and Energy until 2025 (EU4Digital, 2020).

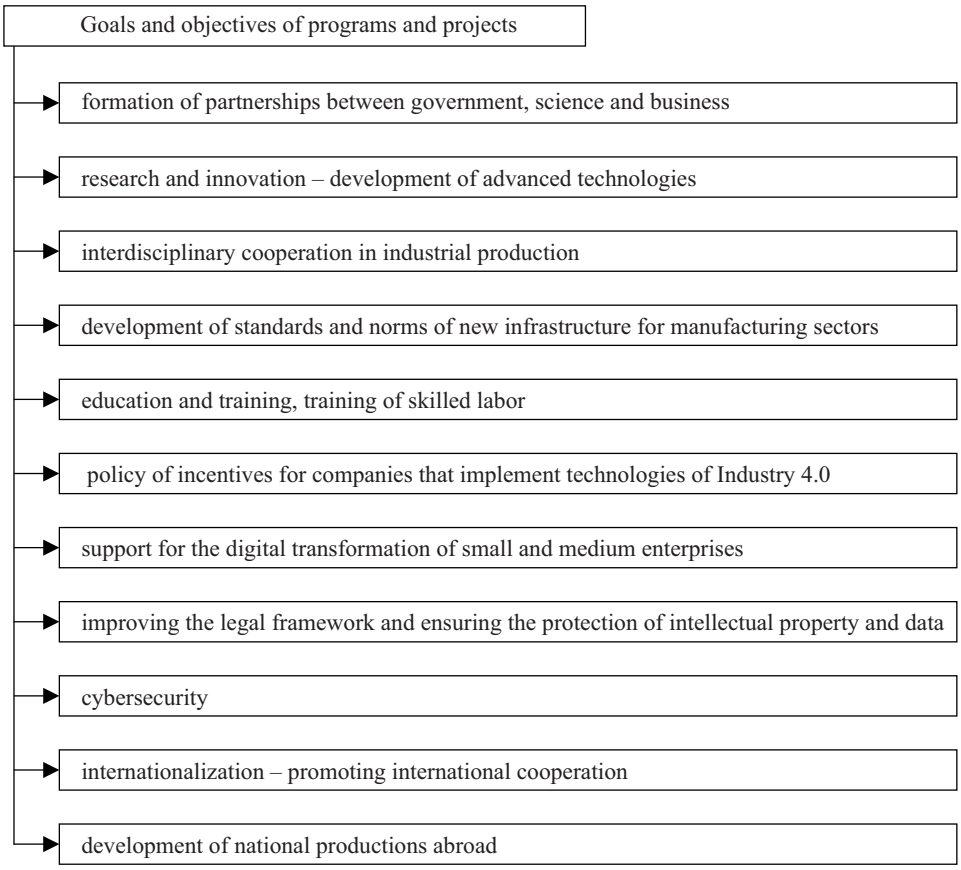


Figure 1. Goals and objectives of programs and projects of world state policy to deepen industry intellectualization in the direction of Industry 4.0

Source: own elaboration.

The components of the EU initiative "Digitalization of European Industry" (DEI) are (European Union, 2017):

1. European Platform for National Industrial Digitization Initiatives. This EU Coordination Forum brings together all Member States to ensure coherence and collective governance. The purpose is to create a critical mass of initiatives and investments to digitize industry and to ensure the commitment of Member States, regions and the private sector to the DEI.

2. Centers of digital innovation. Digital Innovation Centers (DIHs) are universal organizations where companies, especially small and medium-sized enterprises (SMEs), startups and mid-cap companies, can help improve their business, production processes, products and services through digital technologies.

3. Strengthening leadership through partnerships and industrial platforms. To strengthen the EU's competitiveness in digital technologies, the DEI initiative supports both the development of digital industrial platforms and public-private partnerships (PPPs).

4. Regulatory framework corresponding to the digital age. As part of the Digital Single Market Strategy, the European Commission has proposed several measures to update regulations in key areas such as cybersecurity and free data flow.

5. Preparing Europeans for a digital future. Adaptation of the workforce and education systems, investment in retraining of citizens for the effectiveness of digital transformations.

Partnerships, joint efforts of business and government, human capital development, cybersecurity are also addressed in the recommendations of the World Economic Forum (WEF) and McKinsey & Company on the large-scale implementation of Industry 4.0 technologies. In particular, in the context of intellectualization, it is recommended (World Economic Forum, McKinsey & Company, 2019, p. 29):

1. In order to disseminate technologies and related benefits, partnerships should be established between commercial companies and government agencies to improve skills, train employees and prepare them for change. Private and public organizations need to prepare workers for these changes, modernize the education system and invest in vocational training and lifelong learning and to create a mobile workforce capable of taking advantage of new opportunities.

2. Private and public organizations must bring their cybersecurity infrastructure up to the highest standards. Companies should participate in joint initiatives to study and further develop cybersecurity – not only to ensure their economic future, but also to protect employees, customers and the public.

3. The spread of technology is facilitated by tripartite business cooperation with government and research organizations.

4. Necessary cooperation with advanced enterprises ("beacons," leaders) to share experiences and best practices. State and scientific organizations are asked to determine the country's industrial enterprises that develop into "beacons" in 1-2 years, calculate the required amount of support and monitor the results.

In the Future Preparedness Report prepared by the World Economic Forum in collaboration with A.T. Kearney (World Economic Forum & Kearney, 2018, p. 27), on the development and deepening of intellectualization in Industry 4.0 speaks about the importance of investment, supports state participation in industrial development and dialogue between stakeholders and supports the feasibility of public-private partnership, such as:

1. Achieving countries' investment attractiveness in various areas for investment. A strong domestic financial system, together with foreign direct investment, enables the country to adequately finance investments for the modernization and

connection of technology platforms, training of workers, introduction of technologies and transformation of production systems.

2. Availability of a developed infrastructure to support standards in global value chains. It is extremely important for countries to identify opportunities, sectors of the economy in order to participate in the production of national industries in global value chains. If countries do not quickly develop the capabilities of digital technologies and communications, develop industries, they may rapidly lose their market position.

3. Coexistence of opposing views on industrial policy and industrial strategy – some countries believe that it should be guided by government, others give preference to leading industries or companies. However, the experience in a number of countries shows that governments can play an important role in the new technologies transition, promote dialogue between industry, science and other stakeholders through initiatives such as Plattform Industrie 4.0.

4. Successful transformation requires the contribution of all stakeholders and the development of public-private partnerships to solve problems that cannot be solved at the level of government or business alone.

5. The scale of production is not a prerequisite for readiness for future production. More important is the ability to collect, combine and use human capital and technology to create a range of unique products.

Thus, in the above recommendations of the World Economic Forum and A.T. Kearney, an important role is given to capital investment, the stimulating role of the state in the introduction of new technologies, the need to identify priority areas, public-private partnership and the formation of cooperation between government, business, science and civil society. Leaders are usually business entities that invest at least 20% of their income and have outside investors.

Based on the above, for Ukraine the key participants in the modernization of industry, in the direction of Industry 4.0 on the basis of their intellectualization, should identify such:

– state (government, legislature, local and regional government),
– business (entrepreneurs, managers, top management),
– scientific (primarily the National Academy of Sciences of Ukraine) and educational organizations,
– other interested organizations and participants (media, ICT specialists, consulting companies, financial sector, information support centers, innovation parks, business incubators, etc.).

An important role in the process of deepening the intellectualization of industrial enterprises in Ukraine should be played by the state, that has the resources to develop infrastructure, cooperate and stimulate priority enterprises, ensure stability and efficiency of institutions, create development centers, digital platforms, etc.

5. Plans of the Government of Ukraine to develop the economy and deepen the intellectualization of production

In Ukraine, it is advisable to form an institutional basis for digital transformation of industry on the basis of national platforms with the involvement of representatives of government, business, scientific and educational organizations and other stakeholders.

A successful example of PPP implementation in Ukraine is the Center for Economic Recovery, where the Council for Economic Development of Ukraine under the Cabinet of Ministers of Ukraine in 2020 brought together more than 90 developers to conduct research and develop strategic documents for the country's development: think tanks, independent experts, business associations, business representatives. This confirms the importance of cooperation between business, science and government for constructive decisions.

On the basis of the Center for Economic Recovery, the country's economic development programs are already being actively developed. In particular, documents on overcoming the consequences of the crisis in Ukraine caused by the coronavirus pandemic (Cabinet of Ministers of Ukraine, 2020; Ukrainian Association of Light Industry Enterprises, 2020; Resolution of the Cabinet of Ministers of Ukraine No. 534 of May 27, 2020). Currently, the support of domestic producers and the development of the domestic market are determined by development priorities. Methods of support for domestic producers include: assistance in promoting exports; available loans, grant programs; expanding the participation of small and medium-sized businesses in public procurement.

In September 2020, the Government officially launched the National Economic Strategy 2030, and the Center for Economic Recovery (Ministry of Economy, 2020) became the coordinator and platform for its development. On March 3, 2021, the Cabinet of Ministers of Ukraine approved the National Economic Strategy for the period up to 2030 (Resolution of the Cabinet of Ministers of Ukraine No. 179 of March 3, 2021).

The new guidelines for economic development are not aimed at catching up with the development of developed countries, but at being a few steps ahead. The Strategy for Economic Development until 2030 is positioned as a leading document, a roadmap for all branches of government in Ukraine, the "Economic Constitution" of Ukraine, a great "national idea" that each new government will adhere to without changing the economic path (Cabinet of Ministers of Ukraine, 2021a). It is true that the stability of strategic directions and targets is really important for sustainable development.

The loss of the country's potential is estimated at 1 trillion. USD USA GDP for 10 years (Cabinet of Ministers of Ukraine, 2021a). Therefore, the goal of the

Economic Development Strategy until 2030 is to realize the potential of the economy in such areas:

– land – unused land potential is estimated at 85 billion USD,

– subsoil – untapped potential is estimated at 409 billion USD. It is planned to increase the extraction of minerals (oil, gas, ores, precious metals), and direct it not to exports but to the production of high value-added products,

– water resources – untapped potential is estimated at 12 billion USD. For example, hydropower is only half used; fishery development – by a quarter; land irrigation – by 20%,

– trade potential – untapped opportunities are estimated at 407 billion USD. Support for exports and trade diplomacy is envisaged,

– technological heritage and potential: 1) space production, 2) mechanical engineering, 3) aircraft construction, 4) electronics. It is envisaged to support these industries and encourage the creation of high added value,

– investment opportunities of Ukraine – untapped potential is estimated at 63 billion USD. It is necessary to support Ukraine's attractiveness to global investors.

The government named digitalization, artificial intelligence, cloud technologies and robotics as the main trends of the next decade, drivers of Ukraine's economic development. And the main goals of digitalization of the economy are named (Cabinet of Ministers of Ukraine, 2021b, p. 309):

1. Acceleration of economic activity.

2. Transformation of resource sectors of the economy into highly productive, intelligent and competitive.

3. Transformation of life spheres into efficient, modern and comfortable.

4. Creating new opportunities for the realization of human capital, development of innovative, creative and "digital" industries and businesses.

All this requires serious institutional transformations and stable industrial development. The main strategic goals of industrial development are defined by the government (Cabinet of Ministers of Ukraine, 2021b, p. 160):

1. Creating a stable domestic demand for domestic industrial products.

2. Ensuring the integration of the Ukrainian industrial sector into global value chains, creating conditions for expanding exports of industrial products.

3. Strengthening the competitiveness of industrial products produced in Ukraine, the introduction of resource- and energy-efficient technologies.

4. Creation of new production capacities through stimulation of innovative activity of the enterprises in all regions of the country with use of competitive advantages of each of them.

Thus, the National Economic Strategy for the period up to 2030 is an important tool for economic development and including industry. It represents the main vectors for Ukraine's development, such as incentives for industry, for the agri-

cultural sector, for mining and transport corridors, incentives for IT and R&D, for infrastructure and domestic transport and for the energy sector.

The main trends of the next decade in Ukraine, the government called digitalization, artificial intelligence, cloud technology and robotics. Currently, a number of projects on the development of the digital economy have been launched in Ukraine, such as "Digital State" (platforms "Diia," "Diia. Business," "Diia. City"). For example, "Diia. Business" (Online platform "Diia. Business," 2022) was created to stimulate and develop entrepreneurship. This platform has the conditions for the development of your own business: from the idea and start of a new business, offers training programs, financial support and professional advice.

The Ministry of Digital Transformation of Ukraine plans to introduce over the next 25 years within the legal regime "Diia. City" such conditions for the development of the digital industry (Ministry of Digital Transformation of Ukraine, 2021): to conduct technology and innovation business, attract investment, develop digital infrastructure, attract talented workers from around the world, stimulate the creation of domestic innovative products (startups and food companies), the formation of the knowledge economy in Ukraine. On July 15, 2021, this project adopted the Law of Ukraine "On Stimulating the Digital Economy in Ukraine": "This Law defines the organizational, legal and financial framework for the operation of the legal regime Action City, conditions for conducting innovative business, building digital infrastructure, attracting investment, as well as talented professionals." The implementation of these projects is definitely a stimulus and a basis for the development of modern smart industry.

Despite the positive changes in the vectors of economic development of Ukraine and the gradual development of the digital economy ("Digital State"), there are still questions of stimulating industry in order to develop and deepen intellectualization in Industry 4.0, improving the legal framework in new challenges and realities as an important driver of stable long-term transformation and the formation of sustainable institutions in society. It should be noted that the National Economic Strategy for the period up to 2030 was developed with the involvement of business representatives, scientists with a focus on development vectors in the long run. This is what industrial policy in Ukraine needs. Currently, the draft Law of Ukraine "On State Industrial Policy" (Ministry of Strategic Industries of Ukraine, 2021), developed by the Ministry of Strategic Industries (Minstrategprom) in 2021 has being thoroughly finalized.

6. Conclusions

The development of industrial enterprises in the context of technological progress, in particular in the direction of Industry 4.0 on the basis of their intellectual-

ization – is a complex multi-level process involving enterprises, government and other stakeholders. The state forms the institutional environment in the country and maintains its stability based on national interests. The mechanisms of this are targeted programs to support and encourage enterprises to intellectualize, industrial policy, cooperation between government, business, science and education, public-private partnership.

The countries over the world are trying to solve the acute issues that arise in the development of industrial production in the direction of the transition to Industry 4.0 and digitalization through the implementation of public policy projects and programs. The main priorities of such programs are: forming partnerships between government, science and business; research and innovation – development of advanced technologies; interdisciplinary cooperation in industrial production; development of standards and norms of new infrastructure for manufacturing sectors; education and training, training of skilled labor; incentive policy for enterprises implementing Industry 4.0 technologies; support for the digital transformation of small and medium enterprises; improving the legal framework and ensuring the protection of intellectual property and data; cybersecurity; internationalization – promoting international cooperation; development of national productions abroad.

The EU is implementing the Digital Industry Initiative (DEI), which consists of the European Platform for National Industrial Digitization Initiatives; Digital Innovation Centers; leadership is expected to be strengthened through partnerships and industrial platforms; development of the regulatory framework for the requirements of the digital age; preparing Europeans for the digital future.

The conclusions of scientists, recommendations of influential consulting and research networks (World Economic Forum, McKinsey & Company, the experience of the European Union) indicate an important role in the development of modern public-private partnership industry, cooperation between government, business, science, civil society.

State intervention in the industry development in Ukraine in the transition to Industry 4.0 and digitalization is appropriate. This should be implemented in the form of industrial policy and stimulating the introduction of new technologies, establishing cooperation in public-private partnerships. The most important is also to maintain the stability of the institutional environment.

A successful example of public-private partnership in Ukraine is the Center for Economic Recovery, that brings together think tanks, independent experts and business to conduct research and develop strategic documents for the country's development. Support of domestic producers, domestic market, competitiveness of industrial products produced in Ukraine are strategic goals of industrial development. Supporting export promotion is effective tools and mechanisms; available loans, grant programs; expanding the participation of small and medium-sized businesses in public procurement.

To support the state and combine the interests of key participants in the process of production intellectualization in the transition to Industry 4.0 and digitalization, It is advisable to create appropriate national platforms at the state level involving government, business, research and educational organizations and other industry stakeholders.

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Globalne doświadczenia wsparcia państwowego dla produkcji przemysłowej w warunkach przejścia do przemysłu 4.0 i cyfryzacji

Streszczenie. *Artykuł stanowi przegląd inicjatyw rządowych na całym świecie mających na celu wspieranie inteligentnej produkcji przemysłowej. Rządy wielu krajów prowadzą działania w tym zakresie, które koncentrują się na rozwoju technologii cyfrowej, innowacjach, współpracy między rządem, biznesem i nauką. W artykule przedstawiono środki wsparcia państwa w intelektualizacji produkcji w warunkach przejścia do przemysłu 4.0 i cyfryzacji, w tym partnerstwo publiczno-prywatne. Dziś przemysł na Ukrainie przeżywa kryzys. W sektorze produkcji przemysłowej potrzeba zarządzania transformacją cyfrową, większej troski o środowisko i zwiększenia efektywności energetycznej, aby móc konkurować na rynku krajowym i zagranicznym z nowymi, bardziej skutecznymi*

podmiotami. Aby przyspieszyć przejście w kierunku przemysłu 4.0 i proces cyfryzacji, potrzeba skutecznych narzędzi i wsparcia rządu, a także platform porozumienia między przedstawicielami rządu, biznesu, nauki, instytucji edukacyjnych i innych zainteresowanych stron.

Słowa kluczowe: *modernizacja przedsiębiorstw, produkcja przemysłowa, cyfryzacja, rozwój przedsiębiorczości, wsparcie publiczne*

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Problems of the development of the Ukrainian automobile manufacturing

Abstract. *The article identifies key trends in the development of the automotive industry in Ukraine during the period of 1991-2021. The author demonstrates the effectiveness of tools of state protectionism in supporting the Ukrainian automobile industries and compares the share of imports in the total consumption of machine-building products in Ukraine and Poland. The causes of destructive transformations in Ukrainian mechanical engineering are identified and directions for their elimination are outlined.*

Keywords: *sectors of mechanical engineering, automotive industry, production, stimulation, development*

1. Introduction

In terms of contribution to the economy, Ukrainian engineering lags behind most EU countries, and in absolute terms, the volume of GDP generated in this segment is comparable to its counterpart in such a small country as Slovenia. Nevertheless, mechanical engineering was and remains a basic segment of the economy of Ukraine and its industrial sector in particular, as it has sufficient production and resource potential and human capital for effective functioning and provision of the economy's needs with the necessary assortment of mechanical engineering products. Ukrainian machine-building enterprises have considerable experience in the production of airplanes, wagons, buses, sea vessels, cars and trucks, tractors, agricultural equipment and machinery, household appliances, rocket-space and defense-industrial products.

2. Analysis of research and publications

The prospects of Ukrainian machine-building under the influence of economic globalization, especially after the signing of the Free Trade Agreement with the EU, were studied in detail by a team of scientists led by Academician of the National Academy of Sciences of Ukraine V.M. Geets (Geyets & Ostashko, 2016). In particular, highlights the advantages caused by the possibility of using the scientific and technical achievements of European countries for the modernization of domestic production processes, as well as the risks associated primarily with the increase in the import of products of final and intermediate consumption of machine-building industries into Ukraine. Other, internal problems of the Ukrainian engineering industry, which are dominated by high depreciation of fixed assets, insufficient working capital, low innovativeness and, as a result, low competitiveness of Ukrainian engineering products on the domestic and foreign markets, financial, economic and political instability, dependence on the import of components are highlighted in reference literature (Ishchuk, 2021; Amosha & Bulyeyev, 2017; Smerichevsky et al., 2017; Sokolova & Stoyka, 2019; Hurochkina & Menchynska, 2020).

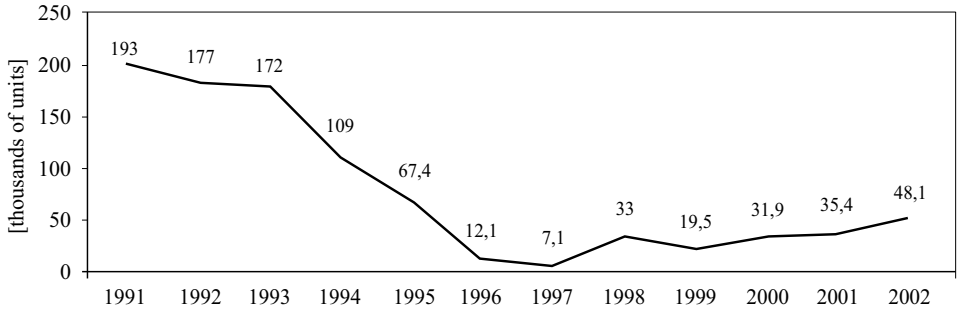
Similar problems of the development of the automobile industry, as one of the basic segments of mechanical engineering, are also characteristic of the countries of Eastern Europe. Thus, it was noted that the main problem of the competitiveness of the automotive industry in the Czech Republic, Slovakia, Poland and Hungary is the shortage of qualified and relatively cheap labor force (Hlušková, 2019). In addition, high export orientation with the growth of protectionist policies and trade tensions pose a serious threat to the functioning of this industrial sector. A detailed assessment of trends and prospects, as well as internal and external factors of the functioning of mechanical engineering in the transport sector of Poland is presented in book of Miłosz Łuczak and Łukasz Małys (2016).

The purpose of the article is to diagnose the problems of the development of the automobile industry in Ukraine.

3. Results of the research

On early 90s 20th century mechanical engineering accounted for a third industrial products of Ukraine, and significant part machine building products almost fully was provided domestic manufacturers. However, during 1991-1998, the share of mechanical engineering in industrial production in Ukraine decreased by 23.6 p.p.: from 38.7% to 15.1%. Subjectively, these negative changes are illustrated by the statistical data of the automobile industry as one of the key sectors of engineering. In particular, according to the data of the DSSU, the production of

Chart 1. Production of cars in Ukraine in 1991-2002



Source: own elaboration according to State Statistics Service of Ukraine, 2022.

cars during the specified period decreased by almost half: from 193 thousand units to in 1991 – up to 7.1 thousand units in 1997 (Chart 1).

Starting from 1998, a certain recovery of positive trends in the mechanical engineering sector began in Ukraine. To a large extent, the recovery of the positive trend was facilitated by the active measures of the state protectionist policy stimulating the development of the automobile industry. For example, in 1995, by a Resolution of the Verkhovna Rada of Ukraine, turnover from the sale of cars and passenger cars of domestic production was exempted from payment of excise duty and value added tax, and since April 1998, a ban was introduced on the import of cars older than 5 years, as well as on a car worth less than USD 5,000. USA (Laboratoriya zakonodavchykh perspektyv, 2003).

During 1997-2008, the Law of Ukraine "On Stimulating the Production of Automobiles in Ukraine" dated September 19, 1997 was in force, according to which until January 1, 2008, components for the construction and production activities of enterprises were exempted from import duty, VAT, and income tax on the production of cars and spare parts for them. Automobile enterprises were exempted from fees to the State Innovation Fund of Ukraine. The law provided that "resident manufacturers must register an investment program with the Cabinet of Ministers of Ukraine (hereinafter referred to as the CMU), which provides for the step-by-step verification of the degree of localization of the production of the component parts of such a car, at least 70% of its estimated cost at the end of the tenth year from the start of the investment program implementation." The localization of production was understood to mean "the introduction of the production of individual car components in the customs territory of Ukraine using the labor of Ukrainian citizens, who must make up at least 90% of the average number of employees in such production."

In 2001, the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding State Support of the Automotive Industry of Ukraine"

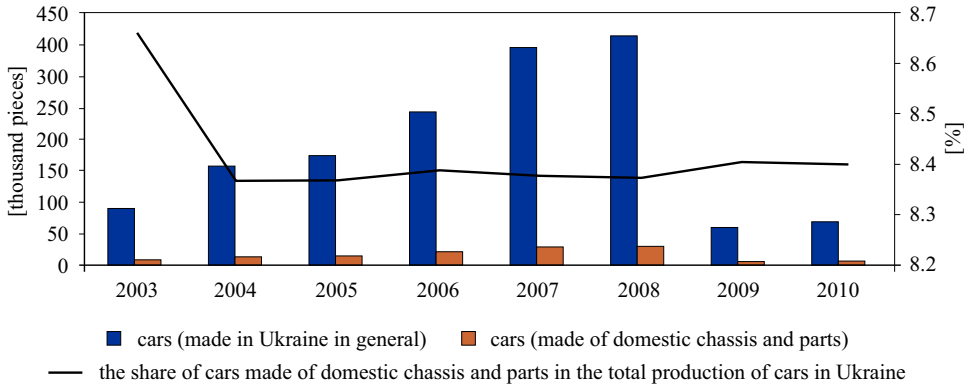
was adopted (2014). This law extended preferential taxation to the production of trucks and buses (minimum investment amount – 30 million USD), production of components for cars and buses (minimum investment amount – 10 million USD); established the need to register an investment program with the CMU in order to receive the relevant preferences; established higher customs tariffs for the import of cars that were in use (the import duty for cars up to five years old increased by two times, more than five years – by three times). In addition, the ban on the import of used cars was extended to only those older than 8 years, and the minimum value of an imported car was abolished. Taken together, these measures made it possible to effectively protect the domestic market from the mass importation of old cars.

At the same time, it should be emphasized that the steps to stimulate and restore the domestic automobile industry with the help of separate instruments of state regulation (requirement for localization of production; exemption from payment of VAT, excise tax, land tax, income tax from enterprises, import duty; ban on the import of cars, that were used) were categorically not accepted and actively criticized by EU representatives, considered incompatible with the provisions of the Partnership and Cooperation Agreement between Ukraine and the EU and the provisions of WTO agreements on the elimination of barriers to international trade. However, despite external pressure, the Ukrainian state still managed to defend its national economic interests, although it had to make concessions in relaxing the ban on the import of used cars from 5 to 8 years old, as well as in canceling the requirement regarding the localization and minimum customs value of imported cars.

As a result of the state stimulation of the development of the domestic automobile industry during 1998-2008, the volume of production of passenger cars increased by 13 times (up to 402 thousand units). According to this indicator, Ukraine was among the ten largest manufacturers of automotive equipment in Europe. The share of domestic cars and buses manufactured in Ukraine in the total volume of registrations on the domestic market was 54%, and the share of the Ukrainian automobile industry in the country's GDP was 4% (Association of Ukrainian Automobile Manufacturers "Ukravtoprom," 2007).

Rapid growth in this period was also observed in the export of cars, which in 2007 amounted to 74.2 thousand units against 3.7 thousand units in 2003 (a 20-fold increase). At the same time, the import of cars grew rapidly, reaching 343.9 thousand units in 2007, against 154.1 thousand units. in 2003 (a two-fold increase). At the same time, it is appropriate to note that 99.4% of exports and 23.8% of imports of cars in Ukraine were accounted for by the Russian Federation. The key manufacturer in this period was PJSC "ZAZ," which accounted for 72.6% of passenger cars manufactured in Ukraine and 70.2% of cars in general. In addition, by 2008, there was an increase in the number of passenger cars manu-

Chart 2. Indicators of manufactured passenger cars in Ukraine in 2003-2010



Source: own elaboration according to State Statistics Service of Ukraine, 2022.

factured from domestic chassis and components (full-scale assembly) (Chart 2). In 2008, the volume of such cars in Ukraine reached 33.5 thousand units, which is 3.9 times more than in 2003 (8.5 thousand units).

The share of full-scale assembly cars in the total number of cars manufactured in Ukraine during this period was low (it did not exceed 8%), but stable. However, in 2009-2010, the production of passenger cars in general and according to the scheme of full-scale assembly in particular decreased by more than 6 times. The fall in production was caused primarily by the consequences of the global financial crisis (devaluation of the hryvnia), the difficulty of access to mortgage loans by manufacturers, and a decrease in business activity. In addition, in 2008, Ukraine joined the WTO, and as a result, the preferences of the automobile industry, provided for by the Law of Ukraine "On stimulating the production of automobiles in Ukraine," ended. Thus, the liberalization of foreign trade (according to the agreement with the WTO) and at the same time the failure to develop other tariff and non-tariff, organizational, legal and economic instruments to support the development of domestic engineering became the determining factors of its subsequent recession, which intensified after the signing of the FTA with EU.

Starting from 2013, a number of new ones were added to the already mentioned destructive factors influencing the development of mechanical engineering in Ukraine, namely:

– partial loss of the production potential of the temporarily occupied territories of Donbass and AR Crimea;

– loss of the traditional sales market for products of domestic engineering in the Russian Federation;

– the difficulty of reorienting production and exports to the markets of developed countries due to the high level of competition and trade protection;

– the insufficient degree of development of the domestic market for the sale of machine-building products and the passive role of the state in solving this problem;

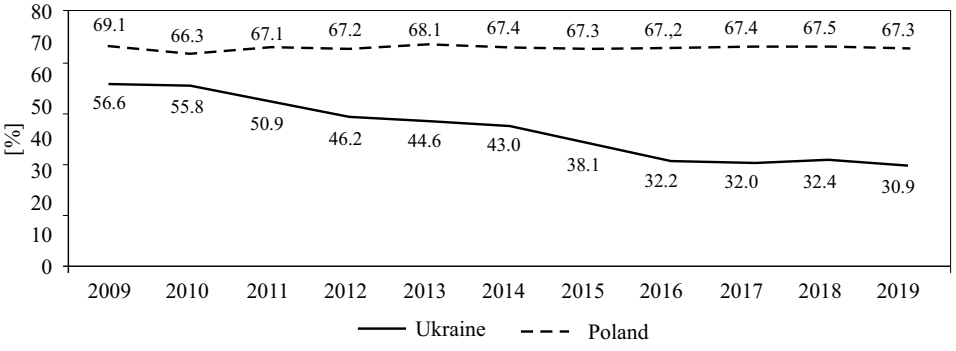
– the general increase in protectionist sentiments and trends in world trade while Ukraine maintains liberal access to the domestic market for foreign products (in accordance with the FTA agreement with the EU) and the lack of effective fiscal and economic tools to support and stimulate the development of domestic engineering.

As a result, during 2011-2016, the volume of production of the vast majority of products of the Ukrainian engineering industry in quantitative terms significantly and rapidly decreased. The biggest drop occurred in the segment of motor vehicles and high-tech components for them, agricultural machinery and tractors, as well as industrial equipment.

Despite some positive dynamics in 2017-2020, there is still a downward trend in the production of a significant number of important types of machine-building products. These are, in particular, tractors with an engine power of more than 59 kW, industrial equipment for sugar production, meat or poultry processing, and other types of machine-building products (Sozanskyy & Koval, 2021). Instead, the number of certain types of electrotechnical products (wires, electrical equipment), which are mostly manufactured by tolling operations or from imported raw materials, has increased. Therefore, the Ukrainian automotive industry reoriented itself from the production of vehicles to sets of wires for spark plugs, the aircraft construction sector – from aircraft to turbo engines for them, railcar construction – from rolling stock to wheelsets for locomotives and railway cars, agricultural engineering – from tractors to mounted mechanisms for them.

The result of global instability and the lack of effective and effective measures of state stimulation of Ukrainian manufacturers was the strengthening of import

Chart 3. Part imports in general consumption products mechanical engineering



Source: own elaboration according to State Statistics Service of Ukraine, 2022; CSOP, 2021.

dependence of the national economy in the segment of machine-building products. So, in particular, the share of the domestic component in the total consumption of mechanical engineering products in Ukraine in 2019 was 30.9% against 56.6% in 2009 (–25.7 p.p.), while, for example, in Poland this indicator was 67.3% in 2019 and decreased by only 1.8 p.p. during the analyzed period (Chart 3).

4. Conclusions

The main causes of destructive transformations in Ukrainian engineering (apart from the military aggression of the Russian Federation with the corresponding consequences) were:

– failure to take into account national economic interests (based on the position of international competitiveness and strategic importance of the development of mechanical engineering) primarily in agreements upon accession to the WTO and FTA with the EU, as well as other documents on the liberalization of foreign trade that concern this industry segment;

– ineffective state policy in terms of creating favorable, motivational and stimulating conditions for attracting capital investments in machine-building production and optimizing their connections with other sectors of the economy, in particular to meet domestic demand for relevant products.

The era of the COVID-19 pandemic has caused a significant increase in protectionist policies, particularly in developed industrialized countries. Under such conditions, in order to preserve and further strengthen its position as a traditionally significant player in the machine-building market, Ukraine needs to move away from the position of passive acceptance of liberal conditions and rules of foreign trade in the direction of full participation in the processes of forming these rules. Accordingly, the main goal of the state's protectionist policy should be to increase the competitiveness of domestic machine-building products of intermediate and final consumption, primarily on the domestic, as well as on foreign markets, and the restoration of internal intersectoral relations of this industrial sector of the economy.

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Problemy rozwoju ukraińskiego przemysłu motoryzacyjnego

Streszczenie. *W artykule przedstawiono główne trendy rozwoju przemysłu motoryzacyjnego na Ukrainie w latach 1991-2021. Wykazano skuteczność narzędzi protekcjonizmu państwowego we wspieraniu ukraińskiego przemysłu motoryzacyjnego. Porównano też udział importu w całkowitym zużyciu wyrobów maszynowych na Ukrainie i w Polsce. Ponadto zidentyfikowano przyczyny destrukcyjnych zmian w ukraińskiej inżynierii mechanicznej oraz wskazano sposoby ich eliminacji.*

Słowa kluczowe: *sektory inżynierii mechanicznej, motoryzacja, produkcja, stymulacja, rozwój*

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- **Rozdział pracy zbiorowej**

Zawiera: nazwisko autora rozdziału, inicjał imienia, rok praw autorskich, tytuł rozdziału (prosto), In, inicjał imienia, nazwisko redaktora + (Ed./Eds.), tytuł pracy zbiorowej (kursywą), numer wydania i zakres stron (w nawiasie), wydawnictwo, DOI lub URL:

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