

ACTA GEOGRAPHICA SLOVENICA

GEOGRAFSKI
ZBORNIK



2018
58
2

ACTA GEOGRAPHICA SLOVENICA

GEOGRAFSKI ZBORNIK

58-2 • 2018

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ISSN 1581-6613



ACTA GEOGRAPHICA SLOVENICA

58-2
2018

ISSN: 1581-6613
COBISS: 124775936
UDC/UDK: 91

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Published by/izdajatelj: Geografski inštitut Antona Melika ZRC SAZU

Issued by/založnik: Založba ZRC

Co-issued by/sozaložnik: Slovenska akademija znanosti in umetnosti

Address/Naslov: Geografski inštitut Antona Melika ZRC SAZU, Gosposka ulica 13, SI – 1000 Ljubljana, Slovenija

The papers are available on-line/prispevki so dostopni na medmrežju:
<http://ags.zrc-sazu.si> (ISSN: 1581-8314)

Ordering/naročanje:

Založba ZRC

Novi trg 2, p. p. 306, SI – 1001 Ljubljana, Slovenija

Phone/telefon: +386 (0)1 470 64 64

Fax/faks: +386 (0)1 425 77 94

E-mail/e-pošta: zalozba@zrc-sazu.si

Annual subscription/letna naročnina: 20 € for individuals/za posameznike, 28 € for institutions/za ustanove.
Single issue/cena posamezne številke: 12,50 € for individuals/za posameznike, 16 € for institutions/za ustanove.

Cartography/kartografija: Geografski inštitut Antona Melika ZRC SAZU

Translations/prevodi: DEKS, d. o. o.

DTP/prelom: SYNCOMP, d. o. o.

Printed by/tiskarna: Collegium Graphicum d. o. o.

Print run/naklada: 400 copies/izvodov

The journal is subsidized by the Slovenian Research Agency/revija izhaja s podporo Javne agencije za raziskovalno dejavnost Republike Slovenije.

The journal is indexed also in/revija je vključena tudi v: SCIE – Science citation index expanded, Scopus, JCR – Journal Citation Report/Science Edition, ERIH PLUS, GEOBASE Journals, Current geographical publications, EBSCOhost, Geoscience e-Journals, Georef, FRANCIS, SJR (SCImago Journal & Country Rank), OCLC WorldCat, and Google scholar, CrossRef.

Front cover photography: Alpine environment has witnessed changes in discharge regimes that depend on the changes in precipitation and temperature regimes, land use and human influence (photograph: Matej Lipar).

Fotografija na naslovnici: Pretočni režimi se v alpskih pokrajinah spreminjajo zaradi sprememb v padavinskem in temperaturnem režimu ter sprememb rabe zemljišč in človeških vplivov (fotografija: Matej Lipar).

EASTERN EUROPEAN CITIES AS COMMAND AND CONTROL CENTERS IN A TIME OF ECONOMIC CRISIS

Piotr Raźniak, Sławomir Dorocki, Anna Winiarczyk-Raźniak



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Warsaw CBD.

DOI: <https://doi.org/10.3986/AGS.3124>

UDC: 911.375:338(4-191.2)

COBISS: 1.01

Eastern European cities as command and control centers in a time of economic crisis

ABSTRACT: This article describes the command and control function of eastern European cities based on the financial performance of the largest corporations with headquarters in the region and the impact of selected sectors on this function. Research has shown that, despite the global economic crisis of 2008–2012, the revenue and net income of the companies studied have increased to some extent. Currently, the strongest »command and control cities« in eastern Europe are Warsaw and Prague. The sector that exerts the greatest influence on the regional command and control function in eastern Europe is the consumer business and transportation sector. The economic crisis has also produced a geographical pattern in eastern Europe that runs counter to current global trends: companies in the region currently tend to concentrate their headquarters in fewer cities, which is becoming common in other parts of the world. The article employs a standardization method based on the mean and standard deviation of financial values for each corporation studied.

KEY WORDS: economic geography, corporation, headquarters, command and control function, Deloitte, Eastern Europe

Vzhodnoevropska mesta kot središča vodenja in upravljanja med gospodarsko krizo

POVZETEK: V članku avtorji opisujejo funkcijo vodenja in upravljanja vzhodnoevropskih mest na podlagi finančne uspešnosti največjih gospodarskih družb, ki imajo sedež v tej regiji, ter vpliv izbranih sektorjev na to funkcijo. Raziskava je pokazala, da so se neto dohodki preučevanih podjetij kljub svetovni gospodarski krizi med letoma 2008 in 2012 še nekoliko povečali. Trenutno sta najmočnejši »središči vodenja in upravljanja« v Vzhodni Evropi Varšava in Praga. Sektorja, ki najmočnejše vplivata na regionalno funkcijo vodenja in upravljanja v Vzhodni Evropi, sta prevoznništvo in sektor izdelkov za široko rabo. Zaradi gospodarske krize se je v Vzhodni Evropi oblikoval tudi geografski vzorec, ki se ne ujema s trenutnimi svetovnimi trendi: težnja podjetij v tej regiji je, da trenutno svoje sedeže zgoščajo v manj mestih, kar postaja vse bolj značilno tudi drugod po svetu. Avtorji v članku za vsako preučevano gospodarsko družbo uporabljajo metodo standardizacije, ki temelji na povprečju in standardnem odklonu finančnih vrednosti.

KLJUČNE BESEDE: ekonomska geografija, gospodarska družba, sedež, funkcija vodenja in upravljanja, Deloitte, Vzhodna Evropa

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This paper was submitted for publication on October 6th, 2015.

Uredništvo je prejelo prispevek 6. oktobra 2015.

1 Introduction

The early 1990s in eastern Europe saw mass privatization of state-owned enterprises, which became the property of corporations headquartered outside of central Europe (Froot 1994). The region experienced massive investment (Ravbar 2009; Lorber 1999), much of which was foreign direct investment (FDI). The development of innovative sectors such as biotechnology that drive the competitiveness of a modern economy is also being spearheaded by western companies. This is the case with the growing economies of the former Eastern Europe, Asia, Africa, and South America (Dorocki and Boguś 2014; Wójtowicz and Dorocki 2014). The growing profitability of companies headquartered in central Europe as well as the »new« eastern Europe including former Soviet republics is helping these companies earn their way to the top in terms of global rankings (Raźniak, Winiarczyk-Raźniak and Nowotnik 2015).

Hall (1966) investigated the theoretical basis for the concept of a »world city«, and his analysis also mentioned the control function of cities in the economy. This function could be observed by looking at the number of large companies (i.e., those doing business on the international scene) present in each city studied as well as by looking at other key factors. The world city concept was later further developed by Friedmann (1986). Sassen (1991) argues that changes in the functioning of cities have had a positive effect on both international business activity and the urban form itself by controlling immense economic resources. At the same time, significant mobility of capital appears to be the most important element of globalization. In effect, an international economic system emerges in which cities are better interconnected with one another and acquire greater economic power as a result of this interconnectedness.

Starting in the 1970s, major corporations operating in the United States began to move their headquarters from large cities to smaller cities outside of large metropolitan areas due to lower living and operating costs and better infrastructure (Lyons and Salmon 1995). In addition, Sassen (2006) notes that many cities are slowly losing their significance as centers of highly specialized functioning. At the same time, advanced manufacturing services still remain in large cities, while command and control functions are moving away to regional and locally important smaller cities.

This concept is the key to understanding cities in the process of globalization. Research on the number of headquarters of world corporations reveals a specific strength of cities in the area of command and control. However, this is not the only measure of a city in the global scheme of cities (Taylor 2004). Csomós (2013) used the publicly available financial data for the largest corporations to calculate a Command and Control Index for the most important cities of the world, including Tokyo, New York, London, Beijing, and Paris.

The literature includes a number of articles on command and control functions for cities around the world (Friedmann and Wolff 1982; Alderson and Beckfield 2004; Taylor and Csomós 2012; Csomós and Derudder 2013). Countries in eastern Europe are characterized by greater growth in the number of corporate headquarters, corporate revenue, and corporate profit than countries in western Europe (Raźniak and Winiarczyk-Raźniak 2015). Hence, their command and control function in the world economy is increasing. The literature contains a number of studies of this function for selected countries in eastern Europe (Csomós 2015; Śleszyński 2007). However, there does not exist a comprehensive study of the magnitude (and changes therein) of the command and control function for the entire region of eastern Europe.

Hence, the purpose of this article is to identify the economic potential of cities in eastern Europe on the basis of financial data of large corporations with headquarters in the region. In addition, the regional command and control function is also assessed on the same basis for the most important urban centers of the region. The sector diversity of the top cities in the region was also assessed.

2 Data sources and research methods

The economic potential of cities in eastern Europe was analyzed using reports published by the Deloitte company (Deloitte ... 2014) for eastern Europe for 2008 and 2012. Since 2008, Deloitte has been publishing a list of the top five hundred companies with headquarters in Albania, Bosnia and Hercegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Serbia, Slovakia, Slovenia, and Ukraine. Russia and Belarus were not included due to difficulties in acquiring data from these countries as well as certain doubts concerning the credibility of the data

available (Deloitte ... 2014). Each company on the list must earn a certain amount of revenue each year and possess sales offices in at least three countries. This list does not include the banking and insurance sectors, which are covered on a separate list. Banking and insurance companies cannot be excluded from the analysis given their special significance in the international economy, especially in the context of the 2008 global financial crisis. In light of this consideration, fifty companies from the banking sector and fifty companies from the insurance sector were added to the list of the top five hundred most important companies in eastern Europe, resulting in a list of six hundred top companies in the region. The Deloitte company ranks countries and distinct political regions. The selected corporations were assigned to nine different sectors used by the Deloitte corporate ranking system: banking, consumer business and transportation, energy and resources, insurance, life sciences and healthcare, manufacturing, public sector, real estate, and technology media and telecommunications. The geographic location of companies was assigned using metropolitan areas home to their corporate headquarters. Metropolitan areas were also used to identify geographic location by researchers developing the currently established »world city« concept (Internet 1), »global city« concept (Sassen 1991), and Command and Control Index (Csomós 2013). These concepts use the word *city* whenever describing an entire metropolitan area; hence, the authors of this article use the same type of terminology in this article.

Taylor and Csomós (2012) argue that the command and control function in the world economy is performed by cities home to corporations on the Forbes Global 2000 list (Internet 2). This article assumes that the regional command and control function in eastern Europe is performed by cities home to corporations found on the Deloitte Central Europe 500 + 100 list (Internet 3). This is a customized list that also includes the top hundred banking and insurance companies.

This article assumes that the control function in the economy of eastern Europe is performed by cities home to at least three top corporate headquarters. The same minimum number for the Command and Control Index in the world economy was listed by Csomós and Derudder (2014). In this article, this yields an Eastern European Command and Control Index (EECCI). The EECCI employs a standardization method based on the mean and the standard deviation of financial values for each corporation studied used by Csomós (2013) to create the Command Control Index.

$$EECCI_{xy} = \sum_{i=1}^{n_{xy}} \frac{R_{ixy} + S_{ixy}}{2}$$

Where:

R_{ixy} = proportion of revenues from sales in the total dataset;

S_{ixy} = proportion of net income in the total dataset;

i = number of company headquarters per city in a given year ($i \geq 3$);

n = total number of companies headquartered in city x in year y .

The total of revenues from sales and the total of net income for each sector studied in each city studied were used to determine the significance of each sector in each city studied in eastern Europe. The resulting basic measure of cities' economic potential is called the Eastern Europe Sector Command and Control Index (EESCCI).

$$EESCCI_{xy} = \sum_{i=1}^{n_{xy}} R_{ixy} + S_{ixy}$$

Where:

R_{ixy} = proportion of revenues from sales in the total dataset for sector;

S_{ixy} = proportion of net income in the total dataset for sector;

i = number of company headquarters per city in a given sector;

n = total number of companies headquartered in city x in sector y .

3 Eastern European command and control centers

The six hundred eastern European corporations studied were located in 144 cities in 2008 and in 134 cities in 2012. This is the opposite pattern of what is observed in the global economy, where globalization processes

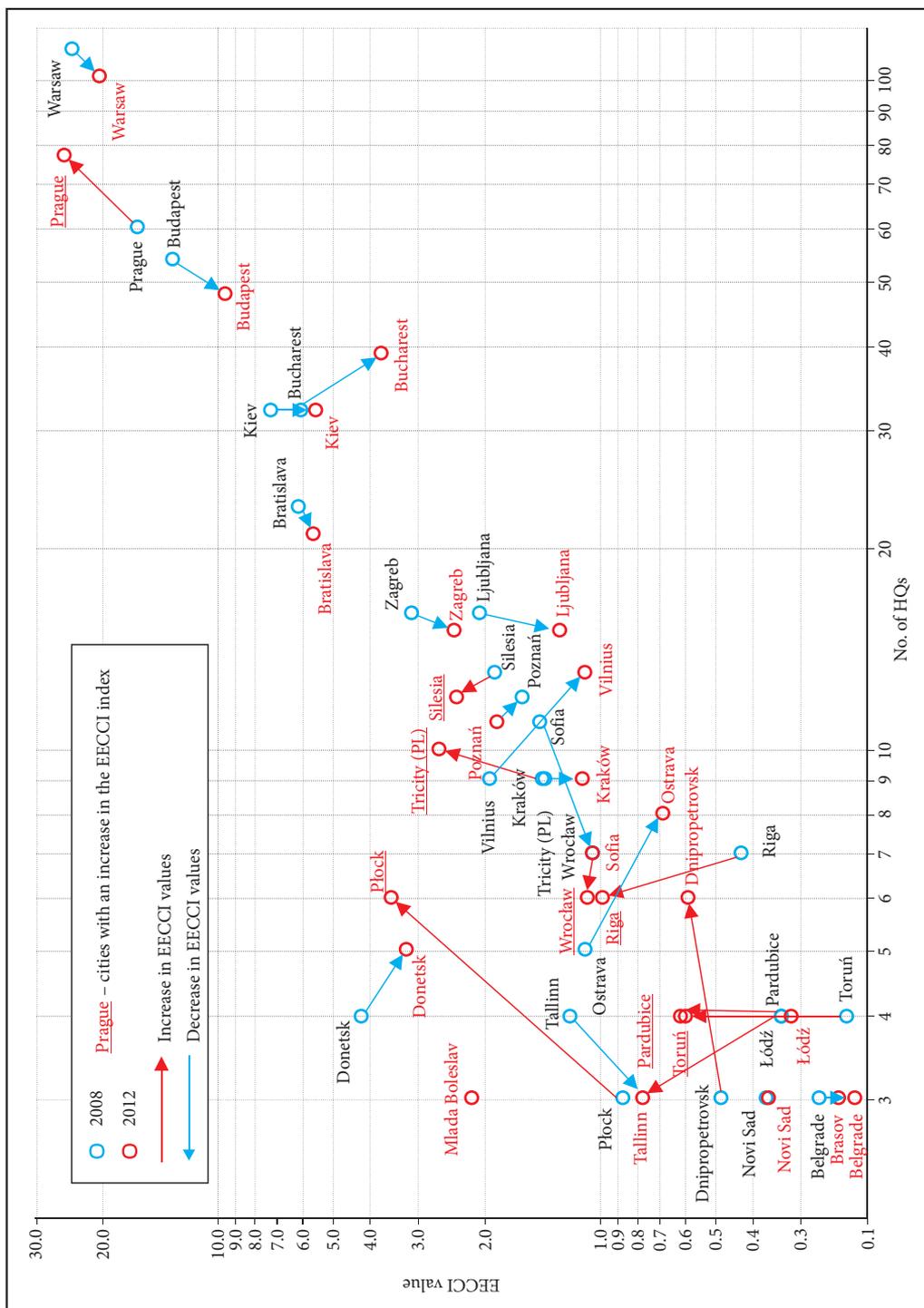


Figure 1: Eastern European Command and Control Index (EECCI) in 2008 and 2012.

continue to increase the number of cities home to the headquarters of top-ranked corporations (Raźniak and Winiarczyk-Raźniak 2015). They were also located in the more developed, western part of the region (Kincses, Nagy and Tóth 2013).

Figure 1 contains a list of cities home to more than three top-ranked corporations as well as corresponding EECCI index values. The largest number of corporate headquarters and the highest EECCI values for 2008 and 2012, which indicate the highest economic potential and the strongest command and control functions, were noted for the capital cities of the six largest countries in eastern Europe: Warsaw, Prague, Budapest, Kiev, Bucharest, and Bratislava. However, the corporate significance of this group of cities has been decreasing over time. Only Prague recorded a meaningful increase in the EECCI index value over the study period (59.3% relative to 2008). The number of corporate headquarters in Prague also increased over this time period. Other major cities in the region experienced a decline in EECCI: Bratislava (-5.4%), Warsaw (-14.2%), Kiev (-21.4%), and Budapest (-26.2%). Ten cities (including Prague) experienced an increase in EECCI values, and sixteen cities experienced a decrease in EECCI values.

The largest increases in EECCI values were noted for Polish cities: Płock (308.0%), Toruń (169.8%), TriCity (89.3%), Silesia (28.3%), Poznań (18.4%), and Wrocław (6.2%). The city of Płock is a special case; it is a city specializing in the oil refining industry. Its dominant company, PKN Orlen, had revenues of €28.7 billion in 2012. The city is also home to other companies linked with Orlen. This very high degree of specialization can lead to declines in profits when oil prices fall, as they did in 2014 and 2015. This type of decline can threaten the command and control function of a specialized city. High gains in EECCI value were also recorded for Riga (169.8%) and Pardubice (88.0%). On the other hand, the largest losses were noted for Belgrade (-63.3%) and Vilnius (-42.8%). Declines of more than 20% were also noted for Donetsk, Zagreb, Sofia, Tallinn, Ostrava, and Ljubljana. In the case of Bucharest, Vilnius, and Ostrava, the decline in EECCI value occurred despite a gain in the number of top-ranked corporate headquarters. At the other end of the spectrum, cities such as Riga, Poznań, and Wrocław and the urban region of Silesia experienced growth in EECCI values despite a loss of one corporate headquarters each during the study period.

A closer look at the Eastern Europe Sector Command and Control Index (EESCCI) for 2012 reveals that Warsaw dominates the region in terms of sector structure (EESCCI value of 395.7; Fig. 2). Prague is ranked second in terms of sector structure, with 165.1 points. These two are the only cities in the region home to corporations from all nine sectors studied. Third in line is Budapest, with an EESCCI value of 102.2 based on companies from seven sectors. The remaining cities in this study do not exceed fifty EESCCI points and feature corporations representing fewer than seven sectors. The one exception is Ljubljana, with seven sectors and an EESCCI value of only 12.2. The case of Slovenia is unique because the country as a whole struggled with GDP decline and other national economic problems during the study period (Brozzi et al. 2015). Three middle-ranked cities are Kiev (45.1), Bratislava (37.2), and Bucharest (28.8). The lowest EESCCI values were noted for Zagreb, Dnipropetrovsk, Riga, and Sofia.

The sector structure of the cities studied varies substantially. Only two key sectors are present in the nineteen cities covered by this study: 1) consumer business and transportation, and 2) energy and resources. The next three most common sectors are manufacturing (eighteen cities), insurance (thirteen cities), and banking (twelve cities). On the other hand, sectors such as real estate and the public sector are found only in the largest cities in eastern Europe.

In large cities such as Warsaw and Prague, all of the sectors present are fairly equal in financial dominance. The lowest values of the index of variance of EESCCI are those of Prague, Bratislava, and Warsaw, following the subtraction of one sector from the local economy. In addition, key Polish cities and urban regions such as Silesia, Łódź, and Poznań feature sectors in relative equilibrium with one another. Cities characterized by strong sector specialization are Zagreb, Płock, Bucharest, Wrocław, and Vilnius.

Warsaw is the regional leader in terms of sector structure, with a focus on corporations with positive net income values. The EESCCI value for Warsaw increased 30.3% between 2008 and 2012, and the value for Prague increased 20.4%. Budapest experienced a decline of 32.5%. Warsaw's high rank is associated with a large number of top-ranked corporations present in the city: all nine sectors in 2008 and 2012. Prague acquired all nine sectors only in 2012, whereas Budapest lost three sectors over the same time period. Warsaw's high rank is also strongly linked with the public sector and the real estate sector. The city has experienced a strong decline in its life sciences and healthcare sectors, which is associated with constant changes in Polish law. At the same time, Prague experienced strong growth in its manufacturing and banking sectors, and strong decline in its real estate sector. Sector structure and changes therein suggest different

development patterns relative to locally dominant sectors and the onset of specialization of certain cities in eastern Europe.

The economy of eastern Europe relied heavily on mining, steel production, chemical manufacturing, and energy production until the 1990s (Rachwał and Boguś 2012). The transition from communism to capitalism also produced a shift towards more sophisticated industries in the region (Gierańczyk and Rachwał 2012). As a result, the employment structure of countries in eastern Europe and their manufactured products began to resemble those of more developed countries in western Europe (Rachwał 2011). The largest cities in present-day eastern Europe are characterized by sector differentiation, which could help them weather an economic crisis in one or more sectors of the local economy.

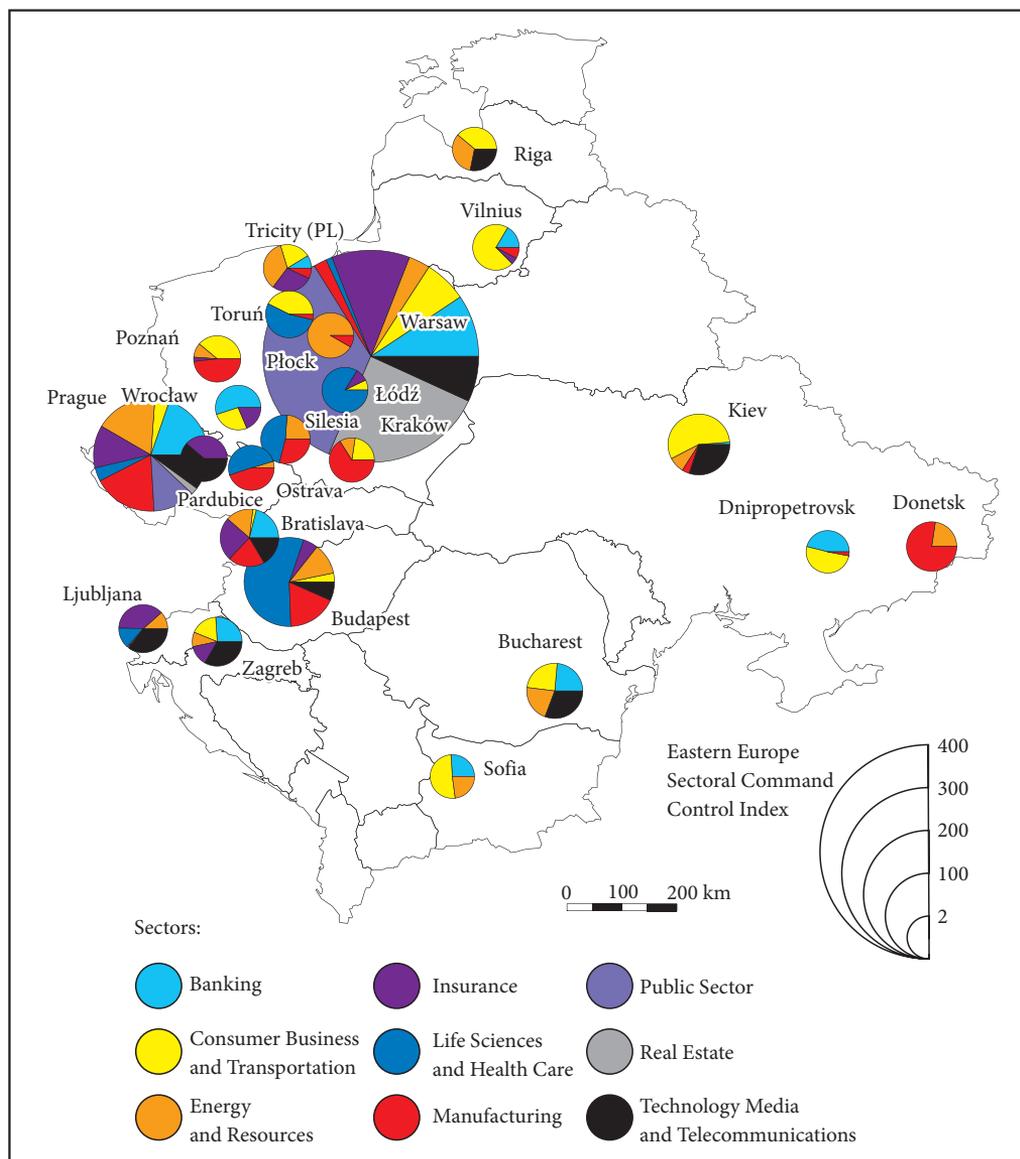


Figure 2: Eastern European Sector Command and Control Index (EESCCI) in 2012.

4 Discussion

Research on the potential of cities and large metropolitan areas in terms of the number of corporate headquarters and corporate financial performance is a growing area in the global literature. The fairly difficult history of eastern Europe has produced a somewhat different pathway for the region with respect to the command and control function of cities. Whereas most large corporations around the world are »dispersing« into a larger number of cities, quite the opposite trend has been observed in eastern Europe. One piece of good news for eastern European corporations is the slight increase in profitability for its major corporations during the global financial crisis, beginning in 2008. Revenues for the region's companies also increased during this time period. This suggests that the corporations are somewhat insulated from the effects of the most recent global financial crisis.

The largest number of headquarters of top-ranked corporations are located in Poland and the Czech Republic. The latter experienced a large increase in the number of top-ranked corporate headquarters during the study period, whereas the former experienced a decline. Most top-ranked corporations have established their headquarters in the western part of eastern Europe. At this point in time, Warsaw and Prague dominate the command and control function in eastern Europe. The global financial crisis of 2008 affected corporations in Warsaw to a greater extent than those in Prague. In 2008 Warsaw was the command and control leader in eastern Europe, and in 2012 the leader was Prague. Most capital cities in the region declined in terms of the strength of their command and control function, whereas secondary cities tended to gain strength in the area of command and control during the study period.

It is also quite reasonable to argue that a change in the number of top-ranked corporate headquarters does not lead to a corresponding change in the strength of the command and control function of a given city. For example, the command and control function of Bucharest, Vilnius, and Ostrava declined despite a larger number of corporations. The opposite trend was observed in the case of Riga, Silesia, Poznań, and Wrocław. Ultimately, there does not exist a single pattern of sector specialization for cities in eastern Europe regarding sector structure or the command and control function. The cities of the region – both those characterized by a highly developed command and control function and those characterized by a weaker function – are also characterized by substantial differences in terms of the dominant sector of the local economy.

An increasing number of corporations in a city usually leads to an increasing number of sectors of the local economy. However, increasing specialization is also an issue. Most of the cities studied experienced an increase in the number of corporations in sectors already in command of the local economy. Warsaw remains the sector diversity leader in eastern Europe, and Prague and Budapest are second and third in line. Both cities feature far fewer sectors in comparison with Warsaw.

On the other hand, Anttiroiko (2015) argues that cities that are not top ranked ought to develop a strong local brand that would differentiate them in the world. Examples include Zurich (banking) and Milan (fashion). In eastern Europe, only Warsaw and Prague are characterized by substantial international linkages. Other major cities in the region possess some or few linkages (Raźniak 2014), and would benefit from the development of a local brand that would be recognized on the world scene. However, it appears that such significant specialization would help make cities more recognizable in the world, but also substantially more susceptible to economic crisis in the event of a downturn in a dominant sector. Examples include the large Polish city of Łódź (Jakóbczyk-Gryszkiewicz 2011) and the American city of Pittsburgh (Duranton and Puga 2000), where the collapse of a dominant sector produced stagnation in most other sectors in the city. It appears that cities with several well-developed sectors fare better in the face of fluctuations in economic conditions than do cities based on a single dominant sector.

The same holds true of the location of corporate headquarters. Cities with an array of different corporate headquarters representing different sectors of the economy tend to weather economic crises better than cities dominated by a single major corporation. Hence, the major cities of eastern Europe ought to pursue the creation of strong, local, and globally recognized brands, which would help attract further business investment, without losing sight of the need to balance economic growth via the development of several different sectors.

5 Conclusions

Historical and political determinants have produced a somewhat different development pathway for the command and control function in cities in eastern Europe versus the rest of the developed world. Whereas the rest of the world is experiencing a spatial deconcentration of corporate headquarters (Csomós 2013), eastern Europe is experiencing the concentration of corporate headquarters in fewer cities. One positive outlook for the region between 2008 and 2012 was a slight increase in revenue and net income for major corporations in the region. It may be the case that the global economic crisis of 2008 did not produce a substantial negative impact on the cities of eastern Europe as measured by corporate financial performance. This type of outcome follows a global pattern of the largest corporations increasing their revenue and net income (Taylor and Csomós 2012).

The mining industry and heavy industry tended to dominate the economies of central Europe until the 1990s (Rachwał 2011). Today, most large cities in the region are dominated by the consumer business and transportation sectors. In the era of globalization, this type of change may prove to be disadvantageous because foreign corporations will find it much easier to shutter their country branches in the consumer business and transportation sector than would be possible in the case of manufacturing or assembly facilities. A given company's cost of shuttering a service business is simply much lower. This factor is important because globalization has accelerated in recent years even in central and eastern Europe.

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