

Innovation as a Determiner of Employment Changes within the Services Sector of EU Economies

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Abstract

The article attempts to identify the role of innovation in the structural changes in employment. The analysis was carried out using the data obtained through international surveys of the EU countries - CIS 2008 and CIS 2010. The methods applied include the descriptive and comparative analysis as well as statistical methods.

The relationships identified with the analysis are of universal nature and illustrate the role of innovation in the service sector as a driver of structural changes in the labour market. The analysis allowed identification of the negative impact of active innovation on employment in the traditional service industries - retail and transport. On the other hand, any increase in the non-technological or interactive innovation has a positive impact on employment in the modern service industries. The changes in employment observed within the national service sectors were then used as a criterion for grouping the EU countries into five categories differing in the rate and directions of changes in their respective employment markets.

Key words: innovation, employment, EU economies

JEL Classification: J21, O31

1 Introduction

Innovation is the driving force behind today's modern economies. They are an outcome of the governmental economic policies combined with the developmental level of national economy. These determine the changes taking place in all areas of the economy, including employment. Today, the competitive advantages of national economies are determined by their innovation levels. Only the innovative economies stand a chance of rapid economic growth and development to ensure growth of the social welfare. Economies must strive to continuously improve their innovation levels and thus reach the required efficiency. Therefore, innovation has become the focus of the Europe 2020 strategy, adopted by the Member States at the European Council's meeting in June 2010 (EUROPA 2010). Innovation not only makes the basis of technological progress as well as of the development of high-tech industries and services based on advanced knowledge but it also embraces social, political and economic aspects. It contributes to the increased standards of living and thus to better prospects for the future. Due to the fact that the services sector is a major and integral part of economy, the effects of any changes taking place there, on a par with those in the manufacturing sector, determine the competitive position of any economy. Innovation in services is given more and more attention, as evidenced by the growing number of publications in this field. However, there are still too few studies on the impact of innovations on the labour market situation.

The article attempts to identify the role of innovation in the structural changes taking place in the services sector employment. The discussion is divided into three parts. The first part identifies the main characteristics of innovation in the service sectors of the European Union member economies. The next part contains an analysis of structural changes in employment in the services. The third part contains differences between European Union countries in terms of both the changes in employment occurring in the service sector and the implemented innovations. The analysis was carried out using the data obtained through international surveys of the EU countries, the *Community Innovation Survey* (CIS) in 2008 and 2010. The methods applied include the descriptive and comparative analysis as well as statistical methods.

2 Innovation in the Services Sector

The broadest, already classic definition of innovation was offered by J. A. Schumpeter, for whom innovation is a function consisting of creative thinking and action, which may include (Schumpeter, 1960):

- an introduction of a new good or a new quality of the good,
- an introduction of a new or improved production process,
- an introduction of a new method for sales or procurement,
- an opening up of a new market,
- an application of new raw materials or semi-finished products,
- an introduction of a new method of production management.
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This definition is interesting because it points out the different areas which may relate to innovation. Economics emphasizes that innovation must mean a successful application of new ideas. This concept of innovation emphasizes its two main characteristics. Firstly, it involves the creation of new ideas, and secondly, their commercialization.

The services sector most commonly sees non-technological innovations, which include organizational and marketing ones. The statistical surveys of Polish Central Statistical Office (GUS) and Eurostat, the concept of organizational innovation is construed to incorporate (*Działalność innowacyjna...*, 2012):

- new methods in terms of the operational principles adopted by the company, e.g. supply chain management, substantial transformation of business processes (business reengineering), lean production and quality management systems;
- new organizational methods in terms of corporate environment relations, i.e. relations with other enterprises or public institutions, for instance the first-time involvement in such business relationships as business alliances, partnerships. outsourcing (handing over the execution of certain tasks to specialized external firms, subcontracting, etc.).
- new methods of allocation of tasks and decision powers among employees, e.g. introduction of a new system of employee accountability, teamwork, decentralization, integration or disintegration of existing departments, training systems, etc.

Another type of non-technological innovation are marketing innovations. They may involve implementation of a new marketing concept or strategy that differs significantly from the enterprise's existing marketing methods. They also include significant changes in the design/structure of a product (service), product packaging, promotion and distribution methods, product positioning, and the pricing of products and services. The most commonly introduced innovation in the services sector involve new methods of distribution, customer

relation management, quality control, security and so on. According to Pim den Hertog, services see four aspects of innovative behaviour (den Hertog, 2002):

- 1) a new concept of service,
- 2) a new level of cooperation with the customer,
- 3) a new system of service delivery,
- 4) an application of new technologies.

Alongside the concept of innovation as such, the professional literature frequently refers to the concept of innovativeness or innovative capacity. They are often considered synonymous. These concepts have not been not clearly and precisely defined and their interpretations are often delivered for the purposes of individual projects and surveys, thus lacking universality rooted in some theoretical foundation (Nowakowska, 2009). Innovativeness often means the ability to create innovations in the broad sense of the word. It is associated with active involvement in the innovation processes and with implementation of innovation-friendly measures. Its level is determined by the available resources (material, human, and financial) and by the ability to participate in the processes of innovation creation, implementation and absorption. The concept of innovativeness also carries the information on the availability of specific resources and on their active use (*Konkurencyjność sektora ...*, 2009).

A summary picture of innovation performance is provided by the *Summary Innovation Index* (SII), a composite indicator obtained by an appropriate aggregation of the 25 indicators used for measuring innovation performance (Innovation..., 2013). Average performance is measured going from a lowest possible performance of 0 to a maximum possible performance of 1. In 2010, the highest value of the index occurred in Sweden (0.739), Denmark (0.705) and Germany (0.701), and the lowest in Latvia (0.216).

The main source of data on innovation in the services sector is the most comprehensive international survey of business innovation activities, i.e. the *Community Innovation Survey* (CIS). The CIS 2008 and CIS 2010 surveys encompassed the entire group of entities carrying out the activities of the required profile and employing more than nine people. In the services sector the surveys covered the companies whose main business activity was classified as market services belonging to the following sections of NACE Rev. 2:

- Section G - Wholesale and retail trade; repair of motor vehicles, including motorcycles,
- Section H – Transportation and storage,
- Section J – Information and communication,
- Section K – Financial and insurance services, and
- Section M – Professional, scientific and technical services.

The share of employment in the European Union in these services sectors accounted for about 30% of total employment. The highest share occurred in Luxembourg (36.3%) and Cyprus (36.1%) and lowest in Romania (22.6%).

The CIS have demonstrated that the European Union's services see a steadily growing proportion of firms introducing organizational and/or marketing innovations. In the 2006-2008 period, the percentage of service firms who have introduced a non-technological innovation was 39.5%, while during 2008-2010 the percentage went up to 41.2% (Fig. 1). The highest share of service firms introducing non-technological innovations was found in Luxembourg (61.7%) and Germany (61.2%) while the lowest in Bulgaria (17.0%) and Poland (22.9%). The EU countries differ not only in the percentage of companies implementing innovation but also in the innovativeness growth rate. The numbers of service firms

introducing non-technological innovations grew fastest in Latvia (164.8%), Germany (139.2%) Malta (131.4%) and the Netherlands (131.0%). Seven European Union countries experienced negative growth in the levels of innovativeness, with the largest decrease recorded in the Czech Republic (84.9%) and Spain (89.6%).

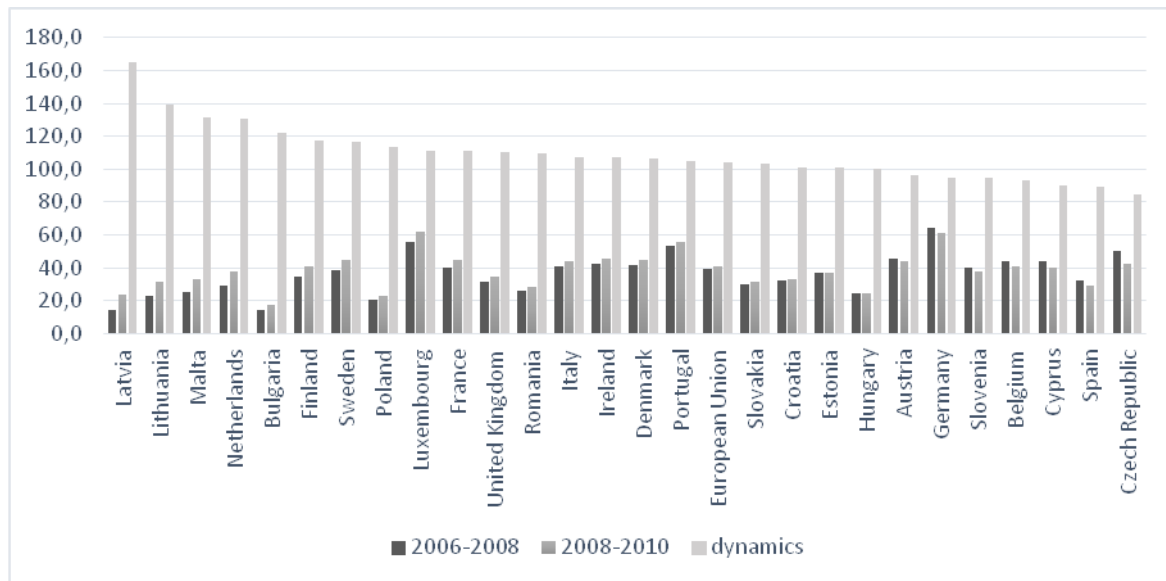


Fig. 1 Service sector enterprises that introduced organisational and/or marketing innovation in the years 2006-2008 and 2008-2010 as the share of innovation active service sector enterprises

Source: own work, based on Eurostat data:

http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database (retrieved on 10.07.2014)

While analyzing the innovation capacity of the services sector, it appears that innovations implemented there are of an interactive nature. Innovations rarely occur in isolation, their implementation is a highly interactive process of collaboration within a growing and diverse network of stakeholders. Creation of an innovation is rooted in the relationships arising both within the company, between its different departments, and from the company's relations with its business environment - suppliers, customers, research institutions, local authorities, universities and financial institutions. Cooperation in the field of innovative activity ensures wider access to knowledge and new technologies. It allows companies to reduce the costs and risks of their business activities and promotes the exchange of experience and knowledge. In addition, cooperation in innovative activities facilitates the growth of innovation capacity for individual companies, sectors and the entire economies. Fig. 2 shows the proportion of enterprises in the services sector who were involved in cooperation in the field of innovative activity in the total number of innovation-active enterprises.¹

¹ An innovation-active enterprise is one which during the period analysed introduced at least one product or process innovation or was engaged in implementing at least one innovative project which was interrupted or abandoned (i.e. unsuccessful) during the period or was not yet completed by the end of this period.

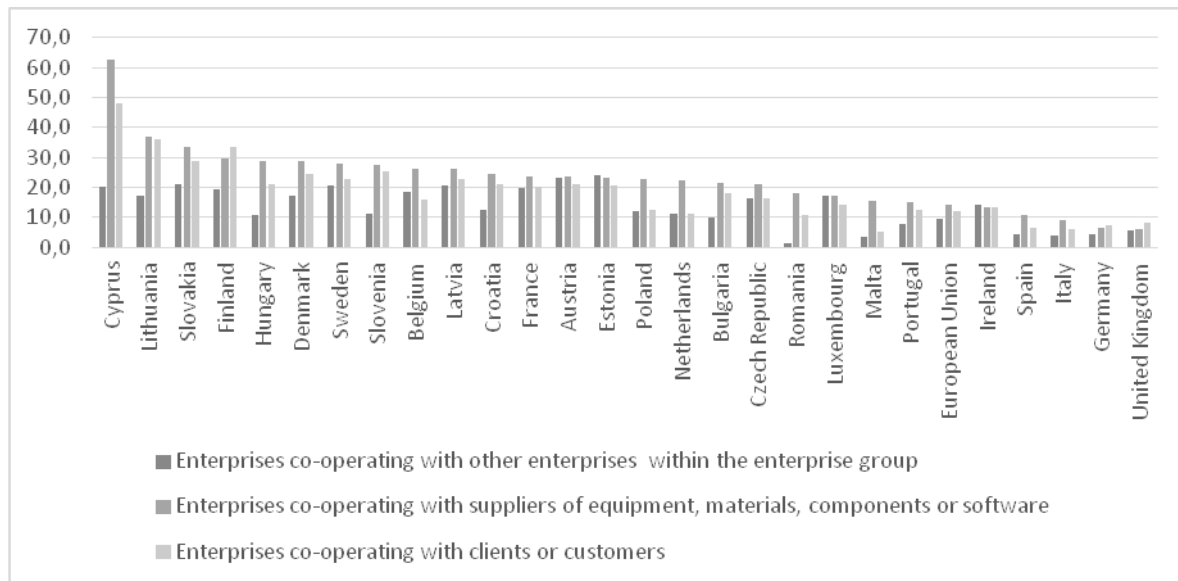


Fig. 2 Service sector enterprises which participated in innovation activities co-operation in the years 2008-2010 as the share of innovation active service sector enterprises

Source: own work, based on Eurostat data:

http://epp.eurostat.ec.europa.eu/portal/page/portal/science_technology_innovation/data/database (retrieved on 10.07.2014)

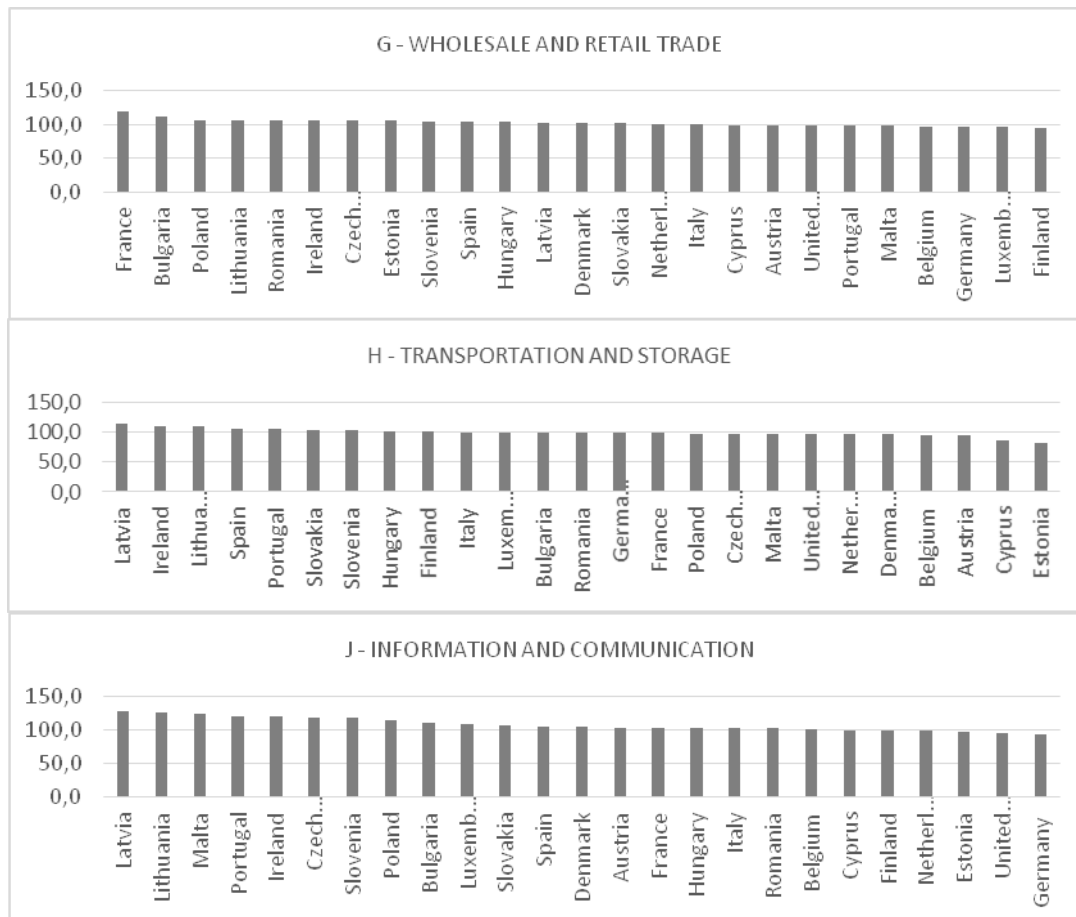
In the 2008-2010 period, 14.3% of all the service companies across the EU cooperated in the field of innovation activities with their suppliers of equipment, materials, components and software, 11.9% of them cooperated with their own customers, and 9.4% - with their peer companies. Across the individual EU countries, both the proportions of innovative enterprises and the types of cooperation in the field of innovative activity showed significant variation. For service enterprises, the main cooperation partners in their innovation activity were suppliers of equipment, materials, components and software. Cooperation with this group of partners was most appreciated by the companies in Cyprus (62.9%), Lithuania (37.0) and Slovakia (33.7%). In contrast, in the UK and Germany this was the lowest rated source of collaboration in innovative measures (6.2% and 6.5%, respectively). Another important partner in the cooperation on innovative activities were customers. Cooperation with customers was mostly taken up by companies in Cyprus (48.2%), Lithuania (36.2%) and Finland (33.5%). However, in Malta, Italy and Spain, collaboration with customers was undertaken respectively by only 5.1%, 5.9% and 6.3% of innovation-active enterprises. Peer companies were the main cooperation partner in innovation activities for businesses in Estonia (24.2%), Austria (23.0%), Slovakia (21.1%), Sweden (20.6%) and Cyprus (20.3 %). In contrast, companies from Romania, Malta and Italy only to a very small extent engaged in cooperation with their peers in terms of their innovative activity. In these countries, the percentage of service companies engaged in such a form of cooperation did not exceed 4% of the total number of innovation-active enterprises.

3 Structural Changes in Employment in the Services Sector

In the professional literature, the concept of structural change has been defined in many ways, but most often identified with long-term and permanent changes in the sectoral structure of economy (Chenery, Robinson, Syrquin, 2007; Syrquin, 2007). Today, the determinant of structural change is primarily the emergence of spheres that create innovation capacity and

that make use of the modern factors of production, i.e. of knowledge. M.G. Woźniak claims that structural changes are manifestations of modernization, which relate to its quantitative dimension, concerning the characteristics of economic growth, and are indicative of a deeper evolution of regulative mechanisms within the economy, resulting from both the top-down reforms and the spontaneous adjustments (Woźniak, 2012). A manifestation of quantitative changes, usually likened to structural changes, is a change in the weights attributed to the individual components of the economic system, which is inevitably accompanied by appearance of the new and disappearance of the old components of the structure. Studies on quantitative changes of this kind mainly cover those occurring in the employment and production structure within various sectors. This makes it possible to identify the industries and sectors showing tendencies toward a growing or declining share in the total employment or production figures. Quantitative measurement of the structural changes consists in calculating changes in the quantitative relationships between the components of economic structures that have been identified by means of specific criteria.

Changes in the structure of employment in the service sectors across the EU countries show considerable variation. In all the countries, the changes are of universally modernizing nature, but their pace is quite varied (Fig. 3).



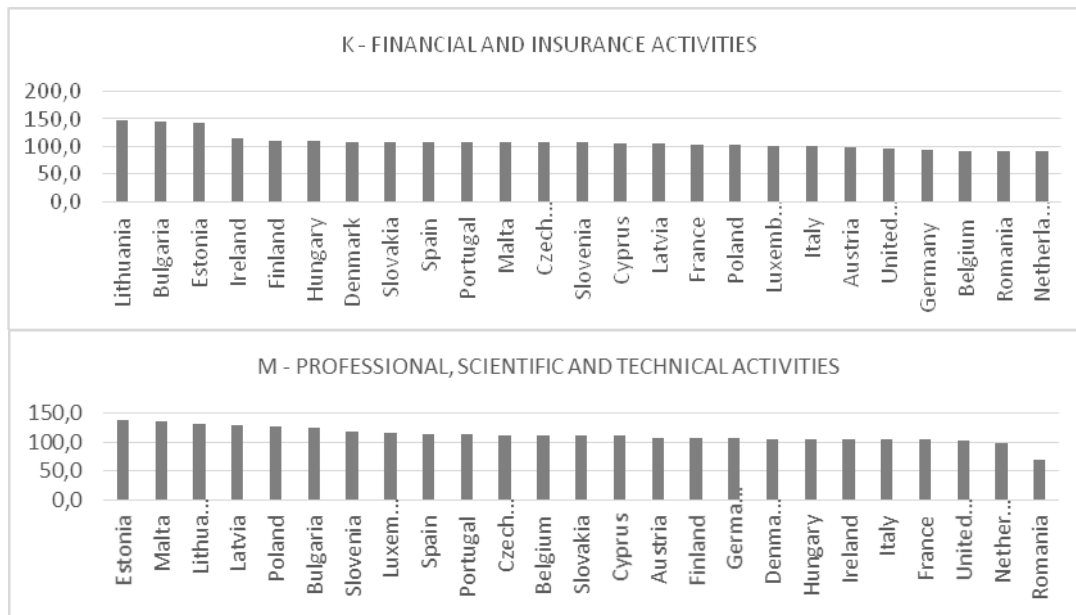


Fig. 3 Changes in the proportion of employment in various sections of the EU economies' services sectors during 2006-2010 (as % of total employment)
Source: own calculations based on Eurostat data

During the 2006-2010 period, employment in the service sector saw a significant increase in the share of people employed in the so-called modern sectors of economy, namely J - Information and communication, K - Financial and insurance activities, and M - Professional, scientific and technical activities, with a simultaneous decrease in the traditional services, i.e. G - Wholesale and retail trade, and H - Transportation and storage.

4 Differences Between European Union Countries in Terms of Both the Changes in Employment Occurring in the Service Sector and the Implemented Innovations

In order to arrive at country grouping, a cluster analysis method was used, namely the Ward's hierarchical clustering (Gatnar, Walesiak, 2004). The method aims to arrive at clusters that are relatively balanced as to their size, and it proved effective in the identification of actual clusters (Grabiński, Sokołowski, 1984). The analysis produces a tree diagram, which is a graphical interpretation of the hierarchical relations identified in the process. The variables describing the structural changes in the labour market and the service sector innovation capacity allowed grouping of EU countries into five clusters. The result is a tree diagram, obtained using the Ward's method with the use of squared Euclidean distance for standardized data, as presented in Fig. 4. Cutting the tree diagram at the level of distance binding equal to 2,8 has led to identification of five clusters (groups) of countries that are similar in terms of structural changes in employment and innovation in the service sector. It turns out that a vast majority of EU countries are similar in terms of changes in employment and innovation levels in the service sector. These countries make Group I, which includes as many as 21 of them. The remaining four groups identified contain just one item, i.e. country, each. This means that Luxembourg, Portugal, Romania and Finland have some really unique features in terms of structural changes in employment and innovation in the service sector. Luxembourg has the highest share of employment in Section K - Financial and insurance activities, and this factor drives changes both in its innovation capacity and in employment.

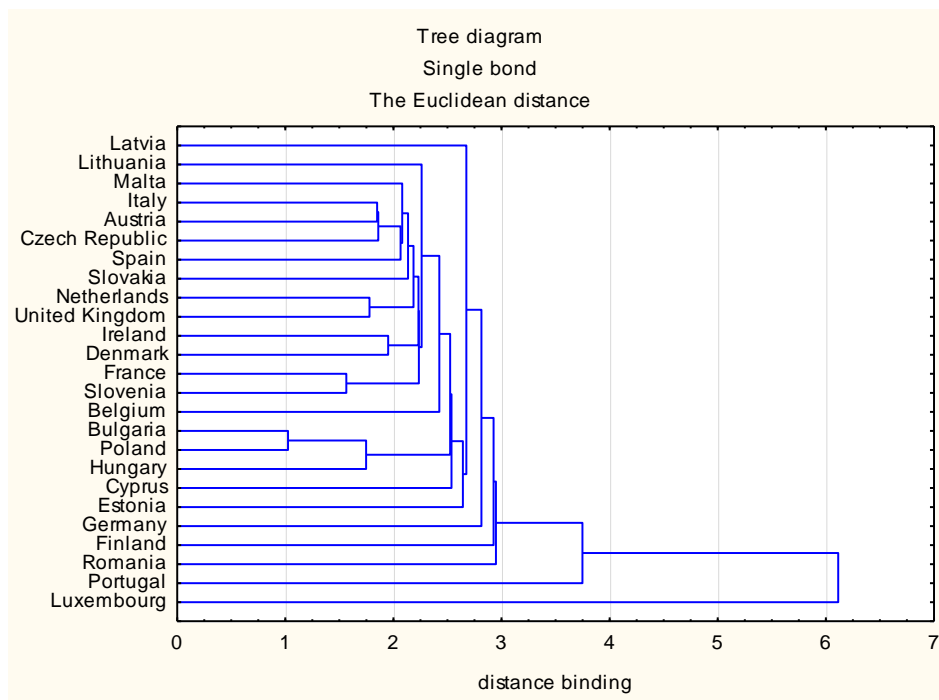


Fig. 4 Tree diagram of the EU countries (25 of them, excluding Greece, Sweden and Croatia), as obtained with Ward's method for the variables describing the innovation capacity and the structural change in employment in services

Source: own work

During the period in question, Portugal had the lowest share of workers in Section H - Transportation and storage, and one of the highest proportions of firms introducing non-technological innovations. Romania, in turn, showed a low level of innovativeness, combined with negative trends on the labour market. The services sector in Romania still remains underdeveloped, as evidenced by a very low percentage of people employed in services. The changes occurring there are not very dynamic and are frequently adverse from the viewpoint of the national economy modernization, e.g. a decline in the share of people employed in Section M – Professional, scientific and technical activities. Finally, Finland also made a separate group due to a significant decline in employment in Section G - Wholesale and retail trade, caused by the relatively high levels of active innovation.

5 Conclusions

The growing importance of services sector and its innovation capacity affects the general situation at the labour market. The study results show that the increasing proportion of service firms who implement organizational and marketing innovation intensifies the structural changes in employment. There is a significant reduction in employment in traditional services with a simultaneous increase in modern services, necessary for the proper functioning of modern economies. Such a reduction of employment in traditional services is often accompanied by the capacity for interactive innovation. B2B cooperation in the field of innovative activity usually gives rise to an increase in the proportion of innovating businesses. This, in turn, stimulates an increase in employment in the modern services which generate innovative ideas, with a simultaneous decline in employment in traditional services.

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