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## Tertiarisation and globalisation of productive systems: comparative analysis

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## **TERTIARISATION AND GLOBALISATION OF PRODUCTIVE SYSTEMS: COMPARATIVE ANALYSIS**

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**ABSTRACT:** It is commonly known that the provision of services is currently carried out at a global level. Tertiary activities not only continuously increase their share in total employment and value added, but also in international trade and, as a consequence, in the processes of externalisation and offshoring, characteristic of contemporary globalisation. These processes help enterprises, especially SMEs, get access to certain types of services which could not be provided internally, and thus increase their level of efficiency and consequently an overall degree of competitiveness of the regions, in which they operate.

The objective of this work consists in an analysis of globalisation of services provision in several regions of the European Union (EU) focused on their productive systems. The study consists in comparison of Slovakia with four Spanish autonomous regions (Aragón, Madrid, Valencia and Andalucía).

The methodology applied is based on input-output tables which enable to appreciate a variety of intersectoral relations existing in the economy. We calculate the level of tertiarization of economies (Camacho, 1999) and their degree of internationalization. The data on services imports obtained by means of input-output tables and services foreign direct investment enable to study in more depth the process of globalisation of services provision and establish relations with the process of tertiarisation of the economies.

By means of the analysis proposed we aim not only to study the regional productive systems from the point of view of globalization of services provision but also to appreciate whether there are any similarities between Slovakia and Spanish regions. It could be interesting to find out if the role played by Bratislava is important enough so that the whole country would show resemblance to Madrid. Or otherwise it is more similar to more industrial regions of Aragón and Valencia or agriculture and tourism oriented Andalucía.

**Key words:** tertiarisation, European regions, productive systems, input-output analysis.

**JEL codes:** L80, R11, O14, O52

## 1. INTRODUCTION

Services are provided each time more at global level. It means that they continue to increase their share not only in total employment and value added, but also in international trade and, as a consequence, in the processes of externalisation and offshoring, characteristic of contemporary globalisation. All these processes help enterprises, especially SMEs, get access to certain types of services which could not be provided internally. According the data of the International Monetary Fund (IMF), during the decade 1994-2004 service imports almost tripled. Besides, there has been a structural shift away from tourism and transport services towards producer and business services (Hoekman and Mattoo, 2008). These two types of services activities are especially important as intermediate inputs because they generate a positive effect on user activities and, in particular, the productivity of economies (Antonelli, 2000; Maroto and Cuadrado, 2009; a review of studies by Kox and Rubalcaba, 2007, among others). This contributes to the general development of the productive system.

In this work we aim to examine the process of globalization of services provision in several regions of the EU. We will combine the analysis of tertiarisation of their productive systems based on input-output tables with the analysis of services trade. Trade in services will be examined by means of services imports and foreign direct investment (FDI) at regional level.

As to the regions, the study is focused on Slovakia and four Spanish autonomous regions which are also European NUTS 2 regions. They are Aragón, Madrid, Valencia and Andalucía. What this selection of territories is due to? Slovakia is one of the EU new member states, situated in the centre of Europe, the fact that could boost its participation in the general globalisation processes. The size of this country in terms of population and extension of its territory is comparable with European NUTS 2 regions.

It can be asked if it is possible to compare Slovakia which is actually a NUTS 1 region with NUTS 2 regions. We consider such a comparison viable as the EU regional division is based upon the institutional and administrative division set out by the European member states and, as a consequence, their administrative and historical foundations differ from country to country. Therefore, the territories which make up the territory nomenclature are far from homogenous. They present important differences not only in terms of the number of inhabitants but also surface extension and population density. The European Commission (2003) establishes the average size of NUTS levels in terms of population. So,

NUTS 2 regions shall lie within the following population thresholds: from 800,000 to 3,000,000. The very Spanish regions are a very good example of problems such an administrative division faces. Suffice it to compare, for example, regions of Autonomous cities of Ceuta and Melilla with 70,000 inhabitants each one of them and Andalucía with about 8 millions. So, as Table 1 shows, Spanish regions included into the analysis are similar to Slovakia in terms of population (Madrid, Valencia), territory (Aragón) or population density (Andalucía) and what is more important there are input-output tables available for these regions.

Table 1. Demographic and territory characteristics of the regions under research

|           | Population, 2010 | Territory, 2008<br>(km <sup>2</sup> ) | Population<br>density, 2008<br>(person/km <sup>2</sup> ) |
|-----------|------------------|---------------------------------------|--|
| Aragón    | 1,313,017        | 47,720.3                              | 27.7   |
| Madrid    | 6,335,807        | 8,027.7                               | 793.3  |
| Valencia  | 4,994,322        | 23,254.5                              | 216.6  |
| Andalucía | 8,206,057        | 87,597.7                              | 94.5   |
| Slovakia  | 5,424,925        | 49,035.0                              | 110.5  |

Source: Eurostat.

Input-output tables of Spanish regions are obtained through the regional statistical offices and refer to the following years: 1999 (Aragón), 2000 (Valencia) and 2005 (Andalucía and Madrid). Unfortunately it appears impossible to find tables for the same year as the elaboration of input-output table is not coordinated at regional level in Spain. So, it was decided to use tables for the latest year available. It is considered possible to use the tables for the period of time between 1999 and 2005, as changes taking place in the productive systems are slow. In case of Slovakia, the input-output table is available in Eurostat and refers to 2005<sup>1</sup>.

The remainder of the paper is organized as follows. In the next section the methodology, which enables to measure the degree of tertiarisation of economies, is presented. The third section is dedicated to the presentation of tertiarisation analysis results. Globalisation of trade in services and services FDI are studied in the fourth part, in which we also try to establish relations between these two processes: tertiarisation of productive systems and globalisation of services provision. The final section draws the main conclusions.

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<sup>1</sup> Mentioned reference years will be used in this work if no any other comment is made.

## 2. METHODOLOGY

The analysis of tertiarisation of the productive systems under research will be carried out using the input-output tables. Namely, by means of the technical coefficients and Leontief inverse matrix coefficients the tertiarisation effects will be obtained.<sup>2</sup> This methodology represents one of the techniques that enable to exploit the valuable economic information contained within the input-output tables (see for example, Camacho and Rodríguez, 2010; Strambach, 2001).

Because of the space available, below we will present briefly the meaning of the tertiarisation effects. So, **direct effects** comprise first-order intersectoral relations between a productive sector and each branch of economic activity, namely, the immediate intermediate demand of each industry necessary to produce an additional unit of its product.

**Total effect** measures all the direct and indirect inputs, up to the n-relationship, necessary for the production of an additional unit of output. So, total effects jointly measure interactions among and within sectors, regardless of these interactions are direct or indirect.

The decomposition of total effects gives us a series of indirect effects: unisectoral, bisectoral and multisectoral. **Unisectoral effects** report the own autoactivation effect of each industry. They represent the capacity of each sector to autonomously encourage its own industries. **Bisectoral effects** summarise the relationships between the industries of two of the three sectors (agriculture, industry and services). These effects can be of two types, depending on whether the driving sector is unique or composed of the industries of the sectors of the bisectoral activation. **Multisectoral effect** can be defined as a balance or residual. It is obtained by subtracting from the total effects the rest of effects described, namely, direct, unisectoral and bisectoral effects. Therefore, by calculating the multisectoral effects we can estimate to what extent structural change is explained by intersectoral relationships. In other words, if intersectoral relationships are weak then the multisectoral effect will be high and vice versa: a low multisectoral effect is a sign of a closely integrated production system.

Additionally, as the basic element of the analysis, it will be distinguished between internal and total effects. Internal effects are obtained from domestic input-output tables that include intermediate consumption of products produced internally, inside each region. Total effects in this case (are not to be confused with total tertiarisation effects described above) come from total input-output tables that refer to the intermediate consumption of products

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<sup>2</sup> See Camacho (1999) for the detailed methodology.

fabricated internally by a country and those imported. Therefore, we can distinguish, for example, between direct internal and direct total effects, on the one hand, and total internal and total total effects, on the other hand.

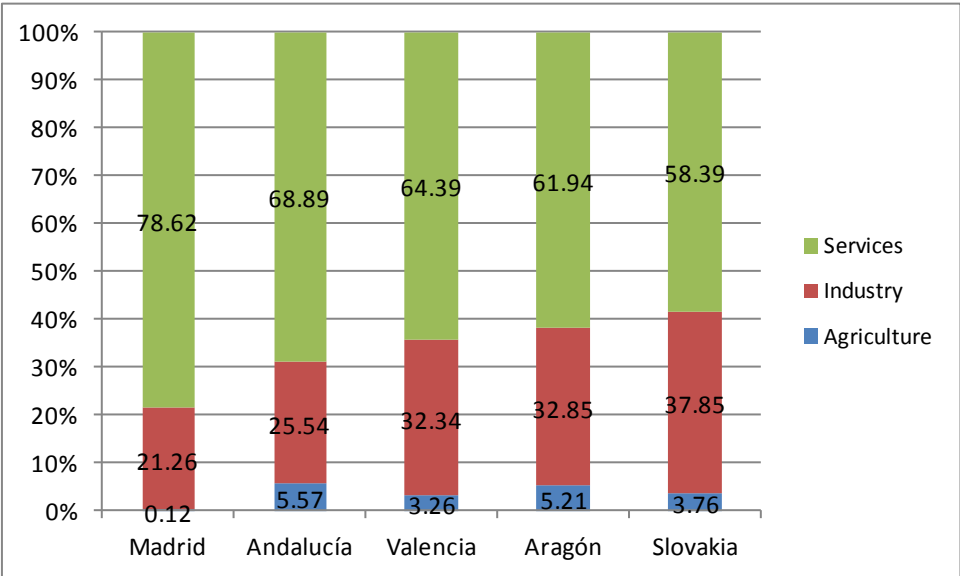
The existence of effects coming from domestic and total input-output tables brings us to the term of **degree of internationalization**. It is the value of imported services inputs incorporated into productive processes. For instance, for each region the degree of internationalization of direct effect is the difference between direct total effect and direct internal effect represented as percentage of direct total effect. This concept can be considered as fundamental in the services globalisation analysis.

### 3. TERTIARISATION OF REGIONAL PRODUCTIVE SYSTEMS

#### 3.1. FIRST APPROACH: SECTORAL VALUE ADDED

As a first step we approach the analysis of regional productive systems under research by means of the value added (VA) of the three main sectors: primary, secondary and tertiary (Figure 1). What can be observed is that Madrid is the most tertiarised sector with services share within the VA of 78.62%. It also presents the lowest values of industrial (21.26%) and agricultural (0.12%) value added. Madrid is followed by Andalucía, although its services share is 10% lower. Andalucía's secondary sector presents the lowest value (25.54%) and its primary sector is the most numerous (5.57%).

Figure 1. Productive systems' structure



Source: Authors' own elaboration.

Other two Spanish regions occupy an intermediate position with a very similar share of industry within the VA (32-33%). Finally, the less tertiarized and at the same time the most industrialized region is Slovakia with shares of 58.39% and 37.85% respectively. An explanation for such a result we find by understanding of historical development of the country starting in the Soviet era. Marxist thinking emphasized the importance of tangible (material) inputs as determinants of economic development, and classified services as unproductive. Therefore, services industries were generally neglected under central planning (Eschenbach and Hoekman, 2005). There was actually no private service sector in former Czechoslovakia before disintegration of the Soviet Union in 1989, public service sector was not significant and strictly controlled by government. During Czechoslovakia period (before separation of Slovakia in 1993 and establishment of two sovereign countries), centralized government tended to locate production, essentially heavy industry such as arm, chemical or metal industry, in Slovakian territory and this created strong background for manufacturing sector (SARIO, 2007). Therefore since 1989 we can observe very high growth rates of service sector share in Slovakia due to governance change, privatization and creation and development of private sector (Michalová et al., 2008a).

### **3.2. ANALYSIS OF TERTIARISATION EFFECTS**

After this general image of the situation with the distribution of the share of productive sectors within the VA, it could be interesting to verify if regions with the highest percentages of services also use the highest amount of services inputs in their productive processes. In order to check it, the tertiarisation effects will be examined. They are obtained by means of total input-output tables and presented in Table 2. For Andalucía, Madrid and Slovakia this table also represents changes that took place between 2000 and 2005. For other two regions, there are now input-output tables available for the same period.

As regards the data of the Table 2, one thing should be clarified. It refers to the term of average tertiarisation, which was not mentioned in the methodology section. Average tertiarisation is calculated as an arithmetic mean of the effects of all the activities forming part of a productive system.

The data indicate that in 2005 the most tertiarised region in terms of the VA (Madrid) also used the most important amount of services inputs as the values of average tertiarisation of direct, total and indirect effects is the highest.

Table 2. Average tertiarisation: total tables

|                                    | Andalucía |         |          | Madrid  |         |          | Slovakia |         |          | Aragón  | Valencia |
|------------------------------------|-----------|---------|----------|---------|---------|----------|----------|---------|----------|---------|----------|
|                                    | 2000      | 2005    | 2000=100 | 2000    | 2005    | 2000=100 | 2000     | 2005    | 2000=100 | 1999    | 2000     |
| Direct effect                      | 0.16687   | 0.17878 | 107.14   | 0.20162 | 0.21307 | 105.68   | 0.24272  | 0.20157 | 83.04    | 0.18325 | 0.12682  |
| Total effect                       | 0.38801   | 0.44588 | 114.91   | 0.44712 | 0.56777 | 126.98   | 0.59414  | 0.45659 | 76.85    | 0.37191 | 0.19552  |
| Indirect effect                    | 0.22114   | 0.26710 | 120.78   | 0.24550 | 0.35471 | 144.48   | 0.35142  | 0.25503 | 72.57    | 0.18866 | 0.06870  |
| Unisectoral effect                 | 0.10185   | 0.11824 | 116.10   | 0.09416 | 0.12972 | 137.78   | 0.26141  | 0.16653 | 63.70    | 0.08569 | 0.06058  |
| Bisectoral effects (driver sector) |           |         |          |         |         |          |          |         |          |         |          |
| Agriculture                        | 0.00187   | 0.00275 | 147.31   | 0.00056 | 0.00085 | 151.82   | 0.00553  | 0.00469 | 84.82    | 0.00038 | 0.00024  |
| Industry                           | 0.09386   | 0.11005 | 117.25   | 0.11299 | 0.15990 | 141.52   | 0.12433  | 0.10020 | 80.59    | 0.08346 | 0.02610  |
| Services                           | 0.05187   | 0.05614 | 108.23   | 0.07060 | 0.08329 | 117.97   | 0.07705  | 0.05763 | 74.81    | 0.04607 | 0.02072  |
| Joint                              | 0.05943   | 0.08310 | 139.82   | 0.08222 | 0.13893 | 168.96   | 0.10335  | 0.07105 | 68.75    | 0.04366 | 0.00921  |
| Multisectoral effect (balance)     | 0.02572   | 0.02915 | 113.33   | 0.00545 | 0.01495 | 274.25   | 0.01650  | 0.01326 | 80.32    | 0.01828 | 0.00288  |

Source: Authors' own elaboration.

A very interesting situation is observed in Slovakia. The tertiarisation here was reduced during the five year period under research. Significant changes occurred with new government in 2002 in Slovakia. Many strategic state companies were privatized and foreign investments came to Slovakia, also automotive, chemical industry, electrical engineering began to be supported and developed. Afterwards these industries became also main drivers of Slovak economy. Service sector shows still potential and reserves for growth (Michalová et al., 2008a). Besides the values of the effects were the highest in 2000. Meanwhile, in 2005 Slovakia follows Madrid. As neither previous nor subsequent input-output tables of this country are available at the moment we cannot say if it is a temporary problem or a long term trend. It could be interesting to examine the changes of tertiarisation effects of Slovakian productive system during a longer period of time.

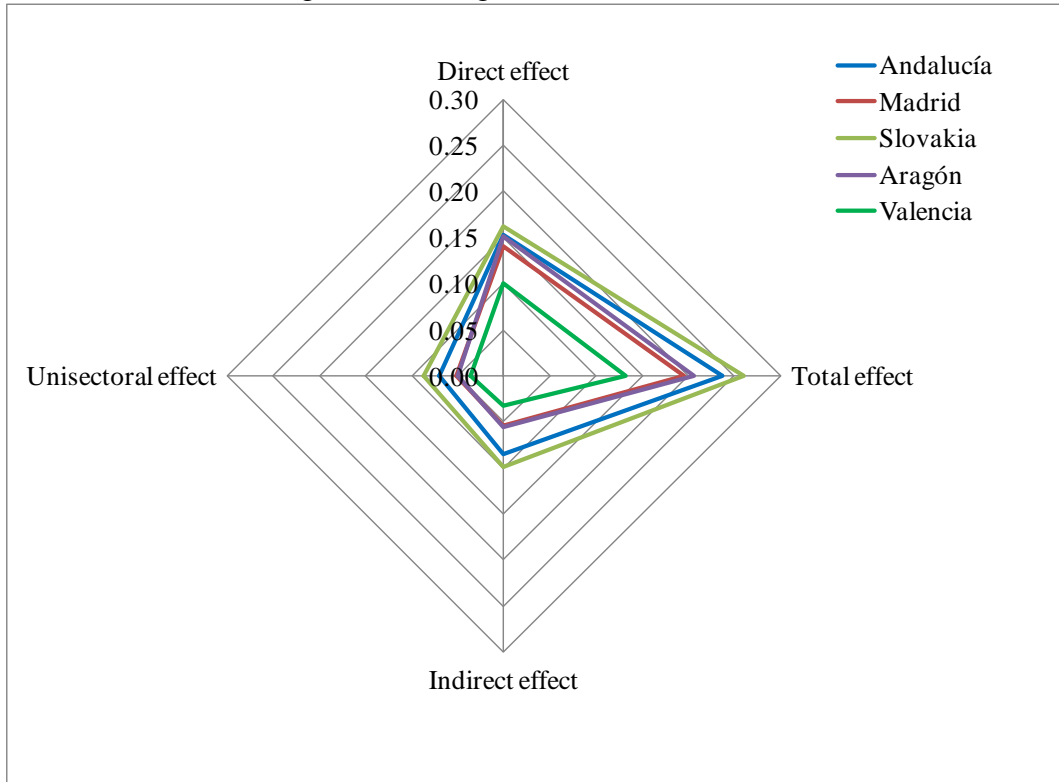
As to the total direct effect, Madrid and Slovakia are followed by Aragón. In case of total effect, the two leading regions are followed by Andalucía. Valencia appears to be the less tertiarised region.

When we examine the changes of the tertiarisation effects during 2000-2005, the data highlight that Madrid experiences the most important increase. The only exception is direct effect which increased more in Andalucía. As it has just been mentioned, Slovakia's productive activities reduced the amount of services inputs they used in their productive systems.

By means of Figures 2-4 we can appreciate differences between tertiarisation effects of domestic and total tables and the degree of internationalization.

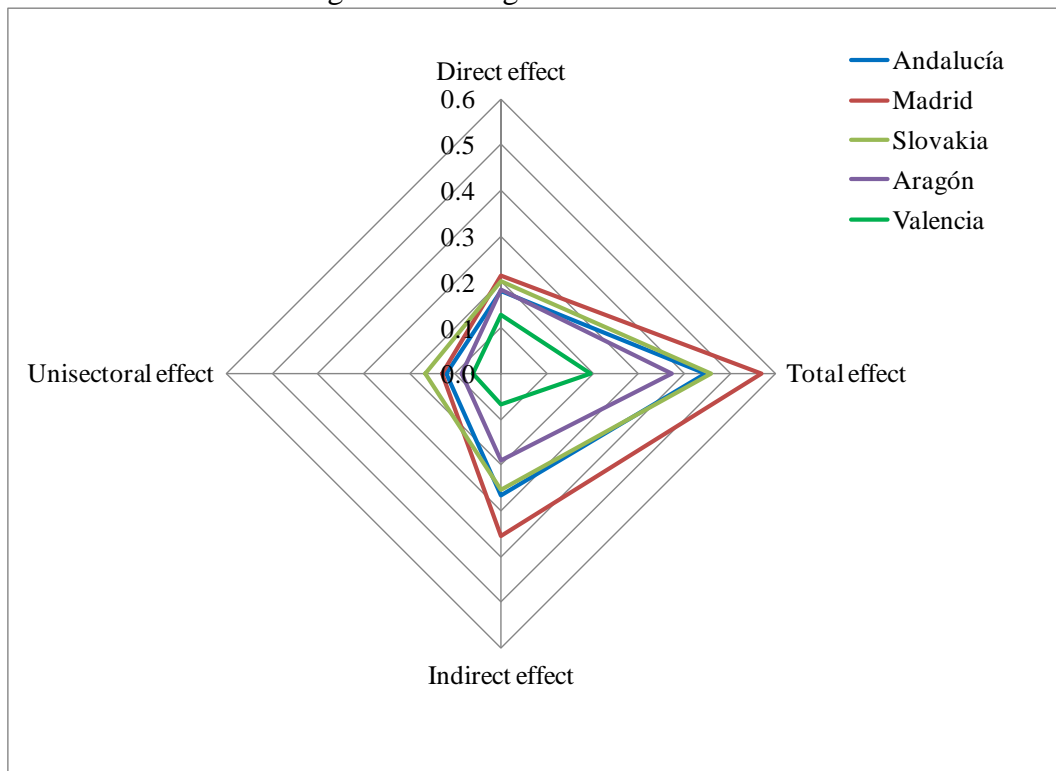


Figure 2. Average tertiarisation: domestic tables



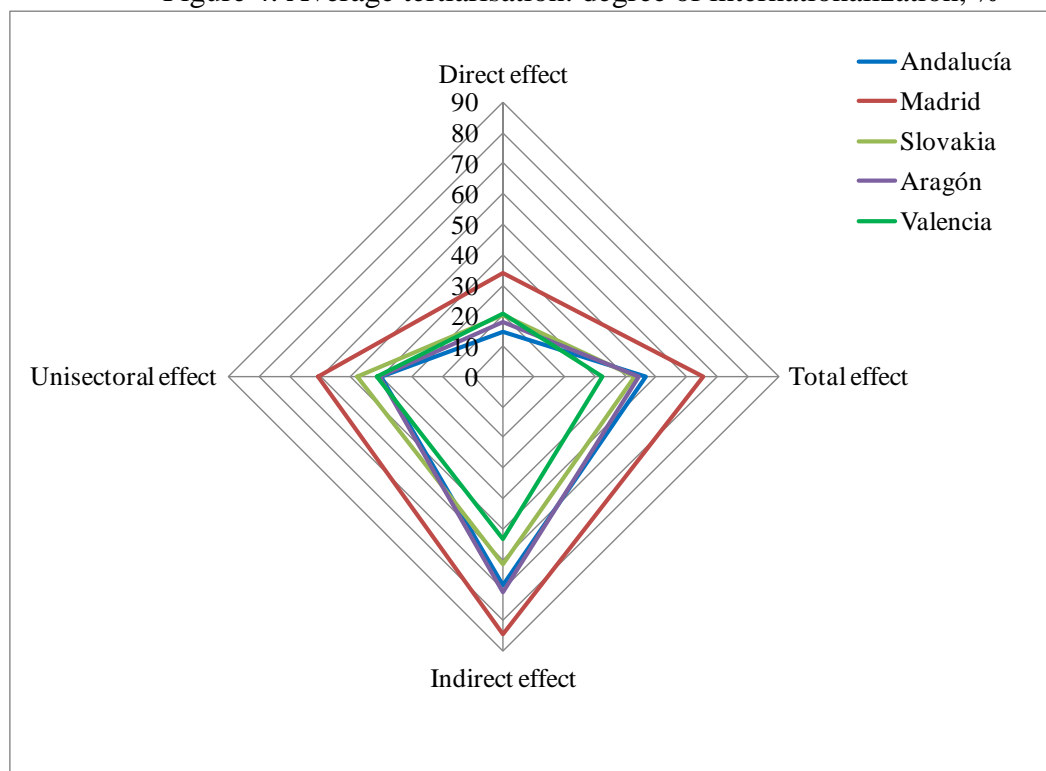
Source: Authors' own elaboration.

Figure 3. Average tertiarisation: total tables



Source: Authors' own elaboration.

Figure 4. Average tertiarisation: degree of internationalization, %



Source: Authors' own elaboration.

The first interesting observation is that Slovakia appears to be the most tertiarised region at internal level (Figure 2). It means that Slovakian productive system uses more domestic services inputs than the rest of the regions. Madrid, the leader of tertiarisation at total level according to Table 2, occupies penultimate place, just before Valencia, which repeats the last position.

If we compare this image with the situation at total level (total input-output tables) the ranking of regions changes (Figure 3). Madrid confirms its leading position. Besides the advantage in relation to the next region (Slovakia) seems to be relatively important, especially in case of total and indirect effects. The only exception is unisectoral effect, in which the first place is occupied by Slovakia. This situation together with the leading position of Slovakia as for domestic table means that national services inputs maintain narrow relations with the rest of the productive system and their capacity of autoactivation is higher than in the rest of the regions under research. So, Slovakia's tertiary activities do not only present a high level of integration with the rest of the productive system, but national and imported services are also self-integrated, presenting an intensive interrelation within the very sector.

In order to appreciate the difference between total and domestic tables, namely, the degree of internationalization, we should have a look at Figure 4. At the first place it shows an

enormous gap existing between the leading region (Madrid) and the rest of the regions under research. The degree of internationalization is especially high in indirect effect which contributes to the increase of the total effect. Madrid is followed by Aragón and Andalucía. The fourth position is occupied by Slovakia which indicates its relatively low degree of internationalization, except the unisectoral effect. In this case Slovakia follows directly Madrid, which confirms a relatively higher importance of imported services inputs for the very services activities if compared with the entire productive system. Valencia appears again as the last region, except direct and unisectoral effects. As to the direct effect, it passes Aragón and Madrid, sharing the second position with Slovakia. And in case of unisectoral effect, its results are similar to those of the two mentioned Spanish regions.

The results of Figure 4 bring us to the analysis of trade in services. It seems logical to suppose that the higher degree of internationalization should be related to the higher degree of services trade in the regions under research. We will go into this topic in more depth in the next section.

#### **4. TRADE IN SERVICES**

Before analyzing trade in services it is necessary to define this concept. The General Agreement on Trade in Services (GATS) establishing the definition of trade in services simultaneously defines four modes of services supply. This definition extends a traditional concept of trade, namely, goods trade, which is measured in terms of cross-border transactions. So, trade in services is defined as the supply of a service:

1. From the territory of one Member into the territory of any other Member (cross-border);
2. In the territory of one Member to the service consumer of any other Member (consumption abroad);
3. By a service supplier of one Member, through commercial presence in the territory of any other Member (commercial presence);
4. By a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member (movement of natural persons).

As Hoekman (2008) points out, the data on these modes is extremely limited. The transactions associated with modes 1 and 2 can be measured through the balance of payments flows. Data on FDI can be used in order to approximate the volume of the mode 3

transactions. As to the mode 4, the global framework for its development is currently under negotiation. That's why there is no data available.

In order to conduct the analysis proposed, in this work the attention will be focused on three modes of services supply, namely, modes 1 and 2 (cross-border trade and consumption abroad) and mode 3 (commercial presence). Transactions under modes 1 and 2 will be estimated by means of the data on services imports obtained through the regional input-output tables. FDI in services will be used to approximate mode 3 (commercial presence).

#### 4.1. REGIONAL SERVICES IMPORTS

As it has just been stressed, the data on regional services imports are provided by input-output tables. These data, together with agriculture and industry imports, are presented in Table 3 and refer to the same years which were pointed out in the introduction.

Table 3. Regional services imports

|                        | Imported intermediate consumption, %<br>of imported total use |       |       |       |       | Imported intermediate consumption, %<br>of total intermediate consumption |       |       |       |       |
|------------------------|---|-------|-------|-------|-------|---|-------|-------|-------|-------|
|                        | SK  | And   | Ara   | Mad   | Val   | SK  | And   | Ara   | Mad   | Val   |
| Agriculture & Industry | 64.51   | 67.49 | 68.43 | 68.63 | 62.62 | 51.90   | 42.53 | 65.40 | 68.62 | 52.22 |
| Services               | 76.23   | 82.57 | 70.96 | 80.39 | 86.27 | 14.48   | 13.27 | 22.70 | 33.37 | 21.26 |

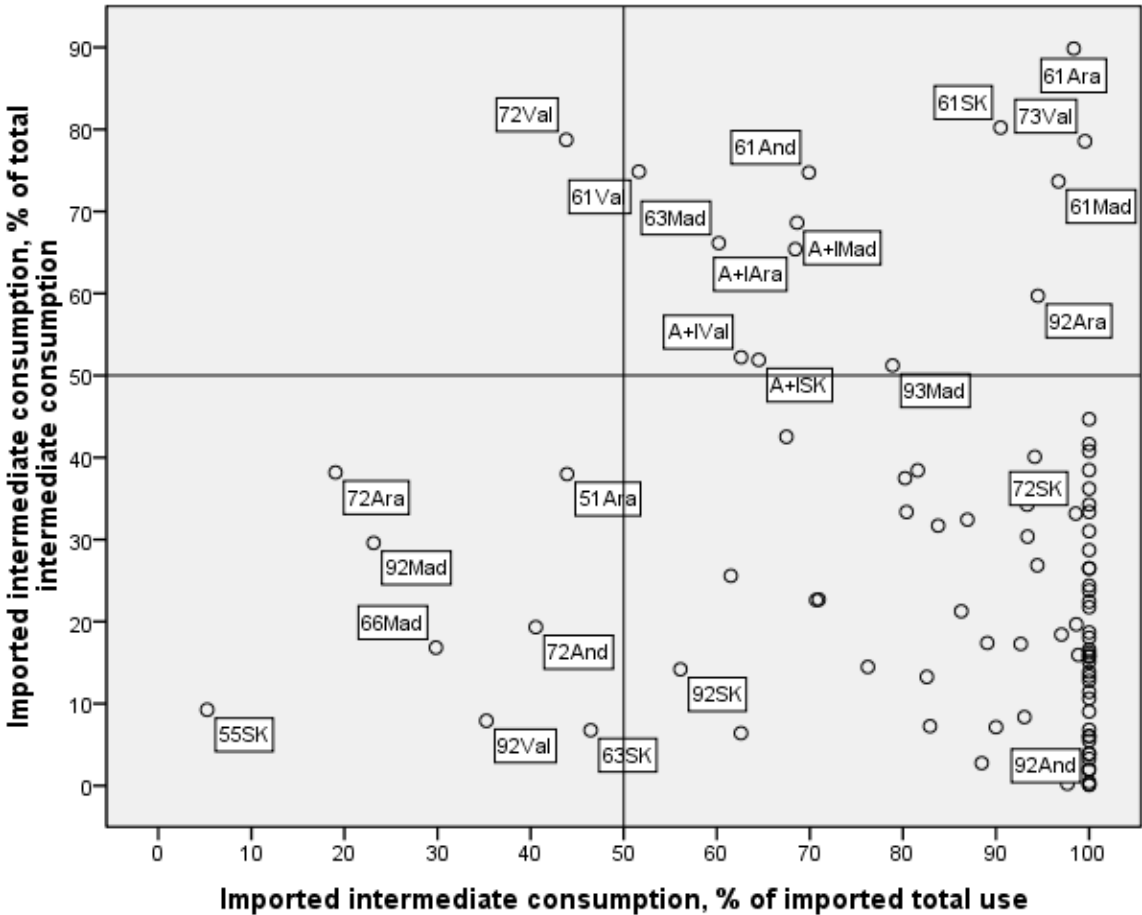
Source: Authors' own elaboration.

Table 3 reveals a very interesting fact. In all the regions more than 70% (86.27% in Valencia) of imported services are used as intermediate inputs by the productive system. These values are higher than average values for agriculture and industry which are below 70% in all cases. A contrary situation is observed when we analyze the structure of intermediated inputs. Only a very small share of services intermediate consumption (between 13.27% in Andalucía and 33.37% in Madrid) is imported. The result of Madrid can be directly related to its degree of internationalization which was the highest as we observed in the section 3.2. Meanwhile, imported agricultural and industrial inputs represent a notably higher percentage of the total intermediate consumption (between 42.53% in Andalucía and 68.62 % in Madrid). This means that in spite of the fact that most part of imported services is consumed by the productive system as intermediate inputs; the share of imported services intermediate inputs within total services intermediate inputs is still relatively low.

But do all services activities have the same behaviour in this regard? Figure 5 helps us to find an answer to this question. It confirms that in general terms services imports are

oriented to productive system. For the regions under research, services imports and average values of agriculture and industry are situated to the right of 50% mark on the x-axis. Besides for an important number of activities 100% of their imports are directed to the productive system as intermediate inputs.

Figure 5. Disparities within imported intermediate inputs: external orientation and dependence



Source: Authors' own elaboration.  
 Note: See Annex 1 for activities' codes.

On the y-axis, the dependence of the productive system from the external sector can be observed. In general terms, in all regions activities with the most important exporting tendency are agricultural and industrial branches and water and air transport services.

The most important disparities are presented by computer and related and recreational, cultural and sporting services: they are situated in three of four quadrants available. As to the regions, the outstanding position is occupied by Madrid. In Spanish capital most of services imports represent especially high shares except several branches such as insurance and

pension funding services, computer and related services or recreational, cultural and sporting services.

## 4.2. REGIONAL FDI IN SERVICES

The analysis of regional FDI in services is based on the data obtained through the database of the Ministry of Economy and Competitiveness of Spain in case of Spanish regions and the OECD database in case of Slovakia. In Spain for activity breakdown only data on FDI flows are available. Therefore we are obliged to use investment flows data for all the regions under research. Time period covers five years, from 2000 till 2005, which is also due to the data availability.

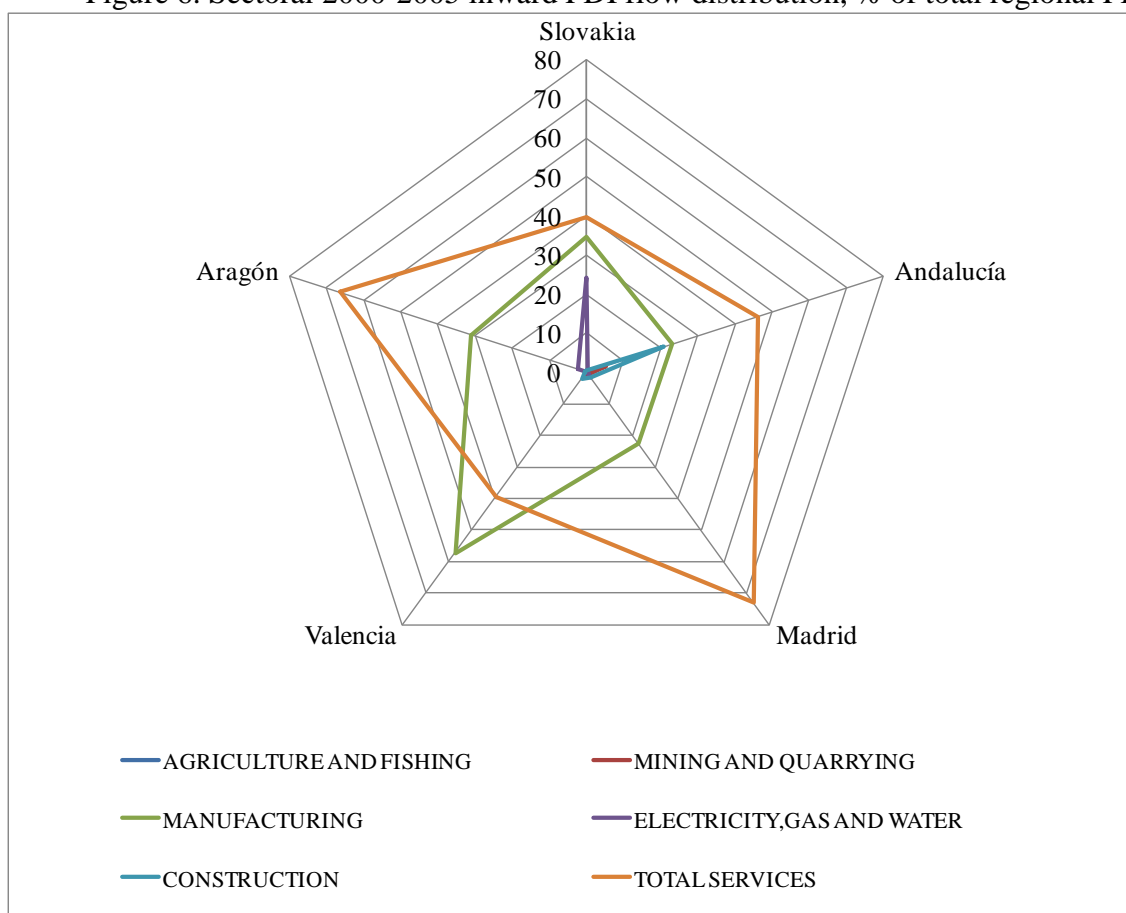
As the first step of the analysis we verify how the FDI is distributed among different sectors. Figure 6 highlights that in four regions the part of inward FDI directed to the services sector is higher than that one received by manufacturing. The only exception is Valencia.

Shares of other sectors within total regional inward FDI can be considered inexistent. The only exceptions are construction and mining in Andalucía and electricity, gas and water in Slovakia, due to high investments by privatization. Such an important share of construction in Andalucía is due to the real estate boom experienced by most part of Spain during the first decade of the XXI century. As Table 4 the share of Andalucía's real estate activities within total inward FDI is notably higher than in the rest of Spanish regions. As in the case of construction, it is directly related to high attractiveness of southern Spain for residents of northern European countries and as a consequence for foreign investors.

Table 4 shows more interesting data. First, it enables to appreciate the part of inward FDI directed to services sector in general. Madrid appears to be a region with the highest share of services (72.92%), which can explain so high degree of internationalization observed in the section 3.2. An important part of services FDI is received by trade and repairs and other services. A relatively high percentage (5.57%) is directed to business services in Madrid. Meanwhile, the share of financial intermediation is the lowest (7.42%).

On the opposite extreme we find Slovakia and Valencia where only less than 40% of total inward FDI goes to service activities. The case of Valencia does not seem surprising. As we observed in the previous section, this region presented the lowest tertiarisation effects. What is more surprising is such a low value of Slovakia which services sector was highly integrated and the degree of internationalization was similar to Andalucía and Aragón.

Figure 6. Sectoral 2000-2005 inward FDI flow distribution, % of total regional FDI



Source: Authors' own elaboration.

Table 4. Services FDI 2000-2005 flow distribution, % of total regional FDI

|  | Slovakia     | Andalucía    | Madrid       | Valencia     | Aragón       |
|--|--------------|--------------|--------------|--------------|--------------|
| <b>TOTAL SERVICES</b>                        | <b>39.64</b> | <b>46.05</b> | <b>72.92</b> | <b>39.41</b> | <b>66.14</b> |
| TRADE AND REPAIRS                            | 9.90         | 10.37        | 23.87        | 4.45         | 13.14        |
| HOTELS AND RESTAURANTS                       | 0.10         | 2.81         | 0.75         | 0.63         | 0.73         |
| TRANSPORTS, STORAGE AND COMMUNICATION        | 6.75         | 0.02         | 1.57         | 0.87         | 0.42         |
| FINANCIAL INTERMEDIATION                     | 17.30        | 18.43        | 7.42         | 22.02        | 26.69        |
| REAL ESTATE, RENTING AND BUSINESS ACTIVITIES | 4.66         | 9.20         | 7.69         | 6.75         | 2.60         |
| Real estate                                  | 2.86         | 7.43         | 2.12         | 4.11         | 2.11         |
| Business services                            | 1.80         | 1.77         | 5.57         | 2.64         | 0.49         |
| OTHER SERVICES                               | 0.93         | 5.22         | 31.62        | 4.70         | 22.56        |

Source: Authors' own elaboration.

In order to try to verify what the reason of such a situation in Slovakia is, we compare the data of inward FDI stock in 2000 with the FDI flows during 2000-2005. Table 5 reveals that in 2000 Slovakia's services has already accumulated an important amount of FDI (52.96% of total inward FDI), which exceeded the value of FDI in agriculture and industry

(46.81%). For almost all activities, the share of the FDI flow received during the following five years represented a very low percentage in relation to the FDI stock in 2000. The only activity that experiences a significant increase is electricity, gas and water which FDI flow during 2000-2005 was almost five times higher than the FDI stock accumulated in 2000. A relatively low share of inward services FDI flow observed in Table 4 can be attributed to the higher share of the secondary sector due to the increase of electricity, gas and water activities.

Table 5. Relation between Slovakia's FDI stock and flow, 2000-2005

|  | FDI stock 2000,<br>% total | FDI flow 2000-2005,<br>% total | FDI flow 2000-2005,<br>% 2000 stock |
|--|----------------------------|--------------------------------|-------------------------------------|
| AGRICULTURE AND FISHING                      | 0.09                       | 0.31                           | 25.40                               |
| MINING AND QUARRYING                         | 0.62                       | 0.20                           | 2.32                                |
| MANUFACTURING                                | 44.76                      | 34.72                          | 5.45                                |
| ELECTRICITY,GAS AND WATER                    | 0.35                       | 24.27                          | 483.65                              |
| CONSTRUCTION                                 | 0.99                       | 0.48                           | 3.44                                |
| TRADE AND REPAIRS                            | 18.72                      | 9.90                           | 3.72                                |
| HOTELS AND RESTAURANTS                       | 0.53                       | 0.10                           | 1.31                                |
| TRANSPORTS, STORAGE AND COMMUNICATION        | 14.00                      | 6.75                           | 3.39                                |
| FINANCIAL INTERMEDIATION                     | 12.14                      | 17.30                          | 10.02                               |
| REAL ESTATE, RENTING AND BUSINESS ACTIVITIES | 5.61                       | 4.66                           | 5.84                                |
| OTHER SERVICES                               | 1.96                       | 0.93                           | 3.35                                |
| <b>AGRICULTURE AND INDUSTRY</b>              | <b>46.81</b>               | <b>59.99</b>                   | <b>9.01</b>                         |
| <b>TOTAL SERVICES</b>                        | <b>52.96</b>               | <b>39.64</b>                   | <b>5.26</b>                         |
| <b>TOTAL</b>                                 | <b>100.00</b>              | <b>100.00</b>                  | <b>7.03</b>                         |

Source: Authors' own elaboration.

During this period privatization of electricity sector was conducted in Slovakia and in 2002 very significant investments from Germany and Italy came into this sector. All the state energetic companies were previously transformed into stock companies and after that 49% of shares were sold to foreign investors.

Similar situation took place in gas industry in the period 2000 – 2002. There was a monopoly on the gas market for a long time and the biggest gas company of Slovakia was privatized in respective period. Significant investments came from France and Germany into Slovakia's gas industry.

In 2002 changes in ownership of water industry properties took place. Investments came firstly from Lichtenstein and afterwards in the same year from Spain.

Several times during this work we have already observed that there could be a relation between regional degree of internationalization and different variables of services trade. In order to find out if this relation actually exists, we calculate Pearson correlation coefficients



between several variables used our analysis. The results of the calculations are presented in Table 6.

Table 6. Pearson correlation coefficients between regional degree of internationalization and services trade

|   | Total effect degree of internationalization,% | Indirect effect degree of internationalization,% | Direct effect degree of internationalization,% |
|---|---|--|--|
| Services imported intermediate consumption, % of total intermediate consumption | 0.94  | 0.98   |  |
| Services FDI, %   | 0.78  | 0.89   |  |
| Business services FDI, %  |   |  | 0.92   |

Source: Authors’ own elaboration.

The data reveal an important correlation between the degree of internationalization of different tertiarisation effects and the variables of services globalisation. If we compare total and indirect effects degree of tertiarisation, the relation is stronger for the second type of effects. In case of imported intermediate services inputs and services FDI, the first variable presents stronger relations with the degree of internationalization. As a general conclusion, we can state that the higher the share of imported intermediate services inputs used by a productive system and the investment in services, the higher the degrees of internationalization. The higher relation in case of indirect effect has a direct impact on the final result of tertiarisation, which is the total effect, because in general terms, total effect is a sum of direct and indirect effects. So, the whole productive system takes advantage of services coming outside the regions.

We also included into Table 6 the Pearson correlation coefficient between the FDI in business services and the direct effect of internationalization. Why have we supposed that there could be a relation between these two variables? The reason is that businesses services, because of their nature and as their name indicates, are mostly intermediate services as they are directly used by all kind of enterprises in their productive processes. Bearing in mind the definition of direct effect which is immediate intermediate demand of each industry necessary to produce an additional unit of its product, it seems logical to suppose the existence of such a relation. And this relation is confirmed by the result of the Pearson correlation coefficient (0.92).

## Conclusions

The objective of this work was, on the one hand, to examine the process of globalization of services provision in several regions of the EU: Slovakia and four Spanish autonomous regions (Aragón, Madrid, Valencia and Andalucía). On the other hand, we aimed to compare Slovakia with Spanish regions trying to find out if there are any similarities between them. The study is based on the combination of the analysis of tertiarisation of regional productive systems using input-output tables with the analysis of services trade, namely, services imports and FDI.

As main conclusion we can state that the analyzed regions present notable differences as to the structures of their productive systems, their level of tertiarisation and globalisation of services trade. Meanwhile, Spanish regions, except Madrid, could be considered similar in several aspects. For example, the structure of their productive systems in terms of VA, particularly in case of Valencia and Aragón, does not present significant differences, whereas the situation of Madrid is outstanding. The share of services within the total VA of the region where the Spanish capital is situated is almost 80%. On the opposite extreme we find Slovakia which services share is the lowest (58.39%) and percentage of industrial VA (37.85%) is the highest. Although in performed comparison Slovakia seems to be poorly tertiarised, we have to consider discarded service sector during the Soviet period 15 years ago. Moreover continuing industry oriented economic development policy of Slovak government gives less space for service development. Nevertheless tertiarisation is in progress and shows high potential for the future development (Michalová et al., 2008b). With foreign investments to industry are still coming more and more investments to services mostly to Bratislava region. International companies are establishing their financial centers and other kinds of business services in shared service centers. This has strong effect on economy of Bratislava region which is actually highly service oriented and belongs to one of most service oriented in Europe (Holubcová, 2009).

It could be logical to suppose that Slovakia's level of tertiarisation should be the lowest, but the observed situation is very different. It is true that the productive system of Madrid uses the most important amount of services inputs in its productive processes (if total and not domestic input-output tables are taken into consideration), but it is not followed by Andalucía or Valencia. Slovakia is the second most tertiarised economy. It is also interesting that the country's degree of tertiarisation was reduced during the period 2000-2005. In 2000 Slovakia's values exceeded notably those presented by Madrid.

The key of so high tertiarisation results of Slovakia could be related to the fact that Slovakia is a region that uses the most important amount of domestic services inputs. If this situation is combined with the highest value of services inputs used by the very service activities at total level (domestic and imported inputs), it can be concluded that Slovakia's services are highly integrated with the rest of the productive system and interrelate intensively with the every sector.

The data of tertiarisation effects at total level point out that Madrid is a leader. This situation is due to the fact that Spanish capital region uses the highest amount of imported services inputs. In fact, the share of imported services intermediate inputs within total intermediate consumption is higher in Madrid than in the rest of the regions under research. Slovakia presents one of the lowest values. If we analyze the inward services FDI the situation is similar: Madrid and Slovakia are situated in opposite extremes. It is also interesting to point out that Valencia presents the lowest results at for the degrees of tertiarisation and internationalization, services imports and FDI, whereas the share of region's services within total VA was average.

Another important conclusion of this work, besides the fact that Slovakia cannot be comparable either with a capital region or with a more industrial one, refers to the relation existing between the degree of internationalization, on the one hand, and services imports and FDI, on the other. We found out that the higher the amount of services coming from outside the regions, the higher the degrees of internationalization. It means that the whole productive system takes advantage of imported services inputs increasing its degree of tertiarisation. On the other hand, a higher amount of imported business services produces a higher direct effect not only on the user activities, but on the whole productive system.

As to the future research, it could be interesting to check if the main findings of this work are confirmed for a more numerous set of regions. The problem that such a study could face is related to the lack of regional input-output tables for most of EU regions. The only exceptions could be Spanish regions and relatively small European member states which size is similar to NUTS 2 level. As to Slovakia, a more detailed study of processes of tertiarisation within its productive system, which would cover a longer period, is necessary.

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### Annex 1. Codes of service activities

| Code | Activity   |
|------|--|
| 50   | Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel         |
| 51   | Wholesale trade and commission trade services, except of motor vehicles and motorcycles                          |
| 52   | Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods |
| 55   | Hotel and restaurant services  |
| 60   | Land transport; transport via pipeline services  |
| 61   | Water + Air transport services   |
| 63   | Supporting and auxiliary transport services; travel agency services  |
| 64   | Post and telecommunication services  |
| 65   | Financial intermediation services, except insurance and pension funding services                                 |
| 66   | Insurance and pension funding services, except compulsory social security services                               |
| 67   | Services auxiliary to financial intermediation   |
| 70   | Real estate services   |
| 71   | Renting services of machinery and equipment without operator and of personal and household goods                 |
| 72   | Computer and related services  |
| 73   | Research and development services  |
| 74   | Other business services  |
| 75   | Public administration and defence services; compulsory social security services                                  |
| 80   | Education services   |
| 85   | Health and social work services  |
| 90   | Sewage and refuse disposal services, sanitation and similar services   |
| 92   | Recreational, cultural and sporting services   |
| 93   | Other services   |
| 95   | Private households with employed persons   |