# DISTRIBUTION OF KNOWLEDGE-BASED ENTERPRISES IN THE URBAN AND RURAL AREAS OF LATVIA

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***Abstract.*** *Transformation of the Latvian economy towards knowledge-based services and industries is one of the main national development goals. In this study, the authors have studied the main economic sectors and enterprises in knowledge-intensive and technology-intensive industries in Latvia.*
*We studied economic sectorial distribution around the different categories of territories, ranging from the largest cities to the rural districts of Latvia. Authors divided the Latvian territorial space in four types: (a) Rural-districts as mainly rural territories that lack even a small urbanised nucleus; (b) Town-districts as hinterland of small and medium-sized urban core; (c) Towns – as separate cores of Town-districts. (d) Cities as nine larger urbanised cores.*
*In general, we can say that in 2013, 68% of the population of Latvia resided in larger or smaller towns and cities, and only 32% in rural areas. A similar situation was observed with respect to a number of enterprises. We can say that 80% of companies are located in small or large urban areas and only 20% in rural areas. Data analysis leads to conclusion that the higher degree of urbanization, the greater the number of people employed in high-technology manufacturing industries and knowledge intensive services sectors. However, less-knowledge intensive services play an important role in all types of territories. This study has implications for understanding that even small urbanised core in the district play an important role in local economies, because in all four territory types we found different sectorial specialization profile. It is in line with the urban hierarchy and theoretical concepts of territorial specialization.*

***Key words:*** *knowledge-intensive services, high-technology, sectors, localization.*

## INTRODUCTION

Most of the world's population in urban areas exceeds the rural population. Latvia, in this sense is no exception. According to the data of Central Statistical Bureau of Latvia, this trend has been observed since 1959 and continues to grow every year. At the same time, in previous studies, authors have observed correlations, suggesting that the majority of the Latvian cities and towns demonstrate low number of enterprises, which in most cases occurs within a small local population. In the majority of the Latvian cities and towns a low concentration of business activity has been observed and in most cases it has been observed on a background of small local population. This might be explained by the fact that a small population results not only in limited sales markets, but a possibly limited labour market effect as well. Of all the observed 76 cities and towns, in 50% cases the cities and towns have less than 160 enterprises with less than 33 different economic activities (NACE 2 Rev. Details of Divisions). Strong urban hierarchy and strong inequalities have been observed in all Latvian cities and towns, ranging from larger centres, and with each subsequent level differences get more distinctive [1]. Earlier researches have shown that small enterprises that invest a large part of its profit to research and development tend to be located in an area with most supportive business milieu, and in the vicinity of high-quality business services suppliers. By contrast, large companies can afford to set up their branches in remote areas, due to their greater economic flexibility and ensure their own a support service [2]. In addition, high science-based industry turns out to be more localised than other industries, especially in the European Union. The robust empirically investigation made by S. Vitali, M. Napoletano and G. Fagiolo present evidence that enterprises tend to be located in very urbanised areas due to presence of services and internal market effect [3],[4]. The role of geography and localization in the process of innovation highlights that knowledge flowing from neighbouring regions improves regional growth performance. At the same time knowledge spillovers are geographically bound due to strong distance decay effect, which in the European case expands to more or less a 200 km radius [5].

Thus we forward the **hypothesis** that, knowledge-based manufacturing and service sector companies are unevenly spread within the territory of Latvia and their specialization may depend on the localization belonging to rural or urban territorial type. The **aim** of the research is to assess the distribution and specialization of manufacturing and service sectors in Latvia and to determine the role of knowledge-intensive enterprises in business activity and employment in the different types of territories. The **research tasks** have been formulated as follows:

1. To define the types of territories (from urban to rural) according to territorial administrative division;
2. To determine the manufacturing and services sectors that are widely distributed within each territorial type;
3. To assess the share of enterprises in knowledge-intensive, high technology and medium-high technology sectors in each type of territory;
4. To identify geographical localization of enterprises in knowledge-intensive, high technology and medium-high technology sectors and assess its role in local employment and business activity.

## MATERIALS AND METHODS

The empirical research builds on the survey of enterprises around the entire territory of Latvia. In this research, authors analysed data on 40 264 enterprises. Research includes the data obtained from the SIA Lursoft database, created especially for the ECOSOC.LV project 2.5.3. Research was conducted in two stages.

At the first stage, authors defined ten most widespread economic sectors for each type of the territory. This data sample did not include sector of trade (NACE II 45, 46, 47), due to a large number of the enterprises in that sector that might complicate interpretation of the analysis of the services sector. At this stage of research data sample included 17 088 enterprises. Thus, authors found out what economics sectors are characteristic for each type of the territory.

At the second stage we analysed only Knowledge-intensive services (KIS) and High-technology intensive industries (HT) and Medium High-technology intensive (MHT) industries. Data sample included 9408 enterprises distributed throughout the entire territory of Latvia.

The authors aimed to find out the specificities of KIS, HT and MHT sectors in the different types of territories, as well as, to determine their geographic location. We also divided the sectors in two parts. Firstly sectors with the largest number of employees, secondly sectors with the largest number of enterprises in it. The research analyzes the situation in 2013 and the following methods were used for the study purposes: comparative analysis and synthesis, and graphical data analysis.

## RESULTS AND DISCUSSION

Due to the huge diversity of the theme scope of knowledge economy authors focused on the two main aspects: geographic distribution of economic activity and location of knowledge-based enterprises.

In this article, authors divided the Latvian territorial space in four types:

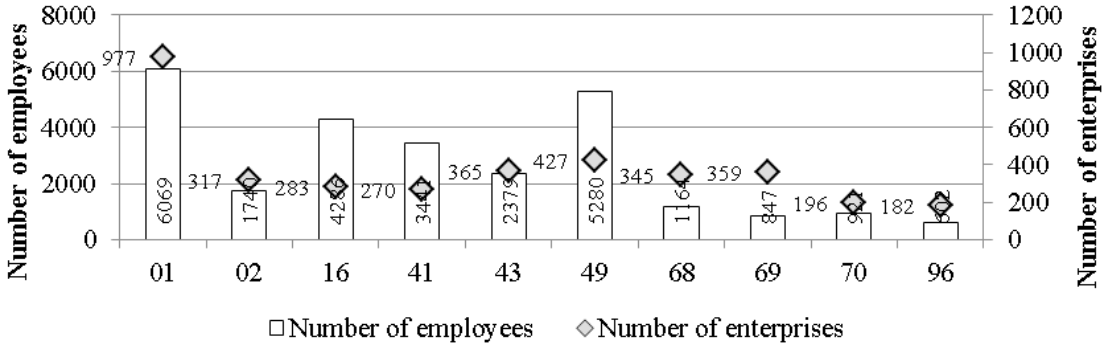
a) Rural-districts as mainly rural territories that lack even a small urbanised nucleus;
b) Town-districts as hinterland of small and medium-sized urban core;
c) Towns – as separate cores of Town-districts;
d) Cities as nine larger urbanised cores in some cases excluding Riga as a very special case.

According to the data of the Central Statistical Bureau of Latvia, at the beginning of 2013, population in Latvia accounted for 2 023 825 residents. From them, 51% live in the largest cities and in capital Riga, 17% in the towns, and 32% in rural areas, or in areas outside the cities or towns. Each area is characterized by a certain type of a profile of economic activity. In continuation, authors offer to compare most frequently observed sectors for each type of territories (rural-districts, town-districts, towns, cities). Figure 1 illustrates major sectors of services and industries in rural areas by the number of enterprises and the number of employees.

Figure 1 shows that ten most frequently observed sectors in rural districts belong to NACE II branches (01), (49), (69), which account for 37% of all enterprises in these ten sectors in rural districts. At the same time, the largest number of employees is observed in sectors (1), (49) and (16), which make up the bulk (59%) of ten most frequently observed sectors in rural districts.

In continuation, authors focus attention on the situation in town-districts. Ten most frequently observed sectors in this territory type are illustrated in fig. 2. Despite the fact that the town-district territory is essentially similar

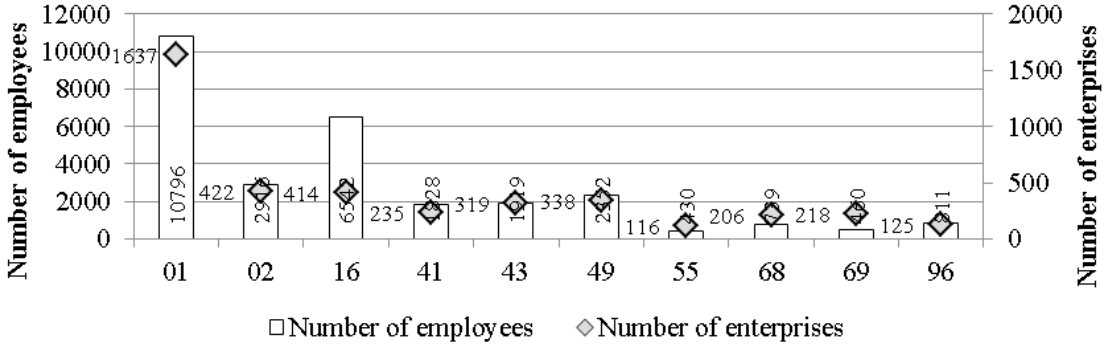
to rural areas, it is not a big surprise that the most common sectors are similar in the rural districts, in other words; nine out of ten sectors coincide).




01_Crop and animal production, hunting and related service activities; 02_Forestry and logging; 16_Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; 41_Construction of buildings; 43_Specialised construction activities; 49_Land transport and transport via pipelines; 68_Real estate activities; 69_Legal and accounting activities; 70_Activities of head offices; management consultancy activities; 96_Other personal service activities

*Source: the author's construction made in accordance to the data provided by Lursoft Ltd, 2015*

Figure 1. **TOP 10 most widespread sectors of economy in Latvian rural districts, number of employees and number of the enterprises in 2013, n = 3721.**




01_Crop and animal production, hunting and related service activities; 02_Forestry and logging; 16_Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; 41_Construction of buildings; 43_Specialised construction activities; 49_Land transport and transport via pipelines; 55_Accommodation; 68_Real estate activities; 69_Legal and accounting activities; 96_Other personal service activities;

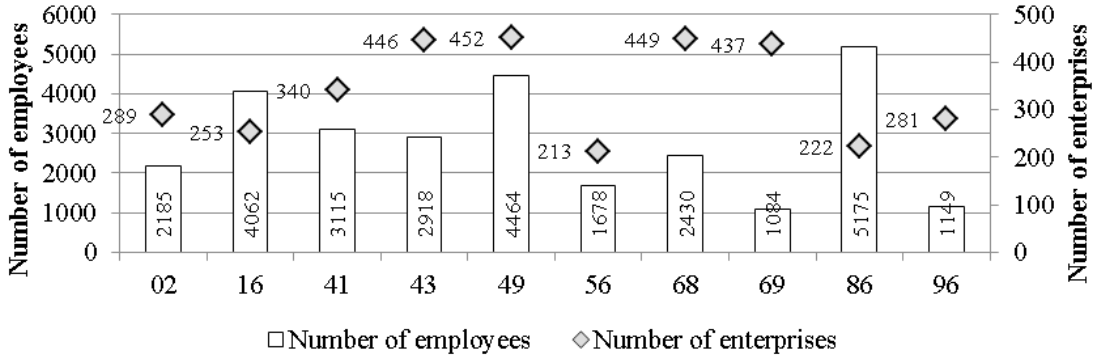
*Source: the author's construction made in accordance to the data provided by Lursoft Ltd, 2015*

Figure 2. **TOP 10 most widespread sectors of economy in Latvian town districts, number of employees and number of the enterprises in 2013, n=4030.**

However, differences can be observed in the internal structure of sectors, by number of companies and employees. For instance, 62% of ten most frequently observed sectors take the enterprises in sectors (01), (02), (16). And the largest number of employees is observed in the same sectors (01), (02) and (16), which make up the bulk (63%) of ten most frequently observed sectors in town-districts. Two territory types observed previously are attributable to rural areas, two next examples describe territories of towns and cities. Figure 3 shows ten most frequently observed companies in towns, in breakdown by sector.

As it showed in fig. 3 sectors (43), (49), (68) in towns account for 1347 enterprises or 39% of ten most frequently observed sectors in this territory type. The largest number of employees is observed in the sectors (16), (49) and (86), which make up a significant part (45%) of employment in ten most frequently observed sectors in towns. Next territory type is the cities, showed in fig.4.

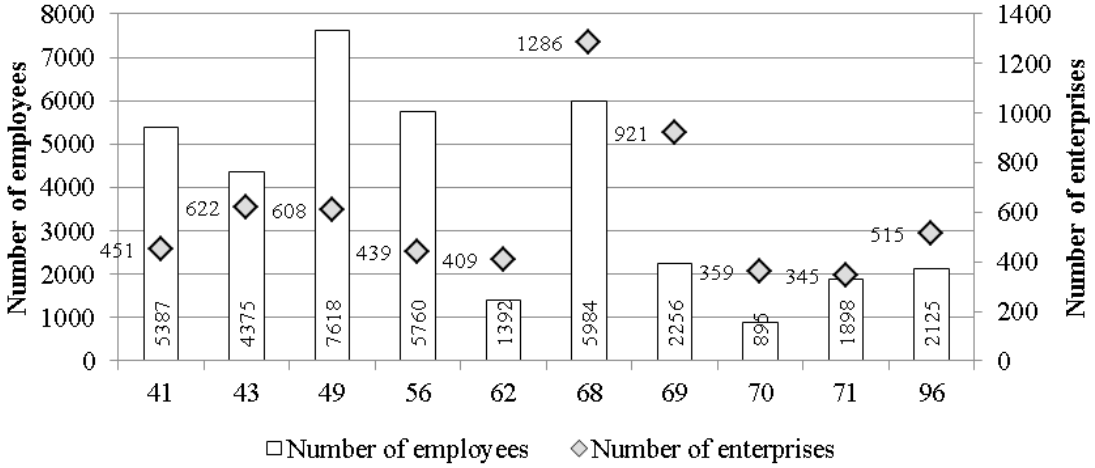
As it showed in figure 4, most frequently observed enterprises belong to sectors (43), (49), (68), (69) which make up the bulk (57%) of ten most frequently observed sectors in cities. In turn the largest number of employees was observed in sectors (49), (56), (68) which take up 51% of the number of employees in ten industries prevalent in the cities.




02_Forestry and logging; 16_Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; 41_Construction of buildings; 43_Specialised construction activities; 49_Land transport and transport via pipelines; 56_Food and beverage service activities; 68_Real estate activities; 69_Legal and accounting activities; 86_Human health activities; 96_Other personal service activities;

*Source: the author's construction made in accordance to the data provided by Lursoft Ltd, 2015*

Figure 3. **TOP 10 most widespread sectors of economy in Latvian towns, number of employees and number of enterprises in 2013, n=3382.**




41_Construction of buildings; 43_Specialised construction activities; 49_Land transport and transport via pipelines; 56_Food and beverage service activities; 62_Computer programming, consultancy and related activities; 68_Real estate activities; 69_Legal and accounting activities; 70_Activities of head offices; management consultancy activities; 71_Architectural and engineering activities; technical testing and analysis; 96_Other personal service activities.

*Source: the author's construction made in accordance to the data provided by Lursoft Ltd, 2015*

Figure 4. **TOP 10 most widespread sectors of economy in Latvian cities, number of employees and number of enterprises in 2013, n=5955.**

The specific set of sectors has been identified for each type of territory, and further the authors will focus on analysis of knowledge-based sectors, preserving the previous territorial typology.

***Rural districts***. Looking at the manufacturing and service companies the percentage breakdown by technological intensity and knowledge intensity in rural districts, the majority of workers in this territory type running in Less Knowledge-intensive services (60%) and Low-technology industries (10%). However, 27% of employees in rural-districts work in KIS, while 1.1% of employees work in HT and MHT industries.

The largest number of employees in KIS in rural-districts work in the following sectors: Air transport (NACE II, 51), Activities of head offices; management consultancy activities (NACE 70 II) and Gambling and getting activities (NACE II 92). Here it is important to highlight the fact that most of these services are concentrated in regions located in peri-urban area of Riga, (percentage according location: Adazi (9%), Babite (9%), Garkalne (9%) and Marupe (23%) districts). The largest number of employees in HT and MHT enterprises in rural districts, work in such sectors as Manufacture of chemicals and chemical products (NACE II, 20); Manufacture of machinery and equipment n.e.c. (NACE 28 II) and Manufacture of motor vehicles, trailers and semi-trailers (II NACE 29). Unlike the services industries, manufacturing sector enterprises with a large number of employees are located not only around Riga, but also in remote areas like Amata and Rucava districts. The authors would like to note that knowledge intensive and technological intensive sectors, which employ a large number of people, differ from the sectors with a large number of enterprises (but not employees). For example, in rural district KIS sector has the largest number of enterprises in the following sectors: Computer programming, consultancy and related activities (NACE 62 II), Legal and accounting activities (II NACE 69), Activities of head offices; management consultancy activities (II NACE 70), Other professional, scientific and technical activities (NACE 74 II) and Security and investigation activities (II NACE 80). All these companies are located in peri-urban area of Riga (Adazi, Babite, Garkalne, Marupe, Stopini districts). In the case of HT and MHT manufacturing companies, the largest number of companies belongs to the following sectors: Manufacture of chemicals and chemical products (NACE 20 II), Manufacture of computer, electronic and optical products (II NACE 26), Manufacture of machinery and equipment n.e.c. (II NACE 28). The total number of people employed in KIS, HT and MHT sectors in rural districts accounts for 8293 employees.

***Town-Districts.*** The largest share of employees work in Less Knowledge-intensive services (57%) and in Low-technology industries (28%). 9% of employees work in KIS, while 0.8% of employees work in HT and MHT industries. The bulk of the number employees in KIS works in such sectors as Security and investigation activities (NACE II, 80), Human health activities (NACE 86 II) and Residential care activities (II NACE 87). The majority of these service suppliers are located remotely from Riga in Aizpute, Akniste, Cesis, Ligatne districts, except for companies that are located in Salaspils district. The largest number of people employed in HT and MHT sector belongs to such sectors as Manufacture of chemicals and chemical products (NACE II, 20); Manufacture of computer, electronic and optical products (NACE 26 II), Manufacture of machinery and equipment n.e.c.(II NACE 28) and Manufacture of other transport equipment (II NACE 30). The main employers in these sectors, in town-district territory type are located in Grobina, Saldus, Talsi and Kekava districts. Analysing the number of enterprises by sector we found that the greatest number of the enterprises in KIS sectors belongs to the following sectors: Legal and accounting activities (NACE II 69), Activities of head offices; management consultancy activities (NACE II 70), Architectural and engineering activities; technical testing and analysis (NACE II 71), Other professional, scientific and technical activities (NACE II 74) and Sports activities and amusement and recreation activities (NACE II 93). The majority of the enterprises in these sectors are located in close proximity to Riga, in Kekava, Olaine, Salaspils, Sigulda, Limbazi districts. In case of HT and MHT sectors, we found a large number of manufacturing enterprises operating in such sectors as Manufacture of chemicals and chemical products (NACE II 20), Manufacture of machinery and equipment n.e.c (NACE II 28), and Manufacture of other transport equipment (NACE II 30). The total number of people employed in KIS, HT and MHT sectors in town districts accounts for 39839 employees.

***Towns.*** The largest share of employees work in Less Knowledge-intensive services (51%) and in Low-technology industries (20%). 18% of employees work in KIS, while 4% of employees work in HT and MHT industries, which is significantly more than in rural or town districts. The largest number of people employed in KIS sectors in towns works in such sectors as Employment activities (NACE II; 78) and Human health… (II NACE 86). The majority of these service supliers are located remotely from Riga in Balvi, Madona, Ogre, Strenci, Tukums. The largest number of people employed HT and MHT sectors works in Manufacture of chemicals and…(NACE II 20), Manufacture of basic pharmaceutical products and pharmaceutical preparations (II NACE 21), Manufacture of computer…(NACE II, 26); Manufacture of electrical equipment (NACE II 27), Manufacture of machinery …(II NACE 28). Major employers of these sectors are located in Livani, Ogre, Salaspils and Olaine. Analysing the sectors by number of enterprises, we found, that the largest number of companies in KIS sector, belong to the followings ectors: Computer programming…(NACE 62 II), Legal and accounting…(II NACE 69), Architectural and engineering …(NACE 71 II), Other professional, scientific…

(II NACE 74) and Human health…(II NACE 86). Most of these industries are located in Balozi, Cesis, Ogre, Salaspils, Sigulda. In the case of HT and MHT manufacturing enterprises, the largest number of enterprises belong to the following sectors: Manufacture of chemicals …(NACE 20 II), Manufacture of computer…(II NACE 26), Manufacture of machinery…(II NACE 28) and are located in Cesis Lielvarde Ogre, Olaine. The total number of people employed in KIS, HT and MHT sectors in town districts accounts for 61 660 employees. ***Cities.*** The largest share of employees work in Less Knowledge-intensive services (53%) and in Low-technology industries (9%). 31% of employees work in KIS, while 3% of employees work in HT and MHT industries. KIS sectors that provide the highest number of jobs are Telecommunications (NACE 61 II), Public administration and defence; compulsory social security (II NACE 84) and Human health… (II NACE 86). The largest number of companies in this sector are located in Daugavpils, Liepaja, Rezekne, Riga. Enterprises of the HT and MHT sectors, employing a large number of employees, work in such sectors as Manufacture of chemicals…(NACE 20 II), Manufacture of basic pharmaceutical…(II NACE 21), Manufacture of electrical… (NACE 27 II), Manufacture of other transport…(II NACE 30). The largest number of enterprises registered in KIS sectors belong to the following sectors: Computer programming…(NACE 62 II), Legal and accounting… (II NACE 69), Activities of head offices…(II NACE 70), Other professional, scientific…(NACE 74 II), Human health… (II NACE 86). These sectors are most commonly observed in Riga and Daugavpils. HT and MHT production facilities most often are seen in sectors like Manufacture of chemicals… (NACE 20 II), Manufacture of electrical…(II NACE 27) and Manufacture of machinery…(II NACE 28). The majority of enterprises of this sectors are located in Daugavpils, Liepaja and Riga.

## CONCLUSIONS

1. In this research, the territory was divided according to the principles of administrative division. Nevertheless, it created a situation when the formal rural districts located close to the cities in own economic specialization are more resembled in the cities, than rural districts located remotely. Thus, a distance factor, especially in suburbs should be emphasized in further research.

2. We studied four types of territories and conclude that economic specialization of the rural districts and the town districts demonstrates insignificant differences. Nevertheless, distinctions are found in internal structure of sectors by number of the enterprises and employees. The sectorial profile in the town differs from the town-district and rural-district, and also of the cities. This type of area should be especially studied in further research. Functionally diverse economic profiles are observed only in the cities. The number of employees in each type of territory, increases within the total number of the population. At the same time, the number of employees in the different sector enterprises varies between 2-23 per one enterprise. It leads to conclude that small enterprises are extended across the entire territory of Latvia.

3. The share of KIS, MHT and HT in sectorial profile of different territory types enlarge within territory urbanization degree increasing. At the same time, low-technologies and less knowledge intensive sectors make up the bulk of economy in all territory types. KIS is more widespread, than HT and MHT. Besides, variance of the services offered above than variance of the industries.

4. Enterprises with the largest number of employees in KIS are most often located to the vicinity of Riga, rarely in Vidzeme and Kurzeme regions. However, they are located in larger cities of Kurzeme and Latgale and also in Riga. A large number of companies of KIS sectors are localized close to Riga, and less in Vidzeme. At the same time, enterprises in High-technology and Medium High-technology sectors, with a large number of employees are localized not only near Riga, but also in Kurzeme and Vidzeme regions, evenly in all types of territory.

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