Dana Benešová et al.

# Services
## and Trends
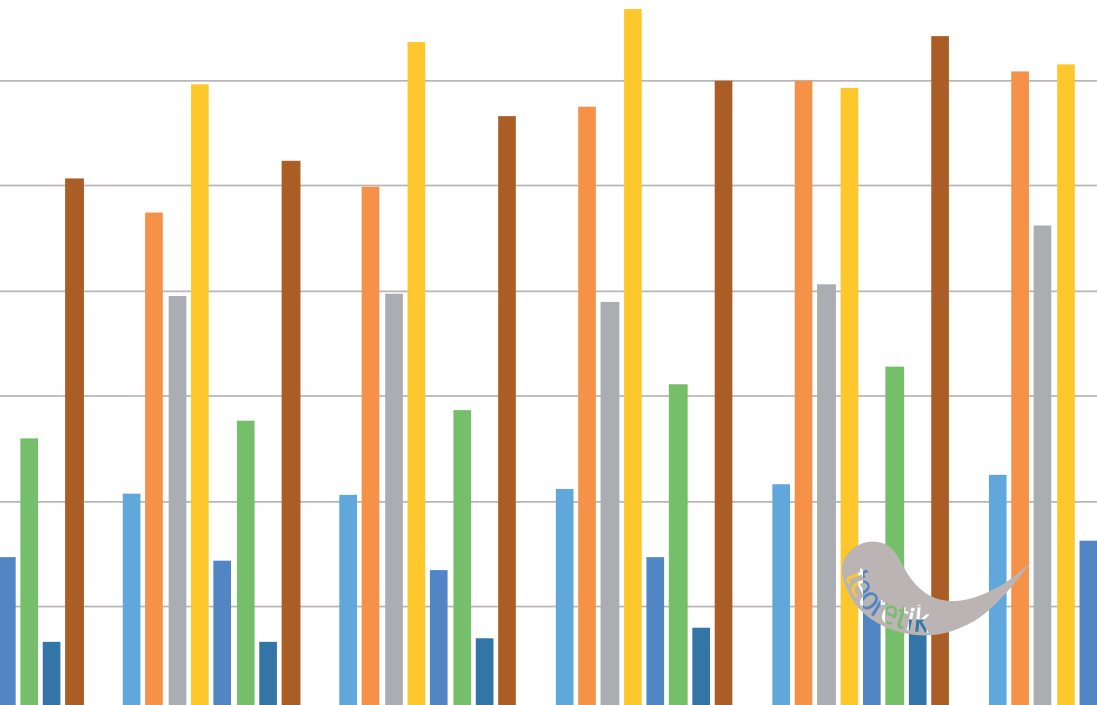
# Services and Trends

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# CONTENTS

# INTRODUCTION

This textbook is the output of the KEGA project No. 007EU-4/2020, "Interactive and Interdisciplinary Teaching of Services and Tourism Innovation Subjects using Information Technology". The intention of the authors was to create a textbook using an interactive and interdisciplinary approach in teaching the subject Analysis and Trends in Tourism Services of the study programme Tourism Management at the second level of engineering studies guaranteed by the Faculty of Commerce at the University of Economics in Bratislava. The aim was to create a new model of teaching, to improve the quality of teaching based on information technology and to link the knowledge of service economy and statistics in order to increase students' motivation, better understanding of the issues, deeper skills and better analytical and critical thinking. It also continuously builds on the teaching of Business Services and Service Management taught at the first cycle of undergraduate studies.

The dynamics of structural change in the economy over the last three decades has been in favour of services, as evidenced by the share of output in total GDP and total employment. The shift towards services has been caused by systemic, technological, organisational and social changes, especially in transition economies such as Slovakia. Externalisation and restructuring processes, the development of intermediate and highly productive services increasingly used by manufacturing enterprises but also by service enterprises, points to the dominance of services in the domestic economy and is a global phenomenon of the world economy. Tourism is an important sub-sector of services, which has the character of a cross-sectoral industry, is characterised by a multiplier effect and thus affects and influences the competitiveness of several sectors of the economy. It is therefore an important part of the service sector and is given special attention.

The aim of the textbook is not only to systematize and generalize the latest knowledge from the service economy and tourism, but also to transpose the theoretical knowledge into the application level and vice versa. By using an interactive and interdisciplinary approach, students can better understand the text and the relational contexts of the subject matter, achieve practical skills in the application of mathematical and statistical methods, and improve their analytical, critical thinking and interpretive skills.

Knowledge of quantitative methods and the ability to implement them in analysis, to evaluate the results correctly and then to use them in decision-making processes increase the opportunities for graduates to obtain an adequate job position. Clearly, digital skills, not only of computer scientists, but also of graduates with a background in economics are essential. Therefore, reflection on the demands placed by practice on graduates of economics degree programmes leads to new models of education based on teaching innovation, interdisciplinary and interactive learning and deepening students' digital skills.

Authors

# 1 SERVICE SECTOR DOMINANCE – SERVICE ECONOMY

## 1.1 Origin, characteristics and development stages of the service economy

The emergence of the service economy represented a new era in the world economy. This phenomenon is characterised by a change in the production mode, a transition from the industrial regime to the information age. This process began to take place after the Second World War and transformed the world economy and society (Bailey, 2001; OECD, 2000). At the beginning of the new millennium, services became the sector with the highest growth rate in the world economy, accounting for 64% of GDP, followed by manufacturing with 32% and agriculture with 4%. Thus, the share of market and non-market services in GDP generation now exceeds 50%, reaching 70% in some countries, and the share of services in employment is recorded in the range of 55%–69% (Orchel, Wegner, 2019). In developed countries, the service sector is thus responsible for more than three-quarters of the economy with its output. In the USA, 79% of GDP is the result of services output, in France 77% and in the UK 76% (Lovelock, Wirtz, 2011; OECD, 2000; CIA, 2017).

The work of Baumol (1967) can be described as pioneering in the identification of the service economy. In his research, he dealt with the relationship between service production and economic growth. He develops a two-sector (manufacturing and services) unbalanced growth model to find out why the share of employment in services increases. The results of his studies show that under the effectiveness of two conditions (productivity growth in manufacturing is higher than in services and there is a constant level of demand for both services and products), the share of employment in services increases and the rate of economic growth gradually declines until it converges to services productivity growth. Baumol identified a "cost disease" in the service sector and attributed it to lower productivity growth in these sectors. If labour productivity in the industrial sector grows faster than in the service sector, then wages in the industrial sector are likely to rise. If the labour market is competitive enough to prevent wage levels in the two sectors from diverging, unit labour costs in the service sector will increase relative to those in the industrial sector. As a consequence, the price level of services increases relative to industri-

al products. The paradoxical result is that the sector with lower productivity gains grows more in terms of value added than the sector with higher productivity gains. At the same time, relatively more jobs are maintained or created (as a result of economic growth) in services rather than in manufacturing, so that the share of employment in the service sector also increases.

Indeed, productivity differences between industries and the corresponding differences in wage costs per unit of output have been growing over time. Despite a significant increase in the relative price level of services, employment in the service sector has grown. Because of increased relative prices of services, the share of value added in the service economy must also increase (Henriques and Kander, 2010; Baily and Bosworth, 2014). The challenge is to determine the reasons for productivity differences across sectors. These are found in the fact about the capital intensity of industrial production, which generates demand for technology, machinery and equipment. These result in the energy intensity of product output. The impact of changes in the price ratio of energy and human capital is reflected in the productivity achieved in industrial production, not in the service sector (Witt, Gross, 2019). While the growth of the industrial economy is provided by mass production and the reduction of unit costs of production, the growth of the service economy is based on knowledge-intensive production of goods and services, well-educated workers, and innovative companies (Shek, Chung, Leung, 2015).

The 'service economy' is characterised by the rise of the service sector's dominance in terms of employment and value added shares. We observe this rise in the second half of the twentieth century in the USA, more precisely in the period from 1970 to 2005 (Witt, Gross, 2019). Structural change in the economy is an inevitable concomitant of economic growth. Its impact can be seen in the changing employment structure and value-added shares of different sectors of the economy. The production of services was stimulated in the 1970s, when there were changes in the resource structure of economic growth and stronger efforts to exploit endogenous resources. Technological progress and the innovations it generated became an essential source of growth, which was becoming more effective due to the development and implementation of information and communication technologies, robotics and artificial intelligence. This has now given rise to the characteristics of Industry 4.0, where services are gaining strength through their significant share in the production of information and communication technologies and in the production of R&D services. The technological maturity and complexity of production systems and their short life cycle generate an intermediate de-

mand for professional consultancy services. Also, the rising standard of living of the population in developed countries and the increase in the leisure fund, as well as demographic changes, are underpinning the increasing production of services for the final consumer.

The author Michalová identifies the promotion of intermediate services on the basis of their role in production processes as a key factor in highlighting their importance in the economy (Michalová, Benešová, Šťastná, 2013). The process of service promotion was also influenced by global developments that gradually removed barriers to world trade in services (Rao, Kothari, Kurtz, 1993). The globalization of markets and the development of information and communication technology (ICT) have enabled enterprises to conduct activities around the world. Thus, services do not require direct physical contact, they can be provided remotely through ICT and this phenomenon includes the use of outsourcing and offshoring (Messenger, Ghosheh, 2010).

Overall, we can conclude that recent and current studies identify socio-technological change as a factor stimulating the demand for services and thus the development of a service economy. Within the framework of societal changes, these are mainly demographic changes, changes in the functioning of the family, upbringing and education, the economy and political power relations. Technological changes take the form of the use of the Internet, Industry 4.0, Internet of Things, Big Data, 3D printers, Clouds (Čukanová, 2017).

Table 1 Development stages of the service economy

| Period | Accompanying development features |
|---|---|
| 50s–60s of the 20th century | Technology development, increasing importance of science and research, changes in the structure of the economy (Japan, USA, Western Europe) |
| 70s of the 20th century | Crisis associated with "oil shocks", restructuring of economies, intensification of economic growth – R&D, services |
| 80s of the 20th century | Use of personal computers, data accumulation and storage |
| 90s of the 20th century | Internet use, mobile communication, ICT development |
| 21st century | Digitalization, automation, robotization, mobile applications, (Industry 4.0)<br>Artificial Intelligence (Industry 5.0)<br>E-business, digital partnerships, collaborative economy, circular economy |

*Source: authors´ own*

As Table 1 suggests, technological development is the dominant factor in the development of the service economy. It is consistent with other factors that have a positive impact on service consumption: leisure, lifestyle, demographic structure and living standards of the population, trade liberalisation and globalisation, and sustainable aspirations.

The current stage of the service economy reflects the needs of Industry 4.0 and 5.0. It is defined by the demand for R&D in digitalisation, artificial intelligence and socially beneficial sustainability solutions. Knowledge is a key element of economic growth. The ability to produce quality knowledge-intensive services, including business services, is a feature of a competitive economy.

## 1.2  Applying knowledge in service production and knowledge-intensive business services

The growing impact of knowledge on the development of the economy increasingly links the production and consumption of services and innovations. Knowledge-intensive services (KIS) and, within them, knowledge-intensive business services (KIBS), which fill the gap between business services and market KIS, are gaining priority in the service economy. This is due to their ability to transform innovations across the economy through intermediate demand. KIBS are represented by companies and institutions that possess advanced professional knowledge in a relatively niche domain and transfer their products into customer portfolios as part of the absorption of their products into value chains. KIBS provide high quality services with highly added intellectual value and their activities lead to the creation, accumulation and dissemination of knowledge in order to develop highly personalised services or even product solutions (Muller, Zenker, 2011).

According to Schnabl and Zenker (2013), statistics provided by Eurostat divide the services sector according to their knowledge content. Based on NACE Rev. 2, Eurostat distinguishes between knowledge-intensive services (KIS) and less knowledge-intensive services (LKIS). The first group of KIS is further subdivided into knowledge-intensive market services, high-tech knowledge-intensive services, knowledge-intensive financial services and other knowledge-intensive services. The second group of LKIS is further subdivided into less knowledge-intensive market services and other less knowledge-intensive services.

According to Eurostat (2016), the following sectors of economic activity are defined as knowledge – intensive services, abbreviated as KIS (NACE Rev. 2 codes – two-digit level in brackets):

Knowledge-intensive market services (excluding financial intermediation and high-tech services):

- Water transport (50);
- Air transport (51);
- Legal and accounting activities (69);
- Activities of head offices; management consultancy activities (70);
- Architectural and engineering activities; technical testing and analysis (71);
- Advertising and market research (73);
- Other professional, scientific and technical activities (74);
- Employment activities (78);
- Security and investigation activities (80)

High-tech knowledge-intensive services:

- Motion picture, video and television programme production, sound recording and music publishing activities (59);
- Programming and broadcasting activities (60);
- Telecommunications (61);
- Computer programming, consultancy and related activities (62);
- Information service activities (63);
- Scientific research and development (72)

Knowledge-intensive financial services:

- Financial service activities, except insurance and pension funding (64);
- Insurance, reinsurance and pension funding, except compulsory social security (65);
- Activities auxiliary to financial services and insurance activities (66)

Other knowledge-intensive services:

- Publishing activities (58);
- Veterinary activities (75);
- Public administration and defence; compulsory social security (84);
- Education (85);
- Human health activities (86);
- Residential care activities (87);
- Social work activities without accommodation (88);
- Creative, arts and entertainment activities (90);
- Libraries, archives, museums and other cultural activities (91);

- Gambling and betting activities (92);
- Sports activities and amusement and recreation activities (93)

One of the first definitions of the term ***Knowledge-Intensive Business Services*** is associated with the work of Davis and Botkin from 1994. Their definition was based on the common characteristic of knowledge intensive businesses. KIBS are represented in economic activities by sections J – information and communication services (divisions J 62, J 63) and M – professional, scientific and technical activities (divisions M 69 – M 74) (Schnabl, Zenker, 2013).

Some studies also assign to the group of KIBS services the divisions N78 – employment activities, N80 – security and investigation activities because of their knowledge intensity of production and belonging to business services, selected subdivisions of section K and L, reducing the set to subdivisions (Badulescu, 2020; Doroshenko et al., 2014). Thus, the authors of the studies take a more or less specific approach to defining the set of KIBS, respecting the intention of their own research.

According to Nählinder (2005), ***Knowledge-Intensive Business Services*** (KIBS) are services and business operations that are highly dependent on expert knowledge. As a result, their employment patterns are shaped in favour of scientists, engineers and other professionals. It also distinguishes between technology KIBS, defined by the J 62 and J 63 divisions, and professional KIBS, defined by the remaining divisions in the KIBS set.

## Table 2 Identification of technological and professional KIBS

| Section | Division | Description |
|---|---|---|
| Section J<br><br>**Information and communication**<br><br>**T-KIBS** | 62 | **Computer programming, consultancy and related activities**<br>62.01 Computer programming activities<br>62.02 Computer consultancy activities<br>62.03 Computer facilities management activities<br>62.09 Other information technology and computer activities |
| | 63 | **Information service activities**<br>63.11 Data processing, hosting and related activities<br>63.12 Web portals |
| Section M<br><br>**Professional, scientific and technical activities**<br><br>**P-KIBS** | 69 | **Legal and accounting activities**<br>69.1 Legal activities<br>69.2 Accounting, bookkeeping and auditing activities; tax consultancy |
| | 70 | **Activities of head offices; management consultancy activities**<br>70.1 Activities of head offices<br>70.2 Management consultancy activities<br>70.21 Public relations and communication activities<br>70.22Business and other management consultancy activities |
| | 71 | **Architectural and engineering activities; technical testing and analysis**<br>71.1 Architectural and engineering activities and related technical consultancy<br>71.11 Architectural activities<br>71.12 Engineering activities and related technical consultancy<br>71.2 Technical testing and analysis |
| | 72 | **Scientific research and development**<br>72.1 Research and experimental development on natural sciences and engineering<br>72.2 Research and experimental development on social sciences and humanities |
| | 73 | **Advertising and market research**<br>73.1 Advertising<br>73.2 Market research and public opinion polling |
| | 74 | **Other professional, scientific and technical activities**<br>74.1 Specialised design activities<br>74.9 Other professional, scientific and technical activities |

*Source: Skórska, 2015, Schnabl a Zenker, 2013, also according to the Statistical Classification of Economic Activities SK NACE Rev. 2 listed on the portal of the Statistical Office of the Slovak Republic*

The KIBS services sector is characterized by high company turnover rates, rapid changes in technological advances (e.g. in the software industry), as

well as high interdependence between sub-sectors (e.g. consulting and industry) (Horgos, Koch, 2008).

The production of KIS services has been attributed with a positive impact on the competitiveness of the economy (Haataja, Okkonen, 2004). This is due to the nature of their products accompanied by high levels of value added, sophistication and intermediate demand. However, the group of knowledge-intensive services also includes education services, scientific activities, healthcare and culture. Their output determines the quality of life of the population and the educational level of society. KIS and within them KIBS are part of national innovation systems (Kox, Rubalcaba, 2007). Their performance (employment, exports, sales, etc.) is monitored for this very function in the framework of European statistical initiatives focused on innovation, high-growth enterprises and, partially, on gazelle enterprises.

The most significant producers of KIBS within Europe are the UK, Germany, France and Spain. The first three of these countries are also the leaders in labour productivity achieved in KIBS. Within the V4 countries, the ranking of KIBS revenue achieved in 2016 is as follows: Poland, Czechia, Hungary and Slovakia. An obvious factor influencing this parameter is the strength of the economy and its priority focus.

Graph 1 Development of the number of KIBS enterprises in selected countries
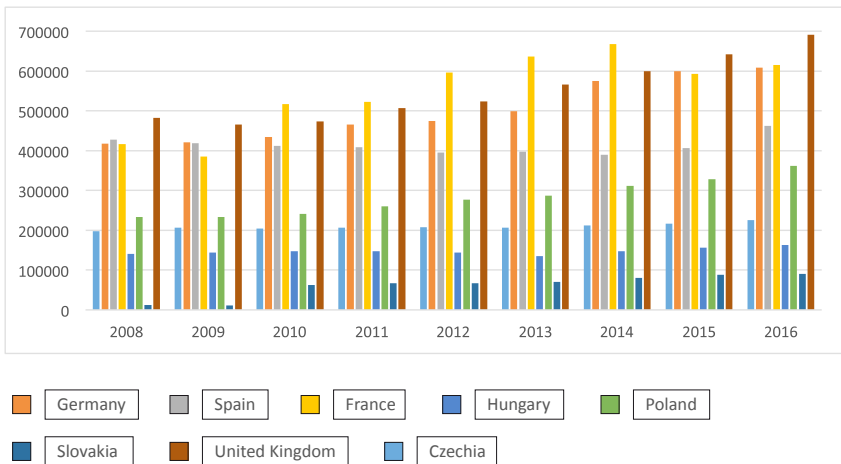


Source: authors´ own based on Eurostat database, 2020

Graph 2 Sales development in KIBS in selected countries (in EUR million)
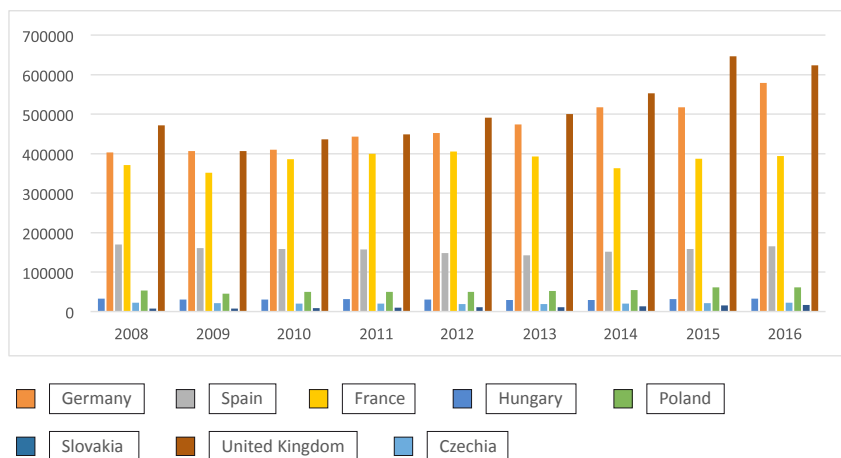


Source: authors´ own based on Eurostat database, 2020

In 2018, KIBS accounted for 13.3% of total GDP in Slovakia, while information and communication services accounted for 4.2% of GDP. In total employment, KIBS accounted for 13.4% and information and communication services 2.9%. (Statistical Office of the Slovak Republic, 2020). Given the statistical availability of GDP and employment, the KIBS includes the performance of sections J, M. In the period 2008–2017, in Slovakia, the volume of GDP generated in sections J and M together was increasing, amounting to 5 211.5 million euro in 2007 and 7 933.0 million euro in 2017. Only in 2013 a decrease in this indicator was recorded. This volume was the lowest among the V4 countries, but the growth rate was higher in Slovakia than in Czechia and Hungary. The average annual growth rate of GDP in KIBS in Slovakia was 4.8% in the period under review (European Commission, 2020). The dynamics of the development of the KIBS in Slovakia suggests that they have a relatively significant impact on the Slovak economy. At the same time, their impact also strengthens the ability of KIBS products to transform innovations into customers and to improve value chains in the Slovak economy. A comparison of the achieved labour productivity in KIBS (expressed as sales per employee) and its development between 2008 and 2017 in the selected countries suggests that the productivity of KIBS in Slovakia has experienced growth and is the highest in the V4 countries at the end of the period

under review and reaches the level of labour productivity achieved in Spain. Promoting performance improvement in KIBS in Slovakia is a challenge for innovation and its management.

Graph 3 Labour productivity in KIBS (in EUR thousands)
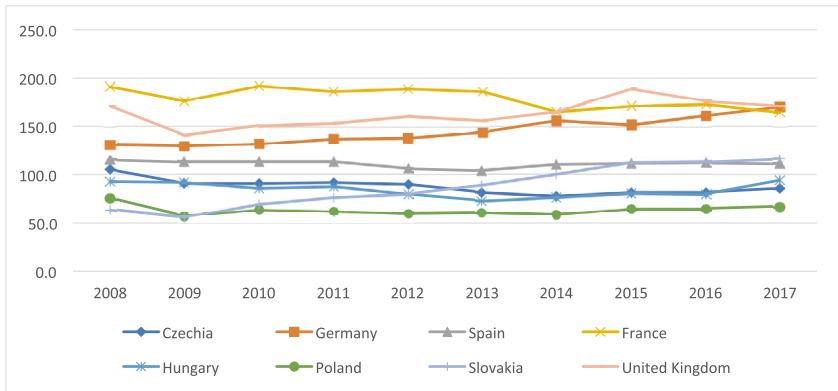


*Source: authors´ own based on Eurostat database, 2020*

## 1.3 Development of service production by knowledge intensity in selected countries

The largest production in tourism services (less knowledge-intensive services) was produced in Germany, France and the United Kingdom (ranging from €69,613 million to €108,493.7 million) during the whole period under review (Table 3). Conversely, the least production in this sector was produced in Croatia, Hungary and Slovakia (ranging from €989 million to €4 406.4 million).

Table 3 Service production in tourism in selected countries
(in EUR million)

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|
| Czechia | 4 865,2 | 4 681,3 | 4 558,0 | 4 467,2 | 4 843,2 | 5 318,1 | 6 405,0 | 6 974,4 |
| Germany | 70 289,7 | 71 766,9 | 69 613,0 | 78 715,7 | 84 936,6 | 90 312,2 | 93 802,4 | 102 674,3 |
| Spain | 58 417,4 | 57 541,8 | 56 494,4 | 57 718,3 | 62 042,4 | 66 535,0 | 73 029,5 | 76 540,5 |
| France | 83 336,8 | 84 005,5 | 85 970,4 | 90 617,3 | 93 055,9 | 95 281,6 | 99 571,8 | 103 952,8 |
| Croatia | 2 260,3 | 2 310,8 | 2 891,9 | 2 949,9 | 3 212,0 | 3 735,4 | 3 975,7 | 4 406,4 |
| Hungary | 2 102,5 | 2 098,4 | 2 170,4 | 2 428,1 | 2 746,9 | 2 958,8 | 3 454,2 | 4 035,2 |
| Austria | 15 378,9 | 16 075,2 | 16 703,8 | 17 115,5 | 17 927,1 | 18 979,8 | 19 975,4 | 21 456,9 |
| Poland | 5 978,2 | 6 133,0 | 6 445,2 | 6 809,4 | 6 790,5 | 7 603,6 | 8 818,5 | 11 745,1 |
| Slovakia | 989,0 | 1 158,0 | 1 213,0 | 1 215,0 | 1 320,8 | 1 487,1 | 1 571,2 | 1 675,4 |
| Sweden | 12 440,9 | 13 557,3 | 14 382,1 | 14 411,0 | 15 043,2 | 16 037,6 | 16 440,2 | 17 112,3 |
| United Kingdom | 70 563,5 | 84 380,5 | 82 069,7 | 93 939,5 | 107 485,9 | 105 920,4 | 108 493,7 | 103 447,5 |

*Source: Eurostat, 2021*

The service production development in tourism in the V4 countries between 2011 and 2018 is shown in Graph 4. It can be seen that the largest production among these countries was in Poland, namely in 2018, amounting to 11 745.1 million euro. The lowest production was in Slovakia in 2011, namely 989 million euro.

Graph 4 Service production development in tourism (section I) in EUR million in the V4 countries
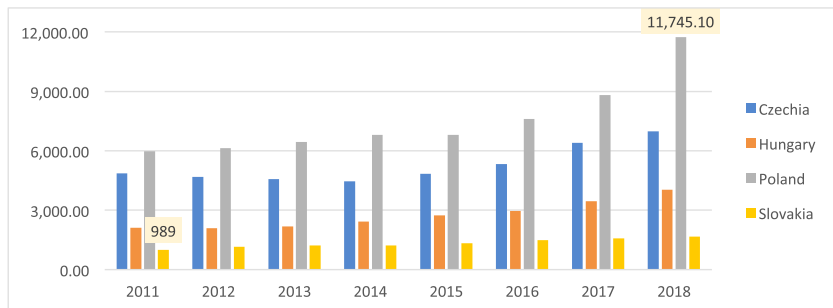


*Source: authors´ own based on Eurostat database, 2011–2018*

Graph 5 Service production development in tourism (section I) in EUR million in selected countries
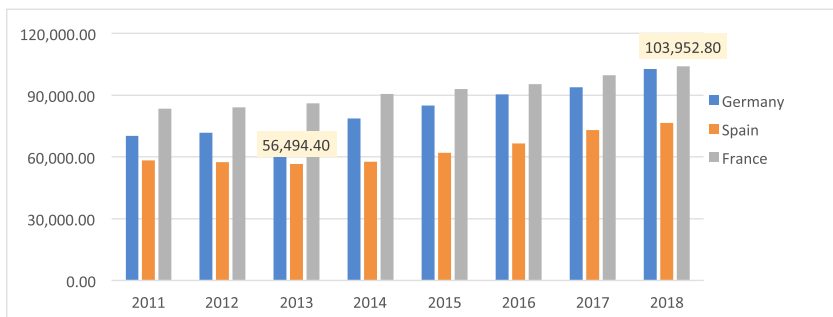


*Source: authors´ own based on Eurostat database, 2011–2018*

Graph 5 shows the development of production in Germany, France and Spain. Among these countries, the highest service production in tourism was found in France in 2018, at 103,952.8 million euro. The lowest production in this sector was recorded in Spain, namely in 2013, at 56,494.4 million euro.

The relative change in production can be analysed using a number of time series characteristics, the growth rate (Table 4) shows that production grew in almost all countries over the whole period, but most notably in the UK, which saw a 19.58% increase in 2012 compared to 2011. On the other hand,

the highest relative decrease was in Czechia in 2012 compared to the previous year, with a decrease of 3.78%. Over the whole period under review, the highest average annual relative growth in service production in tourism was in Poland, up by 10.13%.

Table 4 Growth rates and average growth rates of service production in tourism in selected countries

|  | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\bar{k}$ |
|---|---|---|---|---|---|---|---|---|
| Czechia | 0,9622 | 0,9737 | 0,9801 | 1,0842 | 1,0981 | 1,2044 | 1,0889 | 1,0528 |
| Germany | 1,0210 | 0,9700 | 1,1308 | 1,0790 | 1,0633 | 1,0386 | 1,0946 | 1,0556 |
| Spain | 0,9850 | 0,9818 | 1,0217 | 1,0749 | 1,0724 | 1,0976 | 1,0481 | 1,0394 |
| France | 1,0080 | 1,0234 | 1,0541 | 1,0269 | 1,0239 | 1,0450 | 1,0440 | 1,0320 |
| Croatia | 1,0223 | 1,2515 | 1,0201 | 1,0889 | 1,1630 | 1,0643 | 1,1083 | 1,1001 |
| Hungary | 0,9980 | 1,0343 | 1,1187 | 1,1313 | 1,0771 | 1,1674 | 1,1682 | 1,0976 |
| Austria | 1,0453 | 1,0391 | 1,0246 | 1,0474 | 1,0587 | 1,0525 | 1,0742 | 1,0487 |
| Poland | 1,0259 | 1,0509 | 1,0565 | 0,9972 | 1,1197 | 1,1598 | 1,3319 | 1,1013 |
| Slovakia | 1,1709 | 1,0475 | 1,0016 | 1,0871 | 1,1259 | 1,0566 | 1,0663 | 1,0782 |
| Sweden | 1,0897 | 1,0608 | 1,0020 | 1,0439 | 1,0661 | 1,0251 | 1,0409 | 1,0466 |
| United Kingdom | 1,1958 | 0,9726 | 1,1446 | 1,1442 | 0,9854 | 1,0243 | 0,9535 | 1,0562 |

*Source: authors´ own based on Eurostat database, 2021*

The largest share of production in information and communication services (knowledge-intensive services) was in Germany, France and the United Kingdom (ranging from 174 040.1 million to 152.1 million euro) during the whole period under review. Conversely, the least output in this sector was produced in Croatia, Hungary and Slovakia (ranging from 3 108.6 million to 9 643.4 million euro).

Table 5 Production in information and communication services in selected countries (EUR million)

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|
| Czechia | 13 360,2 | 12 904,2 | 12 328,9 | 11 925,1 | 13 322,4 | 14 342,0 | 15 963,5 | 17 852,8 |
| Germany | 174 928,5 | 179 468,8 | 189 004,9 | 194 391,2 | 192 661,8 | 195 611,1 | 206 493,6 | 223 118,0 |
| Spain | 62 736,6 | 59 353,8 | 57 018,7 | 56 503,5 | 59 289,6 | 62 211,8 | 66 398,3 | 66 267,9 |
| France | 180 841,4 | 182 114,1 | 174 040,1 | 180 292,8 | 183 505,4 | 189 151,1 | 205 116,7 | 205 160,7 |
| Croatia | 3 444,1 | 3 254,0 | 3 166,3 | 3 108,6 | 3 177,4 | 3 325,4 | 3 675,6 | 3 905,4 |
| Hungary | 7 539,8 | 7 464,8 | 7 504,2 | 7 448,1 | 7 716,6 | 7 982,9 | 9 070,2 | 9 643,4 |
| Austria | 14 007,2 | 14 175,6 | 14 766,6 | 15 476,8 | 16 050,2 | 16 249,4 | 16 790,5 | 17 263,4 |
| Poland | 24 279,8 | 25 004,1 | 25 056,8 | 25 198,8 | 26 689,9 | 28 144,6 | 31 503,2 | 34 886,4 |
| Slovakia | 4 764,6 | 4 979,3 | 4 858,0 | 4 937,7 | 5 517,8 | 5 731,5 | 6 118,2 | 6 526,2 |
| Sweden | 40 011,2 | 42 711,7 | 43 391,8 | 43 612,2 | 55 378,4 | 54 771,7 | 55 417,4 | 56 099,2 |
| United Kingdom | 204 929,8 | 219 120,5 | 217 058,1 | 242 122,0 | 287 650,1 | 276 756,5 | 269 657,2 | 293 152,1 |

*Source: Eurostat, 2021*

The production development in information and communication services in the V4 countries between 2011 and 2018 is shown in Graph 6. It can be seen that the largest production among these countries was in Poland, amounting to 34 886.4 million euro in 2018. The lowest production was in Slovakia in 2011 (4 764.6 million euro).

Graph 7 shows the development of production in Germany, Spain, France and the United Kingdom. Among these countries, the highest production in information and communication services was found in the United Kingdom in 2018, amounting to EUR 293,152.1 million euro. The lowest production in this sector was recorded in Spain in 2014 (56,503.5 million euro).

Graph 6 Production development in information and communication services (Section J) in EUR million in the V4 countries
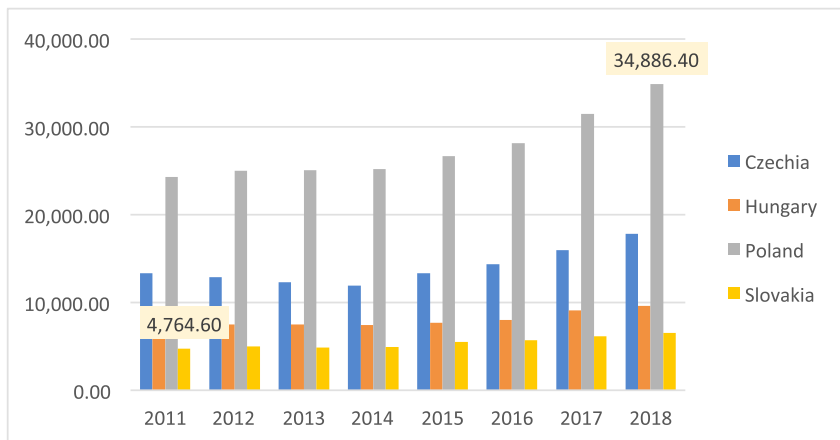


*Source: authors´ own based on Eurostat database, 2011–2018*

Graph 7 Production development in information and communication services (Section J) in EUR million in selected countries
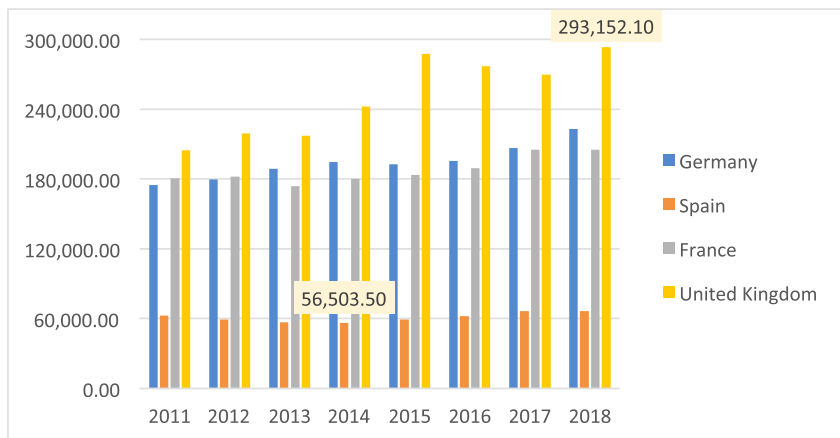


*Source: authors´ own based on Eurostat database, 2011–2018*

23

The relative change in production, tracked through the growth rate (Table 6), shows that production grew in almost all countries throughout the period, but increased the most in Sweden in 2015 compared to 2014 by 26.98%. On the other hand, the highest relative decrease was recorded in Spain in 2012 compared to the previous year, with a decrease of 5.39%. Over the whole period under review, the highest annual average relative growth in production in information and communication services was in Poland, up by 5.31%.

Table 6 Growth rates and average growth rates of production
in the information and communication services in selected countries

| GEO/TIME | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\bar{k}$ |
|---|---|---|---|---|---|---|---|---|
| Czechia | 0,9659 | 0,9554 | 0,9672 | 1,1172 | 1,0765 | 1,1131 | 1,1184 | 1,0423 |
| Germany | 1,0260 | 1,0531 | 1,0285 | 0,9911 | 1,0153 | 1,0556 | 1,0805 | 1,0354 |
| Spain | 0,9461 | 0,9607 | 0,9910 | 1,0493 | 1,0493 | 1,0673 | 0,9980 | 1,0079 |
| France | 1,0070 | 0,9557 | 1,0359 | 1,0178 | 1,0308 | 1,0844 | 1,0002 | 1,0182 |
| Croatia | 0,9448 | 0,9730 | 0,9818 | 1,0221 | 1,0466 | 1,1053 | 1,0625 | 1,0181 |
| Hungary | 0,9901 | 1,0053 | 0,9925 | 1,0360 | 1,0345 | 1,1362 | 1,0632 | 1,0358 |
| Austria | 1,0120 | 1,0417 | 1,0481 | 1,0370 | 1,0124 | 1,0333 | 1,0282 | 1,0303 |
| Poland | 1,0298 | 1,0021 | 1,0057 | 1,0592 | 1,0545 | 1,1193 | 1,1074 | 1,0531 |
| Slovakia | 1,0451 | 0,9756 | 1,0164 | 1,1175 | 1,0387 | 1,0675 | 1,0667 | 1,0460 |
| Sweden | 1,0675 | 1,0159 | 1,0051 | 1,2698 | 0,9890 | 1,0118 | 1,0123 | 1,0495 |
| United Kingdom | 1,0692 | 0,9906 | 1,1155 | 1,1880 | 0,9621 | 0,9743 | 1,0871 | 1,0525 |

*Source: authors´ own based on Eurostat database, 2021*

## Summary

"The 'service economy' is characterised by the rise of the service sector's dominance in terms of employment and value added shares. Service production was stimulated in the 1970s, when changes in the resource structure of economic growth were taking place and efforts to exploit endogenous resources were gaining strength. Technological progress and the innovations it generates have become an essential source of growth, which is becoming more effective due to the development and implementation of information and communication technologies, robotics and artificial intelligence. This has nowadays given rise to the characteristics of Industry 4.0, where services are gaining strength through their significant share in the production of information and communication technologies and in the production of R&D services.

Knowledge-intensive services (KIS) and, within them, knowledge-intensive business services (KIBS) are taking priority in the service economy. The most important producers of KIBS within Europe are the UK, Germany, France and Spain. KIBS are represented by companies and institutions that have advanced professional knowledge in a relatively niche domain and transfer their products into value chains as part of the absorption of their products into customer portfolios. KIBS are part of both value chains and the production of tourism services. They thus ensure the transfer of technology and knowledge that increases the efficiency and competitiveness of their production.

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# 2 DEMAND FOR SERVICES

An essential feature of a developed economy is an economically strong service sector, which is a phenomenon of the modern economy. This phenomenon is evident thanks to globalisation, which is facilitating processes of de-industrialisation and relocating production to less developed countries. Also, the maturity of society places demands on the development of public services, and specialisation results in the strengthening of production services. These processes result in production and employment growth in services. Changes in the lifestyles of today's modern man are creating new requirements for market demand for services.

These processes are dynamised by the effects of socio-technological changes. Adaptation to change is thus a challenge for service production. It is therefore justified to look at the consequences of socio-technological changes on the demand for services, which is manifested in changes in the structure of demand, on the basis of knowledge of the current socio-technological changes in the economy and society, which then allows us to identify their main implications for changes in the demand for services, as well as future trends.

Based on general economic definitions of the term 'demand', it can be said that the demand for services represents the volume of services that buyers are willing to purchase, depending on the price. It expresses a comprehensive view of the quantity of intangible goods that a buyer would purchase at a certain price. Demand thus expresses the interdependence between the quantity of services demanded and their price. The current evolutionary theory of demand shifts the focus to consider the impact of other factors that change demand. In doing so, it also draws inspiration from behavioural economics and changes in consumer behaviour (Valente, 2012). In addition to price and consumer behaviour, the authors also identify substitution possibilities with other goods, consumer income, and the economic and political situation influenced by socio-technological changes as relevant factors (Hachula, Schmeidel, 2016). In general, we recognize the carriers of the demand for services, where there are the household sector, the business sector, the government and the foreign sectors.

- **The household sector** represents consumers who satisfy their needs in the market where they act as buyers. They allocate their income to the purchase of consumer goods and services, savings and the tax payments.

They are mainly influenced by their income, their consumption expenditure related to price increases or decreases. Other factors that influence this sector include socio-economic structure, educational level, and growth in leisure time, technological progress or the increase in the average age of the population (Lisý et al., 2005; Michalová, 1998; Holková, Veselková and Valach, 2014).

- **The business sector** buys production factors from households and pays households wages, rent or interest for their use. It uses the production factors to produce goods and services and then sells them, thereby earning revenue from the given output. This sector is influenced by the scope and complexity of legislation, competitiveness and the growing need for information, innovation, professional development of personnel or the complexity of the technical equipment used (Lisý et al., 2005; Michalová, 1998; Holková, Veselková and Valach, 2014).

- **The government sector** is a specific market entity. Government revenues are mainly made up of taxes, duties, non-tax revenues, donations and grants. Government expenditure can be divided into government purchases of goods, services and transfer payments. The expenditure area of the Government of the Slovak Republic includes the general public service, defence, public order and security, the economic area, environmental protection, as well as housing and amenities, healthcare, recreation, culture, religion, education and social security. This sector is shaped by the scope and intensity of government policy in the areas of healthcare, education, social welfare, security, as well as environmental protection (Lisý et al., 2005; Michalová, 1998; Holková, Veselková and Valach, 2014; Ministry of Finance, 2017; Hontyová, 2005).

- These three entities represent domestic entities. Foreign entities such as households, enterprises and governments represent the fourth sector – **foreign** one. Foreigners purchase consumer goods and services and invest in the home country. Conversely, domestic entities are economically active abroad. We define the difference between exports and imports as net exports, which also affect a country's economy.

The total output of goods and services that households, enterprises, government and foreign countries are willing to buy at a certain price level is aggregate demand. The structure of aggregate demand can be expressed by the relationship (Lisý et al., 2005):

$$AD = C + I + G + NX$$

Aggregate demand equals total spending in the economy. It is equal to the sum of total household expenditures (C), business investments (I), government spending (G) and net exports (NX). It can also be noted that:

- (C) Household expenditures constitute the demand for final goods and services; it can also be referred to as final consumption demand;
- Expenditures by enterprises constitute demand for capital goods and services, or intermediate demand;
- (G) government expenditures constitute demand for goods and services;
- (NX) net exports identify the demand for domestic goods and services by foreign entities.

The quantification of the demand for services is based on the fact that services are indivisible, ephemeral and intangible. Therefore, measuring production in the services sector is more complex than in other sectors of the economy. The production of services and products as an aggregate variable can be identified through GDP. However, in this case, the production of services consists of market output (products actually sold on the market or that would be sold on the market) and non-market output (products whose demand and supply are not regulated by the market price mechanism, such as the production of government or non-profit institutions providing services for free or at reduced prices) (Michalová, Benešová and Šťastná, 2013).

## 2.1 Types of demand

In theory and practice, we distinguish two types of demand for services – final consumption demand and intermediate demand – but the possibilities of quantifying them differ:

### a. Final consumption demand and the factors affecting it

Final consumption demand is the demand for consumer services by individual households. There are many factors (age, gender, income, education, occupation ...) acting on consumer behaviour, because the actual purchasing process is carried out by the activity of the recognised consumer. Knowing the current consumer helps to create a personalised service offer. According to Michalová (1998), the contemporary consumer is more informed, also as a result of the rapid development of information and communication technologies. A service is information tailored to the customer. Today's consumer is demanding and more critical, which may cause them to express their

dissatisfaction with products more often, and thus increase the number of complaints. They demand a high quality of service coupled with the satisfaction of their individual needs. It is characterised by individualism and highly differentiated service requirements. Today, the consumer is often involved in the production process as a producer and consumer, the so-called *prosumer* (producer + consumer). According to the authors A. Kusá, V. Hrabačková, I. Máliková and P. Grešková (2015), today's consumers live digitally and make intensive use of online shopping. Their demands on product quality and the purchasing process itself are increasing, but their loyalty is decreasing. Contemporary consumer behaviour is experience-based. For this reason, enterprises need to put more effort into ensuring the desired level of likeability and brand loyalty. The consumer does not want to be manipulated by advertising and is looking for a personalised shopping experience.

The diversity of the global market with individual differences in nationalities, cultures, interests, expectations or needs creates room for differentiated supply. However, consumer behaviour is influenced by basic factors (Michalová, Benešová and Šťastná, 2013), which are: economic (disposable income); temporal (services representing real-time production); cognitive (personality, experience) and other (perception, attitude ...). Other factors include criteria relating to market segmentation, which allows producers to partially avoid competition and meet the different needs of consumers. The segmentation criteria can be divided into the following four basic categories (Kusá et al., 2015):

(a) *Demographic criteria* – reflect population statistics. For example, age is a strong determinant of consumer behaviour, influencing individuals' interests, tastes, purchasing activities, policy preferences and investment behaviour (Hawkins, Best and Coney, 1993).

(b) *Geographical criteria* – capture consumer behaviour in the context of geographical characteristics. Variables may include population density, settlement type, climate, catchment area or city size.

(c) *Psychographic criteria* – rely on the psychological and personal characteristics of the consumer. The determinants of these criteria are lifestyle, personality, value ranking and psychological profiles.

(d) *Behavioural criteria* – represent the segmentation of consumers according to behaviour. They divide customers into groups based on their knowledge, attitudes or responses to the product and service. Indicators within these criteria include frequency of purchases, product

and service usage, attitudes towards purchases, loyalty, expected benefits as well as consumer readiness to purchase.

The generational distribution of consumers (Kotler and Keller, 2007) is one of the original socio-demographic divisions of the population. It groups consumers according to their years of birth and at the same time assumes their typical traits, characteristics, world views as well as values for a given period. Consumer behaviour helps to understand customer needs, identify potential and trends in development for a closer understanding of markets. The study of consumer behaviour is complex due to the number of variables and their tendency to interact. The consumer himself is influenced by a variety of factors that determine his behaviour. According to the authors K. Richterová, M. Kulčáková, and D. Klepochová (2005), a consumer is an individual who purchases products and services for his own consumption, for use in the family, for a family member or as a gift. The demand of final consumers is associated with increasing income and wealth, changes in lifestyles, people's increasing aspirations for lifelong learning, increasing mobility and cognition, an increase in the number of women involved in the workforce, an ageing population and the loosening of traditional family ties (Michalová, Benešová and Šťastná, 2013).

It is quantified through statistical data tracking household expenditures on individual consumption services, which can be categorised using COICOP (Classification of Individual Household Consumption by Purpose).

### b. Intermediate demand and factors influencing it

Intermediate demand is the demand of producers in order to produce a final product; it is the demand of enterprises for production services. The complementarity of products causes producers to seek competitive advantage in services, and thus services become a tool for differentiating the supply of production companies through innovation, specialisation and externalisation.

For this reason, when deciding on externalization or internalization, we can draw on the work of economists R. H. Coase (1937) and O. E. Williamson (1990), adherents of the New Institutional Economics. In their elaborated Theory of Transaction Costs, they point to their importance for achieving economic efficiency in society (Liška, Sluková and Volejníková, 2011). The basic unit of analysis in institutional economics is the transaction or any act of change between the participants in a contractual relationship. It can be a one-off, occasional or repeated transaction. Transaction costs then represent

the costs that result from the operation of this economic system. We include here the costs associated with the preparation and conclusion of the transaction through contracts – ex ante and the costs induced by the non-compliance with this contract – ex post (Mlčoch, 2005; Holman et al., 2001). The existence of transaction costs explained, according to Coase, the existence of the company (Soukup et al., 2015; Holman et al., 2001). That is, a comes into existence when the administrative costs associated with the use of resources within the firm are greater than the transaction costs associated with the use of these resources through market contractual acts (Holman et al., 2001).

It is these activities – contractual acts – that can be considered as service activities, nowadays as outsourcing[1] and offshoring.[2] According to O. E. Williamson, a firm's decision to use internal or external services can be analysed on the basis of Scheme 1 of the "boundaries of the firm" (Williamson, 1990).

Figure 1 Boundaries of the firm
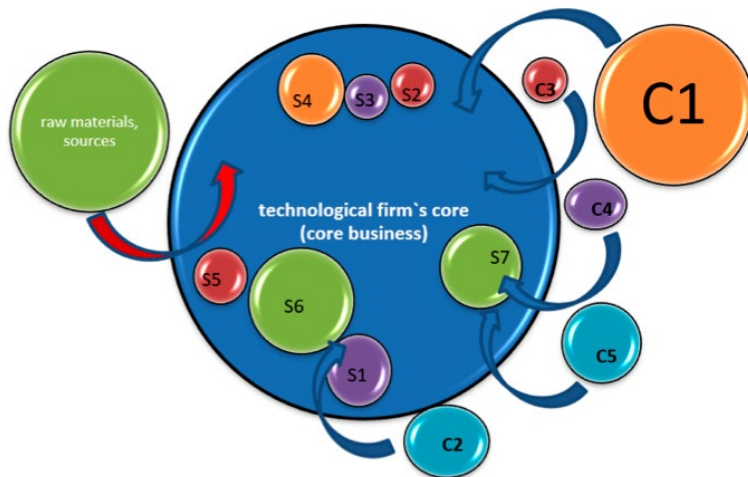


*Source: authors´ own based on O.E. Williamson, 1990*

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[1] Outsourcing – the strategic use of external resources for activities that are traditionally performed by internal employees, or resources (Sivák et al., 2011 ).

[2] Offshoring – transferring the operational process of production, support activities of one firm to a firm based abroad in order to reduce production costs. However, production can also be transferred to another, completely independent firm in the host country (Sivák et al., 2011; Dvořáček and Tyll, 2010).

O. E. Williamson suggests that the firm represents the technological core and performs "core activities" through the unique, specific activities listed in the circle (S1, S2, S3, S4, S5, S6, and S7). Raw materials as input for the technological core are purchased by the firm on the market. However, there are other activities in the firm that do not have such strong specialization and are not as unique. These activities can be carried out by other firms and cheaper than if the firm carried out these activities itself (C1, C2, C3, C4, C5). Thus, the firm makes a 'make or buy' decision based on the transaction costs associated with contracting such activities in the market and on the specificity and uniqueness of the service.

In addition to socio-technological changes (Chapter 2.3), other factors that influence intermediate demand for services can be identified. These are mainly general as well as specific factors determining the externalisation of services, such as competence, cost, capacity, quality, risk, time, legislation, compatibility, control, flexibility, competition, accessibility and psycho-social motives. Specific ones include customer desires, profit, product-service relationship or strategic importance (Michalová, Benešová and Šťastná, 2013).

However, the effectiveness of the factors escalates with socio-technological changes. These factors represent the key factors influencing externalisation from within the company, i.e. at the micro level. However, in order to understand the relationship between socio-technological change and intermediate demand for services, it is important to mention the factors that externally affect companies, i.e. at the macro level. Summarizing the views of several authors (Michalová, Krošláková, 2014; Michalová, Benešová and Šťastná, 2013; Kubičková et al., 2016; Roa, Kothari and Kurtz, 1993; Chahal, 2015; Joshi, 2008 and others), we can state that the development of intermediate demand for services at the macro level is mainly influenced by the following factors:

- economic growth and economic performance,
- globalisation,
- knowledge intensity of production,
- innovation/ companies´ innovation activity,
- structure of the economy,
- strength of key industries.

In general, it can be stated that the production produced in services is consumed at the same time, therefore the parameter of realised sales as well as the parameter of added value are possible expressions of the volume of de-

mand. Value added represents the difference between the gross production and the costs incurred by the company for the purchase of raw materials, materials, so-called intermediate goods from other companies (Lisý et al., 2007). The quantification and evolution of the demand for services is dealt with in numerous studies by foreign authors (Dehejia – Panagariya, 2016; Semia, Sunday – Ini, 2015; Das – Saha, 2015), who quantified it by means of the evolution of value added or sales.

## 2.2 The service economy and the demand for services

Increased demand for services, linked to the explosive growth of the services sector in recent decades, is one of the most striking trends in economies. This is confirmed by statistical data on the growth of employment in services or their share in gross domestic product (GDP). However, the economic level of a country is not only measured by the level of GDP but also by the structure of its economy, as defined by V. Gavaľová (2012). The European Union is characterised by a modern structure of the economy, which represents the highest level in terms of the classical path of structural development of the economy, where services dominate in the first place. The service sector is essential for economic growth in any economy and represents the largest and fastest growing sector in the world economy in the last two decades (Chahal, 2015; Joshi, 2008).

Graph 1 Classical path of structural development
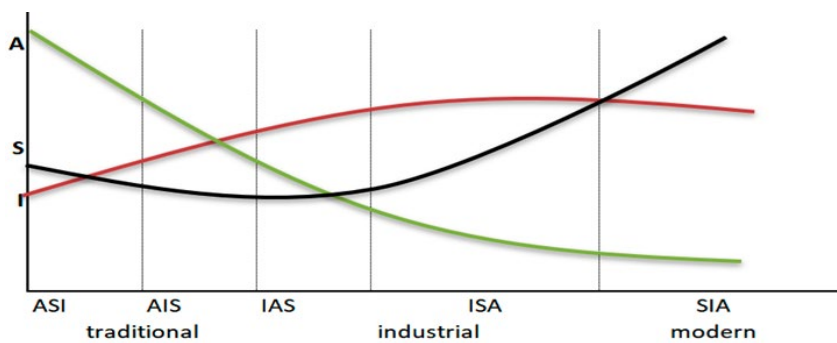


*Source: authors´own according to the economic encyclopedia Euroeconomy, 2016.*

The curves A (primary sector), I (secondary sector), S (tertiary sector) express the structural development of economies (Graph 1) and take into account the share of individual sectors of the economy in GDP (Gavaľová, 2012). According to Holub (1970), there are three historical stages of economic development: traditional (ASI, AIS), industrial (IAS, ISA) and modern (SIA). The dominance of the service sector is associated with the third phase of development. Modern economies achieve the largest share of the service sector in the structure of the economy. This is the model of the modern SIA structure (services – industry – agribusiness), which is dominant mainly in the EU countries and the USA. However, despite the fact that the EU countries represent the most advanced economic structure, the SIA model has also been affected by the crisis phenomena. Former European Commissioner for Industry and Entrepreneurship F. N. Feroci saw the reindustrialisation of the EU as a way out of the crisis (European Commission, 2014a).

Graph 2 Share of services in total employment and GDP in selected European Union countries in 2020 (%)
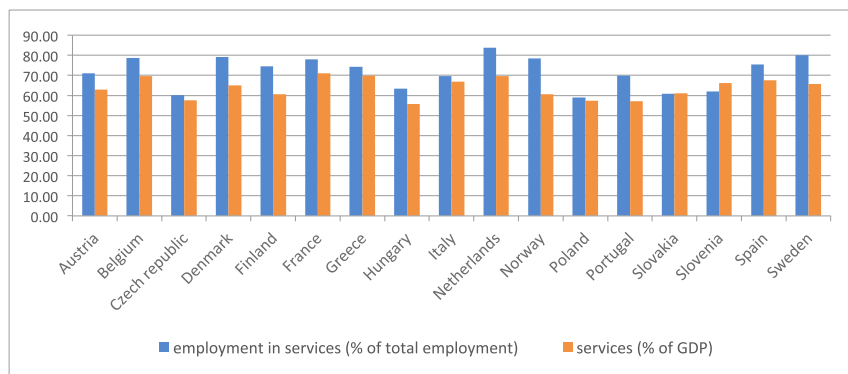


Source: authors´own based on OECD and World Bank data, 2021

From Graph 2 it can be identified that in the selected countries the share of services in GDP was recorded above half. The share of services in GDP for 2020 was recorded highest in France – 71.03% and lowest in Hungary – 55.83%. The share of service sector employment in total employment of the economy is also above half and is reflected in all observed countries. The highest share of services employment for 2020 was achieved in the Netherlands – 83.86% and in Sweden – 80.10%. Graph 2 also shows that the EU coun-

tries represent a model of a modern SIA structure. According to O. Nosáľová (2006), this structure is not a special phenomenon for the Slovak economy, because it is an economy that has already gone through a substantial industrialisation phase, and in 1995-2003 the SIA structure was strengthened.

Systemic, technological and organizational changes in advanced economies are affecting the promotion of services in economic processes. One of the key pillars of the growth of services in Slovakia, but especially in the Visegrad Four countries, has been the complicated process of economic transformation. The transition from a centrally planned economy to a market economy has changed the approach to the status of services. The economic transformation highlighted the importance of innovation and the necessary structural changes in industry, job creation, social welfare, economic growth and international trade (Gallouj and Windrum, 2008). Deindustrialization was accompanied by an increase in the role of services in the national economy (Vintrova, 1997). The workforce released from heavy industry enterprises was partly absorbed by service enterprises (Baláž, Kluvánková-Oravská, and Zajac, 2007).

The position of services in the economy during the transition process was, according to the authors' collective V. Michalová, D. Benešová and J. Šťastná (2013), marked mainly by the increase in the number of business entities and their demand for services, as well as the dependence of business strategies and development in the changed economic conditions on service activities such as organization, storage, financing, trading, recycling of products and materials. The replacement of central planning by a market mechanism increased the risks that needed to be identified and contained. This increased the demand for insurance services. In the transition period, at a time of increased risk, uncertainty or vulnerability for all market players, demand for services increased. There was increasing pressure for a closer link between product and service production, as well as for an increased representation of services in the exchange process in order to gain comparative advantages in the context of the intensification of international economic relations and the liberalisation of the terms of trade. The demand for services increased, as well as the need for a functional service infrastructure for the proper functioning of the market economy.

Graph 3 shows similar trends in employment by sector in Hungary, Czechia, Poland and Slovakia. Between 1994 and 2020, there was a significant increase in employment, especially in the service sector. However, changes in the representation of economic activities do not indicate that agriculture and

industry are not essential to the economy. But they are becoming more efficient thanks to scientific and technological progress, automation or progressive technologies. According to the authors V. Michalová, D. Benešová and J. Šťastná (2013), "*it is more likely that, as it was in previous decades, the share of employee productivity will decrease in line with the historical trend with the growth of the capital, skill and technological content of activities in manufacturing industries*".

Based on the data from the Statistical Office of the Slovak Republic (SO SR), we record the development changes in individual sectors of the economy (Graph 4). The significant growth of the service sector in Slovakia during the reform and integration process was modified in recent years by crisis phenomena. The consequences of the crisis were more intensively manifested in the decline of GDP formation in the industrial and agricultural sectors, but a faster overcoming of these phenomena was recorded in the service sector (Michalová, Benešová and Šťastná, 2013).

Graph 3 Employment gains and losses by sector in selected countries, 1994–2020 (%)
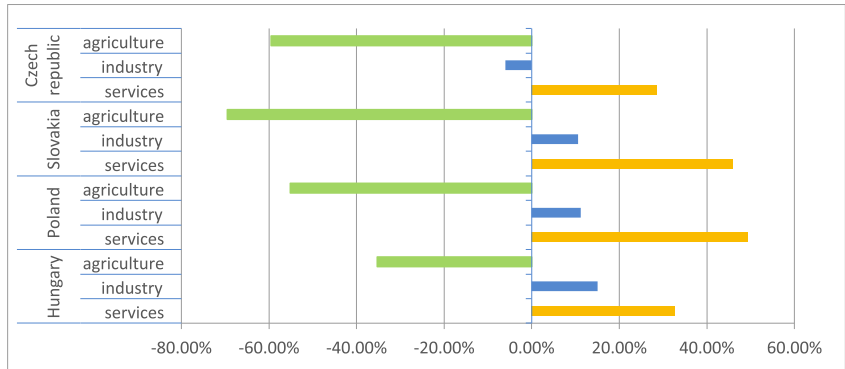


*Source: authors´ own based on Labour Force Statistics OECD, 2021*

Graph 4 GDP development in individual sectors of Slovakia
in the years 1995–2020 (%)
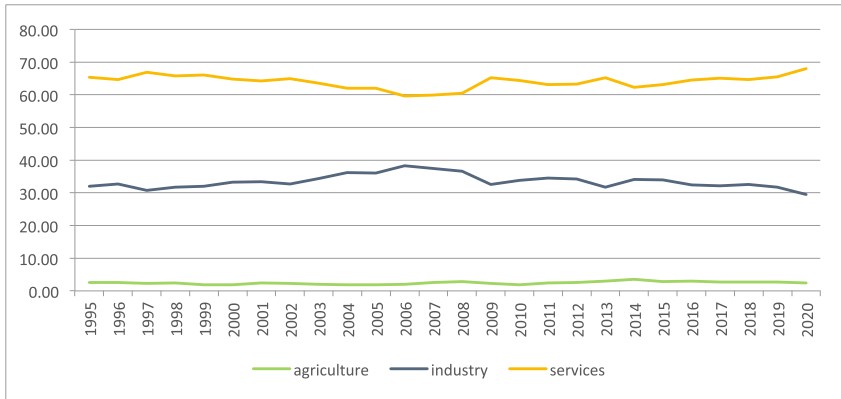


*Source: authors´ own based on data from the time series database of the Statistical Office
of the Slovak Republic, 2021*

## 2.3 Impact of changes in society on the demand for services

Currently, the world economy is undergoing turbulent changes, which are triggered by many circumstances, some of which are global, while others are more local in nature (Baláž, Hamara and Sopková, 2015). The most frequently cited societal changes are population ageing, migration, globalisation and global warming. However, authors and relevant studies broaden this group in terms of a more rigorous specification. The following chapter systematises the available theoretical approaches of the authors to the manifestations of socio-technological change. It identifies the services for which demand is changing in the context of existing changes. In doing so, changes in demand can be traced both quantitatively and qualitatively. The ultimate extent of changes in demand for services cannot be identified in an exhaustive way and, moreover, varies according to the geopolitical location of its origin. However, socio-technological developments are causing changes in the design of services, products have new qualitative characteristics and meet new client expectations. Qualitative changes are thus evident in all service sectors, due to the effects of not only social but also technological change.

### *2.3.1 Impact of societal changes*

Societal changes have been the subject of research in several social sciences, such as sociology, psychology, economics, political science and anthropology. These changes affect all areas in society on a global scale. At the societal level, they affect social institutions, politics, economics, education, technology, the legal system, the family, religion and many others. At the individual level, values shape attitudes, beliefs and behaviour. They influence and change our way of life (UNCW, 2016). In order to better specify the changes in demand for services, it is necessary to identify the changes that shape society and according to Sopóci (2007), they take place in five areas (population, family, education, economy, and change in power relations). The following Table 1 systematizes the available theoretical approaches of the authors to the manifestations of societal changes.

The manner and extent to which an economy copes with societal changes can be reflected in the quality of the business environment, which can be measured through competitiveness indices (e.g. the index of economic freedom). The index of economic freedom is a parameter identifying the adaptation of an economy to societal changes, especially economic change, as it assesses the economy of a country through government measures and the consistency of monetary policy. It focuses on the area of legal structures and property rights, freedom to trade internationally and related terms of trade, as well as the labour area in the form of regulation of working conditions, minimum wages, and the burden of taxation.

Table 1 Areas and manifestations of societal changes, implications for the demand for services within these areas

| Area | Manifestations | Exposed impacts on demand for services (SERVICE INDUSTRIES) |
|---|---|---|
| Population | • Ageing population;<br>• Migration;<br>• Disparities in living standards;<br>• Quantitative population growth;<br>• Increasing life expectancy;<br>• Security; | • Q – increased demand for health and social care<br>• Q – increased demand for care services;<br>• G – qualitative and quantitative changes in specialty food, clothing and medical retail;<br>• R – qualitative and quantitative changes in arts, entertainment and recreation;<br>• O, E, N – changes in demand for public services and security; |
| Family | • Singles population;<br>• Change in the institutionalization of family and partnership;<br>• Women's employment;<br>• Income doubling;<br>• Diversity of lifestyles; | • I – qualitative changes in demand related to the singles population;<br>• M – increased demand for legal services;<br>• P – qualitative and quantitative changes in services related to education, and in particular pre-school education;<br>• I, L, N – increased demand for cleaning services;<br>• Q – increased demand for other health care services,<br>• R – increased demand for relaxation, sports, cultural services; |
| Education | • Raising people's ambitions;<br>• Lifelong learning;<br>• Blending cultures; | • P – increased demand for education, training or courses;<br>• P – qualitative changes in demand related to the increase in specific training of migrants with the promotion of new occupations and changes in the development of the structure of the economy; |
| Economy | • Economic freedom;<br>• Urbanization;<br>• Migration;<br>• Globalization;<br>• Liberalization;<br>• Internationalization;<br>• Externalization;<br>• Economic crisis;<br>• Global warming;<br>• Environmentalisation of production;<br>• Security; | • O, E, N – changes in demand for public services and security, as well as security and investigation services;<br>• R – demand for recreational, sports, cultural services;<br>• J – increased demand for information and communication services;<br>• J, L, M, N – demand for business services;<br>• M – demand for scientific research and development services;<br>• N – services related to the operation of security systems; |

| Area | Manifestations | Exposed impacts on demand for services (SERVICE INDUSTRIES) |
|------|----------------|-------------------------------------------------------------|
| Changes in power relations | • Economic transformation;<br>• Democratisation;<br>• Decentralisation of power;<br>• Polarization of society; | • O – demand for public administration, defence and social security services;<br>• M – increased demand for legal, consulting, and advisory services; |

*Source: authors´ own*

## 2.3.2 Impact of technological changes

The exponentially increasing amount of data and the convergence of different technologies in connection with the ICT boom is transforming all areas of the economy (Kagermann, 2015). Whether it is business or private life, education, economy, public administration, services or politics, the digital revolution covers all areas of our daily lives. New technologies and changes in customer behaviour and demands bring new possibilities and opportunities. The present is marked by digital transformation and its manifestations are digitalization, cloud, Big Data, IoT, 3D printing or Industry 4.0 (Biahmou et al., 2016). The rapid scientific and technological progress and the increased dependence on technology are impacting the labour market, employment and the organisation of work (Cascio - Montealegre, 2016). Technological development has fundamentally changed the manufacturing process of products, production of services and strengthened the role of services associated with products, thus enabling the individualization of production (Obadi et al., 2016). The growth of the service sector in the economy is related to their faster ability to interact, the ability to interact with stored information anywhere and anytime through the Internet (Demirkan, Spohrer and Krishna, 2011). Information and communication technologies support the growth of labour productivity and use such methods and techniques in the service sector that integrate them closer to customers (Michalová, Benešová and Šťastná, 2013). The following Table 2 systematizes the theoretical approaches of authors who identify the demand for services influenced by technological advances. At the same time, they identify service industries.[3]

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[3] Statistical classification of economic activities NACE Rev. 2: Agriculture, forestry and fishing (A); Mining and quarrying (B); Manufacturing (C); Electricity, gas, steam and

Table 2 Areas and manifestations of technological changes, implications for the demand for services within these areas

| Area | Manifestations | Exposed impacts on demand for services (SERVICE INDUSTRIES) |
|---|---|---|
| Internet | • ICT expansion;<br>• Acceleration of business processes;<br>• Networking of businesses;<br>• E-business and e-commerce;<br>• Social media;<br>• Security; | • G – increase in online purchases;<br>• J – demand for ICT services in relation to the use of mobile services and smart devices;<br>• J – demand for IT consultancy;<br>• M – demand for legal services;<br>• O – changes in demand due to the removal of legislative barriers and the creation of a single market for services;<br>• N – services related to the operation of security systems; |
| Industry 4.0 | • Digitalization of production organization; | • J – increased demand for knowledge-intensive, high-technology services (computer programming);<br>• M – demand for scientific research and development; |
| Internet of Things | • Interconnectivity of systems; | • J – increased demand for knowledge-intensive, high-technology services;<br>• M, O – demand for services focused on scientific research and development;<br>• M – demand for legal services; |
| Big Data | • Modelling and influencing socio-economic processes;<br>• Personalisation of services;<br>• Security; | • M – demand for IT services in the field of research, surveys in connection with the increase in the number of unanalysed data;<br>• M, O – demand for legal services with emphasis on the generation of new regulations and directives in the field of data processing and protection;<br>• N – services related to the operation of security systems; |

air conditioning supply (D); Water supply; sewerage, waste management and remediation activities (E); Construction (F); Wholesale and retail trade, repair of motor vehicles and motorcycles (G); Transportation and storage (H); Accommodation and food service activities (I); Information and communication (J); Financial and insurance activities (K); Real estate activities (L); Professional, scientific and technical activities (M); Administrative and support service activities (N); Public administration and defence, compulsory social security (O); Education (P); Human health and social work activities (Q); Arts, entertainment and recreation (R); Other service activities (S).

| Area | Manifestations | Exposed impacts on demand for services (SERVICE INDUSTRIES) |
|------|----------------|-------------------------------------------------------------|
| 3D printers | • Individualization of production; | • J – increased demand for knowledge-intensive, high-technology services such as computer programming in the section; |
| Cloud | • Data range availability;<br>• Technology sharing;<br>• Security; | • J, M – demand for data processing in the areas of collection, storage, sorting, transmission, access, analysis and interpretation is related to the demand for knowledge-intensive, high-technology services;<br>• N – services related to the operation of security systems; |

*Source: authors´ own*

The impact of technological changes on the demand for services can also be measured using competitiveness indices. In this case, we consider the Network Readiness Index as a parameter of adaptation to technological changes. The Network Readiness Index has been used as a parameter identifying technological changes, tracking parameters related to ICT development and its impact on the country's economy through the application of legislation in this area, as well as the availability of the latest technologies. It further identifies the readiness of society and individuals to use ICT through an assessment of infrastructure, mobile coverage or internet connectivity. Another index that can reflect the strength of technological changes can be the Global Innovation Index. The Global Innovation Index ranks the world's economies according to their innovation capabilities and consists of around 80 indicators divided into innovation inputs and outputs. Innovation inputs such as a highly skilled workforce, education and research facilities, services for entrepreneurs, sufficient number of suppliers, a sophisticated market, infrastructure and access to capital are important in generating innovations. Innovation output is a broad concept varying from sector to sector. Measuring it means quantifying the extent to which ideas for new products and services coming from innovative industries add economic value and influence the ability to penetrate the market.

## 2.4 Changes in demand for tourism services

Tourism is one of the most dynamically developing sectors and even in the conditions of Slovakia it already represents an economic sector with its performance. It fulfils important economic functions, income function and multiplier effect, it is a source of value creation and influences GDP, it is a factor of employment, regional development and balance of payments. Tourism is a sector that directly affects the economy, industry, trade and services, finance, transport, regional development, culture, healthcare, education, sport, environmental protection, forestry and water management, agriculture, employment, job creation and the competences of local governments. It is typical of tourism that, while most other sectors deal with a relatively narrow segment of their activities along the vertical axis, the nature of tourism is such that it also brings together different sectors along the horizontal axis. It thus encompasses several areas and we can speak not only of its cross-cutting nature but also of its interdisciplinarity.

On the basis of the data in Graph 5, we can conclude that tourism sales had an upward trend almost throughout the whole period, but in 2020 there was a deep decline, when the lowest sales of 98 658.97 thousand euro were recorded. The highest value of this indicator was in 2018 (752 131, 39 thousand euro).

Graph 5 Development of tourism sales in EUR thousands in Slovakia
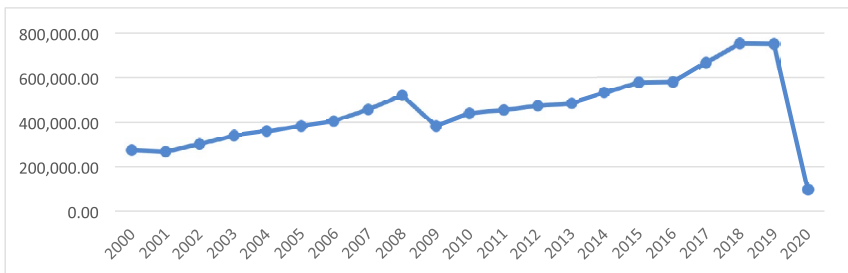


*Source: authors´ own based on datacube.statistics.sk*

## Summary

Globalisation processes, the development of technologies, changes from an industrial to an information society, and the reconstruction of political systems resulted in a change in the structure of the economy, with services taking the first place. The externalization of services that operates in the economy became a key trend of these changes. At the same time, it constitutes an object of intermediate demand and results in outsourcing.

Services account for more than 70% of economic activity in the EU. The services sector is the dominant sector of the national economy in terms of its share of GDP, value added and employment. In terms of economic development, it is the most dynamic component of the modern economy. The current supply of services reflects changes in consumer demand, which has recently been driven by safety and health protection needs.

From the end of 2019 to the present, we have seen a significant decline in demand for services. The pandemic related to the COVID 19 has crippled many industries, which has resulted in a sharp decline, especially for tourism services. Expressing the relationship between the impact of socio-technological changes and the demand for services is a rather complex problem, given the scale of the particular changes. However, in order to increase the output of services production, there is a need for a more rapid response to socio-technological changes.

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# 3 KEY RESOURCES IN THE PRODUCTION OF THE SERVICE OFFER

The importance of the service sector is steadily increasing, as evidenced by the development of macro indicators, but in the current fast-changing market environment it is difficult for service enterprises to compete. The specific characteristics of services strongly influence the processes of production and exchange, thus determining the key resources of supply formation, which are skilled workforce and the use of technology and, within them, in particular information and communication technologies (ICT). Many authors have shown that innovations and ICT, together with a skilled workforce with the necessary digital skills, are factors for sustainable competitive advantage and productivity gains in services.

## 3.1 The human factor and information and communication technologies in services

Services are delivered through close interaction between producer and consumer. In this context, the consumer becomes a co-creator and co-producer of the service. As the interaction occurs, "an appropriate, capable and interested workforce is a key resource to ensure the company's revenues, adequate to resources, capital inputs and demand in the current competitive conditions in the services market" (Michalová et al., 2013). As a carrier of the creative process, a person armed with knowledge is needed, which he or she continuously adds to and develops in connection with the dynamics of innovative changes and social needs (Šikula, 2007).

A service worker, unlike a manufacturing worker, needs to possess several skills, these are professional and technical skills, business skills and interpersonal skills. All are equally important in the selection and evaluation of a worker, given that the worker comes into direct contact with the client, is a representative and the 'face of the enterprise'. It is therefore a key resource of production enabling the company to gain a competitive advantage and therefore differentiates it from its competitors. Human resource management, employee training and skills upgrading are a prerequisite for introducing them into the production process of service enterprises.

Unlike manufacture, service enterprises involve both workers and customers in the human factor. The introduction of new information technologies is increasing the demands on employees' digital skills, changing customers' purchasing habits, and making customers more demanding and informed. Their needs are often very different and customer care must therefore be differentiated. To succeed in the market, service enterprises need to thoroughly understand their customers, know their unique value and optimise every interaction with them. Service workers in interactive product design are instrumental in market analysis, identifying changes in the market, their creative skills are needed to shape and improve product offerings and service delivery systems, tailoring product offerings to customers, they are also "the face of service enterprises at moments of truth" (Normann, 1996) and are an important element in differentiating services from competitors (Michalová et al., 2013).

It is the rapid development in the field of information technologies that enabled companies to treat customers individually and to use technologically entirely new sales channels when managing their relationships with them. The authors Powell (1997), Brynjolfsson, Hitt (2003) and others emphasize the dependencies on work skills, human capital, the ability of companies to restructure work processes, change corporate culture, which the adaptation of ICT brings with it. Investment in information technologies alone, without further changes and investments related to its integration and effective use, cannot provide a company with a competitive advantage and higher productivity. Therefore, when introducing information technologies, the company must innovate not only processes, but also products, change the organisational structure, and introduce human resource innovations. In order to increase the competitiveness of services, according to OECD (2012), it is necessary to select a suitable workforce with the appropriate digital skills, essential to increase the digital skills of permanent staff and to increase the skills of consumers. In this context, the achieved level of digital skills and competences of the population as potential employees of service enterprises, but especially their clients, becomes important.

Graph 1 Internet access and household broadband in the EU-27 (% of households)
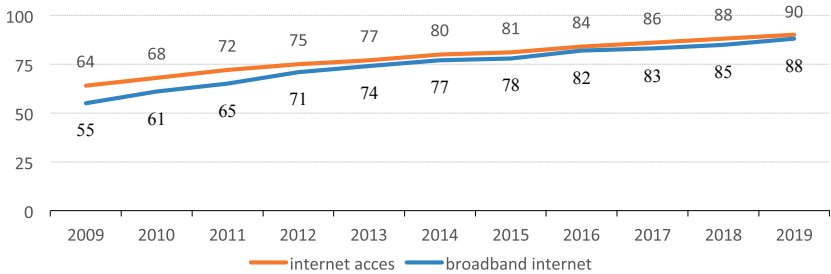


Source: Eurostat, 2021

Household broadband was available to up to 88% of households in the EU-27 in 2019, showing the wide range of connectivity options across the EU-27. Also, the evolution of broadband in particular in the EU-27 since 2009, when only 55% of households used the network, has been increasing at a relatively fast pace over time, with an increase of up to 33 percentage points in 2019 (Graph 1).

Graph 2 Internet use by the EU-27 households (% of all households)
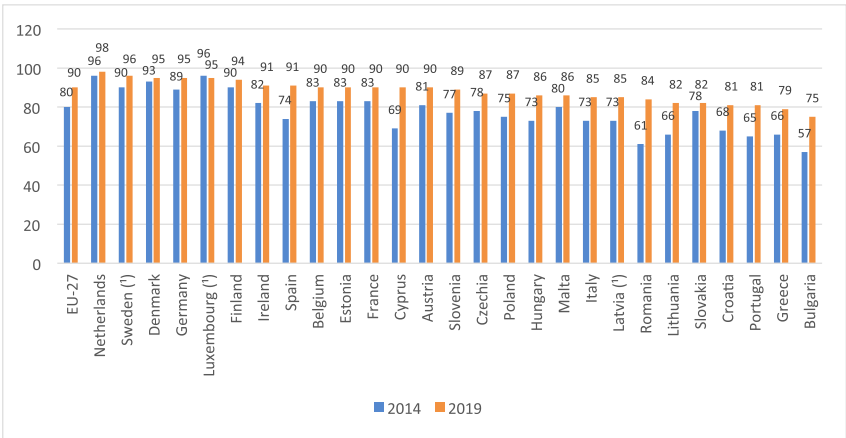


Source: Eurostat, 2021

The highest proportion of households using the Internet in 2019 was recorded in the Netherlands (98%), with Sweden, Denmark, Germany, Luxembourg, Finland, Ireland and Spain recording figures above 90% of households, meaning that more than 9 out of every 10 households used the Internet. Bulgaria (75%) and Greece (79%) had the lowest rates among the EU-27. Romania saw the biggest increase of 23 percentage points, while Cyprus, Spain and Portugal also showed strong progress over the period. Among the V4 countries, Czechia and Poland had the highest percentage of households using the Internet (87%), followed by Hungary (86% of households) and Slovakia at 82%. Hungary made the biggest progress (up 13%), along with Poland (up 12%). All EU-27 countries showed a continuous increase in the period under review, except Luxembourg, which was already close to the ceiling in 2014. Thus, household internet use is increasing, with the Internet becoming an indispensable medium in all EU-27 countries. This is confirmed by the assumption of the disposition of households' digital skills (Graph 2).

Even Porter (1990) described the importance of innovations and ICT as a factor of competitiveness of services, but he also sees the indispensability of quality management and a skilled workforce. The introduction of new progressive ICT tools into service enterprise processes shaping service offerings and increasing their competitiveness is therefore a current challenge. This includes, for example, the widespread use of the Internet to develop the marketing of services, the implementation of business transactions electronically, as well as the widespread use of complex information systems and the interconnectivity of individual information flows.

Graph 3 Broadband internet connectivity of enterprises in the EU 27 (% of enterprises)
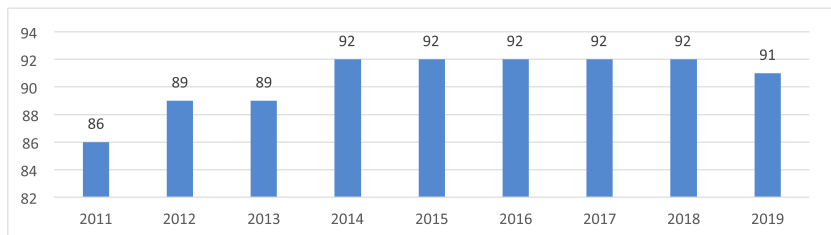


*Source: Eurostat, 2021*

From 2011 to 2014, broadband connectivity of enterprises increased, with more and more enterprises using the network. From 2014 to 2018, the situation stabilised, with more than 9 out of 10 enterprises in the EU-27 connected to broadband, though there was a slight drop in 2019, but only by 1 percentage point, which is negligible. EU-27 countries and enterprises have understood the necessity of using the Internet in their business processes over the last decade, with broadband being widely available (Graph 3).

In 2019, 21% of enterprises in the EU-27 were selling online; since 2010, the share of enterprises conducting business transactions electronically has been growing, increasing by 6 percentage points over the ten-year period. In parallel, the share of sales derived from online sales in total sales has also grown, from 13% in 2010 to 20% in 2019 (Graph 4).

Ireland (39%), Denmark (38%), Sweden (35%), Croatia and Czechia (31%) sold more online than the EU-27 average (21%) in 2020. In Slovakia, 20% of enterprises were selling online in 2020 (Eurostat, 2021).

Graph 4 Percentage of enterprises selling online and percentage of revenue from online sales (% of enterprises, % of online sales as a percentage of total sales)
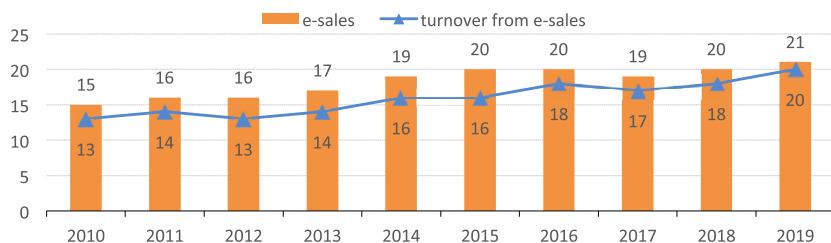


*Source: Eurostat, 2021*

Graph 5 Online sales via enterprises´ own website or app in the EU-27 in 2019 (% of enterprises with a website)
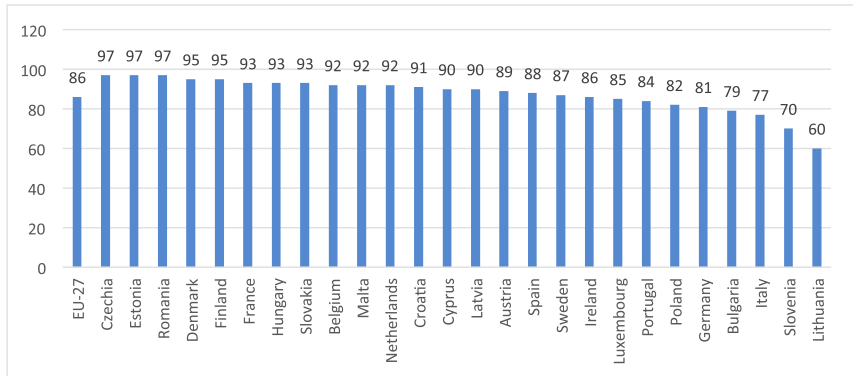


*Source: Eurostat, 2021*

In 2019, enterprises in the EU-27 preferably used their own website or selected app for online sales. Up to 97% of enterprises with a website in Czechia, Estonia and Romania sold online via the web. Among the V4 countries, 9 out of 10 enterprises in Hungary and Slovakia used their websites for sales. The lowest figures were recorded in Lithuania (60%) and Slovenia (70%) (Graph 5).

In ICT investment, the service sector is ahead of other sectors, which, as Lush, Vargo (2004) argue, supports the growth of value added of services. Furthermore, in the service sector, production is largely information and knowledge based, if services are to remain competitive they need to implement and exploit ICT (Berr, 2008). Ghani, Goswami, Kharas (2012) confirm that there is a growing number of service sector enterprises whose portfolio can be communicated to customers through the digital marketplace without the constraints of country borders, removing any barriers and giving even smaller enterprises the opportunity to use more sophisticated ICTs.

## Graph 6 Online sales via website and EDI by economic activity in 2020 (% of enterprises selling online)
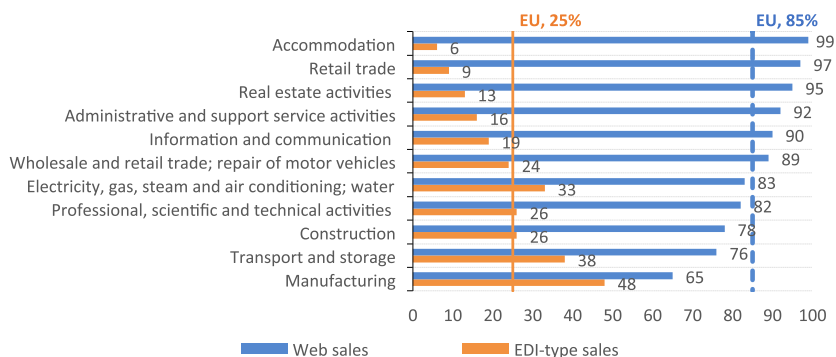


*Source: Eurostat, 2022*

Note: EDI (Electronic Data Interchange) is the structured exchange of data between applications of interconnected computers within the same company or between different companies, this system allows the transfer of standard company documents such as invoices, purchase orders, etc., through a computer network.

Almost all accommodation service enterprises selling online in 2020 used their website or app to sell (99% of enterprises selling online), with only 25% using EDI. The figures for online sales, i.e. via website and apps on the Internet, are higher than the EU-27 average (85%). This shows that accommodation service enterprises were interested in presenting themselves online, allowing their clients to easily access their products and place orders. Other sectors that used their websites to a greater extent to sell their products than the EU-27 average were retail trade services, real estate activities, information and communication services, administrative and support activities and wholesale trade services. These results confirm the researchers' views that the Internet is mainly used for transactional purposes by the service sector.

In contrast, manufacturing enterprises were below average in their use of e-commerce, using e-commerce via EDI (48% of enterprises selling online), as well as transport and storage services (38%), more than the EU-27 average (Graph 6).

**Graph 7 Individuals who used any website or app to secure accommodation in 2019 (% of 16–74 year olds)**
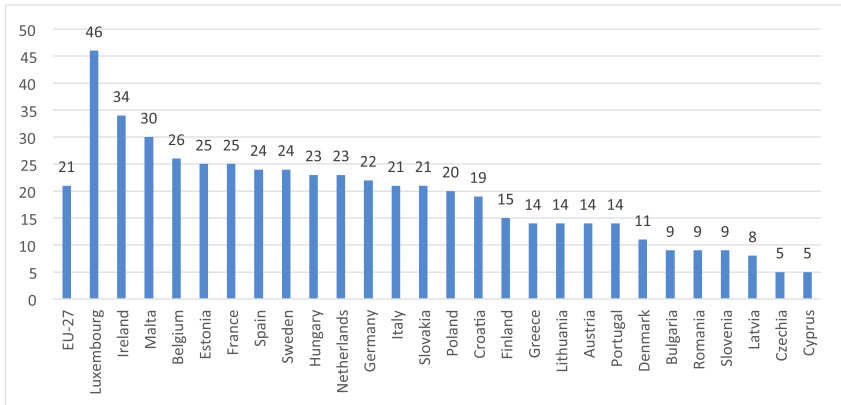


*Source: Eurostat, 2021*

The high level of digital skill of individuals also enables private individuals to trade with each other. New opportunities for independent transactions arise as a result of the use of the Internet. This also supports the development of the sharing economy, allowing services and products to be shared by multiple entities.

In 2019, 21% of individuals aged 16-74 used any website or app on the Internet to secure accommodation from another person in the EU 27 in the previous 12 months. The highest values were indicated in Luxembourg (46%), Ireland (34%) and Malta (30%), while the lowest values were generated in Cyprus, Czechia, Latvia, Slovenia, Romania and Bulgaria, where less than 1 in 10 individuals used the Internet to secure accommodation from a private person. In the other V4 countries, Hungary, Slovakia and Poland, the values were equal or close to the EU-27 average. Most of these services were booked through specialised websites or apps that act as intermediaries and allow private individuals to share access to accommodation services, such as Airbnb or Couchsurfing (Graph 7).

Globalization processes and the Internet have brought new opportunities for enterprises, individuals and society as a whole, resulting in new practices and a change in the enterprise´s paradigm. Therefore, it is important to improve managers' approach to understanding the benefits of adopting ICT, to

recognize the value of ICT for service enterprises and consequently, it is necessary to find out how this understanding and managers' approach affect the real state of ICT implementation, which is directly related to ICT investment (Vargo, Maglio, Akaka, 2008; Ekuobase, 2013). According to Brynjolfsson, Hitt (2000), the impact of ICT on enterprise´s performance and productivity can also be observed in a broader context, which implies that the positive economic consequences of ICT use can be achieved by combining investment in ICT together with additional investment in job skills, enterprise´s process restructuring and human capital.

## 3.2 Technological trends used by service enterprises

Other technologies and technological trends used by enterprises in all sectors of the economy, and therefore also by service enterprises, are mobility, cloud computing, big data, social media and social networks, the Internet of Things, and technological security (European Commission, 2016).

Analyst company Gartner (2018) has identified other trends that are coming to the fore and present an opportunity to improve the performance of enterprises, aligning their physical and digital worlds. These are trends such as artificial intelligence, smart apps, virtual and augmented reality, blockchain, communication systems, digital technology platforms and adaptive security systems.

Client-enterprise interaction is enabled by social media and social networking. This allows them to interact with a larger number of customers who formulate requests, suggestions and service evaluations. When these are recorded and analysed in the company system, they can effectively, unprecedentedly and positively influence the company's marketing, sales and services.

A social network is a social structure composed of a set of social actors (individuals or organizations) and a set of didactic links between these actors. Given that there are many aspects to analyse, social networks are divided into three levels. The micro level focuses on individuals and their behaviour in the social network. The middle level examines the formation of groups and the search for a group leader. The macro level considers the social network as a whole in large scale and hierarchical structures. The social network perspective provides a set of methods for analysing the structure of the entire social entity, as well as a number of theories explaining the patterns of behaviour observed in these structures. Studies use social network analysis

to identify local and global patterns, locate entities, and explore network dynamics (Turban et al., 2018).

Social media is a collection of open, interactive and user-controlled online applications that extend the experience, knowledge and market power of users as participants in business and social processes. Individual applications support the creation of informal networks of users that facilitate the flow of ideas and knowledge by enabling the efficient creation, distribution, sharing, editing and perfecting of information content (Constantinides and Fountain, 2008).

Based on the definitions of several authors, the following types of social media can be identified: *collaborative projects* where users can add, remove and change textual content (Wikipedia); *virtual communities* – these platforms allow sharing information, content (text, audio, video) and opinions on a specific topic (Twitter), writing reviews or blogs; *content communities* – allow sharing media content such as texts, videos, photos (Youtube, Instagram), *social networking websites* – used to create personal profiles and to share the content created (Facebook, LinkedIn), *virtual game platforms and virtual worlds* (Minazzi, 2015).

Graph 8 Social media use by enterprises in the EU-27 by type and economic activity in 2019 (% of enterprises)
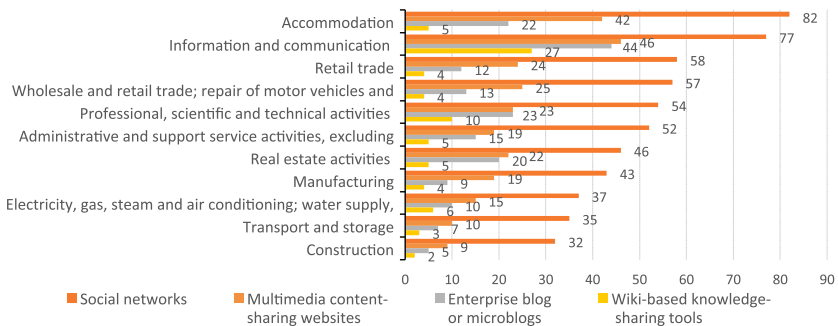


*Source. Eurostat, 2021*

Social network is the most used social medium by enterprises, with accommodation services (82%) and information services (77%) and other service enterprises, excluding real estate services, communicating via social media more than the EU-27 average (51% of enterprises) in 2019. In con-

trast, enterprises in the manufacturing, gas and electricity supply, transport and storage, and construction sectors did not even reach the average for the EU-27. The results show that it is service enterprises in particular that consider electronic communication via networks as an additional channel to connect with clients and other partners. When looking at the use of other social media, the results are comparable, with information services and accommodation services also showing the highest levels of sharing multimedia content on websites, with up to twice as many enterprises as the EU-27 average following multimedia content (Graph 8).

Another technology increasingly used by enterprises is cloud computing. This is the provision of services stored on virtual servers on the Internet. It is a technology that allows files to be shared between a user's devices or between multiple users. The range of cloud services is very wide, the aim being to relieve the user of the burden of managing information technology, from infrastructure to applications, information to processes. These are models such as Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS), Information as a Service (IaaS), Business Process as a Service (BPaaS), entire business processes as a service and others (Michalová et al, 2013).

Graph 9 Use of cloud computing services by economic activity in the EU-27 in 2018 and 2020 (% of enterprises)
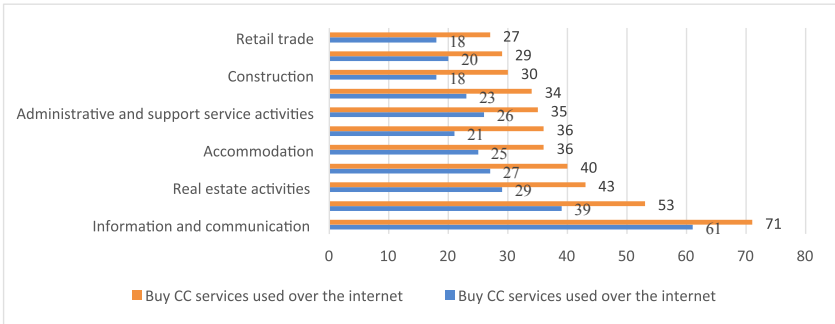


*Source: Eurostat, 2021*

The use of cloud services by enterprises increased across all sectors over the two years under review, with a 12% increase for the EU-27 in 2020 compared to 2018. The largest use of these services is by enterprises belonging to

the information and communication sector, followed by professional, scientific and technical services, real estate activities and electricity and gas supply enterprises. Enterprises in these sectors show above-average values for the EU-27. The biggest progress in the use of cloud computing services was in manufacturing enterprises, with a change of 15 percentage points. The lowest use of cloud computing services is in retail trade and transport and storage (Graph 9). Nevertheless, the use of cloud computing services is steadily increasing, with enterprises realising the benefits of sharing and managing technology with other specialised entities.

Over the past few years, new kinds of machine-software interfaces known as robots have been coming to market. Robots are automated hardware or software machines that are powered by advances in technology and artificial intelligence (AI). An important role is currently played by 'chatbots', so-called AI-enabled conversational robots that take on the functionality of an intelligent personal assistant. They interact with clients using their voice; they are also called intelligent speakers. They are intelligent applications that become personal assistants. Recent developments in machine learning algorithms are improving the performance of AI devices such as automatic speech recognition, natural language understanding, text and speech synthesis, and image recognition (Janarthanam, 2017).

Smarter conversational robots are equipped with natural language processors so the computer can understand unstructured dialogue. Some companies have been experimenting with learning robots that gain more knowledge and experience as they operate. The computer's ability to interact with humans is provided by knowledge-based systems (Turban et al., 2018). The most popular "chatbots" include Alexa created by Amazon, Siri by Apple, Google Assistant by Google, and Cortana by Microsoft. The trend of using intelligent talking assistants is currently growing exponentially (Janarthanam, 2017).

In recent years, emphasis has been placed on data and transaction security. Blockchain technology promises to overcome the critical aspects that represent the "shift from trusted man to trusted technology", when human intervention to achieve security will no longer be necessary. A blockchain consists of data sets that are composed of a chain of data packets (blocks), where a block contains multiple transactions. The blocks can be authenticated by the network using cryptographic means. It is a technology that functions as a decentralized database that can store an ever-expanding number of records. These are protected thanks to this decentralisation and also thanks

to the mutual control by computing technology of the connected computers. Every payment, validity and author verification is verified by thousands of computers around the world, so that no fraud can occur. The advantages are transparency and a high level of security. It is considered to be the most secure system yet devised.

## 3.3 Turnover development and use of technology in tourism

The success of supply and demand for services of tourism enterprises can be identified by the development of turnovers of accommodation and catering establishments as well as travel agencies. Positive changes mean significant progress for established tourism enterprises.

Technological channels allow tourism enterprises to approach the needs of their clients more effectively; in particular, accommodation services, travel agencies and tour operators are increasingly using online sales and social media for their presentation, transactions and communication.

The following graphs and tables identify the development of tourism enterprises' turnovers, the rate of use of social media and online sales via website or app in selected EU countries. Also of relevance is the identification of the impact these processes have on the performance of travel agencies and accommodation and food services as measured by turnovers achieved in the selected EU countries.

Graph 10 Turnover development of accommodation and food services in selected countries in EUR million
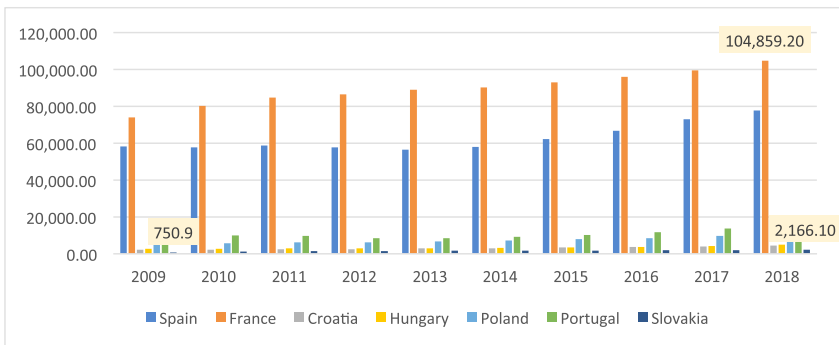


*Source: authors´ own based on Eurostat, 2021*

The highest turnovers in accommodation and food services during the whole period under review were in France (in 2018 in the amount of 104 859.2 million euro), the lowest turnovers were in Slovakia in 2009, i.e. 750.9 million euro. Nevertheless, Slovakia has seen progress in turnover development, with turnovers growing continuously from 2009 to the reference year 2018, with the exception of 2012 (Graph 10).

Based on the growth rate and the average rate, progress in the relative development of turnovers of accommodation and food services in the selected countries is evident, except for 2012. The analysed indicator increased the most in relative terms in Slovakia in 2010 compared to 2009, by 66.88%, while it decreased the most in Portugal in 2012 compared to 2011, when a decrease of 13.28% was observed. On an annual average, sales increased relatively in all countries, the highest in Slovakia, where an average annual increase of 12.49% was recorded (Table 1).

Table 1 Growth rates and average growth rates of turnovers of accommodation and food services

| Country | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\overline{T}$ |
|---------|------|------|------|------|------|------|------|------|------|----|
| Spain | 99,37 | 101,34 | 98,58 | 97,87 | 102,30 | 107,38 | 107,22 | 109,47 | 106,56 | 103,26 |
| France | 108,48 | 105,60 | 102,11 | 102,82 | 101,29 | 103,15 | 103,23 | 103,71 | 105,27 | 103,94 |
| Croatia | 100,29 | 102,94 | 100,10 | 126,49 | 102,10 | 108,85 | 111,08 | 107,41 | 110,02 | 107,43 |
| Hungary | 103,75 | 104,02 | 98,35 | 101,50 | 107,29 | 112,81 | 106,21 | 113,88 | 114,64 | 106,80 |
| Poland | 105,20 | 108,79 | 101,91 | 105,83 | 105,99 | 110,64 | 108,07 | 114,10 | 136,51 | 110,40 |
| Portugal | 100,13 | 98,25 | 86,72 | 99,45 | 109,08 | 110,10 | 114,79 | 118,05 | 108,38 | 104,58 |
| Slovakia | 166,88 | 122,36 | 97,45 | 108,84 | 105,63 | 101,70 | 111,50 | 106,93 | 104,00 | 112,49 |

*Source: authors' own*

Graph 11 Turnovers of travel agencies in selected countries in EUR million
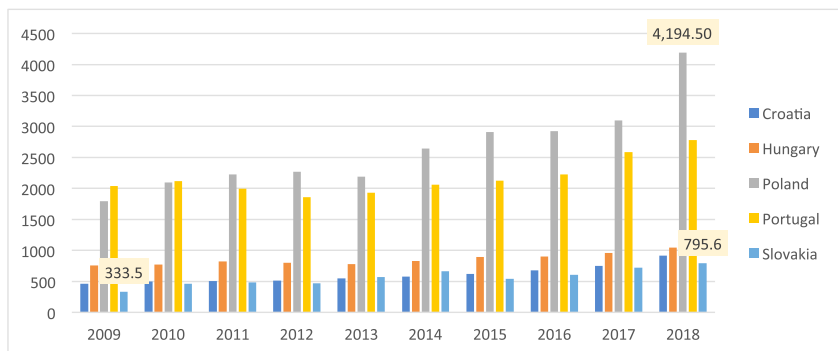


*Source: authors´ own based on Eurostat, 2021*

The development of turnovers of travel agencies in selected countries between 2009 and 2018 is shown in Graph 11. It can be seen that the highest turnovers among these countries were in Poland, amounting to 4 194.5 million euro in 2018. The lowest turnovers were achieved in Slovakia in 2009, namely 333.5 million euro, but they more than doubled in 2018 compared to 2009 (Graph 11).

Table 2 Growth rates and average growth rates of turnovers of travel agencies and tour operators

| Country | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\overline{\overline{T}}$ |
|---------|------|------|------|------|------|------|------|------|------|------|
| Spain | 98,35 | 100,68 | 102,06 | 93,26 | 102,64 | 106,16 | 109,72 | 109,66 | 108,65 | 103,33 |
| France | 98,15 | 103,25 | 98,30 | 99,71 | 96,22 | 100,54 | 100,50 | 93,10 | 102,47 | 99,09 |
| Croatia | 108,10 | 101,74 | 101,24 | 107,20 | 104,47 | 107,87 | 109,63 | 110,06 | 122,28 | 107,91 |
| Hungary | 101,95 | 105,99 | 97,39 | 97,75 | 106,43 | 107,73 | 100,49 | 106,49 | 108,57 | 103,56 |
| Poland | 116,94 | 106,29 | 101,95 | 96,40 | 120,83 | 110,06 | 100,41 | 105,93 | 135,46 | 109,91 |
| Portugal | 103,89 | 94,27 | 93,12 | 103,71 | 106,74 | 103,11 | 104,94 | 116,00 | 107,53 | 103,50 |
| Slovakia | 137,99 | 104,78 | 97,78 | 120,57 | 116,41 | 81,99 | 111,19 | 119,99 | 109,90 | 110,14 |

*Source: authors´ own*

Using the growth rate and the average rate, it is possible to identify the relative development of the turnovers of travel agencies and tour operators in the selected countries. The analysed indicator increased the most in relative terms in Slovakia in 2010 compared to 2009, by 37.99%, and decreased the most in France in 2017 compared to 2016, when a decrease of 6.9% was observed. The average annual relative increase in turnovers was found in all countries except France, with the highest average annual increase of 10.14% in Slovakia. It can be concluded that although Slovakia has the lowest turnovers among the countries under review, it is characterised by the highest growth dynamics. In France, turnovers by travel agencies and tour operators declined by 0.91% on average per year (Table 2).

An important finding is the existence of a relationship between the use of information technology by tourism enterprises and their performance. Optimally, the use of technology by tourism enterprises leads to growth in turnovers, growth in labour productivity and growth in other performances of the tourism enterprise. The impact of technology on performance as measured by turnovers of accommodation and food establishments/offered by travel agencies can be verified through correlation analysis. The correlation was established for the performance and use of technology by tourism enterprises in 2017 in Czechia, Spain, France, Croatia, Hungary, Poland, Portugal and Slovakia.

Variables:

T1 – Use of social networks by accommodation and food service enterprises in selected countries (% of enterprises)

T3 – Accommodation and food service enterprises selling via web, app or e-marketplace (% of enterprises)

T4 – Travel agencies and tour operators selling via web, app or e-marketplace (% of enterprises)

T5 – Turnovers of accommodation and food services (EUR million)

T8 – Turnovers of travel agencies and tour operators (EUR million)

Image 1 Correlation graph



Pearson Product-Moment Correlations

| | T1 | T3 | T4 | T5 | T8 |
|---|---|---|---|---|---|
| **T1** | | 0,73 | 0,05 | 0,63 | 0,82 |
| **T3** | 0,73 | | 0,20 | 0,71 | 0,89 |
| **T4** | 0,05 | 0,20 | | -0,10 | 0,07 |
| **T5** | 0,63 | 0,71 | -0,10 | | 0,86 |
| **T8** | 0,82 | 0,89 | 0,07 | 0,86 | |
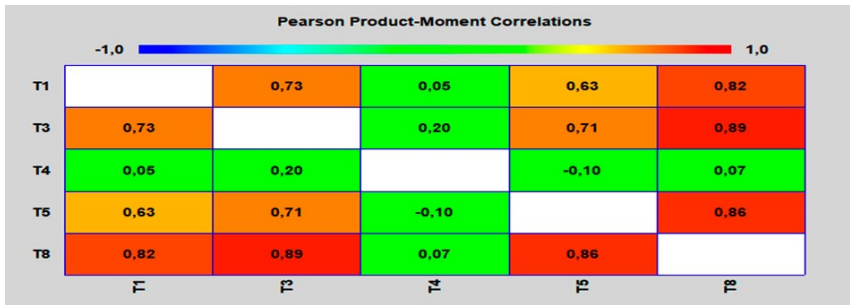
At the 0.05 significance level, the correlation coefficients between following pairs of variables are statistically significant: T1 and T3, T1 and T8, T3 and T5, T3 and T8, and between the pair T5 and T8. This means that there is a proven correlation between these pairs of variables at the indicated significance level.

The correlation coefficient between the pair T1 and T3 has a value of 0.73, which represents a moderately strong direct linear dependence. The greatest strength of dependence is between the pair T3 and T8, as the correlation coefficient takes the value of 0.89. This shows that there is a strong direct linear dependence between the use of social networking sites by accommodation and food service enterprises in the selected countries and the turnovers of travel agencies and tour operators within the selected countries. A strong direct linear relationship is also confirmed for the pair T5 and T8, i.e. between the turnovers of accommodation and food services and the turnovers of travel agencies. On the contrary, the weakest strength of dependence is shown for the pair T1 and T4, or T4 and T8, as the correlation coefficient is very close to 0.

## Summary

The key resources in shaping the supply of services are the human factor and technology. The human factor in services is understood as both the worker of the enterprise and the customer. This stems from the specific nature of services, where the customer is an interactive co-creator in the production of most services. The service worker adapts the product to the client's requirements, improving the enterprise´s offer on the basis of market knowledge mediated by direct contact with clients. The workers are therefore a mirror of the enterprise, with their professional and commercial skills, knowledge and interpersonal skills they have a major influence on the quality of the product and the customer's evaluation of the service. The management of the enterprise must therefore place great emphasis not only on the selection of suitable workforce, but also on their further education, training process and motivation.

The rapid development of technology brought changes not only in practices of enterprise´s processes, but also in the new demands on human actors, requiring them to have an ever higher level of digital skills. This is evident from the steady growth in the number of households, individuals and enterprises connected to the Internet, from the increasing penetration of broadband internet, with more than 9 out of 10 enterprises in the EU-27 being connected to broadband internet. The number of enterprises selling online via their own website or app is also growing, with 21% of enterprises in the EU-27 selling electronically in 2019, and the amount of turnovers generated by online sales is also growing in parallel. Online sales have become an important distribution channel, especially in accommodation services and retail, and technology also enables faster and more extensive communication with clients, leading to customisation of production according to the client's needs. On the other hand, the number of clients requiring online sales and online communication with the enterprise is also increasing, as their digital skills are also constantly increasing.

There is also significant reflection on technology trends by enterprises and individuals, such as social media and social networks, the Internet of Things, technology security, cloud computing, big data, artificial intelligence, intelligent applications, digital technology platforms and more.

Several experts agree that a combination of investment in ICT together with additional investment in work skills, restructuring of enterprise´s processes and human capital can achieve positive economic impacts.

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# 4 THE POSITION OF SERVICES IN EU ECONOMIES AND PRODUCTIVITY IN SERVICES

The structural changes taking place in the EU economies in recent decades look in favour of services. This is evidenced by the high share of services in the performance of individual economies in terms of the share of services in value added and employment, their growth dynamics, and the high labour productivity achieved especially in knowledge-intensive services. The economies of countries are subject to cyclical influences, technological, ecological and social changes, and processes are increasingly globalised, so it is important to monitor the development of output and the effects on service performance.

## 4.1 Development of production and employment in services

The production of services can be monitored using a number of indicators, such as the development of gross value added, sales, their dynamics, changes in labour productivity and others. An important aspect is the relationship between labour productivity and employment in services, since it is the decline in employment in the economy that is one of the first negative phenomena signalling changes in the economy and leading, in the long run, to stagnation or a decline in economic growth.

Services accounted for 72.9% of total EU-27 gross value added in 2019, up from 73.2% in 2009. They stagnated or slightly decreased over the ten-year period. The most significant shares were recorded in Luxembourg, Malta, Cyprus, France, Greece, the Netherlands, Belgium and Portugal, where services generated three quarters or more of total value added. A lower share of value added between 61% and 66% was identified in Ireland, Czechia, Romania, Poland, Slovakia, Slovenia and Hungary (Eurostat, 2021). The design of these economies is relatively more oriented towards industrial production, yet the service sector also participates in a higher share of value added in these countries. Relevant are the findings on the development of value added by sector or industry, which define structural changes over time.

In 2019, all activities in the EU-27 showed growth in gross value added compared to 2018, with the exception of industry. The largest increases were

recorded in information and communication activities and construction, industrial production fell by 0.5%, while the slowest growth among the activities monitored was in agriculture, forestry and fishing (0.4%).

In 2012, the recession affected agriculture, construction, financial and insurance services, arts, entertainment and recreation services, with values below 2010 levels. Also, industry produced less value added in 2012 than in 2011, while professional, scientific, technical and administration services recorded a slight decline (0.2 p.p.). However, we can observe a moderate growth in gross value added over the years under review (Table 1).

Table 1 Development of gross value added in the EU-27 in 2011, 2012, 2018 and 2019 (2010 = 100%)

| Years | 2011 | 2012 | 2018 | 2019 |
|---|---|---|---|---|
| Agriculture, forestry and fishing | 102,9 | 98,1 | 107,4 | 107,8 |
| Industry | 103,3 | 101,7 | 115,5 | 114,9 |
| Construction | 97,6 | 92,8 | 98,1 | 101,4 |
| Wholesale and retail trade, transportation and storage, accommodation and food service activities | 102,2 | 102,5 | 115,3 | 117,7 |
| Information and communication | 104,7 | 107,0 | 140,2 | 145,6 |
| Financial and insurance activities | 101,0 | 99,5 | 101,4 | 103,8 |
| Real estate activities | 102,2 | 102,9 | 110,5 | 112,3 |
| Professional, scientific, technical, administration and support service activities | 102,5 | 102,3 | 122,7 | 124,9 |
| Public administration, defence, education, human health and social work activities | 100,8 | 100,8 | 106,9 | 108,2 |
| Arts, entertainment, recreation, other services, activities of households as employers, activities of extraterritorial organisations and associations | 101,0 | 99,9 | 102,9 | 104,9 |

*Source: Eurostat, 2021*

Graph 1 Development of gross value added in the EU-27 between 2009 and 2019 (2010 – 100%)
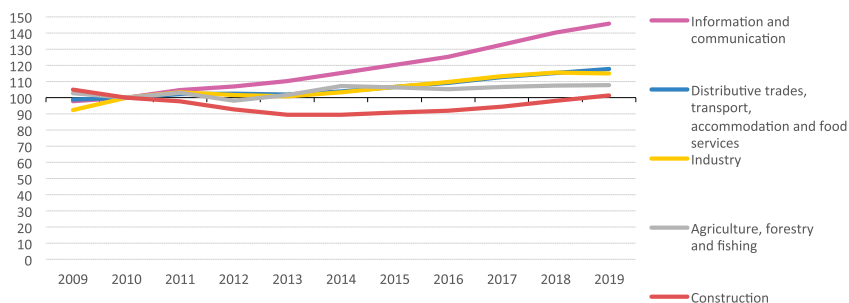


*Source: Eurostat, 2021*

Graph 2 Development of gross value added in the EU-27 between 2009 and 2019 (2010 – 100%)
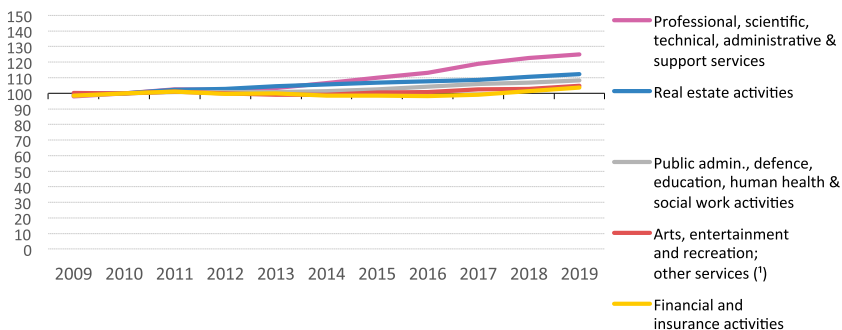


*Source: Eurostat, 2021*

The largest increases over the ten-year period were in professional, scientific, technical and administration services (up 24.9% in 2019 from 2010) and information and communication services (up 45.6%), i.e. services whose production is directed to intermediate consumption, i.e. services for enterprises. During 2009 to 2019, information and communication services and

real estate activities showed annual increases in gross value added. Professional, scientific, technical and administration services also experienced progressive permanent growth, with the exception of a slight decline in 2012 (0.2%). Slight increases accompanied by slight declines in 2012 and 2013 are also observed in public administration services, education, human health and social services, retail and wholesale trade, transport, accommodation and food services and other services monitored. The lowest growth was recorded in financial and insurance services, as well as arts, entertainment and other services (Graph 1, 2). Thus, the services sub-sectors monitored in the EU-27 experienced, with small variations, continuous growth in gross value added over the entire ten-year period.

The position of the service sector in the country's economy, monitored through the employment indicator, provides us with insights into the importance of the service sector and the structure of the economy under study. In the EU-27, the retail and wholesale trade sector alone employed more workers than industry in 2017, with administrative and support services also a significant employer of over 10,000,000 workers, followed by professional, scientific and technical activities, accommodation and food services, and transport and storage. These are both intermediate consumption-oriented services and final consumption-oriented services (Graph 3).

## Graph 3 Number of workers by industry in the EU-27 in 2017 (in thousands)
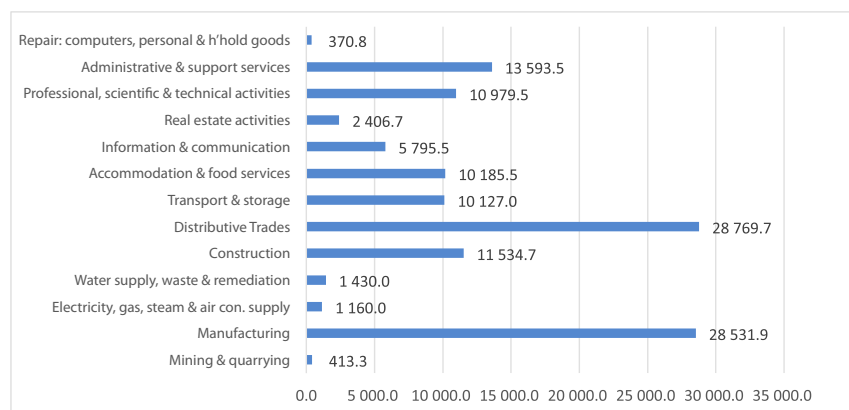


*Source: Eurostat, 2021*

In terms of the share of value added and employment in the EU-27 by sector in 2017, in general, information and communication services were the most productive of the services, contributing a larger share of value added to the EU-27 economy, almost twice as much as employment, while real estate activities and professional, scientific and technical activities were also highly productive. Industrial activities; electricity, gas, steam and air condition supply; water supply, waste and remediation; and mining and quarrying also showed high labour productivity as monitored by these indicators.

Other service sectors such as accommodation and food services, administration and support services, transportation and storage, retail and wholesale trade services did not show high labour productivity, their employment contribution is higher than the share of value added. This means that a larger share of employees produced a lower share of value added. The construction sector was the same (Graph 4).

Graph 4 Share of value added and employment by sectors in the non-financial economy in the EU-27 in 2017 (%)
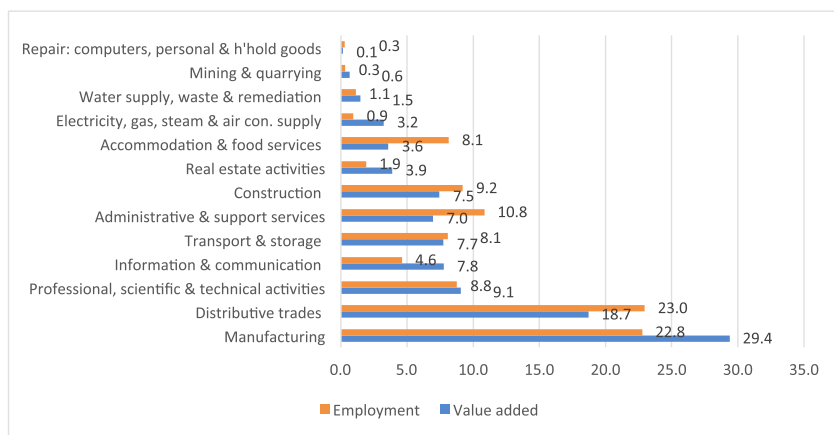


*Source: Eurostat, 2021*

Graph 5 Share of employment by size structure of enterprises in the EU-27 in 2017 (%)
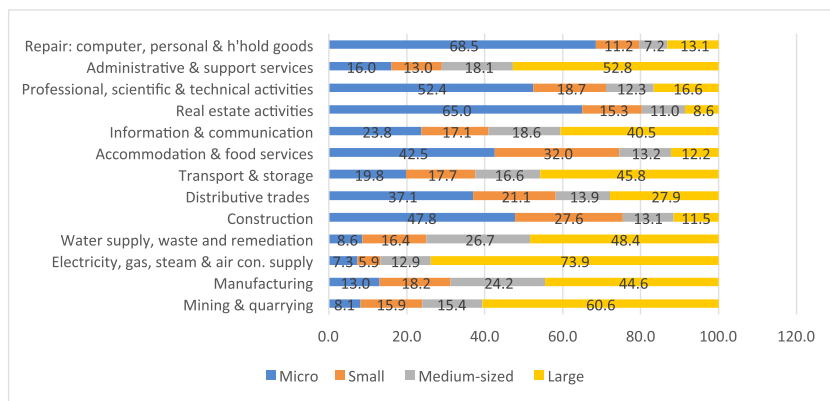


*Source: Eurostat, 2021*

In the EU-27, small and medium-sized enterprises (SMEs) generated more than 50% of jobs in all services, except administration and support activities (47.2%). In 2017, the highest job creation by SMEs was in real estate activities (91.4%), accommodation and food services (87.7%), computer repair, personal and household services (86.9%) and professional, scientific and technical activities (83.4%).

Micro enterprises employed more than half of the workers in computer repair, personal and household services, real estate activities and professional, scientific and technical activities, followed by accommodation and food services with 42.5% employment. Large enterprises provided employment opportunities mainly in administration and support activities, transport and storage, and information and communication services (Graph 5).

## 4.2 Specifics of productivity measurement in services

Productivity, as a measure of the use of inputs with the intention of producing a number of outputs, is one of the most important factors of the success and competitiveness of enterprises or service sector (Michalová et al., 2013). Measuring service productivity is more complex compared to other compo-

nents of the economy. The complexity of measuring service productivity lies primarily in:

- the complexity of the problem of determining the unit of service production (in industrial production the product is a material object that is sold on the market, productivity represents the capacity of production factors produced in a certain period, in services the product is performance, while it is difficult to determine or delimit the unit of production of intangible goods);
- the irrelevance of production volume determination and productivity measurement in some components of the service sector (e.g. preventive health services, public security, local and public administration and national defence, where it is irrelevant to determine the unit of production);
- a significant time lag in the manifestation of the benefits of the service provided (some services facilitate the creation of utility values, the benefits of which are only manifested after a certain time lag, e.g. scientific and human potential) (Michalová et al., 2013).

Service productivity was conceptually underdeveloped until recently (Corsten, 2001). Most definitions are based on the classical understanding of productivity (Sink, 1985), but due to the immateriality and intangibility of services, simply transferring the traditional understanding of productivity from industries producing tangible goods to services is inaccurate and misleading (Corsten, 2001, Baumgartner, Bienzeisler, 2006, Lasshof, 2006, Grönroos, Ojasalo, 2004, Johnston, & Jones, 2004). Intangibility results from the intangibility of the output of service production, also the heterogeneity of services as another characteristic of services makes it difficult to develop a generally valid concept of service productivity. Services are highly diversified, broad spectrum services ranging from public services to business services, mostly knowledge intensive, to personal services. These have heterogeneous characteristics, making it difficult to identify significant factors of productivity and their specificities (Lasshof, 2006; Ojasalo, 1999; Baumgartner, Bienzeisler, 2006).

In addition, the integration and involvement of customers in the value creation process is a major element in service production (Lasshof, 2006). This means that the customer is inevitably a key factor for service providers that must be integrated and included in some way in the measurement of service productivity. This is in contrast to the classical notion of productivity where the customer is usually not an integral part in value creation and busi-

ness processes are also often a closed system (Grönroos and Ojasalo, 2004). This means that the quality of the product output during the value creation process, i.e. in production and also in sales, cannot and must not be influenced by the customer.

A consistent measure of productivity is used in the manufacturing industry, where productivity is defined as the ratio of the outputs of a production unit to its inputs (Hartigh -Zegveld, 2011). However, this is more difficult when measuring service productivity as it requires the participation of people, external and internal stakeholders, technologies, as well as the sharing of a lot of information, which is the main reason why no universal definition of service productivity exists (Hilke, 1989; Maleri - Frietzsche, 2008).

Traditional practices that have been developed for industry are not sufficient to measure service productivity. This is primarily a methodological problem. In the case of services, the measurement of their value and productivity is often based on the value of production factors. From this point of view, for non-market services, it is sufficient to increase the value of the factors of production, e.g. wages, without increasing performance, and it is incorrect to conclude that the value added of the service has increased.

Another problem is the price of services. The price level and its development are different in the structure of manufacturing of products and services. For services, prices generally rise faster and more flexibly than product prices. The different price developments depend on the structure of services (the value of labour input in business sector is usually higher than in final consumption services), but also on the different wage developments in the different components of the service sector and the solvency of customers. The measurement of service productivity, although necessary from an economic point of view, is also limited due to the differences in services (Michalová et al., 2013).

Existing conceptual approaches to service productivity take into account a number of factors influencing its measurement (Lasshof, 2006; Grönroos and Ojasalo, 2004; Johnston, Jones, 2004; Corsten, 1994; Gummesson, 1998). However, there is currently no single definition of service productivity or a commonly used method of measuring it (Johnston, Jones, 2004). The difficulty in defining a method to measure productivity lies in the specific nature of services as well as the difficulty to quantify customer participation in the service production process (Nachum, 1999; Vuorinen, Järvinen, Lehtinen, 1998; Grönroos and Ojasalo 2004; Jääskeläinen, 2010).

Several definitions, such as Sink's (1985), follow a rather classical view of productivity. In the context of APQC (American Productivity and Quality Centre) research, he developed a proposal for a new structure, the "New Total Productivity Measure", which is also specified as the TPM (or APQC model). Based on this structure, he demonstrated that profitability and productivity must be analysed exclusively in parallel. He also identified internal, external and complex performance, which gave rise to the calculation of performance as the sum of price differential and productivity. In addition to the aforementioned, Sink (1985) introduced these three techniques for the reason of productivity evaluation:

- The Normative Performance/Productivity Measurement Methodology (NP/PMM) (structured group processes are used to formulate adequate productivity measures for technical and economic workers);
- The Multi-Factor Productivity Measurement Model (MFPMM) (measuring productivity on the basis of output/input ratio);
- The Multi-Criteria Performance Productivity Measurement Technique (MCP/PMT) (this is a technique by which the user is able to evaluate different measurements and rank them in terms of meaning and importance).

Mohanty and Rajput (1988) carried out research on productivity trends using correlation analysis. In particular, they specified and named interactions to define outputs and inputs as precisely as possible, on the basis of which they were able to establish multifactor and complex productivity indicators. They further analysed their sensitivity to important factors using the coefficient of determination. From this research, multiple regression models showing the dependence between productivity and the aforementioned factors emerged. Like Mohanty, Rajput (1988) similarly opted for correlation analysis when examining the main managerial ratios that are related to enterprise value creation.

The service productivity model of Grönroos and Ojasalo (2004) is one of the main existing concepts in the scientific literature (Balci et al., 2011), extending the classical understanding of service productivity. It is based on a process approach and defines service productivity as a complex of different functional components. From the service provider's perspective, service productivity is determined by three main factors: internal, external and capacity utilization (Scheme 1).

Internal efficiency is identified by the internal structure of the service production, involving inputs from the service provider and customers; external efficiency depends on the quality of outputs, in particular the quality of service and quantity of outputs as assessed by customers; efficient capacity utilisation means the optimal use of the enterprise´s capacity in relation to the quantity of outputs. Capacity utilisation is optimal when demand and supply of output are in balance. The ability of the service provider to maintain cost efficiency (internal efficiency) and to coordinate resources with customers' expectations for quality (external efficiency) along with the enterprise´s capacity utilization (capacity efficiency) is important (Balci et al. 2011).

Scheme 1 Service productivity according to Grönroos and Ojasal
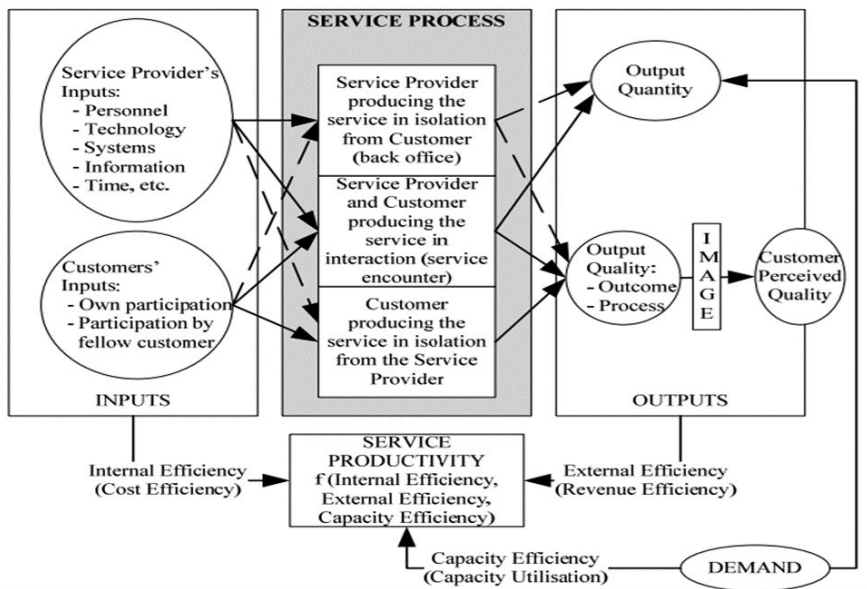


*Source: Balci et al., 2011*

Thus, the traditional service productivity model was extended to include the customer (Vuorinen, Järvinen, & Lehtinen, 1998). When quality and customer satisfaction are incorporated into the concept of productivity, service enterprises can expect greater customer loyalty, increased profits and greater customer participation (Grönroos, Ojasalo, 2004). However, when consider-

ing customer participation in the service production process, the role of the customer is not only to evaluate quality, because in some services customers are directly involved in the service production process and thus have as important a role as the service provider (Grönroos; Ojasalo, 2004). A purely quantitative approach does not include all the characteristics of service production and at the same time it does not reflect the efficiency of service production, which implies that it is essential to focus on the quality of the outputs. This is because the better the quality of services is assessed from the customer's perspective, the better the external efficiency, which itself results in improved service productivity.

Regarding the relationship between service productivity and service quality, some researchers are of the view that productivity and quality are inseparable parts of a whole (Grönroos and Ojasalo, 2004; Gummesson, 1998), while others argue that productivity is independent of quality and can be viewed separately as an expression of a qualitative benefit that is separate from a quantitative outcome (Lasshof, 2006; Nachum, 1999). However, all researchers agree that the customer determines service quality (Lasshof, 2006; Grönroos and Ojasalo, 2004).

Scheme 2 Service productivity according to Lasshof

The aim of the service company:

**Efficiency**

is quantitatively operationalized by:

**productivity**

is decisively influenced by:

Integration of the buyer
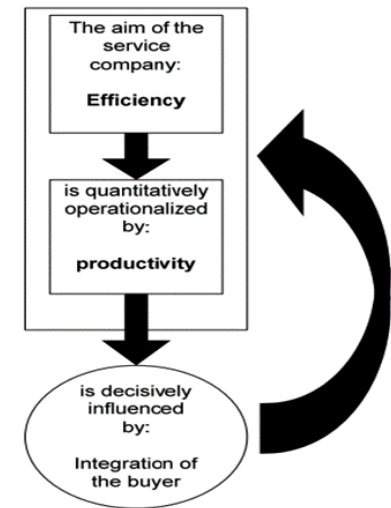
*Source: Lasshof, 2006*

According to Lasshof (2006), productivity is influenced to a decisive extent by the customer, who judges the quality of service (or one aspect of quality) serving as a benchmark for evaluating the efficiency of production. Given that the customer is a critical factor for the success of a service provider, there is a need for simultaneous pressure on production efficiency and customer satisfaction (Lasshof, 2006). Increasing both variables simultaneously leads to competitive advantage. Lasshof (2006) also suggests that productivity considerations also imply that production efficiency and productivity expressed quantitatively can be evaluated independently of each other (Lasshof, 2006) (Scheme 2).

The divergence of the approaches described is highlighted in Scheme 3, which illustrates two approaches: approach (a) views productivity as a complex integrating efficiency and capacity utilisation; approach (b) views service productivity as part of efficiency and competitive advantage.

**Scheme 3 Comparison of the service productivity concept according to (a) Gronroos and Ojasal and (b) Lasshof**
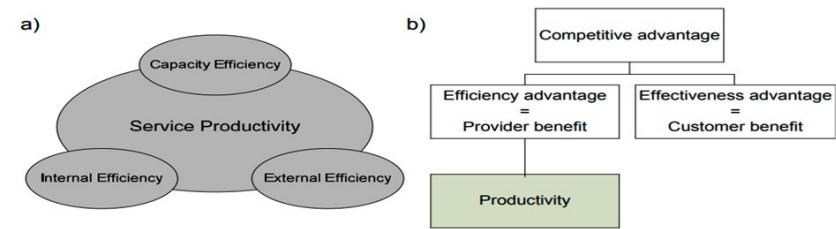


*Source: Balci et al., 2011*

Thus, it can be concluded that the use of the traditional approach to measuring service productivity is justified given the methodological problems arising from the multitude of qualitative factors that directly or indirectly affect service productivity, as well as the differences in approaches to measuring service productivity. At the micro level through output indicators (sales) and number of workers, that is, how one worker contributes to the total sales produced, and at the macro level through the gross value added generated by one worker in a given sector. This approach has, after all, also been applied in statistical survey practice to date.

Over the ten-year period, labour productivity in the EU-27 increased in all economic activities surveyed except arts, entertainment, recreation and

other services, with the highest labour productivity in financial and insurance services, where output per worker increased by €12,400 in 2019, followed by information and communication services, with an increase in labour productivity of €20,200 in 2019 compared to 2009. Labour productivity in these services far exceeds that achieved in industry, being almost double. Other services recorded labour productivity in 2019 of between 40,000 euro and 48,000 euro, gradually catching up with the values achieved in industrial activities; services are thus significant productive activities (Table 2).

Table 2 Labour productivity in the EU-27 in 2009, 2014 and 2019 (in EUR thousands per worker)

| Years | 2009 | 2014 | 2019 |
|---|---|---|---|
| Agriculture, forestry and fishing | 15,7 | 17,9 | 20,4 |
| Industry | 53,3 | 62,6 | 66,3 |
| Construction | 41,3 | 41,4 | 43,3 |
| Wholesale and retail trade, transportation and storage, accommodation and food service | 38,6 | 40,8 | 43,0 |
| Information and communication | 88,3 | 100,5 | 108,5 |
| Real estate activities | 99,0 | 103,1 | 111,4 |
| Professional, scientific, technical, administration and support service activities | 46,7 | 46,3 | 47,7 |
| Public administration, defence, education, human health and social work activities | 41,7 | 41,8 | 41,9 |
| Arts, entertainment, recreation, other services, activities of households as employers, activities of extraterritorial organisations and associations | 29,3 | 28,3 | 28,5 |

Source: Eurostat, 2021

Another approach used in Eurostat statistics is to compare productivity measured by value added per worker and average personal costs per worker. A value of less than 100% means that the average personal costs per worker was higher than the productivity achieved in the service sector under consideration.

In the EU-27, the highest productivity compared to average costs per worker in 2017 was achieved in the real estate activities sector, with a value

of 292%, while it was also high in electricity, gas, steam and air-conditioning supply sector (290%) and in the mining and quarrying sector (260%). A value of more than 150% was achieved in information and communication services, with values above 100% in all other service sectors; average personal costs per worker were higher than productivity only in the computer repair, personal and household goods sector, indicating that average personal costs per worker were higher than average value added per worker (Graph 6).

**Graph 6 Relationship between productivity and average costs per worker by selected sectors in the EU-27 in 2017 (%)**
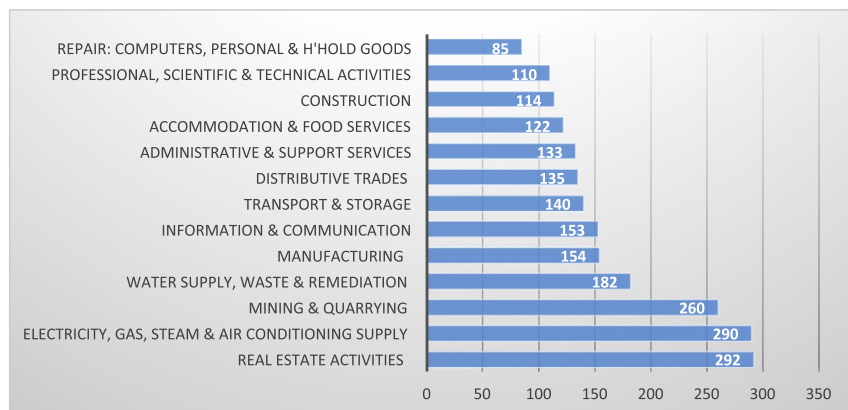


*Source: Eurostat, 2021*

## 4.3 Development of labour productivity of tourism enterprises in selected EU countries and the relationship between performance indicators

The cross-cutting nature of tourism extends across several sectors of the service economy. According to the Tourism Satellite Account (TSA), the complex of services serving the needs of the visitor consists of the characteristic services of tourism, such as accommodation and food services, passenger transport services, activities of travel agents and tour operators, cultural activities, sports and recreational activities. Other tourism-related services are specific in nature, defined regionally, the production of these services satisfies the needs of tourism visitors but also goes to domestic consumption. The

share of employment and sales generated by tourism is difficult to define explicitly. According to Eurostat statistics, tourism output is primarily tracked through Section I – accommodation and food services and Division N79 – activities of travel agencies and tour operator activities.

The aim was to investigate the development of the performance of accommodation and catering services and travel agencies and travel agencies through the labour productivity indicator, their dynamics and to identify the relationship between employment, sales and achieved labour productivity in selected EU countries.

Graph 7 Development of labour productivity in accommodation and food services in EU selected countries (in EUR thousands)
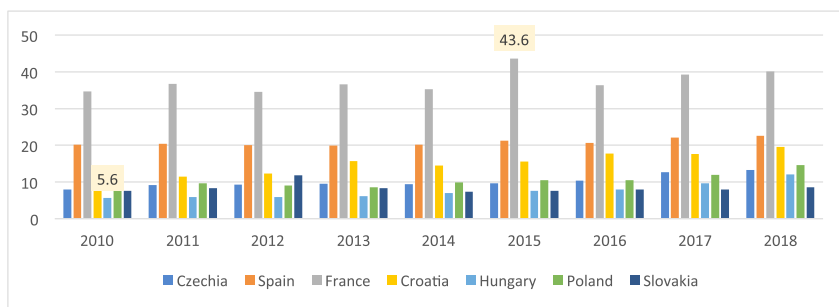


*Source: authors´ own based on Eurostat, 2021*

As can be seen in Graph 7, the highest labour productivity in accommodation and food services was found in France during the whole period under review, at 43.6 thousand euro in 2015. On the contrary, the lowest labour productivity was in Hungary, namely in 2010, when it amounted to 5.6 thousand euro. In Slovakia, labour productivity in 2018 reached a value of 8.5 thousand euro, which means that 1 worker in accommodation and catering establishments produces 8,500 euro per year.

Table 3 Growth rates and average growth rates of labour productivity in accommodation and food services in selected EU countries

|  | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\overline{T}_\Delta$ |
|---|---|---|---|---|---|---|---|---|---|
| Czechia | 15,00 | 1,09 | 2,15 | -1,05 | 2,13 | 8,33 | 22,12 | 4,72 | 6,56 |
| Spain | 0,99 | -1,96 | -0,50 | 1,51 | 4,95 | -2,83 | 7,28 | 2,26 | 1,41 |
| France | 5,76 | -5,99 | 6,09 | -3,55 | 23,51 | -16,51 | 7,97 | 2,04 | 1,82 |
| Croatia | 1,79 | 7,89 | 27,64 | -7,64 | 7,59 | 14,10 | -1,12 | 11,36 | 7,25 |
| Hungary | 5,36 | 0,00 | 5,08 | 12,90 | 8,57 | 5,26 | 21,25 | 24,74 | 10,11 |
| Poland | 12,79 | -6,19 | -5,49 | 15,12 | 6,06 | 0,00 | 13,33 | 22,69 | 6,84 |
| Slovakia | 9,21 | 42,17 | -29,66 | -10,84 | 2,70 | 5,26 | 0,00 | 6,25 | 1,41 |

*Source: authors´ own*

Using the growth rate and the average growth rate, we can see how labour productivity in accommodation and food services evolved relatively in the selected countries. The analysed indicator increased the most in relative terms in Slovakia in 2012 compared to 2011, by 42.17%, and decreased the most also in Slovakia, in 2013 compared to 2012, when a decrease of 29.66% was found. On an average annual basis, productivity increased relatively in all countries, the highest in Hungary, where an average annual growth of 10.11% was recorded (Table 3).

Graph 8 Development of labour productivity in travel agencies and tour operators in selected EU countries in EUR thousands
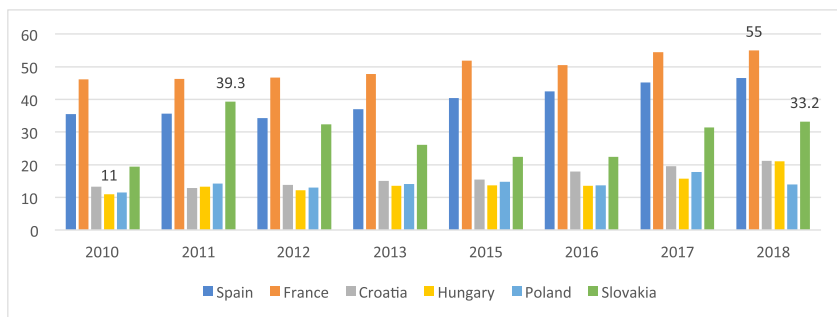


*Source: authors' own based on Eurostat, 2021*

The highest labour productivity in travel agencies and tour operators was found in France during the whole period under review, amounting to 55 thousand euro in 2018. On the contrary, the lowest labour productivity was in Hungary in 2010, when it amounted to 11 thousand euro. The highest value of labour productivity in those activities in Slovakia was reached in 2011 with 39.3 thousand euro, in the following years until 2016 it recorded a decrease, again an increase was achieved from 2017 and in 2018, and it was 33.2 thousand euro.

Table 4 Growth rates and average growth rates of labour productivity in travel agencies and tour operators in selected EU countries

|  | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | $\overline{T}_\Delta$ |
|---|---|---|---|---|---|---|---|---|---|
| Spain | 0,28 | -3,65 | 7,87 | 1,35 | 7,73 | 5,20 | 6,35 | 2,88 | 3,43 |
| France | 0,22 | 0,87 | 2,58 | 5,65 | 2,57 | -2,51 | 7,72 | 1,10 | 2,23 |
| Croatia | -2,27 | 6,98 | 8,70 | 4,67 | -1,27 | 15,48 | 8,94 | 8,72 | 6,10 |
| Hungary | 20,91 | -9,02 | 11,57 | 2,22 | -0,72 | -1,46 | 16,30 | 33,76 | 8,42 |
| Poland | 23,48 | -8,45 | 8,46 | 9,22 | -3,90 | -7,43 | 29,93 | -21,35 | 2,49 |

*Source: authors´ own based on Eurostat, 2021*

The relative development of labour productivity in travel agencies and tour operators in the selected countries was measured by the growth rate and the average growth rate. The indicator in question increased the most in relative terms in Hungary in 2018 compared to 2017, by 33.76%, and decreased the most in Poland in the same period, when a decrease of 21.35% was recorded. On an annual average relative basis, labour productivity in travel agencies and tour operators increased in all countries analysed, the most in Hungary, where an average annual growth of 8.42% was recorded (Table 4).

It is also important to find out whether there is a relationship between the sales achieved in tourism enterprises, employment and labour productivity. Correlation analysis was used in this survey to prove whether the relationship of the variables exists or not. The values of performance indicators were analysed for Czechia, Spain, France, Croatia, Hungary, Poland, and Slovakia for the year 2018.

Variables:

T1 – Sales of accommodation and food services in selected EU countries (EUR million)

T2 – Number of workers in accommodation and food services in selected
 EU countries

T3 – Labour productivity in accommodation and food services in selected
 EU countries (EUR thousands)

Image 1 Correlation graph
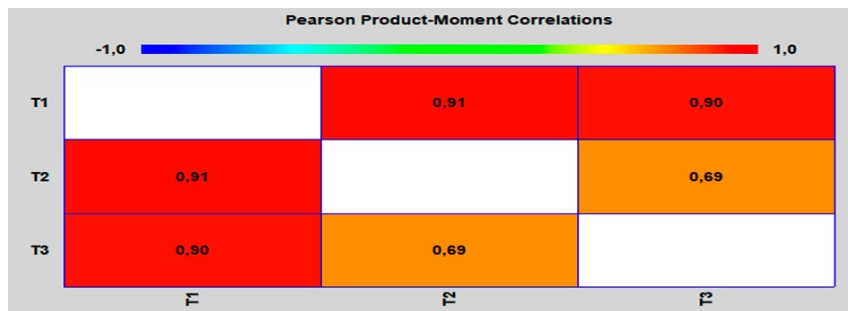


At the 0.1 significance level, we can conclude that the correlation coefficients for each pair are statistically significant because the p-values attributed to each pair are below the established significance level (T1 and T2 → p = 0.004; T1 and T3 → p = 0.0059; T2 and T3 → p = 0.0852).

The strength and direction of the dependence is assessed on the basis of the resulting values of the correlation coefficients, which are shown in the correlation graph. High values of the coefficients (0.9 and 0.91) are obtained for the pairs T1 and T2 and T1 and T3, i.e. there is a strong direct dependence between the sales of accommodation and food services and the number of workers in accommodation and food services, as well as between the sales of accommodation and food services and labour productivity in accommodation and food services in the selected EU countries. This means that the higher the sales of tourism enterprises, the higher the labour productivity and the higher the number of employees.

There is a moderately strong direct relationship between the number of workers in accommodation and food services and labour productivity in accommodation and food services, as in this case the correlation coefficient takes the value of 0.69.

## 4.4 Impact of the global crisis on the services sector

At the beginning of the millennium, the most devastating global crisis was the financial crisis, which grew into an economic crisis. It originated in the US from the mortgage crisis and affected all the economies of the EU-27 from 2008 onwards. However, compared to the industrial sector, the impact of the crisis was moderate in the services sector. The least affected service sector was information and communication services, the lowest decline in sales was recorded in transport and storage services between the fourth quarter (Q4) of 2008 and the first quarter (Q1) of 2009, also in administration and support services. Overall, quarter-on-quarter declines ranged from 81% of the level in each of the previous quarters (Graph 9).

Overall, services recorded a fall in sales of 7 percentage points in the second quarter (Q2) of 2009 compared with the same period in 2008, with the largest fall of 13% in transport and storage services and the least affected by the crisis in information and communication services, with a fall of 2.9% (Table 5).

Graph 9 Development of services sales during the global financial crisis in 2008 and 2009 in the EU-27 (%, 100% = 2015)
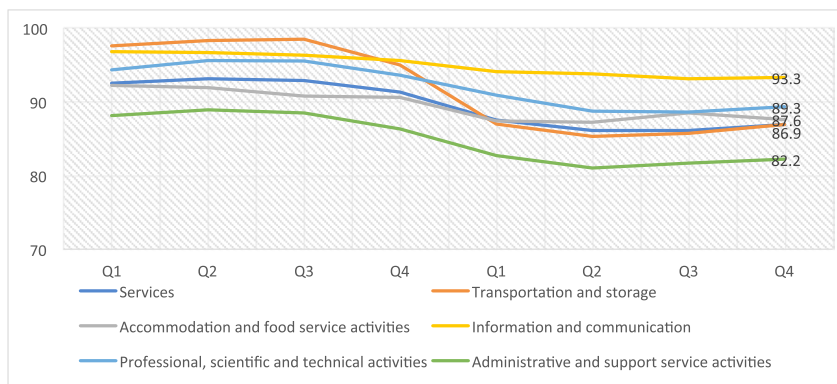


*Source: Eurostat, 2021*

Table 5 Development of services sales in the EU-27 between Q2 2008 and 2009 (%)

|  | Q2 2008 – Q2 2009 |
|---|---|
| Services | -7 |
| Transportation and storage | -13 |
| Accommodation and food service activities | -4,7 |
| Information and communication | -2,9 |
| Professional, scientific and technical activities | -6,9 |
| Administration and support service activities | -7,9 |

*Zdroj: Eurostat, 2021*

Another dramatic global crisis was, and still is, the pandemic caused by the spread of the Covid-19 virus, which hit the whole world in early 2020. In Europe, it manifested itself in January and February 2020, with the first cases confirmed in Spain, France and Italy. EU countries have taken a wide range of measures to combat the pandemic. Since 17 March 2020, EU Member States have introduced temporary restrictions on travel from third countries to the EU, which are not necessary. Exemptions were allowed for nationals of all EU member states and Schengen area states. Nevertheless, most countries have also introduced restrictions on movement between EU Member States.

Schools were closed in most Member States in the second week of March. Public events were cancelled by almost all Member States and private gatherings (with a capacity of between 2 and 50 people) were banned. Bars, restaurants and hotels were closed in almost all countries. In addition, most countries closed retail outlets, with the exception of supermarkets, pharmacies and banks. In Italy and Spain, non-essential production was halted and several countries introduced regional or even national measures to restrict movement, further stifling economic activity in many areas.

The vast majority of preventive measures were taken by mid-March 2020. Most precautionary measures and restrictions were maintained throughout April. In May and June, most measures were fully or partially lifted, leading to an increase in service production activities, but the summer months did not sufficiently compensate for the production shortfall.

With Covid-19 cases increasing after the summer holidays, several countries reintroduced measures against the spread of the disease in September

and October. Unlike the spring measures, these were usually not shop closures, but rather hygiene measures, social distancing, restrictions on public gatherings and the like (Eurostat, 2021).

Strict precautionary measures caused a decline in economic activity in every sector, whether industry or services. In addition, the service sectors were affected in Q2 of 2020, the crisis having the greatest impact on accommodation and food services, with a 57.9% fall in production, followed by administration and support services and transport and storage, with a 19.6% fall. The entire service sector recorded a 17.5% decline in sales during this period, with information and communication services (down 4.3%) being the least affected by the pandemic during this period (Graph 10).

A partial recovery in production occurred in the third quarter (Q3), but the reduced production volume in the previous quarter, with which Q3 is compared, must be taken into account. The largest recovery is recorded in accommodation and food services by 107.4%, but this is followed by a renewed decline in sales in the other quarters under review (Graph 10).

In general, it can be assessed that tourism enterprises were the most affected by the pandemic and the resulting measures. The level of these services is still only at 42% of the last quarter of 2019, i.e. the last quarter before the crisis caused by the Covid-19 disease (Table 6).

Graph 10 Development of sales in selected services during the crisis in the EU-27 (%)
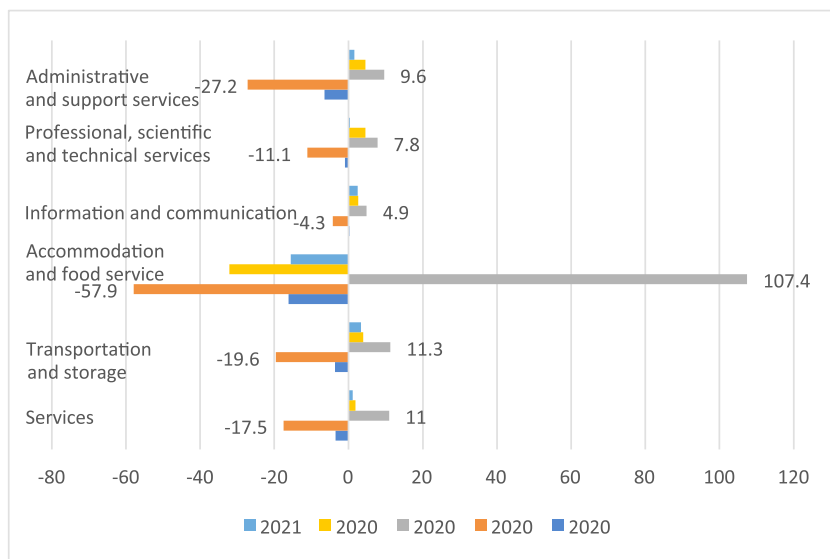


*Source: Eurostat, 2021*

Administration and support services, whose production goes to intermediate consumption, reached 79.2% of pre-pandemic output in Q4 2020. Transportation and storage services, professional, scientific and technical activities reached more than 90% of the pre-pandemic level of sales, and across the services sector, the value of sales in the last quarter of 2020 was more than 90% compared to the last quarter of 2019. Among the service sectors under review, only information and communication services increased the value of sales compared to pre-pandemic sales, to 105.8%. This is also due to the shift of production in other sectors to the online space and the growing demand for these services during the pandemic period. However, overall, the entire service sector reached only 91.1% of the value of sales produced in Q4 of 2020, which was the pre-pandemic period (Table 6).

Table 6 Comparison of pre-pandemic service sales with the last quarter of 2020 (%)

| | Q4 2019/Q4 2020 (%) |
|---|---|
| Services | 91,1 |
| Transportation and storage | 92,8 |
| Accommodation and food service | 42 |
| Information and communication | 105,8 |
| Professional, scientific and technical services | 99,7 |
| Administration and support services | 79,2 |

*Source: Eurostat, 2021*

Different EU-27 countries adopted different scopes of measures to eliminate or reduce the spread of Covid 19, which were flexibly adjusted depending on the number of infections and the time of the largest increases in the disease. Therefore, the impact of the pandemic on the economies of each country also varied in terms of the relaxation or implementation of measures.

Graph 11 Development of service sales in the EU-27 quarterly in 2020 (%)
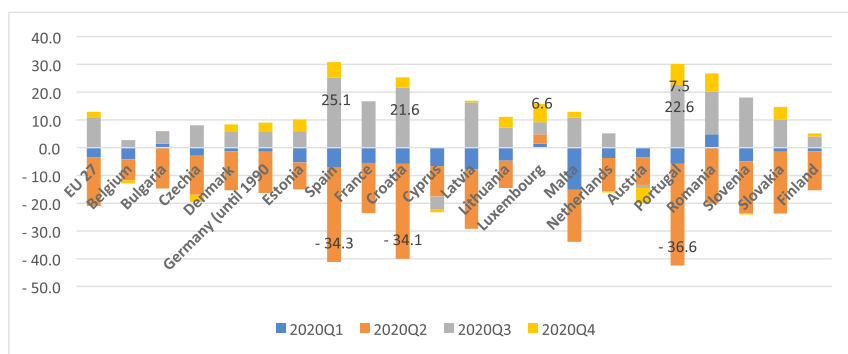


*Source: Eurostat, 2021*

The largest quarter-on-quarter drop in sales in 2020 across all EU-27 countries was found in Q2 of 2020. Total service sales fell by 17.5% across the

EU, with Portugal (−36.6%) recording the most significant decline in Q2, followed by Spain (−34.4%) and closely followed by Croatia (−34.1%). In Q3 of 2020, there was a recovery in the economies and growth in service sales, with Spain, Portugal and Croatia growing the most at 25.1%, 22.6% and 21.6% respectively. It can be noted that the European countries most affected by the anti-covid measures mobilised the fastest, as they achieved the greatest increase in sales, despite the fact that the increase in sales did not reach the values of Q2. A positive trend was observed in all EU-27 countries in Q3 of 2020 except Cyprus (−4.5%) and Austria (−1.1%). In Q4 of 2020, sales growth slowed down, but the fluctuations did not reach the same downward momentum as in Q2; most EU-27 countries stabilised their performance or grew slightly, with a slight decline in sales in Belgium, Czechia, Cyprus, the Netherlands, Austria and Slovenia (Graph 11).

The development of sales in services in Slovakia in 2020 followed the trends found for the EU-27 countries in general, but the differences were in the values. In the first two quarters, a decline in service sales was observed, with a decline of up to 22% in Q2, i.e. larger than the EU-27 average. In the following two quarters, Slovakia followed a positive trend, with sales moderately growing and showing increases (Graph 11).

## Summary

The service sector has a significant position in the EU-27 economy, accounting for around two-thirds of gross value added and employment; labour productivity in selected services is higher than in industry, and productivity values are gradually increasing in other services.

Gross value added in services grew moderately between 2009 and 2019, with information and communication services, professional, scientific, technical and administration services registering the highest growth rates. Continuous growth in gross value added was identified with small variations in all services in the EU-27 over the entire ten-year period.

In the EU-27, the retail and wholesale trade sector employed more workers than industry in 2017, with many jobs generated in administrative and support services, also in professional, scientific and technical activities, accommodation and food services, and transport and storage as well. Across all services, small and medium-sized enterprises generated almost half of the jobs, with the largest share in real estate activities and accommodation and food services.

The highest labour productivity growth was recorded in financial and insurance services, while the highest labour productivity growth was recorded in information and communication services. Labour productivity in these services far exceeds the productivity achieved in industry, reaching almost double the values. In the EU-27, compared to the average cost per worker in 2017, the highest labour productivity values were achieved by real estate activities.

The global crisis phenomena of the last two decades negatively affected the economies of the world and, as part of this, also had a negative impact on the services sector. However, the development of the EU-27 and service economies was different during the last two global crises. The financial crisis between 2008 and 2009 affected the industrial sector to a greater extent, while the impact of the crisis was moderate in services. Information and communication services were the least affected services sector, while transport and storage services and administration and support services were the most affected. The impact of the crisis on services was short-lived, with a recovery of the services market already in 2010 and dynamic growth in services sales in the following years, which lasted until 2020, when the next global crisis began.

The second global crisis caused by the Covid-19 pandemic hit service production, as measured by sales, with much greater force. This is understandable, given that it affected production at both horizontal and vertical levels, i.e. all sectors of countries' economies. The most affected service sector in the EU-27 was accommodation and food services, which recorded a fall in sales volumes in all quarters of 2020 and also in Q1 of 2021. The only exception was Q3 of 2020, when sales gains were observed compared to the previous period. The sales volume of tourism enterprises in the EU-27 was still only 42% of the last quarter of 2019, the period before the start of the pandemic caused by the Covid-19 virus.

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# 5 INTERNATIONAL TRADE IN SERVICES

The service sector and international trade in services have expanded rapidly and continuously in recent years as a result of globalisation and technological developments. The manifestations of this development can be seen in particular in the increasing share of gross domestic product (GDP) and the creation of new jobs not only within the countries of the European Union (hereinafter referred to as 'EU') but also on a global scale. The service sector currently generates up to 35% of GDP, even in less developed countries; within the European Community, its share of GDP generation is 42%, and in the OECD Member States the share of GDP is even more than 70% (UNCTADstat, 2021).

Historically, mercantilism as a new economic policy in the 16th–18th centuries was seen as a predecessor to free trade. It was an attempt to strongly promote the exports of the national economy, while keeping imports as low as possible by various measures. As a new structure of free trade emerged, mercantilism was subsequently replaced by a new theory of international trade. The founders of this theory were Smith and Ricardo, who proved that free trade leads to greater welfare for all stakeholders (Kutschker and Schmid, 2011).

Smith came up with the division of labour theory, which names the benefits of international trade through differentiated production costs and associated price differences. According to Smith and his theory of absolute advantage, the claim that *"international trade occurs because countries that specialize in producing goods in which they have an absolute cost advantage export those goods and in return import goods in which they have an absolute cost disadvantage"* (Kutschker and Schmid, 2011, p. 378). This statement, which provides the first fundamental rationale for international trade, was further extended by Ricardo with his theory of comparative advantage.

In the current literature, there are many views with regard to the precise definition of international trade, which on the one hand are partly complementary, but on the other hand often contradict each other.

International trade in services takes place when domestic factors receive income from non-residents in return for the provision of their services. This definition of Stern and Hoekman incorporates the irrelevance of the place of supply of services and serves as the basis for the IMF's balance of payments statistics (Stern and Hoekman, In: Bürger, 2005).

The General Agreement on Trade in Services (GATS) distinguishes four modes of trade in services based on the location of the supplier and consumer in the provision of the service, taking into account their nationality or origin (shown in Scheme 1). These four modes are generally referred to as:

1. MODE 1 Cross-border-supply:
   No simultaneous and physical presence of the supplier and consumer of the service – the service is carried out through international communication networks such as telephone, the Internet, or through a storage medium;

2. MODE 2 Consumption abroad:
   The service consumer is temporarily located in the country of the service supplier – a tourist abroad;

3. MODE 3 Commercial presence:
   The service supplier establishes (or has acquired) a branch in another territory through which it provides the service connection – a foreign bank providing banking services in a subsidiary in the territory of another country;

4. MODE 4 Presence of natural persons:
   Short or long-term presence of the service supplier in the consumer's host country, but permanent presence is excluded – a singer on a concert tour or a person employed abroad on a temporary basis (Fuchs and Tuerk, 2003).

Scheme 1 A summary view of international trade modes in services
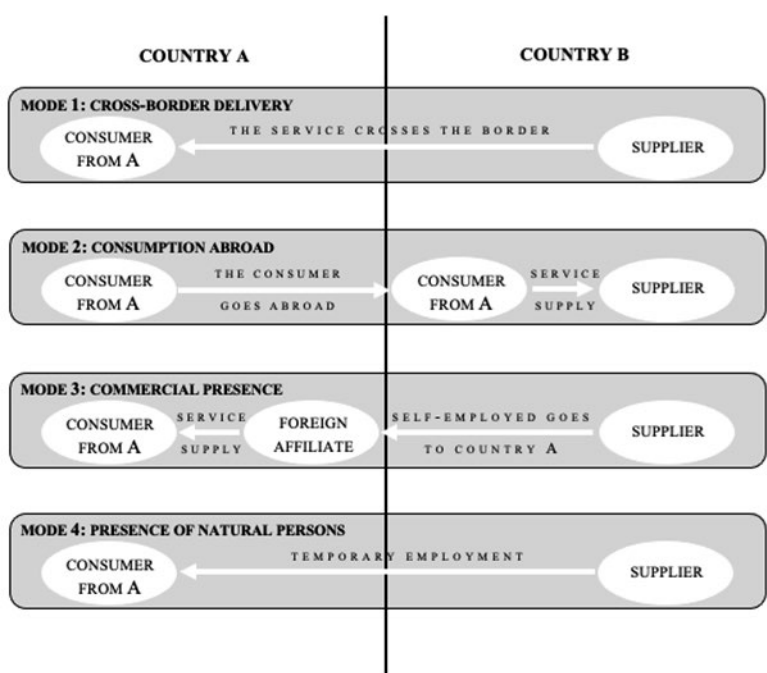


*Source: MSITS, 2010*

International trade includes all economic transactions in goods, services and property between persons, institutions and governments of domestic and foreign countries. In this context, it is understood that the term domestic includes all domestic entities, including foreign workers, who are resident in a domestic country. Foreign is understood to include all business entities that are not resident in the domestic country. This implies the first feature of the distinction between domestic and foreign trade, which states that the country's borders must be crossed when the aforementioned transactions take place (Kutschker and Schmid, 2011).

## 5.1 Statistical evaluation of international trade in services

International trade in services is statistically imperfect and the necessary data are hard to obtain. This problem arises mainly because services, unlike goods, are not registered at the border. Detailed statistics on exports and imports to partner countries are scarcer. Several statistical databases are now available as a source of data on international trade in services, mainly published by the IMF, other international organisations or statistical offices of countries or communities. However, even these databases have a number of shortcomings. Two issues are particularly relevant for the service sector in this respect:

- Not all entrepreneurs who provide services are automatically included in the statistics as service providers. In the statistics, associated entrepreneurs or associated enterprises are included in the economic sector in which they achieve the main focus of their production or in which they employ the largest number of employees.
- Imperfections in the balance of payments cause goods and services to be included together in some data. Traditionally, this concerns the activities of travel agencies and tour operators, whose data also include purchases of goods related to tourists' stay abroad (Eurostat, 2017b).

Statistics show that international trade in services is much lower than in reality. Since the beginning of the Uruguay Round, there have been intensive efforts to improve the statistical situation, with the cooperation of Eurostat, the IMF, the OECD, the UN, and the World Bank. This is the right step towards a globally standardised collection of international trade in services data.

Since the completion of the European single market on 1 January 1993, with the consequent abolition of customs controls on goods at the internal borders of EU Member States, international trade statistics have been divided into intra-trade and extra-trade statistics. Intra-trade statistics cover transnational trade between EU Member States. In this case, the data collection takes the form of direct reporting by both parties involved in the trade. In foreign trade statistics (trade with third countries), each export and import is linked to the clearance of customs formalities. In this case, the implicit statistics on international trade are taken from the customs documents delivered by the exporter or importer.

Based on this concept of statistical survey of data relating to international trade within the countries of the European Community, the statistics are

based on the EU rules and implemented in all Member States according to the same definitions. In this context, the results are, in principle, also comparable (Statistisches Bundesamt, 2017).

### Methodology for measuring international trade in services

The original methodology used for statistical surveys of international trade in services until 2013 was based on the fifth edition of the IMF's Balance of Payments and International Investment Assistance Manual (BPM5) and the Extended Balance of Payments Classification of Services (EBOPS, 2002).

A number of new international standards, including the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6) and the publication of the Manual on Statistics of International Trade in Services (MSITS 2010), led to a major update of the methodology used to measure trade in services in a general balance of payments (BoP) context. This update of the measurement of international trade in services was reflected in Commission Regulation (EU) No 522/2012, which proposed new data requirements consistent with the BPM6 methodology (Eurostat, 2017a).

The new methodology for measuring international trade in services provides better elaboration, clarification and a higher level of detail on the measurement of foreign trade. The main change introduced in the measurement methodology was the expansion of the standard services components from the original 11 main components (BPM5) to 12 standard service components of BPM6, as captured in Scheme 2.

Scheme 2 Main differences in the categorisation of BPM5 and BPM6 standard services

| Standard services BPM5 | Štandardné služby BPM6 |
|---|---|
| Transportation services | Manufacturing services on physical inputs |
| Travel services | Maintenance and repair services |
| Communication services | Transportation services |
| Construction services | Travel services |
| Insurance services | Construction services |
| Financial services | Insurance and pension services |
| Computer and information services | Financial services |

| Standard services BPM5 | Štandardné služby BPM6 |
|---|---|
| Royalties and license fees | Charges for the use of intellectual property |
| Other business services | Telecommunication services, Information services and Computer services |
| Personal, cultural, and recreational services | Other commercial services |
| Government services | Personal, cultural and recreational services |
| | Government goods and services |

*Source: Eurostat, 2017a*

Looking at the new BPM6 standard service components, it can be seen that some categories were dropped, added or renamed to be identical to the new way of measuring the respective services. The transition from one international trade measurement system to the other here is complex and in some cases data comparisons are also problematic, as one BPM5 service category may be split into two new BPM6 service categories or a new BPM6 category may contain elements that were previously recorded under two different BPM5 service categories.

The new methodology for measuring international trade in services has been implemented since 2014 (statistical data of reference year 2013). Data from 2010 to 2012 are processed and distributed under the BPM5 and/or BPM6 methodology in separate tables. Statistical data processed by the original BPM5 system (up to 2010) are still available (Eurostat, 2017a).

## 5.2 International trade in services worldwide, 1990–2020

Services are increasingly important in world trade. Many services that were previously considered non-tradeable became, as a result of economic and technological developments, the subject of international trade. Since the late 1980s, trade in services has become one of the fastest growing areas of world trade. The export of the service sector increased worldwide in the years 1990–2020 from the value of 831,3 million dollars to 4,984 million dollars, which represents an average annual growth of 16.65 pp. This growth even preceded the significant growth of trade in goods, which increased from 3,495 mil-

lion dollars to 17,582 million dollars (with an annual average growth of 13.43 pp).

The following Table 1 shows more detailed data on the development of international trade in services.

Table 1 Development of exports of goods and services of the leading countries from 1990 to 2020 (in USD million and in %)

|  | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
|---|---|---|---|---|---|---|---|
| **Export of goods (USD million)** | | | | | | | |
| World | 3 495 | 5 176 | 6 452 | 10 502 | 15 300 | 16 558 | 17 582 |
| EU[1] | 1 378 | 1 955 | 2 168 | 3 689 | 4 767 | 4 929 | 5 457 |
| China | 62,0 | 148,7 | 249,2 | 761,9 | 1 577 | 2 273 | 2 591 |
| USA | 393,5 | 584,7 | 781,9 | 901,0 | 1 278 | 1 502 | 1 431 |
| Germany | 421,1 | 523,5 | 550,4 | 970,9 | 1 258 | 1 326 | 1 380 |
| Japan | 287,5 | 443,1 | 479,2 | 594,9 | 769,7 | 624,9 | 641,3 |
| France | 217,2 | 301,9 | 326,8 | 463,4 | 523,7 | 506,2 | 488,3 |
| **Export of services (USD million)** | | | | | | | |
| World | 831,3 | 1 222 | 1 521 | 2 573 | 3 896 | 4 999 | 4 984 |
| EU[1] | 405,1 | 552,1 | 661,0 | 1 211 | 1 712 | 2 087 | 2 227 |
| China | 5,8 | 19,1 | 30,4 | 74,4 | 162,1 | 255,7 | 245,5 |
| USA | 147,8 | 219,1 | 289,1 | 377,4 | 557,6 | 768,6 | 705,6 |
| Germany | 62,4 | 82,3 | 83,1 | 163,8 | 247,5 | 280,6 | 310,6 |
| Japan | 41,3 | 65,2 | 69,2 | 110,3 | 141,2 | 162,6 | 160,2 |
| France | 67,7 | 84,0 | 80,6 | 122,3 | 196,3 | 255,7 | 245,5 |
| **Share of services in total exports (%)** | | | | | | | |
| World | 23,79 | 23,61 | 23,57 | 24,50 | 25,46 | 30,19 | 28,35 |
| EU[1] | 29,40 | 28,24 | 30,49 | 32,82 | 35,91 | 42,34 | 40,81 |
| China | 9,35 | 12,84 | 12,20 | 9,77 | 10,28 | 11,25 | 9,48 |
| USA | 37,56 | 27,47 | 36,97 | 41,89 | 43,63 | 51,17 | 49,31 |
| Germany | 14,82 | 15,72 | 15,10 | 16,87 | 19,67 | 21,16 | 22,51 |
| Japan | 14,37 | 14,71 | 14,44 | 18,54 | 18,34 | 26,02 | 24,98 |
| France | 31,17 | 27,82 | 24,66 | 26,39 | 37,48 | 50,51 | 50,28 |
| [1] **EU 12 1993 – 1994 / EU 15 1995 – 2004 / EU 25 2004 – 2006 / EU 27 2007 – 2013 / EU 28 2013 – 2020 / EU 27 2020 – presence** | | | | | | | |

*Source: UNCTADstat, 2021*

According to UNCTADstat, in 2020, exports of international services were worth 4 984 USD million. The share of services in total exports remained at 28.35% over the period under review. The EU, as the largest exporter and importer, including its internal trade, covers 44.68% of world trade in services, placing it far ahead of all other countries. The USA, with exports of services of 705.6 USD million, and its world share of 14.16% in 2020, is the second largest exporter of services followed by Germany, France, China and Japan.

However, the privileged positions of developed countries do not mean that developing countries play no role in trade in services. As many as 15 of the world's top 40 service exporters are from developing countries. Analyses based on uncovering countries' comparative advantages show that it is in fact small developing countries that report above-average export intensity in tourism, transport and other services.

The sectoral development of international trade in the world with priority areas of exported services – transport services, travel and other commercial services between 1990 and 2020 is shown in Graph 1.

Graph 1 World export share of major areas in the services sector between 1990 and 2020 (%)
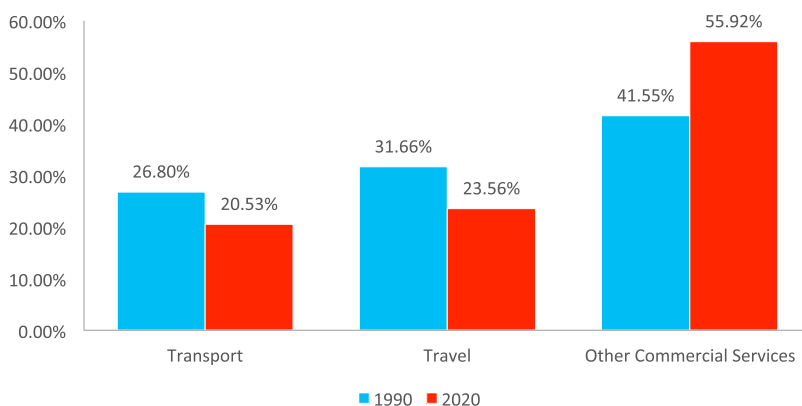


*Source: UNCTADstat, 2021*

From the Graph 1, it is possible to observe significant structural changes pointing to the export of services in the world. Over the last 30 years, the share of transport services declined by 6.27 pp, as did the share of travel services, which fell from 31.66% to 23.56%, while the area that experienced the

greatest change in the form of growth is other commercial services, whose share of exports rose from 41.55% in 1990 to 55.92% in 2020. This most dynamic area of services includes telecommunication and information services, construction, engineering, financial services and other business services.

## 5.3 Development and structure of international trade in services in the EU-27

The development of European international trade in services is a success story that is unrivalled in the world market. As part of internationalisation, 'made in Europe' services are now more popular than ever. European service suppliers have developed dynamically in recent years to become one of the world's leading suppliers of quality, innovation, know-how and reliability. As a result, the EU's market share placed it among other major export countries such as the USA or Japan. However, the global financial crisis (2008–2014) had a very strong impact not only on world but also on European international trade. Developing, emerging and industrialised countries were affected in various ways and the outlook for the economy and world trade was uncertain throughout. The same effect can be anticipated with the onset of COVID-19, the effects of which are certain to be reflected in the statistical databases of global international trade in services.

Exports of total cross-border services within the EU countries increased by 9.88 pp to 1,676.07 million euro (2012:1,525.30 million euro) in the period under review. Imports increased to 1,554.76 million euro during the same period, an increase of 21.71 pp (2012: 1,277.47 million euro). The share of total tourism services in European exports fell from 36.07% (2012: 550.15 million euro) to 1,776.07 million euro (2012: 1,876.15 million euro). A parallel situation also occurred in the case of imports, with the share of tourism services falling from 38.97% (2012: 497.78 million euro) to 26.16% (2020: 406.69 million euro) over the same time period, but this does not necessarily imply weak competitiveness in the European service sector. Despite a slight decline, tourism services have a high (one quarter) share of total service trade. Table 2 below gives us a detailed overview of the development of European imports and exports of services from the period of the end of the global financial crisis, the subsequent economic revitalisation and the emerging crisis caused by the global COVID-19 disease.

## Table 2 International trade in services in the EU 2012–2020 and growth index 2012/2020 (in EUR million and in %)

| | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % of growth 2012/ 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SERVICES TOTAL** | Export | 1 525,3 | 1 598,3 | 1 718,4 | 1 871,0 | 1 891,8 | 2 102,2 | 2 251,1 | 2 407,3 | 1 676,1 | 9,88 |
| | Import | 1 277,5 | 1 346,2 | 1 448,0 | 1 613,9 | 1 659,8 | 1 820,4 | 1 937,7 | 2 151,3 | 1 554,8 | 21,71 |
| | **Balance** | **247,83** | **252,11** | **270,36** | **257,06** | **231,96** | **281,77** | **313,45** | **256,05** | **121,31** | |
| **MANUFACT-URING SERVICES ON PHYSICAL INPUTS** | Export | 182,15 | 192,63 | 66,74 | 75,73 | 73,35 | 51,08 | 58,05 | 59,32 | 51,84 | − 71,54 |
| | Import | 137,94 | 152,85 | 43,87 | 50,39 | 50,68 | 39,55 | 44,48 | 48,18 | 42,09 | − 69,49 |
| | **Balance** | **44,21** | **39,78** | **22,87** | **25,34** | **22,67** | **11,53** | **13,57** | **11,14** | **9,75** | |
| **MAINTENANCE AND REPAIR SERVICES** | Export | 16,65 | 19,81 | 21,09 | 25,61 | 27,87 | 31,02 | 33,32 | 37,18 | 30,90 | 85,59 |
| | Import | 6,89 | 17,77 | 17,29 | 22,83 | 24,86 | 27,13 | 29,22 | 32,46 | 27,17 | 294,34 |
| | **Balance** | **9,76** | **2,04** | **3,80** | **2,78** | **3,01** | **3,89** | **4,10** | **4,72** | **3,73** | |
| **TRAVEL SERVICES** | Export | 282,28 | 295,08 | 319,67 | 334,75 | 339,60 | 390,50 | 405,93 | 426,69 | 158,90 | − 43,71 |
| | Import | 251,11 | 257,72 | 289,24 | 302,20 | 315,05 | 335,38 | 349,98 | 371,82 | 135,66 | − 45,98 |
| | **Balance** | **31,17** | **37,36** | **30,43** | **32,55** | **24,55** | **55,12** | **55,95** | **54,87** | **23,24** | |
| **TRANSPORT SERVICES** | Export | 267,87 | 269,85 | 313,18 | 326,22 | 316,10 | 351,15 | 376,06 | 400,78 | 302,55 | 12,95 |
| | Import | 246,67 | 253,56 | 280,06 | 297,85 | 292,80 | 317,15 | 343,69 | 357,40 | 271,03 | 9,88 |
| | **Balance** | **21,20** | **16,29** | **33,12** | **28,37** | **23,30** | **34,00** | **32,37** | **43,38** | **31,52** | |
| **CONSTRUCTION SERVICES** | Export | 18,40 | 20,34 | 25,83 | 27,93 | 26,74 | 31,86 | 31,16 | 30,64 | 22,37 | 21,58 |
| | Import | 15,08 | 15,46 | 19,14 | 18,63 | 16,80 | 19,61 | 21,95 | 21,81 | 16,87 | 11,87 |
| | **Balance** | **3,32** | **4,88** | **6,69** | **9,30** | **9,94** | **12,25** | **9,21** | **8,83** | **5,50** | |
| **INSURANCE AND PENSION SERVICES** | Export | 55,04 | 56,33 | 60,00 | 55,35 | 57,73 | 59,20 | 62,17 | 64,90 | 39,61 | − 28,03 |
| | Import | 28,25 | 31,01 | 35,54 | 36,43 | 40,23 | 38,47 | 42,52 | 43,57 | 40,89 | 44,74 |
| | **Balance** | **26,79** | **25,32** | **24,46** | **18,92** | **17,50** | **20,73** | **19,65** | **21,33** | **− 1,28** | |
| **FINANCIAL SERVICES** | Export | 151,35 | 157,05 | 175,78 | 195,25 | 189,79 | 208,35 | 212,96 | 216,31 | 153,61 | 1,49 |
| | Import | 75,36 | 83,70 | 96,19 | 103,89 | 105,03 | 121,36 | 126,94 | 133,98 | 120,88 | 60,40 |
| | **Balance** | **75,99** | **73,35** | **79,59** | **91,36** | **84,76** | **86,99** | **86,02** | **82,33** | **32,73** | |
| **ROYALTIES AND LICENCE FEES** | Export | 54,60 | 58,27 | 77,59 | 96,22 | 97,73 | 142,22 | 156,77 | 168,86 | 126,38 | 131,47 |
| | Import | 77,66 | 85,38 | 121,66 | 160,19 | 160,58 | 188,98 | 201,11 | 224,75 | 186,22 | 139,79 |
| | **Balance** | **− 23,06** | **− 27,11** | **− 44,07** | **− 63,97** | **− 62,85** | **− 46,76** | **− 44,34** | **− 55,89** | **− 59,84** | |

| | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | % of growth 2012/ 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **INFORMATION SERVICES AND COMPUTER SERVICES** | Export | 148,44 | 158,24 | 212,71 | 231,47 | 244,36 | 249,67 | 287,00 | 321,69 | 302,29 | 103,64 |
| | Import | 83,46 | 91,74 | 122,53 | 131,92 | 137,47 | 146,49 | 158,57 | 171,21 | 157,17 | 88,32 |
| | **Balance** | **64,98** | **66,50** | **90,18** | **99,55** | **106,89** | **103,18** | **128,43** | **150,48** | **145,12** | |
| **OTHER BUSINESS SERVICES** | Export | 319,99 | 341,04 | 410,87 | 466,95 | 481,33 | 543,25 | 580,48 | 626,06 | 447,96 | 39,99 |
| | Import | 327,94 | 328,21 | 390,44 | 457,67 | 485,12 | 548,34 | 578,74 | 702,17 | 528,88 | 61,27 |
| | **Balance** | **− 7,95** | **12,83** | **20,43** | **9,28** | **− 3,79** | **− 5,09** | **1,74** | **− 76,11** | **− 80,92** | |
| **PERSONAL, CULTURAL AND RECREATIONAL SERVICES** | Export | 15,43 | 16,83 | 20,63 | 19,93 | 21,04 | 28,23 | 30,65 | 37,25 | 27,58 | 78,74 |
| | Import | 16,99 | 18,61 | 22,16 | 23,70 | 22,59 | 28,00 | 30,94 | 34,79 | 23,26 | 36,90 |
| | **Balance** | **− 1,56** | **− 1,78** | **− 1,53** | **− 3,77** | **− 1,55** | **0,23** | **− 0,29** | **2,46** | **4,32** | |
| **GOVERNMENT GOODS AND SERVICES** | Export | 13,10 | 12,84 | 14,29 | 15,56 | 16,14 | 15,63 | 16,55 | 17,64 | 12,08 | − 7,79 |
| | Import | 10,12 | 10,19 | 9,90 | 8,21 | 8,61 | 9,93 | 9,51 | 9,13 | 4,64 | − 54,15 |
| | **Balance** | **2,98** | **2,65** | **4,39** | **7,35** | **7,53** | **5,70** | **7,04** | **8,51** | **7,44** | |

*Source: ITC TRADEMAP, 2021*

In terms of exports, the strongest area of the services sector is other business services, which includes research and development, professional and management consultancy, technical and other business services. Over the period 2012–2020, exports of other business services increased from 319.99 million euro to 447.96 million euro (plus 39.99 pp). Another leading area is travel one, which is mainly import-oriented and the most internationally competitive within the tourism industry. Although their export volume grew year-on-year from 282.28 million euro at the end of the financial crisis, it has now fallen to 158.90 million euro (minus 43.71 pp). Transport services (air and road transport, railways and inland waterways) are in second place with their share, and are considered to be particularly strong export services. Exports of transport services increased from 267.87 million euro to a new level of 302.55 million euro (plus 12.95 pp). Information and computer services reached the third highest volume, 302.29 million euro, which increased by 103.64 pp from 148.44 million euro in 2012. Other areas of the services sector, which are mainly active on the national market, follow (the leading ones) by a wide gap. These 'lagging' service sectors together account for one quarter (2020: 27.70%) of all exports and despite symmetrical growth, their export volumes are at a low level.

The top four areas of service imports, which together account for more than two-thirds of all exports (2020: 73.54%), are other business services, royalties and license fees, transport services, and information and computer services. Other business services outperformed all other areas with an increase in value from 327.94 million euro to 528.88 million euro (plus 61.27 pp). Overall, royalties and license fees made the largest progress in their export share, increasing by 139.79 pp from 77.66 million euro to 186.22 million euro. The value of the import volume of transport services was 271.03 million euro, an increase of plus 9.88 pp, compared to 246.67 million euro in 2008. Information and computer services, with exports worth 157.17 million euro, are the fourth most important sector with an increase of 88.32 pp. The other areas of the services sector increased their export market share over the period, with the exception of travel services, which reflect the current crisis caused by the COVID-19 disease. Their import value fell by 45.98% from the original 251.11 million euro to the current 135.66 million euro. The second category is government goods and services, which reduced their exports from a value of 10.12 million in 2012 to 4.64 million euro in 2020 (minus 54.15 pp). Total volume of the slow-following service areas did not have a significant impact on the total import of services and participated with a share of less than one-third (2020: 26.46%).

Looking at the growth of European exports and imports of services over the period under review, all areas of this sector show a significant parallelism of market share reduction in 2020, which can be attributed to the effects of the aforementioned COVID-19 pandemic.

With the enlargement of the EU to 28 Member States from 2013 and the subsequent change to 27 Member States from 2020, the European Economic Area is the largest common market in the world. As a result of the traditionally close trade links between the economies of Member States and the size of the single market, most trade takes place within the European Community, so-called intra-EU trade. Despite this, intra-EU trade is growing much more slowly than trade with non-member countries. Graph 2 gives an overview of the development of European international trade in services and its trade balance.

Graph 2 Development of exports and imports of total services in the EU (in EUR million)
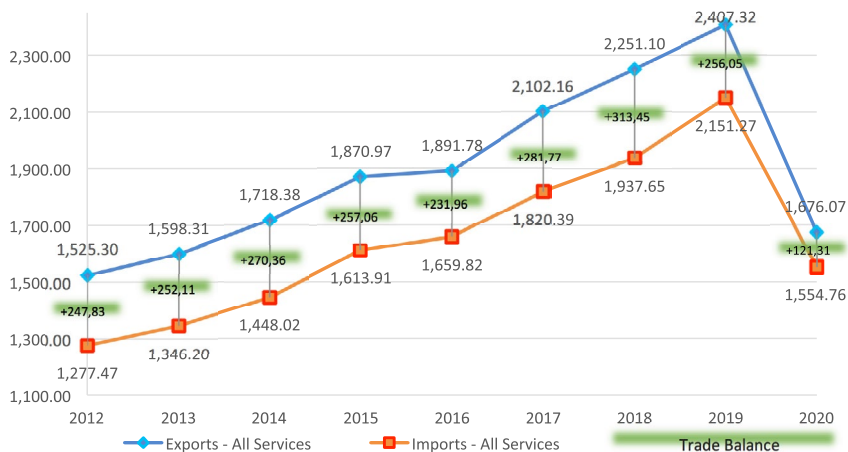


*Source: ITC TRADEMAP, 2021*

In the post-crisis period (since 2012), both export and import volumes of the EU total services increased until they reached a new all-time high in 2019. The Graph illustrates the subsequent large drop in the European services industry in 2020 to 1,676.07 million euro in exports and 1,554.76 million euro in imports of the EU total services.

The services trade balance of the EU countries has always been influenced by different and in some cases contradictory areas of development of the service sector. Despite negative income values in some areas of the sector (Table 2), an active balance of trade in total services was generated throughout the period under review.

Image 1, which presents the share of trading regions in international trade with the EU in services, shows that the EU economy is highly interconnected with the markets of Member States. 57.69% of trade in services is handled by the EU countries, with Germany being by far the most important trading partner, accounting for 16.09% of European exports. Looking at the whole European area, around 67.67% of domestic exports go to this region. This is followed by other continents by a wide gap, with 15.30% of service exports going to the Americas (North and South America), 14.97% to Asia (including Australia and Oceania) and only 2.06% to Africa.

Image 1 Share of world regions in the EU total service exports in 2020 (%)



*Source: Eurostat, 2021*

## 5.4 Assessment of the development of international trade in tourism services

The development of the trade values in transport services between 2012 and 2020 shows a clear positive trend until 2019 in all forms examined. Based on the results shown in Graph 3, it is evident that both exports and imports did not exceed the previous year's values in 2019, which were the highest for the entire period under review. Overall, the EU countries' exports of transport services were 12.95 pp higher in 2020 with a total volume of 302.55 million euro (2012: 268.87 million euro). Imports of services were 271.03 million euro (2012: 246.67 million euro) in the same period, representing a growth rate of 9.88 pp.

In all years, exports exceeded imports and therefore the trade balance shows an active balance with a surplus of 48.60 million euro. This result, despite the large fall in 2020, exceeded the values of previous years.

Graph 3 Development of exports and imports of transport services in the EU (in EUR million)



| | Exports - Transport | Imports - Transport | Trade Balance |
| --- | --- | --- | --- |
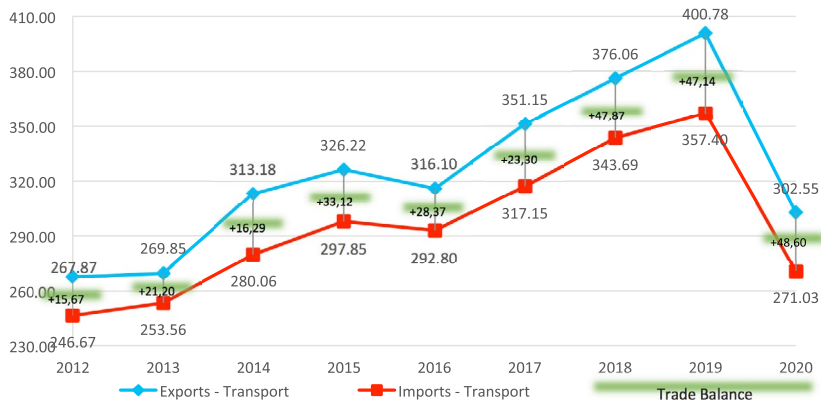
*Source: ITC TRADEMAP, 2021*

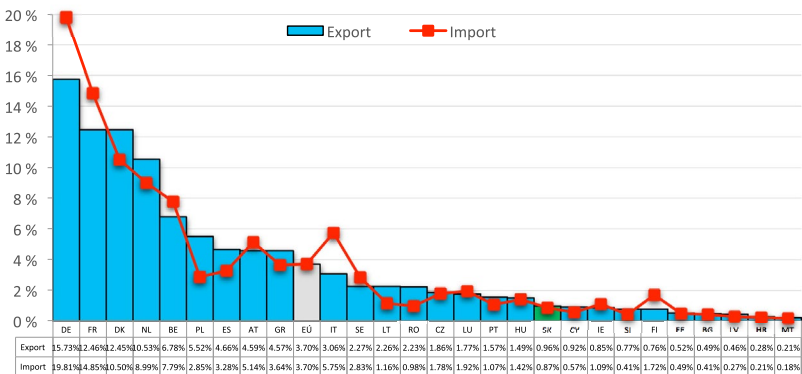Between 2012 and 2020, trade increased mainly in Western European countries, which are among the most economically developed. In particular, Germany and France, as the driving engines of the EU, are increasingly involved in the export of transport services and are becoming the largest exporters of transport services on the European market with a value of 47.59 million euro in the case of Germany (2012: 44.17 million euro) and a gain of 37.69 million euro in France (2012: 36.79 million euro). On the other hand, the exports of Belgium, Italy, Sweden, Portugal, Ireland, Finland, Estonia, Latvia and Croatia surprisingly fell below the level of 2012. Ireland recorded the largest decrease in its volume by minus 45.84 pp with a result of 2.58 million euro (2012: 4.76 million euro). Overall, the growth rate on transport service exports there ranged from minus 45.84 to plus 168.64 pp.

The volumes of exports and imports of transport services developed differently in the countries concerned: the imports of the leading countries were higher than their corresponding exports, this is most evident in the case of Germany, whose import value is 53.69 million euro (2012: 54.35 million euro), France, as the second largest importer of services, recorded a volume of 40.25 million euro (2012: 36.61 million euro). The countries that had a smaller trade gain here compared to 2012 are Sweden (minus 27.09 pp),

111

Croatia (minus 19.54 pp), Italy (minus 19.31 pp), Finland (minus 7.14 pp) and Portugal (minus 3.92 pp).

In the volume of exports, the V4 countries with the highest achieved values are represented by Poland, which is also in the top ten leading EU countries, Slovakia is the country with the lowest results within the V4, despite the positive upward trend, representing 2.90 million euro (2012: 1.60 million euro), while the import of transport services is 2.35 million euro (2012: 1.50 million euro).

Graph 4 Share of the EU countries in transport service exports and imports in 2020 (%, intra EU-27)



| | DE | FR | DK | NL | BE | PL | ES | AT | GR | EÚ | IT | SE | LT | RO | CZ | LU | PT | HU | SK | CY | IE | SI | FI | FF | BG | LV | HR | MT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Export | 15.73% | 12.46% | 12.45% | 10.53% | 6.78% | 5.52% | 4.66% | 4.59% | 4.57% | 3.70% | 3.06% | 2.27% | 2.26% | 2.23% | 1.86% | 1.77% | 1.57% | 1.49% | 0.96% | 0.92% | 0.85% | 0.77% | 0.76% | 0.52% | 0.49% | 0.46% | 0.28% | 0.21% |
| Import | 19.81% | 14.85% | 10.50% | 8.99% | 7.79% | 2.85% | 3.28% | 5.14% | 3.64% | 3.70% | 5.75% | 2.83% | 1.16% | 0.98% | 1.78% | 1.92% | 1.07% | 1.42% | 0.87% | 0.57% | 1.09% | 0.41% | 1.72% | 0.49% | 0.41% | 0.27% | 0.21% | 0.18% |

*Source: ITC TRADEMAP, 2021*

From the ITC TRADEMAP statistics shown in Graph 4, Germany is the most important exporter of services among the EU member states. Its share in total exports is 15.73%. It is followed by France with a market share of (12.46%), Denmark (12.45%), the Netherlands (10.53%) and Belgium (6.78%). In almost every region of the world there are countries that account for a large proportion of service exports. Within the EU, these top five exporters account for more than half (57.95%) of total transport service exports in 2020.

In service imports, Germany's share of 19.81% clearly exceeded that of the other countries, followed by France (14.85%), Denmark (10.50%), the Netherlands (8.99%) and Belgium (7.79%). The overall market share of the most important importing countries in the EU is more than half (61.95%). As in

the case of exports, in the case of imports of services as well, only one third of the countries are above the European average, which is 3.70%; Slovakia accounted for 0.96% of exports of transport services in 2020, the share of imports of transport services of Slovakia is 0.87%.

Graph 5 below illustrates the development of imports and exports of travel services. According to the results obtained, the volume of imports is 135.66 million euro, which is slightly lower than the level of exports of services, which reaches 158.90 million euro; the trend of imports is almost analogous to that of exports. In general, an increase can be seen here, which was muted by the arrival of the COVID-19 disease. The increase in exports of travel services of the EU countries decreased by minus 43.71 pp over the period under review (2012: 282.28 million euro). A slightly higher year-on-year decrease of minus 45.98 pp was recorded in imports of these services (2012: 251.11 million euro).

Graph 5 Development of exports and imports of travel services in the EU (in EUR million)
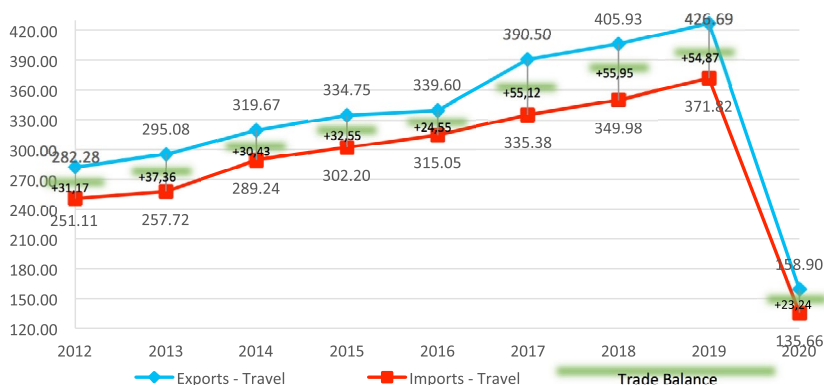


*Source: ITC TRADEMAP, 2021*

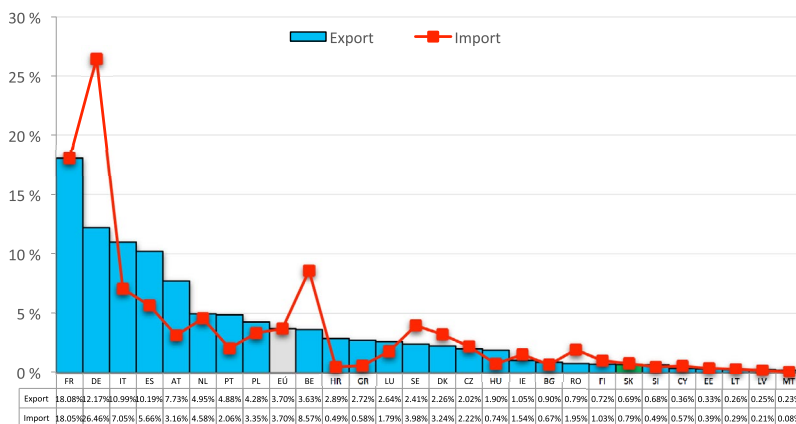Graph 5 shows the balance of foreign trade in travel services. Thus, in 2020, the balance of the EU countries amounted to approximately 23.24 million euro, the largest value was recorded in 2018, when the export surplus amounted to 55.95 million euro.

A comparison of the development of exports and imports of travel services in the individual EU countries shows a decline in this area of the serv-

ice sector, which can be found in almost all EU member states. However, the structural change varies from one EU country to another and shows different degrees of dynamics: the most advanced regression is in Cyprus, where the decline in travel services amounted to minus 71.80%, with a volume of 0.57 million euro (2012: 2.04 million euro). Spain, with an export value of 16.18 million euro, took second place, with a significant decrease compared to 2012 (49.22 million euro). Only one EU country – Romania – recorded a positive development value in the period under review, 9.98%, with an export volume of 1.25 million euro (2012: 1.13 million euro).

The development with imports of travel services is more moderate and different here compared to the export growth figures. As with imports of transport services, Germany similarly recorded the highest import volume of 35.89 million euro (2012: 31.08 million euro). France is the second largest importer of travel services within the EU with 24.49 million euro. Belgium, Italy and Spain occupy the top positions within the EU. The decline in imports of travel services was recorded in all EU countries (except Germany) and ranges from minus 63.21 to plus 15.47 pp.

Graph 6 EU countries' share of exports and imports of travel services in 2020 (%, intra EU-27)



| | FR | DE | IT | ES | AT | NL | PT | PL | EÜ | BE | HR | GR | LU | SE | DK | CZ | HU | IE | BG | RO | FI | SK | SI | CY | EE | LT | LV | MT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Export | 18.08% | 12.17% | 10.99% | 10.19% | 7.73% | 4.95% | 4.88% | 4.28% | 3.70% | 3.63% | 2.89% | 2.72% | 2.64% | 2.41% | 2.26% | 2.02% | 1.90% | 1.05% | 0.90% | 0.79% | 0.72% | 0.69% | 0.68% | 0.36% | 0.33% | 0.26% | 0.25% | 0.23% |
| Import | 18.05% | 26.46% | 7.05% | 5.66% | 3.16% | 4.58% | 2.06% | 3.35% | 3.70% | 8.57% | 0.49% | 0.58% | 1.79% | 3.98% | 3.24% | 2.22% | 0.74% | 1.54% | 0.67% | 1.95% | 1.03% | 0.79% | 0.49% | 0.57% | 0.39% | 0.29% | 0.21% | 0.08% |

*Source: ITC TRADEMAP, 2021*

Slovakia presents itself with exports of travel services with a volume of 1.10 million euro (2012: 1.78 million euro) and imports of 1.07 million euro

(2012: 1.66 million euro). This value puts it in last place in the V4 countries, where the imaginary first place belongs to Poland, which achieved the highest values in both forms of foreign trade.

In terms of exports of travel services, France has long held the top spot in the EU, with a market share of 18.08%, followed by Germany (12.17%), Italy (10.99%), Spain (10.19%) and Austria (7.73%), which came fifth in the ranking. These countries were more successful than the other countries which lag far behind and together account for 59.16% of total EU exports of travel services.

In terms of imports of travel services, Germany tops the list with a share of 26.46%, followed by France (18.05%), Belgium (8.57%), Italy (7.05%) and Spain (5.66%). These countries, which are the main importing markets for travel services, account for up to 65.80% of total European imports, according to calculations. With a share of 0.69% of exports and 0.79% of imports, Slovakia ranks last in the EU and well below the EU average (3.70%).

## 5.5 Development of services exports and FDI in selected countries and the impact of factors on their volume

The aim was to find out which factors positively/negatively affect the total value of services exports and FDI in selected EU countries using panel data of selected factors – service exports, gross domestic product, unemployment rate, foreign direct investment in services and average consumer price index.

As can be observed from Graph 7, the highest FDI was recorded in Germany in 2020 over the whole period under review, amounting to 68.15 million euro. On the contrary, the lowest FDI was in Italy, namely in 2019, when it amounted to 0.72 million euro.
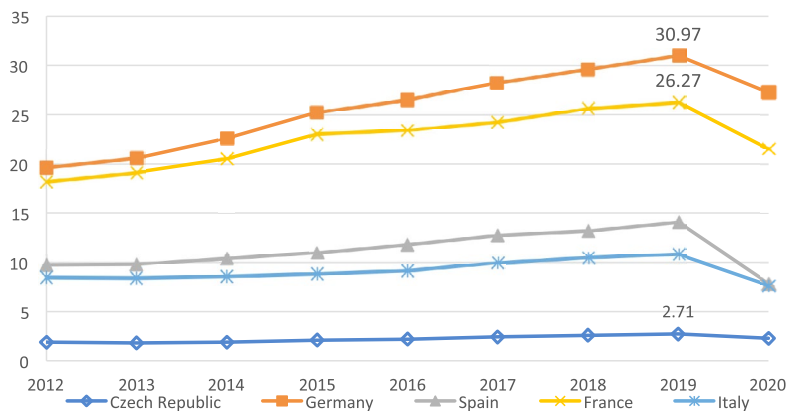
## Graph 7 Development of FDI in services in selected EU countries (in EUR million)
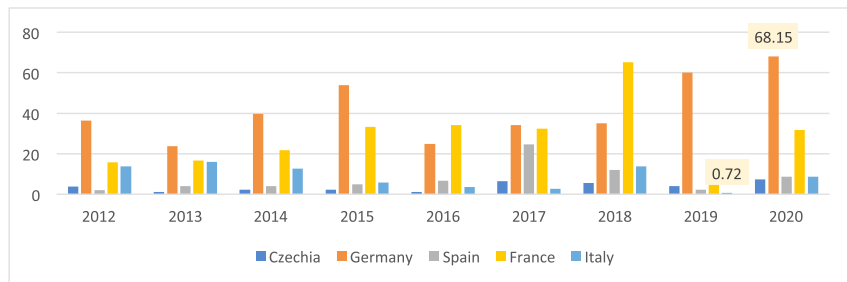


*Source: Eurostat, 2021*

A comparison of the development of total service exports in selected EU countries, illustrated in Graph 8, shows a gradual increase in the importance of international trade in services up to the start of the pandemic period in 2020, which is found in all the countries we compared. However, the structural change varies across countries and shows different degrees of development dynamics. The process of development of the volume of exports of total services is most advanced in Germany, with the largest volume of 30.97 million euro in 2019. France, with an export value of 26.28 million euro, took second place in the same year. On the other hand, Czechia recorded, compared to the other selected EU countries, the smallest export volume in the period under review, with a value of 2.71 million euro.

Graph 8 Development of exports of total services of selected EU countries (in EUR million)



*Source: Eurostat, 2021*

An important finding is to identify the relationship between selected indicators, which are total service exports, GDP, unemployment rate, FDI flow and average consumer price index in Czechia, Germany, Spain, France, Italy, Hungary, the Netherlands, Poland and Slovakia. The correlation is analysed for 2018, at a significance level of 0.1.

Variables

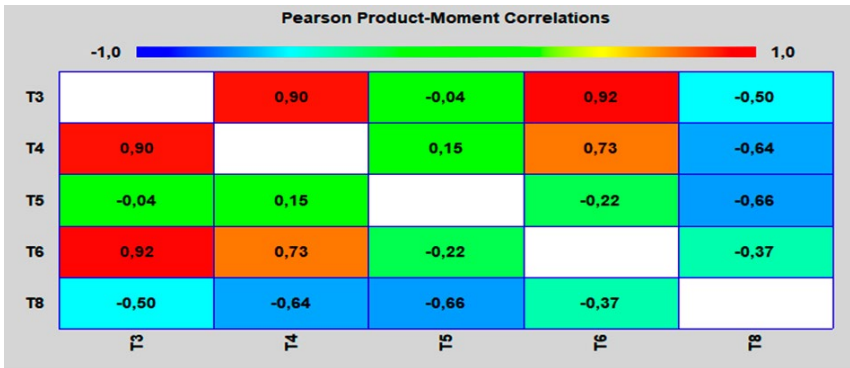T3 – total service exports of selected EU countries (in EUR million)

T4 – GDP of selected EU countries (in EUR million)

T5 – Unemployment rate in selected EU countries (%)

T6 – FDI flow in services in selected EU countries (in EUR million)

T8 – Average consumer price index in selected countries (%)

Image 2 Correlation graph



|  | T3 | T4 | T5 | T6 | T8 |
|---|---|---|---|---|---|
| **T3** |  | 0,90 | -0,04 | 0,92 | -0,50 |
| **T4** | 0,90 |  | 0,15 | 0,73 | -0,64 |
| **T5** | -0,04 | 0,15 |  | -0,22 | -0,66 |
| **T6** | 0,92 | 0,73 | -0,22 |  | -0,37 |
| **T8** | -0,50 | -0,64 | -0,66 | -0,37 |  |

Statistical significance of the correlation coefficients was confirmed for the pairs T3 and T4 (p = 0.0009), T3 and T6 (p = 0.0005), T4 and T6 (p = 0.0247), T4 and T7 (p = 0.0622) and T5 and T7 (p = 0.0539), as the p-values for these pairs do not exceed the significance level of 0.1.

The correlation graph informs us about the direction of dependence between pairs of indicators by means of a colour scale. The red colour in the case of the pairs T3 and T4 as well as T3 and T6 indicates a strong direct dependence (exports of total services and GDP → correlation coefficient = 0.90, exports of total services and FDI flows into services → correlation coefficient = 0.92). There is a correlation coefficient of −0.64 between the GDP of the selected EU countries and the average consumer price index in the selected countries, and a correlation coefficient of −0.66 between the unemployment rate in the selected EU countries and the average consumer price index in the selected countries, indicating a moderately strong inverse dependence (if one indicator increases, the other indicator decreases and vice versa). The correlation coefficient for the pair T4 and T6 has a value of 0.73, which means that there is a moderately strong direct dependence between the GDP of the selected EU countries and the flow of FDI in services in the selected EU countries. The other pairs, which are coloured green within the correlation plot, reflect a weak direct dependence (if the sign is positive) or a weak indirect dependence (if the sign is negative).

# Summary

As a large and open economy, international trade in services is very important for the EU. It is part of the external contribution (exports minus imports) and is included in the calculation of each member state´s GDP. The EU's economic integration with foreign countries has traditionally been high and has continued to increase in recent years. For the Community, as a provider of a wide range of industrial goods and a region with high average wage values, a productive industrial sector is essential in the future – not least as a basis for the further development of the service sector.

As a major finding, we can state that European international trade has seen enormous development. According to UNCTADstat (2021), up to 42% of the share of world trade in services is represented by the EU-27 region. In terms of export and import quotas for services, it has been shown that the largest share is accounted for mainly by the economically developed countries – Germany, France, Italy, Spain and Austria. At the same time, the analysis carried out has shown that transport and travel services are among the main and prospective categories of the tertiary sector of the European market.

In conclusion, it can be said that not only for small and industrially strong but also for developed EU Member States, international trade in services has a special position. From the post-war years to the present day, the prosperity of each country is largely attributed to foreign trade, which is why the EU is now one of the leading regions in the market.

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Nariadenie Rady (ES) č. 3286/94, ktoré stanovuje postupy Spoločenstva v oblasti spoločnej obchodnej politiky s cieľom zaistenia uplatňovania práv Spoločenstva podľa pravidiel medzinárodného obchodu, najmä tých, ktoré boli vytvorené pod záštitou Svetovej obchodnej organizácie, naposledy zmenené a doplnené Nariadením Rady (EÚ) č. 654/2014. (2021). Available at: https://publications.europa.eu/en/publication-detail/-/publication/92fcc659-6ca5-4bf5-9c2c-f9538c4f8413/language-sk

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# 6 SELECTED STATISTICAL AND MATHEMATICAL METHODS USED IN DATA ANALYSIS

## 6.1 Time series

We often need to know how certain indicators will develop in the future. Current information on the development of the indicator will be useful for this purpose. A series of data points that are indexed in time order is called time series (Kotlebová et al., 2017).

A large part of socio-economic phenomena is just in the form of time series. Information for proper decision making and planning needs to be extracted from them by appropriate analysis. For example, we look at how gross domestic product has changed over the last few years, how spending on science and research has evolved, etc.

In this subsection, we list some characteristics that can be used to describe the time series.

A time series is a chronologically ordered sequence of comparable quantitative data on the phenomenon under study (Kotlebová et al., 2017).

We will denote the values of the observed phenomenon by the symbol $y_t$. The time series starts with the first period ($t = 1$) in which the indicator takes value $y_1$, in the second period ($t = 2$) it takes value $y_2$ and so on. We denote the last value in the time series by the symbol $y_T$. Thus, the variable $t$ takes on the values $t = 1, 2, ... T$, corresponding to the observed values $y_1, y_2, ..., y_T$. The number of data in the time series is $T$ – this is the **length** of the time series.

The data of a properly constructed time series that is usable for analysis must be comparable in terms of space and content. It is necessary that they are of the same subject matter, are established according to the same methodology, and are presented in the same units of measurement. (Labudová et al., 2021)

*Elementary characteristics of time series*

If we want to analyse a time series, we should start by describing it using some characteristics. These are simple and easy to interpret information about the development of the phenomena under study.

Among the simplest characteristics of time series analysis are the following absolute and relative growth and decline rates (Kotlebová et al., 2017):

- **Absolute gain (loss)** (1st difference) – $\Delta_t$ is the difference of two consecutive values of a time variable. It expresses by how much the value of the variable increased ($\Delta_t > 0$) or decreased ($\Delta_t < 0$) in period $t$ compared to the previous period $t - 1$:

$$\Delta_t = y_t - y_{t-1} \qquad \text{for } t = 2, 3, ..., T,$$

where: $y_t$ are the values of the phenomenon under study in period $t$, $y_{t-1}$ are the values of the phenomenon under study in period $t-1$.

- **Growth coefficient** – $k_t$ is the ratio of the value of the indicator in period $t$ to the value in the previous period $t - 1$. It expresses how many times the value of the indicator increased ($k_t > 1$) or decreased ($k_t < 1$) compared to the previous period $t - 1$:

$$k_t = \frac{y_t}{y_{t-1}} \qquad \text{for } t = 2, 3, ..., T$$

- **Growth rate** – $T_t$ is the growth coefficient expressed in a percentage:

$$T_t = k_t.100 \qquad \text{for } t = 2, 3, ..., T$$

- **Increase coefficient** (relative increase) – $k_{\Delta_t}$ is the ratio of the absolute increase in period $t$ to the value of the indicator in period $t - 1$:

$$k_{\Delta_t} = \frac{\Delta_t}{y_{t-1}} = \frac{y_t - y_{t-1}}{y_{t-1}} = \frac{y_t}{y_{t-1}} - 1 = k_t - 1 \qquad \text{for } t = 2, 3, ..., T$$

- **Increase rate** – $k_{\Delta_t}$ is the rate of increase expressed in a percentage:

$$T_{\Delta_t} = k_{\Delta_t} \cdot 100 = (k_t - 1) \cdot 100 = k_t \cdot 100 - 100 = T_t - 100$$

- **Base index** – $B_t$ expresses the relative change in the value of $y_t$ compared to the value of $y_0$, which we take as the base (baseline) of the comparison:

$$B_t = \frac{y_t}{y_0} \qquad \text{for } t = 1, 2, ..., T$$

- **Average absolute increase** – $\overline{\Delta}$ is the arithmetic average of absolute increases:

$$\overline{\Delta} = \frac{\sum_{t=2}^{T} \Delta_t}{T-1} = \frac{(y_2 - y_1) + (y_3 - y_2) + ... + (y_T - y_{T-1})}{T-1} = \frac{y_T - y_1}{T-1}$$

It expresses by how much on average the value of the monitored indicator has increased (decreased) over one time period.

- **Average growth coefficient** – $\overline{k}$ is the geometric mean of the individual growth coefficients:

$$\overline{k} = \sqrt[T-1]{k_2 . k_3. ... k_T} = \sqrt[T-1]{\frac{y_2}{y_1} \cdot \frac{y_3}{y_2} \cdot ... \cdot \frac{y_T}{y_{T-1}}} = \sqrt[T-1]{\frac{y_T}{y_1}}$$

It expresses how many times on average the value of the monitored variable has increased (decreased) over one time period.

- **Average growth rate** – $\overline{T}$ is the average growth coefficient expressed in a percentage:

$$\overline{T} = \overline{k} \cdot 100$$

- **Average increase rate** – $\overline{T}_\Delta$ is obtained by subtracting 100 from the average growth rate:

$$\overline{T}_\Delta = \overline{T} - 100$$

The average increase rate expresses by how many percent, on average per time period, the values of the time series grew (declined) in the monitored time series.

### 6.1.1 Time-series trend models

We obtain basic information about the development of the time series through the elementary characteristics. We can also describe the development of a long-run time series using a model with a trend and a random component:

$$y_t = Tr_t + E_t \qquad \text{for } t = 1, 2, \ldots, T,$$

where: $Tr_t$ is the trend function at time $t$,

$\quad\quad E_t$ is the random component at time $t$.

The random component is the part of the model that we attribute to influences that we cannot quantify or estimate, and it must satisfy certain white noise conditions (e.g., Labudová et al., 2021, Rublíková, 2007, for more information).

Long-term changes that affect the long-term rise or fall of time series values are called trend. The most commonly used trend models are:

- **Linear trend model**
  The linear trend model is the simplest type of trend model and is most appropriate for short time series where the absolute increases or decreses in the time series are approximately constant. We express the linear trend in the following way:

  $$Tr_t = \beta_0 + \beta_1 \cdot t$$

  where: $\beta_0$ is a constant expressing the value of the monitored time series variable at time $t = 0$,

  $\quad\quad \beta_1$ is a model parameter expressing the increase/decrease of the monitored time series indicator in the case of a unit change in time.

  We write the estimated linear trend model:

  $$\hat{y}_t = b_0 + b_1 \cdot t$$

- **Quadratic trend model**
  The quadratic trend model, like the linear trend model, is often used in the case of short time series, especially when the values of the moni-

tored time series indicator change linearly at the beginning of the period and their rise (fall) slows down or accelerates over time. We express the quadratic trend in the following way:

$$Tr_t = \beta_0 + \beta_1 \cdot t + \beta_2 \cdot t^2,$$

where: $\beta_2$ is the model parameter expressing the acceleration or deceleration of the growth of the monitored indicator compared to the linear growth

We write the estimated quadratic trend model:

$$\hat{y}_t = b_0 + b_1 \cdot t + b_2 \cdot t^2$$

- **Exponential trend model**
  The exponential trend model is most often used for long time series, when the monitored indicator changes faster than time. Initially, the exponential trend is expressed by a product form which is non-linear in parameters, but by subsequent transformation, i.e. algorithmization, it is possible to modify the shape of the exponential trend so that it remains linear in parameters:

$$Tr_t = e^{\beta_0 + \beta_1 \cdot t_0}$$
$$\ln Tr_t = \beta_0 + \beta_1 \cdot t,$$

where: $\beta_0$ is the geometric mean of the time series,
$\quad\quad \beta_1$ is the average growth coefficient.

We write the estimated linear trend model:

$$\hat{y}_t = e^{b_0 + b_1 \cdot t_0}$$
$$\ln \hat{y}_t = b_0 + b_1 \cdot t$$

*Quality verification and selection of the most suitable model*

Most often, the quality of the model and the selection of the best fitting shape itself are judged on the basis of the average absolute or relative characteristics of the residuals. These characteristics include:

- **ME –** *Mean Error*
  Mean error is a measure of misinterpretation and can be positive or negative. The interpretation of this characteristic depends on the sign of the

resulting value, with a negative sign indicating an overestimation of reality by the model and a positive sign indicating an underestimation of reality by the model.

- **MAE –** *Mean Absolute Error*
  MAE characteristic expresses the average absolute deviation of the actual values from the estimated values, with the resulting value in the same units of measurement as the time series indicator.

- **MSE –** *Mean Squared Error*
  Mean squared error, or error variance, is the most important in assessing the quality or choosing the best model. Its square root, **RMSE –** *Root Mean Squared Error* (or standard deviation of errors), is used to interpret this measure. The resulting RMSE value is in the same units as the monitored time series indicator.

- **MPE –** *Mean Percentage Error*
  Mean percentage error, like the ME, is a measure of misinterpretation where the interpretation depends on the resulting sign. If the resulting value is negative, the model overestimates reality, and if the resulting value is positive, the model underestimates reality.

- **MAPE –** *Mean Absolute Percentage Error*
  MAPE is a relative measure expressing the percentage deviation of the actual values from the estimated values.

The choice of the most appropriate model depends largely on the values of the mean characteristics of the residuals, where the best model is the one with the smallest possible values of the characteristics, but it is important to verify the statistical significance of the parameters in the selected model. If the model parameters are not statistically significant, there is no point in considering the selected model. When verifying the statistical significance of the parameters, we formulate two hypotheses:

- **null hypothesis**: $H_0$: *the model parameter is not statistically significant*,
- **alternative hypothesis**: $H_1$: *the model parameter is statistically significant*.

Statistical tests exist to test the statistical significance of the parameters and the decision to accept or reject the null hypothesis, but these will not be reported in the literature (see, e.g., Labudová et al. 2021, Kotlebová et al. 2017, Rublíková, 2007, etc.).

If we work with statistical software, it is not necessary to know the resulting values of the test statistics and their associated critical values; it is important to have a predetermined significance level α (see e.g. Kotlebová, 2007, Šoltés et al, 2018), with the most common levels of significance in statistics being 0.01, 0.05 or 0.1. In most cases, statistical software, in addition to the results of the test statistics, provides the lowest level of significance at which an assumption can be made about the statistical significance of a parameter, which we call the **p-value.** If the p-value is smaller than the significance level, we reject the claim that the parameter is statistically insignificant (reject the null hypothesis).

## 6.2  Correlation analysis

Correlation is an interrelation or dependence between two or more variables. The essence of correlation analysis is to express the direction and strength of dependence between the quantitative (numerical) variables analysed by means of correlation characteristics.

In order to assess the direction and strength of dependence between variables, the correlation characteristics must satisfy the following conditions:
- the resulting values must fall within the interval
  - $\langle -1; 1 \rangle$, when calculating the correlation coefficient,
  - $\langle 0; 1 \rangle$, if we calculate the coefficient of determination,
- as the dependence increases, their absolute values also increase,
- they are independent of the units of the variables analysed.

**The simple correlation coefficient** measures the two-sided linear dependence of two variables, and the resulting value of this characteristic must fall in the interval $\langle -1; 1 \rangle$. Both the resulting value and the sign of the simple correlation coefficient suggest the strength and direction of the linear dependence. In determining the direction of the dependence, if the sign is positive, we speak of a direct linear dependence and if the resulting sign is negative, there is an indirect linear dependence between the pair of variables. We judge the strength of the dependence by the absolute value of the correlation coefficient. If the absolute value of the correlation coefficient of the intervals is
- $(0; 0{,}25\rangle$, it is a weak dependence,
- $(0{,}25; 0{,}75\rangle$, it is a moderate dependence,
- $(0{,}75; 1\rangle$, it is a strong dependence.

### *Verification of the statistical significance of the correlation coefficient*

There are several statistical hypothesis tests in relation to the correlation coefficient, e.g. hypothesis tests on the compliance of the correlation coefficient with a known constant, a test of the compliance of the pairwise correlation coefficients of the two basic sets or a test of the statistical significance of the simple correlation coefficient. For more information with respect to the test, see, for example, Šoltés, 2019 or Labudová et al., 2021. The statistical significance of the correlation coefficient can also be assessed on the basis of the lowest significance level at which the null hypothesis can be rejected (p-value). We test two hypotheses:

- **null hypothesis:**
  $H_0$: *the correlation coefficient is not statistically significant*
  *(there is no dependence between the variables),*
- **alternative hypothesis:**
  $H_1$: *the correlation coefficient is statistically significant*
  *(there is a dependence between the variables).*

The decision to accept the statement depends on the resulting p-value, which is compared with a predetermined significance level α. If the p-value exceeds the significance level ($p > \alpha$), the null hypothesis is accepted; on the contrary, if the p-value does not exceed the significance level ($p < \alpha$), the null hypothesis is rejected.

A more detailed elaboration of the issue can be found, for example, in Šoltés, 2019, Šoltés 2021, Labudová et al. 2021, Kotlebová et al. 2017, etc.

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