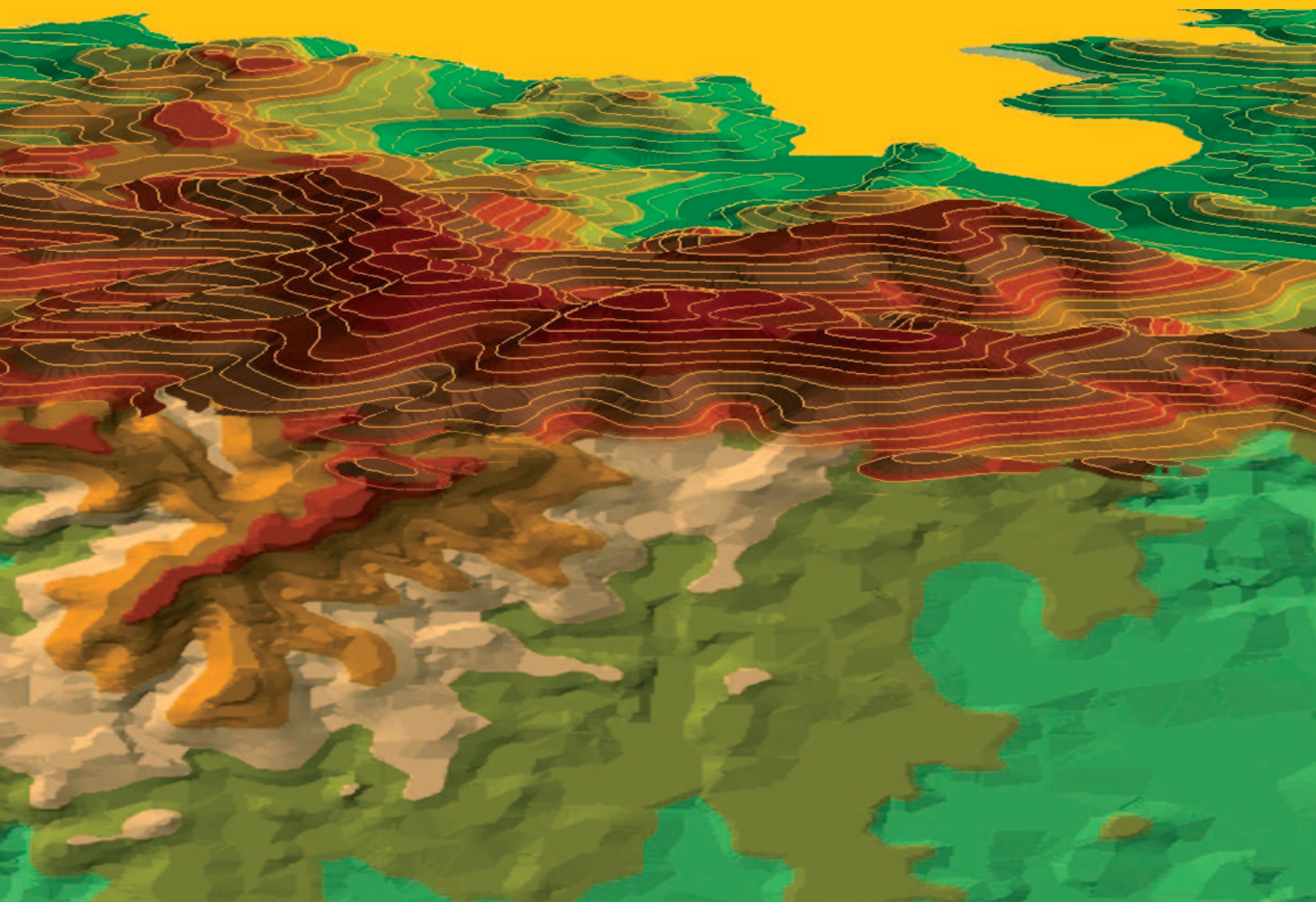


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# MORAVIAN GEOGRAPHICAL REPORTS

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*Fig. 6. Tonie – a northern part of the Kraków city area (Photo: S. Kurek)*



*Fig. 7. New housing development in the area of Modlnica and Zabierzow, northeast of Kraków (Photo: S. Kurek)*

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# Carbon dioxide emissions embodied in international trade in Central Europe between 1995 and 2008

Jana VLČKOVÁ<sup>a\*</sup>, Vojtěch NOSEK<sup>b</sup>, Josef NOVOTNÝ<sup>b</sup>, Antonín LUPÍŠEK<sup>c</sup>

## Abstract

*Climate change and environmental policies are widely discussed, but much less is known about emissions embodied in goods traded internationally, and the distinction between emission producers and consumers. The carbon dioxide emissions embodied in international trade in Central European countries are subject to examination in this paper. As a result of industrial restructuring and environmental legislation, air pollution has improved significantly in Central European countries since the 1989 transition. On the other hand, economic growth has been accompanied by a rise in consumerism. Despite the increasing role of exports, the Visegrad group countries have become net importers of carbon dioxide emissions between 1995 and 2008. This seems to be the 'standard trajectory' of a country's transition toward a more developed and consumption-oriented economy. The global patterns of carbon dioxide emissions embodied in manufacturing exports are also mapped, using network analysis and constructing 'product space'. The analysis confirms that industrial re-structuring played an important role in lowering the production of carbon dioxide emissions in the Visegrad countries.*

**Keywords:** carbon dioxide, embodied emissions, international trade, revealed comparative advantage, product space, Visegrad Group countries

## 1. Introduction

Climate change and environmental protection have attracted a lot of attention, and the Kyoto protocol, part of the United Nations Framework Convention on Climate Change, sets obligations on binding countries to reduce greenhouse gases (GHGs) emissions. The GHG emissions are increasing at the global scale, particularly in developing countries (Raupach et al., 2007). Developed countries (Annex I countries) are given a quantified emission limitation, but developing countries do not have emission commitments to allow for economic development (Gutman, 1994). A reduction of emissions in Annex I countries is often offset by the relocation of production or by import substitution. And since goods traded internationally are on average more carbon-intensive, most of the production of highly carbon-intensive goods is relocated (Ahmad and Wyckoff, 2003). Consequently, GHG emissions could increase globally even if the goals set in the Kyoto protocol are fulfilled. International trade is increasing much faster than world output: between 1995 and 2008, world trade increased by 6% on average, whereas the world output gained only 3.1% (WTO, 2012). Thus, one should focus not only on carbon dioxide emissions production but also on studying carbon dioxide consumption and trade.

Central and Eastern European countries suffered from many environmental problems during the socialist period and air pollution was probably the most important. After 1989, these economies have integrated themselves into the global economy and have become highly export-oriented. Their export orientation, in both geographic and sector terms, has changed significantly. As well, more attention was given to the environment: new legislation, "cleaner" technologies, and the decreasing importance of heavy industry contributed

to improvements in air pollution. On the other hand, there was growth in the number of passenger cars and in consumerism in general, trends which are associated with higher CO<sub>2</sub> consumption. Therefore, exploring carbon dioxide production and consumption in these countries is highly interesting. The main goal of this paper is to study: (i) the carbon dioxide emissions embodied in international trade, with special attention to selected Central European countries (the so-called Visegrad countries); and (ii) to map the exports of carbon dioxide emissions from manufacturing in particular product groups, using network visualizing relatedness between products traded in the global economy. We are focusing on the evolution of these patterns between 1995 and 2008, both globally and at specific regional/national levels. We apply the product space concept (e.g. Hidalgo et al., 2007) to compare CO<sub>2</sub> emissions embodied in goods that are traded internationally.

## 2. Theoretical background

### 2.1 International trade and the Visegrad countries

In the past 30 years we have witnessed significant changes in the patterns of international trade. Traditionally, exports of developing countries were based on primary commodities. Manufacturing goods were produced mainly in developed countries. Furthermore, final goods have been mostly traded internationally. Due to globalization, the rise of TNCs (Trans-National Corporations) and value chains, huge changes in the world economy occurred (Dicken, 2007). A substantial part of the production has been relocated to developing and emerging economies. This has been intensified by the spatial separation of production and consumption.

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Since the 1980s, the trade flows have changed dramatically. This was caused by the rapid growth of many developing economies, China in particular. Later, due to the disintegration of the Eastern European bloc, new markets and exporters emerged in Central and Eastern Europe. In this paper, we focus on the Central European countries – the so called Visegrad countries<sup>1</sup> (hereinafter V4 countries). In general, these countries had been highly industrialized and, during the Soviet period, heavy industry was primarily supported. Therefore, given their industrial traditions, an inexpensive and qualified labour force, and locations close to the Western European economies, these countries had started to attract foreign direct investments (FDI) inflows since the 1990s, especially from the Western European economies (Pavlínek et al., 2009). Furthermore, their relative political and economic stability was amplified by their preparations for EU accession, which occurred in 2004. In all V4 countries, manufacturing and exports play an important role. Exports now account for over 75% of GDP in all V4 countries except Poland, and employment in manufacturing exceeds 30% and accounts for 20–25% of GDP (World Bank, 2015). The V4 countries have become integrated into the global economy and global value chains, and Germany is now the major export destination. This means that their exports incorporate intermediate inputs produced in other countries. Because of these huge changes in the export orientation of V4 countries, changes in exported emissions are to be expected.

Recently, a new set of trade models has been built around the heterogeneity of skills and technologies consistent with emerging patterns of outsourcing (Grossman and Rossi-Hansberg, 2006; Bivens, 2007). In general, countries that export more sophisticated goods have experienced faster economic growth (Fagerberg, 1994; Grossman and Helpman; 1994). At the outset, however, production of a new type of a product is for the first time associated with cost uncertainty; specific factor endowments and an institutional context is required. Countries thus cannot produce and export the goods they might wish, they can only produce the goods for which they have productive knowledge. According to Hidalgo et al. (2007), countries tend to produce similar products that are close to the productive knowledge they already possess. The product space concept is a network of products, where products are connected based on the probability that the same country has developed revealed comparative advantage in these products (export specialisation). Products that require similar capabilities tend to build clusters. We assume that this pattern holds also for carbon dioxide emissions embodied in international trade.

## 2.2 Carbon dioxide emissions

Many studies have looked at the role of pollution embodied in international trade. Most of them focus on air pollution, although some studies include water or land pollution as well (Hoekstra and Hung, 2005; Hubacek and Giljum, 2003). In these research contributions, the balance of emissions embodied in international trade offers an insight into the environmental separation between domestic consumption and global production of GHGs. Such a balance also provides useful information about whether the pollution has been reduced or rather relocated. Carbon leakage is often used to describe the relocation of production. It is defined as

“the part of emissions reductions in Annex I countries that may be offset by an increase of the emissions in the non-constrained countries above their baseline levels.” (Metz et al., 2007: 811).

Peters et al. (2011) found that carbon leakage is responsible for 16 Gt of carbon dioxide (approximately 50% of the annual global emissions of carbon dioxide) relocated from Annex I to non-Annex I countries from 1990 to 2008. It has not been demonstrated, however, that production has shifted due to environmental legislation (Peters and Hertwich, 2008). Economic reasons are much more important, although both motives are interconnected. Neither is environmental legislation sufficient to promote innovation (Hemmelskamp, 1997). In general, policies aimed at reducing emissions from electricity generation at a country level have impacts on prices of electricity.

It is thus important to find out how much of the non-Annex I production is consumed in Annex I countries. Production-based emissions are total domestic emissions produced in a country, consumption-based emissions are emissions consumed in a country regardless of the place of production. Peters and Hertwich (2008) found that, based on international trade among 87 countries in 2001, 21.5% of global carbon dioxide emissions (5.3 Gt) were embodied in international trade. According to them, Annex I countries exported 18.9% of carbon dioxide, and non-Annex I – 25.3%. Annex I countries can be thus considered as net importers of carbon dioxide emissions. In an earlier study based on 24 countries, Ahmad and Wyckoff (2003) found that emissions embodied in net imports of OECD countries were equivalent to 2.5% of global carbon dioxide emissions in 1995. Net emissions transfer in international trade from developing to developed countries increased from 0.4 Gt of carbon dioxide in 1990 to 1.6 Gt in 2008, and their share in global carbon dioxide emissions increased from 20% to 26% (Peters et al., 2011). Measuring the carbon footprint for individual products has recently increased public awareness of the carbon dioxide emissions embodied in trade.

Increase in trade leads to an increase of emissions embodied in trade. On the other hand, technology transfer from less carbon-intensive (developed) to more carbon-intensive (developing) countries leads to a reduction of global emissions (Nakano et al., 2009). In developing countries, however, the decrease of carbon dioxide emissions per unit of GDP can be attributed not only to technological changes related mostly to more efficient resources use, but also to structural changes related to the increasing production of goods that are less carbon-intensive.

As a result of its enormous production growth, China, currently the world's largest exporter (in international trade and also in carbon dioxide emissions) has attracted a lot of attention (e.g. Lin and Sun, 2010; Peters et al., 2007). In this study, we focus on the V4 countries because of the significant changes that occurred in these economies over the last two decades. There is much research dedicated to the ecological situation in post-socialist countries (e.g. Klarer and Moldan, 1997; Andanova, 2003; Šauer et al., 2013), but none of the papers focus on carbon dioxide emissions embodied in international trade. Central and Eastern European countries suffered from many environmental problems and air pollution had been considered the major issue. Due to

<sup>1</sup> The Visegrad Group, also called the Visegrad Four (V4), is an alliance of four Central European countries, including the Czech Republic, Hungary, Poland and Slovakia

the large role of heavy industry and the high dependence on brown coal power plants, sulphur dioxide and nitrogen dioxide emissions were extremely high (Pavlínek and Pickles, 2004). Since the 1990s, these emissions have dropped significantly: partly due to the economic downturn, but also to industrial restructuring resulting in the decline of heavy industry and the increasing role of services. In terms of power generation, the shift from coal to natural gas, hydroelectricity and nuclear power, further contributed to emissions reduction. The accession to the EU required adaptation to the regulations and norms of the 'acquis communautaire' in many areas, including environmental protection. EU funding has contributed to increased investments in green technologies. In terms of the carbon dioxide emissions embodied in international trade, the changes in industrial production, export destinations, environmental legislation, and the rise of mass consumerism have all contributed to making the case of the V4 countries very interesting.

### 3. Methodology and data

#### 3.1 Exports of emissions embodied in international trade

Over the last few years, the quality and availability of data on the production and consumption of CO<sub>2</sub> emissions have improved significantly. Such data, however, are only available at highly aggregated product levels. In order to map trade patterns of exports of carbon dioxide emissions similar to the work of Hidalgo et al. (2008), we need to calculate the exported emissions on a highly-detailed product level. We combine several data sources to calculate these emissions. We work only with carbon dioxide emissions from manufacturing (SITC codes 5–8), since almost two-thirds of world trade occurs in manufacturing (64% in 2011, UNCTAD, 2012). Furthermore, manufacturing exports account for almost 90% of merchandise exports from the V4 countries, and data for manufacturing are available for most countries over longer periods. We use the 3-digit SITC classification: altogether, 527 product categories.

Regarding the international trade data, for the year 1995 we used the World Trade Flows (WTF) data from Feenstra et al. (2005). For 2008, however, these data were not available, so we used the trade data from the UN Comtrade database and adjusted them in the same way as that used by Feenstra et al. (2005). Due to the existence of global production networks and the fragmentation of the production process, trade in intermediate inputs between 1995 and 2005 represented 56% of goods traded (Miroudot et al., 2009). Since exports can embody inputs produced in other countries, we can only take into account the domestic value-added of exports. This should contribute to more accurate results. For example, in the V4 countries the domestic value-added of exports is on average only 60%, and in some industries it reaches only 40%. The share of domestic value-added embodied in exports for individual countries and industries are taken from OECD TIVA data (OECD, 2015).

The exports of emissions embodied in international trade are calculated for 1995, 2000 and 2008, for all countries for which carbon dioxide emissions from manufacturing were available. Data on the estimation of carbon dioxide emissions embodied in international trade are more demanding than those used in carbon dioxide production. In most of the relevant research (e.g. Peters and Hertwich, 2008; Weber

and Matthews, 2007), input-output models, usually using the GTAP database (Narayanan and Walmsley, 2008), are used in order to calculate the emissions embodied in international trade and therein the carbon dioxide consumption of respective countries. In our paper, we use a different approach, referring to a combination of various data sources (similar to Pan et al., 2008). We calculate the export of emissions embodied in international trade in individual countries based on emissions from manufacturing, average carbon intensities of manufacturing sectors, and international trade data.

Three simplifications had to be introduced. They result in a downward bias in emissions exports. As we are interested in general trends and structural changes over time, however, these simplifications should be acceptable. First, we are using only carbon dioxide emissions from manufacturing industries and construction (electricity and heat excluded, not available for earlier years). Globally, the emissions from manufacturing would increase by almost 80% if emissions from electricity were included, although there are huge differences in individual countries. Second, due to the unavailability of data on shares of exported production in individual countries and industries, we multiplied carbon dioxide emissions from manufacturing by the share of exports in GDP. Thus, if exports in a particular country account for 60% of GDP, we expect that 60% of carbon dioxide emissions from manufacturing would be exported. This simplification can overestimate exports of carbon dioxide in countries that do not export carbon-intensive goods, and vice versa. Third, there are large differences in carbon intensities between industry sectors. We used the Eurostat data (Eurostat, 2012) to assess the carbon intensities of individual industries and products. Since these data are only available for some countries, we had to model the intensities for individual countries. We divided the countries into two groups based on the environmental Human Development Index (UNDP, 2012). These two groups are assigned different values of carbon intensities in industries and products.

#### 3.2 Revealed relatedness between individual products

In this paper the focus is on measuring relatedness between individual products, which can offer some useful insights in terms of exported emissions. We do not measure balances of carbon dioxide embodied in international trade, which is the predominant method used in the literature (e.g. Ahmad and Wyckoff, 2003, or Peters et al., 2011). The relatedness is measured between international trade flows of carbon dioxide embodied in international trade in manufacturing industries.

This relatedness between products  $i$  and  $j$  is associated with the revealed comparative advantage (RCA), which measures whether a country  $a$  exports more of embodied carbon dioxide in product  $i$ , as a share of its total export of embodied carbon dioxide, than the average country. This approach combines the classic RCA (Balassa, 1965) with an environmental perspective. The RCA is defined as:

$$RCA_{a,i} = \frac{\frac{x_{a,i}}{\sum_i^n x_{a,i}}}{\frac{\sum_c^k x_{c,i}}{\sum_{c,i}^{k,n} x_{c,i}}} \quad (1)$$

<sup>2</sup> See Supplementary materials for a list of all products and countries

where, product  $i$  in a country  $a$  is considered to have a RCA if, and only if,  $RCA > 1$ . To simplify the forthcoming quantifications, the RCA values have been transformed into a binary variable. Products with  $RCA > 1$  have been assigned value 1, else the value 0.

For measuring the revealed relatedness between individual products (their RCA), we have chosen the Jaccard similarity measure (sometimes the Dice measure is used, see Novotný and Cheshire, 2012). The Jaccard measure captures the number of countries where both of two analyzed flows of carbon dioxide embodied in a particular product are concentrated (having RCA) relative to the number of countries where at least one of them concentrates. The Jaccard measure between the two products (their carbon dioxide embodied in international trade flows)  $i$  and  $j$  when analyzing the co-occurrence over  $n$  countries is defined by the following formula:

$$J_{i,j} = \frac{\{n:RCA_{n,i}>1\} \cap \{n:RCA_{n,j}>1\}}{\{n:RCA_{n,i}>1\} \cup \{n:RCA_{n,j}>1\}} \quad (2)$$

where, the nominator stands for the number of countries where both products  $i$  and  $j$  satisfy the condition  $RCA > 1$ , while the denominator accounts for the number of countries where at least one product satisfies this condition. The measure can attain values between 0 and 1. The lower bound means that the carbon dioxide embodied in the two products does not have RCA in any of the countries in the analysis, and the upper bound signifies that the carbon dioxide in the two products is concentrated in identical countries.

### 3.3 Product space

Due to the relatively high number of observations, the resulting matrix with binary relative relatedness values is very large and difficult to interpret. Moreover, the matrix is full of unimportant results close to 0. Therefore, it is useful to introduce some data mining methods. For this purpose, we have used Cytoscape<sup>3</sup>, open source software, which can visualize large datasets in a form of a network. For visualization, we have chosen the force-directed algorithm. This network can be understood as system of nodes (individual products), which are attracted to each other relative to their revealed relatedness. The nodes are thus distributed within the network in a way which corresponds with the values of measured revealed relatedness between all pairs of nodes and with, if understood as a physical system, minimum energy needed for this arrangement.

This network would not be, due to the high number of pair relations, intelligible. A threshold, which would cut-off unimportant values, must be introduced. According to some authors (Novotný and Cheshire, 2012), inspecting the frequency distribution is suitable for this purpose. The threshold  $J_{i,j}$  (denoted as  $T$ ) is then selected according to a clear break in the graph. The number of  $m$  product-product relations can be thus written as:

$$m = N(J_{i,j} \geq T) \quad (3)$$

The network captures the pattern of carbon dioxide embodied in international trade (i) for a selected year, and (ii) for the global system as a whole. Nonetheless, there are

some possibilities in how to approach changes in time and to highlight specific countries or regions within the product space methodology.

Once the product space is constructed, it is also relatively easy to capture the position of individual countries. Within the network, the products where countries under analysis have developed RCA can be highlighted and compared across years. The product space network must be static, i.e. fixed for a specific year, so that we can easily assess the changes. When studying the structural changes of countries, we have used the product space from 2008 as a background network.

## 4. Results

### 4.1 Carbon dioxide emissions embodied in international trade

The V4 countries are in general small export-oriented countries, where the share of exports to GDP has been increasing steadily. Since the 1989 transition, they have become integrated into the global economy. Their participation in global value chains is among the highest in the world and reaches 60% (OECD, 2015a). This means that 60% of their exports either contain inputs produced in other countries (the so-called backward participation, which reaches around 40%) or are intermediate inputs used in exports of third countries (forward participation reaches around 20%). Thus, due to their large involvement in international trade, focusing on emissions embodied in trade has an important relevance for these economies. To recount, Central and Eastern European countries had widespread ecological problems during the socialist period (Carter and Turnock, 2002), but since 1989 the ecological situation has improved significantly, because of several factors such as economic decline, industrial restructuring or stricter environmental legislation. On the other hand, economic growth has been also associated with negative environmental effects, including higher consumption or increase in car traffic. Assessing how these changes affected air pollution is yet another reason to specify why exploring carbon dioxide emissions embodied in trade is important.

Trade imbalances and differences in carbon-intensity techniques used in production, are responsible for the fact that emissions associated with consumption exceed those from production in most developed countries. Between 1995 and 2008, the number of net exporters of carbon dioxide emissions decreased. The fact that emissions embodied in international trade should globally equal zero indicates that net exporters such as China, the Russian Federation or Saudi Arabia exported more carbon dioxide emissions than before. The V4 countries belong to a group of countries that have become net importers of CO<sub>2</sub> emissions over this period.

Between 1995 and 2008 the production of carbon dioxide emissions slightly decreased in all V4 countries (by 5–10%). The consumption of carbon dioxide emissions on the other increased steadily. In Poland, this growth was the highest and CO<sub>2</sub> consumption increased by 24%, whereas in the Czech Republic it increased only by 7%. The difference between consumption and production is measured by the balance of emissions embodied in trade (BEET). In 1995, all V4 countries were net exporters of CO<sub>2</sub> emissions since their production exceeded consumption. Hungary became

<sup>3</sup> See <http://cytoscapeweb.cytoscape.org/documentation/layout>

Country/MT CO <sub>2</sub>	1995				2008			
	CO <sub>2</sub> production	CO <sub>2</sub> consumption	BEEET	CO <sub>2</sub> exports from manufacturing	CO <sub>2</sub> production	CO <sub>2</sub> consumption	BEEET	CO <sub>2</sub> exports from manufacturing
Czech Republic	124	110	14	12	117	117	0	13
Hungary	57	56	1	4	53	67	- 14	6
Poland	331	285	46	15	299	313	- 14	15
Slovak Republic	41	34	7	6	36	42	- 6	8
Germany	868	1,030	- 162	31	800	929	- 129	57
United States	5,139	5,384	- 245	101	5,587	6,223	- 637	82
China	2,986	2,599	387	481	6,507	5,205	1,302	758

Tab. 1: Carbon dioxide emissions in selected countries (Mt). Sources: OECD (2015); authors' calculations

net importer of CO<sub>2</sub> emissions in 2000. In 2008, all V4 countries are net importers of carbon dioxide emissions embodied in trade, and only in the Czech Republic is the BEEET equal to zero (see Tab. 1). Due to the differences in population size of the V4 countries, Hungary is the largest net importer of CO<sub>2</sub> emissions per person, though in absolute terms the consumption is equal to Poland. The Czech Republic has highest production and consumption of CO<sub>2</sub> per person. According the newer data from 2011, the Czech Republic has remained a net exporter of carbon dioxide emissions, whereas the other V4 countries continue to be net importers. The main reason is the fact that only in the Czech Republic has consumption decreased in comparison to the year 1995 (OECD, 2015c). One explanation could be that in the Czech Republic half of the consumption of carbon dioxide emissions emitted abroad originates from the OECD countries, while in the remaining V4 countries it is from non-OECD countries. As soon as detailed data become available, this aspect should be explored in detail.

Differences between the V4 countries are affected by many factors, including the types of resources used for power generation or consumer behavior. According to OECD data (OECD, 2015b), direct carbon dioxide emissions by households have been decreasing in all of these countries except Slovakia. This is probably caused by gasification and the introduction of new and energy-efficient technologies in general. On the other hand, household carbon dioxide emissions by road, per person, have almost doubled in all V4 countries, although the smallest increase can be observed in Hungary. In the Czech Republic, the number of passenger cars has doubled since the transition, whereas in Hungary the number of passenger cars increased at the slowest rate over the studied period (World Bank, 2015). Industry is another important factor affecting production of carbon dioxide emissions. The exports of emissions from manufacturing production did not change much between 1995 and 2008. The largest exporters are Poland and the Czech Republic, whereas exports per person are highest in Slovakia and the Czech Republic. Industrial orientation also plays an important role due to the differences in carbon intensities. An analysis of industries where V4 countries have revealed comparative advantage in exports of embodied emissions from manufacturing can help to explain this. This is elaborated in greater detail in section 4.3, below.

In Table 1, three other countries are identified: Germany, the United States and China. Thus a first-level comparison can be made with the situation in the V4 countries. In general, except for Estonia, Luxembourg and the Netherlands, all OECD economies are net importers of carbon dioxide emissions. On the other hand, emerging economies are usually net exporters. China is the largest net exporter of carbon dioxide emissions – and the world's leading polluter as well. Its carbon dioxide production is increasing at a much faster rate than its consumption. Despite the fact that the number of passenger cars is increasing at a rapid pace and causes problems in local cities (Ji et al., 2012), emissions of households per road and person are still low in international comparisons. In the case of Germany, production is also decreasing although manufacturing still plays a key role. One of the reasons for this is similar to the situation in the V4 countries – industrial restructuring and the introduction of greener technologies in the former Eastern Germany (Ebelt et al., 2001). The other reason is probably the attention Germany pays to the environment and sustainable energy, in Germany known as 'Energiewende'. The United States represent a country where both production and consumption of carbon dioxide emissions is growing. Since the United States did not ratify the Kyoto protocol, it does not have any binding targets. In comparison to other EU countries, the V4 countries show a more rapid decrease in GHG emissions per unit of GDP in the period 1999–2009 (- 4.7% versus - 2.9%). This can be attributed largely to economic and political transformations. The carbon dioxide emissions were still high in 1999 and due to rapid economic growth in the following years, the emissions intensity decreased, whereas the total emissions declined only slightly (Šauer et al., 2013).

In this paper we used data from the OECD and our own calculations. In other studies (e.g. Ahmad and Wyckoff, 2003; Peters and Hertwich, 2008; or Nakano et al., 2008), the balance of emissions embodied in international trade (BEEET) was also calculated. The trends in individual countries are the same and numbers differ only slightly.

#### 4.2 Product space of embodied emissions

In this section, the network analyses for carbon dioxide emissions embodied in international trade between 1995 and 2008 are presented.

From a first look, several distinctive groups can be identified. On a right-hand side, there is a large cluster comprising



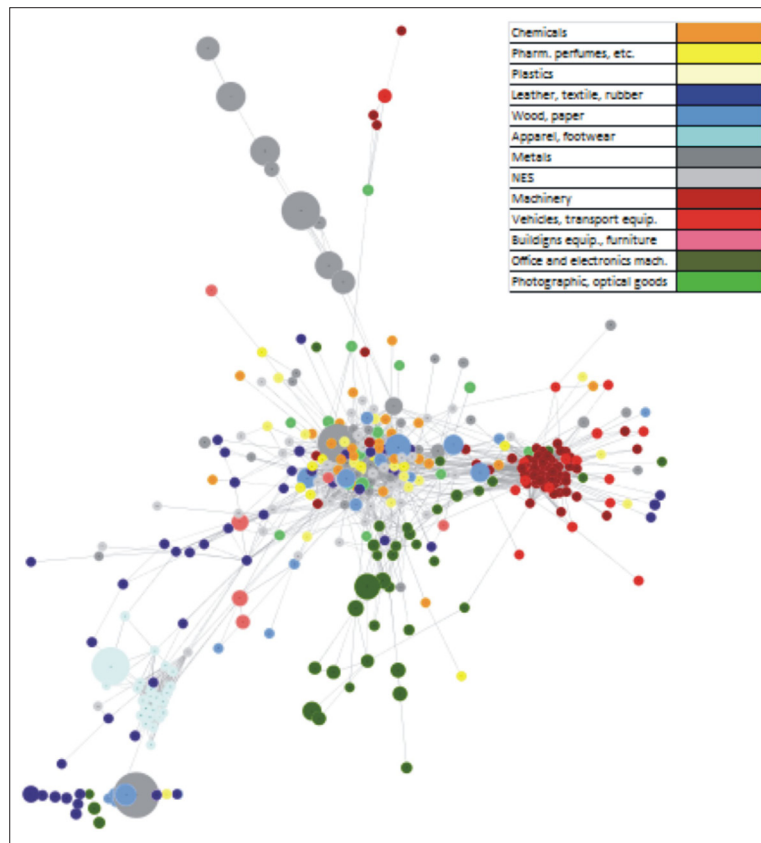


Fig. 1: Product space of embodied emissions in export 1995. Note: Altogether 375 nodes and 3,015 edges; colors of respective nodes represent different groups of sectors, width of edges the revealed relatedness between nodes, and size of the nodes volume of embodied emissions; some peripheral parts of the graph had to be cut off; full-scale figure is downloadable at supportive material at <https://www.dropbox.com/sh/1amx5fwz1t16cwy/AADV9r21ppdBB9zO95Stf4Vqa?dl=0#>. Source: own construction (using Cytoscape 2.8.0); force-directed layout

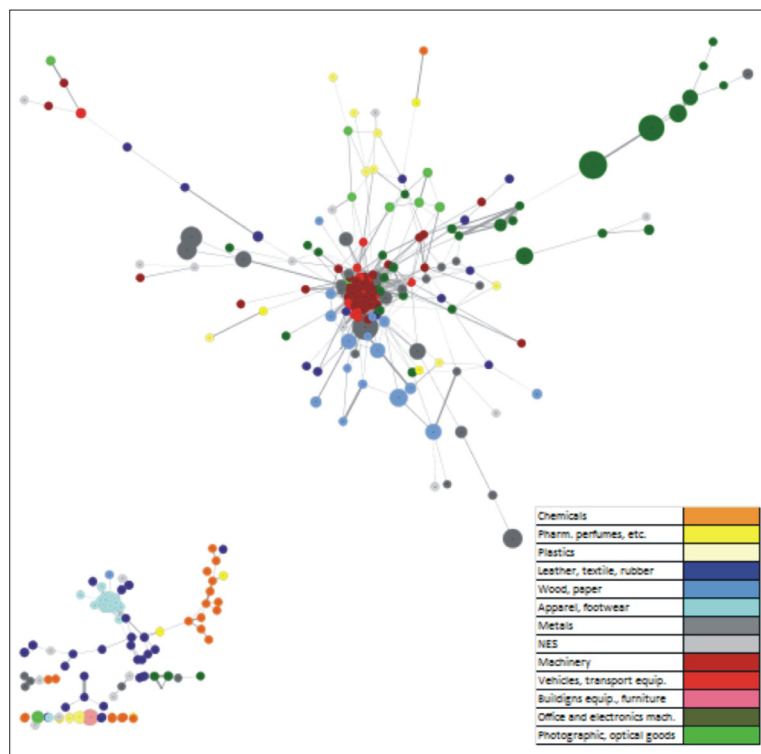


Fig. 2: Product space of embodied emissions in export 2008. Note: Altogether 299 nodes and 2,975 edges; colors of respective nodes represent different groups of sectors, width of edges the revealed relatedness between nodes, and size of the nodes volume of embodied emissions; some peripheral parts of the graph had to be cut off; full-scale figure is downloadable at supportive material at <https://www.dropbox.com/sh/1amx5fwz1t16cwy/AADV9r21ppdBB9zO95Stf4Vqa?dl=0#>. Source: own construction (using Cytoscape 2.8.0); force-directed layout

machinery (dark red) and transport equipment (light red). At the bottom, there is a cluster of office and electronic machinery (dark green). At the top there is a cluster of nodes belonging to metals (dark grey). On the left-hand side, there is a clearly separated cluster representing the apparel and footwear sector (light blue), which is near another distinctive group even though not that tightly connected – textile yarn, fabrics, and made-up articles (dark blue). Other industries, such as chemicals (orange), pharmaceuticals (yellow) or wood and paper (medium blue), are sparsely distributed.

The three significant groups (dark red machinery, light blue apparel, and dark green electronics) imply that traded carbon dioxide emissions are similar across world countries, especially in case of these industries. When studying respective sectors in detail<sup>4</sup>, it seems that similar sectors tend to have similar levels of carbon dioxide embodied in international trade; however, it is never as significant as in case the afore-mentioned three groups.

Moreover, it might be hypothesized that these three groups can to some degree represent complexity (in terms of the volume of added-value) – the core of the “machinery” cluster representing highly complex sector, the “electronics” sector medium complexity, and the “apparel” cluster plus other loosely-connected sectors less complex sectors. This hypothesis can be supported by analysis of revealed comparative advantages of selected countries discussed further in the text.

In 2008, the general pattern is the same again – the machinery and transport equipment cluster in the middle, the apparel-shoe cluster on the left-hand side, and the electronics cluster on the left. The biggest change is seen in the volume of interrelationships. Compared with 1990, many less nodes (i.e. sectors) are included in the network. This might be caused by increasing differences between strongly integrated clusters (machinery, and footwear and apparel) on one side, and weak relations between other sectors on the other. Due to our applied methodology (with a cut-off according to the distribution curve), many of the sectors had to be omitted from the network. There is still a visible cluster of office and electronic machinery, and partly the leather, textile, and rubber sectors. The large clusters (machinery and apparel) are no longer connected in the network, and it might be expected that they will move further away. In general, there are two significant clusters, machinery and apparel. In machinery, mostly developed countries and net importers of carbon dioxide emissions have a competitive advantage (with a few exceptions, such as Estonia or Lithuania). On the other hand, in apparel and footwear, developing and emerging countries have RCAs, among them major exporters of carbon dioxide emissions like China and India, as well as importers of carbon dioxide belonging to the least developed countries.

In the case of the network based only on trade for the year 1995 (see Figure S1 in supplementary material), there are only two visible clusters – electronics and footwear. Nodes from other industries are highly dispersed in the network. The similarity of the international trade matrix and the exported embodied emission matrix, as measured by Pearson's coefficient of correlation, equals 0.15 in 1995, 0.18 in 2000 and 0.42 in 2008. These statistical measures indicate that the patterns of embodied carbon dioxide have become closer to patterns of international trade.

#### 4.3 The position of the V4 countries within the product space

In this section, we study the position of the V4 countries within the networks presented above. For a specific country, its RCA in carbon dioxide export may be visualized in the network. Moreover, if the network is fixed for a certain year (1995 in our case) the evolution of comparative advantages during the study period may be analyzed, and future trajectories predicted. We can expect the greatest changes in the case of countries with significant economic and/or political changes throughout this period. Clearly, the V4 countries have witnessed such changes during the socio-economic transformation between 1995 and 2008.

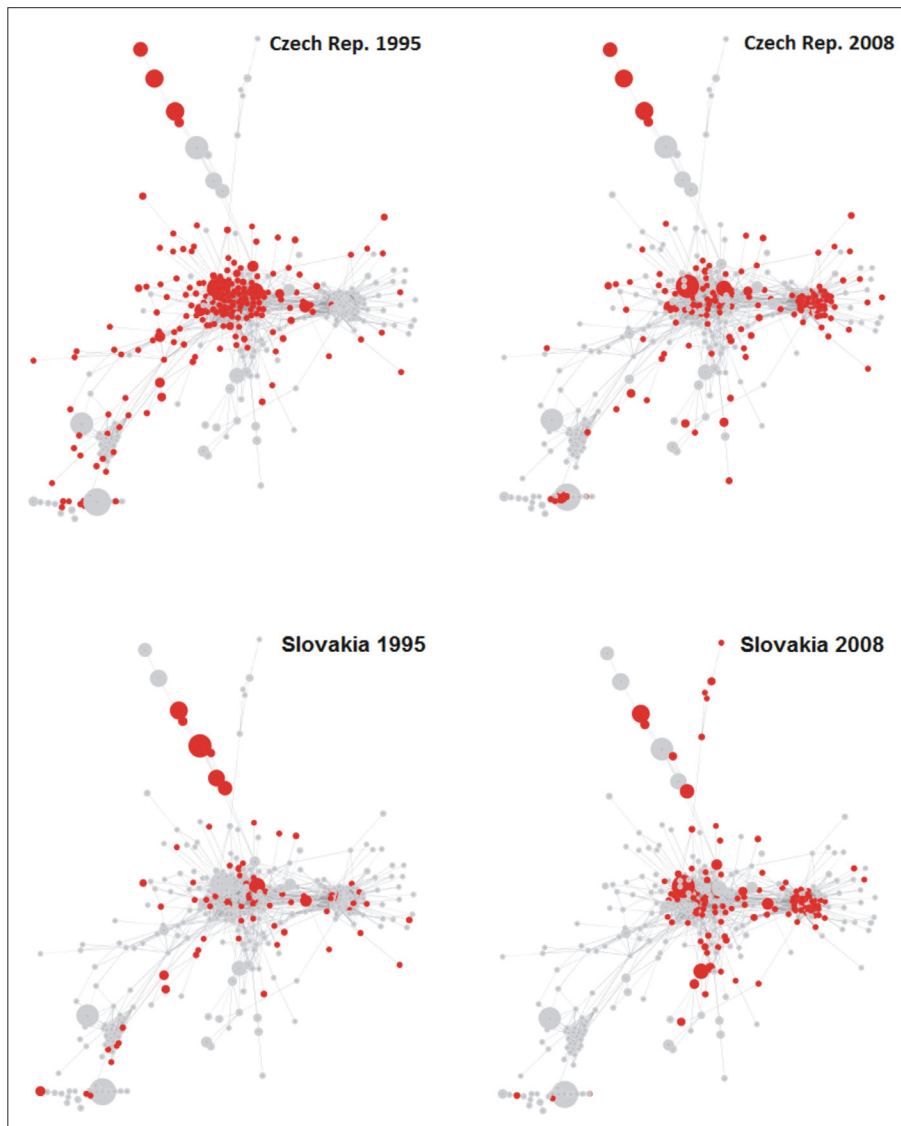
The first country under analysis is the Czech Republic. In this case, the structural change in exported carbon dioxide is very significant. In 1995, the RCA in exported carbon dioxide (meaning sectors with relatively more exported carbon dioxide when compared with other sectors) is mainly in metals, chemicals, and leather and textile. Even though heavy machinery dominated Czech industry before 1989, economic decline and restructuring was relatively quick and before 1995 many large companies went out of business or decreased production (Pavlínek and Pickles, 2002). In 2000, the situation is very similar to the situation in 1995. In 2008, the red nodes shifted in the figure towards machinery and vehicles and transport equipment. By 2008, the Czech Republic lost RCA in carbon dioxide exports in chemicals and textile. The manufacture of chemicals is an industry with the highest carbon intensities, but for textiles the opposite is true. Despite that, the share of exports of goods and services as a percentage of GDP has been steadily increasing (from 39% to 64% over the study period). This indicates major structural changes in the economy. In comparison to other V4 countries, the Czech Republic has RCA in more product categories over the whole period. This is probably one of the reasons why the Czech Republic has not yet become a net importer of carbon dioxide emissions.

In 1995, the Slovak Republic had RCA in exported carbon dioxide emissions only in a few industries (product categories), and most of them belonged to either metals or textiles and the leather industry. In 2000, the number of industries with RCA decreased further; however, in 2008 the structure had changed significantly. In terms of carbon dioxide emissions, the RCA is mostly in machinery, metals, vehicle and transport equipment, but in office and electronics as well.

Another transition economy, Hungary, experienced large changes too. In 1995, Hungary had RCA only in apparel and footwear, and wood and paper. In 2000, there is a move towards machinery and electronics. In 2008, this is further amplified and machinery and electronics belong to the sectors with the highest number product categories with RCA. In this respect, Hungary differs from the other V4 countries since it does not have RCA in transport equipment industry. This can be attributed to the fact that the automotive industry is the largest exporting industry in all V4 economies except Hungary (OECD, 2015b).

Even more significant changes can be observed in Poland. In 1995, there are RCAs in carbon dioxide exports only in several sectors even though Poland is one of the largest net exporters of embodied emissions. The RCAs are mainly in leather, the textile and rubber industry, and in metals exports. In 2008, more sectors in Poland have RCAs in carbon dioxide export. It has shifted from metals

<sup>4</sup> The figure in full-scale is available at: <https://www.dropbox.com/sh/c3vqi6666rozn48/SKgoconnfT>



*Fig. 3: Product space of embodied emissions in export 1990–2008 (Czech Republic, Slovak Republic). Notes: Within the network, red nodes depict the products where countries under analysis have developed comparative advantage. The product space network from 2008 is fixed so that we can easily assess the changes. Some peripheral parts of graphs had to be cut off; <https://www.dropbox.com/sh/1amx5fwz1t16cwylAADV9r21ppdBB9zO95Stf4Vqa?dl=0#>. Source: own construction (using Cytoscape 2.8.0); force-directed layout*

and leather, and the textile and rubber industry, towards machinery, vehicles and transport machinery, and office and electronics machinery sectors. Quite paradoxically, even though the number of sectors with RCA in carbon dioxide emission has risen over time, Poland has become net importer of emissions embodied in international trade. This can be explained by the growth of purchasing power and the volume of international trade as such. Similar to Slovakia and Hungary, the change in carbon dioxide consumption/production structure (net exporters becoming net importers) seems to be a standard trajectory of a transition towards a more developed (consumption-oriented) economy.

In general, in all V4 countries, there is an obvious shift away from the leather and textile, metals and chemicals clusters – towards the machinery and transport equipment industry. In Hungary or Slovakia, the electronics industry is also more significant in terms of RCA in exported emissions. In the Czech Republic, the electronics industry exports contain 60% of foreign value-added (OECD, 2015a). Since in our calculations we take only domestic value-added exports into account, this is probably the reason why the Czech

Republic does not have RCA in exported emissions in this industry. A common feature of the V4 countries is a move away from carbon-intensive industries (such as chemicals and metals) to the less carbon-intensive industries. This corresponds with the FDI inflows, which were directed towards export-oriented industries, especially the automotive industry due to their comparative advantage in assembly and labour-intensive manufacturing (Humphrey et al., 2000). The EU accession surely played an important role in the changes that occurred between 2000 and 2008, since it was accompanied by the largest FDI inflow over the period in all V4 countries (UNCTAD, 2012). This industrial restructuring definitely contributed to the decrease in carbon dioxide emissions production. Furthermore, despite the fact that exports as a percentage of GDP almost doubled over the studied period, carbon dioxide emissions from manufacturing embodied in exports increased only slightly. The calculations of exported emissions are based on value-added exports. Despite that, RCA in exported emissions differs slightly from the RCA based on the value-added exports. For example, Poland still has RCA

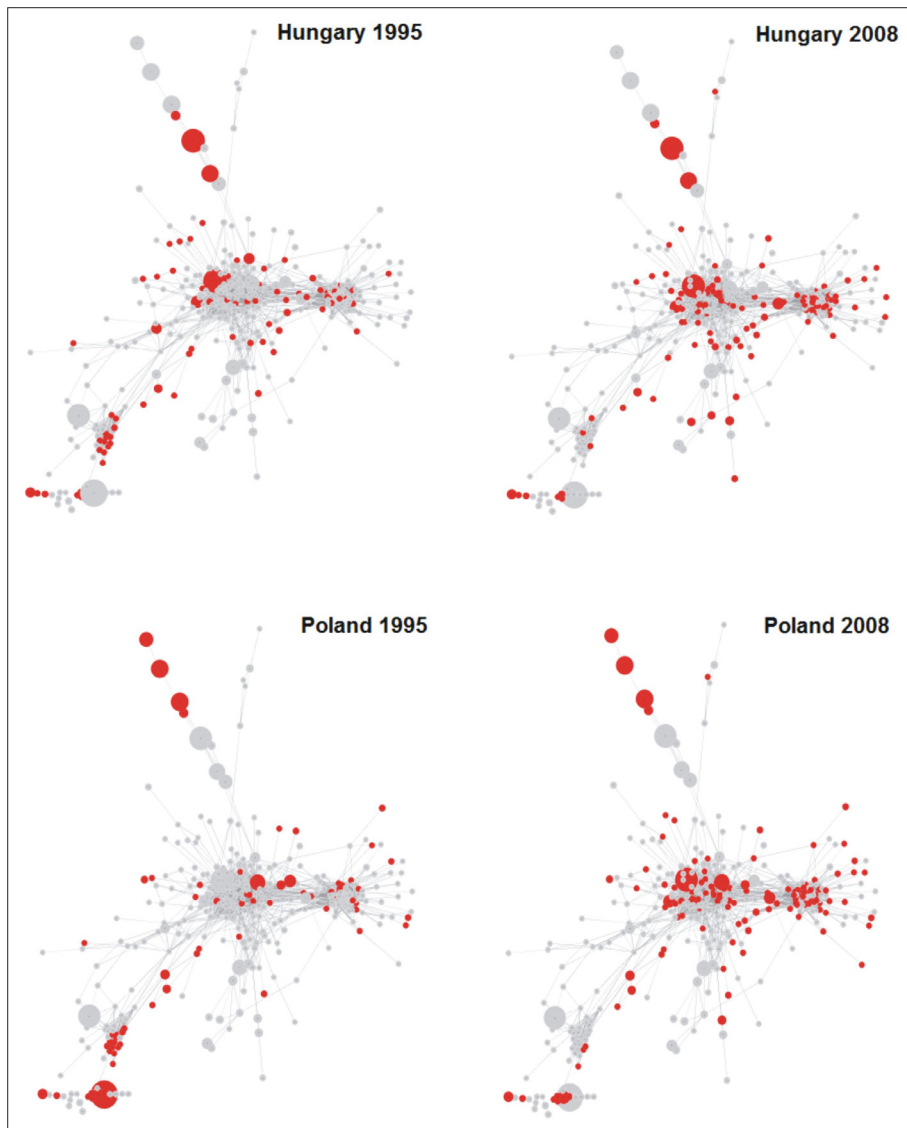


Fig. 4: Product space of embodied emissions in export 1990–2008 (Hungary, Poland). Note: Within the network, red nodes depict the products where countries under analysis have developed comparative advantage. The product space network from 2008 is fixed so that we can easily assess the changes. Some peripheral parts of graphs had to be cut off; <https://www.dropbox.com/sh/1amx5fwz1t16cwy/AADV9r21ppdBB9zO95Stf4Vqa?dl=0#>. Source: own construction (using Cytoscape 2.8.0); force-directed layout

in manufacturing NEC (not elsewhere specified) based on value-added exports. Based on the network analysis, we can also predict future trajectories in terms of exported carbon dioxide emissions. The networks indicate that the exported carbon dioxide emissions in terms of RCA will further concentrate in machinery and transport industries, and in some countries also to the electronics industry.

## 5. Conclusions

In this paper, we have studied the carbon dioxide emissions embodied in international trade, with special attention to Central European countries. The main goal was to assess the changes in these countries in terms of emissions production and consumption. Major attention was given to the manufacturing sector.

Globally, since 1990 there have always been more net importers than net exporters. This disparity has been steadily rising. This means that fewer countries are responsible for the amount of carbon dioxide embodied in international trade, even though the volume of embodied

emissions as such is rising (most significantly in China). Generally, BEET has changed mostly in countries which have experienced important political or/and economic changes, such as the Central European countries. At the beginning of the transformation period in 1989, all V4 countries were exporters of carbon dioxide emissions. Despite the fact that production of emissions decreased slightly in all countries, the consumption of CO<sub>2</sub> emissions increased at a faster pace. Several factors contributed to the decrease in carbon dioxide emissions. Economic decline, industrial restructuring, the introduction of environmental legislation and less carbon intensive technologies, are probably the major ones. On the other hand, growing incomes, preferences for foreign consumer goods and an increase in the number of passenger cars, contributed to the growth in consumption of carbon dioxide emissions. Over time, all the V4 countries except the Czech Republic became net importers of carbon dioxide emissions. The change in carbon dioxide consumption/production structure (net exporters becoming net importers) appears to be the 'standard trajectory' of a transition toward a more developed and consumption-oriented economy.

Furthermore, we explored patterns of these embodied emissions through a network analysis. Based on the application of several data sources, such as international trade data, domestic value-added embodied in exports, carbon dioxide emissions from manufacturing and carbon intensities of individual industries, we calculated carbon dioxide emissions embodied in trade for 128 countries at a highly disaggregated product level (527 product groups). We limited our analyses to manufacturing industries, where the majority of traded (embodied) carbon dioxide emissions occur.

We used these balances for studying patterns of embodied emissions through network analysis. Within this network, product space, the sectors with similar exporting structure cluster, are recorded. This similarity was based on relative comparative advantages (RCAs) of individual countries in the export of carbon dioxide emissions. In other words, sectors which are exported by similar countries and at the same time these countries export relatively more embodied emissions than other countries in these sectors, are considered similar and are clustered in the network. These networks also help to explain the changes in carbon dioxide production, since industrial orientation plays an important role in terms of exports of emissions embodied in trade due to the differences in carbon intensities. Within the product space, three main clusters appeared. One cluster comprises predominantly the machinery sectors, the second one the textile and apparel sectors, and the third sector represents electronics. Other sectors are clustered less significantly or not at all. Moreover, these three largest clusters drifted apart, indicating more intensive specialization. Interestingly, the correlation between trade network and emissions exports has risen significantly during the study period.

Finally, we studied the evolution of RCAs in exported carbon dioxide emissions in the V4 countries. These countries (unlike other countries such as United States) showed significant shifts of these RCAs. In 1995, V4 countries had RCAs in CO<sub>2</sub> exported emissions in industries such as metals, chemicals, and textile and leather. In 2008, they have RCA mostly in the vehicle and transport equipment, machinery, and electronics industries. This is consistent with FDI inflows, which were directed mainly towards the automotive industry (Pavlínek et al., 2009; Humphrey et al., 2000). In addition, the automotive and machinery industry are closely connected, since many supplying companies of car producers belong to the machinery industry. These industries have lower carbon intensities, whereas metals and chemicals have the highest carbon intensities. Industrial restructuring is thus probably the major reason why exported emissions increased only slightly in the V4 countries, whereas the share of exports to GDP almost doubled over the study period. The differences in industrial orientation and exported CO<sub>2</sub> emissions between the V4 countries are small: for example, the electronics industry is less important in the Czech Republic, whereas transport equipment is less represented in Hungary. RCAs in carbon dioxide emissions differ slightly from RCA based on value-added exports.

There are several avenues for future research. First of all, the methodology can be improved and more sophisticated modelling can be introduced. More attention should be given to changes in consumer patterns in the transition countries. Furthermore, the impacts of increased attention given to the reduction of carbon dioxide emissions and increased energy efficiency in the EU set in the goals of strategy Europe 2020, should be explored in the V4 countries. There is relevant public

support for environmental projects such as the “Green Saving Programme”, targeted at energy efficiency in the Czech Republic, and its impacts on BEET would be very interesting. Moreover, the time span of the analysis may be extended in order to account for the impacts of economic crises, especially in relation to the global slump in international trade, which was surprisingly accompanied by growth in carbon dioxide emissions after the crises (Peters et al., 2012)

These findings have some important practical implications. First of all, it should be considered whether the responsibility for global emissions should be assessed solely according to their production, or whether also consuming of emissions embodied in international trade, should be controlled. Despite academic discussions regarding the importance of the “consumption” of carbon dioxide emissions (Peters and Hertwich, 2008; Turner et al., 2007 etc.), the extension of the Kyoto protocol from the U.N. Framework Convention on Climate Change conference held in 2012 in Doha, did not result in any changes in this respect. But, the consumption of goods in economies which like to consider themselves as ‘clean’ (such as Germany), implies production of these emissions elsewhere, typically in China. Since some of these emissions (carbon dioxide above all) are global and thus affect the whole planet, even the “clean economies” are responsible for the detrimental effects of carbon dioxide produced in China, such as global warming. We believe that more scientific and political attention should be given to this problem.

## Acknowledgement

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**Supplementary material:**

<https://www.dropbox.com/sh/1amx5fwz1t16cw/AADV9r21ppdBB9zO95Stf4Vqa?dl=0#>

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# Labour productivity of agricultural business companies and cooperatives in the Czech Republic: A micro-regional level analysis

Jan ŽENKA <sup>a\*</sup>, Petr ŽUFAN <sup>a</sup>, Luděk KRTIČKA <sup>a</sup>, Ondřej SLACH <sup>a</sup>

## Abstract

*Drawing on empirical evidence from the Czech Republic, differences in agricultural labour productivity at the micro-regional level are examined. The role of geographical factors: natural conditions, landscape fragmentation, localisation and urbanization economies, are discussed. In addition, we also test the effects of farm size structure to capture the results of internal scale economies. The key importance of natural conditions is confirmed: they were significantly more important than farm characteristics such as size structure, ownership status and mode of production. Regional agricultural labour productivity was positively influenced by the nominal price of agricultural land and population density. Surprisingly, micro-regions dominated by large farms performed at lower productivity levels than micro-regions with fragmented farm size structure in the Czech Republic.*

**Keywords:** agriculture, labour productivity, micro-region, localisation economies, urbanisation economies, Czech Republic

## 1. Introduction

Agricultural productivity has been studied extensively both at an (inter)national level (e.g. Hayami and Ruttan, 1970; Retortillo and Pinnila, 2005; Headey, et al. 2010; Alexiadis et al., 2013; Giannakis and Bruggeman, 2015) and at a farm level (e.g. Alvarez and Arias, 2004; Helfand and Levine, 2004; Bojnec and Latruffe, 2013). There is a well-developed theoretical framework and empirical tests considering the question why and how states differ from each other in terms of agricultural productivity or what are the most important factors of a farm's productivity. On the other hand, little has been written about agricultural productivity at the regional level. This is quite surprising, considering the persisting importance of the Common Agricultural Policy in the European Union (EU) and claims about regional convergence and cohesion. Although in the majority of rural regions agriculture is only one of the drivers of economic and employment growth (Terluin, 2003), and despite the focus on non-production functions of agriculture, competitive agricultural production is still of strategic importance (Giannakis and Bruggeman, 2015).

Recent studies concerning the issue of regional agricultural labour productivity level (Ezcurra et al., 2011; Esposti, 2011; Cuerva, 2012; Latruffe et al., 2012) were performed at the NUTS2 or NUTS3 levels. While Esposti (2011) provided a comprehensive analysis of regional agricultural productivity in Italy (focusing on total factor productivity), Latruffe et al. (2012) compared regional productivity levels of farms in France and Hungary without considering geographical factors. Cuerva (2012: 255) defined the group of less productive regions as those with smaller farm size, less skilled labour force, more aged workers and lower degree of mechanization. Similarly, Ezcurra et al. (2011: 130) found positive relationships between agricultural labour productivity and per capita GDP, investment per worker and mean farm size, and

negative effects of the share of less favoured areas, the farm owner's age, the percentage of non-owned land and regions specializing in field crops and grazing livestock.

Therefore, we identified three current gaps in the research on regional agricultural labour productivity in the European Union. Firstly, none of the above-mentioned authors studied the effect of agglomeration economies on farm productivity. Second, except for the case study of Hungary (Latruffe et al., 2012), there is a lack of knowledge about regional differences in agricultural labour productivity in Central and Eastern Europe. Thirdly, as far as we know, there has been no systematic research carried out on agricultural labour productivity at a micro-regional level to date.

There are several arguments why analyses of this kind could improve our understanding of agricultural labour productivity and its factors. The micro-regional level allows for more detailed analyses of the following relationships:

- the effects of natural conditions and land-use on agricultural labour productivity since NUTS2 and NUTS3 regions can be internally too heterogeneous for such an assessment;
- localisation and cluster economies resulting from the spatial concentration of farms or the co-localisation of farms and the food processing industry;
- urbanisation economies that may increase agricultural labour productivity in metropolitan regions and their hinterlands; and
- geographical descriptions that link the quality of the good to its geographical origin (Belletti et al., 2015: 94), where the particular locality with its natural resources, know-how, culture and traditions may be the key source of competitive high value-added agricultural production.

In this paper, we aim to fill the gaps and evaluate the importance of geographical factors in explaining differences

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in agricultural labour productivity at the micro-regional level<sup>1</sup>. Our research goal is to describe and explain current micro-regional disparities in agricultural labour productivity in the Czech Republic. We focus on the labour productivity of agricultural business companies and cooperatives. Private farms were excluded from the analysis because there are no available data covering economic indicators for private farms at a micro-regional level. We test the effects of natural conditions (measured by the nominal price of agricultural land), population density as a proxy for urbanization economies and farm density, and employment in the food processing industry and regional specialization in agriculture as proxies for localisation economies. In addition, farm size structure is evaluated in order to compare the effects of internal and external scale economies. This discussion begins with a brief list of selected factors of regional agricultural labour productivity, and the formulation of hypotheses for statistical testing.

## 2. Theoretical departures and hypotheses

Even in countries close to the technological frontier, agricultural productivity still responds significantly to natural conditions (Ruttan, 2002). In general, natural conditions for agriculture are defined by the sum of multiple natural factors, in particular by the characteristics of geological relief, soil preconditions and the climatic characteristics of the area (Bičík and Jančák, 2005). All other things being equal, the combination of mild climate, flat terrain and high quality soils should translate into higher yields, and therefore to higher labour productivity. Conversely, agricultural labour productivity in mountainous areas would suffer from a harsh climate and steep slopes, limiting the use of machinery and increasing the risk of soil erosion (Grigg, 2003) and slope deformations (Hradecký and Pánek, 2008).

The highest agricultural labour productivity can be therefore expected in fertile lowland areas, which allow for intensive agricultural production with high capital inputs in terms of machinery and fertilisers. On the other hand, extensive agriculture in higher altitudes oriented to pastoral farming can also exhibit relatively high labour productivity levels due to low labour inputs into such kinds of activity. In general, the effects of natural conditions on agricultural productivity can be operationalized through a synthetic variable: “mean nominal price of agricultural land”<sup>2</sup> (Bičík and Jančák, 2005; Martinát and Klusáček, 2014). Our first hypothesis states that:

- *H1: There is a positive relationship between the nominal price of agricultural land and agricultural labour productivity at the micro-regional level.*

Farm size as a proxy for internal scale economies is one of the most common predictors of farm productivity (Alvarez and Arias, 2004). There are no conclusive findings relating these two variables. Many studies propose an inverse relationship between farm size and productivity (e.g. Bardhan, 1973; Bhalla and Roy, 1988). Considering the low likelihood of decreasing returns to scale (Vollrath, 2007), an inverse relationship between farm size and productivity can be explained by the costly monitoring of workers (Binswanger and Rosenzweig, 1986), or by the lower average quality of land owned by large farmers, who often buy (even low

quality) land from smaller farmers to become monopolists in local land markets (Vollrath, 2007).

Diseconomies of scale were, however, documented in developing rather than in developed economies and rather for land productivity than for labour productivity. The latter should be positively related to farm size (for empirical evidence, see for example: Ezcurra, 2011; Cuerva, 2012; Adamopoulos and Restuccia, 2013). Increasing farm size reflects indirectly a more efficient division of labour, higher capital endowments and easier access to raw materials (Karagiannis and Sarris, 2005). Higher and increasing capital/labour ratios capture embodied technological change, which is tightly positively related to labour productivity (Ball et al., 2001; Sakellaris and Wilson, 2004). Higher capital endowments in terms of machinery, fertilizers or irrigation should translate into higher levels of labour productivity (Retortillo and Pinilla, 2005). In addition, small farms may have alternative sources of income, therefore putting less effort and investment into farming compared to larger farmers (Coelli and Battese, 1996).

Our second hypothesis is that:

- *H2: Micro-regions with a concentrated farm size structure (dominated by large farms) exhibit higher agricultural labour productivity than micro-regions with a fragmented farm size structure (many smaller farms).*

Relationships between farm size structure and agricultural labour productivity at a regional level may be ambiguous however. A fragmented farm size structure may reflect the spatial clustering of many small agricultural enterprises producing the same commodity. These farms can benefit significantly from the spatial density of economic activities (Ciccone and Hall, 1996) through the effects of localisation economies in terms of labour market pooling, developed supplier networks and localized knowledge spillovers (Henderson, 2003). A higher labour productivity of farms can be also spurred by the effects of reduced transport costs. Moreover, a combination of agglomeration effects, local tradition, highly specialized and contextual know-how and predominantly incremental technological innovations, is a powerful source of regional path-dependence and increasing returns (Martin, 2006). Highly persistent and successful wine clusters in California (Porter and Bond, 2008) or Chile (Giuliani and Bell, 2005) document this kind of positive development.

Therefore, the spatial concentration of farms can be used as a proxy for the effects of localisation economies in agricultural production. Nevertheless, farm density can be significantly distorted by natural conditions. In micro-regions with high shares of mountainous or environmentally-protected areas, farm density will be relatively low despite the possibility of high spatial concentration of farms in lowland areas. This is the reason why we decided to test two other proxies for localisation economies: the relative regional specialization in agriculture measured by the share of agriculture in regional employment, and the share of the food processing industry in regional employment.

The relationship between regional specialization in agriculture and agricultural labour productivity is also ambiguous (Ezcurra et al., 2011). On one hand, high shares of agriculture in regional employment may result from the

<sup>1</sup> Municipalities with extended competences (small districts) – administrative units that roughly correspond with nodal regions

<sup>2</sup> For definition and discussion see Section 4

inability of a region to attract and develop manufacturing or service activities. On the other hand, specialization may result from a high level of investment in the agricultural sector (Ezcurra et al., 2011), a shift towards high value-added agricultural products or the development of a functioning ecosystem, working simultaneously as a supply system, a local labour market matching system, and also a context for knowledge diffusion (Kemeny and Storper, 2015: 5). Regional specialization in the food processing industry may boost localisation (cluster) economies through local backward linkages and potential for localised technology spillovers. As such, we test the possibility that:

- *H3: Agricultural labour productivity at a micro-regional level is positively related to farm density, the share of agriculture in regional employment, and the share of the food processing industry in regional employment.*

Apart from natural conditions, urbanization rate, population and firm density are key geographical factors influencing agricultural productivity levels. The relationships between these variables are complex and there are various mechanisms through which urban proximity and population density alter productivity rates of farms. In general, urban proximity increases the productivity of farms, which are pressured by high rents to improve their efficiency or move towards the production of higher value-added and high yield commodities (Sokolow, 2003). Heimlich and Barnard (1992: 50) argue that "...farms in metro areas are generally smaller, produce more per acre, have more diverse enterprises and are more focused on high value production than non-metro farms". Farmers may also capitalize on urbanization economies, such as proximity to large markets for their commodities and the opportunity to sell directly to final customers (such as restaurants) without incurring high transaction costs (Heimlich and Barnard, 1992).

The higher rate of competition in the labour market in metropolitan regions is another factor, which pushes the farms to a higher labour productivity. The agricultural labour force has a wider possibility of asserting itself in sectors with higher average wages (e.g. in the services sector). Besides the competition in the labour market, the higher average wages of the metropolitan labour market also have an impact on the higher personnel costs of farms. As a result of the above-mentioned cost factors, the farms are pushed to achieve higher labour productivity in order to retain their competitiveness (Grigg, 2003).

On the other hand, there also some limits to agricultural productivity in highly urbanised and densely populated areas. Farmers may be legislatively constrained in their activities. For example, night farming can be prohibited because of noise. Correspondingly, aerial and ground spraying can be prohibited in order to protect the health of local residents (Sokolow, 2003). In addition, farmers in highly urbanised areas often avoid high capital investment in anticipation of selling their land for urban development, which lowers their productivity levels (Sokolow, 2003: 295). Although both positive and negative effects of the urbanisation rate and population density on agricultural labour productivity have been identified, we expect that positive effects will prevail and our next hypothesis is that:

- *H4: There is a positive relationship between population density and agricultural labour productivity at the micro-regional level.*

These four hypotheses can now be tested for the case of the Czech Republic.

### 3. Agriculture in the Czech Republic

The most recent analysis of agricultural productivity in the European Union (Giannakis and Bruggeman, 2015) classified the member countries into two clusters – the highly-performing "Northern-Central European countries" (around the North Sea) on one hand and poorly-performing "continental peripheries" on the other. The second group included the Mediterranean, East-Central, Northern Scandinavian and Celtic (Ireland) countries. Perhaps surprisingly, the Czech Republic was a member of the first cluster of high performers – together with Belgium, Denmark, Germany, France, Luxembourg, Netherlands and the United Kingdom. All other East-Central European (ECE) countries fell into the group of the lower productivity 'continental peripheries'.

According to these authors, the Czech Republic performed better than other ECE countries due to higher technical efficiency, human capital and a larger average size of farms. Although Czech agriculture has certainly not completely shaken off the socialist legacy of poor management and an interrupted tradition of rural entrepreneurship, these results caution researchers about 'one-size-fits-all' approaches to agricultural productivity in East-Central European transition countries. At this point, a brief contextualisation of regional differences in factors influencing agricultural labour productivity at the micro-regional level is necessary.

While the share of less favoured areas (LFAs) in the Czech Republic is lower than in the majority of EU28 countries, 42% of all Czech municipalities (Pelucha et al., 2013) and almost one half of the agricultural areas are located in LFAs (Giannakis and Bruggeman, 2015): see Fig. 1. Therefore, overall, natural conditions in the Czech Republic are generally not very favourable for intensive crop production, because hilly areas and highlands prevail (Bičík and Jančák, 2005).

At the same time, there is relatively high regional variability in the nominal price of agricultural land as a synthetic variable of natural conditions for agricultural production (Fig. 2). The most important distinction is between fertile lowlands along the main rivers and their catchment areas – Labe (micro-regions such as Roudnice nad Labem, Kolín, Nymburk, Hradec Králové), Ohře (e.g. Žatec, Louny), Morava (e.g. Olomouc, Prostějov, Přerov, Kroměříž, Vyškov, Břeclav) and Dyje (Znojmo) on the one hand, and mountainous borderland areas (e.g. Prachatice, Český Krumlov, Semily, Šumperk), together with the highland "Vysočina", on the other (see Fig. 1 and Appendix 1). The former allow for highly intensive crop and livestock production. Mountainous areas in the borderlands combine high average altitude with sloping relief, limiting the use of machinery and providing better conditions for extensive livestock production (Věžník et al., 2013), as well as ecological farmers (Hrnčiarová et al., 2010: 173).

Moreover, Vysočina and some other inland hilly areas (Strakonice, Písek, Jindřichův Hradec, Beroun, Benešov) exhibit a relatively high intensity of livestock (mostly pig) production (Hrnčiarová et al., 2010: 173). It is important to note that intensive production of pigs and poultry is significantly less constrained by natural conditions than other types of agricultural production. This may disturb any observed relationship between the nominal price of agricultural land and agricultural labour productivity. Nevertheless, in 2012 the share of pig production in Czech agricultural production overall was only 7.6%, and the share of poultry production stood at 4.8% (CSO, 2013a).

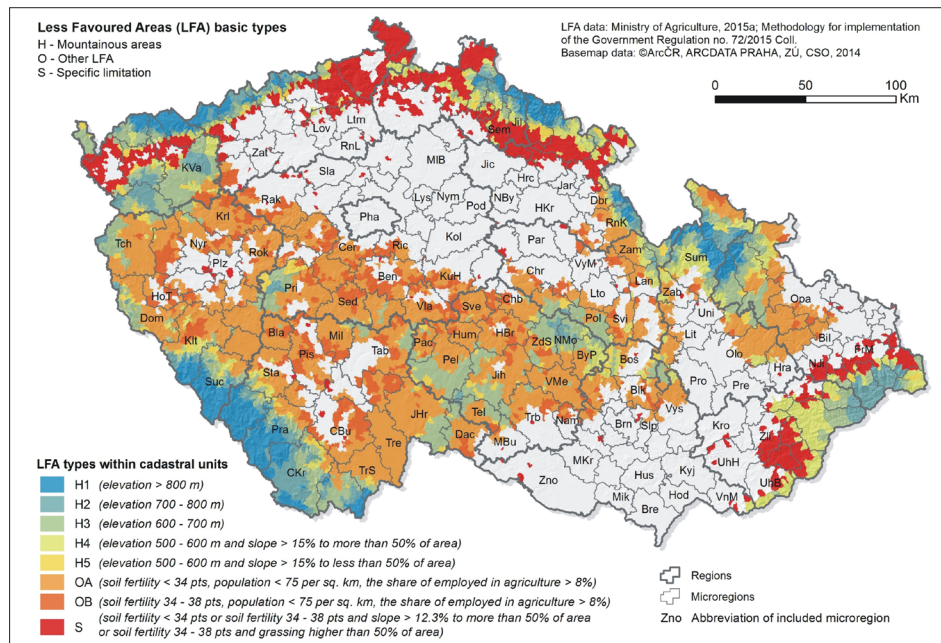


Fig. 1: Less favoured areas (LFAs) in the Czech Republic (2015)  
Sources: Ministry of Agriculture, 2015a; Ministry of Agriculture, 2015b

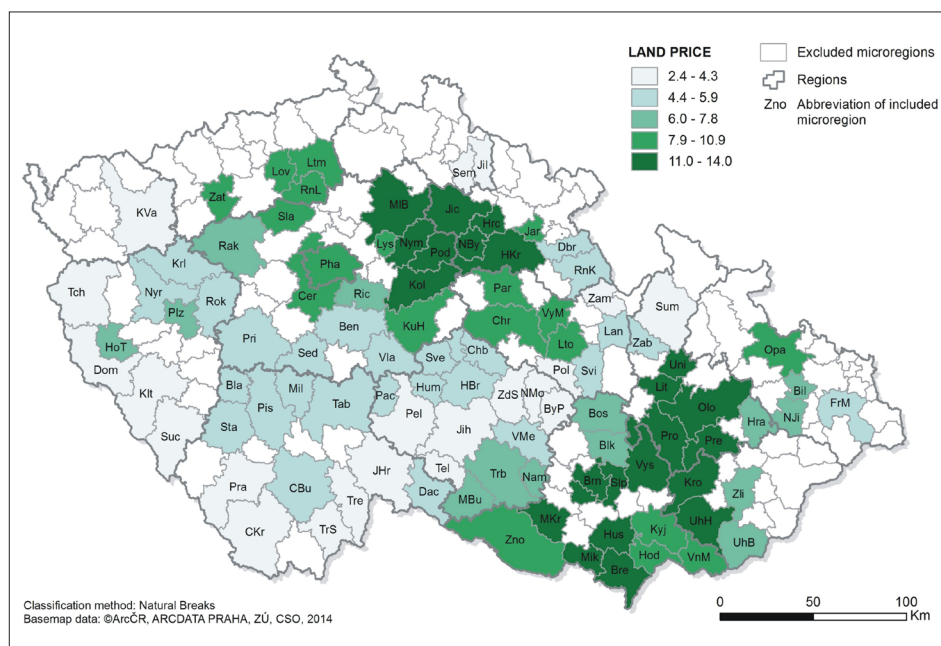


Fig. 2: Nominal price of farmland (CZK per  $m^2$ ). Source: VUMOP, 2014

When considering the structural characteristics of farms, it is possible to identify three basic features of Czech agriculture:

- the dominant position of large farms (Grešlová et al., 2015);
- a high share<sup>3</sup> of agricultural cooperatives in agricultural employment; and
- a relatively low share of utilised agricultural area operated by private farmers (CSO, 2013b).

The lowest share of agricultural cooperatives and the highest share of private farmers can be found along the

borders with Germany – a belt stretching between Tachov and Liberec (Věžník and Bartošová, 2004). Before 1989, agricultural production in this area was dominated by state-owned farms, which were established in order to farm the land obtained by the state after the exodus of the German speaking population in 1945–1946 (Bičík and Jančák, 2005). For the same reasons, these and other mountainous boundary micro-regions also exhibit the highest share of large farms in agricultural employment. In contrast, the densely inhabited areas of large inland cities such as Prague or Hradec Králové (Fig. 3) and some highly fertile lowland areas (Znojmo, Přerov), are characterised not only by a smaller average size

<sup>3</sup> In 2009 it was roughly one third in agricultural employment, when excluding individual farmers (RES 2009).

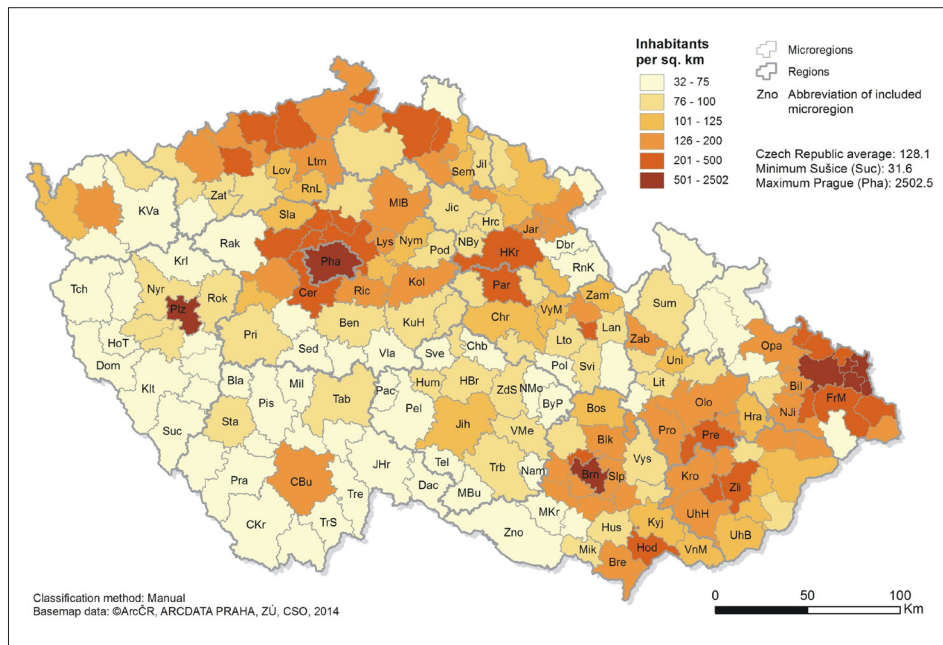


Fig. 3: Population Density in the Czech Republic (2014)  
Sources: ARCDATA PRAHA and CSO, 2014

of farms (in terms of employment), but also by a high level spatial concentration of farms per hectare of agricultural land.

The Czech Republic (and Slovakia) are characterised by the largest share of agricultural land tilled by large farms (Eurostat, 2011). As such, these countries provide an excellent case (Kofroň, 2012) for studying the effects of internal scale economies on regional agricultural productivity. In other words, if internal scale economies are really a relevant factor in regional labour productivity, they should be manifested in the Czech Republic and Slovakia.

#### 4. Material and methods

We draw on the unique database collected by the Czech Statistical Office (CSO, 2009b), compiled from raw microeconomic firm level data aggregated into 206 administrative micro-regions, the so-called municipalities with extended competence. The data cover agricultural employment and financial indicators such as production, value-added, and wages for the year 2009. We use this source to calculate our dependent variable – agricultural labour productivity, defined for our purposes as annual agricultural production per employee.

Data were available only for business companies and agricultural cooperatives; individual farmers were not included. The share of utilised agricultural area operated by private farmers in the Czech Republic, however, is only 30.5% (CSO, 2013b), and they dominate in micro-regions along the Czech-German borders – units with low agricultural employment that were excluded from our analysis. For determining the mean nominal price of agricultural land we used the data of the VUMOP (2014) – the Research Institute for Soil and Water Conservation – including the so-called system of evaluated soil ecological units (SESEU). The valuation of the agricultural land is determined from the specific characteristics of the land (in particular by its fertility), which were surveyed in the framework of the land resources valuation. The valuation comprises the basic natural characteristics like the climate, soil types, slope inclination, granularity, and the topsoil depth for each specific plot.

The economic SESEU valuation is based on a parametrized subsistence yield of the ten main field crops (winter wheat, rye, oats, barley, grain corn, potatoes, sugar beet, silage corn, perennial fodder plants, rape), and normative costs spent on their production (see Novotný et al., 2013, for details). As a criterion for determining the official prices of the agricultural land, we used the economic “HRRE” (gross annual rental effect) valuation of the vegetable production in the given agro-ecological conditions with normatively determined farming efficiency. It is important to note that the prices of agricultural land are nominal and can be used only as a synthetic variable of the soil quality. As such, they do not correspond with market prices (Bičík and Jančák, 2005), which may be significantly influenced by the proximity to larger cities (Sklenicka et al., 2013), food processing plants, markets or state borders.

To account for farm size structure, we applied the Herfindahl-Hirschmann Index (HHI) calculated from the relative employment shares of particular firms in the total employment at a micro-regional level. The Herfindahl-Hirschmann Index is formally expressed as:

$$HHI = \sum_a e_a^2$$

where,  $e_a$  is the relative share of a firm in micro-region  $a$  in total employment in the particular micro-region. A concentrated farm size structure is reflected by high values of HHI.

We also employed several variables to cope with the fact that various kinds of agricultural activities may have differential impacts on labour productivity (Ezcurra, 2011; Cuerva, 2012). Our list of independent variables (see Tab. 1) includes the share of arable land in the total agricultural land to distinguish between plant and animal production, and also the share of agricultural land farmed by conventional farmers, to distinguish between intensive commercial and extensive ecological agriculture. Finally, we added the share of agricultural land located in less favoured areas with respect

to the total agricultural area as another synthetic indicator of natural conditions (Ezcurra et al., 2011), reflecting also the potential effects of agricultural subsidies.

The share of business companies in the total agricultural land of a particular micro-region was also added as another control variable. The ownership status of agricultural enterprises is another possible factor of farm labour productivity (Deininger, 1995), and business companies are generally more productive than agricultural cooperatives (Chrastinová, 2008).

We calculated four simple OLS regression models with micro-regional level agricultural labour productivity as the dependent variable (Tab. 3). In all models we employed logarithmic transformations of the independent variables that violated the assumptions of normality. After several empirical tests, we decided to exclude<sup>4</sup> all micro-regions with low agricultural employment (less than 300 employees). These units disturbed any observable regional patterns of labour productivity. Our final sample therefore included only 102 micro-regions. As a result, it was not possible to use spatially weighted regression models to cope with potential spatial autocorrelation because we were not analysing a geographically compact area (i.e., an area without the 'missing' micro-regional data points).

The first model tested the effects of only one (but key) geographical variable – natural conditions – represented by the average nominal land price of 1 m<sup>2</sup> of agricultural land ('Land price'). We ran several regression models, which combined the variable 'Land price' with other explanatory variables such as 'Population density' or 'Farm size structure', but we decided to exclude these models from our analysis because of problems with high multicollinearity.

The second model included 'Population density' as a proxy for urbanization economies, 'Farm size structure' representing internal scale economies, and the share of 'Employment of manufacture of food products in regional employment' ("Food"), capturing potential cluster economies stemming from the co-localisation of agriculture and manufacture of food products. The third model was very similar – the only difference was that localisation economies were represented by the variable 'share of agriculture in regional employment' ("Agriculture"). The variable 'Farm density' was excluded from all models due to extremely high values of the multicollinearity condition number. To summarize, models 2 and 3 attempted to test the effects of internal scale economies, localisation economies and urbanization economies in regional agricultural production, at the same time.

The last model tested the effects of structural variables: 'Farm size structure', the 'Share of business companies in agricultural employment' ("Ownership status"), and the 'Share of conventional farmers in the total number of farmers' ("Conventional farmers"). Therefore, this model attempted to capture the effects of structural farm characteristics with regard to farm size distribution, ownership status and mode of production. Unfortunately, it was not possible to merge the first and the last regression model into a single model that would test the effects of geographical and structural independent variables at the same time. The small number of cases (n = 102) did not allow for a complicated regression

model with more than three independent variables, because the problems of multicollinearity, heteroscedasticity and an extremely high value of the Akaike criterion occurred.

## 5. Results

The basic statistical relationships listed in the correlation matrix (Tab. 2) can be discussed briefly. Surprisingly, almost no statistical relationship was found between the key variable 'Agricultural' productivity on the one hand and the proxies for localisation economies, 'Farm size structure', 'Conventional farmers', and 'Arable land' on the other. Therefore, neither external nor internal scale economies seem to be related to the patterns of agricultural productivity at a micro-regional level. Furthermore, a negative significant correlation (although weak) between 'Agricultural' productivity and 'Ownership status' was documented. This means that micro-regions with higher shares of agricultural cooperatives are on average more productive than micro-regions dominated by business companies.

Table 2 also documents the relatively strong role of other geographical factors. 'Land price' exhibited the strongest positive correlation with 'Agricultural' productivity: better natural conditions in terms of climate, soils and morphology are associated with higher agricultural labour productivity at the micro-regional level. Correspondingly, a weak but significant negative effect of the variable 'LFA share' was found. 'Population density' showed a relatively strong and significant positive relationship with 'Farm density' and 'Land price', but a negative relationship with 'LFA share'. A higher urbanisation rate is thus associated with a higher spatial concentration of farms, which may capitalize on the large market area. There is also a higher share of business companies ('Ownership status') in highly urbanized regions, while agricultural cooperatives dominate in the mountainous borderlands (e.g. Rožnov pod Radhoštěm, Vsetín, Sušice) or the inner peripheries with hilly georelief (e.g. Pacov, Milevsko).

'Farm size structure' correlated (positively) only with the 'share of agriculture' and 'manufacture of food products' in regional employment. Although one could expect that larger farms (in terms of employment) will be concentrated in the fertile lowland areas with high nominal 'Land price', the results did not confirm this initial expectation. Figure 5 reveals the complicated regional patterns of farm size structure, with relatively smaller farms in the borderlands and larger farms in the metropolitan hinterlands of large cities, and in some micro-regions with smaller urban cores, such as Litovel, Lanškroun or Humpolec. Metropolitan regions are characterised by a higher spatial density of farms. Not surprisingly, densely populated areas combine higher average 'Land price' with a lower 'Share of agriculture in regional employment' (with the developed sectors of industry and services) and higher 'Employment in manufacture of food products', reflecting also population size. Therefore, there is relatively strong negative relationship between two possible indicators of localisation economies - regional specialisation in agriculture and employment in the food processing industry. Micro-regions with high employment in the food processing industry are mostly larger cities and their hinterlands, but also some sparsely populated peripheral

<sup>4</sup> We also tried to exclude the largest urban regions, Prague and Brno, that may distort regional patterns of agricultural labour productivity (following Věžník and Konečný, 2011), but the results did not change. Our regression models therefore include Prague and Brno, because both cities had more than 300 employees in agriculture in 2009. The threshold of 300 employees was set empirically after several regression trials.

Variable	Proxy indicator (year)	Abbreviation	Mean	St. Dev.	Data source
Agricultural productivity	Production per employee in thousands CZK (2009)	PROD	958	265	CSO 2009b
Population density	Population density per km (2009)	POPENS	146.6	291.785	CSO 2009a
Farm density	Number of farms per km <sup>2</sup> (2009)	FARMDENS	2.52	1.90	CSO 2009c
Farm size structure	Herfindahl-Hirschmann Index of farm employment (2009)	FARMSIZE	10.36	6.612	CSO 2009c
Ownership status	Share of business companies in agricultural employment (2009)	OWNER	0.71	0.252	RES 2009
Conventional farmers	Share of conventional farmers in total number of farmers (2010)	CONVENT	0.96	0.195	LPIS 2010
Land price	Mean nominal land price in the microregion in CZK per m <sup>2</sup> (2014)	PRICE	7.43	3.321	VUMOP 2014
LFA share	Share of LFAs in total area of the microregion (2010)	LFA	0.50	0.502	SZ 2010
Arable land	Share of arable land in agricultural land (2011)	ARABLE	0.75	0.185	CUZK 2011
Agriculture	Share of agriculture in regional employment (2009)*	AGRIC	0.076	0.048	CSO 2009b
Food	Employment in manufacture of food products (2009)	FOOD	6.60	9.05	CSO 2009b

Tab. 1: Variables employed in the statistical analyses ( $n = 102$  micro-regions)

Note: \* The share of agriculture was not calculated from total regional employment in 2009 (not available), but from regional employment excluding industries not covered by reliable micro-regional level data – mining and quarrying; distribution of water and energy, sewerage and waste management; wholesales and retail trade; repair of motor vehicles and public services. Source: authors

	PROD	POPENS	FARMDENS	FARMSIZE	OWNER	CONVENT	PRICE	LFA	ARABLE	AGRIC	FOOD
PROD		0.204*	- 0.082	- 0.154	- 0.225*	0.149	0.496**	- 0.296**	0.188	- 0.059	0.169
POPENS	0.204*		0.668**	- 0.095	0.380**	0.156	0.595**	- 0.607**	0.327**	- 0.570***	0.414***
FARMDENS	- 0.082	0.668**		0.037	0.466**	0.082	0.360**	- 0.433**	0.143	- 0.323***	0.318***
FARMSIZE	- 0.154	- 0.095	0.037		0.118	- 0.046	- 0.062	0.044	- 0.111	0.230*	- 0.560***
OWNER	- 0.225*	0.380**	0.466**	0.118		0.055	0.262**	- 0.253*	0.061	- 0.116	0.081
CONVENT	0.149	0.156	0.082	- 0.046	0.055		0.162	- 0.202*	0.613**	0.094	0.022
PRICE	0.496**	0.595**	0.360**	- 0.062	0.262**	0.162		- 0.703**	0.270**	- 0.196*	0.175
LFA	- 0.296**	- 0.607**	- 0.433**	0.044	- 0.255*	- 0.202*	- 0.703**		- 0.330**	0.225*	- 0.199*
ARABLE	0.188	0.327**	0.143	- 0.110	0.061	0.613**	0.270**	- 0.330**		- 0.040	0.177
AGRIC	- 0.059	- 0.570***	- 0.323***	0.230**	- 0.116	0.094	- 0.196**	0.225**	- 0.040		- 0.500***
FOOD	0.169	0.414***	0.318***	- 0.560***	0.081	0.022	0.175	- 0.199*	0.177	- 0.500***	

Tab. 2: Correlates of Micro-regional Level Agricultural Labour Productivity (Spearman's rho) Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Source: authors

	MODEL 1		MODEL 2		MODEL 3		MODEL 4	
	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error
Log_POPDENS			0.080	0.050	0.120*	0.057		
Log_AGRIC					0.054	0.048		
Log_FOOD			- 4,12e <sup>-6</sup>	1,83e <sup>-5</sup>				
Log_PRICE	0.281***	0.048						
Log_FARMSIZE			- 0.062	0.056	- 0.068	0.050	- 0.057	0.046
Log_OWNER							- 0.103*	0.047
Log_CONVENT							0.468***	0.137
R <sup>2</sup>	0.256		0.057		0.068		0.161	
Multicollinearity condition number			22.347		32.948		20.753	
Akaike criterion			- 153		- 154		- 164	

Tab. 3: OLS Regression Models: Micro-regional Agricultural Labour Productivity as the Dependent Variable. Note: \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ . Source: authors

regions such as Vlašim, Klatovy or Příbram. On the other hand, there are two different types of micro-regions with high levels of specialization in agriculture:

1. hilly peripheral micro-regions with unfavourable conditions for intensive agriculture such as Pacov, Dačice or Pelhřimov; and
2. fertile lowland areas with favourable conditions for intensive crop production, such as Lysá nad Labem, Hodonín or Znojmo.

OLS regression models showed mixed results (Tab. 3). Most importantly, the first model with only one independent variable explained 25.6% of variance of the dependent variable, significantly more than other regression models. Therefore, the effects of natural conditions seem to be related to agricultural labour productivity to greater extent than farm structural characteristics, mode of production and scale economies at the micro-regional level. The 'Nominal price' of agricultural land is a synthetic variable with high explanatory power, not only because of its complexity, but also because it correlates with other factors of regional agricultural labour productivity such as population density, the share of arable land and the share of business companies.

Regression models (2) and (3) tested the effects of urbanisation economies, localisation economies and internal scale economies simultaneously. Surprisingly, these models failed to explain regional disparities in agricultural labour productivity, explaining only 5.7% (6.8%) of the variability of the dependent variable. A positive effect of 'Population density' on regional labour productivity was found, although

its regression coefficient was significant only in model (3). This means that agricultural labour productivity was higher in urbanised micro-regions with a higher spatial concentration of farms, and lower in less densely populated micro-regions.

Model 4 showed two basic results. No significant positive relationship between 'Farm size structure' and 'Agricultural' productivity was found. On the contrary, while not statistically significant, there was an inverse relationship between these two variables, suggesting higher labour productivity in micro-regions dominated by smaller farms. As discussed above, we also confirmed the negative significant relationship between 'Ownership status' and 'Agricultural' productivity. This means that micro-regions with higher shares of agricultural cooperatives tend to be more productive than micro-regions dominated by business companies. As expected, agricultural labour productivity increases with an increasing share of conventional farmers on a micro-regional basis.

## 6. Discussion and conclusions

The first hypothesis anticipating a positive relationship between the nominal price of agricultural land and agricultural labour productivity was confirmed. Natural conditions have retained their key influence on the regional differentiation in the productivity of agricultural production in the Czech Republic. Areas with the most suitable conditions for agriculture are in the lowlands along the rivers (Figs. 3 and 4). These areas are characterised by weakly dissected relief, warm climate and highly fertile soils

Hypothesis – expected relationship		Confirmed?
H1	There is a positive relationship between the nominal price of agricultural land and agricultural labour productivity at a micro-regional level	Yes
H2	Micro-regions with larger farms are more productive than micro-regions with smaller farms	No Negative slope but not significant relationship
H3	There is a positive relationship between the proxies for localisation economies and agricultural labour productivity at a micro-regional level	No
H4	There is a positive relationship between population density and agricultural labour productivity at a micro-regional level	Yes

Tab. 4: Hypotheses: Confirmed or Rejected? Source: authors

(Bičík and Jančák, 2005), which enable a larger variability of planted crops and an orientation on intensive production of crops (cereals, oil plants) and intensive livestock production (breeding of pigs, poultry and cattle: see Strěleček and Lososová, 2005; Hrnčiarová et al., 2010). But a relatively high concentration of intensive livestock production can also be found in large cities and in peripheral areas with less favourable natural conditions, such as the micro-regions in Vysočina. Therefore, the regional distribution of intensive livestock production (mostly the breeding of pigs and poultry) that is relatively less constrained by natural conditions, may partly distort the relationship between the nominal price of agricultural land and agricultural labour productivity at the micro-regional level.

The second hypothesis was rejected (Tab. 4), because we did not find convincing empirical evidence that a higher share of large farms affects the labour productivity

at a micro-regional level (see Fig. 5). This finding does not correspond with the results of Ezcurra et al. (2011) for the EU15 countries. Further research is needed in order to determine whether there really is no systematic relationship between farm size structure and agricultural labour productivity at the micro-regional level, or whether the rejection of the second hypothesis was caused by the methodological limitations of our research due to the lack of data accessibility. We are aware that our analysis did not include relevant explanatory variables of agricultural labour productivity such as the type of agricultural production (crop or livestock), and other key factors at the individual farm level, such as production technology and management.

From the perspective of the influence of ownership structure on productivity, the results are in compliance with the findings of Davidova et al. (2003), although their

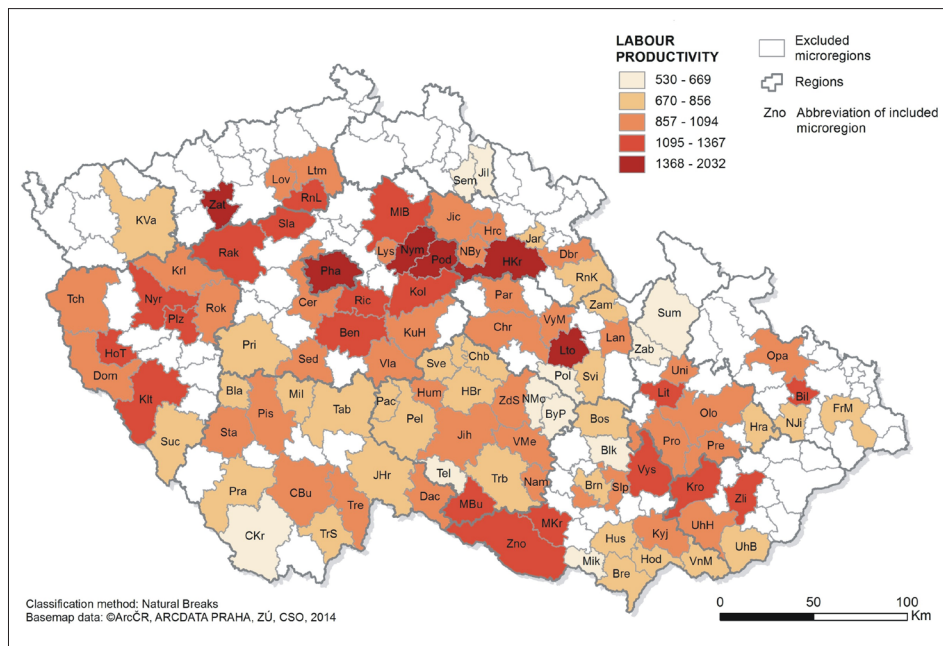


Fig. 4. Agricultural labour productivity at the micro-regional level (2009). Source: CSO, 2009b

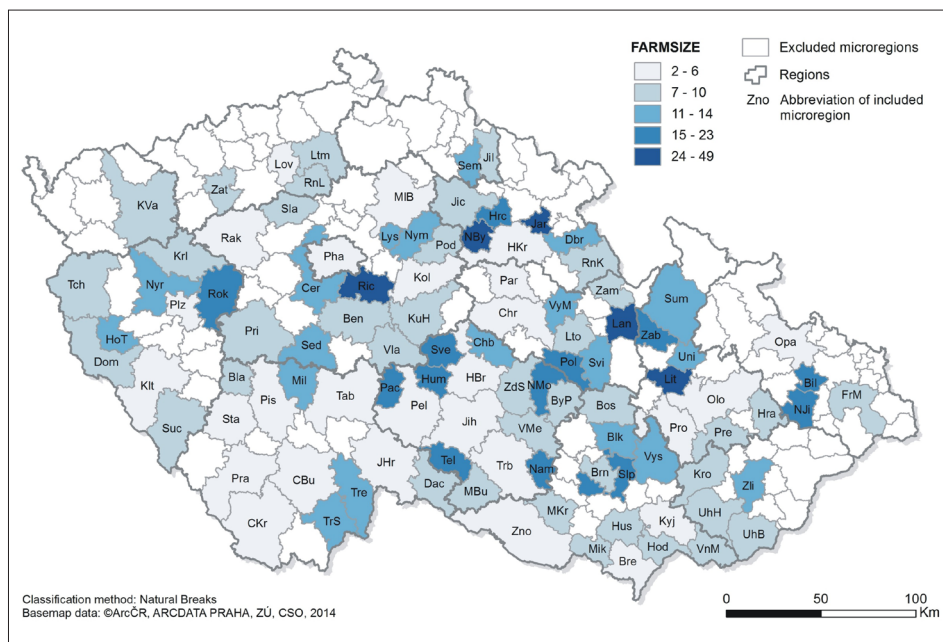


Fig. 5. Farm size structure measured by the Herfindahl-Hirschmann Index (2009). Source: CSO, 2009c



analysis was carried at the firm level. Lower agricultural labour productivity in Czech micro-regions dominated by business companies compared to micro-regions dominated by agricultural cooperatives, can be explained by the lower managerial capacity of business companies compared to the agricultural cooperatives (Davidova and Latruffe, 2007).

Hypothesis 3 was not supported either. We did not find any significant relationships between agricultural productivity, on the one hand, and indicators of potential localisation economies (spatial concentration of farms, share of agriculture in regional employment, and employment in the food processing industry). Although relatively high labour productivity was found in metropolitan regions with a high spatial concentration of farms, peripheral rural regions with high farm densities exhibited relatively low labour productivity. This pattern can be caused by the fact that agriculture in such regions represents a relatively attractive area of farming business because of available subventions for ecological farmers. It has been argued that subventions may negatively affect levels of agricultural labour productivity (Giannakis and Bruggeman, 2015).

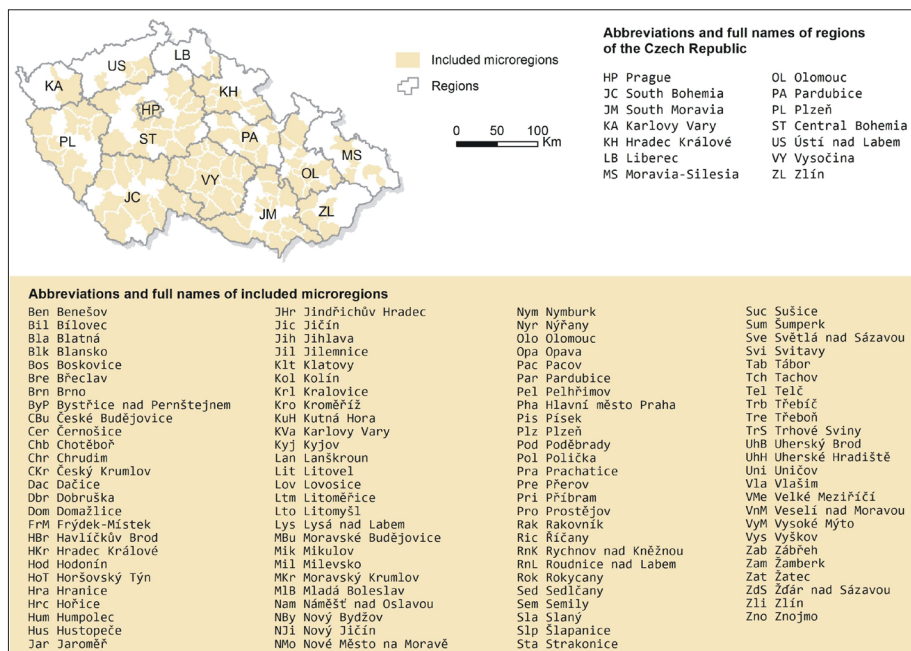
Correspondingly, this finding can illustrate the fact that Czech agriculture has become more extensive and ecological (Věžník et al., 2013). High farm density in less densely populated areas is associated predominantly with a high number of ecological farmers. On the other hand, no statistical relationship between urbanisation rate/population density and farm size structure was found. This finding does not correspond with general expectations that highly urbanised areas will be characterised by a dense network of small farms (Sokolow, 2003).

In accordance with Hypothesis 4, we confirmed the positive influence of population density (urbanisation rate) on labour productivity, resulting probably from the higher wages competition in the labour market and an orientation to higher value-added agricultural products. Additionally, labour productivity in metropolitan hinterlands may be pushed up by pressures of the construction development industry on agricultural land (Sklenicka et al., 2013) as a consequence of uncoordinated suburbanisation.

The focus of this article was to describe and explain, with only a time-limited “snapshot”, the differences in agricultural labour productivity at a micro-regional level for the case of the Czech Republic. The current results confirm the general hypotheses that geographical factors (natural conditions and population density) have significant effects on agricultural labour productivity. Conversely, we did not confirm the hypotheses concerning the positive influence of internal and external scale economies on agricultural labour productivity. One possible reason for this outcome is the continuing high levels of internal heterogeneity of agricultural labour productivity in the framework of individual micro-regions. Further research on geographical factors affecting agricultural productivity in the Czech Republic will require farm-level analyses.

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Appendix 1: Full names of NUTS3 regions and micro-regions in the Czech Republic. Source: authors

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# The reurbanisation concept and its utility for contemporary research on post-socialist cities: The case of the Czech Republic

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## Abstract

*The concept of reurbanisation is discussed in this article from theoretical and methodological perspectives. Reurbanisation has been defined as one of the stages of urban development recently, but it is also tied to processes of gentrification, or perceived as a policy aimed at the revitalisation of inner cities. The main objective of this contribution is to discuss three principal and different perspectives of reurbanisation: firstly, reurbanisation as defined on the macro-scale of settlement system development; secondly, the concept as elaborated at the micro-scale of the transformation of inner cities; and, thirdly, reurbanisation viewed as a specific urban policy at the local government scale of analysis. The authors' singular understanding of the reurbanisation process – as suburban-to-urban migration – is then presented as an alternative conceptualization of reurbanisation. This paper presents and evaluates the use of the reurbanisation concept in research on residential environments in current conditions in the Czech Republic and relates it to the broader domain of research on post-socialist cities.*

**Keywords:** reurbanisation, metropolitan regions, migration, post-socialist cities, Czech Republic

## 1. Introduction

In contemporary urban research, there is a need to investigate reurbanisation as a process that may have a marked effect on residential environments in metropolitan regions. Given the fact that there is no consistent definition of reurbanisation (Kabisch, Haase, Haase, 2010), the term is used relatively loosely for labelling manifold urban processes – such as urban renaissance, urban resurgence, back-to-the-city movement, etc. (Glatter and Siedhoff, 2008). Reurbanisation is understood in a variety of ways, reflecting the history of a particular settlement system as well as different scholarly traditions in the regions under study.

In population geography, reurbanisation is connected with the so-called stages of urban development, where it is defined as the fourth stage in the development of a settlement system or of separate metropolitan areas (van den Berg et al., 1982; Cheshire and Hay, 1989; Ouředníček, 2000). Reurbanisation is thus understood as the quantitative growth of population in the core cities of metropolitan areas (van den Berg et al., 1982). Although this simplified model of urban development has been repeatedly criticised (Champion, 2001) or advanced (Geyer and Kontuly, 1996), the terminology it established has been retained as a tool for the description of urban system development. One of the critiques pointed out that reurbanisation is not a stage of urban development per se, but it is only a trend in migration patterns in an already urbanised settlement system and society (Champion, 2001), notwithstanding the impact of such migration in urban spaces.

In urban studies, reurbanisation is often seen as a distinctive qualitative change in local population structures, particularly in the inner neighbourhoods of cities (Haase et al., 2003; Hyra, 2015). It is often linked

with urban renewal (Bernt, 2009; Grabkowska, 2015; Haase and Rink, 2015), middle class housing change (Millard-Ball, 2002; Bridge, 2006), and with the process of gentrification (Smith, 1996). Population change in inner cities might be driven by a whole array of inputs, ranging from rural-to-urban migration, suburban-to-urban migration, inner city population redistribution, or many other factors related to demographic change (Haase et al., 2011) or shifts in household and economy structure (Buzar et al., 2007; Hutton, 2004). Reurbanisation research is thus a relatively complex issue, balancing diverse empirical and theoretical approaches. In compliance with the current research situation, the principal goal of this article is to clarify the theoretical concept of reurbanisation as a specific process of urban development and to evaluate its potential influence on the socio-spatial structures of metropolitan areas in the Czech Republic. The findings could have a broader validity in post-socialist cities in general. The specific target of this article is an operationalization of the reurbanisation concept as a process of return migration of suburbanites back to the city.

The concept of reurbanisation is particularly relevant in contemporary post-socialist cities which, on the one hand, share certain common socialist urbanisation experiences (Szelényi, 1984), but on the other hand, differ significantly in their overall urban histories and current levels of urbanisation in the society (Musil, 1993, 2005). Population deconcentration and decentralisation in post-socialist countries is mostly expressed as suburbanisation, and it occurred later and to lesser extent than in western cities. The population redistribution occurred under conditions where many countries dealt with demographic change, such as population ageing, low fertility levels, an overall population decrease, and also with population losses from migration

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abroad (Lesthaeghe and Willems, 1999; Geróházi et al., 2011; Botev, 2012; DEMIFER, 2013). Current research on the dynamics of population decentralisation might therefore be challenged and revised in the near future. The possible increasing trend of reurbanisation can be seen either as a growing preference for an urban way of life, but also as an economic calculation optimizing previous residential choices. Capital cities are in an exceptional position in comparison with second-order and smaller cities, which more often share population decrease or reurbanisation trajectories in Europe (Turok and Mykhnenko, 2007).

In this article, interpretations of the reurbanisation process from various authors are reviewed, primarily within the framework of post-socialist discourse. Over the last thirty years, the term reurbanisation began to appear more frequently in both theoretical concepts and empirical research. The different approaches to the assessment of reurbanisation can be divided into three broad groups (cf. Rérat, 2012): firstly, an approach that recognises the process as one of the stages of urban development, where reurbanisation is perceived at a macro level as a process of the quantitative change in the whole settlement system; secondly, the researcher can define reurbanisation as a process that transforms a local social environment, especially in inner cities; and thirdly, the approach in which specific understandings of reurbanisation as a policy is examined. Apart from the literature review of the three different reurbanisation approaches, we advance our own operationalisation of the term, illustrate it with examples from the Czech Republic, and discuss the relevance of the concept for contemporary research on post-socialist cities.

## 2. Reurbanisation as a stage of urban development: Description and criticism

The 'stages of urban development' theory (SUD) can be seen as a distinct paradigm of settlement geography in the last thirty years or so (Champion, 2001; Ouředníček, 2000). The core ideas of SUD were independently developed in the framework of CURB<sup>1</sup> research (van den Berg et al., 1982) and by British authors (Hall and Hay, 1980; Cheshire and Hay, 1989; Cheshire, 1995). According to van den Berg et al. (1982), reurbanisation is a phase of the urbanisation process which marks an end to a decentralisation period and a return towards concentration. The processes of decentralisation and disurbanisation (counterurbanisation) 'cause' a succession of problems in society and economy. Several studies have illustrated that population outflows outside city boundaries have negative impacts on municipal budgets and the provision of services of general interest to inhabitants and city users (Lais and Penker, 2012). The costs of public services delivery and population change are statistically related, although innovative changes in service provision might reduce the fiscal burdens (Baron et al., 2014).

Van den Berg et al. have argued that such decrease-driven problems can be mitigated by a reversal of population development and by a transition to reurbanisation. The shift back to population concentration is driven primarily by the initiatives of municipal authorities and possibly central government, through targeted programs aimed at urban renewal via housing stock investment and overall

infrastructure improvement. In this stage of urban development, the decline in the city's population should slow initially in central areas and gradually in its outlying areas as well. The reurbanisation stage means a restoration of the concentration process, after which the whole urbanisation process begins again as a new cycle of development (van den Berg et al., 1982).

Perceiving reurbanisation as a stage of the urbanisation process requires caution from at least three points of view. Firstly, reurbanisation occurs in already urbanised settlement systems and societies, and therefore it is qualitatively different from previous urbanisation processes, which contribute not only to qualitative but also to quantitative changes in a society. Reurbanisation as migration from a suburban zone back to a city centre results, for instance, in population density growth in a city centre or in the revival of some declining parts of a city. It is more urban revitalisation or local regeneration of an already urbanized environment than urbanisation processes in a broad sense. It is also reasonable, however, to argue that reurbanisation has a fundamental influence on the regeneration or revitalisation of inner cities. Reurbanisation is utilized in urban policy via planning tools that seek to limit commercialisation and the de-population of inner city areas and thus to revitalise residential functions or even to substitute the original non-residential functions (Piro and Ganser, 2012). Secondly, it became obvious that reurbanisation is not comparable – in terms of the size of migration movements and the ability to structure spatial patterns of metropolitan areas – with previous stages of urban development (Champion, 2001). Notwithstanding, reurbanisation can be considered a logical continuation as the fourth phase (stage) in the development of cities, and as a response to de-concentration tendencies in settlement system (Rérat, 2012). Thirdly, it has been found that all constituent processes of SUD (urbanisation, suburbanisation, counterurbanisation, and reurbanisation) do not appear as sequential, internally-connected stages in urban development, as in the model. In fact, they are mutually related processes that depend on the size of the social and demographic groups preferring a given residential environment, and on the context of economic progress in a society (notably purchasing power, housing policy and the real estate market) (Ouředníček, 2000).

## 3. Reurbanisation as a micro-regional process

Reurbanisation as a process transforming local residential environments on a micro-regional level can be defined as one of the city-shaping processes, essentially affecting the overall urban fabric in both its physical appearance and its social structure. Reurbanisation on a local level is mainly understood as a process of the re-settlement of central city areas (Ogden and Hall, 2000). Population change in central city areas is influenced by many factors, such as the growth of the service economy, an increasing preference for an urban way of life, and also with the renovation of historical areas of the city (Ogden and Hall, 2000). Marked changes in central city areas can be seen in many European cities today (Cassiers and Kesteloot, 2012). Haase et al. (2010) define reurbanisation broadly as a process of populating and diversifying the inner city with a variety of residential groups of different ages and socio-economic backgrounds. At present, the perception of the reurbanisation process as

<sup>1</sup> The Cost of Urban Growth; For the evaluation of city development in Europe, the so-called FUR (Functional Urban Region) was used, which makes it possible to compare the relation between population growth of a city and its hinterland (Ouředníček, 2000).

a movement 'back to the city' is seen by Haase et al. (2010) rather as a shift in housing preferences than the actual return of residents from suburbia back into city.

Reurbanisation is thus seen as an ample term for various inner city population changes, which is in contrast with the migration-based definition of reurbanisation. In fact, the broad definition of reurbanisation encompasses and includes migration-based definitions, which poses a few key questions for further discussion. Does reurbanisation occur in shrinking, in stagnating, or in growing cities? In what way(s) should reurbanisation be operationalized and measured in empirical research (Glatter and Siedhoff, 2008)? To what extent is reurbanisation, as inner city population change, related to other urban processes also shaping inner cities, such as commercialisation, regeneration, marginalisation, gentrification, or incumbent upgrading?

Distinguishing between reurbanisation and gentrification concepts is complicated, particularly because it is difficult to specify the influence of wider social, economic and political changes (Atkinson, 2003). For instance, Allen and Blandy (2004) assert that positive aspects of reurbanisation include the improvement of the social environment of inner city localities due to the influx of the middle and upper classes. In a similar manner, Lever (1993) suggests that repeated colonisations of central city areas in the course of reurbanisation occur mostly in the case of inhabitants with higher incomes and residential groups preferring an urban way of life in the inner city. According to Buzar et al. (2007), however, and also to Kabish, Haase and Haase (2010), reurbanisation has an impact on the entire inner city and it represents the mobility of a wider population spectrum.

In our opinion, the gentrification process – unlike reurbanisation – affects only certain parts of the inner city and it is linked exclusively with certain social groups and economic processes. Haase and Rink (2015) argue that gentrification and reurbanisation represent two distinct approaches for explaining inner-city transformation, and point to the displacement of former population groups as a major consequence of gentrification. Similarly Grabkowska, who compares gentrification and reurbanisation using the case of Gdańsk, claims that the reurbanisation approach "places the emphasis on enriching the social mix instead of regarding the repopulation as invasion of socio-demographically alien groups of outsiders to the inner city" (Grabkowska, 2015: 213). Indeed, there is also a considerable difference in the etymology and initial meaning of gentrification and reurbanisation: while the former term for rural aristocracy (gentry) represented an ironic, negative perception of this phenomenon in London by Marxist critic Ruth Glass (Glass, 1964; Lees, Slater, Wyly, 2007), reurbanisation is a positive phenomenon welcomed by all authors.

But, similar to gentrification, reurbanisation is also changing the socio-demographic situation at a local level. There are some noticeable signs of the transformation of traditional residential patterns and inner city neighbourhoods in Central and Eastern Europe (Steinführer et al., 2010). In Western Europe – for instance, Manchester – we can observe population growth of the inner cities in the 1990s, despite the fact that other similar cities stagnated from a demographic point of view (DETR, 2000; Colomb, 2007). This renewed growth of the populations in core city areas indicated the start of the reurbanisation process, driven by a preference for developing local sectors mainly in the service and knowledge economy, such as banking, media, arts and entertainment

(Lever, 1993; Cheshire, 1995). The residential preferences of population groups are changing as a consequence of changing household structure and the occupational structure of the inhabitants. Various studies show the growing attractiveness of core city areas particularly for middle and upper-middle strata of the population (Todorovic and Wellington, 2000; Tallon and Bromley, 2004).

The impact of reurbanisation is discussed from several different points of view. Demographic and social change is closely linked with transformations in the functional structure of inner cities, the spatial aspects of change are related to urbanisation history in particular settlement contexts, and the practical impact of reurbanisation is directly linked to its applications in planning and policy praxis. These factors are discussed in detail here, but we note also here that architectural and legal aspects of the reurbanisation process are examined in contemporary research (Kühn and Liebmann, 2012).

Demographic and social change is one area of prime interest in the evaluation of residential environments influenced by reurbanisation processes. In terms of population trends, the impact of the 'second demographic transition' resulted in falling birth rates among residents, a growing fragmentation of families, an increase of one-person households, and changes in residents' life styles (Buzar et al., 2007). According to Fishman (2000) and Watters (2004), the process of reurbanisation includes a return of former urban residents from suburbia and the segmentation of inner city neighbourhoods between various social strata. The reurbanisation process is closely linked with demographic developments and with the composition of urban populations. The transformation of core city areas is to a certain extent a result of changing household structures, general trends in demographic development, changes in life styles, value orientations and the social stratification of inhabitants (Haase et al., 2003).

The development of housing and the functional structure of inner city areas is shaped by socio-demographic changes stemming from changing mobility patterns. Growing differences in subjective expectations of urban housing and urban space utilization are important manifestations of demographic change, and also a result of the increasing individualization of society. New household types, such as DINKies or living-together-dwelling-apart, need a new kind of housing, such as co-housing, sub-leasing, accommodation in lodging houses, etc. The central areas of cities may become areas with high rates of residential fluctuations, although it is rather difficult to support this with relevant research methods because of difficulties in the statistical recording of inner city mobility and assessing its causes (Haase et al., 2003). From a methodological point of view, qualitative research and in-depth approaches are more appropriate to study inner city mobility than ordinary quantitative approaches. In addition, it is necessary to take into account specific measures for the development of cities and their effects on reurbanisation, as well as the long-term objectives of city management (Haase et al., 2003).

The spatial aspect of reurbanisation is decisive, since it provides an understanding of population change in particular residential contexts. According to Butler (2007), a growing number of inhabitants in the inner city are sometimes directly linked with an outflow of inhabitants from suburban areas. For example, migration research in Riga dealt with the return moves of suburban population groups back to the central areas of the city, and identified two main groups

of migrants (Barber, 2007). Firstly, it is clear that those groups moving into the central urban areas were mostly young people who grew up in suburban areas and now study or work in the city. The central areas of the city are characterised by proximity to jobs, cultural venues, shopping opportunities, and options for entertainment (Barber, 2007). The second group of migrants are older persons moving back to the city because of service need: central urban areas are more hospitable for them due to the better availability and accessibility of social and healthcare services.

The situation in post-socialist countries differs to a large extent from experiences drawn from Western Europe and North America. The initial conditions for reurbanisation reflect previous urbanisation experiences, and the ways that reurbanisation can occur stem directly from current demographic and socio-economic developments. Importantly, CEE countries have witnessed far less urban out-migration and suburban sprawl than their western counterparts in the past 25 years, although the terminology used for the description of different empirical realities in the West and in the East is roughly similar (Ouředníček, 2003; Turok and Mykhnenko, 2007). Many CEE countries also deal with out-migration and overall population decrease, which sets limits for population deconcentration (Šimon and Mikešová, 2014). Additionally, studies of counterurbanisation as a prominent form of residential decentralisation, which are relatively common in the Western context, are rather rare in the post-socialist context (see Šimon, 2014, for an overview). Thus, reurbanisation in the post-socialist context occurs under conditions of demographic change and directly after suburbanisation or the ephemeral counterurbanisation stage. The diversity of the urban trajectories of post-socialist cities, however, should be pointed out – and the exceptional case of East Germany should be acknowledged (Rink et al., 2011).

#### 4. Reurbanisation as a policy approach

The impact of reurbanisation in inner city areas depends not only on the intensity of population and housing change but also on policy and development praxis. An important role is played by local and regional authorities, which have high competence in planning. For example, in Switzerland local authorities have launched programs designed to attract new residents to the cities and to promote a compact city model. Other important actors include investors and developers who shape the housing market in cities and thus also reurbanisation per se (Rérat, 2012). On the other hand, it could be argued that inner city re-population might occur without specific policy tools. Changing housing prices in the inner city and changing demands by smaller or new types of households can lead to inner city re-development as theories of gentrification suggests (Hyra, 2015).

One important difference can be identified between the three urbanisation processes (urbanisation, suburbanisation, counterurbanisation) and reurbanisation at the policy level, in addition to the physical transformation of central parts of the city itself, which is influenced by reconstructions and refurbishments. A qualitative change in the city environment is also a part of this process. Within urban upgrading, the qualitative change includes an intentional refinement of the quality of life in central city areas, which occurs across various social strata in the population, types of households and generations (Haase et al., 2003). Reurbanisation is understood as the development of a city through increasing density of construction, renewed exploitation of unused areas in the city centre, or the revitalisation of brownfield

sites (McIntyre and McKee, 2008). The reurbanisation process demands deeper involvement of local government in town planning, stemming from the increasing popularity of PPP (public private partnerships) projects (Šolks, 2010).

In many ways reurbanisation is not just another stage in the development of a settlement system or even a process shaping metropolitan areas, but rather a policy approach, an urban vision or a town planning policy of many municipal governments dealing with the impacts of demographic change in urban space. An array of economic, social and demographic processes supports city expansion, which is often regarded as a negative tendency in relation to sustainable economic and environmental development (Pichler-Milanovič, Gutry-Korycka, Rink, 2007). Many urban and regional policies seek to favour compact city development in order to prevent urban sprawl and to shift attention towards revitalisation of brownfield sites inside the city (Polanska, 2008). This policy appears in the concept of shrinking cities (Šimon and Mikešová, 2014), but also in practice and in the preparation of planning tools and instruments (Hnilička, 2005; Koucký, 2014).

The reurbanisation process is then understood as a process of the long-term stabilisation of central city areas by retaining existing inhabitants and attempting to attract new residents (Haase et al., 2008). For many European cities with a declining number of inhabitants, the reurbanisation process could be the main route and vision for their future development (Turok and Mykhnenko, 2007). Contemporary research shows that the emergence and the extent of the reurbanisation process depends to a considerable degree on a local set of institutional, socio-economic and infrastructure factors (Haase et al., 2011). For example, Griffiths (1995: 254) describes three models to improve the appearance of the city: the integration model, a cultural model and the promotional model. The promotional model emphasizes the benefits of the physical changes of central city space, and entices people to come to the city for work. The activities proposed in the promotional model include the marketing of office spaces, shops, restaurants and cultural facilities. The cultural model focuses on the importance of cultural facilities, especially of high art in cities and their importance for the future development of the city. Cultural strategies are used especially for revitalising the city centre or renewing the image of old industrial cities, and thus restore the potential of city development. The integration model is oriented towards supporting civic identity, which includes the revitalization of public social life, reviving a sense of belonging to the city (Seo, 2002).

Reurbanisation as a policy approach has the potential to be used in the urban policy agenda at a broader scale – in contrast to the related concepts of shrinking cities and gentrification, especially when reurbanisation is defined as a process for the re-population and diversification of inner city areas by various social groups (cf. Buzar et al., 2007 and Rérat, 2012), without specifying whether such re-population is achieved by in-migration or by natural change. Reurbanisation is presented mainly as a process of demographic change, which is not implicitly connected with population displacement and social conflicts, as in the case of gentrification (Lees, 2000; Kabisch, Haase, Haase, 2010). Such a neutral description of inner city change might conceal social and political conflicts over urban space.

Reurbanisation is also presented as a positive approach to urban population change applicable in growing, stagnating or shrinking cities. In contrast, the concept of shrinking cities

is mostly negatively perceived, reluctantly acknowledged and, exceptionally, tackled in urban/public policy. As Bernt et al. (2013) point out: urban shrinkage does not get easily onto the policy agenda. Reurbanisation, on the other hand, is presented as 'an improvement policy' and thus has a positive connotation. At the same time, it might be argued that inner city re-population by migration from outer parts of the city is clearly an opposition to previous urban growth, and thus reurbanisation is minor positive change marking a lowering population significance of the whole metropolitan area. In this article we have reflected on these different perspectives and scales of reurbanisation research, and argued for a broader and more refined understanding of reurbanisation grounded in local population developments in metropolitan regions.

## 5. Discussion

### 5.1 Implications for post-socialist urban research

Particular developmental stages of SUD theory (urbanisation – suburbanisation – counterurbanisation – reurbanisation) have been demonstrated as the background for a discussion of urban development in the context of CEE countries. A certain kind of periodicity is revealed for the example of settlement development in the former Czechoslovakia and in the current Czech Republic.

The classic stage of urbanisation, i.e. a distinct concentration of population into cities, took place in Czechoslovakia, particularly in the period of industrialisation. Targeted urbanisation strategies were common for the socialist period. Within this framework, centres of local, district and regional importance were established and supported by state redistributive mechanisms. This centralized settlement system subsequently influenced the dominant streams of migration (Musil, 1977; Hampl and Kühnl, 1993). Growth occurred primarily in selected settlement centres and industrial cities (Matoušek, 1966), however, while some comparatively attractive and easily accessible hinterlands of large cities exhibited a low level of population growth or even population decline. In the centralised settlement policy, there was very little investment in the technical and social infrastructure of suburban villages. This economic disadvantage together with other factors led to the continuous degradation of small settlements and to the outflow of younger people from urban hinterlands (Ouředníček, 2003).

The rise of suburbanisation after 1990 differs from the previous period of concentration and brought a marked change in the shape of large cities and their hinterlands, particularly since the second half of the 1990s (Ouředníček, Špačková, Novák, 2013). Today, suburbanisation is frequently described in media discourse as a negative process of selective migration to small settlements with a low level of services and with a lack of social and technical infrastructure. Many experts anticipate (Hnilička, 2005; Kopečná and Špačková, 2012) that the not-so-well planned migration to suburbs will eventually lead to a gradual return of at least some inhabitants back to the cities (i.e. reurbanisation): already confirmed in the case of the former Eastern Germany (Kabisch, Haase, 2010; Holm, Marcińczak, Ogrodowczyk, 2015).

The economic downturn, combined with increasing housing prices, created pressures to relocate for the economically weaker population of large industrial cities in East European countries at the beginning of 1990s, and the discussion of counterurbanisation emerged (Dandolova, 2003; Leetmaa, Tammaru, Anniste, 2009). Economic pressures led to a return of a certain part of the urban population to genuinely rural areas, where housing was less expensive and family and subsistence networks were more available (Ladányi and Szélenyi, 1998). Similar trends re-appear in some poorer East European countries as a consequence of the economic crisis in 2008<sup>2</sup>. A significant part of such residential decentralisation was driven by the economic unsustainability of urban life for individuals, and migration to rural areas was driven by subsistence reasons. In the Czech Republic, there has also been a certain revival of migration activity outside metropolitan suburban areas since the early 2000s (Ouředníček, Špačková, Feřtsová, 2011). Counterurbanisation, however, has not produced a high absolute population growth in rural areas and it can rather be seen as an alternative migration movement (Šimon, 2014), driven mostly by quality of life and lifestyle motivations. Contemporary counterurbanisation differs in volume and pace from urbanisation and suburbanisation (Ouředníček, 2000). Nonetheless, research on counterurbanisation can contribute to a better understanding of the effects of counterurbanites on local rural environments, especially when differences in migration patterns and its underlying factors between CEE countries are large<sup>3</sup>.

In comparison with urbanisation, suburbanisation and counterurbanisation, reurbanisation has been relatively little studied in the Czech context until recently (Rumpel and Slach, 2012). Reurbanisation as a process has not as yet reached a high level of intensity in the Czech Republic. As noted by Čermák, Hampl and Müller (2009), counterurbanisation and reurbanisation will not cause major changes in the spatial patterns and organisation of the settlement system. On the other hand, these processes will definitely transform local social structures in individual parts of the metropolitan areas.

The importance of reurbanisation can be seen from the spatial (i.e. geographical) perspective, as a process which has source and target destinations. Firstly, the quality of the residential environment of the inner parts of the central city (target localities) of metropolitan areas is decisive. Its potential for redevelopment can be advanced due to the support for inner-city regeneration by the local governments. This part of the process, however, has been widely discussed – and it does not create the core of our research program.

Secondly, the changing life-cycle structure of households in suburban areas (with the first generation of empty-nesters) gradually provides a source of potential migration back to the inner cities of Prague and other Czech cities (Ouředníček, Špačková, Novák, 2013). This part of the reurbanisation process, which is focused on the stability of the demographic composition of suburbs (as source localities of reurbanisation), is much more important for our research, which deals mainly with suburban development (Ouředníček, 2003, 2007). We argue that the housing

<sup>2</sup> EAST Workshop – 'Depopulation of Rural Areas in Central and Eastern Europe: Causes, consequences and solutions', Görlitz, Germany, 11–13 June 2015, organised by The Oxford Institute of Population Ageing.

<sup>3</sup> For a more detailed evaluation of counterurbanisation in the post-socialist context see Martin Šimon (Šimon and Ouředníček, 2010; Šimon, 2011, 2014).



preferences of selected groups of suburbanites to move back to the city have the potential to shape suburban-to-urban migration. Among them, the second-generation (adolescents and grown-up children) from the early suburbanisation of the middle 1990s will reach the age of high migration intensity and will shape current population development in older suburban localities. We can ask whether the second generation of suburbanites has different migration housing preferences compared to their parents – and will then stay in the suburbs or move back to the city? As Kopečná and Špačková have confirmed, temporary suburbanites, who escaped the city especially to apartment blocks, seem to be another potential group of reurbanisation migrants, which has less residential stability than households of family houses with their tendencies to out-migrate (Kopečná and Špačková, 2012).

### 5.2 Operationalisation of reurbanisation for the post-socialist context

As the preceding sections illustrate, the reurbanisation process represents an important mechanism of local social change shaping residential environments in inner cities. In the post-socialist condition with its relatively short period of suburbanisation and the population decline of the inner cities, a back-to-the-city migration is expected to occur due to the generational shift of suburban inhabitants (Hnilička, 2005; Ouředníček, Špačková, Novák, 2013). Therefore our working definition (operationalisation) of reurbanisation is based on migration flows<sup>4</sup> – as a process of return of residents from suburban areas back to the city (see Tab. 1). Our definition of the reurbanisation process is related to the local context rather than to the settlement system per se. On the other hand, the process is similar to other urbanisation processes, and reurbanisation cannot be understood purely in terms of the size and directions of migration flows. It is also necessary to consider contextual and compositional characteristics of this flow: for example, to consider what kind of inhabitants tend to move from suburban areas (back) to the city<sup>5</sup>. It is important, if they are (i) mostly former villagers born in the original built-up area (actually representing the urbanisation process of moving from country to city: see Table 1); (ii) the grown-up children of the first generation of suburbanites; or (iii) those (suburbanites) who have moved out of the city in the course of the last two decades (reurbanisation – back to the city). These three groups will certainly have a different composition, as well as distinct reasons for migration, which is decisive for both the source and target areas of metropolitan regions and which is expressed also by social links to inhabitants in both source and target areas.

Consequently, in comparison with all reurbanisation studies which deal with the impacts on inner city neighbourhoods, we would like to focus also on the source destinations of reurbanisation. Currently, the adaptation of new inhabitants in new suburban environments, the tension between their existing life styles, social networks and the localisation of life settings, are under research scrutiny (Špačková and Ouředníček, 2012). This approach to reurbanisation leads to the establishment of a tailor-made methodology for the research of residential mobility, focused on tracing fluctuations or stability and satisfaction with housing in various forms of suburban dwelling, which is important for predictions of the future development of suburban neighbourhoods (Kopečná and Špačková, 2012; Ouředníček, Špačková, Novák, 2013).

The definition of urbanisation processes based on migration streams and the empirical experiences from post-socialist cities enable us to update the earlier discussions and to distinguish between reurbanisation and gentrification from a geographical perspective. Firstly, one considerable difference can be seen in target localities of both processes within the city. In accordance with the opinion of Ogden and Hall (2000), it could be said that reurbanisation tendencies are not simply counter-streams of existing migration flows and they are not limited to processes of gentrification or inner city renewal. According to van den Berg et al. (1982), reurbanisation is not primarily embedded in deteriorating parts of the inner city but rather is measured as an increase of the number of inhabitants in the whole core city. In a post-socialist context, another important target area in this respect – besides the inner parts of the city – could be housing estates, which are now serving as starting accommodation for young families or students (Temelová et al., 2011), and are certainly more affordable for these households than inner city neighbourhoods.

A second difference between gentrification and reurbanisation in the post-socialist context relates to the source localities of both processes. It is noteworthy that many scholars of gentrification and reurbanisation describe well their social, economic and demographic structure, but only rarely have they investigated the “from where” both gentrifiers or reurbanites come (for comparison: see the issue of *Geografie* [2015, No. 2] focused on gentrification in CEE-countries). The character of a previous residence, however, should be at least one of the important factors in which the behaviours of new incomers to the city can differ. While in post-socialist cities gentrification is linked particularly with yuppies and foreigners (Sýkora, 2005), the newcomers from suburbia (reurbanisation) can be completely different in both demographic and socio-

Type of settlement		Destination (target) of migration		
		Urban	Suburban	Rural
Source of migration	Urban	Intra and inter-city migration	Suburbanisation	Counterurbanisation
	Suburban	Urbanisation or REURBANISATION	Tangential migration (intra-metropolitan)	Counterurbanisation
	Rural	Urbanisation or REURBANISATION	Urbanisation	Rural migration

Tab. 1: Source-destination matrix of migration and the definition of reurbanisation

<sup>4</sup> It seems that the most suitable tool for the recording of urbanisation processes is the analysis of migration flows (Sjöberg and Tammaru, 1999, Ott, 2000).

<sup>5</sup> Theoretically, we could discuss also a return back to the city for the case of counterurbanites. At present, we cannot describe such tendencies in the Czech settlement system, since exact assessments cannot be made due to the lack of relevant data.

economic terms. To reveal emerging migration trends in contemporary suburbia is one of the important research targets of urban geography in post-socialist countries. The intensity and structure of reurbanisation can have a considerable influence on the future development of suburban localities, as well as of cities.

## 6. Conclusions

This contribution to the research literature articulates an effort to clarify the theoretical concept of reurbanisation and its application in research on the socio-spatial differentiation of cities in the Czech Republic, with possible consequences for cities in post-socialist countries in general. The first conclusion is that approaches to the study of reurbanisation should focus on 'process' – from both of the competing perspectives: as an urbanisation process or stage of urban system development, and at the same time as a micro-regional process changing selected parts of metropolitan regions (e.g. suburbs). Both of these perspectives provide valuable insights into population redistribution and residential change in European cities, as they enable evaluations from different geographical scales. Consequently, we perceive reurbanisation as a process changing local social environments and serving often as a policy for positive changes within the inner cities.

Secondly, the elaboration of diverse approaches and conceptualisations of reurbanisation gathered for the purpose of this paper, has contributed to a deeper understanding of the reurbanisation process, but has also demonstrated the enormous "flexibility" and poor clarity of the concept in its academic usage. We have tried to distinguish the most commonly-used terms – gentrification and reurbanisation – and to identify the advantages of a clear distinction between these two processes in urban research.

Thirdly, a definition of reurbanisation stemming from the demands of empirical work in the Czech Republic and within the framework of post-socialist (sub)urban research, was elaborated. We define reurbanisation as a process of the return of residents from suburban areas back to the city. The return migration of suburban residents back to the city is an indisputably interesting question in both scientific and media discourse today. The demands for a clear definition of reurbanisation and clarity in its delimitation in relation to other processes changing the urban environment are crucial for the formation of cumulative knowledge. Methodological accuracy and definitional purification (Halfacree, 2001) in researching urbanisation processes should be one of the crucial elements in efforts to improve the explanatory and predictive functions of theoretical concepts in urban geography.

Fourth and finally, although trajectories of inner city decline or reurbanisation are common for many European cities, the research agenda is rather different in post-socialist cities. The relatively short period of residential decentralisation and related population decreases in many cities is to be confronted with profound demographic changes, namely population ageing, changing household structure, and population decrease (Hoff, 2011; Šimon and Mikešová, 2014). The connections between suburbanisation and reurbanisation could be one of the prominent research topics in post-socialist countries. The attention of this kind of research should be paid not only to target localities (inner cities, as well as socialist housing estates) but also to places and neighbourhoods from where people migrate back to the city.

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# Planning post-summurbia: From spontaneous pragmatism to collaborative planning?

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## Abstract

*The possibilities to apply collaborative planning frameworks in formerly strictly planned areas that have experienced spontaneous transformations since the demise of the Soviet Union are examined in this paper. The enquiry is based on a case study of the Tartu region in Estonia, former socialist summerhouse settlements ('summurbia'), which are experiencing a transition towards permanent residence resulting in a new year-round form of suburbia. Both the residents and local planning authorities were interviewed in order to understand the prevailing planning and building activities, as well as the social relations between these stakeholders. The collaborative planning process is then elaborated by exploring the social dynamics and learned practices of the local residents.*

**Keywords:** *summerhouses, suburbanization, pragmatic planning, collaborative planning, Tartu, Estonia*

## 1. Introduction

The conditions for collaborative planning practices to be used in suburban residential areas that have deep roots in Soviet planning practices, and which have been spontaneously transformed during the post-socialist years, are examined in this article. Estonia, like the rest of the demised Soviet regime, suffered from economic hardships associated with the collapse of the command economy. As a result, there emerged serious conflicts and contradictions between the comprehensive and top-down planning system that characterized the Soviet economy, and the post-1991 market-led developments, which required deregulation and decentralization (Roose and Kull, 2012; Tsenkova, 2010 and 2014). Indeed, the planning discourse in post-socialist cities has centred on a number of conflicts: comprehensive vs. pragmatic planning; centralized vs. decentralized decision-making; top-down vs. bottom-up approaches; and interventionist vs. entrepreneurial market-driven, planning (Altrock et al., 2006; Hirt and Stanilov, 2009). In order to keep up with contemporary 'western' planning theories, more strategic, including collaborative, planning approaches have also been applied at various levels (Simpson and Chapman, 1999; Golubchikov, 2004; Hirt and Stanilov, 2009). Nevertheless, the planning-related literature on the Central and Eastern European (CEE) region is mostly limited to the abstract level, and is characterized by a relative scarcity of concrete case studies. Our article addresses the latter gap through an in-depth examination of a particular suburban milieu, allowing for a deeper understanding of the challenges facing planners in the present stage of post-socialist transformation.

Our study area consists of socialist-era summer house settlements that were originally planned as seasonal destinations for urban dwellers. We refer to these areas as 'summurbia' to reflect their simultaneous suburban and summer-seasonal nature. Although we focus on one post-Soviet planning example in Estonia, these areas are a near-ubiquitous feature of the urban regions of post-socialist countries (Ioffe and Nefédova, 1998; Fialová, 1999; Pócsi, 2011; Vágner et al., 2011). Summurbia represents

the strict planning and functional regulations that characterized the socialist years. Additionally, situated in the suburban zones of cities, these settlements are good examples of the rapid and liberal post-socialist development that has taken place over the last 25 years (cf. Hirt, 2007; Ouředníček, 2007; Leetmaa et al., 2012). Contemporary 'post-summurban' milieux typically combine modern suburban living with remnants of the dacha culture of the still recent socialist past (see Fig. 1).

This article focuses on how residents and local municipality officials relate to planning issues in post-summurbia. We chose a research strategy built on qualitative interview methods, as we view these as essential to provide personal insights into the ideas, needs and visions of our informants towards permanent residence in post-summurbia. While mapping out the planning arena from the perspectives of local planning officials and post-summurban residents, the article gives special recognition to the lack of rules and principles that have emerged. In contrast, principles are a fundamental feature of planning as a common governance practice (cf. Healey, 2009). In our discussion of the case studies, we view the absence of proactive planning as a form of 'spontaneous



Fig. 1: Post-summurban milieux (Photo: A. Kährrik, 2009)

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pragmatism', which evolved through the residents' activities and actions. By 'spontaneous pragmatism', we refer to the planning principle of pragmatism-incrementalism (Næss, 2001) which brings us back to one of the foundational ideas of collaborative planning (Healey, 2009).

Our account proceeds with a discussion of the relevant planning theory relating to suburbia, setting the theoretical context for the subsequent description of past and present planning practices in the case study area, and allowing us to frame our research questions. Then, after presenting our case study locale and methods, we continue with the results of our interview study.

## 2. Theories of suburban planning

The planning of suburban areas has a long and varied history, rendering it difficult to identify unified experiences of suburbanization. Instead, researchers and planners must come to terms with a variety of planning frameworks and approaches. Broadly speaking, suburban homes tend to be either built: (i) systematically, to the specifications of the owner, or indeed by the owner over time; or (ii) by developers and builders on the neighborhood, municipal, or regional scale (Forsyth, 2012). Hence, these two approaches echo the two most prominent planning methodologies, respectively, the pragmatic-incrementalist, where suburbs are allowed to expand spontaneously, and the rational-comprehensive approach, through which suburban areas are master-planned as neighbourhoods or communities (Rosenhead, 1980).

Incrementalism is described as "one bite at a time" planning (Næss, 2001: 513). It arises from the philosophical idea of pragmatism that states that there should be no rules for planning and that everything should be discovered and asserted in the flow (Healey, 2009). In this way, the consideration of alternative goals and policies is only marginally different from the status quo, and the examination and comparison of different alternatives are relatively simplified. The results are thus experimented as in social situations rather than built in theories. As Healey (2009: 287) puts it: "... the pragmatists insist on focusing transformative attention in the flow of practice and the practical challenges and puzzles that are continually confronted in the particularities of practices". Following this approach, the planner would see no value in comprehensiveness, preferring instead to deal with problems as they arise. By relying on such small steps and cycles of learning and adaptation, the more restrained incremental approach has been recognized as the antithesis of planning (Kemp et al., 2007). At the same time, as a planning approach it still takes into account that it has to "address the difficulties created by the complex collocations of activities and their relations and the impacts these collocations generate across space-time" (Healey, 2009: 277).

In contrast, the rational-comprehensive methodology, which is based on positivist theories, offers a comprehensive planning process that is logical, consistent, and systematic, and it follows an idealized 'analysis-problem-solution-implementation' planning model (Lawrence, 2000). The rational-comprehensive approach in its pure form emphasizes predictability and seeks to eliminate such aspects as uncertainty, human fallibility and indecisiveness (Rosenhead, 1980). In the context of the present study, rational positivist planning is seen as a basis for Soviet and socialist planning (French, 1995; Smith, 1996).

In principle, the incrementalist and rational-comprehensive approaches have been used concurrently

throughout the history of suburbia in Western countries, with the dominance of one or the other determined by the idiosyncrasies of the prevailing social, economic and institutional setting. The growing concerns over environmental and sustainability issues that emerged in the 1980s, however, affected both styles: therefore, planners turned to mixed land use, connected street patterns and pedestrian-friendly communities (Grant, 2009), and to developments that favoured amenity-rich and sustainable urban lifestyles (Danielsen et al., 1999), as well as traditional neighbourhood designs (Duany et al., 2000). Armed with these principles, planners pushed through such strategies and ideas as smart growth, liveable communities and new urbanism, gradually introducing them into suburban planning throughout the West.

In parallel with the upsurge of interest in sustainability issues, another new approach attracted the attention of planners in the 1990s. Realizing that planners typically mediate between various interests, planning theorists acknowledged the existence and encouraged the development of 'collaborative', 'communicative', or 'community planning', which emphasize communication, participation, and consensus-building throughout the planning process (Forester, 1989; Healey, 2003; Innes and Booher, 2010). This approach combines incrementalist and comprehensive planning, as it simultaneously deals with the everyday issues of the participants and puts together long-term strategies and goals. The most important contribution of collaborative planning theorists was therefore that the claim that planning would only be successful if its stakeholders were able to participate in the process in a meaningful way. Many aspects of the collaborative approach are laudable. Firstly, it recognizes the multiplicity and diversity of planning stakeholders within an increasingly complex, pluralist, and unpredictable world. Secondly, it adopts a holistic perspective towards development and accepts the implicit value of subsidiarity. Thirdly, it involves an informed and engaged citizenry in the settlement of disputes (Brand and Gaffikin, 2007).

The largely enthusiastic reception that greeted the communicative approach in urban planning in the 1990s, however, was accompanied by both a questioning of the theory and suggestions on how to improve it (Allmendinger and Tewdwr-Jones, 2002; Healey, 2003). In particular, the fact that planning practice rarely reflects the qualities of a potential collaborative process, fuelled some criticisms of the overall conceptualization and practical relevance of the collaborative planning idea (Huxley and Yiftachel, 2000). For example, Healey (2003) argues that authoritative and allocative "systems" operate within the interactive process of planning, which suggests that these systems depend not only on the interplay of different actors with specific interests, but also on the way in which routine social relations and practices are structured through institutional designs and deeper values and conceptions. Indeed, collaborative planning theorists strictly emphasize taking account of the concrete settings in which planning takes place, which relates back to the incremental-pragmatic philosophies and practices of planning (Healey, 2003, 2009).

In this regard, post-summurbia offers an interesting setting to study the potential of collaborative planning, relating it back to its roots in the incremental approach. In order to better understand the background of this setting, we continue by introducing the planning history and context of post-summurbia.

### 3. Summurbia: an anomaly of socialism and a hallmark of post-socialist planning

#### 3.1 Summer houses from the socialist planning perspective

In the Soviet Union, the task of planning was to command and allocate: regional and urban planning were subservient to the complex hierarchy of central economic planning (Shomina, 1992; French, 1995). Detailed and strict rules produced in Moscow regulated planning activities in Estonia. The urban and regional Executive Committees (gorispolkom and rayispolkom, respectively, in Russian) were responsible for the plans to be fulfilled, but they had little influence on their contents.

Hence, urban and regional planning was largely a technical exercise. Planners, who were trained as architects or engineers rather than as overseers of social change, translated the detailed instructions into finished designs for, say, a complex of settlements, a particular city, or a city district (Hirt and Stanilov, 2009; Golubchikov, 2004, 2006). The rayispolkom ordered planning projects from the Union-Republic's Building Committee. The latter, in turn, organized competitions for architectural designs and created detailed solutions for the specific objects. All the detailed plans, e.g. plans for private houses, were examined by the committee of experts on architecture, fire safety and sanitary issues, and each project required the consent of the electricity provider (Bruns, 2007).

The plans were not required to be made public, and planning documents (including, not least, the genplan or master plan itself) were usually secret or for official use only. Still, in Estonia, by the end of the Soviet period, the plans were more and more discussed in public (Bruns, 2007). Despite its lack of democracy, transparency, and accountability, socialist planning has been recognized for its ability to restrain urban sprawl and as conscious towards nature preservation in general (Bater, 1980; French, 1995).

Our summurban case study areas were typically created around larger cities to provide a way for some urban dwellers – particularly apartment dwellers (French, 1995) – to enjoy weekend getaways and summer living, and to engage in private kitchen gardening (Ioffe and Nefédova, 1998; Lovell, 2003). Although this “individualist” recreation function of the dachas (as the summer houses are called in Russian) was not considered to be genuinely socialist because of its excessive proximity to the concept of ‘private property’, it was tolerated by the authorities mainly because of its long tradition in Russia (Shaw, 1979). Moreover, it effectively helped counter the effects of the food shortages that were a relatively frequent occurrence in the Soviet Union. In more contemporary research literature, the summer house settlements have been referred to in using the concepts of seasonal or recreational suburbanization, quasi-suburbanization, or even exurbanization (Ioffe and Nefédova, 1998; Lovell, 2003; Rudolf and Brade, 2005). Wanting to stress both the seasonal and the suburban nature of the settlements, we choose to refer to them by the concept of ‘summurbia’.

To better understand the historical background of our case study districts, our lead author interviewed two experts that have been working for the Estonian Building Committee, Anne Siht (2011) and Eve Niineväli (2011). Both were involved in establishing the summer house settlements between the 1960s and 1980s.

In accordance with the rest of the planning and building activities of the Soviet period, summurbia was established following commands from Moscow, with the more detailed

decisions about the size and location of the developments decided upon by the rayispolkom (Siht, 2011). Summurbia was planned in a technically detailed way. It was not built on good agricultural land, but rather on fields that were not accessible to large agricultural machinery. The land used for settlements consisted mainly of wild brushy 600–1100 m<sup>2</sup> wetland plots (Niineväli, 2011; Siht, 2011). Each settlement typically included many ‘cooperatives’ (a set of plots) that were combined by the members of work places or trade unions.

The allocation of the summer house plots took place as follows. The work places and trade unions where the cooperatives were formed, applied for the land from the rayispolkom. After the land was provided, the Building Committee was responsible for putting together the detailed plan, covering the subdivision of the plots, main roads, water wells, drainage, and electricity supply (Niineväli, 2011). The cooperative members could meet with the chief architect in a social gathering in order to choose the design of the buildings from up to 50 standard designs, asking for adjustments (Siht, 2011). The architect then arranged the summer house buildings into suitable combinations, taking the surrounding environment into consideration – e.g. a pitched roof was combined with the spruce forest on the edge of the settlement (Siht, 2011). The construction-related activities, including clearing the area of shrubs and building the huts and fences were carried out by the summurbanites themselves (Niineväli, 2011; Siht, 2011). The building activities were controlled by the other cooperative members and their coherence with the plan was every now and then inspected by the respective authorities (Siht, 2011).

Although the maximum permitted building size gradually increased over time, plot-owners still found ways to circumvent the regulations (Siht, 2011; Niineväli, 2011), resulting in a spontaneous evolution from garden cooperatives (which only permitted small huts or shacks) to modest summertime settlements. Already during Soviet times, some people moved to their summer houses permanently; and creativity and self-reliance became commonplace. Although comprehensive, planning could not fully control the activities that took place in summurbia, people adjusted their summer houses in accordance with their dreams and available resources (Niineväli, 2011). In this regard, we consider summurban settlements to be anomalies within the socialist system of central planning.

#### 3.2 Post-socialist ‘twists’ in planning

Socialist ideology and planning vanished during the early years of the post-1991 market transition, favouring the rise of a liberal planning regime characterized by “boosterism” (Ruoppila, 2007) and ad hoc pragmatism (French, 1995). Many Soviet norms and regulations – even the reasonable ones – were vigorously rejected. Even now, when the Planning Act regulating planning affairs has been adjusted several times since its first adaption in 1995, there are only a few concrete norms and rules. Nevertheless, Estonian national planning is “rooted in rational thinking and technocratic management promoting straightforward, command-and-control solution-oriented plans”, as was the common practice during Soviet times (Roose and Kull, 2012: 498). Planning is still managed by a wide range of professionals instead of by specifically trained planners (Adams et al., 2014).

During the transition, most post-socialist countries embarked on a path towards administrative decentralization and increased self-government at the local level (Hirt and



Stanilov, 2009; Tsenkova, 2011). The main responsibility for planning, including detailed residential planning, was assigned to the local authorities that were newly empowered but financially poor (Simpson and Chapman, 1999; Samarüütel, et al., 2010). Also, in Estonia, more general plans for the country and the regions are rather visions that could be easily amended in accordance with local needs (Roose and Kull, 2012).

One of the main changes in the planning context, and for residential planning more specifically, was the fact that private property was reintroduced, and public interests may no longer impose restrictions on private property. Both the general mistrust about planning that lingered on from Soviet times and low public interest and participation encouraged the development of liberal and eclectic legislation (Simpson and Chapman, 1999; Tsenkova, 2011). This trend, in turn, resulted in a period of institutional uncertainty (Raagmaa, 2009). An ad hoc approach in which planning initiatives were developed with few resources, little time and little attention to strategic thinking, emerged in Estonia during the first half of the 2000s, when the national economy developed steadily (Roose and Kull, 2012). During this period, residential suburbanization boomed, following a trend that characterized many post-socialist countries (Ouředníček, 2007; Brade et al., 2009; Tammaru et al., 2009).

Most summurban plots were privatized, and the gradual conversion of simple huts into solid suburban residences for use in all seasons gained momentum (cf. Mason and Nigmatullina, 2011). At present, post-summurbia is diverse: although many residents live there permanently, some houses are used as second homes, while a few plots are simply deserted (Leetmaa et al., 2012). The territory offers a variety of visual impressions: one may find genuine (“untouched”) and renovated Soviet summer huts, buildings at various

stages of construction or renovation, simple single-family housing, and the occasional architectural faux pas design(at) ed for the new rich (see Fig. 2).

Summurbia, however, received little attention from planners, and it was and is being transformed in an unregulated fashion. Conveniently for local municipalities, the now year-round residents of the former summurbia are already accustomed to coping on their own. Moreover, the habit of challenging high-level planning regulations facilitated residents’ independent approach to make and manage changes in post-summurbia.

This trend pushes us to view these areas as the epitome of post-socialist planning and interpret planning in these areas through the lens of ‘spontaneous pragmatism’. While not grounded in the philosophy of pragmatism per se, the concept of spontaneous pragmatism captures the spontaneous changes, lack of comprehensiveness and ad hoc approaches that permeate the literature on planning in the post-socialist context (Altrock et al., 2006; Hirt and Stanilov, 2009).

Next, we look into our specific case to describe this context in detail and discuss the possibilities for changing the contemporary situation in post-summurbia into planning based on more collaboration. We formulated the following main research question:

- How can the current understanding and discussions surrounding planning in post-summurbia foster collaborative planning?

To provide a comprehensive answer to this question, we addressed the following sub-questions:

- What characterises spontaneous pragmatic planning in post-summurbia?
- What are the experiences and practices of communication in post-summurbia between the residents and authorities?



Fig. 2: Examples of the visual impressions from post-summurbia (Photo: A. Kährrik, A. Org and H. Lainjärv, 2009)

### 4. Study design

Our research took place in the Tartu urban area. Tartu is the second largest city in Estonia with approximately 100,000 inhabitants in the core city. The vast majority of the post-summurban settlements are located within a 40-km radius of the city limits (Fig. 3). There are approximately 3,000 summurban plots around the city (Fig. 4). The most intense new suburbanization is observable within 10 km of the Tartu city limits (Roose et al., 2013), which also affects the summurban settlements located within this radius to a greater degree (Fig. 4). The scale and extent of suburbanization around Tartu are comparable to similar processes surrounding comparable cities across the post-socialist realm (Roose et al., 2013).

In spring 2010, one of the authors of this paper conducted 19 informally structured in-depth interviews with municipal officials from all municipalities that include

summurban settlements within the Tartu region. The interviewed officials were responsible for property affairs, environmental issues, or were experts in building and construction in their respective municipalities.

The interviews focused on the following three topics: (i) post-summurban residents' relations with the municipality; (ii) the main problems related to post-summurbia; and (iii) officials' planning visions for these areas.

In addition to these expert interviews, we have conducted twenty-one interviews with permanent post-summurbanites in the Tartu region in autumn 2009. This endeavour was part of a wider interview study that aimed at understanding the reasons people decided to move to former summer areas (Leetmaa et al., 2011). The interviews were carried out by five interviewers (three of us are the authors of the current article). One of the interviewers spoke in Russian, in order to address the preferences of the significant

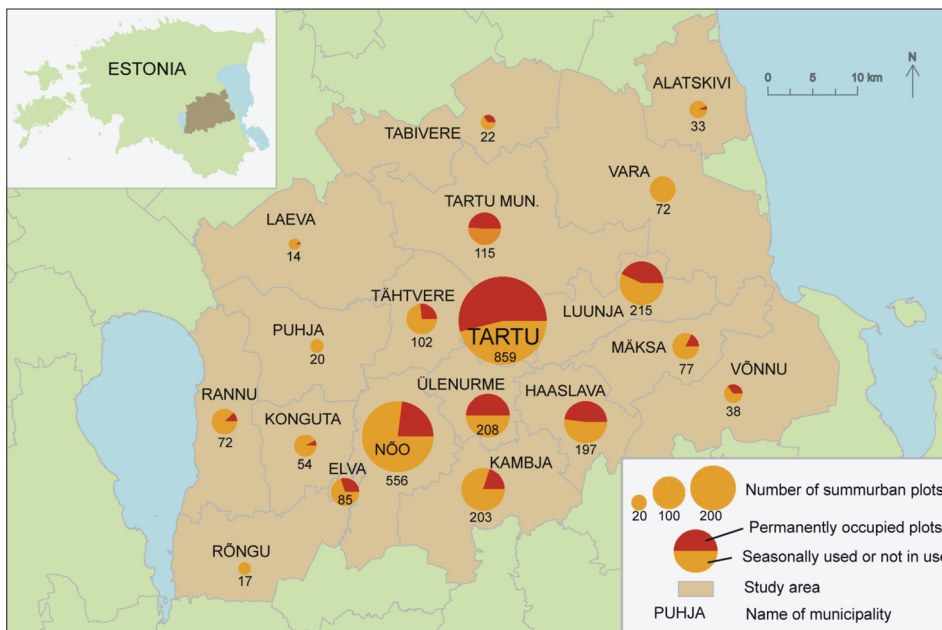


Fig. 3: Share of permanent residents in post-summurbia by municipality. Data is estimated by the interviewed municipality officials

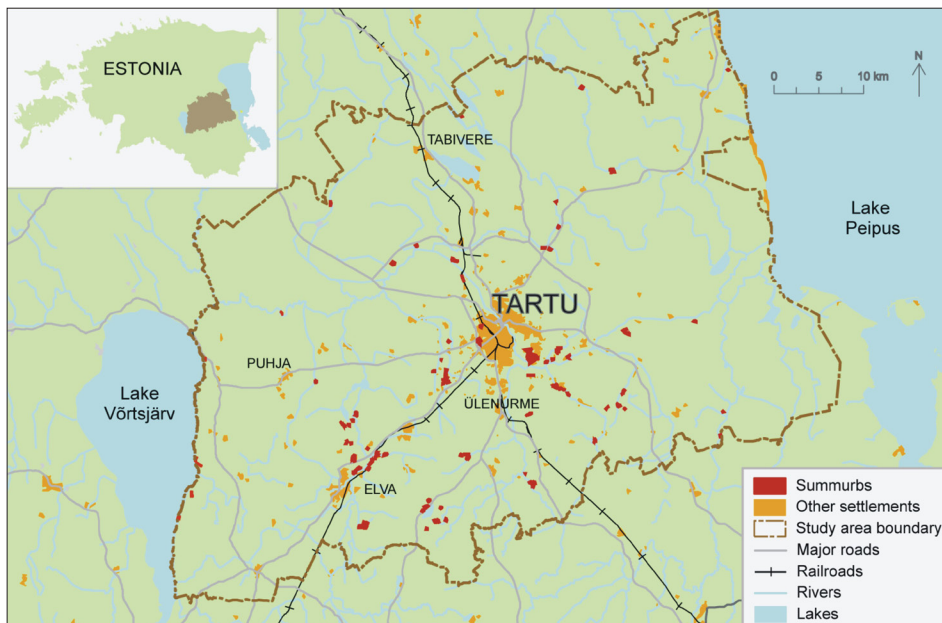


Fig. 4: Locations of summurban settlements in the Tartu region

Russian-speaking ethno-linguistic minority present in the country. The participants were selected based on two criteria: (i) geographical location (in relation to Tartu) and morphological characteristics of the settlements, and (ii) the physical condition of the specific buildings occupied by (potential) informants. The latter was assessed based on the degree of renovation (original summer house, renovated summer house, or new house). This approach enabled us to capture the diversity of the residents' living milieux and also the diversity of possible planning-related ideas.

The resident participants were approached door-to-door, and in only a few cases did the approached persons refuse to cooperate, and people were overall very open to participate. Interviews were conducted on the spot, either immediately or by later appointment, and lasted about one hour.

All interviews were recorded, transcribed and coded. Open coding was applied to the text as the first step, in order to avoid imposing an outside set of categories and to get as close as possible to emic knowledge (Crang and Cook, 2007). These codes were categorized during the intuitive interpretation of the interview transcripts, keeping in mind the planning-related research questions.

The interview data presented us with a diversity of opinions and ideas relating to the planning-context of the settlement. Eventually, with an increasing number of overlapping opinions, our study approached saturation in relation to our main aim.

We combine the views of the summurbanites and of the municipality officials in the following two sections. The first section (5.1) describes the planning situation and building activities in post-summurbia in order to elaborate on the residents' and planners' learned customs for living and solving (planning) problems. Moreover, it offers novel insights into the specific context of socialist history and post-socialist change that influences the planning process. The second section (5.2) describes the social dynamics that are unfolding in post-summurbia. It also presents the basis for barriers to developing a communicative planning approach in such settlements.

## 5. Findings of the study

### 5.1 The spontaneous pragmatic approach in post-summurbia

Self-sufficiency is a principal feature of life in post-summurbia. A topic frequently raised by residents was how they proudly self-manage everything at home and in their neighbourhoods. As mentioned earlier, summurbanites prepared, cleared, and built on their plots themselves. Further, households make their choices carefully after weighing the advantages and disadvantages of living in post-summurbia, especially with respect to its inadequate infrastructure:

*When you live in the countryside, you have to take into consideration that sometimes the roads are impassable and the power supply is down. You just have to manage (middle-aged married man, int. R16).*

The residents of post-summurbia perceive their lives as rural and beyond the need of interference by classical settlement planning. It is also worthy of note that the municipal building regulations on design and (re) construction are minimal. Commonly, they do not stretch beyond an approximate building height or function. Sometimes, municipal planners are satisfied with just any reconstruction and are either unable or unwilling to issue

more specific building regulations. Similarly, former summer huts are commonly rebuilt by the residents themselves, with only more specialized work being paid for. Indeed, only a few of the interviewed households had settled into a ready-made dwelling. According to them, their homes are often never-ending creative building projects inspired by their own dreams. As one of our participants told us:

*My main activity here is to redesign the house... There are always more ideas than time to fulfil them (middle-aged woman living alone, int. R18).*

Such activities have led to the areas being developed in a unique, alternative, and somewhat chaotic way. Structures built some years ago may be redeveloped into something that has quite a different purpose, for example, into a garage or a sauna. This is in stark contrast to the socialist period, when the ubiquitous concrete architectural schemes could be changed only marginally – and then only with the prior consent of the authorities (Niineväli, 2011). A corollary of such self-management is that residents can regulate how much they spend on everyday expenses such as heating, water, garbage collection, and so forth.

A closer look at post-summurbia, however, reveals a number of problems related to the deficiencies of the general infrastructure, including the water supply, sewerage and drainage, waste management, power lines, and roads. Even though these problems are present elsewhere too, no planning guidelines have been devised to solve them, so the residents have started to look for temporary solutions. In addition to building and renovating their own homes, residents have dug wells, built sewerage systems, and even constructed shared roads:

*We built our own biological treatment plant. It was expensive to install, but the maintenance costs are basically zero... Let's assume the municipality was to come to inspect the situation in our area and other similar places. They would probably discover that 90% of the sewerage systems do not correspond to modern requirements (wife in a young couple, both educated as biologists, with two children, int. R03).*

Such activities indicate the presence of sustainability thinking, and of a frugal yet urbanized approach among the residents (cf. Danielsen et al., 1999). While some residents saw their independence from the authorities as resulting in lower infrastructure-related expenses (i.e. positive), the poor overall state of the infrastructure was an issue that disturbed many. Nevertheless, despite the need for investment in this area, few thought that they would have been able to afford all of the necessary costs. As a result, almost no one complains about the municipality's lack of interest in the living conditions in the neighbourhood; rather, the residents, not the municipalities, initiate most of the current solutions to infrastructural problems.

Of course, there exist also exceptions to this trend as a sign that post-summurbia is diverse. As an official from one municipality explained:

*At first, the National Health Board did not allow people to permanently reside there. The main reason was the poor quality of the drinking water. But now, a collective water system has been established in most of the area, as the desire to live there was high and we needed to react (expert from a municipality office, int. M01).*

One particular problem is drainage, because summer houses are often situated close to bodies of water or simply in areas subject to seasonal flooding. For a problem such as this, finding solutions can be complicated because the land

is divided among various owners. The major barrier for comprehensive planning and solutions nowadays lies in the private ownership rights for each plot. Clearly, plot owners attempt to fix the problems within their own boundaries:

*After two years of living here, drainage problems appeared. The basement was always full of water and it made the walls rot. I have now filled the basement with gravel and renovated the walls. I hope the problem is solved (middle-aged man living with wife and elderly mother, int. R08).*

Although infrastructural problems are the most common reason for communicating with other plot-owners or the municipality, residents only do this when they cannot think of any solutions themselves. Municipalities offer some help to solve problems, but they do not initiate renovation works, even though such problems often require comprehensive investigation and planning. For example, according to Estonian law, municipalities are responsible for ensuring the provision of water and sewerage in densely populated areas, but post-summurbia is still not always officially designated as densely populated.

Municipalities thus challenge whether it is even their task to provide a sewerage system, because settlements are not fully inhabited (which is technically true, but the density is still rather high in most cases). This connects to the overall institutional uncertainty related to planning and extra expenses that municipalities would probably want to avoid (Raagmaa, 2009). This points also to an extreme case of pragmatic planning, or perhaps simply 'non-planning' (cf. Kemp et al., 2007). There is minimum reaction to the problems by the planning authorities, but there should still be at least some step-by-step progress, as hinted at by the following interviewee:

*The increase in the residential function makes the water and sewer system issue important. So far, the residents have fixed it, but those areas are not meant for such volumes of wastewater generated by so many residents (expert from a municipality office, int. M04).*

Roads are another example of the problems faced by residents. Firstly, overall maintenance is poor, because the roads were not built for intensive use, especially during the non-peak season. Secondly, the legal ownership status of the roads is often unclear. In some cases, roads belong to the municipality, but in many others they have been privatized by the former cooperative, which no longer exists, neither de facto or de jure. In yet other cases, road ownership is shared between the properties, or there are no legally-defined roads, but rather designated segments of plots that, combined together, constitute them. The reasons for this disarray lie in the rapid conduct of land privatization, which caused complex problems in relation to ownership and maintenance responsibilities. Residents often maintain roads despite their messy legal status, just to make access possible. In the best of cases, this is done with the support of the municipality:

*After many attempts, we finally wrote a polite and probably reasonable application to get the roadwork done. Before that we collected money from the neighbours and my husband used to be very active in ordering the road-filling material every once in a while. But each time the filling was washed away relatively fast... In fact, the local government saw that we had invested a lot in it by ourselves, but that this was not enough. So, they finally did it [paved the road] two years ago (wife of middle-aged couple with young children, int. R10).*

This quotation also suggests that despite the wish for independence from the municipality in finding solutions, residents are most satisfied when the authorities play an important role in renovating roads, putting up streetlights, establishing water and sewerage systems, organizing a school bus route through the neighbourhood, and other services. In hindsight, this type of help from municipalities was seen as having a positive effect. Nevertheless, in areas where systems had not been renovated, residents demanded little input from the municipality, or were even skeptical about it.

Overall, the current planning approach in post-summurbia is rather eclectic. Residents have learned to be creative and to depend on their own resources; indeed, in many ways, they are happy to be independent and free from regulations. One can even recognize a hint of rebelliousness, which is clearly a reaction to the former socialist regulatory planning activities in these settlements. Local planners prefer not to interrupt residents' activities and tend to react only if residents ask first, if even then. Planning regulations are also difficult to enact when the landownership situation is fragmented, while property rights themselves are sacrosanct. Residents have learned to look positively on finding their own creative solutions and to be skeptical about collaboration. In contrast, they have also shown some initiative in cooperating with each other and with the municipality, whenever possible, to find collective solutions. We describe the issues related to collaboration and cooperation in more detail in the following subsection.

## 5.2 Communication practices in post-summurbia

The everyday social dynamics between neighbours highlight tacit local values (Healey, 2003) and form the basis for forging common coalitions for planning ideas. The traditional Soviet summer house community ideal: intensive communication between neighbours; communal working activities in settlements and on each other's plots; and celebrations of national and personal anniversaries (Lovell, 2003), may be what distinguishes the socialist-era summurban lifestyle from its capitalist suburban counterpart. According to the presented analyses, this type of 'dacha community' is a dwindling phenomenon in our sample settlements, quite unlike the situation in the so-called 'garage areas' of the core cities, where gendered community-building practices persist unchallenged (Tuvikene, 2010). Old-style community life persists in post-summurbia when the original summer hut owners are still present. Although old connections and traditions may remain alive, however, they are maintained and practised, respectively, less intensely, or only during the summer months when the seasonal residents arrive:

*I am the only person living here [a small cooperative – Authors] during winter. In spring, the summerhouse people come and life begins. Everybody manages their own gardens, but the interaction between the neighbours is also intensive. They are all old friends or old friends' children like me (single middle-aged man, int. R05).*

The next level of community life could be called 'the new community'. In some areas, new owners have blended into the community and started to interact with other newcomers, who are often from similar life situations (e.g. young couples with children). Communication also provides mutual benefits: older people help look after the children, while young families help the elderly with their everyday needs (e.g. shopping, shovelling snow). These communities, however, often only engage with the more active residents, as one participant told us:

*Sometimes we find ourselves in someone else's garden talking, talking, and talking for hours. But this happens chaotically and in an unplanned way... For the New Year celebration we have a tradition of spending a few hours in different neighbours' homes. But not all the neighbourhood is included, just some close friends (wife in a middle-aged couple with three children, int. R15).*

Residents typically form closer relations with only a handful of locals. Such connections are often developed following requests for help in everyday situations – lifting something, building something, transporting something or somebody by car, finding a missing ingredient for cooking, or, not least, solving the shared infrastructure problems in the settlement. In this way, although dwellers do not feel any special need to create a community life in post-summurbia, neither do they reject it if it develops naturally:

*We did not know anybody at the beginning. One day, I was baking a cake but discovered at the last moment that I did not have any sugar left. There were only a few people living here at this time. One was an old lady that did not like us; I went to the other house where I had not met the people before. It happened to be a young family like us. We have really started to get along well. We even have a tradition to invite each other for a sauna most weekends (young married mother with one child, int. R10).*

There can be hard feelings among residents. Some dwellers have the impression that while others are interacting, they have been left out for some reason. Others feel anxious about the neighbours not being interested in communicating, while prejudice, hostility, and quarrels occasionally damage the social environment:

*I was born in Estonia and I know that Estonians are very calm and introverted people... On the other hand, it is also good that they don't stick their noses into our business (wife in an older couple, Russian speaking, int. R12).*

Many residents avoid close (or any) communication with their neighbours apart from a simple greeting on the street. They do not know their neighbours and have little interest in them. For these people, home is a private place for family and friends, who often live in the city or who are spread over a larger area. People in this category may lead a very active social life unconnected to the settlement:

*Maybe the neighbours interact with each other but we don't. We had bad relations with the one neighbour next to us, but luckily he sold his plot. We have relatives living in the settlement close to here – we interact a lot with them (wife in a young couple with two children, int. R20).*

To summarize, the social dynamics between residents in post-summurbia vary by life stage, settlement type and, above all, household. Some people live self-oriented lives, while others have strong ties with their neighbours. In fact, there is no concrete pattern in the evolution of the connections between residents. All groups – newcomers, the elderly, young families, the middle-aged, and retirees – communicate to varying degrees. Nevertheless, our interview findings show that residents are mostly satisfied with their communal lives in the studied settlements – be it active or passive – and they enjoy choosing with whom to communicate and establishing their own ways of living. In this respect, post-summurbia characterizes how diverse suburban areas can be (cf. Teaford, 2008).

From a collaborative planning perspective, it is positive that people are largely satisfied with the social dynamics of their home settlements because this makes them more

attached to the place, thereby allowing greater commitment to developing community spirit (Healey, 2003). At the same time, however, the diversity in the quality and depth of social connections makes it difficult to listen to all voices and to find consensus among residents, notably concerning feasible planning alternatives. Such diversity also prevents local planning authorities from understanding the social dynamics of settlements. Municipal officials would like to improve communality in these areas, although their perceptions are somewhat blurred by memories of the Soviet-style close-knit summurban communities of the past. Some officials stated that collaboration practices had previously been established by old summurban community members, but in comparison that new plot-owners and residents neither knew about them nor were interested in getting involved. Post-summurbanites consider themselves to be individual landowners and prefer to address their personal problems and solutions to the municipality:

*We have established ways and contact persons to communicate with summer house users. But the new residents are not aware of them. They come here and demand whatever they need, not taking into account the overall situation in these settlements (expert from a municipality office, int. M13).*

Municipalities would prefer to meet with a representative body of plot owners, to simplify the communication process. Such representative bodies, however, are rare in post-summurbia because the disjointed needs and attitudes of plot owners make forming them difficult. Presented with this situation, municipalities tend to cling to the memory of how things were regulated in Soviet times and are reluctant to find new ways of meeting the diverse needs of modern post-summurbanites. As a result, while it would make the planners' jobs easier if a representative body or even a single representative person for the entire settlement could be found who could stand for everyone's interests, this might be unrealistic for most municipalities:

*Summerhouse residents should choose a spokesperson and submit their wishes in a compact form. [However,] we do not even know who to contact there. This would be easier for us and for them (expert from a municipality office, int. M10).*

Even though municipal officials are aware of the difficulties involved in collaborating with plot-owners, they rarely take the initiative in terms of planning or renovating infrastructure, preferring to wait until residents contact them:

*Residents approach us only when something really annoys them. Otherwise there seems to be no collaboration between them and it is difficult to understand what they need (expert from a municipality office, int. M17).*

In part, this attitude in consideration of the municipalities may be due to the fact that they are poorly informed about how problems in post-summurbia are managed, and do not recognize that the limits of residents' activities are generally set by their plot boundaries. In addition, the municipalities' attitude may be due to reservations on the part of the residents themselves: some grass-root ideas for co-financing joint systems with all owners and the municipality have been proposed, but these have been contested by plot owners who fear the new expenses these systems may generate. Our participants did not state that the driving force to live in former summurbia was economic, but the topic was raised repeatedly in relation to the cost of investing in the overall infrastructure. For example, one participant told us:

*We tried to initiate the establishment of a central water and sewerage system at our community meeting in spring. To do things properly, you know... It was really difficult to get people to even start thinking about it. They were afraid that they would have to start paying for their neighbours' water. Many families are very small here and some still use the plot as a summer house (husband in a young family with two children, int. R03).*

For their part, residents are not generally interested in the actions of the municipality. They believe that they should resolve technical issues themselves, without reliance on the municipality. Indeed, many residents are ill-disposed towards and distrustful of official bureaucracy in general, and they often only register their residences officially in order to receive small benefits, such as a snow plough in the winter or places in the kindergarten. The following two quotations describe such attitudes:

*All our life is related to the city. We work there, the kids go to school and have their sports training there. We don't care about local politics. My wife is only registered here to get the roads cleared of snow in the winter. I am still officially living in town (married middle-aged man with two children, int. R03).*

*The municipality is all about bureaucracy. We do not need that and can manage here without any help from them (wife of an older couple, int. R06).*

Municipality officials claimed to be open to developing ideas about post-summurbia, despite the fact that they had hardly considered them in their planning strategies thus far. They do pay some attention to those areas where the permanent residents outnumber the seasonal ones, but there is still a lack of vision and few practical planning ideas:

*Those areas are not specifically addressed in our Master Plan. The residents there have not proposed anything to change that. We support the idea that these areas are becoming more and more residential, but we do not really know how to accommodate the process (expert from a municipality office, int. M16).*

*We have not considered those areas in our master plan but the opening up of a new group in the kindergarten and renovating the school are definitely related to the needs of the former summer house district (expert from a municipality office, int. M11)*

Municipal planners register the signals of self-reliance coming from residents and consider it to be easier to leave the areas as they are, allowing for the spontaneous transformation of these settlements into residential districts. The overall position of planning officials, however, suggests that the existence of a path-dependent planning lock-in where, following the top-down establishment of summurban cooperatives, no further attention is given to such areas.

## 6. Conclusions

This article registers some of the ways in which we can come to understand the challenges of contemporary collaborative planning approaches in suburban residential areas that have experienced the transition from socialist- to post-socialist planning practices. Based on the relevant theoretical planning literature, and sensitive to the particular experiences of our case study settlements, we formulated our main research question: How can current understandings and discussions about planning in post-summurbia foster collaborative planning?

Our interviews indicate that post-summurbia is evolving into a fully-fledged form of stable residential suburbia, not least because of the residents' attitudes of self-reliance. The post-summurbanites aversion to their socialist past is vividly manifested in their somewhat rebellious activities. This desire for self-reliance also suits the local municipalities, who are weakly positioned in a 'neoliberal' planning context. The outcome of this situation is that post-summurbia is spontaneously being redrawn as residential districts, with the interests of local residents at the forefront and with little guidance or control being offered by the local municipalities. Moreover, the relative success of such a transformation thus far seems to have strengthened the autonomy of the residents, further weakening the role of planning.

Still, planning needs to reassert its status because of the environmental, infrastructural and social problems the residents themselves bring out in our interview study. In practice, the post-summurban residents' spontaneity and self-sufficiency affect the environment significantly, but their independent activities and rejection of the authorities have resulted in the near-absence of general perspectives and planning. This, combined with the passivity of the authorities, has prevented planning from playing a more active role: problems are solved only when they cry out loud or are presented within a politically powerful framing.

Our study confirms the tendency to listen to unequal voices, which is a classical focus of critiques of collaborative planning (Healey, 2003). The challenge for planners lies in seeing the bigger picture of post-summurban development. The municipal officials interviewed in this study are, of course, also affected by the post-socialist attitudes of rejecting comprehensive planning altogether. It appears that this stance inhibits them from seeing the alternatives that lie between the two extremes of comprehensive planning and non-planning.

The responsibility to foster the communicative approach in post-summurbia rests heavily on the local planning agents. Their passive attitudes have stayed in limbo for a long time, but they are probably connected to the wider problems of unclear institutional assignments and budget decisions (Raagmaa, 2009), or to the fact that professional planning education has developed slowly in Estonia (Adams et al., 2014).

The present study shows that in order to launch collaborative planning in post-summurbia, it should be brought back to its roots in pragmatic philosophy. The residents' learned experiences of self-sufficient problem-solving are a valuable untapped resource for planning in these settlements. This uniqueness is worth preserving as it has made the locals bond to their living places in multi-dimensional ways. They are strongly motivated to develop post-summurbia as a liveable and sustainable environment. The main obstacle in these areas consists of the tensions between individualism and self-sufficiency versus the willingness to demand or accept municipal investment in the improvement of the public infrastructure. The main challenge for planning is to take the lived experiences, resources and needs of the residents seriously. How this can be done is an issue that requires further research.

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# Creative industries in the capital cities of the Baltic States: Are there innovations in urban policy?

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## Abstract

*The transformation of urban policy, resulting from 'creative industries' policy developments, is explored in this article, with respect to the Baltic capitals. Policy initiatives in the creative industries in Central and Eastern European cities have predominantly developed through policy transfers from Western Europe, with its long-term market economy experience. How adaptable are such policies for post-socialist cities? Using the concept of social innovation, this article describes mechanisms that facilitate policy acceptance and examines whether and how the development of creative industries has resulted in urban policy renewal in the Baltic capitals.*

**Keywords:** creative industries, urban policy, social innovation, Baltic capitals (Tallinn, Riga and Vilnius)

## 1. Introduction

The increased role of cities as economic competitors together with the diversification of their functions, forces them continually to adjust policies in line with socio-economic changes, while also providing new development targets. In recent decades, the concept of creative industries (CI) has become recognized as an important field for the cultural and economic vitality of (city) regions, providing significant economic resources especially through creating value, employment and image. This shift – the recognition of CI – is not restricted to the transformation of the economy, but is also closely related to changes in lifestyles, including the use of leisure time as well as changes in the role of culture (Bramham and Spink, 2009), and an increase in postmodern values (Beck, 1986). In developed (Western) economies, the significance of CI in local-level policies has been observable since the 1980s (Hesmondhalgh and Pratt, 2005). The emergence of a new policy stream – a creative industries policy – has shaken the backbone of several other policies, including cultural, economic, innovation, education and regional policies (Throsby, 2008; Wyszomirski, 2008; Potts and Cunningham, 2008).

In developed (Western) countries, however, such policies developed more or less alongside general socio-economic changes. In contrast, in the majority of post-socialist Central and Eastern European (CEE) countries, the ideology of CI was predominantly introduced via an initiative of the British Council (Jürisson, 2007; Primorac, 2006; Suci, 2009). Thus, the main mechanism for the emergence of CI policy-related initiatives was policy transfer from the UK, and therefore, the development of CI policies can be considered (mainly) as a top-down innovation or reform in these countries (Lassur et al., 2010). As the support policy for CI has been considered quite location- and culture-specific, linked to the particular urban environment and the peculiarities of local cultures, this raises the question of whether and how the socio-economic context in CEE countries enables the transfer of new kinds of policies and supports their adoption and development.

In this article, we explore the transformation of urban policy which has resulted from the introduction and

diffusion of the concept of CI in three post-socialist cities: Tallinn, Riga and Vilnius (Fig. 1). Compared to countries with long market-economy traditions, the capitals of the three Baltic States are 'newcomers' in terms of CI development, and have rarely been in the focus of CI policy studies. The fact that they are capital cities located in the same geographical region, with roughly similar populations and sharing a similar socio-economic background, makes them a good collective subject for such a study, as their starting positions and capacity for developing new policies seem similar. Following the concept of social innovation, we examine whether and what kinds of mechanisms can be identified in CI policies that facilitate the adoption and (successful) implementation of CI policies in the three Baltic capitals. The discussion is premised on the findings of an international study: "Creative Metropolises" (CM, 2010), that mapped the public CI policies in eleven European cities (including Tallinn, Riga and Vilnius) in 2009.



Fig. 1: Area under study

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## 2. Explanation of CI policies: social innovation approach

In this article, CI policies are discussed in the context of the top-down transfer of the CI ideology and the development of the resulting policies. Regarding 'policy', we have followed Lodge (2007) and taken three key variables into focus: policy rationale; policy instruments or intervention mechanisms for supporting and developing CI; and governance of the policy process which includes certain conventional top-down patterns as well as horizontal or bottom-up processes, which take form in certain organisational or institutional arrangements (Lange et al., 2010). The focus is set on exploring how the implementation and acceptance of CI policy practices can be facilitated.

To explain the facilitation possibilities of CI policies we make use of the concept of social innovation (SI). We follow the wide-scope approach to SI (a narrow approach proceeds from the understanding that SI is induced by some kind of social need and/or is aimed at solving a critical social problem: see e.g. Mulgan, 2006; Nussbaumer and Moulaert, 2004) according to which SI is particularly concerned with processes and mechanisms that facilitate the process of adopting change. This kind of approach to SI stems from economic and technological, as well as organizational and management theories. These explain SI as an important 'enabling mechanism', facilitating the implementation and adoption of the 'main' innovation (Gopalakrishnan and Damnapour, 1997; Moulaert et al., 2005) – the ideology of CI and particularly CI policies in our context. In this case, the trigger for a SI is the need for structural adjustment due to reforms and/or radical (e.g. technological or economic) changes in the external environment. There are two main issues that illuminate "the power" of SI to facilitate the adoption and acceptance of change. On the one hand, SI is explained as change in multilevel social institutions (Heiskala, 2007) that encompasses regulative, normative and cultural elements of institutional change:

*"Regulative innovations transform explicit regulations and/or the ways they are sanctioned. Normative innovations challenge established value commitments and/or the way the values are specified into legitimate social norms. Finally, cultural innovations challenge the established ways to interpret reality by transforming mental paradigms, cognitive frames and habits of interpretation. Taken together these three classes form the sphere of social innovations" (Heiskala, 2007: 59).*

Accordingly, the concept of SI emphasizes that the innovation (CI policies in our context) to be implemented and adopted should be accompanied by changes in meanings, everyday practices and social structures (Tuomi, 2006). This suggests that changes should occur not only at the regulatory level (e.g. state reform) but also at the normative and cultural-cognitive levels of social institutions (Scott, 2001). On the other hand, the concept of SI also makes it possible to highlight certain social mechanisms that facilitate the process of innovation and bring about change at the level of subjective meaning.

Social innovation theorists (Marcey and Mumford, 2007; Heiskala and Hämäläinen, 2007; Tuomi, 2005) emphasize that the processes of interaction, learning and the attribution of subjective meanings to changes are closely related and fundamental to the innovation process, as shared understandings arise from these processes. These mechanisms can be seen as the 'carriers' of SI, thus helping

to explain the implementation, adoption and adaptation of the innovation, making it part of social practice. From the perspective of SI, the "success" of an innovation can be assessed in terms of the depth of the change regarding institutional levels and the acceptance of the change by the actors the policy addresses. Applying the concept of SI in the context of CI policies can illuminate the importance of the interaction mechanisms that bring together CI policy makers and beneficiaries (e.g. CI sector representatives, policy makers from other fields, citizens, etc.) and support the diffusion of CI policy practices. Thus, the implementation of change through public policies requires certain mechanisms, initiatives and institutional settings – different forms of formal and informal social networks, options and spaces for knowledge exchange, involvement, arenas for collective learning – which all facilitate the sense-making, and therefore, support the adoption of the policies.

To analyze CI policies, we focus on identifying those mechanisms which: i) support the diffusion of new CI-related knowledge and practices; and ii) are directly created to facilitate the acceptance of CI policies, including networks and other types of interaction instruments which bring together the policy-makers and the beneficiaries that the policies address.

Creative industries deal with discussing and (re)defining the relations between economy and culture; they bring together contact points or border zones of different activity systems (Engeström, 1987; Tuomi-Gröhn et al., 2003). Recent developments in the conceptualization of CI indicate that the understanding of CI has been moving from industry-based definitions towards market- and network-based conceptualizations (Potts et al., 2008). By generalizing former discussions on CI and its policies, we can highlight the following three topics where the issue of interaction mechanisms has been revealed:

1. through the existence of interaction at the level of CI as a field;
2. through cooperation practices within the organizational structure of support for CI policy; and
3. through the beneficiaries of CI policies.

The existence of interaction within the field of CI and with other fields depends on the particular approach to CI. At the one end lies the sector-based approach (i.e. creative economy (Howkins, 2002) that determines CI as a group of certain sectors that constitute the spectrum of CI – or 'just another industry', if using Potts and Cunningham's (2008) approach. In terms of policy this means that CI is treated as an insulated sector policy (beside other policies). At the other end of the spectrum are approaches that explain CI in a wider sense/context. Here we may refer to concepts such as creative city (Landry, 2000) that can be described as all-embracing by capturing all kinds of fields related to urban development (Landry et al., 2005) or the concept of the experience economy (Pine II, Gilmore, 1999), which stresses the customer point of view – not only on developing CI, but on the economy in general. Florida's (2002) creative class concept also coincides with the wider approach to CI. He defines the creative class as consisting of people who add economic value through their creativity. His concept encompasses both 'traditional' creative fields, as well as a range of knowledge-intensive industries.

In principle, these approaches are based on the idea that activities supporting CI have cross-sector scope. The more recent approaches to CI (e.g. value-creating ecology, social

network markets) define CI as network-based activities: the constellation of CI firms is dynamic and value flow is multi-directional and works through networks (Hearn et al., 2007). The findings from recent studies on CI policies indicate that there is an increasing tendency towards a comprehensive approach to creativity and a rise in creativity as strongly related to different fields. Major importance is attached to linking enhancements in CI to the policies and practices governing other sectors and fields (e.g. innovation and ICT). CI is increasingly included in innovation and other strategies supporting the tendencies towards the knowledge economy (Foord, 2008).

The second topic concerns the forms of interaction in terms of the organizational structure of the support for CI policy. As CI policy, due to its inter-disciplinarity, is a field of responsibility for several policy institutions, we may raise the question of whether the organizational structure of support is based on cooperation and enhances (new) forms of collaboration between different structures and institutions. A discussion has been growing in the theoretical discourse regarding whether the traditional structures of governance are suitable to CI due to its peculiar patterns of operation (Lange, 2009; Balducci, 2004; Kunzmann, 2004). CI challenges the structures and practices of governance in several ways, including: the blurring of borders between parties at the governance level and the intertwining of relations (Jessop, 1995; Rhodes, 1996); an increased need for cooperation, cross-sector policies (O'Connor, 2009; Potts and Cunningham, 2008; Throsby, 2008); the deinstitutionalization of public and private sector partnerships (Lange, 2009); and the increasing significance of the mediating institutions (Costa et al., 2008), etc. It has been argued that CI is creating new (network-based) forms of governance arrangements (Lange, 2008; Kalandides, 2007).

The third issue concerns the beneficiaries of CI policies. In terms of supporting interaction, we may raise the question of which kinds of actors are addressed via CI policies: whose practices are expected to change, and in addition, whether the policy instruments force the actors to cooperate with each other. It is recognized that creative activities often take place in clusters (Porter, 1998; Porter and Stern, 2001) that enable spaces of intensive collaboration. The importance of CI clusters has been seen in their highly interdependent nature, which cultivates urban density and supports the building of healthy communities (Shoales, 2006). The recent studies on CI (Foord, 2008; Evans, 2009) also reveal the increasing importance of cluster development in CI supporting strategies. The discussions about supporting CI have also highlighted that CI push us towards a rethink of the industries, as their organizational model is the network interaction (Hartley, 2005) of micro and small producers rather than the supply chain hierarchy of Fordist industries (Borg and Russo, 2006), and their production model is strongly influenced by user-created content (OECD, 2007). This illuminates the importance of demand-side instruments aside from the supply-side measures in supporting CI. This means that the target group of CI policy is not defined using CI sector representatives, but is addressed to representatives of other fields, including citizens and the wider public.

We may conclude that CI policies are connected with the design of several different social interaction mechanisms.

Therefore we may raise the following central research question for our study: Have the three Baltic capitals introduced interaction mechanisms in their CI policies that i) support the diffusion of CI knowledge and practices, and ii) facilitate the acceptance of CI policies? If so, what kinds of mechanisms are they?

### 3. Creative industries in the capitals of the Baltic States: The context of CI policies

Tallinn, Riga and Vilnius are 'newcomers' in terms of CI policies. The collapse of the Soviet system at the beginning of the 1990s called for substantial changes in all fields, including cultural policy. The introduction of the "Western" concept of CI into the cities of the Baltic States coincided with a period when the market economy was just starting to function in these cities. This makes the situation for developing CI policy in CEE countries radically different from that for Western developed countries. The following peculiarities of the socio-economic background can be considered most important.

Firstly, as Jürisson (2007) has argued, the conflation of market- and consumer-oriented CI with a traditionally elitist cultural policy created a rather conflicting mix. In all post-socialist countries, the cultural sector has initially been perceived from the view of "expenditures on culture" and not from the perspective that the cultural or creative field can generate profit (Primorac, 2006). In the course of time, this kind of attitude changed along with the rise in the importance of making money – this has taken place at different speeds in different spheres of culture<sup>1</sup>.

Secondly, the social context of the "transitional" markets of post-socialist countries differs radically from the social context from which the notion of the CI originated (Tomić-Koludrović and Petrić, 2005). During the 1990s, developed countries faced the 'second-modernity' (Beck, 1986), which was marked by an increase in post-traditional organizational forms and post-materialist values, and which also paved the way for the emergence of creative industries. At the same time, trends in post-socialist countries can be described according to Inglehart's (2000) classification, as using "survival values". We have to agree with Tomić-Koludrović and Petrić (2005) that despite the development towards individualism, it was certainly not individualization in the sense of post-modernism.

Thirdly, suitable administrative structures for supporting such a new type of integrative development were generally missing in post-socialist countries. The structures in these countries were established for supporting culture via public funding and not for the development of cultural entrepreneurship (Jürisson, 2007). Regarding support measures for entrepreneurship, generally these did not take account of the peculiarities of creative/cultural entrepreneurship.

Fourthly, since the secondary sector (i.e. industry) dominated the economies of these countries during the socialist period, the transformation of industrial urban space in the early 1990s was generally more topical than in the cities of highly-developed market economies (i.e. there was a delayed transition to a services economy). This opened the potential for CI to join the processes of transforming the

<sup>1</sup> As the findings of the study, carried out in mid-1990s in Tallinn, Riga and Vilnius and exploring the new industries, indicated (see Cooke et al. (2003) for more details), the level of adopting market economy principles among the cultural enterprises and institutions varied to a great extent (e.g. advertising agencies and architectural bureaus were at the forefront).

urban environment. The extent that this has been realized in post-socialist countries is another matter (Tafel-Viia et al., 2014).

In all of these cities – Tallinn, Riga and Vilnius – the impetus for introducing the CI concept and related policies, in particular, came via a British Council initiative. The efforts to disseminate the CI ideology landed on fertile ground, as cultural policy officials saw new (financial) opportunities through developing CI (Lassur et al., 2010). Initially, the concept of CI made its way to the national policy level and was further transferred to local level programs. Although there are other important factors, which have influenced the development of CI in the cities (e.g. Nordic influence in the case of Tallinn), this kind of top-down policy transfer mechanism has been the central driving force in the emergence of CI policies (Lassur et al., 2010). Certain policy instruments (e.g. strategy document in Latvia, support for incubators and creative centres in Estonia and Lithuania, etc.) for supporting CI have also been developed at the national level; nevertheless, regarding specific actions, the cities themselves have been more active.

All three capitals in the Baltic States have followed an approach to CI adopted at the national level that is an adaptation of the British definition of CI: “The creative industries are those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property” (CITEF, 1998). Still, some important differences can be recognized. Estonia made some minor changes to the British definition by adding a clause about ‘collective creativity’, in addition to the ‘individual’ in the definition. In terms of the sub-sectors involved, then only a very limited part of the IT sector is included – entertainment IT (the production of computer games, interactive games, etc.). Latvia and Lithuania encompass a much broader spectrum of the IT sector. Vilnius uses the broadest definition of CI and includes also tourism, sport and other cultural activities. Still, sport and related activities are left out of the mapping studies and in calculations of the economic contribution of CI (Lietuvos Kūrybinės ir Kultūrinės Industrijos, 2009). Thus, Vilnius has defined the concept of CI more loosely and included more sub-sectors, compared to Tallinn and Riga. This indicates that Vilnius aspires to integrate a greater variety of spheres under the development of CI or, the other way round, develop CI via various spheres of life. The addition made by Estonia reflects the need to strengthen interaction within the CI sector, which is important in terms of social innovation.

#### 4. Methods of data collection and analysis

The research team which developed the methodology for this study and carried out the analysis was led by the authors. The study encompassed, in addition to the three Baltic capitals (Tallinn, Riga and Vilnius) the following European cities: Helsinki, Oslo, Stockholm, Amsterdam, Barcelona, Berlin, Birmingham and Warsaw. The study was designed to examine the development of CI policies in these cities. Data were collected using a qualitative, structured and semi-open questionnaire. The questionnaire was completed by local researchers in each of the 11 cities, who interviewed the local policy-makers and sector representatives to receive answers to the questions. This process assured that the most relevant and up-to-date information was being used.

The questionnaire consisted of 37 questions divided into four sections:

1. general architecture of support;
2. measures supporting the development of CI;
3. the criteria behind strategic choices in CI policy; and
4. background statistical data.

Cultural policy instruments and supporting measures were excluded for this study. About half of the questions were open-ended, and the remainder had a finite set of predetermined answers. The questionnaire also contained ranking type questions where a 10-point scale was used.

We analysed the data by modifying constant comparative methods (Strauss, 1987; Strauss and Corbin, 1990), which allowed us to develop coding criteria enabling a categorisation of the characteristics of both topics and cities. We implemented an open coding method, meaning that we broke down, examined, compared, conceptualized and categorized the data (Strauss and Corbin, 1990) gathered with the questionnaires. The final coding scheme emerged from several category redefinitions and recoding. Three of the authors of this article were involved in the coding process in order to increase the reliability of coding and categorisation.

After coding all the data (city questionnaires), we moved forward with the analysis using a text expansion strategy to find illustrative texts for the codes and categories (Laherand, 2008). This iterative process was needed to avoid interpretation mistakes in generalising the results of the analysis. The results of the analysis made by the research team were checked with each of the cities several times. In the first phase of analysis, the research team divided the cities into two groups based on the different stages of the development of their CI policies:

1. cities with more established CI policies (Western-European and Nordic cities); and
2. cities as ‘newcomers’, such as post-socialist cities including Tallinn, Riga and Vilnius.

The first outcomes of the analysis were sent back to the cities’ researchers and officials in order to obtain confirmation from them that the results were interpreted correctly. The findings of the analysis were discussed during several interactive workshops among city officials and other CI policy stakeholders to obtain wider reflections. Based on the feedback and discussions, the findings were specified and summarized by the research team members.

In the following section we concentrate on identifying the extent to which the CI policies of Tallinn, Riga and Vilnius contain interaction mechanisms that support the diffusion of CI-related knowledge and, on the other hand, facilitate the adoption of CI policies by various actors in society. The findings reflect each city’s policy and do not encompass regional and national policies that may also apply to the cities.

#### 5. CI policies of Tallinn, Riga and Vilnius in the context of international comparison

The findings of the study are presented in three parts. Firstly, we explore the focus of the CI policies in the three cities. Thereupon, we describe how the organizational structure of support in these cities supports the development and adoption of CI policy practices. And thirdly, we explore the changes related to policy instruments in force in the three cities.

### 5.1 The focus of CI policies

When examining the focus of CI policy as written into the policy documents and perceived by the city representatives themselves, two issues are taken into focus: the extent of interaction between CI and other fields at the policy document level, and second, how widely or narrowly CI is understood in terms of the approach and aims set for the CI policy. In the study, the cities were asked to describe the main strategic documents that currently support and develop CI in their city, and to assess the overall focus and approach of their CI policy (see the questions in Table 1).

In all three cities, CIs are included in the city's general strategy and/or long-term development plan. In the case of Tallinn, this means that the development of CI is included in the general strategy document Strategy Tallinn 2025 (from 2004) and the Development Plan for Tallinn 2009–2027. The

development of CI is also included in the Tallinn Innovation Strategy (enacted in 2008) and the Tallinn Old Town Development Plan 2008–2013 (enacted in 2008). Regarding Riga, the development of CI is written into the "Riga city long-term development strategy 2025" (followed by the "Riga city development program 2006–2012"). Riga has also included the development of CI in its cultural policy document: "Riga city cultural policy". Another important document to mention is the "Agreement of support for Creative Industries – Riga City Council and Ministry of Culture protocol of intentions", which is directly aimed at developing CI. With respect to Vilnius, the development of CI is included in the strategy document "Strategic Vilnius City 2002–2011 Plan". Another important document is "The Creative Incubators Financing Programme", that directly focuses on stimulating the CI sector. CI is also mentioned in the "Vilnius Master Plan 2015 – urban city development strategy".

Questions	
a)	Please provide a list of the strategic documents in force (strategies, action plans, etc.) that are aimed at supporting CI or include activities related to CI. Please start with the most relevant.
b)	Please provide a short overview (nature and main goals) of the documents listed.
c)	Please indicate the focus of CI policy on the given scale (economic, spatial, social / inward – outward)
d)	Please describe the overall aim of your city's CI policy.
e)	Please indicate which overall approach to supporting CI dominates in your city, selecting between the following alternatives (sector-based, cluster based, CI sector is supported as a whole).

Tab. 1: Questions related to the focus of CI policy

Source: "Creative Metropolises study: Situation analysis of 11 cities" (CM, 2010); compiled by the authors

Comparing the three cities then, Tallinn in particular has chosen to include the development of CI in various strategic documents. The inclusion of CI in the innovation strategy indicates that Tallinn is following rather recent trends in CI policies that link the development of CI with economic and innovation policies. Tallinn, however, has no dedicated document for the development of the CI sector. Vilnius has primarily included CI in documents that relate to wider urban development. In the form of the incubator financing programme, Vilnius also has a policy document directly supporting the CI sector. As opposed to Tallinn and Vilnius, Riga is developing CI more within the framework of its cultural policy. Therefore, we can notice differences in the policy practices of each of the cities: compared to Riga, Tallinn and Vilnius have linked the development of CI more broadly with other fields. Despite the fact that the mere inclusion of the development of CI in policy documents does not directly indicate changes in policy practices, we may still argue that designating CI among the development priorities of the cities can be considered as a relatively large achievement.

Analyzing the aim and approach of CI policies in the three cities, we start from the question of the overall aim of the city's CI policy. Tallinn responded as follows:

*"... different documents and activities derive towards two main focuses: 1) attractive living, working and visiting environment - meaning the development of space and supporting of vivid cultural life in the city; aimed at attracting and inspiring for locals, visitors, investors and talents; 2) [...] to pay more attention also to creative entrepreneurship [...]". (Tallinn)*

This aim contains two main spheres – spatial and economic – present in Tallinn's CI policy. It also indicates that CI policy has both an inward and outward dimension: the city environment has to inspire locals and also attract visitors and investors. Further analysis of the policy documents enables us to explain the aim of Tallinn's CI policy in more detail. One group of objectives in different strategic documents for developing CI is linked with the tourism sector. By using the term 'experience economy' in the document, "Strategy Tallinn 2025", CI is understood as a broad sector including all actors and activities which provide emotions (i.e. culture, sport, leisure time activities, etc.). In other policy documents the term 'creative industries' as understood in the British approach is used.

In the Development Plan of Tallinn 2009–2027 one can find objectives explicitly focusing on developing the CI sector: "Opportunities for creators to introduce their creation and others for partaking in artistic experiences" (Development..., 2008). The inclusion of CI in the Tallinn Innovation Strategy (2008) broadens the framework in which CI is to develop. This strategy focuses on CI's ability to create an inspiring and attractive living and working environment (attracting talents and investments); therefore, emphasizing the spatial dimension. On the other hand, the creative industries are explained in the context of "[...] having a major influence on other economic activities" (Tallinn..., 2008), which illuminates the economic aspiration in developing CI and emphasizes linkages with other economic sectors. The inclusion of CI in the innovation strategy also refers to the integration between cultural, entrepreneurial and innovation fields. The objectives related to the development

of CI in the Tallinn Old Town Development Plan 2008–2013 (Tallinna..., 2008) are primarily associated with tourism and business development in this area, but also CI's importance in developing an attractive environment. Thus, we see again an emphasis on the spatial in the policy document.

Riga's response to the question about the overall aim of the city's CI policy was as follows:

*"... to maximize economic benefit from the cultural industries concentrated in the city and from creative potential." (Riga)*

This kind of aim indicates the rather clear economic focus of the city's CI policy. The analysis of Riga's policy documents, however, enables us to somewhat broaden the policy focus. In the "Riga city long-term development strategy until 2025", Riga has set up the creative economy as one of the priorities in the development of the city. The policy documents oriented explicitly towards the development of the CI sector address primarily the economic sphere: the priority is to maximize the economic benefit from the city's cultural and creative industries. The spatial focus is also addressed by linking the development of the city's infrastructure, cultural processes and creative districts to the development of CI. The development of the city space is considered important for both locals and tourists, which indicates that inward and outward dimensions are both addressed in the documents. According to explanations by representatives of the city, the spatial orientation is considerably less important compared to attaching value to maximizing the economic benefits from the CI sector.

Vilnius described the overall aim of the city's CI policy as follows:

*"[...] one of the main CI developments [...] should be aimed at those CI sectors that are directly related to tourist arrival activities, namely related to the export of CI products and services. [...] However, another very important CI function of the city is to stimulate public creativity and civil activity, participating in Vilnius city as well as international cultural projects to ensure harmonious urban city development, attracting the local community as well as the guests of the city."*

Based on this response, Vilnius has set rather a broad goal for its CI policy. It contains building linkages with other sectors – with the tourism sector in particular. Furthermore, it includes the aspiration of including the wider public and not merely the actors in the CI sector. Thus, the policy

focus is not limited to enhancing the business capacity of the CI sector, but the participation and social interaction of the wider public are also seen as part of CI policy. Further analysis of the policy documents confirm that one group of activities in the CI policy is linked to the tourism sector. The development of the entertainment and leisure sector is also seen as part of the development of CI. The city's main strategy document "Strategic Vilnius City 2002–2011 Plan", makes use of the concept of a creative city and has set up four strategic development priorities: international competitiveness, new economy, progressive society and communication system. This indicates a rather broad focus, including the stimulation of public creativity and citizen participation as important CI-related activities. The CI-sector specific document "The Creative incubators financing programme" has again a clear economic focus: it is intended to stimulate artists that are starting businesses and creative businesses by offering reduced rent, business consulting and public relations services.

At the level of CI policy goals, we see that of all the three cities, Vilnius is making the strongest attempt to follow an all-embracing approach in developing CI: economic, spatial and social spheres are all visible on the level of overall focus of its CI policy. Tallinn also has set a rather broad focus for its CI policy, especially in terms of linking CI development with innovation enhancement. Riga tends to emphasize an economic focus in developing CI, which is the narrowest approach compared to the other two cities.

## 5.2 Organizational support for CI policy in Tallinn, Riga and Vilnius

In this section we examine the form of support structures for CI policy in Tallinn, Riga and Vilnius. The question is whether the organizational structure of support is based on cooperation and how it enhances (new) forms of collaboration between different structures and institutions (see the questions in Table 2).

Based on the responses, the situation of the support architecture in the three capitals of the Baltic States can be described as follows:

- In Tallinn there are principally three departments involved: the Business Development Department, the Cultural Department and the City Office Development Bureau. The responsibility for supporting CI is mainly divided between the business development and cultural department who provide grants or other forms of support

Questions	
a)	Please describe the division of support architecture between state, regional and local (your city) level in supporting CI.
b)	Please describe the explicit role (the extent of activities) the city has in developing and supporting CIs.
c)	Please describe the organizational structure of support for CI. Please name and describe the structural units of the city, special organizations and actors responsible for supporting (implementing) the CI on the city level.
d)	Please describe the cooperation model with businesses and the third sector: the division of work/tasks between the public sector, business sector and third sector.
e)	Please describe the situation in international cooperation in the field of CI development.
f)	Please indicate who initiates the goals for CI policies in your city. (List of five possible variants was given.)

Tab. 2: Questions related to the organizational structure of support for CI policy

Source: "Creative Metropolises study: Situation analysis of 11 cities" (CM, 2010); compiled by the authors

and services. The City Office Development Bureau is responsible of compiling strategies and other city development documents. The cooperation with the third sector has been gradually getting stronger – especially the cooperation with sector-based organizations (e.g. professional unions). Cooperation with the third sector has also been developing due to increasing grass-roots activities within the CI sector (Lassur et al., 2010);

- In Riga, the Culture Department is the leading actor in implementing and developing CI support policy and two other departments are also involved, the City Development Department and the Business Coordination Centre. There is no dedicated unit for the coordination of CI-related activities; however, the Culture Department aims to involve the aforementioned departments in coordinated actions. The leading role of the Culture Department also explains why CI has been included primarily in cultural development documents. Regarding cooperation with the business and third sector, Riga has claimed that each of the aforementioned City council departments has developed its own method of cooperation. Still, cooperation with non-government organizations can be characterized as rather reactive to requests from different sectors, expecting the private and third sectors to come up with their own initiatives.
- Vilnius has claimed that there are several departments involved in developing CI, including: the Property Department, which includes business activities, the Urban Planning Department and the Culture and Education Department, which also has a tourism development section. There are various administrative units involved in supporting CI, but there is still no indication of how the coordination of activities between such departments takes place. In terms of cooperation between the city and the business and third sectors, this takes place solely in the context of certain topics and issues, such as specific events and activities.

According to the SI approach, for interaction processes the amount of various actors involved plays a critical role. Therefore we may assume that the greater amount of different departments involved in policy development and implementation, is the first necessary condition for cooperation to take place. SI emphasizes the importance of shared understandings, such that the existence of

interaction mechanisms between different actors – between different departments in our case – plays also a critical role. In light of the involvement of different actors in policy development and implementation processes, Vilnius and Tallinn perform slightly better than Riga. Still, none of the three cities indicated any new cooperation patterns or forms, or the creation of any new governance arrangements. Levels of interaction with various stakeholders have also remained rather modest in all three cities.

### 5.3 CI policy instruments in Tallinn, Riga and Vilnius

In this study the cities were asked to single out the ten most important measures that support and develop CI.

*Q: Please name the 10 most relevant measures (grant schemes, support tools, investments, regulations, etc.) in force in your city.*

The cities were also given a list of four arguments to consider when selecting the measures. The measure was considered important if: (1) it has an impact on a large number of CI actors; (2) it is directed at developing the prioritized CI sector or cluster; (3) it is financially significant; and (4) it has a broad impact. In the case of each measure, the cities were asked to answer seven questions to describe the measure (see Tab. 3).

All three Baltic capitals indicated less than 10 measures, which show that their CI policies are at a developmental stage. Furthermore, the majority of the measures the cities singled out are not specifically tailor-made measures for developing the CI sector, but are measures that also apply to other sectors (e.g. startup aid for starting companies, including creative enterprises) or existing measures supporting the cultural sector that are now also starting to be seen as measures that support the development of CI (e.g. support for festivals). In the analysis, we focused on identifying whether interaction is supported through applying these measures and what kind of interaction. By coding the measures using a scale where 1 = no orientation to cooperation and 4 = orientation to wider social interaction, we were able to divide the measures for the three cities into four groups. The first group contains measures that are targeted at enhancing the CI sector's own capacity, but contains no interaction within the CI sector or with other sectors. The second group consists of measures focusing on supporting cooperation within the CI sector. The third group

Questions	
a)	Title of the measure.
b)	Type of measure (based on the given classification).
c)	Purpose of the measure. Please describe the main goals and rationale (analytical reasoning why this measure is being created).
d)	Start date and expected end / no end date planned.
e)	Target groups. Please indicate which group(s) the measures are targeted at.
f)	In what form is funding provided?
g)	Please provide the annual city funding for the measure and total city funding of the measure, if applicable (e.g. the total investment for the city district for 3 years).

Tab. 3: Questions related to measures supporting and developing CI in the city

Source: "Creative Metropolises study: Situation analysis of 11 cities" (CM, 2010); compiled by the authors

of measures relate to enhancing cooperation between the CI sector and other sector(s). This group also includes measures where CI is developed through the development of other sectors. The fourth group of measures encompasses activities supporting wider interaction or involvement. The measures in the fourth group may also contain forms of cooperation from the second and third group or some combinations of these forms (see Tab. 4).

As can be seen from Table 4, Tallinn has placed emphasis on two directions: enhancing the capacity of the CI sector and supporting broader involvement. Two measures in particular – “Start-up aid for new business” and “Support for cultural activities by non-profit organizations” – are targeted to improve the economic performance of CI sector actors. The “Action of Culture” award has established the aim of valuing creative professionals and/or events. Regarding the other end of the scale – supporting wider interaction – within the framework of the reconstruction of the Culture Cauldron in Tallinn, educational activities in cooperation with the Energy Science Centre (museum, science and discovery centre located in Tallinn) are foreseen (Kultuurikatel, 2009). A plan exists to embed the centre in the local community of the city and to involve the general public; however, currently this plan is rather poorly expressed. Two more measures – “Support for citywide cultural events” and “Compilation and exhibition of art collections” – are both intended to stimulate demand for CI sector products and services: the first measure is targeted at stimulating demand in the wider public, and the second fosters the use of CI services by the public sector.

It is important to highlight the Tallinn Creative Incubator, as it has been tailor-made for the development of the CI sector. Launched in 2009, it represents a new element in the CI support system in Tallinn. Besides supporting the economic capacity of CI sector actors, the shared space also stimulates cooperation within the sector.

In Riga, the majority of the measures belong to the third and fourth group, targeted at supporting cooperation with other sectors and stimulating wider social involvement. As in Tallinn, Riga supports festivals and develops the “Riga Art Space” (similar to the Culture Cauldron in Tallinn), which is seen as a multifunctional contemporary art space. The “Future City Game” measure is directly oriented towards developing and strengthening linkages between the arts, culture and entrepreneurship. It is aimed at producing innovative ideas for the city's development and stimulating the participation of actors from different spheres of life (CI sector, real estate market, citizens, etc.) in improving their living environment. Compared to the other two cities, Riga has more measures related to supporting cooperation between CI and other sectors. The cooperation pattern here, however, is rather one-sided and relates to developing CI in the context of the exposure of cultural heritage and the renovation of infrastructure.

Vilnius implements the most measures that support wider social interaction. As with Tallinn, Vilnius supports the enhancement of public demand for CI through supporting citizen access to different cultural events (“Financing festivals, cultural events and shows”), and stimulates the

	1 CI sector enhancement (no orientation for cooperation)	2 Cooperation within CI sector	3 Cooperation between CI and other sector(s)	4 Wider social interaction/ involvement
Tallinn	<ul style="list-style-type: none"> <li>• Award “Action of Culture”</li> <li>• Start-up aid to support new businesses (incl. creative companies, individuals)</li> <li>• Support for cultural activities by non-profit organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Tallinn Creative Incubator</li> <li>• Co-financing of cluster projects</li> </ul>	<ul style="list-style-type: none"> <li>• Neat Old House Project</li> </ul>	<ul style="list-style-type: none"> <li>• Reconstruction of Culture Cauldron and development of the organization of the Culture Cauldron</li> <li>• Support for citywide cultural events</li> <li>• Compilation and exhibition of art collections</li> </ul>
Riga	<ul style="list-style-type: none"> <li>• Grant program „Take-Off“</li> </ul>		<ul style="list-style-type: none"> <li>• Public support for renovating architectural heritage objects</li> <li>• Infrastructure improvement in the Spīkeri district</li> </ul>	<ul style="list-style-type: none"> <li>• Riga Art Space</li> <li>• Target program to support festivals</li> <li>• Future City Game</li> </ul>
Vilnius	<ul style="list-style-type: none"> <li>• Support for separate CI sectors by financing municipal institutions operating in the field of CI (theatres, cinemas, orchestras, choirs, cultural centers, galleries, event organizers, etc.)</li> <li>• Enterprise training measures</li> </ul>	<ul style="list-style-type: none"> <li>• CI incubators in Vilnius</li> <li>• Funding for participating in international cultural projects</li> </ul>	<ul style="list-style-type: none"> <li>• Tourism development (tourism development strategies, marketing tools for city identity, image, tourism)</li> </ul>	<ul style="list-style-type: none"> <li>• Financing festivals, cultural events and shows</li> <li>• Municipal expenditures on CI services and products (advertising, architects, media and other services)</li> <li>• Planning cultural city districts and investing in their development</li> <li>• Support for cultural projects and creative educational projects</li> </ul>

Tab. 4: Division of the most important CI policy instruments of the three cities based on their orientation to supporting cooperation/interaction. Source: “Creative Metropolises study: Situation analysis of 11 cities” (CM, 2010); compiled by the authors



need for professional CI services and products among the general public that is within the parameters of the measure “Cultural project and creative educational project support”. The measure “Municipal expenditures on CI services and products”, has been established in order to stimulate CI activities that have the highest level of public and social demand. Here the public sector uses a direct instrument in order to draw wider public attention to CI and increase the awareness of the capacities CI have to offer. Also like Tallinn, Vilnius has paid attention to enhancing the capacity of the CI sector and stimulating cooperation within the sector. Vilnius has a tailor-made measure for the CI sector (a CI incubator) and also finances participation in international cultural projects in order to stimulate shared experiences in the CI sector internationally, and increase awareness of Vilnius’s CI abroad. Regarding cooperation with other sectors, Vilnius supports the linkages between CI and the tourism sector.

To sum up, the majority of the measures in the three cities are targetted at enhancing wider social interaction and involvement, and at the very least the measures are targetted at supporting cooperation within the CI sector as well as with other sectors. The rather high importance of demand-side measures – those supporting wider social interaction, which include the most important measures in all three cities – is in line with recent CI policy trends. Nevertheless, as the majority of these measures have already been in use to support the cultural sector for some time, and are now being viewed as also appropriate for the development of CI (e.g. support for festivals), it is questionable how contemporary these measures actually are. What seems clear is that the beneficiaries from these measures are not limited to CI sector actors, but also encompass citizens and the general public. At the same time, cluster development, which has also been highlighted as a recent important direction in CI policy development, is practically missing in all three cities. The comparison of the three cities indicates that the spectrum of measures in Vilnius and Tallinn is more diverse than in Riga, and that although Vilnius has implemented more measures that support wider social interaction, the complex of measures in these two cities is rather similar.

## 6. Conclusions

This article aimed to explore the transformation of urban policy emerging from the development of CI policies-related initiatives in Tallinn, Riga and Vilnius. Due to the domination of top-down policy transformation, we used the concept of social innovation to highlight the importance of facilitating the adoption processes in the development of CI policies. We examined whether and which types of interaction mechanisms can be identified within CI policies of Baltic States capitals from three perspectives: in terms of the aims described in the policy documents; the structure of organizational support; and the actual measures.

All in all, the findings of the study enable us to conclude that all three cities seem rather active in developing CI, but from the perspective of supporting the implementation of CI policies and facilitate the adoption of related new practices, the situation is somewhat vague. We drew three significant conclusions:

- First: the interaction mechanisms are presented differently at the level of strategies, the structure of organizational support, and CI policy measures. In terms of the aims described in the policy documents, all three cities have included the topic of CI in different

policy documents, although the scope of the aims and the level of integration with other policy documents vary. Vilnius has made the strongest attempt to follow an all-embracing approach at the level of an overall policy focus by encompassing economic, spatial and social spheres into the development of CI. Tallinn also has taken a rather broad focus, with the emphasis on the economic and spatial dimensions. Riga has taken the narrowest approach, seeing the development of CI primarily in the context of economic benefit and developing CI as a sector-based policy.

In terms of the organizational support structure, there is no reflection of any interaction mechanisms between different policy actors involved in developing CI, and this applies to all three cities. There is no indication of the creation of a new type of organisational arrangement that could support cooperation between different units or departments. In terms of actual measures, there are only some single instruments in the cities especially designed to support the development of CI. As there are practically no signs of interaction at the level of the support structure and instruments by means of which CI policy is to be implemented, we may conclude that there are only weak isolated signals about the transformation of urban policy resulting from the introduction and diffusion of the concept of CI in Tallinn, Riga and Vilnius. CI policy development predominantly takes place in the form of the continuation of cultural, entrepreneurship and/or innovation policy practices from previous periods, so the CI policy in the Baltics is predominantly “old wine in a new bottle”.

- Second: none of the three cities has made specific efforts to facilitate the acceptance of CI-related policy initiatives among the beneficiaries of the policies: building networks, arenas for knowledge exchange, and other interaction mechanisms. All reported weak cooperation with the business and third sector in the field of CI, only a few measures support cooperation between the CI and other sectors. CI measures are not targetted at involving actors from other sectors, which can be seen as an obstacle for the wider diffusion of CI knowledge and practices. Integration between CI and other spheres exists mainly at the policy document level.
- Third: we can observe contradictions between policy aims and the structures and instruments chosen. Vilnius’s CI policy practices seem to be the most coherent. Vilnius has taken the most comprehensive approach to the development of CI at all levels: it has included it in various policy documents, it has involved several city departments and it has the greatest number of measures that are targetted towards wider social interaction. In the case of Tallinn and Riga, we can see certain discrepancies between the aims and the structures and instruments. Although Tallinn has taken a rather broad approach by linking CI development with innovation policy and including the development of CI in various documents and dividing tasks between several departments, the measures are mostly targetted at enhancing CI sector capacity, and not supporting the linkages between other sectors and actors. Riga has chosen the most focused approach by concentrating on raising the economic benefit from CI, although the main support structure is the cultural department, which explains why the majority of the CI policy measures are related to the development of cultural heritage and festivals.

Thus, despite the application of similar top-down CI policies, location-specific factors do influence the cities in their choice of different development trajectories, which also supports the path-dependency argument in explaining the development of CI policy practices. The three cities are similar in terms of having certain difficulties in adapting organizational support structures and policy measures to support CI development. All tried to adapt their existing cultural and economic policy measures and organizational structures to suit CI policy, rather than focusing on introducing new instruments and governance forms that are based on interaction and involvement. These findings reveal that the introduction of the CI concept in the Baltic States capitals has still had a rather slight influence on their urban policy transformation. This reaffirms the argument that cities with a post-socialist background find it difficult to develop CI policies because suitable administrative structures for supporting such new integrative developments are missing.

To summarize, this study has shown that all three Baltic capitals have perceived the opportunities inherent in CI development – and have included the development of CI among their strategic aims and in development documents. The results of the study reveal, however, that the phenomena of such kinds of policy transformations that one can find in Western cities where CI policy development has focused on reshaping the city's images, renewing economic policy principles and integrating cultural fields with other sectors, are rather weakly present in the Baltic capitals that have post-socialist backgrounds. In the Baltic States, we may rather notice a continuation of the policy practices of previous periods. The 'traditional' structures and instruments dominate without new policy practices being developed, even though in isolated cases we can see the adaptation of existing schemes to meet the needs resulting from the peculiarities of CI (e.g. the Creative Incubator in Tallinn). The lack of particular interaction mechanisms within the support structures and instruments for supporting CI hinders, or at least slows down, potential interaction among the different policy actors and stakeholders. Therefore, it is complicated to predict the deeper changes in meanings, everyday practices and social structures that are seen as the main characteristics of change by SI theorists. All in all, at present, we can acknowledge the fact that the introduction of the concept of CI in the Baltic capitals has brought along only minimal transformation of urban policy. As the transformation of urban policy is a complex process, there is a need to further explore the changes taking place in time to evaluate the depth of possible changes.

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# The changing role of migration and natural increase in suburban population growth: The case of a non-capital post-socialist city (The Krakow Metropolitan Area, Poland)

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## Abstract

*The evolution of population distributions in the Krakow Metropolitan Area (KMA) in Poland is subject to analysis in this contribution. Changes and recent reversals in the relationships between the main components of total population growth (natural increase and net migration) are examined in order to determine the level of development of suburbanisation processes in zones of the KMA, with the use of the Webb typology. Research was carried out in four time points: 1988, 1995, 2002 and 2012, covering the year just before the collapse of the socialist regime, the first decade of political and socio-economic transition, and the period before and after accession to the EU. The analysis of differentials in natural increase and net migration is conducted within the context of residential suburbanisation in the KMA, using as a background context recent population developments in Poland and Polish cities. Implications for urban policy arising from changes in the spatial concentration of the population in the metropolitan area are discussed.*

**Keywords:** suburbanisation; metropolitan areas; population change; natural increase; migration; Krakow; Poland

## 1. Introduction

Urbanisation is a spatial process where, in an early phase, the geographical distribution of population gradually concentrates in cities, while at a later stage urban lifestyles and infrastructure diffuse to the countryside. According to van den Berg et al. (1982), the process of movement of the population from city centres to peripheral areas is the phase of urban development known as suburbanisation, which results from the depopulation of core cities (Klasseen et al., 1981; Champion, 2001). On the other hand and especially in the cities of Western Europe, a renewed process of population concentration is observed, which is the result of processes of gentrification and urban policy measures aiming to revitalize town centers through the development of housing on brownfields, to increase the level of education of the population, as well as the effects of the second demographic transition (Buzar et al, 2007; Haase et al., 2010; Rae, 2013; Steinführer and Haase, 2007; van de Kaa, 1987). Therefore, current pictures of urban development in western Europe are more diversified – between core cities and fringe areas, owing to both the coexistence of suburbanisation and developing reurbanisation (Kabisch and Haase, 2011; Rérat, 2012), which is opposite to the sequential model that van den Berg et al. originally proposed.

For post-socialist cities in the late twentieth and early twenty-first century, however, many researchers report that suburbanisation is one of the major processes shaping spatial development and population dynamics (Hirt, 2007; Leetmaa and Tammaru, 2007; Leetmaa et al., 2009; Ouředníček, 2007). Such trends are manifested by an increase in population numbers in the hinterland of larger towns, which is caused by the transition from a centrally planned to a market economy,

and by the emergence of a real estate market. Population growth in suburban areas thus can be the result of increased in-migration – but other components (especially, natural increase) should also be taken into account. On the one hand, fertility declining to low values far below replacement levels, has been observed along with the diffusion of the ‘second demographic transition’ (van de Kaa, 2003; Sobotka, 2008; Lesthaeghe, 2010). On the other hand, residential mobility may encourage couples to have more children (Vobecka and Piguët, 2012), as it is generally recognised that suburban areas record higher fertility levels than urban centres and differences in fertility by residential context persist even when controlled for the effect of population composition and selective migrations (Kulu and Washbrook, 2014).

This article aims to analyse changes in the spatial concentration of population, using the case of the Krakow Metropolitan Area (KMA) in Poland, in a residential (urban-suburban) context. The research contributes to the existing literature on suburbanisation by focusing on the relationships between the main components of total population growth (natural growth rate and net migration) in the residential zones of a metropolitan area. The following questions are central to our research: How does the development of suburbanisation reflect the influence of the contribution of natural growth and migration in population change, and how are these two components linked? We assume that after an initial increase, the net migration rates exceed natural growth as the main driver of population change. The reversed trend in natural growth, however, in recent years is observed in particular due to a rise in the number of births and selective residential migration of a predominantly young population.

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## 2. Literature review: Urbanisation development in socialist and post-socialist cities

The urbanisation process in socialist and capitalist cities was different in that in the former a development priority was the industrialisation of the socialist economy. Socialist urbanisation was characterised by state ownership of urban land and infrastructure and central planning of urban development, while western urbanisation was led by market competition, private property, and real-estate profitability, as well as local decision-making (Enyedi, 1992, 1996, 1998).

Urbanisation in socialist cities – characterised by collective ownership, the centrally planned allocation of development funds and centralised decision making – has been described as less advanced compared to that in Western Europe. So, when western countries in the 1970s recorded population relocation towards non-metropolitan areas, Eastern Europe recorded rapid growth of industrial employment in cities and high volumes of rural-urban migration. The most important priority of socialist governments was the industrialization of the economy and the growth of industrial cities, both of which were accompanied by the collectivisation of agricultural land and increased waves of rural migrants. As a result, the socialist CEE countries experienced accelerated urbanization rates, which almost doubled between 1950 and 1990 (Stanilov and Sýkora, 2014).

The on-going process of urban development in socialist countries was termed under-urbanisation, where the growth of job opportunities in industry was much faster than the growth of the permanent urban population, due to housing shortages which resulted in massive rural-urban commuting (Murray and Szelenyi, 1984; Szelenyi, 1996). The spatial allocations of public investments in socialist cities were associated with the expansion of industrial zones, development of massive housing estates at the urban edges, as well as the redevelopment of city centres as communist monuments with political and economic motives (Stanilov and Sýkora, 2014). The new multi-family socialist housing estates were located within the administrative boundaries of the cities and were integrated functionally with industrial hubs through mass public transport.

Under these circumstances, socialist urban areas were rather compact, with limited growth of peripheral settlements designated for recreational use (dacha zones) or to the concentration of industrial workers in rural areas due to the restrictions of in-migration to large cities where housing provision usually lagged behind demand (Leetmaa and Tammaru, 2007; Lisowski et al., 2014). Thus, socialist cities were characterised by a centralized system of control over territories developed without suburban communities, in contrast to their western counterparts where suburban units grew as (relatively) politically independent units.

The change from socialist to post-socialist development of urban areas can be referred to as a concept of heteropolitization (Gentile, Tammaru, van Kempen, 2012). During the socialist era, urban planning was characterised by homogenization and standardisation of housing construction and the administrative allocation of living space. After the collapse in 1989, urban areas experienced several fundamental changes that led to a socio-spatial complexity, which distinguished the post-industrial metropolis of the 21<sup>st</sup> century from its industrial predecessor. These changes were the result of a mix of legacy effects and

path dependencies on the one hand, and transition-induced factors associated with globalisation – increased creativity, connectivity and competitiveness, on the other.

The huge demand for urban housing inherited from decades of the socialist regime pushed households away from inner cities to suburban hinterlands, in search of ‘friendly’ living environments. The main driving forces of suburbanisation in CEE countries were the forces of globalisation and the integration of their states into the global financial and economic networks that were accompanied by the arrival of foreign capital into the real estate sector. Suburban areas gained increasing shares of metropolitan population growth in the form of low-density, developer-built residential environments that were pushed by the rise of a new middle class and supported through the establishment of a system of mortgage financing, as well as large-scale commercial developments altering the post-socialist landscape of metropolitan areas (Stanilov and Sýkora, 2014). It is argued that suburbanisation in CEE countries added specific features to the process, in comparison with the experience of Western countries – features that were specifically associated with different dimensions of socio-economic transition, namely privatisation of the housing stock, changes in the labour market, as well as the changing social stratification order (Ladanyi and Szelenyi, 1998).

Massive suburban explosion, however, has been uncontrolled and associated with extensive spatial expansion of built-up areas outside city cores, spreading not only housing but also retail, offices and industrial uses -- in highly fragmented and diffused patterns. These processes lead to urban sprawl and pose major challenges to natural habitat and social cohesion. The dispersal of new housing has strained the ability of the public sector to provide infrastructure and services, has increased car dependency and thus undermined the prospects of sustainable development (Stanilov and Sýkora, 2014: 18–19).

According to Sýkora and Bouzarovski (2012), post-socialist urban restructuring reflects the interactions between three aspects of the ‘post-communist’ transition: the institutional transformations, the socio-economic, and the cultural transformations exhibited in the everyday life of people, as well as the transformation of dynamics of urban change leading to suburbanisation. Leetmaa et al. (2009) have indicated that suburbanisation in post-communist countries is different in comparison with “western” suburbanization in that the former has a different socio-economic background, and inherited the spatial context of the multi-family housing market. They also noticed that the transition from priority-led to market-led suburbanisation was gradual and was connected with the changing role of metropolitan actors (households, public authorities and companies). Rebernik (2005) has also pointed out that the processes of suburbanisation in post-communist cities have been influenced by several specific factors connected to the political and economic transition and its social effects. Researchers have investigated the motivations of movements to new household settlements (e.g. Kährlik, Leetmaa, Tammaru (2011), the socio-spatial segregation of suburbanising areas (Marcinićzak et al., 2012; Hirt, 2007; Sýkora, 2009, Brader et al., 2009) and the social relationships within new suburban localities (Špacková and Ouředníček, 2012). Few studies, however, have focused on the spatial patterns of suburbanisation (Timár and Varádi, 2011), and the territorial relation between the major

components of population change in suburban areas, namely natural increase and migration (Vobecka and Piguet, 2012; Kabisch et al., 2012).

It is generally recognized that demographic changes in metropolitan areas in Europe are associated with fertility decline and migration, the latter being an increasingly dominant population growth factor. There were significant changes in population development, however, between western and central-eastern Europe. The former has been characterised by fertility decline since the 1960s and an increase of residential migration to the suburban hinterland. In the latter East European case, the process of rural-urban in-migration to the city cores prevailed and was accompanied by relatively high fertility (Kabisch, Haase, Haase, 2012). After 1989, the urban core areas were first affected by population decline resulting from a dramatic decline in natural increase, as well as a decrease in the volume of in-migration. At present, many city cores are characterised by negative population change with negative net migration (outflows of population to suburban areas) and negative natural increase. All of these changes may be associated with the 'second demographic transition' (SDT) (van de Kaa, 1987; Bongaarts, 2002; Lesthaeghe and Meekers, 1986; Lesthaeghe, 2010), which was first identified in Western Europe in the 1960s and then diffused to CEE countries in the 1990s. The main features of SDT incorporate fertility decline below replacement levels, an increase in the mean age of mothers at birth, a decline in the number of marriages and an increase in the number of divorces. The decline in fertility is the result of changing attitudes towards having children and, more generally, towards the family, associated with the destabilisation of traditional family structures, including postponement of childbearing and increased diversification of households (e.g. the rise of childless couples).

Considering population changes within metropolitan areas, many studies have been devoted to the role of migration (e.g. Sýkora and Čermák, 1998; Ott, 2001), with special focus on changing migration patterns under the transition process, or to the composition and destinations of suburbanisers (Leetmaa and Tammaru, 2007; Ouředníček, 2007; Stanilov, 2007; Sýkora, 1999; Tammaru, 2001, 2005). In turn, Steinführer et al. (2010) refer to SDT as a concept explaining depopulation in post-socialist cities, leading to a low fertility and reported surpluses of deaths.

### 3. The case of Polish cities

For many years, Polish cities were the main locations for people to settle. Initiated after the Second World War, intensive urbanisation processes and large-scale industrialisation processes stimulated migration movements of the population. By the end of the 1980s, migration from rural to urban areas prevailed in relation to the processes of industrialisation and the development of multi-family housing (apartment blocks). After 1989 and the introduction of the principles of a free market economy, there was a change in the direction and intensity of migration flows (Zborowski and Raźniak, 2013). After 1990, the restructuring of industry and the emergence of market mechanisms in the sphere of economy, land and housing, gave rise to migration from cities to rural areas, especially those in the vicinity of urban centres, moulding the social-spatial structure of the population (Parysek and Wdowicka, 2002; Szymańska and Matczak, 2002; Marcińczak, 2012).

The restructuring of the economy and related changes in the labour market, increasing self-awareness of residents, the availability of housing loans and greater freedom in the choice of place of residence, effectively meant that people began to leave the city. Major changes have taken place, especially in metropolitan areas that entered the phase of suburbanisation: these changes were evident in the accelerated migration to the suburban periphery as a principal component of population change (Parysek and Wdowicka, 2002; Szymańska and Matczak, 2002; Jakóbczyk-Gryszkiewicz, 1998, 2011; Śleszyński, 2006; Beim, 2010; Lisowski, 2010). Such changes resulted in a negative migration balance in core cities and in a positive migration balance in suburban areas. The outflow of young people from core cities, together with low birth rates, initiated adverse changes in the demographic structure of core cities in Polish metropolitan areas (Warych-Juras and Gałka, 2011).

There has been a rapid development of single-family housing in Poland, which was driven by an increase in personal wealth, lower prices of land and real estate in suburban areas, and the increased availability of mortgage loans. The development of urbanisation also contributed to several social mechanisms, such as the increased environmental awareness of residents, the poor quality of urban housing, an increased demand for higher quality housing to guarantee tranquillity, and a better living environment with respect to 'fashionable rusticity' (Kajdaneck, 2011, 2012).

### 4. Methodology

The method used for the study of changes in the main components of population growth was the typology developed by Webb, useful in measuring both static and dynamic views (Długosz, 2001). In its classic application, the typology allows for the identification of relationships between natural increase and net migration in a given year, as well as the spatial variability in the demographic situation (Webb, 1963). Webb distinguished eight types of population change:

- Type A – positive natural increase surpasses negative net migration;
- Type B – positive natural increase surpasses positive net migration;
- Type C – positive natural increase is lower than positive net migration;
- Type D – positive net migration with surplus compensates negative natural increase;
- Type E – negative natural increase is not compensated by positive net migration;
- Type F – negative natural increase with negative, but not lesser (in absolute value) net migration;
- Type G – negative natural increase with negative, but not bigger (in absolute value) net migration;
- Type H – negative net migration is not compensated by positive natural increase.

To analyse the trends, a dynamic approach was used, based on the changes in Webb's categories: (Długosz, 2001; Wiśniewski, 2014), and examining specific time periods. In the present case, they were determined by referring to the main phases of socio-economic transformation that were identified on the basis of changes in macroeconomic and demographic indicators. Due to the fact that with eight types and the theoretical number of combinations being 64, in order to facilitate the analysis, the typological transition matrix was divided into four major types (Długosz, 2001; see Tab. 1):

- I. permanent populating, when in both sections there is population growth (unit type A, B, C or D which maintains the type designation of this system);
- II. populating, when population decline in the first period is stopped and, in the second period, the population grows (unit of type E, F, G or H changes into type A, B, C or D);
- III. depopulating, when population growth in the first period is stopped and, in the second period, the population declines (unit of type A, B, C or D changes into type E, F, G or H); and
- IV. permanent depopulating, when in both sections there is population decline (unit type E, F, G or H keeps the type designation of this system)

Type	A	B	C	D	E	F	G	H
A	I	I	I	I	III	III	III	III
B	I	I	I	I	III	III	III	III
C	I	I	I	I	III	III	III	III
D	I	I	I	I	III	III	III	III
E	II	II	II	II	IV	IV	IV	IV
F	II	II	II	II	IV	IV	IV	IV
G	II	II	II	II	IV	IV	IV	IV
H	II	II	II	II	IV	IV	IV	IV

Tab. 1: Scheme of theoretical connections for four dynamic types (the first period in the rows). Source: Długosz, 2001: 64

For a more detailed analysis, sub-types can be used. They show the changing relations between the components of total population growth (Tab. 2):

- o – stabilised, when the relationship between the components of the Webb system remains unchanged;
- x – reversed, when the relationship between the components of the Webb system changed radically;
- a – increasing natural increase, when the relationship between the components of the Webb system are changing due to the increasing role of natural increase;
- b – increasing net migration, when the relationship between the components of the Webb system are changing due to the increasing role of net migration;
- c – declining natural increase, changing due to the decreasing role of natural increase;
- d – declining net migration, when the relationships between the components of the Webb system are changing due to the decreasing role of net migration.

Type	A	B	C	D	E	F	G	H
A	o	b	b	b	X	C	c	d
B	a	o	b	b	C	X	d	d
C	a	a	o	b	C	C	x	d
D	a	a	a	o	C	D	d	x
E	x	a	a	b	O	D	d	d
F	a	x	b	b	C	O	d	d
G	a	a	x	b	C	C	o	d
H	a	b	b	x	C	C	c	o

Tab. 2: The scheme of theoretical connections within 8 types (the first period in rows). Source: Długosz. 2001: 65

The research reported here was carried out for the municipalities in four time periods: 1988, 1995, 2002 and 2012. The averages for demographic indicators, however, were calculated from three-year-periods (1987–1989, 1994–1996, 2001–2003 and 2011–2013 respectively). The first study period covers the situation before the socio-economic transition; the second summarizes the first stage of transformation; while the next time periods span the years before and after joining the European Union. In the final part of this report, the implications for urban policy arising from changes in the spatial concentration of the population in the metropolitan area, are discussed.

The analysis included data on vital and migration statistics from the population registration derived from the Central Statistical Office (Regional Databank). Some populations fail to register their permanent residency shortly after moving into a new place, however, which could affect the final results and underestimate the actual size of migration flows and postponing them in time.

According to Śleszyński (2011), the population numbers in suburban areas may be underestimated by 10 percent. An incomplete registration of migration also makes it impossible to assess the accurate volume of births and deaths, because fertility and mortality statistics are based on the permanent address register (Steinführer et al., 2011). Furthermore, it should be noted that the data produced by the central statistical office are published with a rural-urban division, not taking into account the so-called Standard Metropolitan Statistical Areas, as metropolitan areas are not defined in official statistics. They appear only in land-use planning or scientific analysis. These difficulties notwithstanding, we have attempted to investigate the level of demographic changes in the research area, being aware that the data used are the only available, long-term and complete statistical materials.

## 5. The study area

The study was conducted for the Krakow Metropolitan Area (KMA), a functional region, which includes the city, Krakow, and the surrounding group of 50 municipalities in eight districts (poviats), including one urban municipality, 14 urban-rural municipalities (consisting of a town together with its surrounding villages and countryside), and 35 rural municipalities. Taking into account the classification of urban and rural units and including Krakow, the KMA encompasses 65 spatial units, which were included in this analysis (Fig. 1). The Krakow Metropolitan Area and its division into suburban and commuting zones were established on the basis of commuting patterns to Krakow, in which at least 30 % of the working population commute to the central city (Zborowski, 2005; Zborowski et al., 2010). In 2012, the KMA region had a population of 1,488 thousand people, of which 759 thousand resided in Krakow (51 per cent of the entire metropolitan region). It should be noted that the share of the population of Krakow in the total KMA population is decreasing (in 1988 it amounted to 54.2 per cent). In terms of demographic potential, the metropolitan area of Krakow occupies 3<sup>rd</sup> place in Poland, after the Upper Silesian and Warsaw metropolitan areas.

## 6. Population dynamics

After 1989, the socio-economic transition in Poland was associated with an increase in unemployment and a decline in fertility and the volume of migration. The natural increase





Fig. 1: Territorial extension of Krakow Metropolitan Area (KMA)

in Poland decreased from 5.7 to 0.0 per thousand population from 1988–1999. Also, there was a decline in the volume of domestic migration: flows recorded a considerable drop from 639.5 thousand in 1988 to 369.3 thousand in 2001. In spatial terms, the main trends in population distribution were the concentration of population in metropolitan areas, a deconcentration within metropolitan areas leading to suburbanisation, as well as the depopulation of peripheral rural areas (Węclawowicz et al., 2006).

In the years from 1988 to 2012, the population of the Krakow Metropolitan Area increased by 8.1 per cent: the highest average annual growth was recorded in the last studied period, 2002–2012. This sharp population growth in urban and suburban areas was masked by a long-term spatial differentiation (Fig. 3), with suburban areas outperforming by far the core city with respect to absolute population growth. In Krakow, from 1988–2012, the population increased slightly from 746,000 to 759,000 (according to the Central Statistical Office data), while the population in the remaining KMA area increased from 630,600 to 729,000 (by 15.6%), and in its suburban zone from 218,100 to 273,100 (by 25.2%). In spatial terms, in the period from 1988 to 1995, 10 study units out of 65, including Krakow, recorded a decline of population; the declines occurred mainly in units in the northern part of the KMA. The largest population growth occurred municipalities located in the southern part of the KMA (with an increase of more than 10 per cent). In the second analysed period (1995–2002), 49 municipalities exhibited population growth with the largest increase in units with convenient locations and proximity to the centre of Krakow (up to 22 per cent), where housing was already

in intensive development, effectively accelerating residential suburbanisation (Zborowski, Chaberko, Kretowicz, 2011; Węclaw-Michniewska, 2011). The largest decrease occurred in agricultural municipalities located in the northern part of the study area (over 6 %).

In the last examined period, 2002–2012, population decline was noted only in seven (7) units, while an increase in the number of residents moving to the outskirts of Krakow became even more pronounced, reaching up to 35 per cent. According to the available data, Krakow in different sub-periods as well as in the complete research period, was characterised by small fluctuations in population.

A synthetic picture of the spatial dynamics of the population in the years 1988–2012 shows clearly the diversity of the Krakow Metropolitan Area (Fig. 2):

- the northern part, with mostly agricultural land use and an ageing population structure, shows negative total population growth;
- the zone of cities and municipalities in the immediate vicinity of Krakow is characterised by a significant increase in population, except for areas located east of the Nowa Huta district (agricultural land use and proximity to the steelworks); and
- the southern part with high population dynamics, especially along the main road towards the Zakopane resort.

Thus the diversification in the dynamics of population change in KMA was the result of the economic functions performed, proximity to Krakow and its accessibility, as well as attractiveness for investment purposes.

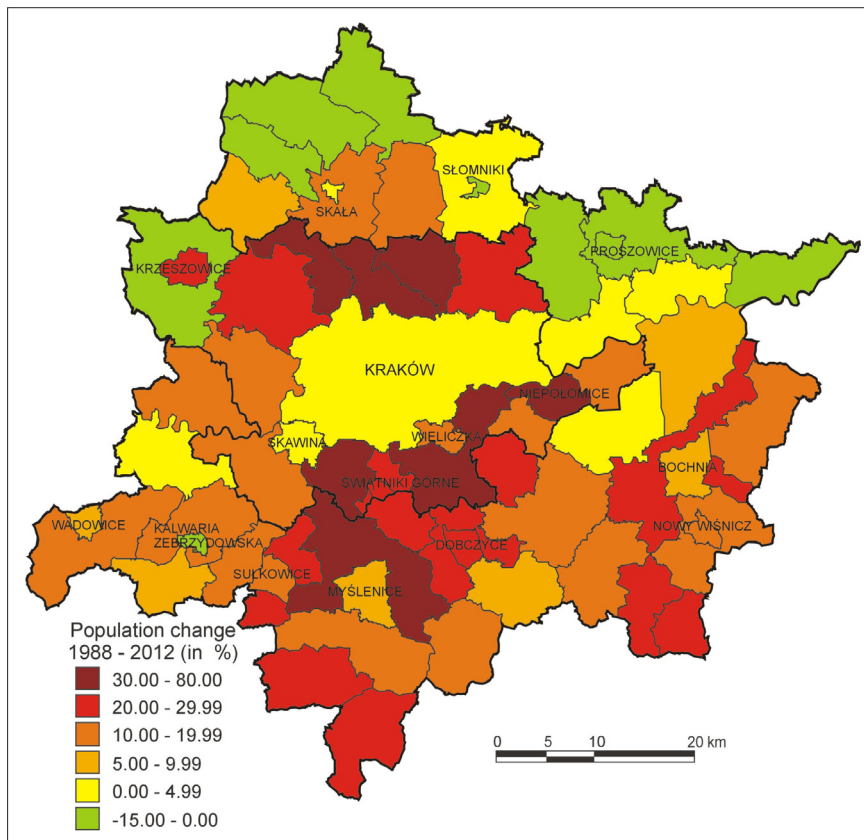


Fig. 2: Spatial patterns of population change in Krakow Metropolitan Area in 1988–2012

## 7. Webb typology (static)

In this section we seek to answer the following questions: *Which of the components of total population growth (natural increase or net migration) was dominant? ... and, if the relationship between these components changed in certain periods?* We used the Webb typology for both the static and the dynamic approaches. Taking into account all urban areas in Poland, at the turn of 1980s and 1990s, they are represented as type C, with positive net migration offsetting natural increase (Fig. 4). It was not until 1998, however, that the negative migration balance grew in importance in urban areas (within their administrative borders) and they began to show Webb's type G – where negative net migration surpassed negative natural increase. In recent years, Polish urban areas have moved towards type H, recording positive natural increase which, however, did not compensate for any negative migration balance. In the last two years, the natural increase in Polish cities reached negative values again, so they moved to type G.

In 1988, type A was the most common among the surveyed units (39 out of 65). In this type, the loss of population caused by net migration was more than compensated for by natural increase (Fig. 4a). This type included units located mainly south of Krakow, from which people were moving to the core city. And at the same time, these areas were characterised by traditionally high birth rates. In the northern part of the KMA, units were mostly of type H, with dominant agricultural land use, where natural increase did not compensate for the loss caused by migration. Some municipalities adjacent to Krakow represented type B, in which both the natural increase rate and net migration were positive, with the former being the major component of the total population growth. Migration gains were even more important (type C) in the municipality of Zielonki, located

near the road to Warsaw, in the proximity of Ojców National Park and, at the same time, situated close (5 km) to the centre of Krakow. Type C was also represented by Krakow (net migration rate of 3.1%) and the town of Niepołomice (4.8%). By the end of 1980s, however and before the collapse of communism, migration to urban cores was still more common as a result of previous industrialization.

In 1995, the situation of the major components of total population growth had changed dramatically (Fig. 4b). The number of units representing type A was reduced to 12, the number of units of type B increased from 4 to 22, and type C was already represented by 12 municipalities. In addition to the increasing share of net migration in the balance of population, there was also an increase in the typological diversity. While in 1988 there were only four types (A, B, C and H), in 1995, each of the eight types was represented. A

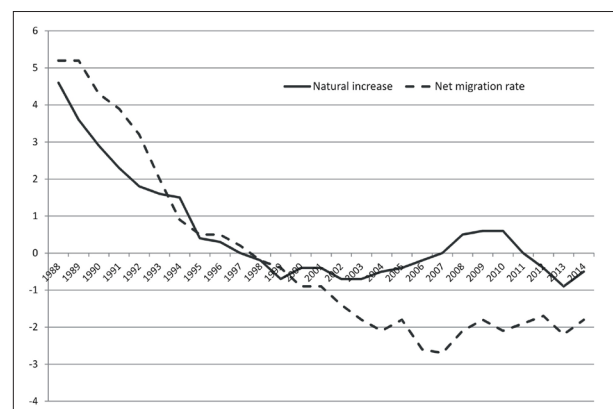


Fig. 3: Main components of population growth in urban areas in Poland in the years 1988–2013 (natural increase and net migration per 1,000 persons)

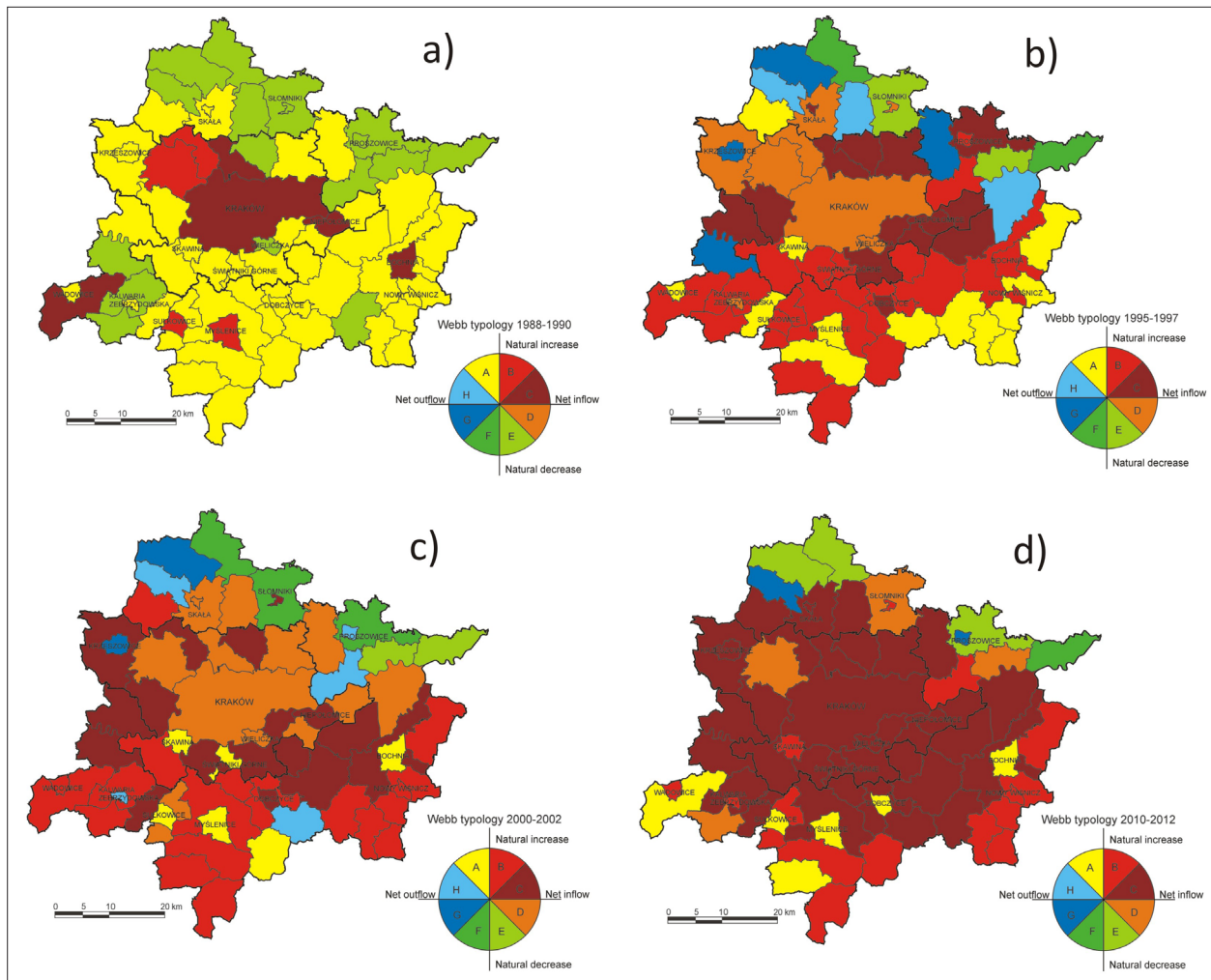


Fig. 4: Static typology of Webb in KMA administrative units – period a) 1988–1990; b) 1995–1997; c) 2000–2002; d) 2010–2012)

distinct suburban area evolved around Krakow, with units of type C (with higher net migration gains than natural increase) located in the southeast (on the transportation route to the eastern border of the country) and in the north-west. At this point in time, the city of Krakow itself became type D – despite the positive net migration that was characterised by negative natural population growth, which was typical of most major cities in the 1990s. Municipalities located at the southeast rim of the KMA remained in type A, while the northern part represented types associated with population shrinkage (from E to H).

At the beginning of the twenty-first century, the number of municipalities with net migration higher than natural increase (type C) grew to 18, and the units of type B and C together accounted for 55% of all cities and municipalities (Fig. 4c), showing an acceleration of the suburbanisation rate. There was also an increase the number of units of type D, from 8 to 12. These were mostly the municipalities surrounding Krakow in the north and were characterised by negative balance of natural increase. In the south, however, Krakow was surrounded by units representing type C, which had consistent positive indexes of population growth. In the areas east of Kraków, suburbanisation processes developed much more slowly, which was the result of the operating metallurgical plant and the presence of fertile soils (chernozem and the presence of the so-called "Vegetable Region"). On the other side of the spectrum, type E and F were traditionally represented by municipalities situated on

the northern edge of KMA, with high levels of population aging. Gradually, the situation in the housing market improved and the process of suburbanisation became more advanced, not only in the KMA but in all Polish metropolitan areas. The only difference was that Krakow, unlike to most other large cities (with the exception of Warsaw), did not start to lose their population.

In 2012, there was a further demographic consolidation and growth of the suburban area of KMA. The number of units of type C increased from 17 to 35, accounting for more than half of all the surveyed municipalities (Fig. 4d). The second most numerous group of units belonged to type B, covering mainly the eastern and southern margins of the KMA. Unfavourable demographic types (E, F, G) were located on the northern edge of KMA. Joining the European Union and a period of economic prosperity before the onset of financial crisis, led to a boom on the housing market and fuelled the process of suburbanisation in KMA and Poland.

## 8. Webb typology (dynamic)

When comparing the changes in the relationship between the main components of total population growth between the two examined sub-periods (1989–1996 and 2001–2011), it can clearly be seen that at the beginning of the 21<sup>st</sup> century, the importance of net migration has increased (Fig. 5a, 5c). This situation is similar to most metropolitan areas in Poland, where the communes located in the close neighbourhood of

1988–1995								
Type	A	B	C	D	E	F	G	H
A	10	15	8	3			2	1
B	1	1		2				
C		2	2	1				
D								
E								
F								
G								
H	1	4	2	2	2	2	2	2
1995–2002								
Type	A	B	C	D	E	F	G	H
A	2	8	1					1
B	4	10	5	1				2
C			7	4		1		
D			3	4				1
E					1	1		
F					1	1		
G			1	1			2	
H				2				1
2002–2012								
Type	A	B	C	D	E	F	G	H
A	3	2	1					
B	2	8	7	1				
C	1	1	15					
D		1	10	1				
E				1		1		
F				1	2			
G			1		1			
H		2	1				2	

Tab. 3. The number of changes of Webb types between years under study (the first period in rows).

central cities recorded a significant increase in the number of in-migrants from the core. In the dynamic analysis of the distribution of Webb types, transitions between different years (Tables 3 a–c) are presented here.

From 1988–1995, the most common transition between types was a combination of A and B (which was represented by 15 units). In 10 cases, the unit retained type A, while in eight (8) units there was a transition from type A to C. In the period 1995–2002, the changes in the distribution of types were more stable. The most recurrent transition regarding Webb types was the combination of B-B (10 records), then A-B (8 records) and C-C (7 times). From 2002–2012, 15 municipalities retained type C, and the second most common transition was the combination of type D to type C (which was from the type with negative population increase to the type where both components are positive): 10 cases. In general, most transformations of types were connected with the growing importance of net migration which confirmed the process of suburbanisation, a pattern characteristic in Poland for all large cities as well as middle-sized towns.

The surveyed cities and municipalities of KMA, in all three sub-periods (1988–1995, 1995–2002, and 2002–2012) were dominated by the main type I (permanent populating): in

1988–1995 it covered 45 spatial units (69 per cent, located usually in the central and southern zone of the KMA); in 1995–2002, 49 units (3/4 of the total number of cities and municipalities); and in the years 2002–2012, 53 units (82 per cent). In other words, the number of KMA units with an increase in population grew between the examined time periods – despite the general trend of a decreasing population growth. Only four municipalities (located on the northern edge of the KMA) in all periods had reported ‘permanent depopulating’ (type IV).

These four main types were compared with the four subtypes. According to this classification, in the period 1989–1996, there were 12 combinations of which the most numerous was sub-type Ib, indicating the increasing role of migration in the continuation of the process of populating, which is characteristic of the phase of suburbanisation (Fig. 5a). This group of municipalities included Krakow and the first ring, and in the south the second and even third ring of surrounding units. Another large group of units was marked with Io, that is, units with an increase in population and where the relationship between the components of this growth remained unchanged. The first period of socio-economic transition in Polish urban areas was indicated by a decreasing role of natural increase in population change. In the period 1996–2001, in the KMA, there was a further increase in the stabilisation of the units with regard to the dynamics of Webb types, since the most numerous sub-type combination was Io (23 units), dominated by the type B (10 units). A common sub-type was Ib (19 units), associated with an increasing role for net migration (Fig. 5b).

Units representing sub-types of Io and Ib together accounted for almost two-thirds of all surveyed cities and municipalities. Units located on the northern edge of KMA were also stable, but remained within the main type of permanent depopulation (Webb types E, F, G and H).

In the last investigated period, 2001–2011, the sub-types were characterised by a higher spatial concentration (Fig. 5c). As many as 53 units (82 per cent of the total) represented only three sub-types. The most numerous sub-type was the stabilised Io (27 units), the second common was sub-type Ia, with an increase in natural population growth in relation to net migration. The third most numerous was the sub-type Ib, in which the dominant component of the total population growth changed from natural increase to migratory growth. These units were located in the southern part of KMA.

Thus, in the last period under study, covering the time of joining the EU, reflected the trends in all districts in Poland, where fertility recorded a slight increase. It was associated with completed postponement of births to later ages of mother, after the first decade of socio-economic transition, economic improvements connected with EU accession, as well as introducing some pro-natalist policy measures (baby bonuses, extending parental leaves, etc.). At the local level, the rise in natural increase can be the result of selective migration as the decision to migrate can depend on people’s plans to start or expand their family; the suburban environment may encourage the decision to have more children (Vobecka and Piguët, 2012; Kulu and Boyle, 2009).

After joining the EU, natural increases accounted for 38 percent of the population change in the KMA in 2008, while before 2004 net migration often surpassed total population growth and compensated for natural losses. The main direction of migration was from Krakow to its hinterland, which contributed to the ongoing suburbanisation.

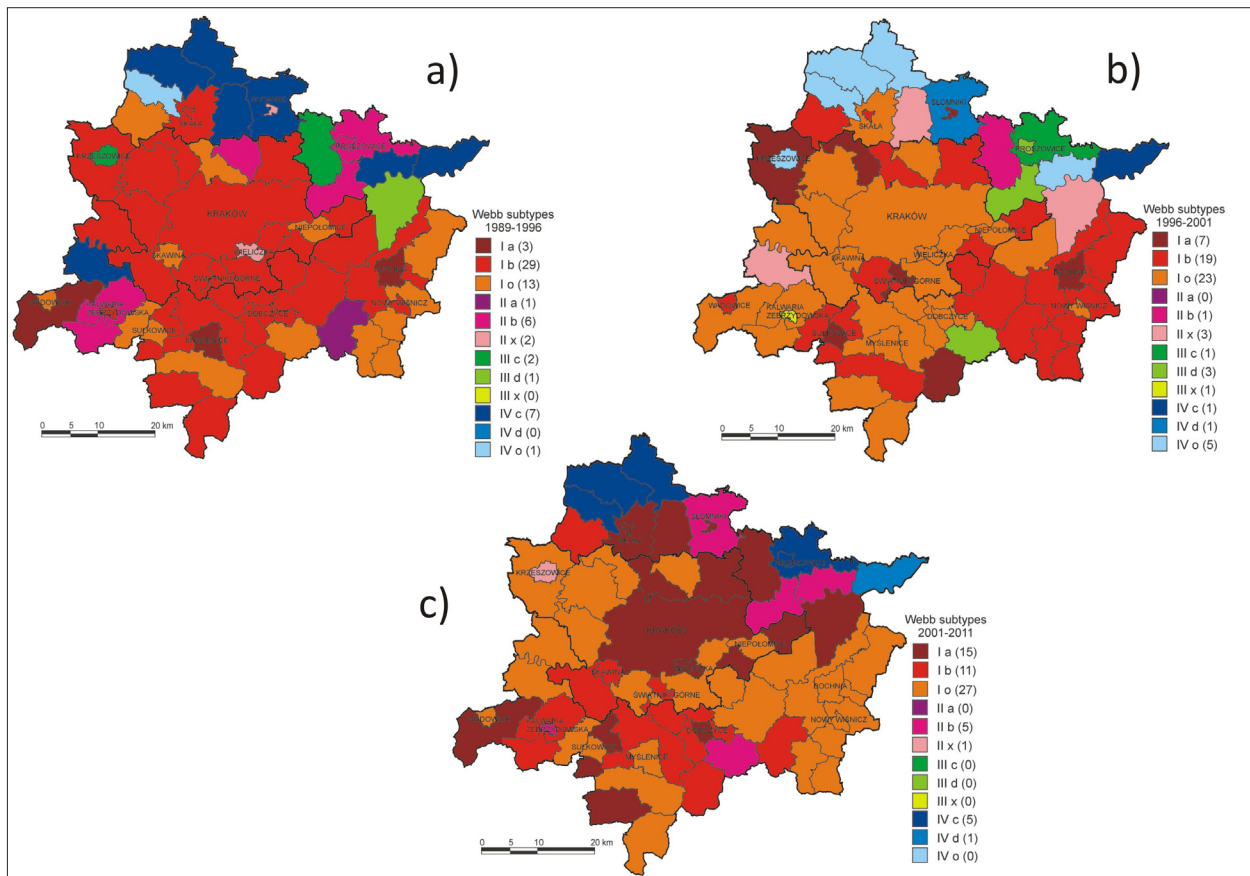


Fig. 5: Dynamic typology of Webb in KMA administrative units

In the immediate fringes around the city, from 1988–2013, only 25 percent of migration flows came from outside the Krakow Metropolitan Area, while in the “to commuting zone” it was 36 percent (Kurek et al., 2014). In other large urban areas in Poland (within their administrative borders), the situation was slightly different as they began to lose their population after 2000 and this pattern persisted with negative migration balance, contributing mostly to their population decline. Positive natural increase in recent years did not compensate for negative population growth. The share of population living in urban areas in Poland decreased from 62 to 60 per cent in the years 1988–2013, and most of this decrease has been fuelled by the growth of suburban areas.

## 9. Conclusions

Residential suburbanisation processes taking place in the Krakow Metropolitan Area are diverse in terms of population dynamics and in terms of the relationships between the main components of total population growth, both static and dynamic. We studied the long-term spatial patterns of population dynamics across suburban contexts and our results showed reversed trends since the 1990s, with a growing importance of residential migration and, in recent years, gains in natural increase. These results are similar to patterns observed in research by Vobecka and Piguet (2012), where a reversal of spatial population dynamics over the last 20 years has had a modest but undeniable impact on fertility levels. This is also in line with recent research which revealed that residential mobility is an important factor influencing the level of fertility in suburban areas (Boyle, 2003; Kulu, 2005; Mulder, 2006; Kulu and Vikata, 2007; Kulu and Boyle, 2009; Kulu et al., 2009). The decision to change the place of residence often takes into

account enlargement plans or the start of a family. On the other hand, a more comfortable and larger apartment in a friendly environment can promote an increase in fertility levels (suburban contextual effect, Kulu et al., 2009). According to survey research made by Kurek et al. (2014), more suburban migrants intended to have children than suburban non-migrants.

Spatial differences within metropolitan areas, however, still exist. Municipalities located on the northern edge of the KMA with mainly agricultural land use, have lagged behind, showing a decrease in population numbers. While in the first time period (1988) most municipalities belonged to type H in the Webb system (where birth rate does not compensate for the loss of population due to migration), by 2012 there was a shift to type E, where net migration was positive but it did not balance the natural loss of population. In the 1990s and 2000s, most of these municipalities recorded negative values of both components of population growth. In the dynamic Webb typology, they experienced permanent depopulation with a decreasing role of birth rates.

The zone of cities and municipalities in the immediate vicinity of Krakow was characterised by a significant increase in population (especially along main transportation routes), except for areas located east of Nowa Huta, which was due to intensive agricultural land use and in proximity to the steelworks. In the Webb typology, these units were initially marked as type A. But in the first analysed sub-period (1988–1995) there was a clear shift to type C, with an increased role of net migration and then a stable trend of permanent populating with a dominant component of migration. This zone is an area of the most intense process of suburbanisation and an associated influx of migration, mainly from Krakow. The trend was revealed

in the first of the analysed time periods and strengthened in the next studied periods, reaching its maximum values in the years 2002–2012. The economic boom after joining the EU, the improvement of the economic situation and the ease in obtaining housing loans, "pushed" the highest wave of migrants to suburban zones. In time, there were slight increases in family sizes, as families sought new more spacious and more comfortable suburban homes.

The southern zone of KMA, traditionally characterised by high birth rates, initially consisted of units classified as type A, and later to type B, according to Webb. Municipalities in this area, belonging to the main type – permanent populating – were usually characterised by increasing levels of migration, although in the last sub-period more and more units showed a change from dominant net migration to dominant natural increase.

It should also be emphasized that the KMA is far more heterogeneous in terms of settlement and, beyond the dominance of agricultural land, an important role in the concentration of population is also played by small towns (as in Mysłenice, Dobczyce, Wadowice, Bochnia). These centers today are becoming increasingly significant industrial centers on the one hand, characterised by the transfer of industrial plants from Krakow, and on the other hand, actively attracting new greenfield investments. These towns also produce their own zone of suburbanisation, with local systems of migration characterised on the one hand by the outflow of population from cities to surrounding rural areas with little flow in the opposite direction, and on the other hand these satellite towns are often attractive to in-migrants moving from Krakow (Kurek, Gałka, Wójtowicz, 2014).

The static and dynamic Webb typology is a helpful framework or scheme to analyse the diversity of population dynamics and its components. Using the example of the KMA, this typology demonstrated the spreading of residential suburbanisation by the changing relationship between migration and fertility in the populating of areas located outside of the core city of Krakow.

These results allow us to assess the scale of changes of particular components of population change in the studied time sections, which could be valuable information for local authorities in planning further development of individual municipalities. The lack of coordinated management of metropolitan areas in Poland is responsible in many ways for urban sprawl (Lisowski et al., 2013). The fragmentation of administrative units and non-existent official statistics for delimiting suburban areas defined on the basis of commuting data, makes effective urban growth management difficult. Nonetheless, in broader spatial terms, these results may be useful in the planning of regional development, especially of the road network and public transport as municipalities developing in the light of the typology. Spatial units defined by the Webb scheme mainly grow as a result of positive net migration and the accompanying greater spatial mobility of their inhabitants. Especially for their new residents, the commute-to-work or -school mostly relates to the core of the metropolitan region. Specifying specific types of demographic developments among municipalities within the KMA also allows us to forecast the dominant social behaviors of the population, in terms of commuting to work or school, and to the use of different types of services and the creation of functional and spatial ties between administrative units. This information might therefore be particularly useful in planning further socio-economic development of the Krakow metropolitan region.

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*Figures 8, 9: New small terrace houses in Wieliczka town, the Kraków metropolitan area (Photo: S. Kurek)*