



CHANGES IN INDUSTRY AND SERVICES SECTORS IN POLAND DURING THE COVID-19 PANDEMIC

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ABSTRACT: In 2020, the World Health Organization announced the global COVID-19 pandemic, which was followed by unprecedented constraints on society and the economy. The restrictions imposed had an impact on the transformation in industry and services sectors. The pandemic, however, affected particular industry sections and types of services to a different degree. Overall, the industry sector is assumed to have been less affected by the crisis, because the government restrictions did not embrace industrial production for the most part. Services faced a different situation; some of them were not provided due to top-down decisions. Therefore, the vulnerability of industry and services to such a strong external impact varies. The article aims to identify the degree and trends in changes in industry and services sectors during the COVID-19 pandemic and to determine the regularities stemming from a different degree of vulnerability of both sectors to such a powerful external stimulus. The study examines changes occurring in different industries and types of services (by the Polish Classification of Economic Activity/NACE 2.0) by way of statistical indicator analysis and using Statistics Poland and Eurostat data.

The conducted analysis of the COVID-19 pandemic influence on the industry and services sector leads to the conclusions that its impact on the industry sector was very time-limited – a sharp fall in gross value added in industry occurred mainly in the second quarter of 2020. The pandemic had a modest effect on industry employment, primarily as a result of anti-crisis shields and the will to maintain the potential of labour resources. In the services sector, accommodation and food services suffered the most. The significant falls were noted in the transport section as well as cultural, sports and personal services. Business services which were transferred to the Internet and were provided online ended up the most resilient. The ultimate winner of the pandemic is ICT services, especially electronic ones, which have replaced, wherever possible, traditional types of services.

KEYWORDS: pandemic, industry, industrial production, manufacturing, services sector, Poland

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Introduction

There have been instances of infectious disease outbreaks throughout human history. However, the global COVID-19 pandemic announced in 2020 by the World Health Organization was

followed by unprecedented constraints on society and the economy, imposing changes in work, education and other activities, including social relations. In those circumstances, a significant role was played by the ICT sector, whose dynamic growth, considering the restrictions

on personal contacts, made it possible to transfer some new social and economic activities to virtual reality. The recent digital transformation accelerated changes and brought about effects in various parts of life, which are likely to remain, at least to some extent, after the pandemic ends. The research results to date concerning the COVID-19 pandemic effects show that despite serious health implications, we face important economic consequences, a halt to global economic growth and an increase in the unemployment and poverty level. Various types of pandemic-related restrictions had also an impact on the transformation in industry and services sectors. The pandemic, however, affected particular industries and types of services to a different degree, which means that the vulnerability of those sectors to such a strong impact of an external factor as the pandemic is highly diverse.

As the COVID-19 pandemic was spreading, governments of many countries (first China, then most of the world) began to implement rigorous measures to save lives, such as banning on events, urging citizens to stay indoors and limiting activity of many companies, which slowed down the COVID-19 transmission and protected national health systems from overload. However, those measures also threatened the survival of many businesses in all sectors across the globe, which in turn may have a potential catastrophic individual, social and economic impact, such as mass unemployment and social insecurity (Lu 2021). It is worth emphasising at this point that although strategies of governments varied in this respect (Kinnunen et al. 2021), the limitations on activities concerned the services sector for the most part, and top-down decisions on periodic suspension of production were infrequent. Even though in Poland and most European countries there were no regulations regarding industrial enterprises, still rigorous principles of quarantine and employees' tests, reduction in demand or serious disturbances of supply chains of assembly parts (particularly in automotive production, *see* Hoeft 2021; Stojczew 2021; Ziolo 2022) necessitated the suspension of production on the initiative of the very industrial enterprises. Therefore, it also affected the functioning of the industry sector, regarding especially the economic downturn and limitation to the production value in the first months of the pandemic (Brezdeń

2022), and had certain economic, social and cultural implications, also in Poland. The pandemic also brought about organisational changes in enterprises, particularly limitation to the 'just in time' supply system resulting from disturbances of supply chains (Ziolo 2022). It should be highlighted that pandemic-caused changes overlapped the general trends in transformations in industry and services sectors observed earlier in Poland. In particular, this concerns first a steep fall (in the early 1990s), and later a slow decline in the importance of industry in terms of the activation of labour resources and an increase in the share of services in employment (Dominiak, Rachwał 2016; Markowska, Sokołowski 2019; Rachwał 2011, 2015). Those changes take place in specific national and international circumstances related mainly to globalisation processes under the formation of a knowledge-based economy and information society (Ziolo 2013, 2017), and also the fourth industrial revolution (Nawracaj-Grygiel 2022).

The article aims to identify the degree and trends in changes in industry and services sectors during the COVID-19 pandemic and to determine the regularities resulting from a different degree of vulnerability of industry and services to such a powerful external stimulus. The pandemic is coming to an end now. In the authors opinion, 2021 was the last year in which restrictions were imposed. Therefore, it seems to be the right moment to identify the regularities and attempt to summarise the impact of the pandemic on the economy sectors analysed. The research procedure involves an attempt to answer the following main questions: (1) how the dynamic of changes in industry and services sectors evolves in the light of the measure of gross value added in industry and services in Poland as compared to the EU states; (2) what changes occurred in terms of employment, production sold and service orders; (3) how the structure of industry and services sectors changed during the pandemic. The first sector of the economy (agricultural) was not included in the analysis, because of its specificity: there was no top-down restrictions on its functioning resulting from the lack of increased direct contact between employees and mainly outdoor work, which limited the virus transmission.

The analysis of changes in different types of industrial and service activity in Poland is carried

out in the system of the Polish Classification of Economic Activity/NACE 2.0, using Statistics Poland and Eurostat data, and by way of statistical indicator analysis. Use was primarily made of dynamics indices (to show the impact of the COVID-19 pandemic on employment and production changes), and structural indices (to show changes in relations between particular types of activity). It should be also emphasised that although the industry is losing its role in the activation of labor resources, structural analyses of changes in terms of employment are important for the industrial activity as well. The application of an employment indicator, highly significant for the interpretation of changes in services, resulted also from the wish to compare both sectors.

The impact of the pandemic on industry and services sectors in the light of the literature

In the source literature, the issue of natural disasters and previous epidemics and their influence on various economic sectors has been raised repeatedly. Regardless of a causative factor, catastrophes meant limitations in economic activity and human mobility, significantly affecting industry and services sectors, as well as reducing consumption expenditure (Gossling et al. 2020).

The research on a long-term effect of the COVID-19 pandemic has been limited due to its unprecedented scale and a relatively short time since its outbreak. Undoubtedly, the COVID-19 pandemic had an impact, and still does, on every economy in the world owing to restrictions on economic activity, travels and social contacts (McKibbin, Fernando 2020; Javed 2020; Ziolo 2022). The impact of the pandemic on the world economy can be considered through: (1) a direct impact on production and services, (2) a financial impact on enterprises and markets, and (3) disruption to supply chains (Maital, Barzani 2020). Loayza et al. (2012) claim, however, that the influence of those events may differ according to the sector of the economy. Likewise, Ziolo (2022) noticed that economic entities make up a diverse set and have various technical and economic potential, different functions in the economy, distinct production and capital relations, and so on. Therefore, a crisis affects – often to a varying

degree – particular sectors and areas of economic activity.

Overall, the pandemic has less serious effect on the industry sector than on the services sector. This was because only some countries' governments decided to suspend production entirely and restrictions on mobility generally did not concern travels to industrial enterprises. Therefore, economic downturns in industry and the value of production sold were significant only in the first months of the pandemic in 2020, and then in most industries the rates increased above the pre-pandemic values. Some industry sections, especially those producing computers and electronic devices for communication, were not strongly affected because of the dissemination of remote learning and virtual contacts. The great demand, however, was blocked by accessibility of assembly parts. As Ziolo (2022) pointed out, enterprises supplying sub-assemblies from China faced the most serious difficulties, due to the strict restrictions introduced in this country. Undertaken by various authors, introductory research on the COVID-19 pandemic outcomes has shown large differences in particular industry sections (Nayak et al. 2022). Obviously, an outright winner turned out to be the pharmaceutical industry, especially the one producing vaccines, antibiotics and antivirus drugs, which saw a record increase in production and sales values during the pandemic. For other industries, the picture of the pandemic consequences is not so definite. For instance, with regard to the automotive industry, the main problem was the reduction in demand resulting from limiting the mobility in most countries worldwide, because of the transition to remote working and education, and the disturbances of supply chains related to the suspension of production in China (Nayak et al. 2022; Stojczew 2021; Ziolo 2022). This meant the need to change the strategy in many areas of activity, including sales methods, owing to major sales limitations in traditional retail outlets (Hoefl 2021). The clothing industry was also among those facing serious disturbances. Despite a significant decrease in demand in traditional shops, often closed for many weeks in the initial phase of the pandemic, the problem was partly mitigated by online sales. The sellers had problems, however, with offering full collections, because of barriers related to production and

supply disturbances from China and other Asian countries, which are main world clothing suppliers (Castañeda-Navarrete et al. 2021).

In the light of the source literature, it can be assumed that the COVID-19 pandemic affected the industry sector not so much directly (because of the need to close establishments), but mainly indirectly, primarily by disturbances of global supply chains (Magableh 2021). Owing to this fact, some researchers in the field demonstrate first synthetic approaches, application conclusions and recommendations from these analyses. Magableh (2021) has shown a synthetic approach of the relationship between the COVID-19 pandemic and supply chains. He posits that while considering the impact of the pandemic on supply chains, three aspects should be taken into account: primary causes of the disturbances, challenges of the pandemic and trends in changes during the crisis. The researcher distinguished three main, interrelated factors which led to the disturbances of supply chains, i.e., supply changes, fluctuations in demand and responses of particular countries' governments to the pandemic (Magableh 2021). Ziolo (2022) has synthesised the effect of the pandemic on business activity in somewhat broader terms, indicating also the consequences in the form of social constraints (labour market, access to education other than remote, social contact barriers), increases in companies' operating costs (both production and services), and a rise in prices. On the other hand, Hayakawa and Mukunoki (2021) point out that the diversification of raw material sources, embracing both domestic and international markets, and having 'double' sources of supply of the same resources from different countries should help in preventing negative shocks coming from disturbances of supply chains. Besides, the authors propose changes in stock management, which may mitigate negative effects of such pandemic-caused disturbances (Hayakawa, Mukunoki 2021). Kersan-Škabić (2022) in her comprehensive analysis of the source literature points out that strategies of internationalisation and business relocation will be inhibited. The 'renationalisation' of supply chains, however, is not a good solution, but rather tightening them in more regional arrangements. Likewise, Magableh (2021) states that among the most important effects of this crisis will be greater concentration on local

and regional supply chains, which still does not mean a complete abandonment of global sourcing links.

The pandemic has had a much greater impact on the services sector (Benanav 2021) which has dominated the structure of developed economies for several decades. This sector was hit particularly hard and for a longer period by lockdown, social distancing and fear of contagion because the majority of its activities required closeness between buyers and sellers (Shingal 2020). The macroeconomic consequences of the social distancing measures applied to prevent the COVID-19 spread were profound here. Closing some tourism sector services, introducing numerous restrictions on food service activities, retail trade and other services alongside serious international limitations concerning travel and social contacts contributed largely to the crisis in the services sector. However, not all types of services suffered equally. It is emphasised in the source literature that by far the greater negative impact of the pandemic was noted for those services that required some physical closeness between buyers and sellers, and which cannot be replaced online. The tourism sector as well as food services and transport were among those most seriously affected by the pandemic (Javed 2020; Gunay, Kurtulmus 2021; Xiang et al. 2021; Kordowska, Poreda 2022; Niezgodą, Markiewicz 2022). The earlier epidemics (Ebola, SARS) already showed, although not on a global scale, that the tourism sector and transport were highly vulnerable and noted significant decreases (Burkle 2006). An adverse impact of the previous epidemics on tourism has been described by Page et al. (2006), Lee et al. (2012) – using the example of the flu pandemic, Wilder Smith (2006) – analysing the SARS epidemic, and so on. Restrictions on travels and recommendations for social distancing caused this sector to suffer the most during COVID-19 as well, alongside the economies of tourism-based countries. When analysing the COVID-19 impact, Lu (2021) indicates that hotel (accommodation and food services) and transport industry turned out to be the most vulnerable. While some services were transferred online, the tourism sector ended up as the primary victim of the pandemic. From the economic point of view, COVID-19 had the most devastating influence on tourism services as compared to the previous crises (Xiang et al.

2021; Nayak et al. 2022). A negative effect of the pandemic was also noted for the retail industry (with the exception of food retail and daily necessities), especially small retail shops (e.g. Pearson et al. 2011; Liu et al. 2012) which were affected by the shortage of staff most severely due to diseases and quarantine, often with no alternative online sales methods. The COVID-19 pandemic also adversely influenced cultural services to a considerable degree (Vitalisova et al. 2021). The majority of mass cultural events (concerts, shows) were suspended during the first period of the pandemic or postponed until after the pandemic.

In the case of business services, e.g. insurance, financial, telecommunication and IT, the influence was more limited. This was so, because most of them, if not all, do not require direct proximity between the service provider and service recipient; they can be rendered online, while working from home. Therefore, they are much more immune to all social distances imposed.

The pandemic, despite its undoubtedly negative consequences for a large part of the services sector, contributed simultaneously to the considerable growth of some of them, mainly those based on new technologies. For adaptation purposes, responding to pandemic-related challenges, the services sector began to use quickly modern technologies wherever it was possible (Caroll, Conboy 2020). The pandemic meant transferring many different services and social activities to a virtual world. The ICT sector became the only way, during lockdowns and times of social distancing, to compensate for social and economic losses. IC technologies made it relatively possible to provide a large part of services online. The demand for electronic services, especially e-commerce and remote education, significantly increased. What was also noted was pressure on the development of the medical sector because of a greater demand for pandemic-related health care (Keesara et al. 2020). The ICT sector proved most helpful at the diagnostic stage (online consultations, diagnosis). Call centres were established, where specialists gave online advice. Use was made of mobile applications which tracked the COVID-19 spread and collected information on the location of infected people.

When analysing the source literature, what should be also noted is that a spatial approach to the spread and impact of the COVID-19

pandemic on social and economic structures is of interest to many authors, e.g. Aalbers et al. (2020), Dentinho, Reid (2020), Krzysztofik et al. (2020), Rose-Redwood et al. (2020), Parysek, Mierzejewska (2021), Śleszyński (2021, 2022).

Based on the above-mentioned short literature review devoted to the impact of COVID-19 on both economic sectors analysed herein, a general conclusion can be drawn about a different degree of vulnerability of particular industries and services to the pandemic-caused crisis.

Industry and services sectors in Poland as compared to the EU in the years 2019–2021

General trends regarding the impact of the pandemic on the functioning of industry and services sectors are illustrated by changes in gross value added. When considering quarterly data from 2019–2021, one can distinguish two important periods of changes: the first one from the first quarter of 2019 to the second quarter of 2020, which is the highest intensity of pandemic-related restrictions (lockdown in Poland and virtually all EU states), and the second one from the third quarter of 2020 to the fourth quarter of 2021 (demonstrated in Table 1 as Period 1 and Period 2). Owing to the fact that in 2019 there were large increases in gross value added, it seems reasonable to pay attention to the changes of 2020–Q2 in relation to 2019–Q4, which is the period with the highest values of this measure (Period 1a).

What is clearly visible in Period 1 (2019–Q1 to 2020–Q2) are decreases in gross value added, slightly larger for industry and construction than services. There are also small differences between the EU and Poland, which shows that the situation in Poland in this entire period was slightly better. The comparison with the last quarter of 2019 is somewhat different. Large decreases in gross value added in Poland's industry (up to 65.8%) are noted here, much greater than in the EU. However, the numbers bounced back from the third quarter of 2020. The end of the investigated period (2021–Q4) shows large increases especially in industry and construction sectors, even close to 180% in relation to the second quarter of 2020.

Table 1. Changes in gross value added of industry and services sectors in the EU and Poland in 2019–2021 (by quarter).

Time	European Union (27)		Poland	
	industry (including construction)	services	industry (including construction)	services
	gross value added in millions of euro (current prices)			
2019-Q1	772,270.5	2,194,441.3	34,271.7	71,800.5
2019-Q2	788,488.4	2,280,772.5	34,057.1	75,894.9
2019-Q3	780,632.2	2,287,091.7	35,083.3	77,396.5
2019-Q4	832,498.0	2,374,657.6	45,908.7	82,401.0
2020-Q1	762,476.5	2,205,316.8	35,828.6	77,781.6
2020-Q2	669,964.2	2,042,733.9	30,199.7	70,766.1
2020-Q3	756,483.3	2,243,864.8	34,304.9	77,540.2
2020-Q4	836,724.7	2,312,133.1	45,639.6	78,563.7
2021-Q1	792,486.5	2,191,947.3	36,220.3	74,386.8
2021-Q2	822,455.7	2,307,921.9	38,113.2	77,917.1
2021-Q3	815,654.8	2,386,809.4	38,849.4	81,858.4
2021-Q4	895,755.2	2,487,530.2	54,175.7	84,199.4
Index of dynamics				
Period 1: 2019-Q1 to 2020-Q2 (2019-Q1=100)	86.8	93.1	88.1	98.6
Period 1a: 2019-Q4 to 2020-Q2 (2019-Q4=100)	80.5	86.0	65.8	85.9
Period 2: 2020-Q2 to 2021-Q4 (2020-Q2=100)	133.7	121.8	179.4	119.0
All time: 2019-Q1 to 2021-Q4 (2019-Q1=100)	116.0	113.4	158.1	117.3

Source: own study based on Eurostat data.

While analysing the entire examined period (2019–Q1 to 2021–Q4), increases in gross value added in both sectors are observable. However, growth in value for the industry sector is higher than for services, which is particularly visible in Poland (index of dynamics 158.1%). This proves a great vitality of Polish industry and shows that a negative impact of the pandemic on the results of economic activity in both sectors was short-lived, especially for industry.

The analysis of gross value added dynamics in 2019–2021 by quarter for particular groups of economic activity sections in the EU and Poland (Fig. 1) indicates similarity in the trends of change. The month in which a decrease in value added was the greatest is the second quarter of 2020. They are also visible for some groups of the section in the first quarter of 2021, in which there were also different types of restrictions on the operation of services and, to a smaller extent, population mobility. It can be noticed here that the situation in Poland is better than in the entire EU, but the gross value added index in the former is subject to considerable fluctuations, much

larger than in the entire EU. This depends clearly on the amount of gross value added in absolute terms, because for the EU, this is the total for all the countries, hence the smaller fluctuations. In Poland's industrial activity, after relatively large drops in the second quarter of 2020 and 2021, a dynamic growth in gross value added has been observed, both in manufacturing and other industry sections. It is much higher than in the entire EU. On the contrary, the situation in construction is slightly different. In this case, after previous large drops, increases in Poland are smaller than in the entire EU.

In the case of the services sector, sections with major restrictions – accommodation, food, trade, culture and sports services (the group of sections G, H, I and R section) – experienced the most noticeable drops which took place in subsequent epidemic waves – in the first and second quarter of 2020 and in the first and third quarter of 2021. A considerably smaller fall in gross value added can be observed in professional and other types of services for business, which moved to the Internet relatively fast.

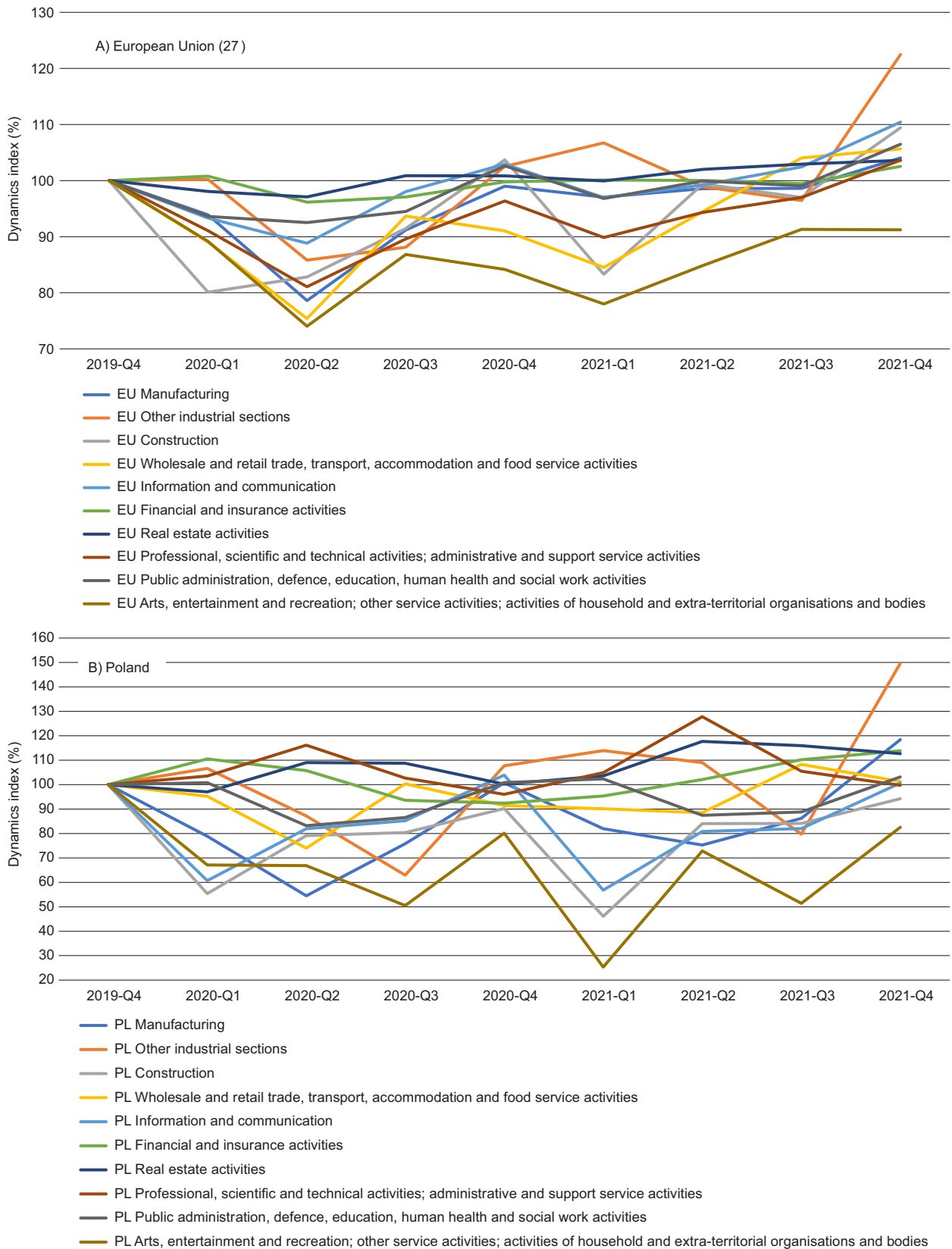


Fig. 1. Gross value added growth in industry and services in the groups of the NACE section in the EU and Poland (2019-Q4 = 100%).

Source: own study based on Eurostat data.

Changes in employment in Poland’s industry and services by section

The course of the pandemic in Poland and the measures taken by the government to prevent the virus spread, which consisted in the implementation of social distancing, limitations to the activities of selected economic sectors, as well as measures to protect jobs (anti-crisis shields) triggered economic downturn and significantly affected the operation of economic entities. Like in the entire EU, tourism and food services ended up as the most vulnerable to the pandemic; the consequences were also visible in non-food trade (Radlińska 2020) and personal services. The

impact of the pandemic on employment in industrial activity was much limited due to its specificity. Job protection in both sectors depended on the applied mechanisms of financial support for enterprises (the so-called anti-crisis shield), one of the conditions being maintaining employment at the current level. This resulted in fewer or postponed redundancies. Therefore, job changes in particular industry and services sections were mostly small (Fig. 2).

Industry (determined as Sector 2 of the economy after agriculture – Sector 1) experienced a small drop in employment (taking the year 2019 as 100%) in the analysed periods of 2019–2020 and 2019–2021. Relatively big falls were noted in Section C – manufacturing, the largest one in

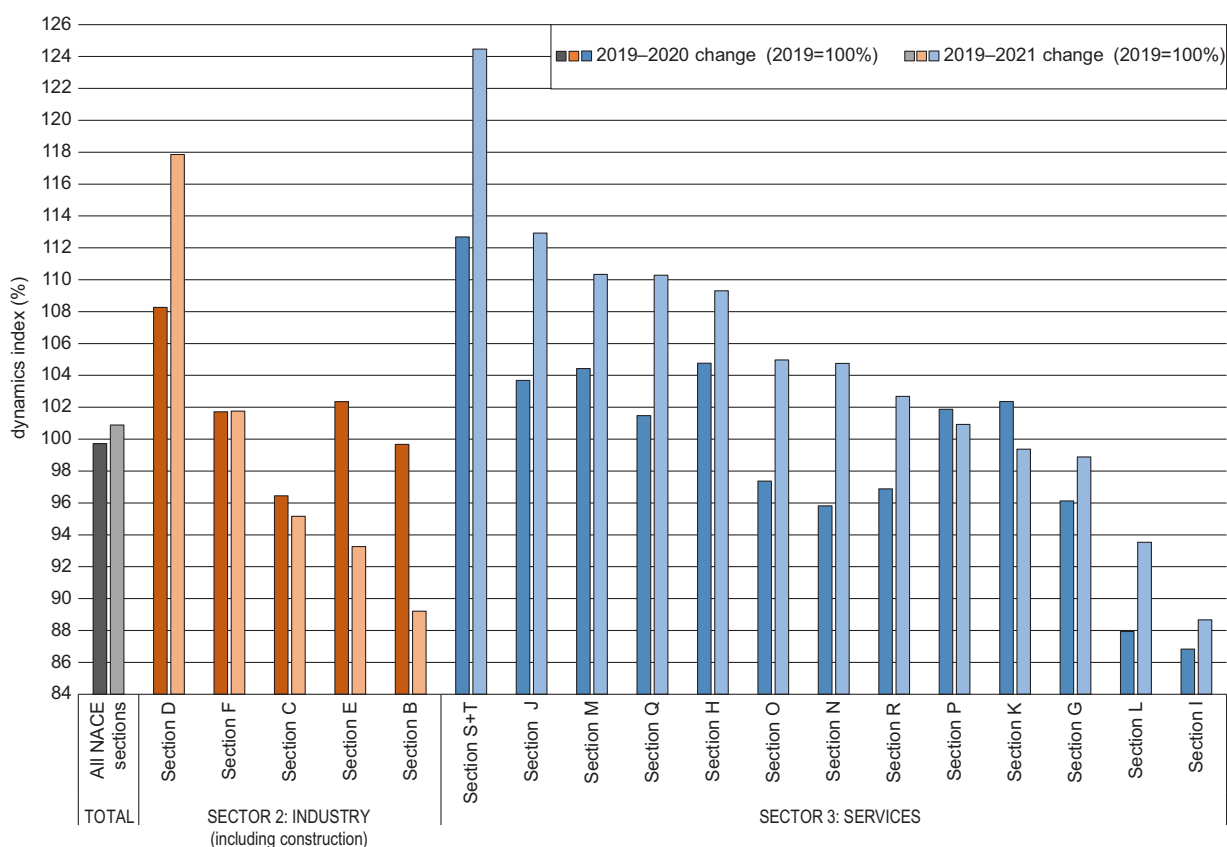


Fig. 2. Employment growth in industry and services by the NACE section in the period of 2019–2021 in Poland (2019 = 100%).

Section B: mining and quarrying; Section C: manufacturing; Section D: electricity, gas, steam and air conditioning supply; Section E: water supply, sewerage, waste management and remediation activities; Section F: construction; Section G: wholesale and retail trade; repair of motor vehicles and motorcycles; Section H: transport and storage; Section I: accommodation and food service activities; Section J: information and communication; Section K: financial and insurance activities; Section L: real estate activities; Section M: professional, scientific and technical activities; Section N: administrative and support service activities; Section O: public administration and defence; compulsory social security; Section P: education; Section Q: human health and social work activities; Section R: arts, entertainment and recreation; Section S+T: other service activities and activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

Source: own study based on Eurostat data.

terms of potential, and Section B – mining and quarrying. They were exacerbated in the subsequent year – up to 93% in manufacturing and 89% in mining. It should be highlighted, however, that in industry a downward trend in the employment rate had already been observed for many years, especially in Sections C and B. A decisive influence on decreases in this section was exerted by reduction in employment in traditional sections of manufacturing, such as manufacture of leather and leather products, clothing, and also motor vehicle, trailers and semi-trailers production. At this point it should be emphasised that in Sections D (power generation) and E (water supply, sewerage, waste management and remediation) there was even an increase in employment, especially in power generation industry in the entire 2019–2021 period (up to nearly 118%). This stemmed mainly from a certain inertia of the industry sector, which, as a result of costly and a long-time horizon investment process, cannot lay off a significant proportion of its employees at short notice without investing in automation and robotisation of manufacturing processes. Besides, as shown in the analysis of gross value added above, the production level quickly returned to the pre-pandemic values from as early as the third quarter of 2020. An employment increase in Section F – construction is also worth noting.

Employment in services (determined as Sector 3 of the economy) was more varied in individual sections. Accommodation and food services were hit particularly hard in this respect. Hotel activities were temporarily suspended, catering was limited only to the sale of take-away meals. Employment rate dynamics in those services (Section I) in 2020 was 86.8% (where 2019=100%), and in the subsequent 2021 was slightly higher (88.7%). In other services, after initial falls, there was a rebound, and the dynamic rate at the end of the analysis conducted amounted to more than 100%. It was especially visible in business and ICT sectors (Sections J, M) which recorded employment growth. For professional services (Section M embracing legal, accounting, marketing services and so on), decreases at the beginning of 2020 were not so large; they returned as early as the end of the year to the pre-pandemic levels. In 2021, the employment growth rate

(where 2019=100%) was already more than 110%, and for Section J (ICT sector), even 113%.

The ABSL (Association of Business Service Leaders representing modern business services in Poland) report in 2021 shows that during the pandemic in Poland (in 2020) 13.5 thousand new jobs were created in business services centres. A large part of these services has been provided online. The majority of employees are involved in business processes necessary for the operation of companies, even in crisis situations (financial and accounting services, HR, IT).

As a result of changes in employment, structural changes take place – a fall or rise in the share of particular sections in the economic structure. Changes in the structure of industry and services by section in the years 2019–2021 were relatively small. Those sectors, especially industry, were characterised by a certain stability of structure, therefore no major changes have been observed. In the case of industrial activity, a decrease in the share in the employment structure by section was noted in manufacturing as well as in mining and quarrying. This trend was already observed in the previous years and resulted from the loss of importance of the mining industry (especially hard coal and lignite) for more modern sections of manufacturing alongside economic development, including the assumptions of power transformation policy and changes in the automation and robotisation of raw material extraction leading to the elimination of live labour in processing. Therefore, the fall in manufacturing (Section C) is relatively large compared to other sections. One should consider, however, a significant share of this section in the overall structure, because it accounts for nearly 1/5 of all employment in the economy. Attention should be also paid to stability in construction (Section F). Owing to a long investment process, construction does not react immediately to crisis situations. Moreover, although uncertainty among customers in the market was detectable and an interest in investments in office buildings waned, the pandemic still contributed to the search for new places of residence outside cities and increased an interest in renovating apartments and houses. These factors were influenced by record-low interest rates, making it possible to maintain low interest rates on mortgages, which sustained the good

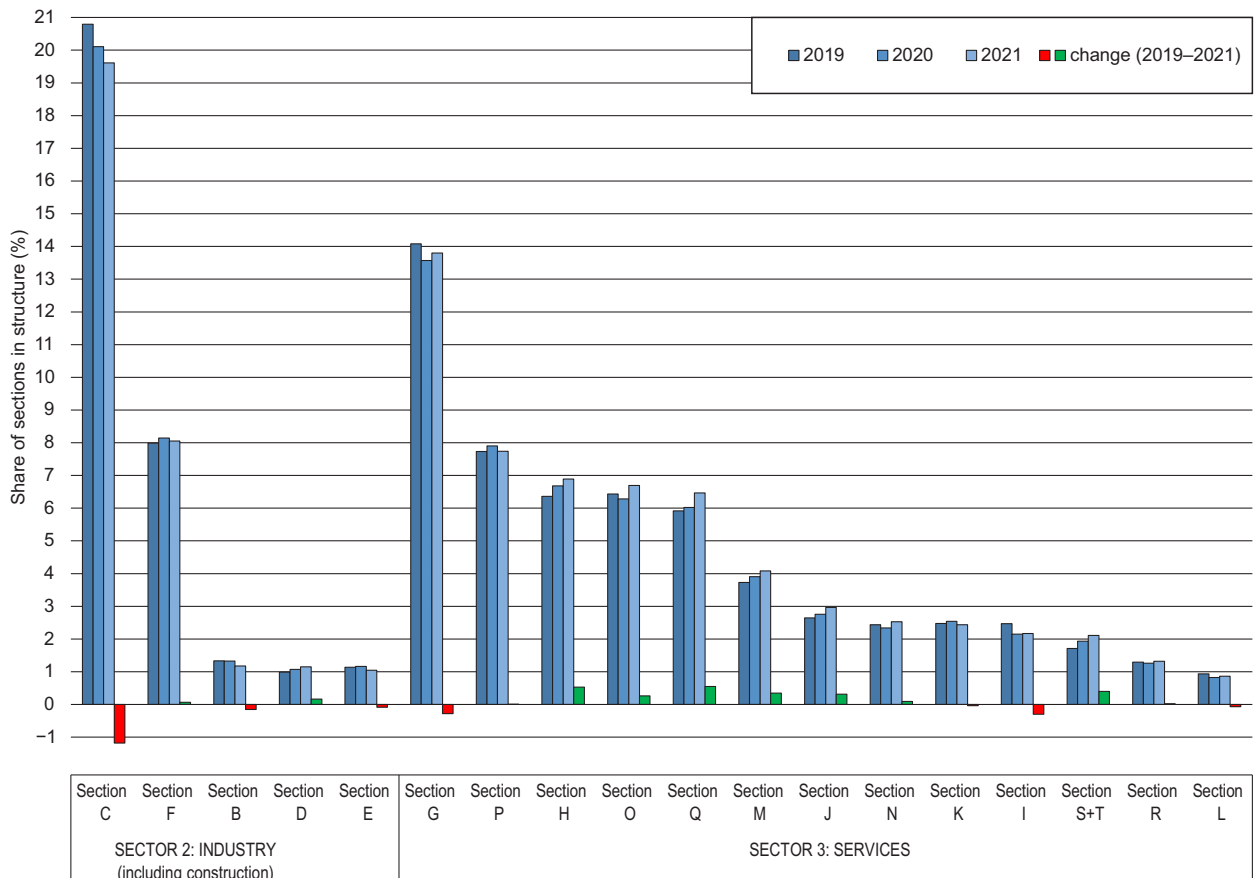


Fig. 3. Changes in the employment structure of industry and services sectors by section in the years 2019–2021 in Poland.

Section B: mining and quarrying; Section C: manufacturing; Section D: electricity, gas, steam and air conditioning supply; Section E: water supply; sewerage, waste management and remediation activities; Section F: construction; Section G: wholesale and retail trade; repair of motor vehicles and motorcycles; Section H: transport and storage; Section I: accommodation and food service activities; Section J: information and communication; Section K: financial and insurance activities; Section L: real estate activities; Section M: professional, scientific and technical activities; Section N: administrative and support service activities; Section O: public administration and defence; compulsory social security; Section P: education; Section Q: human health and social work activities; Section R: arts, entertainment and recreation; Section S+T: other service activities and activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

Source: own study based on Eurostat data.

functioning of the housing industry in Poland in 2020–2021. Local factors, including local government activity, was also of great significance in the development of the construction market (*see e.g. Załączna, Antczak-Stępnik 2022*).

Among small changes in the structure of the services sector are an increase in the shares of services sections embracing ICT (Section J), professional (Section M) and medical (Section Q) services. A drop in shares in the sector structure was noted in sections related to accommodation and food services (Section I), transport and storage (Section H) and wholesale and retail trade, as well as repair of motor vehicles (Section G).

Changes in industrial production sold and service orders

In the early stages of the pandemic, a fall in the value of industrial production sold and service orders was generally observed in enterprises of all industry sections and types of services.

What should be pointed out in the case of the industry sector is that production sold returned very quickly to the path of growth (Fig. 4). After a significant decline in the value of production sold for the entire industry (in relation to the corresponding month of the previous year), and especially for Section C (manufacturing) there was a

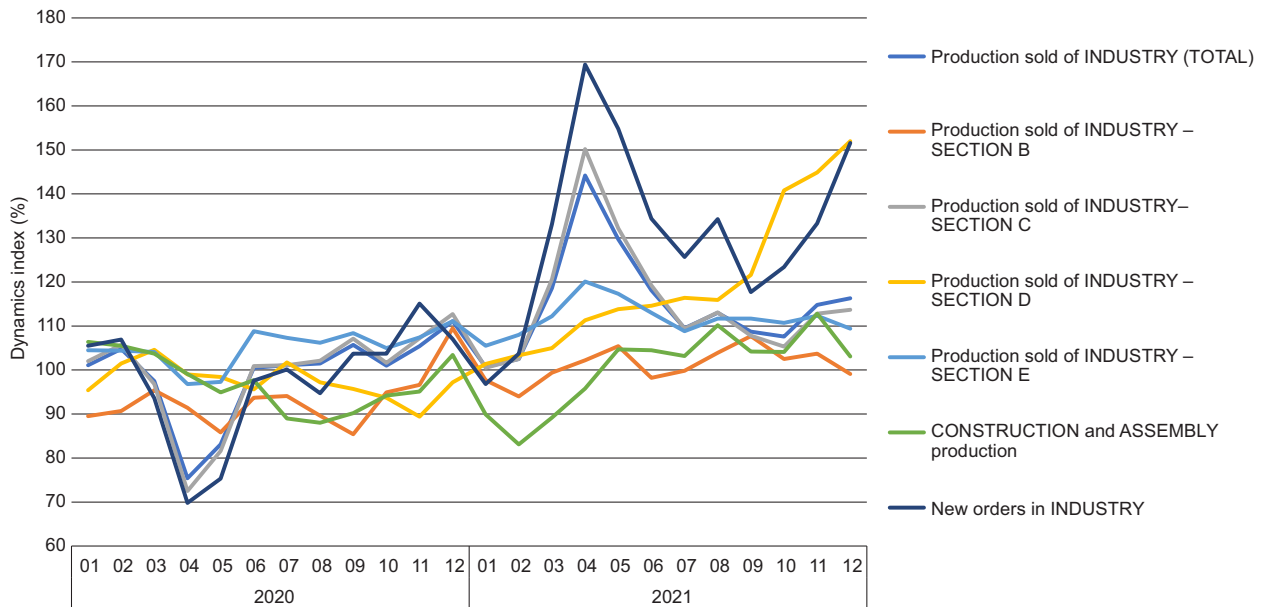


Fig. 4. Dynamics of industrial production sold, construction and new orders in industry in Poland in the years 2020–2021* (corresponding period of the previous year = 100).

*Production in constant prices, new orders in current prices

Section B: mining and quarrying; Section C: manufacturing; Section D: electricity, gas, steam and air conditioning supply; Section E: water supply, sewerage, waste management and remediation activities

Source: own study based on Statistics Poland (GUS) data.

major rebound towards an upward trend in April 2020. It should be noticed that falls in Section D (power generation), Section E (water supply) and construction were much smaller. This is due to the provision of common, essential goods (such as power or water) and in the case of construction—the need to continue work already started. Therefore, in the construction, falls in production came a little later. The production sold value went up particularly from November 2020 in power generation (Section D), which is related to the rapidly growing prices on energy markets caused by the crisis, hence large increases in the production sold value in the industry section. The smallest fluctuations (both falls and later rises) can be found in Section C – mining, which is a natural consequence of, on the one hand, mining stability related to the technological process, and on the other, a slow, gradual departure from mining of certain raw materials in Poland (mainly hard coal¹) as part of energy transition towards an increased share of energy production from

renewable sources (Pach-Gurgul, Ulbrych 2019; Raźniak et al. 2021). The analysis of new contracts dynamics in industry shows that the collapse of new orders in April 2020 (i.e. in the first month of the pandemic with significant restrictions caused by the lockdown) to nearly 70% compared to April of the previous year was later compensated by dynamic growth in 2021, especially at the end of the first and the beginning of the second quarter.

Thus, it is apparent that such crisis events do not affect the reduction in potential and technical production capabilities, because when the market improves, industrial enterprises increase the volume of production very quickly, adapting it for current needs, which was also proved during research on the previous crisis at the end of the first decade of the 20th century (Rachwał 2014). It should be emphasised at this point that export plays an important role in Polish industry. The depreciation of Polish currency against the euro and dollar during the pandemic-related crisis, which is beneficial for exporters, as well as greater restrictions on activities in some European countries linked to the pandemic, contributed to a rapid reversal of the negative trends and a return to growth in the value of production sold.

¹ It should be noted here that this trend may reverse in 2022 and in the following years owing to the raw material crisis triggered by the war in Ukraine, as a result of sanctions imposed on Russia as an aggressor.

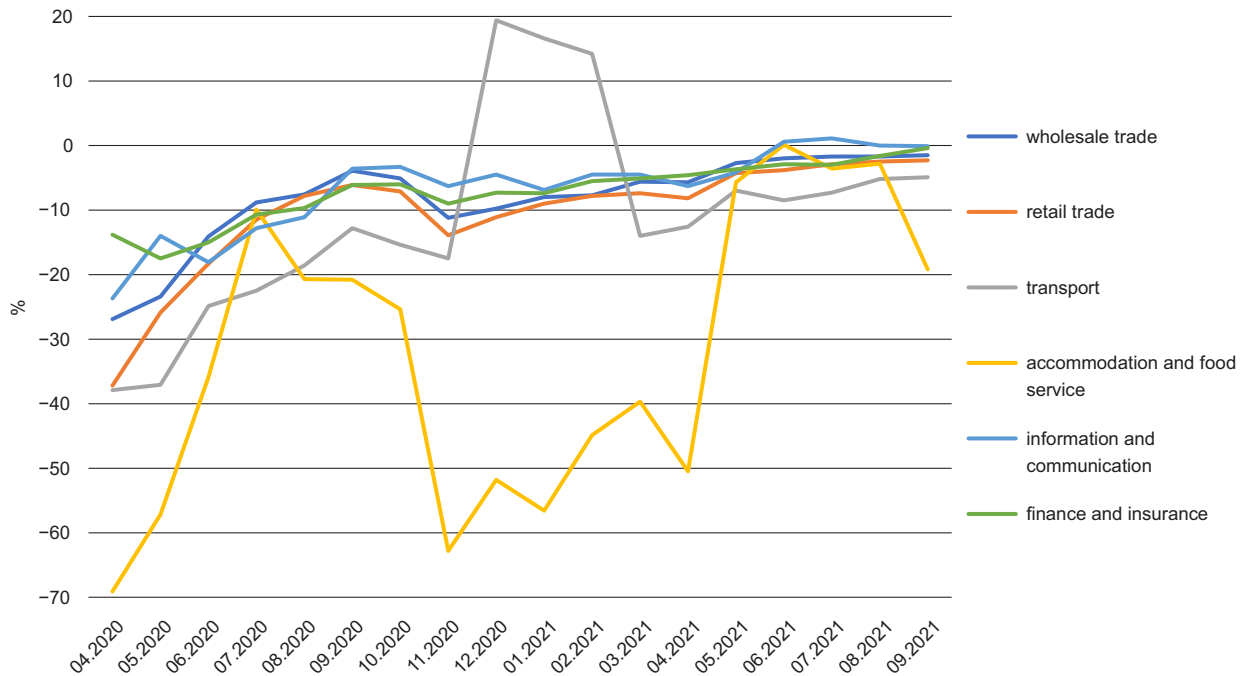


Fig. 5. Change in service orders in Poland between April 2020 and September 2021².

Source: own study based on GUS data from the publication: *The impact of the COVID-19 pandemic on the economic situation – assessments and expectations (detailed data and time series) – Annexe to the publication: “Economic situation in manufacturing, construction, trade and services 2000–2021 (September 2021)”* (GUS, 2021).

² An estimate change in orders (%) compared to the previous month.

For the services sector (Fig. 5) the largest decrease in orders was recorded in accommodation and food service section (nearly 70%). In transport enterprises this change was -37.9%, and for wholesale and retail trade it was 26.9% and 37.2%, respectively. The smallest change in demand was observed for ICT - 23.7% and financial-insurance services - 13.8%.

The impact of the pandemic on industry and services in the light of entrepreneurs' assessment

A negative impact of the COVID-19 pandemic on industrial and service enterprises can be measured by data from studies carried out by Statistics Poland (GUS 2021). The assessment of negative consequences of the pandemic varied according to the industry section and types of services, and changed alongside the pandemic waves, as well as limitations and restrictions imposed. The issue of the impact of the pandemic on entrepreneurship, including entrepreneurial motivations and behaviour of entrepreneurs in particular sections

is very wide (see, e.g. González-Tejero et al. 2022; Marjański, Sułkowski 2021; Pelle, Tabajdi 2021) and is not the subject of particular interest in this work, because it would require broader discussion. Therefore, focus in the analysis below has been on research results considering the effect of the pandemic on the activity of industry and services enterprises in the light of entrepreneurs' opinions.

On the basis of GUS (Statistics Poland) research data (2021), general conclusions for selected industrial and service sections can be drawn. At the onset of the pandemic (in April 2020), as much as over 72% of manufacturing enterprises and more than 70% of construction enterprises treated the negative consequences as serious or threatening the stability of the company (Fig. 6). This proportion, however, was steadily decreasing and from July 2021 it was just several percent for those two activities.

The GUS research results (2021) show that 73.6% of the surveyed wholesale trade enterprises assessed negative results (serious or threatening the stability of the company) at the onset of the pandemic. Nevertheless, this percentage was

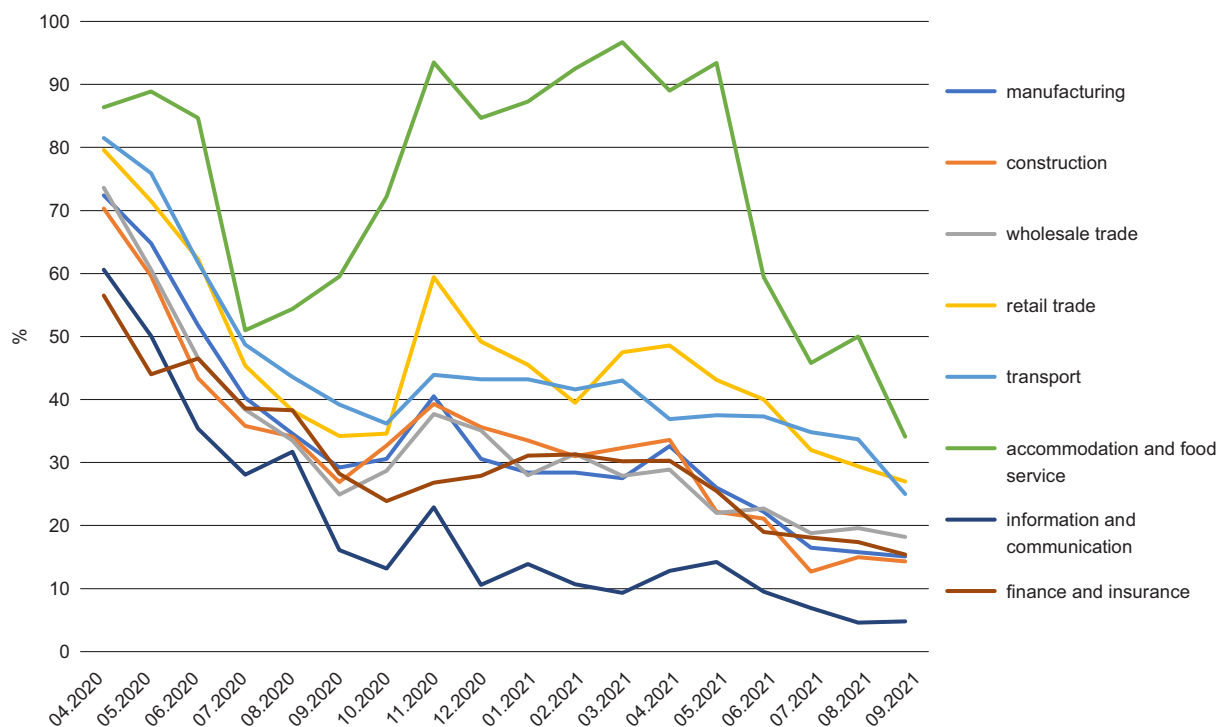


Fig. 6. Proportion of Polish industrial, construction and service enterprises assessing the impact of the COVID-19 pandemic as serious or threatening the stability of the company during the pandemic in Poland, from April 2020 to September 2021.

Source: own study based on GUS data from the publication: *The impact of the COVID-19 pandemic on the economic situation – assessments and expectations (detailed data and time series) – Annexe to the publication: “Economic situation in manufacturing, construction, trade and services 2000–2021 (September 2021)”* (GUS, 2021).

declining from month to month during the pandemic and stabilised between August 2020 and April 2021 at about 30%. From May 2021, what was observed was a slight but steady decrease in the proportion of wholesale trade enterprises assessing the pandemic results as serious or threatening the stability, from 22% to 18.2%.

A slightly more difficult situation can be observed in retail trade enterprises. The proportion of those negatively assessing the pandemic implications dropped between April 2020 and September 2021 from 79.6% to 27%. The case is even more serious for the transport industry. At the beginning of the pandemic, as much as 81.5% of the entrepreneurs thought that its consequences were serious or threatening the stability of the company.

However, the most difficult situation occurs in the accommodation and food service section. In this case, the proportion of those negatively assessing the consequences of the pandemic did not fall in the investigated period, but fluctuated considerably alongside the pandemic waves and restrictions imposed on the enterprises by

the government. The largest share of enterprises assessing the consequences as serious or threatening the stability of the company was noted in November 2020 – 93.5%, and then in February and March 2021 – about 97%. The percentage of those negatively assessing the consequences began to fall during the summer vacation of 2021, and in September it reached the lowest point after the onset of the pandemic – 34.1% (although it is the largest share compared to other service sections).

The situation of financial and insurance enterprises looks markedly better. The proportion of those negatively assessing the consequences of COVID-19 was 56.5% at the onset of the pandemic, and it was steadily decreasing reaching 15.4% in September 2021. The Section J entrepreneurs (information and communication) also assessed the situation as serious and threatening the stability of the company at the beginning of the pandemic. However, over time, this proportion was declining and reached 5–6% in July–September 2021.

When comparing these data to the proportion of employees working from home, it can be

clearly seen that for the services in which remote work was possible (ICT, finance and insurance), the impact of the pandemic was assessed less negatively. In ICT services, 70–80% people were working remotely, whereas in financial and insurance activities it was 45–67%. In enterprises providing accommodation and food services, this proportion was up to 13.6% and in September 2021 – 0.8%.

Conclusions

The conducted analysis of the impact of the COVID-19 pandemic on the industry and services sector leads to the following conclusions. The COVID-19 pandemic had only a short-term effect on the industrial production rate – significant falls in gross value added in industry were mainly in the second quarter of 2020. They were smaller than during the earlier crisis (that hit in 2007/2008), which, as was stated in the research on the previous crisis (Rachwał 2014), proves a relatively high ‘inertia’ and resilience to recessions of enterprises in this sector. Compared to other EU states, the industry sector returned relatively faster to the upward path.

The pandemic had a modest effect on industry employment, as a result of anti-crisis shields and the need to maintain the potential of labour resources, necessary after the pre-pandemic production level is restored. Falls in employment concerned mainly Section C – manufacturing and B – mining and quarrying; therefore, it was only the intensification of the trends in changes observed in the preceding years. Despite the pandemic, an increase in employment was recorded in 2019–2021 in Section E (e.g. water supply, sewerage and waste management). The situation was slightly different with regard to changes in the production volume. The pandemic had an impact on large fluctuations in the dynamics of industrial production sold, construction and new orders in industry. However, from as early as the third quarter of 2020, the production started to grow again. Manufacturing suffered the most as a result of the pandemic; mining and quarrying were slightly less affected. Yet, power generation enterprises and those related to water supply did not practically go through the pandemic-caused crisis; as a result of rising prices, sales were

steadily increasing, especially in the second half of 2021. Changes concerning economic activity in Poland do not significantly deviate from those in the EU. This relates to both the impact of the pandemic on the economy and the degree to which some of its types are vulnerable to the crisis.

In the services sector, as a result of the pandemic-caused crisis, accommodation and food services suffered the most. It is the tourism-related enterprises that turned out to be the most vulnerable, and given no alternative in the form of electronic services, they were the biggest ‘losers’ among economic entities connected to the services sector. The significant falls were noted in the transport section as well as cultural, sports and personal services. They were subject to considerable fluctuations in demand related to the pandemic waves and restrictions imposed at the time. Business services which were transferred to the Internet and were provided online ended up the most resilient. After the first weeks needed for appropriate adaptation, they are among those activities which are likely – at least partly – to remain online permanently, even in the post-pandemic period. The ultimate winner of the pandemic in the service sector is ICT services, especially electronic ones, which have replaced, wherever possible, traditional types of services. During the pandemic, a high increase in electronic trade was noted, following from the need to find alternative, safe methods of purchasing various commodities in the pandemic era. Moreover, there has been a development of distance learning and remote medical services. The digital revolution related to the COVID-19 pandemic has changed our habits and significantly accelerated the development of new services. It seems that pandemic-induced changes in electronic trade will continue to be a long-term trend, not only because of the successive pandemic waves we expect, but also due to the fact that people have got used to new shopping habits, and companies adapted their business models to new circumstances, investing in new forms of marketing (OECD, 2021).

The up-to-date changes in the employment structure, because of a relatively short period, did not affect significantly the industry and service structure, although there are some minor shifts towards some service sections at the expense of industrial ones, mainly manufacturing

and mining. This trend, however, was already observed in the previous years. There are also small changes between services sections, but they do not lead to significant changes in economy structure observed before the pandemic.

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