Kateryna Dedelyuk*

POST CRISIS SERVICE INNOVATION DEVELOPMENT

У статті проаналізовані основні тенденції розвитку сфери послуг, досліджено роль та специфічні риси інновацій у сфері послуг, визначені основні чинники розвитку інновацій у сфері послуг у посткризовий період.

Ключові слова: інновація, інноваційний процес, сфера послуг, зростання, розвиток.

This article analyses service sector development and growth, describes the role and specific features of service innovation, defines the main drivers of service innovation development at post-crisis period.

Key words: service innovation, innovation process, service sector, growth, development.

The services sector is becoming increasingly important for economic development in many countries. Services offer an important contribution to economic growth and employment. Because innovation is among the key drivers of growth and development, innovation in service sector has become an important topic for global economic development. Yet there was limited knowledge about its theoretical base and its empirical dimensions - services have been largely overlooked in economic, industrial and innovation research. The field of services innovation studies has expanded, with two main results of significance here. It has been recognised that many services are active in the innovation process, not merely passive recipients of others' innovations and the importance of non-technological elements of service innovation has been accepted. This resulted in a growing importance of general characteristics of service sector innovation better understanding and defining its impact on the global economic development.

The aim of our research is to characterize the specific features of service innovation development at post crisis period. The aim is concreticised in following tasks: to analise service sector development and growth; to describe the role and specific features of service innovation; to define the main drivers of service innovation development at post-crisis period.

Theoretical and methodological basement of our research is taken from the information and statistic data given in reports and investigations which were conducted within Organization of Economic Cooperation and Development,, World Bank, European Union, World Trade Organization. We also used some theoretical material from Hollanders, Alban Fisher, Leif B. Methlie, Per E. Pedersen, Zhang Bo, Zhang Xiao-lin.

Economic growth and global competitiveness are increasingly driven by knowledge, innovation is vital for countries' post-crisis growth, according to the World Bank. The Bank urges countries to focus on key priorities for sustainable growth by ensuring that resources for innovation are not cut as part of fiscal consolidation, but are used more efficiently, and by approaching the crisis as an opportunity to change policies that would protect Research and Development (R&D) and investment in human capital [3].

The 'Europe 2020 Strategy. A strategy for smart, sustainable and inclusive growth puts for-

*Postgraduate of Volyn National Lesya Ukrainka University

ward a dynamic vision of an effective social market for the 21st century [9]. It identify three priorities: Smart Growth to develop an economy based on knowledge and innovation; Sustainable Growth to promote greener and more competitive economy; Inclusive Growth to foster a high-employment economy delivering social and territorial cohesion. In all these chapters service sector and service innovation with play the key role, as it is largely market driven and pioneered by private commercial enterprises, in particular business-to-business services. These firms create value by building "intelligence" into the design and modelling of the processes, networks, and customers they serve. By better understanding how to transform their customers' working practices, these service firms will play a key role in delivering the smart growth highlighted in the Europe 2020 Strategy.

The official statistics on services in Europe are based on the NACE classification. This classification makes it difficult to fully capture the phenomenon of the rapidly growing service economy because it does not adequately reflect the role of services in the economy and their increasing interactions with the other sectors. According to Eurostat, the terms "service industry", "service sector" or simply "services" are generally used to refer to economic activities covered by Sections G to U of NACE revision 2 (see Table 1).

Table 1
Service sectors according to NACE classification

[8]

Section	Description
G	Wholesale and retail trade
H	Hotels and restaurants
I	Transport, storage and communications
J	Financial intermediation
K	Real estate, renting and business activities
L	Public Administration and defence; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities
P	Activities of private household as employers and undifferentiated production activities of private households
Q	Extraterritorial organizations and bodies

Boosting innovation in service industries is central to improving the performance of the service sector. The sector has traditionally been seen as less innovative than manufacturing and as playing only a supportive role in the innovation system. As a result, national innovation policies have paid scant attention to services, and service-sector firms have not been active participants in government-sponsored innovation programmes. Recent work confirms, however, that services are more innovative than previously thought; indeed, in some areas, they are more innovative than the average manufacturing industry. In fact, knowledge-intensive business services play an increasingly dynamic and pivotal role in the knowledgebased economy.

Innovation surveys suggest that service-sector firms innovate for many of the same reasons as manufacturing firms: to increase market share, to improve service quality and to expand product or service range. However, how innovation occurs in the service sector is less well under-

stood. Compared to manufacturing, most innovations in services appear to be non-technical and result from small, incremental changes in processes and procedures that do not require much formal research and development (R&D) [1].

The analysis of service sector development during last decade allows us to define some characteristic features of this process:

- the economies are increasingly services-oriented. That is, they are increasingly dominated by industries that aim to deliver help, utility or care, and experience, information or other intellectual content. Most of their value added is intangible rather than incorporated in a physical product. The service economy has grown rapidly in recent years. Growth in the share of market services is apparent in almost all OECD countries, with the exception of some in eastern Europe (the Czech Republic, Hungary and the Slovak Republic) that have undergone significant structural reforms [10]. As you can see from the Table 2 the worlds annual export change in 2010 is 8%, the same indicatar of im;ort is equal 9% . It is important to stress attention on that fact that the highest indicator of services trade is observed in Asia – 21% of export and 20% of import.

Table 2
World services Trade by region and selected Countries (US$ billions and %)

[7]

	EXPORTS				IMPORTS			
	Value US$B 2010	2010 Share %	Annual change %		Value US$B 2010	2010 Share %	Annual change %	
			2009	2010			2009	2010
World	**3.665**	**100**	**-12**	**8**	**3,505**	**100**	**-11**	**9**
North America	**599**	**16,3**	**-8**	**9**	**471**	**13,4**	**-11**	**9**
U.S.	515	14,1	-7	8	358	10,2	-9	742,4
Canada	66	1,8	-	15	89	2,5	-8	15
Central and South America	**111**	**3**	**-8**	**11**	**135**	**3,9**	**-9**	**23**
Brazil	30	0,8	-9	15	60	1,7	-1	35
Europe	**1,724**	**47**	**-14**	**2**	**1,504**	**42,9**	**-13**	**1**
EU 27	1,553	42,4	-15	2	1,394	39,8	-13	1
Germany	230	6,3	12	2	256	7,3	-12	1
France	140	3,8	-14	1	126	3,6	-10	0
Italy	97	2,6	-	3	108	3,1	-	1
U.K.	227	6,2	-19	0	156	4,5	-19	1
C.I.S	**78**	**2,1**	**-17**	**10**	**105**	**3**	**-19**	**14**
Russia	44	1,2	-19	6	70	2	-20	18
Africa	**86**	**2,3**	**-9**	**11**	**141**	**4**	**-12**	**12**
Middle East	**103**	**2,8**	**-3**	**9**	**185**	**5,3**	**-8**	**9**
Asia	**963**	**26,3**	**-11**	**21**	**961**	**27,4**	**-10**	**20**
China	170	4,6	-12	32	192	5,5	0	22
Japan	138	3,8	-14	9	155	4,4	-12	6
India	110	3	-13	-	117	3,3	-9	-
NIEs	**343**	**9,4**	**-**	**-**	**277**	**7,9**	**-**	**-**

- over the past decade, services have been the main driver of economic growth. Two sec-

tors, wholesale and retail trade and business services, make large contributions to GDP growth. Wholesale and retail trade generated over a quarter of output growth in many countries, and more than a third in Mexico, Poland, Spain, Sweden and the United States. Business services accounted on average for a third or more of output growth and more than two-thirds in Belgium, Hungary and Japan. This is partly due to the prominent size of these sectors in national economies, but also to their sharp rises in output [10].

- growth in business services has benefited from recent changes in corporate management: increased investment in intangible activities, growing emphasis on knowledge management, renewed focus on core competencies, outsourcing of some activities and greater reliance on external service providers [2, p. 16]. In the manufacturing sector, services previously produced in house are increasingly obtained via outsourcing. By the mid-1990s, services accounted for nearly 25% of the value added embodied in final demand for manufactured goods in most countries for which data are available, compared to 15% or less in the early 1970s. The rise in embodied services was particularly strong in Australia, Japan and the Netherlands, it was less marked in Canada and the United States [10]. In most countries, the manufacturing sector now relies more heavily on telecommunications, business and computer services with a view to stimulating greater productivity. Manufacturing firms have also moved more and more to link products and services as a central element of their broad competitive strategy. They are providing product-service packages, in which products and services are linked together in one package for clients, and selling solutions rather than what are traditionally thought of as products [10].

- the service sector also makes sizeable contributions to job creation (Figure 1). Across the OECD, most employment growth in the 1990s was due to services, in particular business services, which generated more than half of all employment growth in most countries and often compensated for job losses in manufacturing. Within the service sector, the largest relative job growth was in wholesale and retail trade and business services. In the 1990s, the former supported more than half of employment growth in Eastern Europe (Hungary, Poland and the Slovak Republic), Canada, Denmark, Korea, Spain and the United Kingdom. The latter were a significant source of employment growth in Europe (Belgium, France, Italy, Netherlands and Portugal), the Nordic countries (Finland, Norway and Sweden) and Japan [10].

- Services also make a major contribution to labour productivity growth. While the service sector has traditionally been viewed as a sector with poor productivity growth, measurement problems are to some extent responsible: services output is difficult to define, and changes in services quality are hard to measure. Market services, however, account for the bulk of labour productivity growth in many OECD countries, including Germany, the United Kingdom and the United States. The manufacturing sector remains important in some of the newer member countries, including Hungary, Korea and Poland, which had the highest levels of labour productivity growth. In other countries, increases in total labour productivity tend to be driven by the service sector

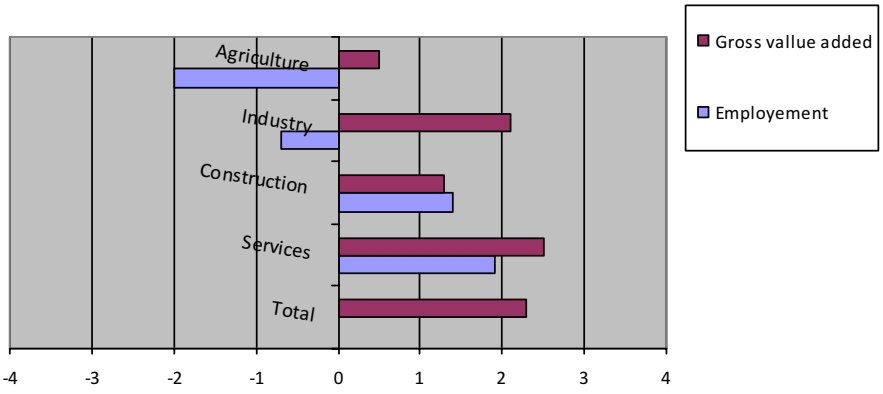

Figure 1 Annual growth rates of employement and gross domestic product by sectors, EU27, 1995-2008

[10]. The growing contribution of market services to productivity is linked both to their growing share in total value added and to a strong rise in their labour productivity.

- The so-called knowledge-based market services have been particularly important: post and telecommunications, finance and insurance, and business services. These sectors tend to have the largest investments in R&D among service-sector industries, as illustrated below, and the greatest reliance on highly skilled workers. The share of knowledge-based market services in total value added increased. Growth was particularly marked in Eastern Europe (Hungary and the Slovak Republic), Iceland, Luxembourg, Netherlands and the United States [10]. Much of this growth derived from business services, which grew faster than post and telecommunications or finance and insurance (Table 3).

Table 3

Main data regarding knowledge intensive services in the EU25 (1995-2005)

Sectors	NACE	Value added			Employment		
		Thousand million Euro (*) 2005	Relative % 1995	Relative % 2005	Thousand 2005	Relative % 1995	Relative % 2005
Knowladge intensive services (KIS)	61/62/64/J/K/M/N/o.92	4729,2	42,5	45,9	70688,4	30,30 p.	34,8
High-tech knowladge intensive services (HTKIS)	64/72/73	489,3	3,7	4,8	6765,4	2,8	3,3
Knowladge intensive business services (KIS)	72/73/74.1t4	711,4	5,4	6,9	12259,7	4,5	6

The service sector produces “intangible” goods, some well known—government, health, education—and some quite new—modern communications, information, and business services. Producing services tends to require relatively less natural capital and more human capital than producing agricultural or industrial goods. As a result demand has grown for more educated workers, prompting countries to invest more in education—an overall benefit to their people. Another benefit of the growing service sector is that by using fewer natural resources than agriculture or industry, it puts less pressure on the local, regional, and global environment. Conserving natural capital and building up human capital may help global development become more environmentally and socially sustainable. Growth of the service sector will not, however, be a miracle solution to the problem of sustainability, because agricultural and industrial growth are also necessary to meet the needs of the growing world population [3]. The economic importance of services means that improvements in European living standards are likely to depend more and more on productivity improvements in services rather than in manufacturing (Figure 2).

Financial intermediation, real estate, renting and business activities (NACE J and K) proved to be the most dynamic service sectors in terms of employment as well as value added. Figure 2 shows that both growth rates are higher than the overall rates for all services. In 1995-2007 they have experienced annual growth rates higher than the service sector as a whole, thus increasing their share in services employment (from 17.5% in 1995 to 21.7% in 2007) and value added (from 35.7% in 1995 to 39.2% in 2007). In contrast, public-related services (NACE L to P) have been loosing positions during the last 12 years.

“Business services” (NACE codes 71 to 74) were the most important service category in

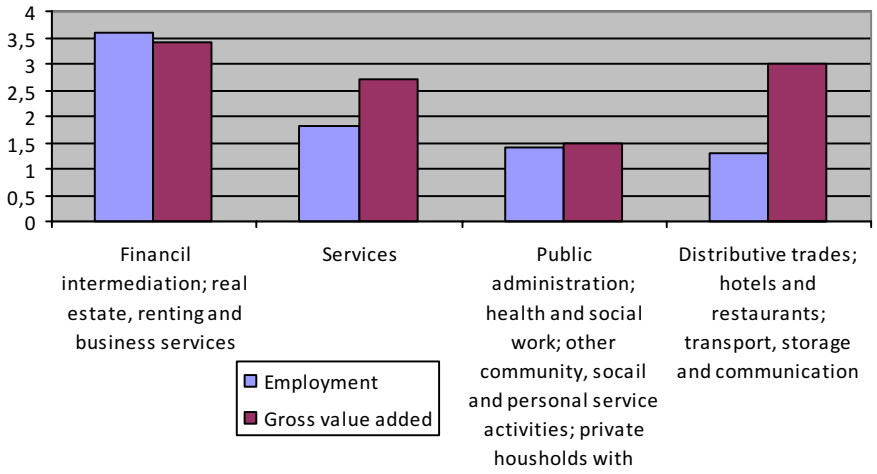

Figure 2 Annual growth rates of employment and gross value added by service sectors in the EU27, 1995-2007

terms of value added in the European economy in 2005, while it ranked second in terms of employment after distributive trades. This sector has increased its share in EU25 value added by 2.6% in the last decade, and by 3.3% in the case of employment. Luxembourg, Netherlands, United Kingdom, Belgium, France, Germany and Italy are the most specialised countries in business services employment relative to EU25, while Cyprus, Estonia and Latvia are lagging behind [7]. "Other business activities" (NACE 74) represent the category that contains the bulk of business services, both in terms of value added and employment. This category comprises very heterogeneous activities, ranging from operative services, such as security activities or industrial cleaning to intensive services requiring highly qualified human capital, including advanced consultancy services. More than 18 million people were engaged in such service activities in 2005, and their share in employment increased from 6.4% to 9.0% out of all employment [7]. This is important to bear in mind when reflecting on how and in which sectors innovation could best contribute to more jobs and value creation in Europe.

The role of all these services in the development of post-crisis economy is difficult to predict, especially to calculate the exact date of the impact on employment and gross value added, but there is no doubt that service sector innovation will play sagnificant role in global economic development. To confirm this idea we made an attempt to analyse such aspects of this problem, as: the role of innovation (both in service sector and manufacture); understanding of service innovation essence and its differences with the industrial ones.

Innovation has been recognised as a key to growth, but the role of service-sector innovation has long been under-appreciated. This is due to some extent to the difficulty of measuring innovation in the service sector, a patchwork of different industries with significantly different innovation processes. R&D expenditures are often employed as a proxy for innovation, although they measure just one input into the innovation process. An increasing number of innovation surveys, however, have made it clear that expenditure on R&D is only one element of firms' expenditures on innovation. Even in manufacturing, R&D generally amounts to only about half of total investment in innovation but in services the share is even smaller. Other components of innovation appear more important for services, where most innovation is linked to changes in processes, organisational arrangements and markets. There is evidence that innovative activity in services is organisational and disembodied in nature so that it escapes standard measures of innovation [1].

Our present understanding of innovation is primarily an understanding of "manufacturing" innovation. Hence the Oslo Manual (1997) gives a clear definition of technological product and process innovation, where the term "product" is used to cover both goods and services. Service innovation may be technological innovations but are often non-technological innovation too. Service innovations are the creation of new knowledge or information, or new ways of handling

things or persons, they are often small adjustments of procedures and thus incremental and rarely radical [10].

The term service innovation is used to refer to several things. These include [1], [4, p. 14]:

1. Innovation in services, in service products – new or improved service products (commodities or public services). Often this is contrasted with "technological innovation", though service products can have technological elements. This sense of service innovation is closely related to Service design and "new service development".

2. Innovation in service processes – new or improved ways of designing and producing services. This may include innovation in service delivery systems, though often this will be regarded instead as a service product innovation. Innovation of this sort may be technological, technique- or expertise-based, or a matter of work organization (e.g. restructuring work between professionals and paraprofessionals).

3. Innovation in service firms, organizations, and industries – organizational innovations, as well as service product and process innovations, and the management of innovation processes, within service organizations.

A helpful definition comes from Finland's research agency, TEKES: Service innovation is a new or significantly improved service concept that is taken into practice. It can be for example a new customer interaction channel, a distribution system or a technological concept or a combination of them. A service innovation always includes replicable elements that can be identified and systematically reproduced in other cases or environments. The replicable element can be the service outcome or the service process as such or a part of them. A service innovation benefits both the service producer and customers and it improves its developer's competitive edge. …A service innovation is a service product or service process that is based on some technology or systematic method. In services however, the innovation does not necessarily relate to the novelty of the technology itself but the innovation often lies in the non-technological areas. Service innovations can for instance be new solutions in the customer interface, new distribution methods, novel application of technology in the service process, new forms of operation with the supply chain or new ways to organize and manage services [4, p. 16]

Most researchers agree that innovation in service firms has a different character than in manufacturing. Innovations in service industries are often non-technological. They mostly involve small and incremental changes in processes and procedures. Many service innovations are not very radical and have often already been implemented in or by other service organisations. Some researches have characterised the process of service innovation as a "reverse product cycle" in which a firm first adopts new technology (e.g. ICT) to improve the efficiency of an existing process; next, the improved process generates a significant improvement in the quality and delivery of the services provided; and finally the new technology provides the basis for an entirely new service, usually in a different field. Others suggest that innovation in services is mostly non-technical and occurs with small and incremental improvement in processes and procedures [1; 6, p. 7].

Service innovation is quite different from the model manufacturing innovation, which is mainly determined by their characteristics in production [11]. In the production process of manufacturing industry, the customer only is the accepter and the user of final product, and doesn't participate in the production and transmission, neither have the correlation with the manufacturers, and therefore from a standpoint of customer participancy this process is known as 'the independent production process'. While in the production process of service industry, the customers positively participate in the entire production and the transmission process, and has the massive correlations with the staff, so the process is one kind of 'the cooperative production'.

By contrasting 'independent production' and 'cooperative production', we will find the differences between service industry and the manufacturing industry in nature, which result in the significant difference between the two innovations processes. This is profoundly manifested in the following ways [11]:

1. Service innovation may adopt different forms. First, the innovation in the manufacturing industry in product and process mainly aims at the visible product, which leads to obvious innovation result; But in the service industry, in fact, product and the process innovation is invisible, which only contains the method and the process. However, this kind of invisible innovation is often not perceptible. Although the technology plays an important role in modern services, it is not the necessary condition for service innovation, because the product and process innovation in service industry can take place without any technical factors. Second, special innovation for special customers and custom-made service innovation widely exist in the service industry. Compared with the innovation in manufacturing industry, it is obviously unable to duplicate, but it is indeed an extremely universal and important innovation form in the service industry, which makes the old and narrow innovation concept-innovation means duplication to a degree-widened.

2. Service innovation can be organized in different ways. First, usually the service innovation never or seldom contain R&D or innovation department, and often there isn't any official R&D department related to manufacturing industry significance. Besides, the way R&D department and innovation department conduct is quite different from the innovation in the manufacturing industry innovation. R&D activities in the service innovation tends to analysis concept, mainly taking the social sciences as the foundation, while R&D activities in the manufacturing industry are mainly based on the natural sciences; Next, the service innovation carries on the organization through the complex correlation pattern, which is different from the linear mode in the traditional manufacturing industry innovation, in which the service innovation is a complex process where the different behaviors and the different departments are mutually dependent. For example, in order to develop a new safe product in a bigger scale, only when the lawyers, calculators, IT experts, sales personnel and customers to work together and depend on each other, the process can be completed.

To further characterize service innovation, we shall discuss some of the main differences with innovation in manufacturing which will include: object of innovation, degree of novelty and dimension of newness.

Object of innovation. In manufacturing, innovation can be classified by two basicforms: changes in the things (products, goods) which an organization offers, and changes in the ways in which they are created and delivered. Traditionally, these changes are termed as 'product' and 'process' innovation. In services, the dividing line between product and process innovation tends to be blurred. Because of the simultaneity of services, product- and process innovations usually coincide. New services often go together with new patterns of distribution, client interaction, quality control and assurance, etc [4, p. 17].

Degree of novelty. Service innovation involves the creation and introduction of a new offering or delivery process. An innovation can be viewed in terms of the degree of novelty, ranging from a totally new, discontinuous innovation to a service involving simple line extensions or minor adaptations/adjustments that are of an evolutionary nature. As in manufacturing, the degree of novelty can be applied to characterize service innovations. Radical innovations and incremental new services represent opposite ends of the newness spectrum (this could be interpreted as the difference between revolution and evolution):

- Radical/revolution: The complete system of characteristics and competences that make

up a service is replaced by another system of characteristics and competences, or a completely new service is introduced, causing the old service to vanish.

- Incremental/evolution: Characteristics are replaced or added without changing the service essentially, the service is changed marginally only. This can entail new elements that were previously not perceived, encountered or utilized by customers. This could also include developing a solution for a specific problem in cooperation with the client [4, p.17-18].

Dimension of newness. Apart from the degree of novelty, innovations can be described along several dimensions of newness, the most common of which include measures of newness to the developing firm, to the outside world or to both of these. First, a service innovation can be new to the developing firm. In this case, a new service exploits a service concept which already existed elsewhere, but is totally new to the developing firm. On the contrary, a service innovation can be new to the outside world. In this case, newness refers to the perception by new customers and/or competitors who are confronted with previously unfamiliar offerings [4, p. 18].

Innovation surveys do not cover the full spectrum of innovation models, but they do suggest that few firms engage in only one type of innovation. Generally product, process and organisational innovation occurs together. In the CIS3 Survey, between 60% and 90% of innovative firms introduced new products on the market; between one-third and two-thirds also introduced new processes (Figure 3, 4).

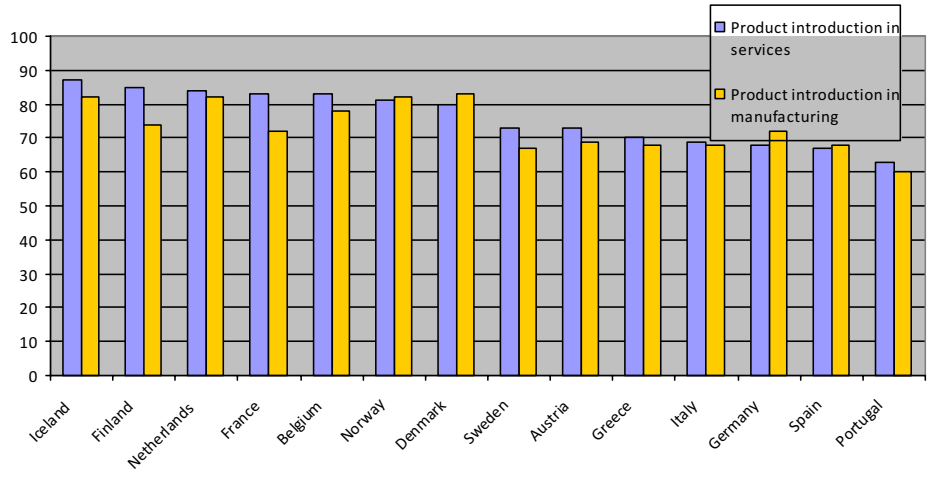

Figure 3 Product innovation in service and manufacturing sectors (as a % of all innovative firms)

Although product innovation is more frequent, many innovative firms engage in both types of innovation. Moreover, the innovation surveys indicate that:

- firms in both the manufacturing and service sectors engage in product innovation;
- in many countries, innovative service firms are more likely than innovative manufac-

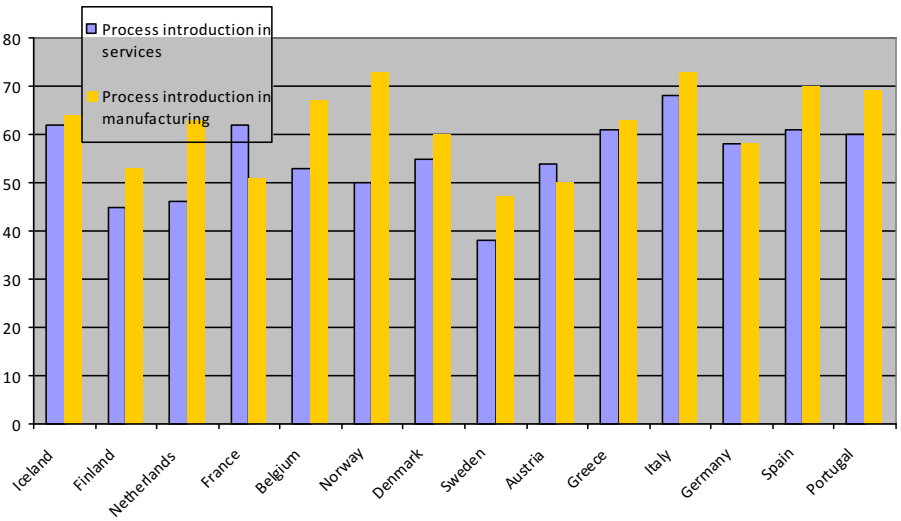

Figure 4 Process innovation in service and manufacturing sectors (as a % of all innovative firms)

turing firms to introduce new products;

- the largest differences between service firms and manufacturing firms relate to process innovations, which were reported more frequently by manufacturing firms [1].

As it was mentioned above, one of the main problem in defining the influence of service sector innovation proceses to the global development and growth is connected with some difficulties in measuring servoce innovation. The Service Sector Innovation Index (SSII) is a first attempt to define an aggregate index of the innovation performance in the service sector [5]. Using a selection of 12 indicators of the 29 innovation indicators used in the 2008 European Innovation Scoreboard (EIS) a separate composite indicator measuring innovation performance for services and industry was constructed and tested. There were following indicators for services and industry:

• EIS 2.1.1 Business R&D expenditures (% of GDP)
• EIS 2.1.3 Non-R&D innovation expenditures (% of turnover)
• EIS 2.2.1 SMEs innovating in-house (% of SMEs)
• EIS 2.2.2 Innovative SMEs collaborating with others (% of SMEs)
• EIS 2.2.3 Firm renewal (SME entries plus exits) (% of SMEs)
• EIS 3.1.1 SMEs introducing product or process innovations (% of SMEs)
• EIS 3.1.2 SMES introducing marketing or organisational innovation (% of SMEs)
• EIS 3.1.3 Resource efficiency innovators, unweighted average of: Share of innovators where innovation has significantly reduced labour costs (% of firms) and Share of innovators where innovation has significantly reduced the use of materials and energy (% of firms)
• EIS 3.2.5 New-to-market sales (% of turnover)
• EIS 3.2.6 New-to-firm sales (% of turnover)

Indicators for services only:
• EIS 3.2.2 Employment in knowledge-intensive services (% of workforce)
• EIS 3.2.4 Knowledge-intensive services exports (% of total services exports)

Indicators for industry only:
• EIS 3.2.1 Employment in medium-high and high-tech manufacturing (% of workforce)
• EIS 3.2.3 Medium and high-tech manufacturing exports (% of total exports).

According to this system of indiators we may conclude that: the best overall innovation performer in services is Luxembourg, followed by Greece and Germany. Some of Europe's better performers in the European Innovation Scoreboard, such as the Netherlands, do not achieve comparable results in the SSII. On the other side, some new Member States that present lower levels as regards the overall EIS perform relatively well in terms of service sector innovation. Greece is also performing quite well, but it should be noted that despite improvements in the CIS survey, CIS data are not yet fully able to capture innovation performance in services. A comparison between the relative importance of innovation performance in service and manufacturing sectors shows particular differences between European countries. In this respect, for some particular services-driven economies, such as Luxembourg and Greece, innovation performance in service firms ranks higher than that of the manufacturing industry. In other countries, like Austria and the Netherlands, innovation performance in services and manufacturing is about the same. In a number of countries, including most notably Slovakia, Belgium and Finland, innovation performance in manufacturing is remarkable higher than in services (Table 4).

Table 4
Innovation performance in service and manufacturing sectors at national level

Note: the calculation of the Services SSII (Service Sector innovation index) and the manu-

Country	Services SSII	Rank Services SSII	Manufacturing SSII	Rank Manufacturing SSII
Luxemburg	0,75	1	0,45	12
Greece	0,67	2	0,47	11
Germany	0.66	3	0,84	1
Austria	0,64	4	0,63	2
Estonia	0,63	5	0,51	9
Cyprus	0,62	6	0,57	5
Ireland	0,6	7	0,57	5
Portugal	0,54	8	0,49	10
Belgium	0,52	9	0,6	4
Finland	0,51	10	0,61	3
Chech republic	0,5	11	0,55	7
Denmark	0,47	12	0,53	8
Netherlands	0,44	13	0,44	14
Spain	0,41	14	0,37	16
Romania	0,39	15	0,44	14
Poland	0,31	16	0,35	18
Slovakia	0,3	17	0,45	12
Hungary	0,25	18	0,37	16
Latvia	0,25	18	0,09	21
Lithuania	0,24	20	0,35	18
Bulgaria	0,21	21	0,3	20

facturing SSII are very different, therefore a dirrect comparisson cannot be made. [7]

One clear difference between innovation in services and manufacturing is that services appear to rely less on R&D as a key driver of innovation. Although R&D is only one element of innovation in manufacturing, investments in R&D are closely correlated with innovative performance. In countries with higher levels of business R&D as a share of gross domestic product (GDP), the share of innovative firms is also larger [1]. In many countries, the R&D intensity of the service sector is less than 10% that of the manufacturing sector. This does not mean that R&D is not important to service-sector firms, but that other factors may also play a significant role in service-sector innovation. In spite of the fact that the service sector relies less on R&D for innovation, service-sector investments in R&D appear to be rising. Between 1990 and 2001, service-sector R&D increased at an average annual rate of 12% across OECD member countries, compared to approximately 3% in manufacturing [10].

Large differences between growth rates in services and manufacturing are most pronounced in countries such as France, Germany, Japan, Netherlands, Spain and the United States [10].While it is clear that a portion of the rapid growth in service-sector R&D is a statistical artifact reflecting better measurement of R&D in the service sector and a possible reclassification of some R&D-intensive firms from manufacturing to services (as their service activities have ex-

panded), it also appears to reflect real increases in R&D by service-sector firms, driven by competitive demands or by increased outsourcing of R&D by manufacturing firms and government.

Moreover, R&D appears to have grown faster than value added in services, reflecting its increased importance. R&D spending as a share of value added (R&D intensity) in services is still considerably below that in manufacturing. Whereas R&D spending in the manufacturing sector is above 1% of total value added in half of all OECD member countries for which data are available — and 2% or more of value added in seven countries — R&D intensity in the service sector remains below 0.5% in most countries [10]. However, available statistics indicate that R&D intensity in services has increased quickly in most OECD member countries, even in many in which manufacturing R&D intensity has declined. Denmark, Iceland, Sweden and the United States show relatively high R&D intensity in the service sector (more than 1%) and high rates of growth, as each added a half-point or more of R&D intensity during the decade. In Australia, Norway and Portugal, R&D intensities in services and manufacturing are about equal [10].

Service-sector R&D remains highly concentrated. In most countries, business services and post and telecommunications account for more than three-quarters of R&D intensity. Within these broad categories, computer and related services, R&D services and telecommunications services account for almost the entirety. These three sectors, and computer and related services in particular, account for most of the growth in R&D intensity over the last decade. In Germany, Korea, Netherlands and Portugal, R&D intensity in the computer and related services industry increased more than 25% annually in recent years, and the Korean R&D service sector has seen increases of the order of 75% a year [10]. This highlights the fact that service-sector R&D varies considerably across industries, as is also the case in manufacturing.

The widespread correlation exists between the service and the manufacturing industry, and the development of many service departments relies on the manufacturing industry, these departments mainly provide such service support as finance, advertisement, sale, consultation, communication for the manufacturing industry. Similarly, to smoothly develop, the manufacturing industry counts on service industry as well , and at the same time the conformity of all the service factor and the effective use is helpful to promote the quality of manufacturing industry product and its market competition, which mainly displays as follows [11]:

1. Service technology has improved reaction time in the manufacturing industry. The success of manufacturing industry lies in a faster response, the stronger customer product as well as less cycle times, while these all depend on the service conformity and making the most use of the relevant service technology, such as the technology in marketing and advertisement and so on.

2. Services become the important source which makes business enterprise competition ability and profits. Some manufacturers may provide the more development opportunities for the enterprises through big scale sales and the support system. When selling their equipment, many manufacturer find that they are able to get more profits by providing the training service for the customer enterprise, and in fact earlier IBM has turned their attention to software, network and the communication connection service, which all means the service is the important origin to promote the enterprise value and profits, and the service factor is becoming the key weapon to compete for the large-scale manufacture enterprises.

3. Services reduce the cost, but meantime increase the product value. In the modern manufacturing industry, the contribution of the basic merchandise is usually smaller than the value which is increased by various services of exterior or inside the business enterprise. 75% the entire cost which makes the business enterprise as well as higher proportion of the increment constitutes to forming the service activity, therefore reasonable choice and exploitation's serving will effectively decline the cost and enhance the additional value of product.

4. Manufacturers attain the profit from the exterior service innovation. At present the service business enterprise has become an important innovation. It has enormously improved the service quality, the scope and the flexibility and produced many new products of much innovation, so the customers (including manufacturers) can benefit from the competition.

5. Service supports international operation of manufacturers. An outstanding realm where the service technique influences manufacturing industry is in the international operation in manufacturing industry. To a large extent, the multinational manufacturing business enterprise acquires its scale economy depending on its service ability, the ability in the technique transfer, marketing, finance, logistics etc., but not on manufacturing factories to acquire its scale economy.

The connection between service industry and the manufacturing industry is becoming more and more closely, which is mainly manifested in the fact that the services which are put in the manufacturing industry is rapidly increasing, and meanwhile but outside the outside enterprise activities of the manufacturing industry also helps the emerging service industry to develop, thus promoting the service industry with the manufacturing industry to develop in integrating (Table 5).

Table 5

Percentage of EU27 enterprises that introduced a product or process innovation

	Product and/or Process innovation	**Product innovation**	**Process innovation**
	All enterprises		
Manufacturing	42,1	30,22	31,3
Services	33,1	22,2	23,8
KIBS	46,8	37,2	33
Services, excl. KIBS	29,9	19,7	22,6
	All product and process innovators		
Manufacturing		69,9	71,2
Services		63,6	71,7
KIBS		78	71,4
Services, excl. KIBS		60,7	74,2

The industrial may promote its competition by integrating, achieving the coordinated development of all the industries. In the current economical development, the integrating development between the modern manufacturing industry and service industry mainly lies in the fact that the service industry tries to infiltrate the manufacturing industry, special production service industry, which is related to the process of production, directly acts on process of manufacturing industry. Both of them develop in integrating in the following main three aspects [11]:

1. Integrating development in interior industry. At present, many manufactures of enterprises have merged with services, and the work management also has extended from the domain of manufacture to the service. The economic activities of someenterprises have even changed the manufacturing center into the service center. In many famous multinational corporations, service industry has a larger proportion in output value and profits, and so it is very difficult to judge whether it is a manufacturing industry or a service industry.

2. Integrating development in industrial chains. In fact, the time which is spent in manufacturing a product is much less, while most of the is spent on the stages, such as R&B, purc-

hase, storage, operation, sale, and post-sale service, the operation of each industrial chain more depends on production service industry, and the efficiency of the service industry has a great effect on the entire chain.

3. Integrating development among the regions. It is also called colony development where the manufacturing industry and service industry work together in a specific region. Such production service industry as finance, the insurance, class, education training and so on works together with the manufacturing industry, makes up the service strut system of the industrial colony, and help industry colony make a healthy development.

Characteristic of the main specific features of service innovation development allows us to summarise the main drivers of its growth [10]:

- Embodied knowledge is a key driver of innovation in the service sector.

Investment and equipment are a main source of innovation in service-sector firms. The service sector has traditionally furnished the bulk of tangible investments in buildings, structures and equipment. It accounts for the largest share of economic output, and its investment intensity (ratio of gross fixed capital formation to gross value added) has been substantially higher than that of the manufacturing sector over the past decades. Services such as transport and communication are highly capital-intensive owing to their large investments in infrastructure. Others, such as wholesale and retail trade or financial and business services, are becoming more capital-intensive over time.

- Human capital remains a cornerstone of services innovation.

Skills upgrading and human capital are pillars of the innovation process, especially in knowledgebased economies. Reliance on human capital is crucial in the labour-intensive services sector. Employment in services is no longer considered low-skilled and low-paid, and the shift in employment towards services cannot be regarded as a move towards less desirable employment. With the increasing involvement of highly skilled workers, growth in service employment accelerated solidly. The shift towards more high-skill jobs and the increase in activity has increased the risks of shortages and misallocations. At present, while some of the best-paid and most high-skill jobs are in services, many low-skill jobs remain. The share of employees with higher education is larger in market services than in manufacturing. In Finland, more than one employee out of three in the service sector is a university graduate, compared to one out of four in manufacturing. In many countries the share of highly skilled employees in manufacturing is often less than half of the share in services. The gap is particularly striking in Greece, Luxembourg, Portugal and Sweden.

- Entrepreneurship is a key driver of services innovation.

The process of firm entry and exit plays a significant role in productivity growth by reallocating resources from units with lower productivity to units with higher productivity. Recent studies indicate that in Europe between 12% and 19% of all non-agricultural firms enter or exit the market every year. This process of creative destruction facilitates innovation and the adoption of new technology. Research demonstrates several additional points: entries and exits are highly correlated, illustrating a process of search and experimentation, but entries exceed exits in most countries; new firms typically start small and do not survive very long, but those that do usually grow rapidly over time. Entrepreneurship plays an important role in service-sector innovation. First, firm renewal is generally more intense in services than in manufacturing. In particular, entries are substantially higher in dynamic service sectors, such as business services or ICT-related industries, than in mature industries. Second, innovation surveys indicate that new firms account for a larger share of innovative firms in the service sector than in manufacturing (Sweden, Denmark). In countries with lower rates of new firm entry, however (e.g. Austria, Italy

and Portugal), the difference between the service and manufacturing sectors is smaller or even reversed. This may highlight the strong role of an innovative service sector in business dynamism and, beyond a threshold of entries, a shift in firm creation towards innovative service activities. Nevertheless, there appear to be limits to the ability of entrepreneurship to improve innovative performance in the service sector. To some extent, the ability of new firms to innovate is conditioned by the general economic environment in which they operate. In more innovative economies, new firms need to be more innovative to compete and to integrate into the supply chains of established, and often larger, firms. In less innovative economies, the incentives for new firms to innovate may be weaker. Results of the CIS3 Survey provide some support for this hypothesis: countries with higher overall levels of innovation (i.e. larger shares of firms reporting the introduction of an innovation) tended to have higher levels of innovation among new firms; countries with low innovative density, such as Greece, Italy and Spain, had the lowest innovative density among small firms. In the cases of Greece and Italy, new firms were less innovative than the general population of service firms. Interestingly, while the innovative density of new service-sector firms is higher than that of established firms in most countries, the same trend does not hold true in manufacturing.

Conclusions. As indicated, the service sector is of growing importance in the world economy. Productivity and employment growth are highly dependent on the success of service industries, and services are strong drivers of recent economic growth in most OECD economies. Services are increasingly knowledge-based, innovative and drivers of growth. Service-sector firms in general are less likely to innovate than manufacturing firms, but they are becoming more innovative and knowledge-intensive, and services such as financial intermediation and business services show aboveaverage levels of innovation. Service-sector innovation derives less from investments in formal R&D and draws more extensively on acquisition of knowledge from outside sources that is acquired through purchases of equipment and intellectual property, as well as via collaboration.

Human resource development is especially important to service firms, given their high reliance on highly skilled and highly educated workers, as well as indications that a lack of highly skilled personnel is a major impediment to service innovation in most OECD economies.

The role of newly established firms in innovative activity is greater in services than in manufacturing, so that entrepreneurship is also a key driver of service innovation. Nonetheless, small firms tend to be less innovative than larger firms.

Nowadays there is a high importance of working out and improving some aspects of natonal innovation policy connected with service innovation development. To date, however, innovation policy measures in most countries have not been attuned to the service sector. Only a few countries have integrated services-related concerns into their innovation policies, and participation of service-sector firms in sector-neutral programmes remains low. The few policies targeting service innovation aim primarily at ICT development and use. Clearly, greater effort is needed to raise awareness of innovation policies and programmes among service-sector firms, as well as to design or adapt support programmes to be more relevant and useful to the service sector.

References

1. Alban Fischer A Practical Introduction to Service Innovation / http://www.skmf.net/ file-admin/redaktion/aktiver_content/06_Download/1KB003.pdf
2. Challenges for EU support to innovation in services – Fostering new markets and jobs through innovation // Luxembourg: Publications Office of the European Union. – 2009. — 76 pp. —ISBN 978-92-79-12032-9

3. Growth of the Service Sector / http://www.worldbank.org/depweb/beyond/beyondco/beg_09.pdf
4. J.P.J. de Jong, A. Bruins, W. Dolfsma, J. Meijaard Innovation in service firms explored: what, how and why?: Literatute review // Zoetermeer. – 2003. – 73 pp. - ISBN: 90-371-0874-1
5. Measuring Services Innovation: Service Sector Innovation Index / http://innovatiecentrum.be/ page_attachments/0000/0814/Hollanders.pdf
6. Leif B. Methlie, Per E. Pedersen Service innovation – new service development with involvement of users and value networks // Research Council of Norway. – Bergen. – 2005. – 126 pp. – ISBN 82-491-0393-9
7. Overview of World Trade Developments / http://www.international.gc.ca/economist-economiste/assets/pdfs/SoT_2011_ch2_e.pdf
8. Statistical Classification of Economic Activities / http://www.fifoost.org/database/nace/nace-en_2002AB.php
9. The transformative power of service innovetion. Meeting of the Challenge of Europe 2020. Report by the Expert Panel on Service Innovation in the EU / http://www.reachlaw.fi/images/uploads/files/Service_Innovation__EU_cases_Expert_Panel_2011.pdf
10. Working Party on Innovation and Technology Policy. Promoting innovation in services / http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/STP/TIP(2004)4/FINAL&docLanguage=En
11. ZHANG Bo, ZHANG Xiao-lin On Innovation in Service and Manufacturing Sector– Tendency and Integration / http://www.seiofbluemountain.com/upload/product/201001/1264472322q2ytyf2b.pdf