"Mind the scenery!" Landscape depiction and the travel intentions of Game of Thrones fans: some insights for DMOs

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Screen tourism is becoming increasingly popular. Successful feature films and television series can form, enhance or alter place image, and put filming locations on tourists' mental maps. Very little is known, however, about how the resonance of landscape depiction and place attachment may affect the gathering of information about different filming locations and, consequently, consumers' travel intentions. This study seeks to identify a nexus between landscape depiction and travel intention through an exploration of the fantasy television series *Game of Thrones* (GoT). The structured questionnaire survey carried out with 314 GoT fans reveals that different dimensions have had a scale-effect on travel intentions. Partial least squares structural equation modelling (PLS-SEM) – considered the most appropriate for this exploratory study – was applied for the data analysis. The results indicate that landscape depiction has a positive effect on place attachment, information gathering and travel intentions, thus providing destination management organisations (DMOs) with opportunities to interact with potential tourists to promote filming locations.

"We're in the business of creating addicts."
HBO CEO Richard Plepler

Introduction

Content producers and distributors like HBO are determined to capture people's imaginations and make them loyal consumers by broadcasting high quality entertainment using new media technologies and screens (Scharl et al. 2016). *Game of Thrones* (GoT) is an expensively produced and extremely popular HBO series based on the epic fantasy cycle *A Song of Ice and Fire* by George R. R. Martin. The series premiered in 2011 and its seventh season, which started in August 2017, was watched by 16.1 million HBO subscribers and about 21 million pirate viewers (www.independent.co.uk). The storyline follows two rival families waging war on each other in a twisted game for control of the Seven Kingdoms and its medieval-style headquarters, the city of Kings' Landing. Tangled family weave through the struggle rich in intrigue, violence, sex and fights for political and royal power (Stanton 2015). The latest season and its extensive media coverage have further broadened the series' already highly active international fan base (Business Insider 2017). GoT has been popular with critics and viewers, and received more than 30 Emmy awards. The commitment of the series' fans is evidenced by their enthusiastic following of each episode, which they actively discuss and tweet about on social media, their creation of virtual communities, and by their producing and consuming (prosuming) of GoT news and stories (Beveridge–Shan 2016, Scharl et al. 2016).

All 70 GoT episodes have been distinguished by their expert characterisation and careful attention to detail in the presentation of the atmosphere in which landscape plays a key role. The complex relationships between the more than 30 vividly drawn, memorable, leading characters and the intricate plotlines keep audiences alert (Beveridge–Shan 2016). Historical and geographical notions, such as references to England's 15th century War of the Roses between the Houses of Lancaster and York, are embedded in both the novels and the series, endowing plotlines with some realism (Larrington 2016). The complex construction and communication of spatial knowledge of Westeros, the Lands of Always Winter, Iron Island, Bay of Dragons, etc. is reinforced by the 3D maps in the opening sequences of the show (Marshall 2015). GoT frequently uses long shots of cultural and natural landscapes and landscapes are rarely shown for their beauty alone: as an in-depth sentiment analysis has shown, their portrayal – often imbued with the emotions elicited by the film's characters – almost always serves a dramatic purpose (Scharl et al. 2016). Host cities are credited at the end of each episode, allowing keen-viewers to identify even digitally modified scenery as a particular geographical filming location. GoT has been filmed mainly in Europe, in six different countries (see Table 1) and in 42 loca-

tions, some of which are UNESCO World Heritage sites and thus bear strong cultural and heritage place identity (King–Halpenny 2014).

Table 1

Key *Game of Thrones* filming locations

Country of filming	UNESCO World Heritage Site (fantasy location)	*Game of Thrones* fantasy location
Croatia	Old City of Dubrovnik (King's Landing) Diocletian's Palace, Split (Meereen) Historic City of Trogir (Qarth) The Cathedral of Saint James of Sibenik (Braavos)	King's Landing, King's Landing Palace Gardens, Braavos, Red Keep, House of the Undying, Meereen, Qarth
Iceland	Thingvellir National Park (The Eyrie)	Arrowhead Mountain, Beyond the Wall, Jon and Ygritte's love cave, The Eyrie
Northern Ireland, United Kingdom	–	The Wall, Castle Black, Winterfell, Iron Islands, King's Road, Dragonstone, The Crownlands, Riverrun, The Stormlands
Scotland, United Kingdom		Winterfell, Slavers' Bay
Spain	Alcazar of Seville (Dorne, Sunspear) Historic Center of Cordoba (Volantis)	Tower of Joy, Dothraki Sea, Dragonstone, Dorne, High Garden, Meeren, Braavos, Volantis
Malta	City of Valletta (King's Landing)	Red Keep, King's Landing Gate, King's Landing, Pentos
Morocco	The city of Essaouira (Astapor)	Yunkai, Astapor, Pentos

Source: Own elaboration; the list of locations is not exhaustive.

This study increases our knowledge of how the portrayal of natural and urban landscapes has influenced GoT viewers' information gathering on various locations, and subsequently their travel intentions vis a vis filming locations.

Landscape depiction and trips to fantasy worlds

Film and screen experiences are undeniably powerful image creators that can give symbolic meaning to cultural products and experiences (Kim 2010, Lundberg et al. 2017, Urry 1994). According to Chris Rojek (1997), tourists have concrete ideas of particular places because they have seen them in pictures, films and television programmes or have read books or magazines in which the places were featured. Media-generated perceived familiarity with places gives meaning to locations (Bódi 2008). This is particularly true for fantasy movies linked to distinct landscapes and

locations, such as the *Lord of the Rings* movies (Beeton 2016) or the numerous *Star Wars* movie series (Escher et al. 2008). It has been widely acknowledged that – through storytelling and landscape depiction – films and television series can influence viewers' perceptions of places and increase visitor numbers to filming locations (Busby–Klug 2001, Busby–Haines 2013, Im–Chon 2008, Iwashita 2008, O'Connor et al. 2008, Reijnders 2010a).

Recently, screen tourism, i.e. visits to the filming locations of television series/films, has received considerable attention from both academics and the tourism industry (Beeton 2016, Connell 2012). In fact, the phenomenon was also widely studied in the 1990s (Tooke–Baker 1996, Riley–Van Doren 1992). Our assumption is therefore that the importance that viewers attribute to landscape depiction raises their interest in, and attachment to, the screened landscape of a particular destination. Based on the previous literature, the following hypotheses can be formulated:

H1: Resonance of landscape depiction strengthens place attachment.

H2: Resonance of landscape depiction affects viewers' information gathering about locations.

Busby and Haines (2013) have claimed that the British television comedy drama *Doc Martin* was one of the primary motivations leading visitors to go to the depicted locality, the fishing village of Port Isaac in Cornwall, in 2011. Screen tourism is not just a Western phenomenon. Internationally distributed Turkish soap operas have attracted record-breaking audiences and significantly raised in-bound tourism to Turkey (Balli et al. 2013). The endorsement of leading actors, such as Kivanç Tatlituğ, played a key role in branding Turkey and creating place attachment among fans and tourists (Busby et al. 2013). Regular watching of television dramas creates emotional bonds not only with the characters but also with the featured background and cultural landscape (Irimiás 2015). The stronger the viewer's emotional involvement with a storyline, and the more meaningful to them the landscape, the more likely they will be to travel to locations, as the popularity of South Korean television series with Japanese tourists has shown (Kim 2012). It can therefore be assumed that visual landscape narratives are likely to increase visitor numbers to filming locations:

H3: Resonance of landscape depiction has a positive effect on travel intentions.

Locations familiar to drama viewers, such as the privately owned heritage location of Highclere castle in the British series *Downton Abbey*, are associated with engaging storylines and stimulate fans to gather information on, and even visit, the site itself (Lundberg et al. 2017). Reijnders (2010b) argued that information gathering on James Bond filming sites, such as locating the secret door leading to the MI6 headquarters on Westminster Bridge in London, is essential for fans to link physical places to those in a fantasy world. Based on this evidence, we have formulated the following hypotheses:

H4: Place attachment has a positive effect on information gathering about locations.

H5: Place attachment has a positive effect on travel intentions.

H6: Information gathering about locations has a positive effect on travel intentions.

Iconic places are not the only pull factors for film tourists (Macionis 2004). Even intentionally undistinctive streets and built environments in sci-fi television series, such as *Smallville* and *X-files* set in Vancouver, are attracting viewers. Apparently characterless 'non-places' (Augè 1995) can be extremely rich in symbols and signs for sci-fi fans and weave a web of urban mystery that only those "in the know" can decode (Brooker 2007). Fans' geographical reading of a symbolic on-location Vancouver thus creates a meaningful experience through place attachment and information gathering about locations.

DMO initiatives to leverage screen tourism

Various tourism-marketing initiatives implemented by destinations to increase the potential of films and television series to attract film tourists to destinations have been described in the literature (Beeton 2016, Buchmann et al. 2010, Hahm–Wand 2011, Iwashita 2008, Lin–Huang 2008). Iconic films are often identified with their geographical locations. Although cultural products such as films are not created with the intention of attracting tourists to their locations, functional site placement (similar to product placement) enhances the attractiveness of locations and forms, reinforces or alters destination image (Croy 2010, O'Connor 2011, Papp-Váry 2015). The unprecedented popularity by the screen sets different challenges to featured locations and especially to historic cities and urban settlements (Puczkó–Rátz 2003). There is evidence that Forks in the US and the Italian city of Volterra, depicted in the *Twilight* novels and movies, have become popular destinations among vampire story fans (Larson et al. 2013): these fans represent a new tourist segment for the destinations, and the DMOs have had to respond to the challenge of meeting their needs.

DMOs can implement several strategies to leverage on the popularity of films to raise tourist awareness and reinforce brand building (Hudson–Ritchie 2006, Volo–Irimiás 2016). The producers of the *Lord of the Rings* saga (Buchmann 2010, Jones–Smith 2005) and of *The Hobbit* (Li et al. 2017, Lundberg et al. 2017) worked with New Zealand's DMOs in a joint marketing campaign to relabel and brand the country as "100% Middle-Earth" to explore New Zealand (Lundberget al. 2017).

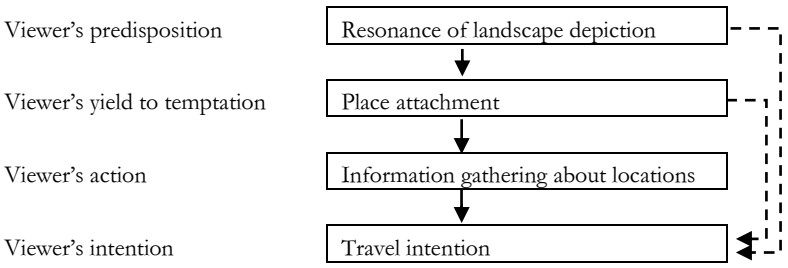
Hudson and Ritchie (2006) elaborated a detailed model on pre- and post-release marketing initiatives that destinations could exploit. The focus is on film-specific factors and the film locations need to be identifiable and accessible and have an emotional resonance and a physical icon that fans can identify. DMOs can partici-

pate in the pre- and post-release periods, creating marketing initiatives that target film-tourists. As Frost (2010) has shown, investing in a promotional campaign constructed around a film, as was done by Tourism Australia in 2008 to leverage on the film *Australia*, while not uncommon, is potentially risky, because no film's success is guaranteed. The new 'Victoria's Island' Trail was launched in 2017, long before the release of the film *Victoria and Abdul*, to promote Osborne, the seaside residence of the Queen. The Isle of Wight DMO invested more than £200,000 in the campaign, on thematic tours and movie maps, and interactive guides to the island's heritage sites (visitwightpro.com).

Other marketing initiatives involve built attractions such as theme parks or film related museums/exhibitions. In South Korea, a highly successful theme park reproduces the royal kitchen and hospital of the cooking maid Daejanggeum, and received more than 180,000 visitors in the two years after its opening, it has been proposed that this popularity is due to the fact that viewers are responding to the emotional appeal of the screen stories linked to the place (Kim 2012, Kim et al. 2008). Specific products and services need to be developed to meet screen tourists' needs: when on location, fans want to imitate film characters and re-enact their favourite scenes, as both James Bond and South Korean drama fans have demonstrated (Reijnders 2010b, Kim 2010). Experiential events celebrating the *Lord of the Rings* and *The Hobbit,* or the fan event inspired by the television series *Supernatural* filmed in Vancouver, are created to facilitate place recognition and to allow fans to have memorable film-based on-location experiences (Lundberg et al. 2017; Hudson–Ritchie 2006, Connell 2012). Previous studies have shown that DMOs implement a variety of marketing strategies based on film or television series releases (Volo–Irimiás 2016). No in-depth study of interactions with potential tourists investigating viewers' place attachment, information gathering and travel intention has yet been done, however. *Game of Thrones* is deemed particularly interesting in the study of landscape depiction and travel intentions. The series are mainly set in Europe and some film locations are within UNESCO World Heritage sites (see Table 1); the urban and natural landscape is closely interwoven into the fantasy storyline. Memorable characters and violent and adult content influence the destination image of film locations. The interrelations of our hypotheses constitute the theoretical framework of this study, summarised in Figure 1.

Figure 1

Assumed scale-effect of landscape resonance on intentions to travel to GoT locations



Note: The direct arrows indicate direct effects; the dotted arrows denote indirect effects.
Source: Own elaboration.

The suggestive, iconic GoT filming locations quickly became fan pilgrimage sites, boosting tourism to destinations that have acquired new layers of meaning through the storylines (Beeton 2016). GoT-tourists have flocked to the Adriatic Sea, and above all to Dubrovnik (Croatia), the GoT Kings' Landing. According to Tkalec et al. (2017), tourist arrivals increased by 37.9% between 2011 and 2015 and about 1 million tickets were sold to the city's walls in 2016. Similarly, Gozo (Malta) and Belfast (Northern Ireland) saw a dramatic increase in international tourism arrivals in the first seven months of 2017. Future GoT seasons are very likely to increase audience share, thus stimulating interest in filming locations among different consumer segments, and challenging DMOs' ability to communicate with GoT-tourists.

Methodology

The purpose of this paper is to investigate the nexus between landscape depiction, place attachment and travel intentions. Our research focused on the GoT HBO television series, and investigated the landscape depiction of the series' filming locations. Table 1 includes the most important GoT filming locations.

Research instrument and data collection

The research instrument used was a structured questionnaire survey, the items of which were based on the literature on film-induced tourism, within which we identified those items that could be used or modified to develop appropriate scales. The pilot survey and main data collection were done in Budapest, Hungary – the former in August 2016, the latter between September and November 2016.

Sample

Hungarian GoT fans were contacted through a snowball sample of students from the Corvinus University of Budapest. The chosen respondents had to have watched at least three of the six GoT seasons. The convenience sample consisted of 314 Hungarian respondents aged 18 to 35 years who were willing to fill out the questionnaire. 84.1% of the survey participants had watched all six GoT seasons, and 19.7% had already visited at least one GoT filming location, while most (80.3%) had only indirect experience of the filming locations.

Data analysis

Variance-based PLS-SEM was applied to test the model. Data analysis was conducted with ADANCO software (Dijkstra–Henseler 2015). The exploratory nature of the research justified the use of PLS-SEM (see e.g. Hair et al. 2012).

Measures and the quality criteria of the measurement model

As there are no internationally pre-tested scales, newly developed scales were used in this study (see Appendix). Each item was measured on a seven-point Likert scale, ranked from 1 = strongly disagree to 7 = strongly agree. *Landscape resonance* is a self-developed scale with two statements intended to measure how important natural and urban landscape depiction is to GoT viewers. The scale validity is good (Cronbach $\alpha = 0.86$). The *place attachment* scale was also developed for this study, three statements measure the strength of viewers' attraction to the depicted landscapes. The scale validity is good (Cronbach $\alpha = 0.77$). An *information gathering about locations* scale, too, was developed for the study, it includes three statements to measure how actively viewers search visual and textual information about GoT locations. The scale validity is good (Cronbach $\alpha = 0.77$). To measure *travel intention*, a three-item scale by Shani et al. (2009) was adopted. The scale validity is good (Cronbach $\alpha = 0.79$).

The three self-developed scales and the adopted scale required the use of PLS-SEM.

It is possible to test convergent validity with standardized factor loadings more than 0.5 (0.4 in exploratory research), but, ideally, 0.7 should be reached (Hair et al. 2012). The Appendix indicates Dijkstra–Henseler's ρA values – the index of internal consistency reliability measure of constructs, which is well above the favourable 0.7 value in each case (Dijkstra–Henseler 2015). The index applied to measure convergent validity is average variance extracted (AVE), where values should be more than 0.5 in each construct (Hair et al. 2006). AVE can be found on the diagonal of Table 2. The data meet the required criteria.

Discriminant validity was measured by Fornell and Larcker's test (1981), where, in all cases, the AVE measure is larger than the squared latent variable correlations of all the other constructs. As Table 1 demonstrates, this requirement has been met.

Table 2

Discriminant validity: Fornell-Larcker criterion

Construct	Travel intention	Information gathering about locations	Resonance of landscape depiction	Place attachment
Travel intention	0.7041			
Information gathering about locations	0.3032	0.6823		
Resonance of landscape depiction	0.0985	0.0989	0.8806	
Place attachment	0.2513	0.3096	0.2096	0.6901

Note: AVE values can be found on the diagonal; values under the diagonal are the squared latent variable correlations of each construct.

Source: Own calculation.

Discriminant validity was measured by the heterotrait-monotrait ratio of correlations (HTMT)[1], where each pair of constructs must be significantly lower than 1; this criterion is met in our study (see Table 3).

Table 3

Discriminant validity: heterotrait-monotrait ratio of correlations

Construct	Travel intention	Information gathering about locations	Resonance of landscape depiction	Place attachment
Travel intention				
Information gathering about locations	0.7041			
Resonance of landscape depiction	0.3789	0.3833		
Place attachment	0.6343	0.7107	0.5539	

Source: Own calculation.

In sum, enough statistical evidence was found to verify the existence of the four constructs, and to verify that the measured variables are appropriate indicators of the related factors and that the constructs are different.

[1] The HTMT of the correlations, which is the average of the heterotrait-heteromethod correlations (i.e. the correlations of indicators across constructs measuring different phenomena), is relative to the average of the monotrait-heteromethod correlations (i.e. the correlations of indicators within the same construct).

Structural model and results

Only one model fit criterion, the standardized root mean square residual (SRMR) is applied in PLS modelling, its cut-off value is 0.08 (Hu–Bentler 1999). The model delineated in this study has an appropriate model fit, because SRMR = 0.072. The results (see Table 4 and Figure 2) demonstrate that not every hypothesis was accepted.

Table 4

Direct effects in the model

	β	*t*-value	*p*-value
Resonance of landscape depiction → Place attachment (H1+)	0.4579	9.8086	0.0000
Resonance of landscape depiction → Information gathering about locations (H2+)	0.0755	1.4994	0.1341
Resonance of landscape depiction → Travel intention (H3+)	0.0775	1.4758	0.1403
Place attachment → Information gathering about locations (H4+)	0.5218	11.9429	0.0000
Place attachment → Travel intention (H5+)	0.2505	5.1369	0.0000
Information gathering about locations → Travel intention (H6+)	0.3869	6.9376	0.0000

Note: Unverified hypotheses are written in italics. + indicates positive effect.
Source: Own calculation using ADANCO software.

Resonance of landscape depiction has a positive effect on place attachment (β = 0.46), which means that the more important natural and urban landscapes are for viewers, the stronger place attachment becomes, leading viewers to be more attracted to locations (the H1 hypothesis is accepted). It might seem surprising that landscape resonance does not have a positive effect on either information gathering or travel intentions (no significant correlation, the H2 and H3 hypotheses are rejected), although indirect effects are significant in both cases.

Resonance of landscape indirectly affects information gathering about locations through place attachment (β = 0.24; *t*-value = 7.74; *p*-value = 0.000), and – in a similarly indirect way (through place attachment and information gathering about locations) – has a positive effect on travel intentions (β = 0.24; *t*-value = 6.85; *p*-value = 0.000).

This means that the predisposition of viewers to find resonance in the landscapes depicted in GoT is just the first step in the formulation of travel intentions. Our research reveals a multilevel scale in which each step can potentially be managed by the destination or the supply side, to influence travel intentions. Landscape depiction does not directly determine travel intentions but does have an indirect impact on them.

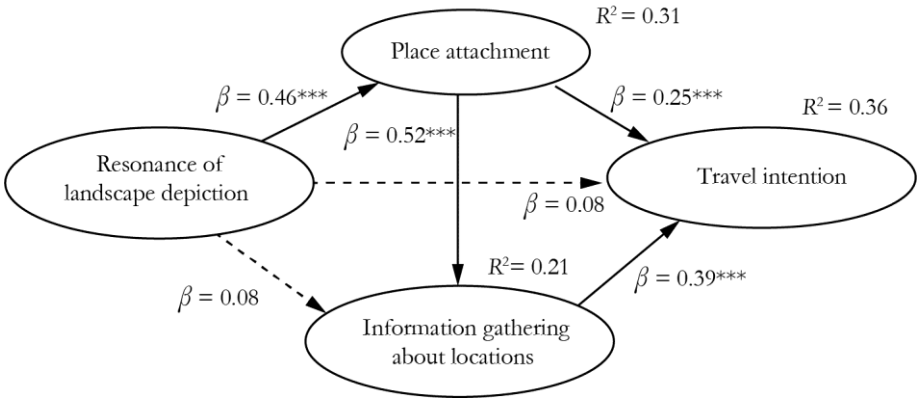
Place attachment has a positive effect on information gathering about locations (β = 0.52): the more attractive and meaningful a film location is, the stronger the

interest in information gathering about that location becomes (the H4 hypothesis is accepted). Place attachment is mainly determined by the visual narrative of GoT.

Place attachment affects travel intentions positively both directly (β = 0.25; the H5 hypothesis is accepted) and indirectly through information gathering about locations (β = 0.20; *t*-value = 6.23; *p*-value = 0.000). This means that the more attractive a film location is, the stronger travel intentions become, which means that viewers' intentions to visit a location can be strengthened by simply increasing that location's on-screen attractiveness. Furthermore, strong place attachment motivates viewers to act and increases information search activity, leading to stronger commitment.

Figure 2

Structural model and results



Note: Every path coefficient is standardized (*** $p < 0.001$). The dotted lines represent the rejected hypotheses.
Source: Own elaboration.

Information gathering about locations has a positive effect on travel intentions (β = 0.39). This means that information gathering leads to greater commitment: knowing more about a location inspires viewers to want to discover and experience that place themselves (the H6 hypothesis is accepted). Information gathering is a cognitive effort involving the examination of visual material about locations, comparing fictional images and photos, and discovering surprising and/or engaging information about destinations (see Table 5). From the marketing communication point of view, intervention at this point can be crucial to convincing viewers to actually visit a filming location. The quality of the information that viewers find, of course, partly depends on their own activities in selecting and distinguishing visual and textual content. However, if destinations can provide easy access to information, this will clearly be to their own advantage. The link between the real and fantasy world must be made evident in order to involve viewers in the discovery of a location.

Table 5

Direct and indirect effects in the model

Effect	Direct effect	Indirect effect	Total effect	Cohen's f^2
	β			
Information gathering about locations → Travel intention	0.3869		0.3869	0.1612
Resonance of landscape depiction → Travel intention	0.0775	0.2364	0.3139	0.0074
Resonance of landscape depiction → Information gathering about locations	0.0755	0.2389	0.3144	0.0066
Resonance of landscape depiction → Place attachment	0.4579		0.4579	0.2652
Place attachment → Travel intention	0.2505	0.2019	0.4524	0.0593
Place attachment → Information gathering about locations	0.5218		0.5218	0.3137

Source: Own calculation using ADANCO software.

Conclusions

This research has several limitations, one of which is the limited sample size of Hungarian GoT fans. The constructs, moreover, were based on the perceptions of GoT viewers. Some conclusive marks have nevertheless emerged from our findings. The attraction of GoT filming locations acts like a magnet, drawing viewers to film locations in order to experience them personally. The point at which viewers' interest is first aroused, and they begin to gather information about locations, and wish to discover more about them, is key for tourism marketers. DMOs and marketers should implement several strategies to interact with potential tourists and to promote film locations as destinations. Destinations can leverage landscape depiction by highlighting their connections with GoT through short YouTube videos and promotional videos shared on interactive social media platforms and released simultaneously with GoT premieres. Information gathering about film locations requires cognitive efforts and may not be embarked upon immediately after watching a GoT episode. DMOs should therefore provide all the relevant information about film locations three to five weeks after the start of a new GoT season. DMOs should focus on viewers' travel intentions when the previous three steps on the scale-effect – resonance of landscape depiction, place attachment and information gathering – have been taken into consideration by marketers. The GoT film locations are extremely diverse: cold, inhospitable places, filmed in Iceland and the forests and moorlands of Northern Ireland; deserts, filmed in Spain, and stunning medieval cities in Croatia. Communication about the destination is always key to successful marketing. While Dubrovnik has been swamped by mass tourism and needs to implement strict rules to manage the site and the access to the medieval city cen-

tre, Belfast and the locations in the Northern Irish countryside should be more proactive in attracting media attention, organising events and festivals and involving celebrities to promote GoT film locations. An understanding of the scale-effect between landscape depiction, place attachment and information gathering, which determines travel intentions, is useful for DMOs who wish to structure promotional strategies and interact with potential tourists.

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APPENDIX

Measurement and reliability of constructs

Construct (Dijkstra–Henseler's ρ)	Item	Standardised factor loading	Mean	Standard deviation
Resonance of landscape depiction (A = 0.871)	Natural landscape depiction	0.945	4.46	1.757
	Urban landscape depiction	0.932	4.45	1.686
Place attachment (ρA = 0.784)	I am amazed by the landscape in which GoT is set	0.851	3.65	1.824
	I am interested in GoT filming locations	0.890	5.15	1.656
	GoT filming locations are particularly significant for me	0.783	4.97	1.738
Information gathering about locations (ρA = 0.779)	I like checking pictures on GoT filming locations	0.862	3.04	1.809
	I collect information on specific filming locations	0.824	1.75	1.152
	I like comparing film locations on screen and in reality	0.791	2.85	1.907
Travel intention (ρA = 0.790)	I plan to travel to one of the GoT locations in the near future	0.859	2.65	1.803
	I strongly desire to travel to one of the GoT locations	0.800	2.21	1.498
	I am very likely to travel to one of the GoT locations in the near future	0.857	2.09	1.507

Note: Each item was measured on a seven-scale Likert-scale where 1 = not resonant at all, 7 = extremely resonant.

Source: Own calculation.

Types of development paths and the hierarchy of the regional centres of Central and Eastern Europe

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After the rapid transformation period of the 1990s, determined predominantly by the crisis effects of a radical political-economic transition, the reshaping of the spatial structure and urban networks slowed in the post-socialist countries of Central and Eastern Europe. The spillover effects of the market economy transition are fading, and cannot be generalized. Instead, other factors, such as involvement in global processes and the creation and exploitation of new types of synergies, become the main drivers of the differentiation and development in the urban system. This study attempts to explore the framework and specifics of this new environment by examining resources for development in the Eastern and Central European regional centres.

Keywords:
Central and Eastern Europe, regional centres, spatial structure

Introduction

Examining the different paths of the development of Central and Eastern European regional centres and analysing their positions in the spatial structure of the region are timely in many respects. On the one hand, the two and a half decades that have elapsed since the regime changes have provided sufficient time for the major regional centres to adapt and find their place within the conditions imposed by the new socio-economic environment. After the rapid transitional stage of the early 1990s, burdened by an economic crisis and the subsequent 'recovery' stage, the main factors defining the hierarchical ordering of cities and their development potential have changed (Cheshire–Hamilton 2000). Parallel to the de-emphasizing of the primary factors of production and, to some extent, geographical location, novel factors have begun to play a greater role in the differentiation and polarization of the urban network (Horváth 2014). The intensity and concentration of knowledge and information are catching up in importance to the concentration of production and the labour force and, thus, so is network cooperation.

On the other hand, the past two and a half decades have been sufficient time for a multi-stage development process to evolve. The first stage was 'crisis-management', including coping with the crises resulting from rapid and radical eco-

nomic and social transformation. This was followed by the 'learning of operation' stage which involved adjusting to the changed circumstances. Differences in terms of available resources resulted in variations in the speed and extent of transition. A significant proportion of cities did not get beyond the first or second stage. As a result, few reached the third phase which is based on forming and exploiting external conditions for their own interests and the effective mobilization of internal resources. Cities and urban regions that reached certain stages of transition more quickly and successfully gained major benefits in terms of the competition between cities, further increasing the gaps inherited from their starting position. This was a crucial factor in the new environment, where the mechanisms of central planning and regional equalization degraded and became unremarkable. For cities and regions that struggled (and continue to struggle) with restructuring, the concern is not only their lack of, or low level of competitiveness, but also the negative social and demographic processes that have 'exhausted' their human capital (Gorzelak 1998, Lintz et al. 2005). In general, we cannot say that the transition is complete. However, the urban network of the region has reached a new state determined mainly by novel factors of development. The primary objective of this study is to present an outline of this new state, exploring both the main developmental types of Central and Eastern European regional centres and the basic factors of the urban hierarchy and functional differentiation.

Theoretical background and previous research

During the past two decades, several studies have been conducted on the socio-economic development of regional centres in our region after the transition, focusing on different aspects. The majority of them are confined to analysing single countries, although several papers examine a general framework or compare the development across countries.

The theoretical approach of post-socialist urbanization and urban development covers various elements and aspects of transformation. These include comparisons of the basic and specific features of socialist and post-socialist urbanization (Szelényi 1996), the modification of the economic framework of urban development (Kovács 1999, Stanilov 2007a, Turnock 1997), the restructuring of local government systems and the effects of policy interventions on urbanization (Bennet 1998, Stanilov 2007b), as well as the transformation of urban spatial structures and land use (Sykora 2008, Tsenkova–Nedovic-Budic 2006) among several other research fields.

While a theoretical approach enables us to evaluate the factors behind the transformation and development, it is more important to briefly review those studies that focus on the hierarchical and functional structure of the Central and Eastern European urban network.

Models of the spatial structure of Europe and our region reflect the positions and development opportunities of prominent cities and metropolitan areas in the region (Lang 2015). Early European spatial structure models focused primarily on nodes and development zones and used a centre-periphery approach (e.g. the Blue Banana or Pentagon models). As a result, Central and Eastern Europe fell outside the core areas and, thus, did not receive much attention. However, since the second half of the 1990s, models that include potential development zones have been given increasing weight. These models, based on either zones or developmental axes, cover our region by extending the zones of the core regions towards Austria and the Czech Republic, or by extending the axes in the Berlin-Warsaw and Vienna-Budapest-Belgrade directions (Szabó 2009).

In addition, in the 1990s, a new type of model emerged, slightly exceeding the mainstream centre-periphery relations and highlighting metropolitan regions as nodes and basic organizational units of the spatial structure. These growth centres are participants in the continental regional and urban competition (Kunzmann–Wegener 1992). Therefore, this 'bunch of grapes' model places considerable emphasis on the development of cities and urban areas, and on the formation of a polycentric network.

The most influential model on the internal characteristics of the spatial structure of Central and Eastern Europe was proposed by Gorzelak (1996). This model assumes that regions with an affordable infrastructure and a favourable geographic location for business interactions, and centres with an adequate size and role have passed through a successful transition and formed a dynamic development zone in the region. This so-called Central and Eastern European boomerang spreads to the south-west from Gdansk, with Poznan and Wroclaw as its important nodes, through the Czech Republic, and then to the south-east, including Vienna, Bratislava, and Budapest (Gorzelak 1996). Thus, the zone is considered to be the Blue Banana of Central and Eastern Europe, with a weaker economic concentration and links between the nodes.

Other experiments have attempted to identify similar development zones in the region. These include the Central European Pentagon linking various capitals, or the 'dual banana' and 'second banana' concepts which define development zones that originate in German areas.

After the turn of the millennium, the main transitional trends in the region were concentration and polarization. The primary scenes of these processes are metropolitan areas that stand out in increasingly characteristic ways. These areas show the most significant degree of concentration of resources, and have become crucial to being competitive in terms of, for example, human capital, research and development, and the ability to absorb and adopt innovation. These are the primary factors that place a capital in a distinguished position (Rechnitzer 2016).

The advanced processes of concentration and polarization, and the fact that the links between metropolitan areas are less strong than those in Western Europe, indicate that the presence of continuous developmental zones is less pronounced in the region. Instead, a kind of nodal structure prevails with a hierarchical distribution of centres and relatively lax inner linkages. Szabó and Farkas (2014) distinguished four levels of such nodes, as well as a special category (see Table 1).

Table 1

Hierarchy of nodes in the spatial structure of Central and Eastern Europe

1. Economic and social nodes with capital functions and of international and European significance		
Vienna		
2. Social and economic nodes with capital functions and of European significance		
Budapest, Bucharest, Prague, Warsaw		
3. Social and economic nodes with capital functions		
Ljubljana, Bratislava, Zagreb		
4. Regional metropolises		
Social and economic nodes	*Economic nodes*	*Social nodes*
Brno, Kosice, Krakow, Lodz, Ostrava, Poznan, Wroclaw	Graz, Innsbruck, Linz, Salzburg	Bialystok, Brasov, Bydgoszcz, Constanta, Craiova, Galati, Iasi, Cluj-Napoca, Lublin, Szczecin, Timisoara
Special category: Central and Eastern European megalopoles		
Silesian conurbation[a)], Trójmiasto [b)]		

a) Bytom, Chorzow, Dąbrowa Górnicza, Gliwice, Jaworzno, Katowice, Mysłowice, Piekary Śląskie, Ruda Śląska, Siemianowice Śląskie, Sosnowiec, Świętochłowice, Tychy, Zabrze.

b) Gdansk, Gdynia, Sopot.

Source: Szabó–Farkas (2014).

Few nodes exist around which major development fields have formed, and these tend to be country capitals. The network elements of the spatial structure are mainly West–East transit corridors and are not necessarily connected to the nodes. Special regions are important elements of the spatial structure, embracing declining industrial and emerging tourist regions (Szabó–Farkas 2014). The 'emptying' of peripheral regions is far more rapid than in their Western European counterparts, and the weakness of the integration of these regions into the spatial structure reinforces the imbalances (Rechnitzer 2016).

Multidimensional studies on the spatial structure of the region partly support the general findings (Kincses–Nagy–Tóth 2014). However, a deeper analysis gives a more nuanced and precise picture of the region, highlighting the imbalances. Egri and Tánczos (2015) separate various layers of factors that form the spatial structure, and examine the interactions among them, distinguishing three major types of regions:

1. Urban areas generating and concentrating development: This group includes the capital cities in the upper echelon, which dominate the spatial structure, such as Vienna, Budapest, Prague, and Warsaw, as well as Bucharest, with a slight lag behind them as a lopsided centre. Bucharest has high economic concentration and dynamics, but also has weak infrastructure and innovation potential. The first line of Polish regional centres (i.e. the Silesian conurbation) and the Austrian cities also belong to this group.
2. Attraction zone regions: These are essentially the agglomerations of metropolitan areas and their wider regions with favourable geographical locations and developed centres in close proximity (Western Poland, Czech Republic, Slovenia, Northern Transdanubia).
3. Rural and peripheral regions: The majority of regions in this group are concentrated in the Eastern areas (Eastern Poland, Romania, and Bulgaria) and include the rural areas of Hungary (Egri–Tánczos 2015).

In addition to the typology of the regions, the analysis highlights the relationships that exist between the factors which form the spatial structure and determine the imbalances in the spatial structure.

Data and methodology

This study covers Central and Eastern Europe that consists of nine countries, of which eight have regional centres suitable for our analysis (Slovenia has no cities with a population over 100,000, except for the capital, Ljubljana). The V4 countries (Czech Republic, Hungary, Poland, and Slovakia) are the most obvious parts of the core area of the region. The region also includes the 'remnants' of the Habsburg territories and the Austro-Hungarian Empire, which played a crucial role in shaping the historical and cultural character of the region, especially in the modernization process. Thus, Croatia and Slovenia are included, as is the only non-post-socialist country, Austria. Based on its current position and orientation, Romania is also regarded as part of the region. The country whose involvement may be considered the most doubtful is Bulgaria. In most regards, the country can be classified more as part of South-eastern Europe since its historical orientation, development and modernization path are slightly different from those of the other eight countries. However, based on the processes of the 20th century, particularly from the period of the post-socialist transition, and with its accession to the European Union, Bulgaria is becoming integrated into East Central Europe.

The different nature and various distributions of the urban networks in the Central and Eastern European countries make it difficult to clearly designate the regional centres. The average size of second-tier cities with regional roles differs from country to country, as does the density of these networks. Therefore, for our empirical analysis, we use a classification based on an objective threshold by size rather

than on supposed roles. Thus, the cities included in the study are those with a population greater than 100,000,[1] excluding the capitals of countries, yielding a sample of 82 cities.

Data from various sources were used in the analysis, based primarily on the Urban Audit and Eurostat regional databases. However, the data collection process showed that the range of comparable data for the entire region is relatively small and that the databases have significant deficiencies in terms of time series and the availability of data. In order to supplement and expand the data sets, territorial data modules of national statistical offices are used for those indicators that are comparable by measurement and category. This data collection method proved useful, providing longer time series on the population, as well as data on vital events and on the sectoral distribution of employment.

Basically, four types of indicators are used. The majority are specific and related to a particular year (2014, in most cases), and are the same for each country when the data collection was 'independent'. Some indicators are compared with an average value (e.g. gross domestic product [GDP] as a percentage of the EU average) or are proportional to the population. When 'spot' data are less suitable, yearly averages for a certain interval are used (e.g. yearly average of migration balance for five-year intervals). In addition, some indicators are intended to illustrate the dynamics of economic processes (e.g. growth rate of GDP).

For a handful of indicators, municipal data were not available for all the countries or cities and, thus, they are used on a higher territorial level (NUTS 3). The only important indicators of this type are related to the GDP. In this case, the problem of modified territorial units arises, primarily because, in several countries within the European Union, large cities are functioning as NUTS 3 units themselves. However, in the examined countries, this practice is less widespread and, for the most part, the capitals fall into this category. The only exception is Poland, where six cities (i.e. Gdansk, Lodz, Krakow, Poznan, Szczecin, and Wroclaw) constitute NUTS 3 level units. In these cases, 'agglomeration' units, in which these cities are also seats, are added to the data, with population weighting.

The 'thematic' dimensions of the analysis are configured by data reduction using a principal component analysis. The base indicators used in the process are standardized. For each dimension (i.e. economy, knowledge economy, demography, culture, and environment), a sufficient level of compression and applicability of the relevant indicators was achieved (see Table 2). The regional centres can be ranked based on these dimensions. Besides, it is also possible to identify homogeneous groups. This procedure was carried out using a *K*-means cluster analysis, given the sample size and the nature of the indicators. A separate cluster analysis explores the types of demographic processes. In addition to the classification, an examination of

[1] Including the core city only, not the whole metropolitan area.

the balance of developmental factors is carried out to determine the weight of each dimension in the complex developmental score.

Table 2

Constitution of the principal components

Economy (explained variance: 62%, KMO: 0.617)	
Companies per 1,000 inhabitants	0.855
Cars per 1,000 inhabitants	0.739
Activity rate	0.645
Proportion of employees in the service sector	0.623
GDP per capita in PPS	0.524
Knowledge economy (explained variance: 67%, KMO: 0.647)	
Percentage of R&D employment	0.873
Patent applications, 2010–2014	0.797
Employment rate in knowledge-intensive services	0.758
Proportion of people with tertiary degree	0.712
Students in tertiary education per 1,000 inhabitants	0.624
Demography (explained variance: 50%, KMO: 0.622)	
Death rate under 65 years	–0.847
Natural change per 1,000 inhabitants, 2011–2015 yearly average	0.843
Migration balance per 1,000 inhabitants, 2011–2015 yearly average	0.636
Infant mortality per 1,000 births	–0.517
Dependency ratio	–0.433
Culture and environment (explained variance: 52%, KMO: 0.627)	
Number of crimes per 1,000 inhabitants	–0.781
Visitors to cultural institutions	0.710
Number of cinema seats per 1,000 inhabitants	0.682
Number of available beds in accommodation establishments per 1,000 inhabitants	0.637
Share of urban green and recreational areas	0.546
Average number of nights spent by tourists in accommodation establishments	0.518

Note: KMO: Kaiser–Meyer-Olkin test; PPS: purchasing power standard; R&D: research and development. Unless otherwise specified, the indicators refer to 2014.

Source: Own calculation.

The dimensions

Economy

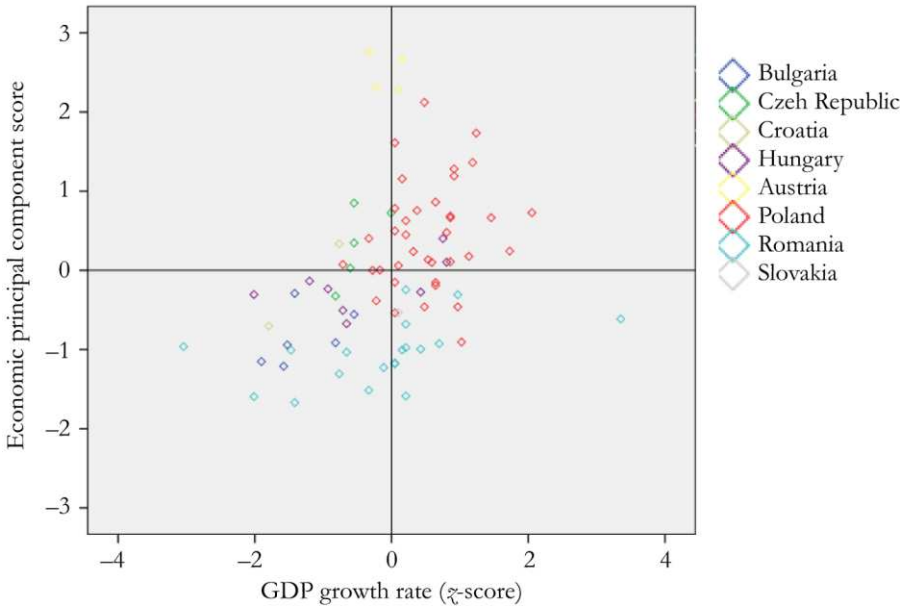
The indicators for the economy principal component can be divided into three groups. The first is related to production and income, the second measures the den-

sity of enterprises and business demography, and the third group is associated with employment and unemployment. Of the fourteen starting variables, five remained to shape the final indicator, with 62 per cent explained variance.

Based on the principal component scores, we find a significant advantage in Austrian cities, followed, with some lag, by the large regional centres in Poland (Poznan, Wroclaw, Katowice, Krakow, and Gdansk). With the exception of Ostrava, the Czech cities also produce above-average values. In addition to the cities of these three countries, only two regional centres in Hungary (Győr, Székesfehérvár) and one in Croatia (Rijeka) show above-average performance. The other end of the scale comprises mostly Romanian and Bulgarian cities. Of these cities, only the two larger Romanian centres have a favourable geographical position (Cluj-Napoca, Timisoara), and the dynamically developing Varna stands out from those lagging behind. The Hungarian regional centres belong to the 'lower middle class' in terms of economic development, forming a relatively homogenous group. In this case, only Győr stands out to some extent.

Figure 1

Relationship between the economic principal component score and the GDP growth rate, 2010–2014



Source: Own calculation.

Regarding the spatial distribution of economic development, the West–East slope is prominent (see Appendix 1). In addition, economic status is correlated with

the size of a city, but this rate varies by country. Especially strong links are found in the case of Polish cities, while in Hungary, the links are not considered significant. To investigate whether convergent trends are evident in terms of economic development, the economic factor scores are compared with the growth rate of GDP for the 2010–2014 period (see Figure 1). The two variables are significantly correlated with moderate strength, which suggests that polarization is increasing within the network of regional centres.

If we compare the economic development with the sectoral structure of production and employment, it is clear that industry does not have a positive impact. A significant negative correlation is observed between the economic principal component score and the industrial employment rate and between the economic principal component score and the share of the industry gross value-added produced. The quintiles composed of the economic principal component scores show that the share of employment per industry increases from top to bottom. The proportion in the top quintile is only 26 per cent and in the lowest quintile is 41 per cent. Only six cities are found in the top two quintiles with an above-average share of industrial employment, one of which is Győr.

Knowledge economy

The variables of the knowledge economy principal component can also be divided into three 'thematic' groups. These include indicators on qualifications and the institutional basis of higher education, data on research and development, and on the concentration of knowledge-intensive elements within the service sector. The principal component is based on five variables that explain 67 per cent of the variance.

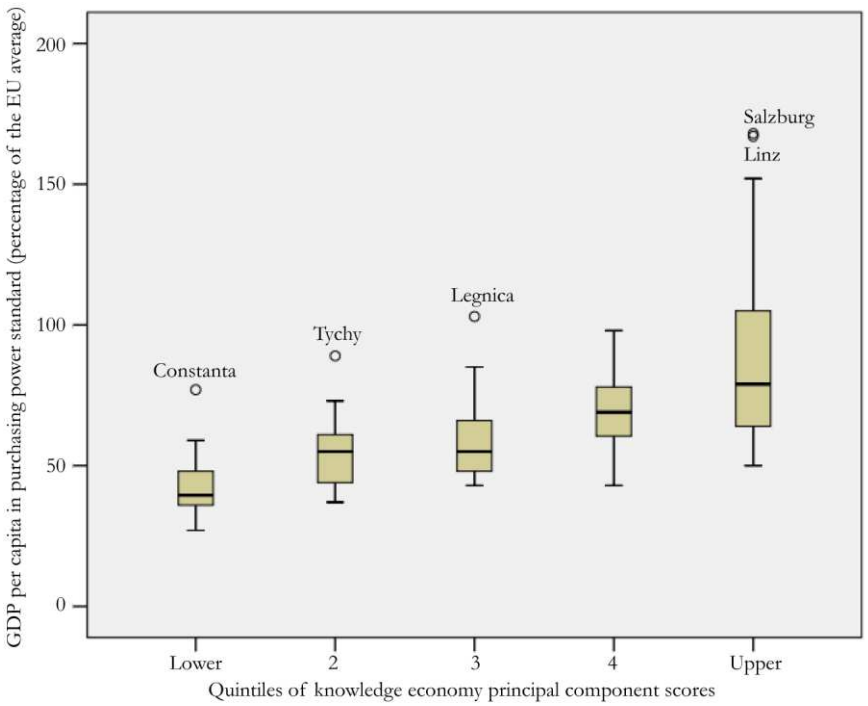
The distribution of the principal component scores shows that for knowledge economy the degree of concentration in the case of the top-performing cities is the highest of the four dimensions examined. A relatively small group of cities are significantly better than those in the rest of the network. As in the case of the previous dimension, Austrian cities stand out. However, while they have similar performance in terms of economic development, there is a visible break in terms of the knowledge economy. Graz and Linz perform much better than Innsbruck and Salzburg do. The following group is similar to that of the economic status indicator, consisting of the biggest Polish regional centres. However, the same break is observable here, with Krakow, Poznan and Wroclaw belonging to a separate category. As regards knowledge economy, Czech cities are in a relatively better position than in the case of economic development. Brno has similar indicators to those of the Polish cities mentioned above. Here, the scores again reflect the West–East slope, but the composition of the cities that lag behind is not as homogenous as for the previous factor. The end of the list comprises largely the Romanian and Bulgarian cities, although the centres of rural regions in Poland and

the cities of the Silesian conurbation, with the exception of Katowice, are also included in this group.

Overall, the geographical distribution and level of concentration of knowledge economy show a different picture to that of economic status. Geographical position is less important in this case. For example, smaller regional centres in Western Poland are found on the opposite ends of the scale with regard to the two factors. Their close proximity to the European core regions does not have perceptible positive effects on knowledge economy. In contrast, the centres of traditionally agrarian South-eastern Polish regions, with sparse urban networks (Lublin, Rzeszow), show a significant concentration of human capital (see Appendix 2). The correlations between the principal component scores and city population are similar in strength to those of the previous dimension.

Figure 2

Distribution of GDP per capita in purchasing power standard along the quintiles of knowledge economy principal component scores, 2014



Note: The boxplots display the median (central line), the interquartile range (box), the full range (between the whiskers) and the outliers (points with city names).

Source: Own calculation.

Hungarian cities show a somewhat more differentiated picture than that of economic development. The relatively large university centres perform well, even on

macro-regional level. For example, the scores show that Szeged is in the upper quintile, while Debrecen and Pécs appear in the second quintile. Previous studies related to the Hungarian urban network present a somewhat lopsided development of the regional centres. Cities with significant innovation potential have relatively weak economic performance. This finding cannot be generalized for the whole region, although this discrepancy is reflected in some countries. Figure 2 shows the distribution of GDP per capita in purchasing power standards along the quintiles of the knowledge economy principal component.

Overall, with regard to higher education, innovative activity, and advanced services, a more nuanced picture is evident, as in the case of the primary indicators of economic development. However, fundamental levels of inequalities and ruptures within the region are constituted in the same manner.

Demography

In parallel with the political changes in the socialist countries by the early 1990s, trends in urban-rural migration shifted noticeably. The majority of the Central and Eastern European regional centres experienced a population decrease in this decade, owing to the exodus from the cities to the rural areas on the one hand, and the accelerating natural decrease on the other. However, in several countries after the millennium, the demographic processes of regional centres began to differentiate. This is mainly due to the restarting of migration towards the cities entering a positive development path, thus providing better opportunities in the labour market and in terms of potential income, and to the metropolization processes of larger countries characterised by a multi-tiered network of regional centres.

In the case of larger cities that are considered primary targets for migrants, a transformation in the age structure is observable within the medium term, which has dynamizing effects on the natural demographic conditions. Of course, these processes cannot be reduced to the population flow towards the economically developed regions. In some peripheral areas of regions with higher fertility rates, the migration of a significant portion of the rural population surplus is towards the centres of their respective regions. In general, these cities do not show strong economic potential at the macro-regional level, but emerge from their close hinterlands. These processes are typical in the Eastern regions of Poland and Romania.

The principal component of demographic status consists of data on vital events, indicators of the age structure illustrating the 'inner' dynamics of the population, and migration statistics. The proportion of explained variance is smaller here than in the case of the other principal components (50 per cent), and, in general, the pairwise correlations among the initial variables are weaker.

As might be expected, in this case the distribution of cities is somewhat different, with the spatial polarization of the principal component scores showing a lower level (see Appendix 3). Economically developed Austrian and Polish cities have

favourable demographic conditions, as do the regional centres of the Eastern part of Poland and Romania. The data confirm that the demographic crises of the traditional centres of heavy industry are permanent, the vital migration statistics and population structure indicators of the majority of these cities do not show any improvement, even two and a half decades after the transition. The thirteen cities in the most unfavourable situation (lagging by more than one standard deviation below the average) are former centres of heavy industry, except Pleven, which is the centre of a remote, rural Bulgarian region. Two Hungarian cities, Miskolc and Pécs, also fall into this category.

In order to make the two-sided nature of the demographic dynamics sensible, a *K*-means cluster analysis is performed on the basis of the indicators of the primary component (except for infant mortality). Six clusters are set up, and two groups of cities characterized by favourable demographic trends are separated. Dynamic eastern cities are more balanced than others by the sources of growth: their migration surplus is complemented by natural increase, but their mortality rates are high. The 'Western' model of demographic dynamics, mainly typical in Austrian and Czech cities, shows a slight natural decrease, a stable migration surplus, and exceptionally low mortality rates.

Culture and environment

This principal component is built from indicators of a different nature. It includes data on cultural institutions and cultural consumption, core indicators of tourism, and data related to the quality of the living environment. The principal component consists of six variables, two of which (number of visitors to cultural institutions and the infrastructure of recreational activities) are complex indicators. The explained variance is 52 per cent.

The principal component scores show the separation of the two Austrian cities with weaker performance in the knowledge economy (Innsbruck, Salzburg) and Krakow. The other two Austrian cities, along with Poznan, Wroclaw, Pécs, and Sibiu, constitute the second tier. The positions of Czech cities are relatively lower than those in the other three dimensions. The centres of the agricultural regions in Moldavia and Wallachia and the industrial towns of Silesia have the lowest scores. The West–East differences are significant, appearing a rupture rather than a slope (see Appendix 4).

Ranking of cities

Aggregating the four dimensions, a simple ranking of Central and Eastern European regional centres can be compiled. As expected, the Austrian cities top the list, followed by the major centres in Poland. Czech cities are close to the leading group,

except the below-average Ostrava. Hungarian cities score near the average, making up a relatively homogenous group. Romanian and Bulgarian cities, primarily centres of remote rural regions with sparse urban networks, are at the bottom of the list. Table 3 shows the top and bottom ten cities, according to the aggregate score.

Table 3

The top and bottom ten cities by the complex development score, 2014

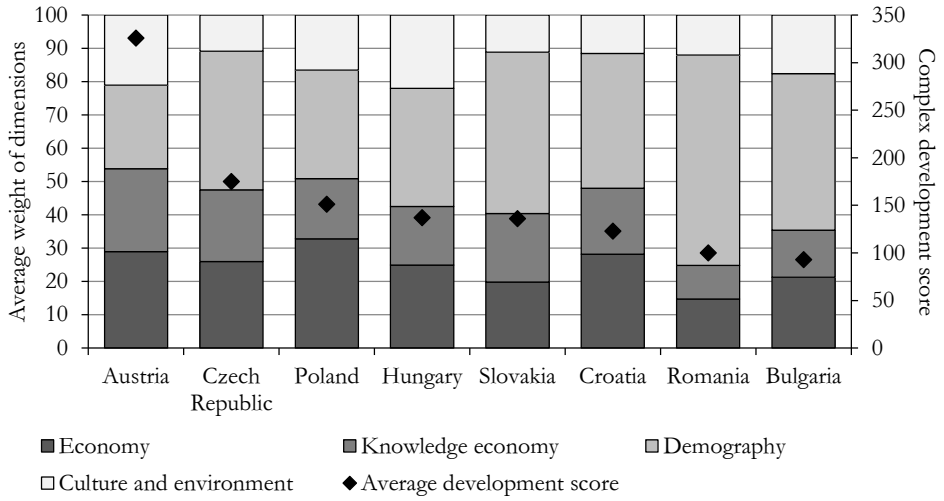
Top 10		Bottom 10	
City	Score	City	Score
Innsbruck	10.66	Bytom	–3.06
Graz	10.00	Wloclawek	–3.09
Salzburg	9.42	Ploiesti	–3.10
Linz	7.89	Burgas	–3.30
Krakow	7.46	Botosani	–3.38
Wroclaw	5.44	Ruse	–3.40
Poznan	4.94	Satu Mare	–3.67
Gdansk	3.78	Buzau	–4.04
Rzeszow	3.31	Pleven	–4.17
Brno	3.23	Braila	–5.90

Source: Own calculation.

With regard to the aggregation of the principal components, the balance of the various factors responsible for the development indicator is also examined. Breaking down the principal component scores to percentiles, each city has a value from 1 to 100 in each dimension. These scores indicate the complex development status on the one hand, and the weight of each dimension on the other. A comparison of the dimensions of the complex indicator shows two linear trends. In parallel with an increase in the level of overall development, the weight of the knowledge economy is also increasing, while that of demography is decreasing. In the next step, the average weights of the four components are examined by country (see Figure 3). The results show that Austrian cities are distinct from those in other countries, not only in the sense that their average developmental score is outstanding, but also because they are characterized by an almost perfect functional balance. In their case, the four factors have roughly the same level of involvement in the complex indicator. If we only separate the economic and non-economic dimensions, Poland also shows an equilibrium, although her deep structure is different: the traditional economic factors predominate over the knowledge economy, while the same level of relationship exists between demography and culture and environment.

Figure 3

Average weight of dimensions in the complex development score, by country



Source: Own calculation.

Types and hierarchy of regional centres

A *K*-means cluster analysis is conducted based on the four principal components in order to map the functional-hierarchical structure of the urban network of the region. The final cluster structure is divided into seven groups, two of which are specific, with a total of five cities. The remaining five clusters have a roughly similar number of membership, with an average of fifteen cities. The cluster structure does not reflect a hierarchical structure, although a fundamental arrangement is evident based on the developmental level. However, in some cases, specific factors are well manifested next to similar roles and levels of development.

Table 4

Final cluster centres based on the principal component scores

	1.	2.	3.	4.	5.	6.	7.
Economy	2.53	2.10	0.90	–0.14	–0.56	0.13	–1.03
Knowledge economy	3.76	2.21	0.67	–0.28	–0.39	–0.06	–0.88
Demography	1.54	1.00	0.46	0.22	0.72	–1.37	–0.59
Culture and environment	1.10	3.85	0.36	0.56	–0.51	–0.29	–0.71

Source: Own calculation.

Outstanding cities with a dominant knowledge economy /2 cities/

Only two cities, Graz and Linz, belong to this specific cluster. Their position is not determined primarily by their favourable economic situation, but by their outstanding performance in the knowledge economy. In the case of Austrian cities, which generally show high performance in the latter aspect, there is a kind of fracture. The leading positions of the two cities are illustrated not only in the present study, but also in earlier analyses on the knowledge economy and the role of universities in research and development (Fischer–Varga 2002), as well as in territorial aspects of the creative and cultural industry (Trippl et al. 2013). The advantage of these two cities is manifested strongly in the outstanding number of patent applications and their employment ratio in research and development and knowledge-intensive services. In the case of Linz, the pattern of transformation is clearly visible and exemplary, even on a European level. The city was one of the primary centres of traditional heavy industry in Austria during the 20th century, based primarily on the steel industry. From the 1980s onwards, economic diversification processes started at a fast pace, which, in addition to strengthening the role of small and medium-sized enterprises, was characterized by the active participation of large companies in the city and the region in investments in economic activities with high added-value. Today, cooperation between the primary actors (economic organizations, higher education, and local government) can be considered exemplary, providing a potential model for other major cities of the region. Similar processes can be observed in the case of Graz, with minor distinctions. The starting positions of these cities were more favourable, with Graz having a traditionally stronger regional role and a more diverse economic structure.

Outstanding cities with high cultural capital /3 cities/

This specific cluster has the two 'remnant' Austrian cities, Innsbruck and Salzburg, as well as Krakow, which is the most populous regional centre in Poland and the overall study region. Cities in this cluster perform slightly worse in economic terms than those in the previous cluster. The specialty of their position is clearly defined by the outstanding concentration of cultural capital.

These positions are formed along slightly different emphases for the three cities. In terms of cultural institutions and events, Salzburg is outstanding. This has a significant positive effect on tourism, which is the primary factor behind the membership of Innsbruck in this cluster. Krakow is much more balanced and performs consistently above average with regard to the indicators of cultural capital and environment. The differences between the two Austrian cities and Krakow manifest themselves in economic terms. However, the indicators related to the knowledge economy and capital, especially those connected to higher education, show similar values. The fact that Krakow stands in this position and belongs to this cluster is

due to the effect of its size. Beyond that, the city is considered to be the primary centre of culture in Poland, and its regional role is traditionally significant. This is not only true of its economic concentration, but also its human capital. Krakow is the largest academic centre among all the cities in this analysis.

Fully fledged, balanced regional centres /17 cities/

The seventeen cities belonging to this cluster are considered fully fledged, balanced centres of the urban network on a macro-regional level. In terms of the examined dimensions, they perform above average in all respects, although we can identify different emphases and focal points with respect to the resources that determine their positions.

The first group of cities in this cluster gains the status of fully fledged regional centres by virtue of size, regional scope, and economic concentration. These include, on the one hand, the Polish cities with strong signs of metropolization, beyond their significant population (Gdansk, Poznan, Szczecin, Wroclaw), and Brno which is the primary centre of the Czech Republic, after the capital. These cities are separated from the cluster, to some extent, by their economic concentration. Here, the two dynamic centres of Western Poland, Poznan and Wroclaw, have the highest level.

The two cities with a population of more than half a million and an agglomeration over one million are considered to have the highest level of development potential in Poland, owing to the combined effect of their geographical location and the concentration of their population. The starting positions of the two cities necessary for the economic restructuring in the transition era were more favourable than those of their 'peers', namely these cities were (are) similar in size and had a more dominant traditional heavy industry or processing industry. In terms of economic indicators, in addition to their favourable position, dynamics is a factor that distinguishes Poznan and Wroclaw. Their positive tendencies are stronger and more significant than in the majority of cities in this cluster.

The second group consists of those cities in the Czech Republic and Western Poland that are on a lower tier in terms of their size and regional role than are the cities in the first group. Their position is strongly determined by their geographic location. These are regional centres with relatively significant educational and cultural functions (Bydgoszcz, Pilsen, Torun), as well as cities with a local economy based on innovative industrial sectors (Opole, Zielona Góra).

As slight geographical 'outliers', the two major centres in South-eastern Poland, Lublin and Rzeszow, also belong to this cluster. Their membership is based partly on mechanisms of Polish regional policy, which builds strongly on the capacity and quality development of higher education, and encourages knowledge-intensive activities as a tool through which the Eastern regions can catch up. The presence of these two cities in this cluster is largely due to the outstanding values of indicators related to higher education and the qualifications of the workforce.

Katowice also has a special position in this cluster. The city is the centre of the Silesian conurbation which developed mainly on the basis of traditional heavy industry. Most of the cities located in this area that are characterized as industrial towns lag behind, but the dominant role of Katowice in service and institutional activities in the region is clearly evident. The negative demographic trends, considered to be general in the region, slightly separate Katowice from the other cities of the cluster.

Secondary centres /10 cities/

The ten cities of this cluster are generally characterized by weaker economic performance than that of the fully fledged regional centres, as well as a lower level of regional scope and attraction, although with sufficient development potential. Their vast majority are Hungarian and Polish cities.

The Polish cities represent two basic types. First, there are two cities located in the 'shadow' of the major centres, but in the case of Gorzow Wielkopolski, the geographic location, and in the case of Kielce, the relatively important regional role ensure their favourable positions. The other two cities are located in Upper Silesia and have good economic and employment potentials, mainly owing to the vehicle industry. Fiat operates a factory in both Bielsko-Biala and Tychy.

Five of the eight Hungarian regional centres belong to this cluster. Therefore, those differences that were pronounced in the domestic analysis have reduced significantly at the macro-regional level. One possible reason is that Hungarian regional centres and their hinterlands have similar and quite low population weights and economic concentrations in the macro-regional comparisons. Thus, cities with a relatively strong economy, such as Győr or Kecskemét, are unable to achieve the same level as the second-tier regional centres of the Czech Republic or Western Poland. However, the asymmetry observable in the domestic analysis is partly confirmed here. While Győr and Székesfehérvár have relatively good economic indicators, they lag behind in terms of their knowledge economy and human capital, just as the Polish cities in this cluster do. Szeged is considered atypical with an opposite relationship for these two factors. One Romanian city, Sibiu, belongs to this cluster. Its economic indicators are only slightly better than its environment, but its performance in terms of culture and environment is well above average.

'Dynamic' Eastern cities /19 cities/

This is the largest cluster with nineteen members. The vast majority of these are located in the Eastern part of the region, with nine cities in Romania. However, they possess a relatively favourable position compared to their environment.

Romania is represented by two slightly different groups of cities within the cluster. The first includes the traditional major centres of Transylvania and the Partium

(i.e. Cluj-Napoca, Oradea, and Timisoara), which possess an advantageous position in Romania with respect to foreign direct investment, and their economic development lags only slightly behind the average level of the region. The other type is represented by the larger cities outside the Carpathian Mountains, which are hindered in their development in comparison with the first group, but rise from their hinterlands like islands. Thus, they have the ability to attract immigrants from rural areas, ensuring a stable population increase. These trends are manifested most significantly in the case of Iasi, but the smaller Bacau has the same characteristics.

Bulgaria's two largest and, in the last decade, most dynamically developing cities, Plovdiv and Varna, also belong to this cluster. In the case of both cities, suburbanization and the expansion of agglomeration are highly evident processes. Other members of this cluster are Debrecen, Split, and the only Slovakian town in this study, Kosice. The four Polish cities and the one Czech city in the cluster represent peripheral geographic locations, except for Rybnik in Upper Silesia.

Cities lagging behind (industrial) /15 cities/

The first cluster of the two characterized by a lack of resources and significant lag includes former or actual centres of heavy industry. The two exceptions are Kalisz and Lodz. In the case of these cities, it is clear that the problems of industrial restructuring have a long-term hindering impact on their development. In this cluster, the demographic trends are highly unfavourable. Almost all of the cities show a stable, but negative balance of migration from the early 1990s or even from the previous decade. As a result, the age structure shows a significant rate of ageing.

Six of the cities are located in Silesia. However, in a wider scope, Czestochowa and Ostrava are also classified as part of this region. In terms of the traditional foundations of economic structure and the process of restructuring, the two cities on the Polish side of the Sudeten, Legnica and Walbrzych, built on coal- and ore mining, are in a similar situation. Two Hungarian cities, Miskolc and Pécs, complete this cluster, and have similar problems and processes.

Lodz is a special case in this cluster, differing from the other centres of heavy industry in its size, regional role, and economic endowments. Still, it faces the same industrial restructuring problems that this group does. The economy of the city was dominated by the textile industry before the transition. Then, after its decline, economic restructuring began in a more favourable environment. However, the process is slow and cannot be considered complete. Lodz drops behind the other two similar-sized Polish cities. Although its economic indicators stand out from this cluster and the tertiarization process is relatively fast, its unfavourable demographic trends are more pronounced than in the heavy industry centres. Since 1990, the city has lost nearly 20 per cent of its population and, while the rate of population decline has continued to slow in the majority of Upper Silesian cities in the past five years, in Lodz, it has remained stable.

Cities lagging behind (peripheral) /16 cities/

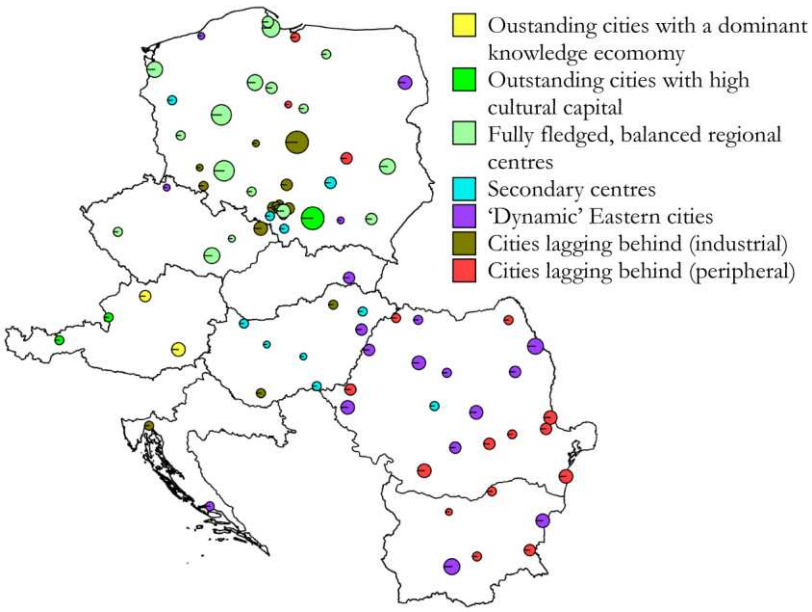
The disadvantageous position of this cluster is not a result of its industrial past, but rather of its peripheral position. A considerable proportion of these cities are centres of rural areas or are located in the 'shadow' of bigger cities. Most of the cities in this group are Romanian and Bulgarian towns with very weak economic performance and potential.

The cluster includes Romanian cities located outside the Carpathians, with two exceptions (Arad and Satu Mare), and mainly Wallachian cities. The situation of Constanta merits special mention, as the largest city of this cluster with a population of 300,000. Even with its seaport and relatively good transport links, the city has been unable to progress beyond the category of the regional centres that lag behind.

There is a significant contrast in the case of Bulgaria. Apart from the two relatively dynamic centres (Plovdiv and Varna), the other Bulgarian cities all belong to this cluster. These cities are characterized by a high level of emigration and population decline, which exceeds even that of industrial towns. Lastly, the cluster membership is complemented by three Polish cities, of which Elblag and Radom are centres of remote areas.

Figure 4

Distribution of cities by the clusters



Source: Own elaboration.

Conclusions – primary factors determining the hierarchy of Central and Eastern European regional centres

The cluster structure revealed in this study confirms many of the main findings of previous studies on the spatial structure and regional inequalities of the region. In terms of shaping the hierarchy of Central and Eastern European regional centres, the following factors play major roles:

1. Size and concentration. There is a clear and strong relationship between the size of cities and urban areas and their position in the network hierarchy. On the one hand, regional centres with an adequate population concentration, in general, occupy higher positions in their regions. For example, the big Polish regional centres are the largest elements of the network and hold prominent positions. On the other hand, the relationship is also evident in countries and regions with less favourable geographic locations and a lower level of economic development. The two largest regional centres in Bulgaria clearly represent the second level, behind the capital, while Lublin, the biggest city in Eastern Poland, also stands out among the smaller centres of the region.
2. Geographical location, West–East slope. With regard to specific dimensions, geographical position plays an important role in creating the complex cluster structure. The effects of the traditional inequalities in the region are evident in the density and development of the urban network, and in the spatial organizing functions of the cities. The rupture between the cities in Austria and those in other countries is clearly visible, as are the traditional inner disparities of the region. Romanian and Bulgarian cities that perform somewhat better than other cities in the two countries join the network of the macro-region at a low level.
3. 'National' effect. The noticeable differences between the regional centres in the domestic network are notably reduced at the macro-regional level, with the positions and types of cities in most countries showing relative homogeneity. The lone exception is Poland which has easily detectable levels formed by the sizes of the cities and the regional inequalities.
4. Structural effect. Here, the effects of several factors prevail. It is important to highlight the inherited economic structure which is a crucial determinant in the case of the industrial regions. The majority of cities that were key targets of socialist industrialization largely maintain their unfavourable positions two and a half decades after the beginning of the transition. The situation is quite similar in the centres of the rural areas, where the potential of the knowledge economy and innovation generally lack resources.

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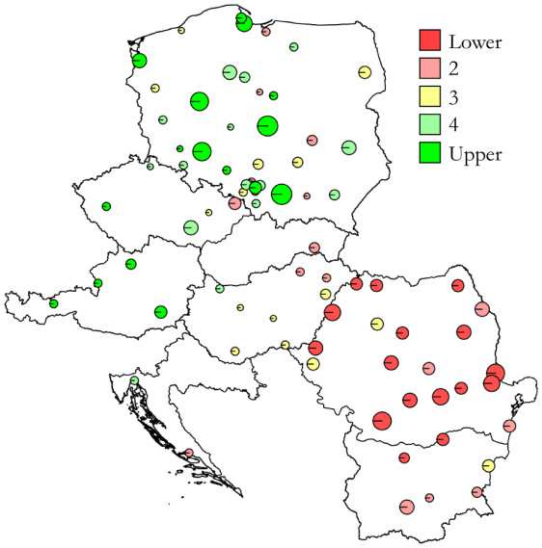
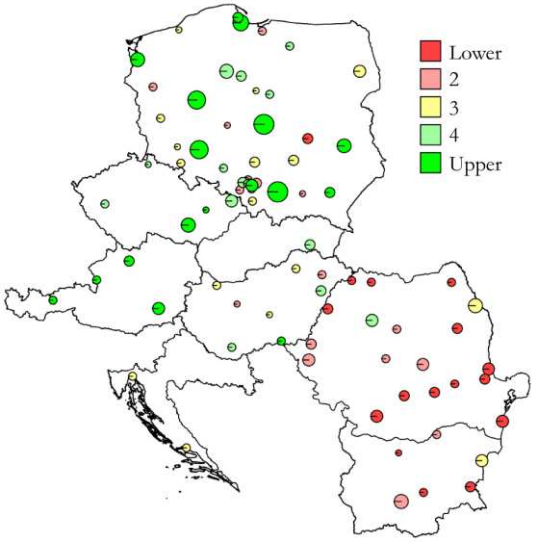
Appendix

1. Distribution of regional centres by the quintiles of the economy principal component scores



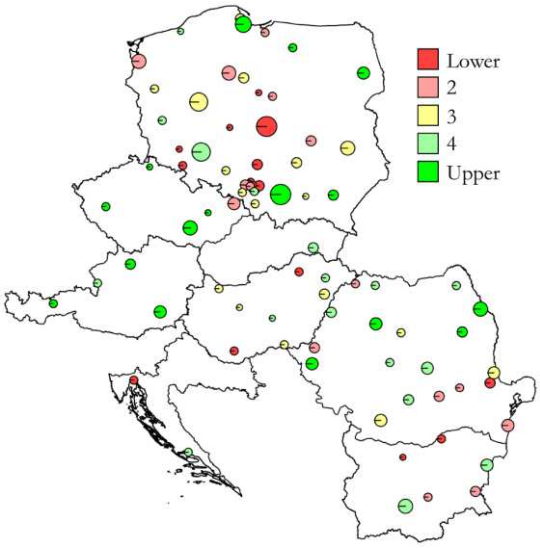
Source: Own elaboration.

2. Distribution of regional centres by the quintiles of the knowledge economy principal component scores



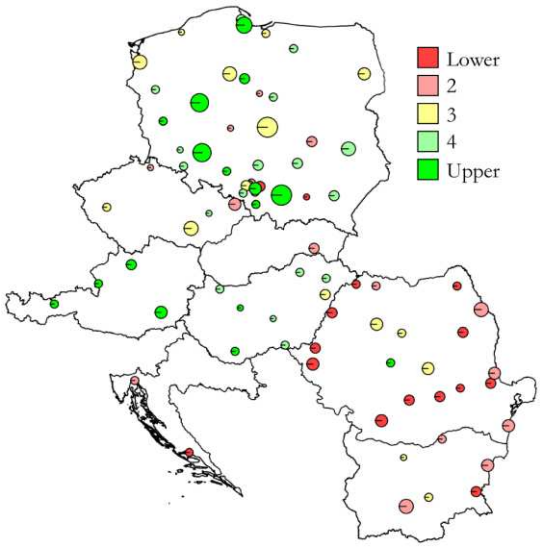
Source: Own elaboration.

3. Distribution of regional centres by the quintiles of the demography principal component scores



Source: Own elaboration.

4. Distribution of regional centres by the quintiles of culture and environment principal component scores



Source: Own elaboration.

International migration and official migration statistics in Hungary

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migration statistics,
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population,
network analysis,
neighbourhoods

The challenges that official migration statistics face in the 21st century are manifold. In line with intensifying globalisation processes, and new patterns and types of migration, new routes and new migrant identities have been emerging. However, the new trends also offer new, potentially usable data sources, tools, and methods for the measurement of this changing phenomenon. Attempting to provide an overview of the Hungarian migration statistical system, the aim of this paper is to promote interdisciplinary scientific dialogue on migration and share some of the most important figures and trends of international migration in Hungary, highlighting its remarkable geographical aspects in the European context, and the peculiarities, challenges, and opportunities of its measurement.

Introduction

Geographical movements characterise humanity from the very beginning of its history. However, as the United Nations' New York Declaration for Refugees and Migrants adopted in 2016 affirms 'we are witnessing in today's world an unprece-

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dented level of human mobility. More people than ever before live in a country other than the one in which they were born. […] In 2015, their number surpassed 244 million, growing at a rate faster than the world's population.' (UN General Assembly 2016 p. 2.) Intentions – mainly in population-, labour market-, and social cohesion policy-making – to reduce undesired negative effects of human mobility or to harvest potential benefits, making the best of it, have become central topics in hot-tempered political debates and public discourses on future socio-economic and demographic developments of both sending and receiving societies.

Corresponding to opposing theoretical approaches[1], greater discussion emerged on the relations of migration and development that determined both related policy debates and research.[2] In this context, the relevance of producing high-quality official statistics on migration-related phenomena that provides inputs indispensable for contrasting hypotheses – that is for theory construction – and for making well-designed policies is undeniable. Not even the tendency of the relationship of policy-making and scientific knowledge that leads through the phases of 'evidence-based' and 'evidence-informed' policies to 'post-truth' policy-making minimises this relevance. The counter-trend of an increasingly stronger desire and efforts of the scientific society to have a voice in migration policy-making is manifested by the fact that increasingly more research centres and projects position themselves as government capacity builders.[3] Despite the efforts, the warning of De Jong and Gardner (1981) from almost four decades – that 'the difficulty in implementing policies designed to alter migration behaviour in the absence of theoretically sound and empirically validated models of such behaviour is apparent' – is still as actual as it was in its time.

However, the lack of empirically validated theoretical models and the weakening impact of scientific research on migration policy decision-making are not the only challenges that official statistics face. The phenomenon and related aspects – that we try to measure and understand – is changing over time. Massey et al. (1998) described how migration phenomena had been changing over the last century and lamented that the concepts used for analysing them in the millennium were products of the industrial era. Changes, such as intensifying socio-economic trends of the globalising world, global markets, global media and communication, and cheaper and faster global transportation, affect not only migration decision-making processes, but have also created increasingly newer migration routes, patterns of migration

[1] For a review of migration theories, see for example De Haas (2008).

[2] On the migration-development nexus (or migration-development mantra), see for example Castles–Delgado Wise (2008), Castles (2008), Faist (2008), etc.

[3] See for example the government capacity building activities of the IOM's (International Organization for Migration) Global Migration Data Analysis Centre at http://gmdac.iom.int/capacity-building-search or the ongoing Danube Region youth migration project, YOUMIG – Improving institutional capacities and fostering cooperation to tackle the impacts of transnational youth migration at http://www.interreg-danube.eu/approved-projects/youmig

behaviour, migrant types, and identities. Circular or multiple movements, commuting, multilocation – merely to mention a few – have gained importance in migration literature (see e.g. Tannenbaum 2007, Illés 2008, Illés et al. 2009, Skeldon 2012, Mc Loughlin et al. 2011, McHugh 1995, Egedy 2017). As a result, more than ever, a dynamic and inter-disciplinary theoretical framework is needed that considers geographical mobility and development both at the micro and macro levels from an interdisciplinary point of view.

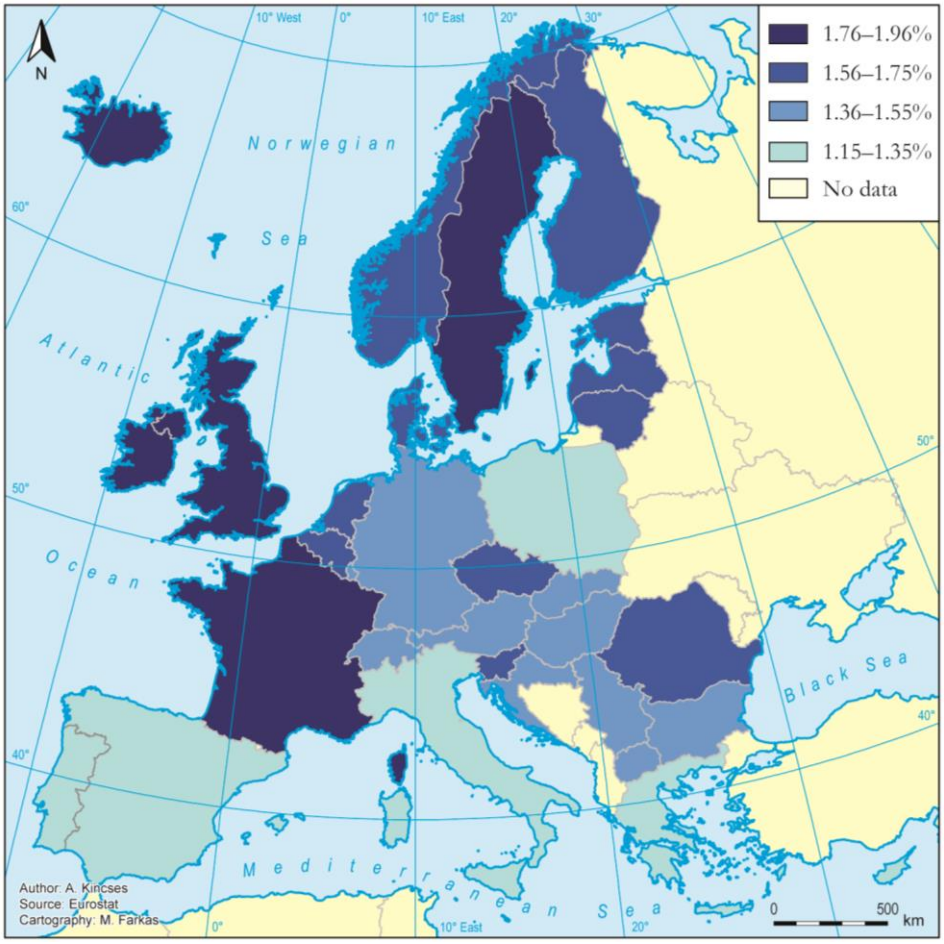
In parallel with the transformation of migration phenomena, new types of data sources have also become available for statistical use that yield in the development of the tools and methods of measuring and analysing migration. The general use of administrative data sources in the production of official statistics – and the potential benefits of using Big Data – involves the constant improvement of data integration techniques, making possible the creation of new, internally and externally coherent, high-quality data sets for the joint analysis of variables not jointly observed previously. A detailed overview of the methodological improvements or the possibilities for theory making is out of the scope of this paper. Instead, this paper – focusing exclusively on international, voluntary, and documented migration flows – reflects the attempt of its authors to promote scientific dialogue on migration, sharing on one hand some of the figures and trends of international migration in Hungary highlighting its remarkable geographical aspects in the European context, and the peculiarities of its measurement in the Hungarian statistical system on the other. By doing so, first, some details of the European migration context will be outlined in which Hungarian migration processes take place. Second, the patterns and some of the most important geographic aspects of international migration in Hungary will be traced. This will be followed by a description of the official migration statistics production system of the Hungarian Central Statistical Office (HCSO). Finally, some concluding remarks close the paper.

Migration context in Europe

Due to decreasing tendencies in childbearing, for decades, developed European Union (EU) countries have been facing the demographic challenges of negative natural changes and the consequent aging of the population (Salt 2001). As an illustration, see Figure 1 that shows that the fertility rates of European countries are below the reproduction level, and Figure 2 that depicts the threats of population aging by comparing the share of elderly people (65+) in European societies as in 2016 and as projected for the year 2050.

Figure 1

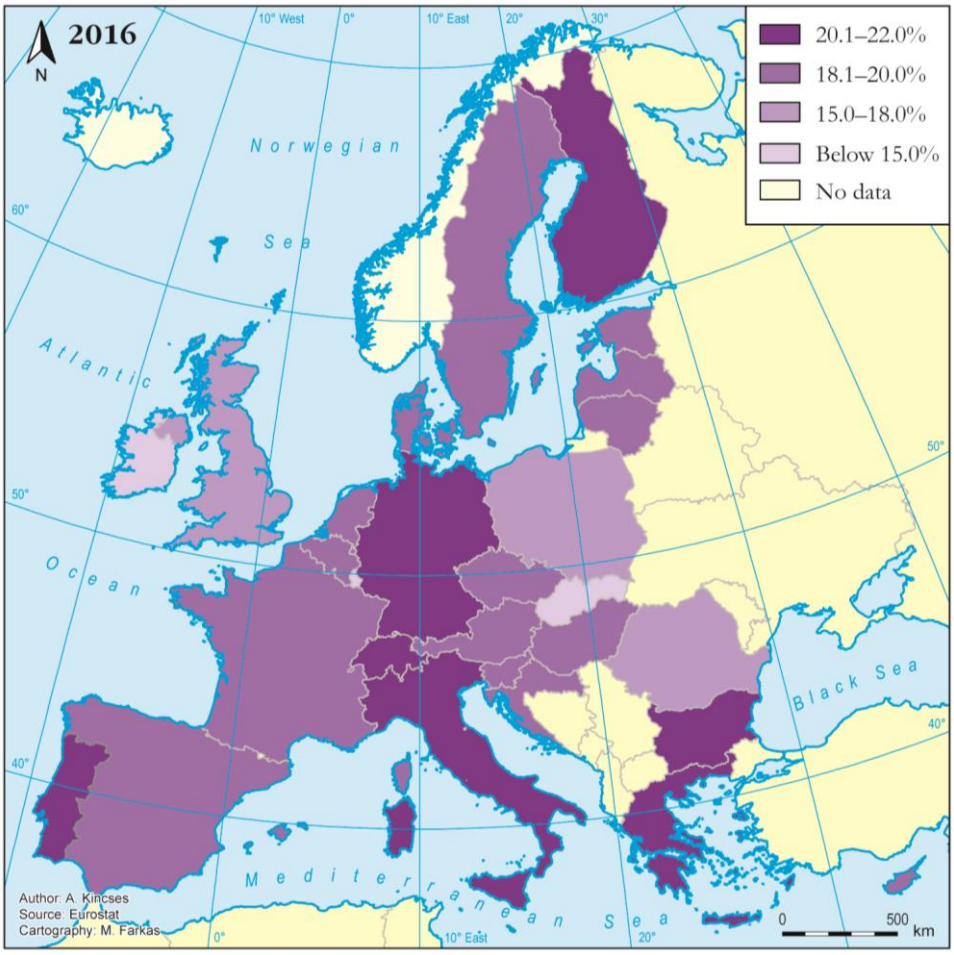
Total fertility rates in European countries, 2015



Source: Eurostat database.

Figure 2

Share of the elderly population (aged 65 and older) in European countries



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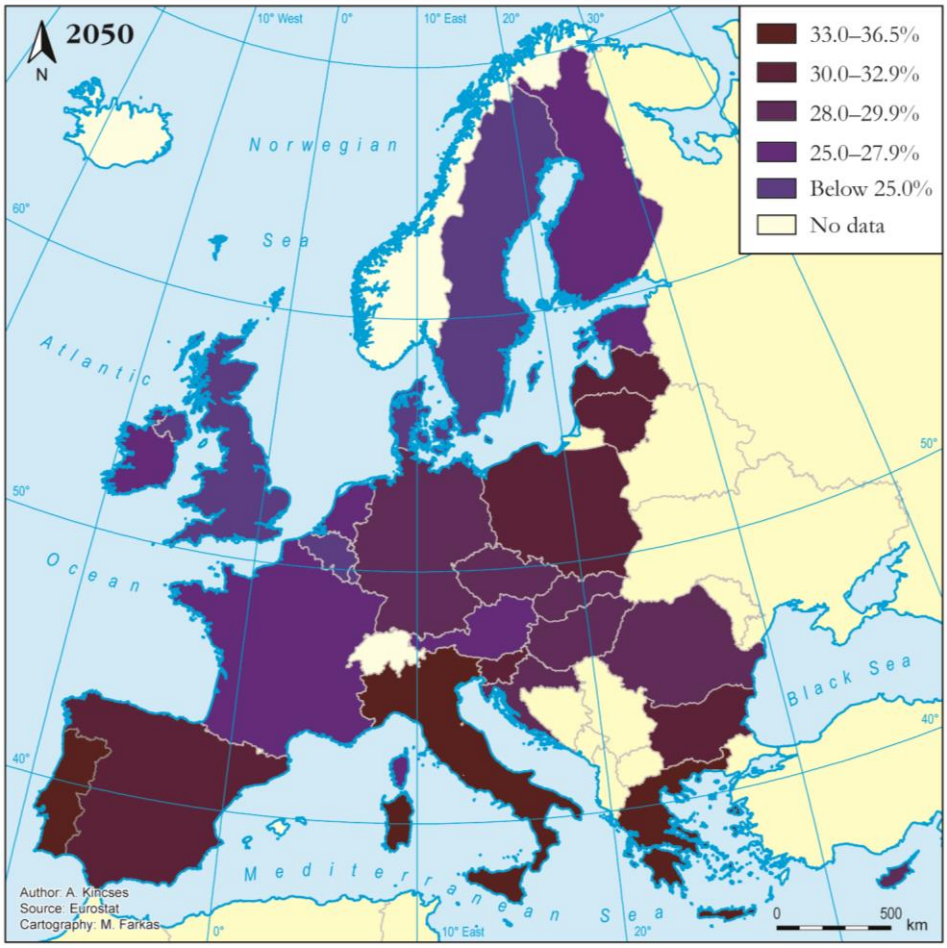


Source: Eurostat database.

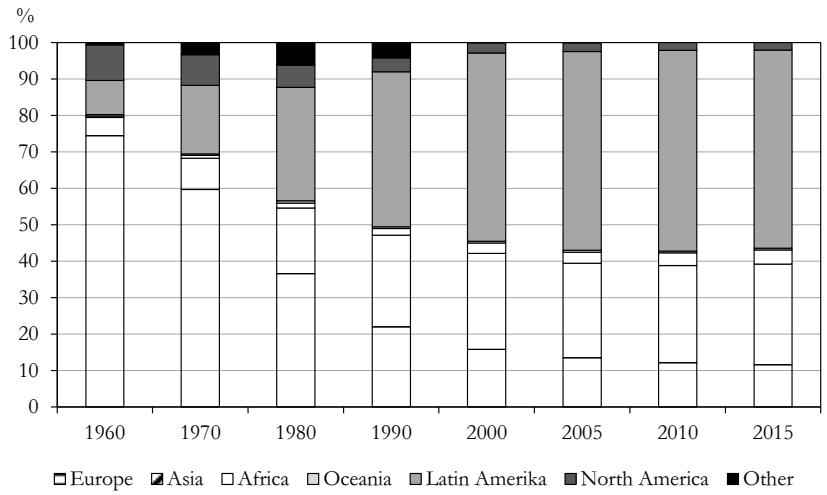
It should be added here that in parallel – and in relation – with the above-mentioned tendencies of population ageing, the patterns of emigration from Europe have also changed. This is rather well illustrated by the decreasing relative share of European-born population in the United States. As it can be observed in Figure 3, the significance of European emigration to the United States has been falling since the last half century (while simultaneously, the share of those born in developing countries has been increasing).

As regards intra-European movements, the free movement of persons within the Schengen territory in recent decades – that has made crossing internal borders easier in Europe – serves the aims of mitigating the inequalities and labour market disequi-

libria in member states and creates a peculiar situation in which migrating European and third-country citizens are distinguished, and their rights and possibilities are distinct. Indeed, the decreasing and aging population in the most developed Northern and Western-European countries resulted in labour shortages, and in a consequent replacement of migration and recruitment of foreign workers from less developed European or developing third countries (Hatton et al. 2005, Gellérné et al. 2005). Figure 4 shows how the relative share of EU-born foreign population in the total foreign population is varying across European countries in accordance with the type of dominant immigration flows in each of them, that is, whether in a given EU member state, intra-European movements or inflows of third-country nationals are predominant.

Figure 3

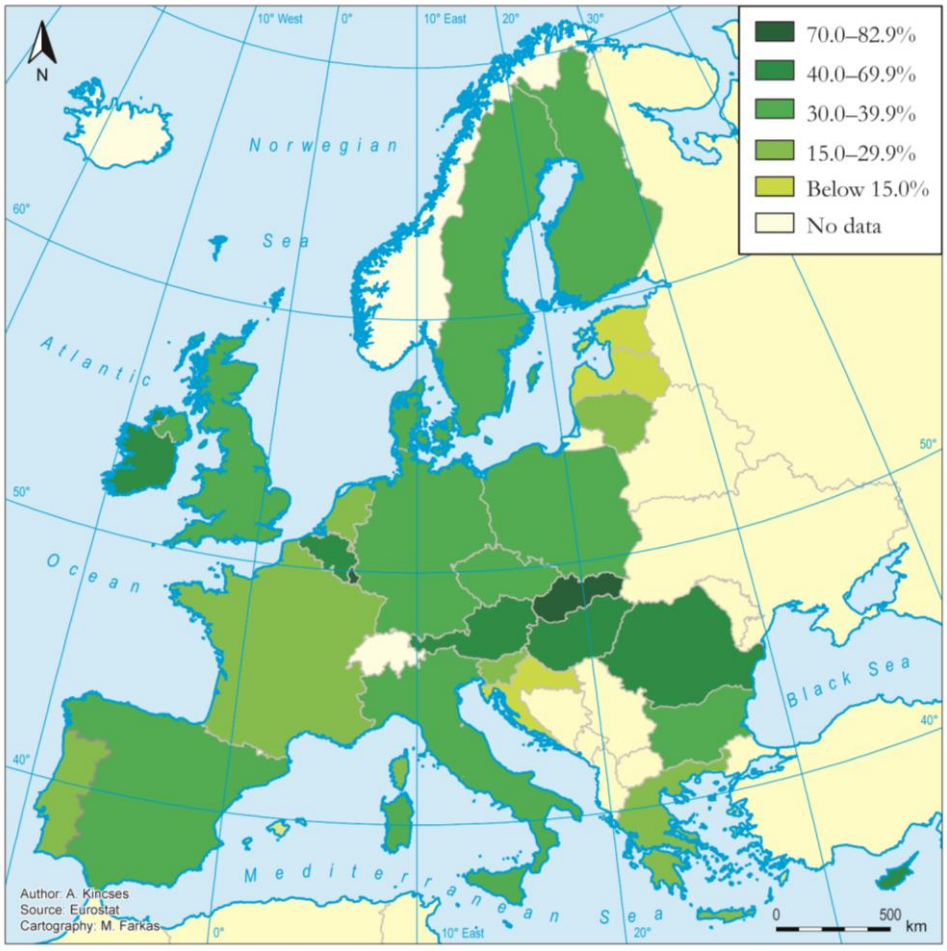
Relative share of foreign-born population in the United States, by continent



Source: United Nations database.

Figure 4

Share of EU-born foreign population in the total foreign population of European countries, 2016



Source: Eurostat database.

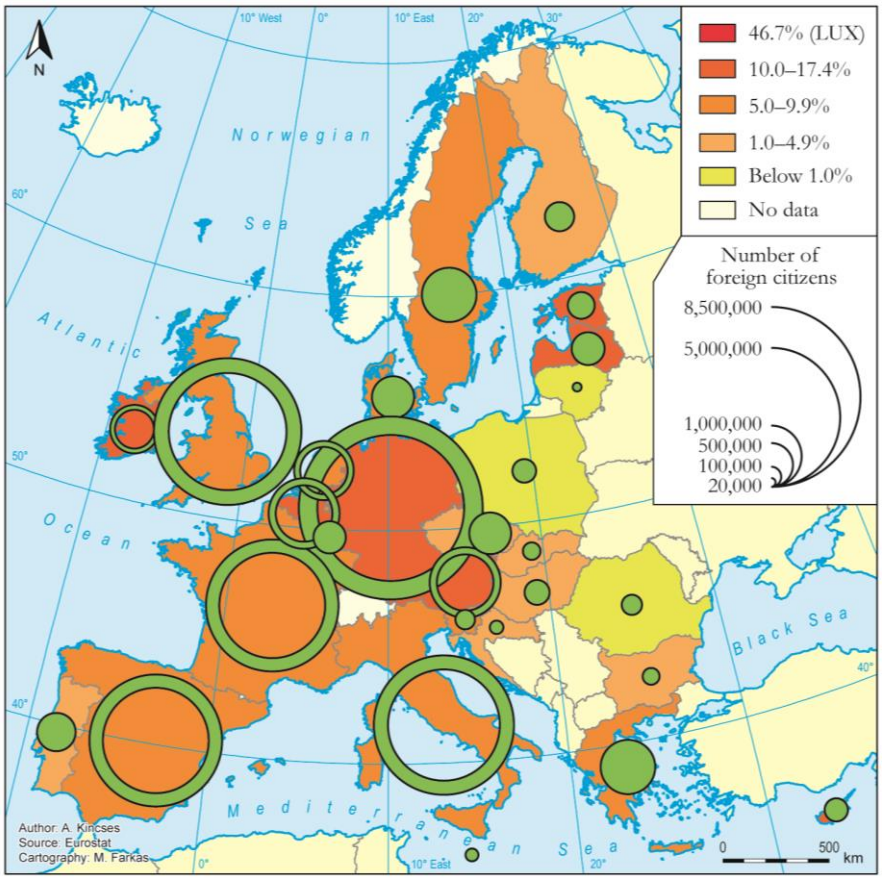
Focusing on immigration from third countries, as the global population projections suggest, the relative share of developing countries in the world's population in comparison to that of more developed ones will further increase (Cohen 2006). Over-population, together with growing income gaps and the imbalanced development of the world's countries (Kofman 2003), encourage the geographical movements from all over the world (Hatton et al. 2005), making Europe a popular destination among migrants from other continents. Furthermore, migration decision-making is also affected by trends of a globalising world as the rapid development of

transportation and telecommunication technology make relocation cheaper and easier, reduce economic and psycho-social costs of moving, and help potential migrants to access more trustable and up-to-date information on destinations. As a result, a rising awareness is observable in migration decision-making.

Overall, in parallel with the increasing accessibility to global markets and high wage areas (Williamson 2006), over the past decades, the migration role of Europe (as a host area) has been revaluated (Venables 1998, Gábrity 2006, Kincses 2012, Kincses 2015). Nowadays, most Western and Northern European countries have a foreign-born population of several million. Since the regime changes of the 1990s in Central and Eastern European countries, as a result of economic integration, they have also become host areas to migrant population (Traistaru et. al. 2002) (for the share of foreign citizens in EU countries, see Figure 5).

Figure 5

Share of foreign citizens in the population of EU countries, 2016



Source: Eurostat database.

International migration in Hungary

Hungary, like other countries in Central Europe, has become a target, mostly for migrants from other European countries (Tóth 2005, Hárs 2009, Hárs–Simon 2015). However, the source areas are expanding constantly: Hungary nowadays hosts citizens from 168 countries, thus it has become part of the global route. An important feature of international immigration in Hungary is that due to simplified naturalisation procedures for ethnic Hungarians in neighbouring countries, migration data by citizenship[4] and by country of birth strongly differ. As the table shows, while the number of foreign citizens[5] residing in Hungary was 150,000 in 2016, the foreign-born population[6] was 380,000 (approximately 4% of the total population).

Number of foreign citizens and foreign-born population in Hungary

Country of citizenship/ country of place of birth	2001		2011		2016	
	Foreign citizens	Foreign-born population	Foreign citizens	Foreign-born population	Foreign citizens	Foreign-born population
Total	93,005	283,951	143,197	383,236	149,111	383,495
Of which:						
Romania	35,558	141,191	38,574	176,550	21,738	158,020
Ukraine	10,195	22,481	11,820	35,354	4,966	37,121
Slovakia	4,213	36,382	8,246	33,155	17,051	32,843
Serbia	8,920	26,060	7,752	29,144	3,038	25,387
Austria	1,086	3,540	3,936	6,160	4,475	5,978
Croatia	1,246	4,323	845	3,498	1,042	2,605
Slovenia	84	674	252	657	323	820
Germany	5,674	9,841	16,987	22,605	19,517	23,453
China	4,057	3,825	8,852	8,767	13,279	12,308
Russia	2,630	6,393	2,512	6,690	4,408	8,687
United Kingdom	835	1,081	2,602	3,597	4,334	5,646
United States	1,588	2,355	3,022	4,684	3,523	5,042

Source: HCSO (Census 2001, 2011, and Microcensus 2016) data.

It should be added that while in 2001, the share of foreign citizens from neighbouring countries in the total foreign population was 66%, by 2016 it decreased to

[4] Ethnic Hungarians in neighbouring countries who obtain Hungarian citizenship are automatically considered as Hungarian citizens. On their immigration to Hungary, see for example Kósa (2016).

[5] The foreign population consists of people who still have the nationality of their home country.

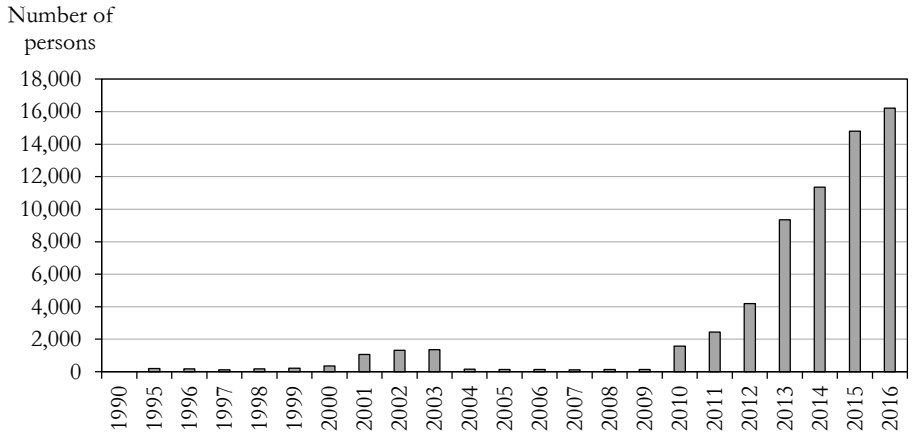
[6] The foreign-born population covers all people who have ever migrated from their country of birth to their current country of residence.

5%. The largest decrease occurred among the Romanian (by 24 percentage points), the Ukrainian, and the Serbian citizens (both by 8 percentage points). The decrease was smaller among people born in the neighbouring countries (from 83% to 69%). The main reason for this is the simplified naturalisation procedure that came into force in Hungary in 2011. Between 2011 and 2016, almost 62,000 ethnic Hungarians acquired Hungarian citizenship from the neighbouring countries, most of which were Romanian (79%), Ukrainian (10%), and Serbian (7%) citizens.

On the other hand, regarding the measurement of national Hungarians abroad, a certain level of uncertainty is apparent.[7] The use of administrative data sources for estimating emigrant stocks and flows is often criticised since migrants tend not to de-register, thus the results based on registers necessarily underestimate outmigration. Estimations based on different data sources increase this uncertainty considerably more. According to expert estimations (Gödri 2010, Kapitány et al. 2013), the stock of Hungarian emigrants is between 300,000 and 650,000. Using mirror statistics,[8] this number is 595,000. However, mirror statistics – biased by the fact that many emigrants return to their home countries (Horváth 2016) – presumably overestimate real outmigration. As Figure 6 illustrates, the number of returners in Hungary is rapidly growing: more than 10,000 Hungarians have returned home annually since 2013.

Figure 6

Returning Hungarian citizens



Source: HCSO migration database.

[7] On the emigration of Hungarian citizens, see for example SEEMIG (2014), Blaskó–Ligeti–Sik (2014), Blaskó (2014), Hárs (2016), and Moreh (2014). On the emigration intentions, see Sik–Örkény (2003), Sik–Szeitl (2016) and Siska–Szilasi–Kóródi–Vadnai (2016).

[8] United Nations, Department of Economic and Social Affairs (2015). Trends in International Migrant Stock: Migrants by Destination and Origin (United Nations database, POP/DB/MIG/Stock/Rev.2015).

Returning to the question of estimating emigration, our own research, carried out in the framework of the SEEMIG[9] project in 2014, calculated the stock of Hungarian emigrants based on the following usage and reconciliation of three different data sources:

a) A SEEMIG pilot survey was conducted as a complementary module of LFS (labour force survey), in which resident household members were asked on other household members and relatives, aged 15–74, residing abroad. The survey found, among others, that 88% of the emigrant population aged 15–74 belongs to the age group 18–49, that at least 81% of the emigrant population left the country more than 1 year before data collection, and that at least 20% of those who left the country more than 1 year before residing outside the EU.
b) A complementary module was introduced in the Hungarian Demographic Research Institute's Turning Points of Life Course survey that provided the opportunity to check the Central Population and Address Register of Hungary, that is, whether registered persons do reside at the address indicated in the register or not. According to the results, 335,000 registered citizens aged 18–49 resided abroad in 2013.
c) Using mirror statistics from Eurostat and the UK Population Survey, it was estimated that 280,000 Hungarian citizens lived in European countries.

SEEMIG experts developed two methods that combined a) and b), and a) and c) data sources respectively, and the results from both were consistent with each other: in 2013, approximately 350,000 Hungarians – who left the country between 1989 and 2012 – lived abroad.

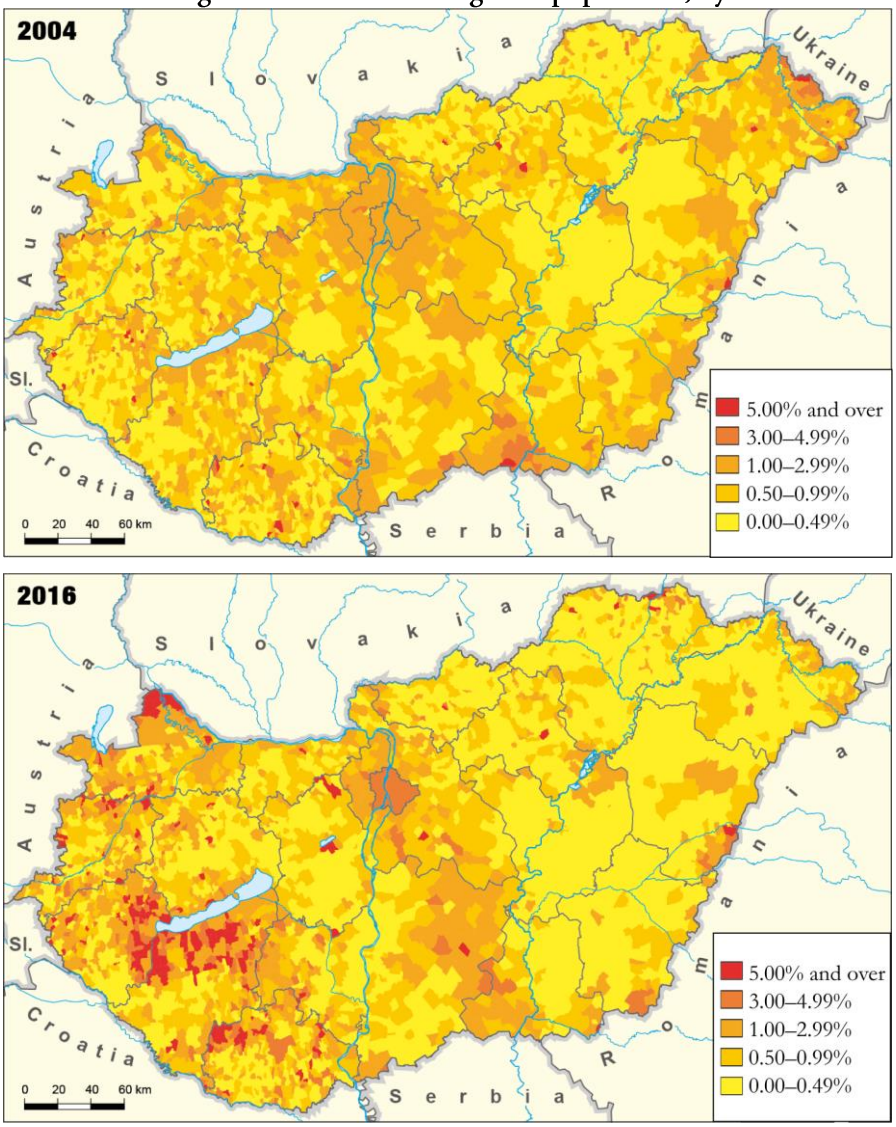
Geographical aspects of immigration in Hungary

The following two maps indicate the number of foreign citizens per 100 inhabitants by settlements in 2004 and 2016. The rate increased from 2004 to 2011, and in 2012, it declined owing to the new regulation coming into force on simplified naturalisation in Hungary. In this year, approximately 40,000 foreigners obtained Hungarian citizenship and fell out of the scope of the foreigners. After this period, from 2013, the number and rate of migrants increased again.

[9] SEEMIG is a strategic project funded by the European Union's South-East Europe Programme. www.seemig.eu

Figure 7

Share of foreign citizens in the Hungarian population, by settlement



Source: HCSO migration database.

The following tree areas have risen significantly:

– The first is Budapest (and Pest county), the capital city of Hungary, which is a global destination for migrants (Kőszeghy 2010). Each second foreigner in Hungary has chosen Budapest. The farther the migrants come from, the more the capital city becomes the number one destination. 58% Africans, 77%

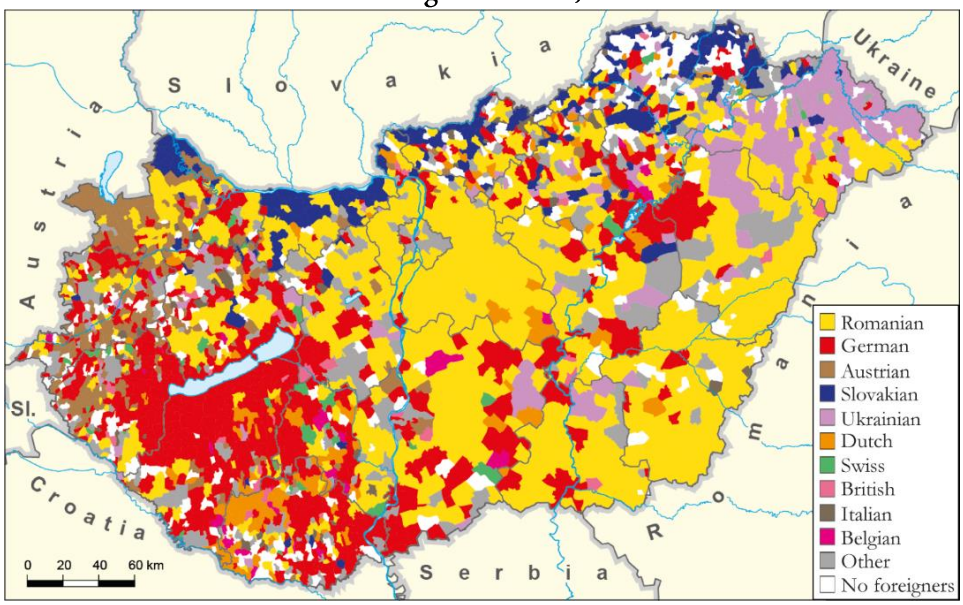
Asians, and 56% Americans live in the capital. In Budapest, 5% of the taxpayers are non-Hungarian citizens.

– The second area is the surroundings of Lake Balaton. Retired immigrants are concentrated here (Illés et al. 2008). Most of them come from EU15 countries. Elderly individuals' migration to Hungary, mostly to small villages, is a new profile in the migration statistics.
– The third area includes settlements along the border, which is not a barrier, but rather a contact zone (Anderson et al. 1999, Hansen 1977, Nijkamp 1998, Van Geenhuizen et al. 2001).

These findings are supported by the following map, which illustrates the settlements of Hungary, according to the highest number of foreign nationals living there. We can observe typical connected groups on the map by citizenship. Foreign citizens along the border mostly come from the other side of the border (as we can see in the case of Ukrainian citizens, marked in purple or in the case of Slovakian citizens marked in blue), while Lake Balaton is mostly red, indicating German citizens. The most considerable group of foreign citizens is Romanians in Hungary marked by yellow.

Figure 8

Settlements of Hungary by the nationality of foreign citizens living there in the largest number, 2016



Source: HCSO migration database.

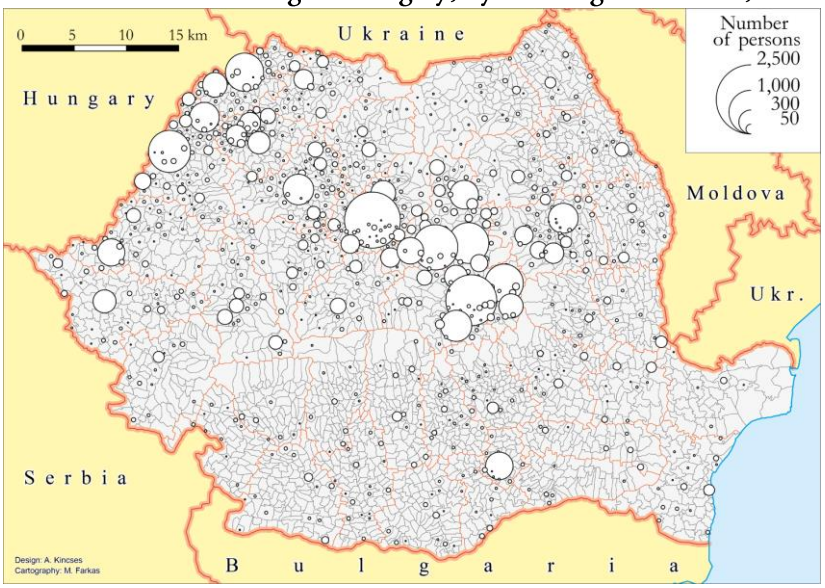
One of the most important analytical potential of Hungarian migration statistics is the fact that we can identify the foreigners' settlement of origin. We can demonstrate it using the most prominent group of foreign citizens in Hungary.

The largest population of Hungarian ethnicity outside Hungary lives in Romania. In 1992, 7.1% of Romania's population identified themselves as Hungarian. This figure was 6.7% in 2002, while 6.1% in 2011. The proportion of Hungarians living in Transylvania, Banat, and Partium is 18%. More than half of the Hungarians in Romania live in Székely Land. Besides Transylvania, a significant number of Hungarians in Romania live in Csángó Land and Bucharest (Kapitány et al. 2013). Belonging to the ethnicity has long played an important role in international migration characteristics between the two countries. The Hungarian characteristic of international migration is that parts of the foreign citizens have a Hungarian mother tongue. The intensity of cross-border linguistic and cultural links is mainly the consequence of peace treaties ending World War I and II. This determinism is continuously decreasing, but still dominant.

Romanian-Hungarian migration relations are traditionally strong. According to census data, 38,600 Romanian citizens lived in Hungary (as of 1 October 2011), and 176,600 people born in Romania settled into Hungary. By 2016, the number of both groups decreased marginally: to 21,700 and 158,000, respectively. International migration between the two countries affects all Romanian and Hungarian counties. This means that migrants come to Hungary from each Romanian county, while Romanian migrants can be found in all Hungarian counties.

Figure 9

Romanian citizens living in Hungary, by 'sending' settlement, 2016



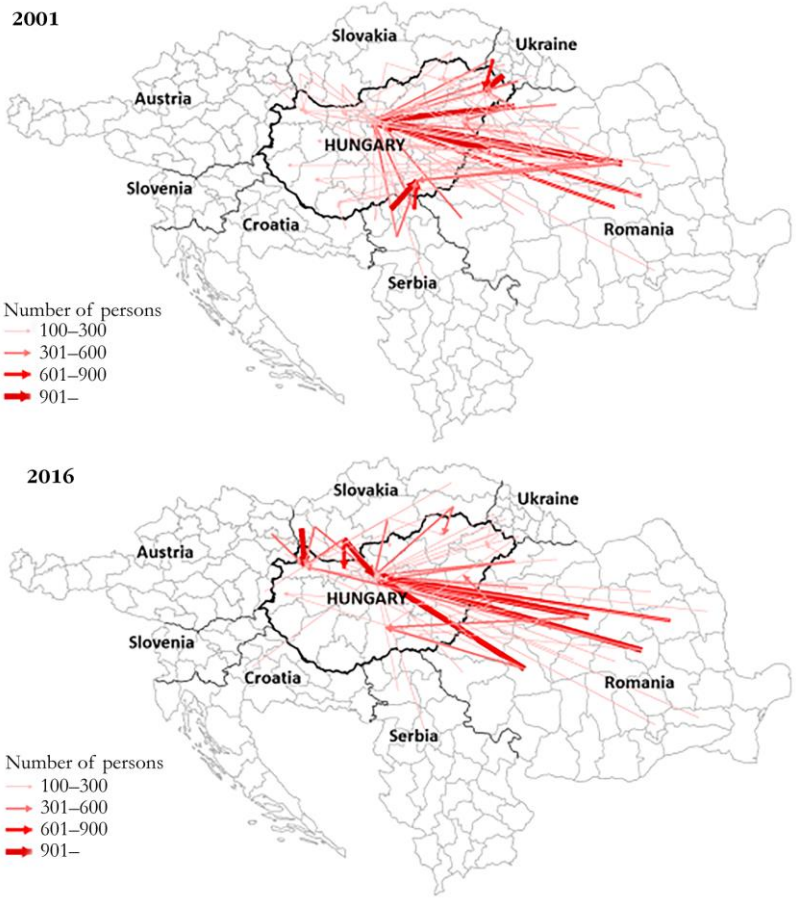
Source: HCSO migration database.

The most affected Romanian counties in the migration to Hungary are Harghita (3,588 people), Mures (3,240 people), Covasna (3,090 people), Bihor (2,117 people), Satu Mare (1,524 people), Bacau (1,387 people), and Cluj (1,116 people). A significant number of Hungarian minorities live in these areas. Approximately 66% of the foreign citizens coming to Hungary come from these seven counties.

This result allows us to take the geographical 'from-to' matrix type approach (Kincses–Bálint 2016). We can examine the relationship between the place of origin and current locations. The next flow maps present the foreign citizens staying in Hungary from neighbouring countries at regional level. These are stock type of data, and the arrows link together the origin and current regions.

Figure 10

Spatial relationship between the 'sending' and 'receiving regions' at NUTS 3 level



Source: HCSO migration database.

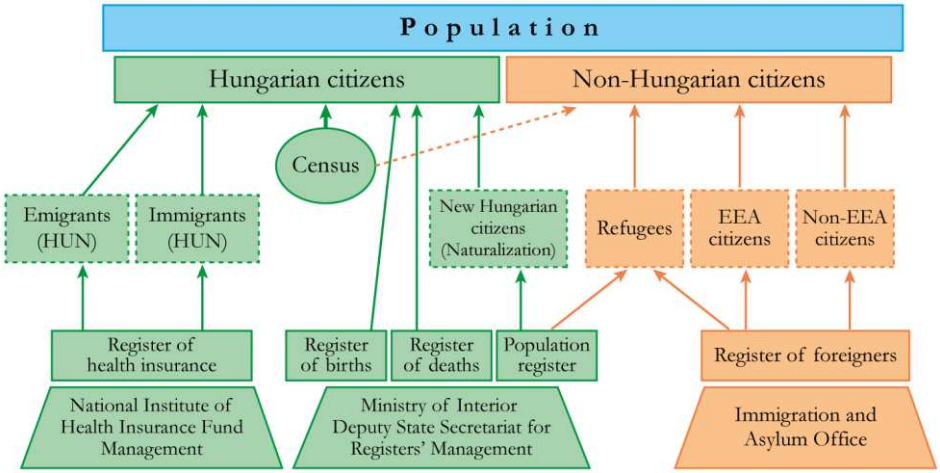
Budapest is clearly the centre of international immigration in Hungary, but other regional hubs have gained importance as a destination in the meantime. Migration directions have shifted to the west and north. If we further specify our examination according to the educational level, we can identify that with the increase of skills and capabilities, migration becomes more concentrated in the economic centre areas, such as Budapest and other developed regional cities (Rédei 2007).

Producing official migration statistics in Hungary

Before attempting to briefly describe the Hungarian migration data production system, some clarifications should be made (see also Gárdos–Gödri 2013, SEEMIG 2014). First, the migration statistical system in Hungary forms part of the population statistical system, and migration data – beyond the data that refer to the natural population changes – are used for census-based population estimations. Second, as it was mentioned in previous sections of this paper, due to the high number of ethnic Hungarians in neighbouring countries and the simplified naturalisation processes for them, a sharp distinction of migration processes by citizenship and country of birth is required. Third, migration data are produced on the basis of administrative data sources (see Figure 11), and all phases of data production – from data transmissions between data owners and the HCSO to data processing and analyses – are carried out in the HCSO's integrated information technology applications.

Figure 11

Population statistics in Hungary



Note: EEA – European Economic Area.
Source: Own elaboration.

Data on the following migration types are produced in the Hungarian migration statistical system:

– International immigration of foreign citizens: inflows and stocks of both European Economic Area (EEA) and non-EEA citizens in Hungary are calculated on the basis of the respective sub-systems of the Register of Foreigners, owned by the Immigration and Asylum Office. There is also data available in this register on asylum seekers (however, they are not considered in population estimates) and refugees (that also appear in the Population Register of the Ministry of Interior).
– International emigration of foreign citizens: outflows of EEA and non-EEAcitizens are calculated separately using the formerly mentioned sub-systems of the Register of Foreigners. Residence documents issued by the Immigration and Asylum Office for non-EEA citizens expire, thus providing a crucial input for producing data on their outflows. Contrarily, residence documents of EEA citizens do not expire, thus data on their outflows are estimations.
– The international immigration of Hungarian citizens refers on one hand to the naturalised ethnic Hungarians born abroad and to returners on the other. Flow and stock data on the former are produced using the Population Register. In other words, their number is calculated as the total of foreign-born Hungarian citizens with valid addresses in the Hungarian national territory, while flow data on the return migration of Hungarian citizens are calculated as the number of re-registrations in the Register of Health Insurance.
– International emigration of Hungarian citizens: the outflow of Hungarian citizens is calculated on the basis of de-registrations[10] from the Register of Health Insurance (owned by the National Institute of Health Insurance Fund Management).[11]

One of the most important concerns regarding this data production system is the quality of the secondary data sources that serve as the primary input for migration statistics. These quality concerns are particularly relevant when producing emigration and return migration data (Hegedűs–Lados 2017), since – as it was mentioned above – movers often do not de- (and re-) register. In this respect, it should be added that in the framework of an ongoing ESS.VIP ADMIN[12] project, all administrative sources used by the HCSO, including those used in migration statistics, are being evaluated from a quality point of view.

[10] In a strict sense, emigrants do not de-register, but suspend the validity of their registration. Similarly, returners do not re-register, but request authorities to finalise the suspension of their registration.

[11] Stocks of Hungarian citizens abroad are out of the scope of official migration statistics in Hungary; however, mirror statistics are regularly checked and expert estimations are made (see the section 'International Migration in Hungary' of this paper).

[12] https://ec.europa.eu/eurostat/cros/content/essvip-admin-business-case_en

Another concern is that the available data sources are often inconsistent. As the SEEMIG exercise suggested (see above), their reconciliation and the creation of externally as well as internally consistent data sets based on multiple sources is crucial to produce reliable migration statistics. However, the integrability of different data sources on migration is limited in the Hungarian statistical system due to data protection principles and laws in Hungary. It should be emphasised that the new Statistical Act that recently come into force in Hungary enables the HCSO to ignore those strict regulations of data protection in the future. Considering this reason, it is expected that migration statistics will be based on multiple sources in the next few years.

Conclusions

Over the last century, in line with intensifying globalisation processes, and new patterns and types of migration, new routes and new migrant identities emerged. In the meanwhile, Europe – after being a migrant sending continent for centuries – has become one of the most popular destinations for migrants globally. Since the regime changes of the 1990s, Central and Eastern European countries – as a result of the economic integration of the continent – have become host areas to migrant population. Hungary today, as part of the global route, is hosting citizens from 168 countries. The role of cross-border mobility – as it was pointed out in this paper – has been playing a considerable role in how the number and composition of the Hungarian population have changed since the 1990s.

In terms of the regional distribution of foreigners, we pointed out that Budapest and Pest County account for a major part, while the micro-regions along the border and the surroundings of Lake Balaton account a smaller part. Budapest is a global destination for migrants accounting for most non-European citizens. Metropolitan areas are primary destinations for migration showing diversity in culture and ethnic composition and providing a wide spectrum of job opportunities. According to our results, in addition to regional differences in earnings, the location of destination areas plays a major role in how the migrants are distributed regionally. When finding a new place to live, beyond economic core areas, neighbouring and border – in this case peripheral – areas play a major role too, where the propensity to migrate has a linear relationship with economic disparities and a reverse one with distances (topographic as well as cultural). According to the traditional approach of location theories, border areas are disadvantaged. There was a change in their situation in the age of global market processes and regional integrations. Border regions are increasingly becoming active contact areas. In case of migration, a geographical 'from-to' matrix type approach enabled us to study migration networks. We found that in addition to the regional differences in earnings, the locations of host areas, as well as the mi-

grant networks played a major role while interpreting the regional distribution of migrants.

Migration is an inherently complex, continually evolving, and potentially sensitive topic with implications for a wide range of socio-economic, demographic, geographic, and public policy areas. Considering this reason, according to the authors of this paper, for a better understanding of international migrations – as the basis for the making well-designed polices – an inter-disciplinary approach is required, that is based on harmonised definitions and methods, links sending, host and transit countries, and can take into account new forms of migration. The role of official statistics in this is to provide high quality empirical evidences for such an approach that deals with the inconsistencies across different data sources and provides the opportunity to jointly examine a series of demographic, socio-economic, and subjective characteristics of migrants, potential migrants, and non-migrants. As such, the use of multiple sources, including administrative data sets, surveys, and potentially mirror statistics and Big Data sources is unavoidable, for which the application and methodological development of data integration techniques is foreseen.

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Coastal and marine tourism: the employment system in Northern Latium at the time of the economic crisis

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The ending of the global economic crisis has left some sectors of the economy in the need to start-off with a more efficient and more competitive offer of the pre-crisis period. Rome offers urban and cultural tourism that presents problems of over-crowding and risk of banalisation of the product. Thus, owing to all the tourism, Rome managed to overcome the crisis period without much difficulty. However, the situation on the coast near Rome is still problematic. It extends along the sea between the Fiumicino Airport and the port of Civitavecchia. Coastal and marine tourism products have undergone major transformations, and to overcome the crisis, a profound renewal work is required. There is a need for a different regional development organisation to update supply and offer new products to guests. Up until now, coastal entrepreneurs had only considered their territory and their business. A possible solution to the problem is suggested by greater integration between the coast and inland areas. In the case of Lazio, these areas are rich in tangible cultural goods, as a result of various civilizations that developed over the centuries, and intangible cultural goods that are the result of sedimentation of different cultures. The situation of coastal and marine tourism on the north coast of Lazio is considered in relation to the development of the sector in the rest of Italy. The variables under consideration are those of the tourism sector in the period 2001–2011 to check the effects of the global economic crisis on employment at each individual municipali-

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ty. The analysis examines all municipalities in order to confirm how the crisis has had consequences, particularly on the coastal communes. Only the communes of the coast are taken into consideration. The indexation of occupants in tourism in comparison to the residents shows a clear difference between the municipalities in northern Italy and those in southern Italy. However, the study of the employment situation in the Latium region shows a lesser presence of occupiers in the coastal areas where the supply is potentially concentrated. In the seven communes of the North Coast, the situation is even more worrying, as it is clear that many of the activities are carried out by companies that are located outside the area, as the ones inside are inadequate and unable to compete at national and international levels. Hence, there is a need to create networks of companies where cooperation and better organisation can enable them to be more competitive.

Keywords:
tourism,
employment,
regional development,
small and medium-sized enterprises,
Latium

Introduction

The term 'seaside tourism' has long been used to refer to those forms of recreational and free-time activities that take place along the coast. In the Mediterranean, the coastal region is often a narrow area that includes land and sea. Seaside tourism developed in Western European countries since the end of World War II in conjunction with the Fordist production model, a general climate of strong economic development and the consolidation of the welfare state that provided appropriate paid holiday leave. This period of industrial production also promoted Fordist development in the tourism sector and domination by major tour operators, hotel chains, and airlines. The period also featured a prevalence of integration in various forms between the systems for accommodation, transport, and service management. The result was a phenomenon that has been termed 'mass tourism', concentrated mainly around the coasts of the regions that front onto the Mediterranean. The resulting product has been defined by the 'three S's' (sun, sand, and sea) as the focus of the demand is a product that has no connection to the environment, landscape, and culture of the place. Tourism demand at this stage was shown by the typical behaviours of what is called the 'modern tourist' (Claval 1995). Periods of

economic crises have always been associated with the acceleration of the period of decline of already-mature products. The economic crisis that dogged Europe between 2007 and 2014 accelerated changes in habits and in the culture of demand. We are now in a transition period that is being used to understand how supply can be restructured to suit the tastes of tourists who now display the characteristics of post-modern consumers. During the years of the economic crisis, seaside tourism in Italy grew lesser than other types of tourism, mainly as consumers living in Italy generated a smaller share of tourism of this type. This phenomenon must also be considered in terms of the challenges that seaside tourism suffered in many non-European Union (the EU) Mediterranean countries owing to war or terrorist attacks organised partly to create panic among foreign consumers of the seaside tourism industry. Therefore, traditional seaside tourism in Italy entered a recession, but the demand from Italian consumers has not decreased; instead, we have observed growth in the cruise sector, and seaside tourism in France and Spain has remained stable. This essay seeks to ascertain whether and how the decline in seaside tourism has affected tourism-related occupations in coastal Italian municipalities. The employment sectors we will consider are accommodation, transportation, and tourism-related services.

This essay will not only discuss seaside tourism – the type of tourism that has for years been known by the 'three S's' – but also the wide range of options that coastal municipalities of Italy may offer, such as boat trips, marine protected areas, diving, and fishing (Hall 2001). In addition, we cannot ignore the fact that cruise tourism has grown steadily, even considering the economic crisis. Cruise passengers are considered tourists with high added value as, on an average, they spend more than other types of tourists (Dwyer–Forsyth 1998). Cruises in the Mediterranean basin are characterised by a varied supply of tourism products and services that we could call 'soft' as all those recreational and leisure opportunities that were previously available exclusively in coastal areas are offered on board. The difference between traditional coastal tourism and cruise tourism is not in the product offered, but in the integration of various elements of that product. In traditional coastal tourism, as in the case of the northern Latium coastal areas, there is almost no integration; the elements in cruise tourism are fully integrated. This different organisation is also reflected in price packaging. In traditional tourism, the cost of the holiday is the sum of the costs of each element. It is generally challenging to determine a priori and will always be subject to instability in terms of timing and options. In cruise tourism, the offer is organised in 'packages' that are clearly identified at the time of purchase. What the two modes have in common is the territory. Traditional tourism is firmly connected to the territory, albeit in a fragmented manner up to now. In cruise tourism, the territory is a distinguishing element in the product, which is why daily stops are made in ports connected with historic centres and areas with monuments.

The essay examines employment data from 2001, long before the clues and signs of the international economic crisis, and from 2011, when the crisis had already been evident for some years and the various industries had already taken initial measures to mitigate its effects. The first chapter examines the international literature from recent decades on coastal tourism to draw attention to its changing characteristics, approach, and organisation. The second chapter presents the characteristics of Italian coastal tourism. The third chapter compares the specific features of Italian tourism to those of coastal tourism. The fourth chapter explores the issues of coastal tourism by examining a case study from the northern coast of Latium. The tourism crisis in this area highlights the need for restructuring into a sector that, in this specific case, is located in an area between the Leonardo da Vinci International Airport, the historic centre of Rome and the Port of Civitavecchia, where most Sardinia-bound passengers pass through. Civitavecchia is also Italy's main port for cruises. Passenger traffic at this port is comparable to that of to the Port of Barcelona, which is currently the number one Mediterranean port in terms of the number of cruise passengers. In quantitative terms, all these three points remained unaffected by the economic crisis.

Literature and method

Coastal and marine tourism in Mediterranean countries developed around the late 1950s, when tourists began to arrive from northern European countries, where income was on the rise with a new phase of prosperity that came along with the post-war period. Thus, we may be surprised by the observation of Bramwell (2004) on the lack of publications on the development, planning, and management of mass tourism in coastal areas. Urry (1990) drew attention to the particular feature of mass coastal tourism characterised by a labour market involving long periods of unemployment that alternate with briefer periods of long hours of intense work. King (1995) argues that despite tourism's contribution to the economy and to employment in many countries, the system for statistical study is still lacking, and is effectively an obstacle to the evaluation of the impact of tourism on employment and the effects of any restructuring of the supply of products and services. Montanari and Magnarapa (1998) point out that the statistical measurement of data on coastal tourism is inadequate for the transformations that the industry has undergone in recent decades. King (1995), referring to the work of the United Nations World Tourism Organization (UNWTO), identifies three sectors where tourism activity is concentrated. The most obvious is accommodation. Structures used exclusively by those that the UNWTO calls tourists are considered accommodation. However, this employment category also involves workers in restaurants, and other food and beverage structures. These businesses do not carry out functions exclusively for tourists as they are also used by residents and visitors.

A second category is transport, although only in part as some lines and some services are directed at commuter users who travel repeatedly within metropolitan areas. A third category is tourism services, such as agencies, and information and marketing systems directed primarily towards tourists and in part towards visitors.

However, it must be noted that, as observed by Williams and Montanari (1995), the transition from Fordism to post-Fordism was neither linear nor universal. From the end of the 20th century to today, mass tourism in Europe has co-existed with forms of tourism that are more individual and more attentive to unique cultural and environmental features.

The success of coastal and marine tourism in Mediterranean countries has its origins in the good level of economic development in Northern European countries, in the redistribution of income between the middle and lower classes, and finally, in paid holiday leave. To this end, we add the evolution of the air transport system, which has helped to reduce costs, as has tour operators' competitiveness in managing packages. Thus, the supply of tourism products and services has become ever more standardised, and competitiveness is increasingly based only on prices (Williams 1996). There were various motives for the local and national authorities to rush to develop the supply of mass coastal tourism products. According to Williams (2001), these motives are: 1. the regions of Southern Europe were economically and culturally behind in the 1960s and 1970s; 2. tourism is considered as a tool of modernisation and cultural change, and political legitimisation and economic development; 3. tourism is also appreciated for being work-intensive and therefore a significant component in local development (Williams–Shaw 1988).

In the final decades of the 20th century, coastal mass tourism began to show the first signs of crisis, and along with the hoped-for expectations and benefits, we began to observe the limits of uncontrolled development and destructive effects on the natural environment owing to the use of resources concentrated in a limited time and space (Bramwell 2004). The tourists who came from the north in the 1990s were already familiar with and practice of the principles of sustainable development, a concept still new in Mediterranean Europe. According to Bramwell (2004), the local tourism authorities interpreted this change in demand as a need for diversification of the product requiring investments on a larger scale, but primarily targeted to a clientele that would be willing to pay more. As such, golf courses, marinas for docking large boats, casinos, and congress centres were built. Essentially, mass tourism offers ever-decreasing profits, and those limited earnings fall into the hands of tour operators selling packages that include every possible product, leaving nothing, or almost nothing, for the local economy. Moussios (1999) reports that from 1995 to 1998, the Greek government approved investments for 13 congress centres, 5 marinas, 3 thalassotherapy centres, 2 golf courses, and 1 spa centre. A second type of diversification involves the development of small-scale alternative tourism products based on enhancing and promoting tangi-

ble and intangible cultural goods. Manente and Furlan (2004) report that in order to facilitate the expansion of the tourism season, and therefore for more efficient use of resources and production potential, it is necessary to modernise the product and to identify objectives separate from the current ones, in order to favour diversification of demand. The meaning of coastal tourism demand has changed completely 50 years later. The major operators are certainly aware of this. The cruise industry has also noticed this, and is offering a type of virtual coastal tourism that moves among the major Mediterranean ports, offering an easily modifiable and diversifiable quality product. The situation is more challenging for small companies, which struggle to deal with the rapid changes in demand, even with information and communication technologies (ICT) tools. Therefore, it is necessary to update all the parameters for identifying coastal and marine tourism. Hall (2001) argues that considering coastal and marine tourism, it is now necessary to indicate all the activities carried out on or near the coast that relate to tourism, leisure, and recreation These include accommodations such as hotels, second homes, restaurants, and cafes. We must then consider the services necessary for the activities involving the seaside, such as swimming, diving, boat trips, recreational fishing, and ecotourism practised on land and sea. Hall (2001) argues that marine tourism, closely tied to coastal tourism activities, also includes activities that must take place offshore, such as deep sea fishing and sailing on the open sea. With the development of technology that facilitated the use of vehicles on water and underwater, tourism has moved further into the open sea. Protected areas located in open waters can be an attraction for visitors as well as for study, and can therefore be economically supported by appropriate tourism activities. Montanari and Staniscia (2009) consider the coast to be part of a complex system made up of mountains, hills, coastal plains, open seas, and high seas.

Global climate change in recent decades has reduced the availability of resources in coastal areas; as such, there have been conflicts in the use of buildable land, beaches, and water (Montanari–Staniscia 2013). Khan et al. (2013) illustrate these conflicts and point out the sectors in which stakeholders with opposing interests concentrate their competing activities. Lohmann (2001) identifies three possible points of connections between tourism in coastal areas and the problems presented by global climate change: 1. a climate change at the regional level; 2. society's perception and assessment of climate change; political, administrative, and economic reactions; and 3. changing climatic conditions in areas with competing products. The issue is indeed complex and therefore challenging to manage; as such, it is fundamental that any solution involves policies that effectively involve all stakeholders (Montanari 2014).

Considering tourism purposes, mountain areas and hill areas can be used for walking, observing biodiversity, food and wine tourism, and cultural tourism. The coastal plains can be used for leisure, tourism, sports, play, swimming, eating

meals, interpersonal relations, and people watching. The open sea offers swimming, recreational fishing, underwater observation, coastal sailing, windsurfing, parasailing, and water skiing. In the high seas, there are deep-sea fishing, diving, submarine tours, sailing and motor boating, and cruises (Montanari 2006). Montanari and Staniscia (2009) argue that there is a need for some rebalancing between overdeveloped coastal areas, and the nearby areas where an environment of quality still exists. Forms of tourism tied to an environment of good quality not only stimulate the economy, but also act as a form of protection for a fragile, at-risk area; this can be a contemporary form of sustainable development. Tourism is an area where various sectors overlap; accommodation and food and beverage make up for approximately half of the industry, and the rest is accounted by complementary activities and services, transport, rentals, travel agencies, business support services, and recreational, cultural, and sports activities. Data down to the level of municipalities on workers in the tourism sector have been extracted with the assistance of the relevant Istat offices. More specifically, companies were considered as tourism companies based on the following categories: 1. Lodging (purchase of real estate and real estate activities on behalf of third parties; rental and management of property owned or leased); 2. Food and beverage services; 3. Rail transport; 4. Water transport; 5. Other passenger land transport; 6. Air transport; 7. Rental and leasing activities; 8. Travel agency services, tour operators, and other booking services; 9. Creative, artistic, and entertainment activities; 10. Libraries, archives, museums, and other cultural activities; 11. Activities relating to lotteries, betting, gambling houses; 12. Sports, entertainment, and recreation.

At least one third of all European tourism businesses are concentrated in coastal areas. For a majority of small and medium-sized enterprises (SMEs), which have challenges solving the problems related to: 1. seasonality of demand; 2. material and immaterial accessibility of the places; 3. environmental sustainability of supply; and 4. weight of taxation and of bureaucratic instruments management (Hotrec 2015). From the production point of view, the sector is very fragmented due to the role played by SMEs as participants and competitors propose (McCamley–Gilmore 2017). The quality of employment induced by tourism in the coastal areas is conditioned by the risk of advantages concentration in the hands of the large international tour operators to the detriment of local SMEs (Bramwell 2004). The tour operators, in-turn, locally use low-skilled labour, who are limitedly and badly paid. Issues faced by SMEs at the local level overlap with global competitiveness issues. A possible solution is identified in increasingly elaborate forms of public engagement by university research facilities (Page et al. 2017).

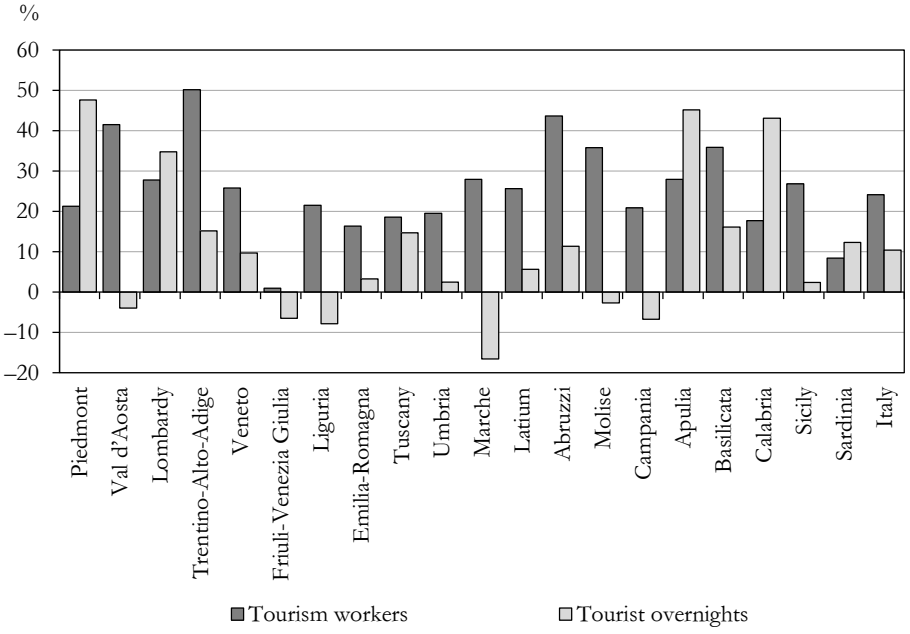
Coastal and marine tourism in Italy at the time of the crisis

In Italy, coastal tourism developed according to the models of demand, which essentially meant the needs of citizens of Northern and Central Europe, where the economic crisis arrived earlier than in the countries of Mediterranean Europe. Coastal tourism developed in Europe beginning in the late 1700s, when European court culture and aristocratic families began to take an interest in the violent and inhospitable nature of the sea. The sea and coastal areas were also appreciated for their powers of healing all illnesses affecting the respiratory system. With industrialisation in Northern and Central Europe at the beginning of the 20th century, the new middle classes tried to emulate the aristocratic model, developing a demand for coastal tourism that, while still elite, sought prices that were more standardised and therefore more affordable. Beginning after the end of World War II, the spread of paid holidays, and the greater distribution of income and welfare contributed to the democratisation of seaside tourism. The demand for summer holidays, due in part to increased industrial efficiency, found coastal tourism to be an increasingly efficient, low-cost product. Tour operators packaged a product that offered plenty of the aforementioned 'three S's, but was not connected to any specific holiday location. The number of tourists increased. In Southern Europe, their number exceeded the total capacity of the coastal areas (Montanari 1995). The 1970s' recession and the introduction of ICT tools contributed to changing who the tourists were, but not the numbers. Other consequences introduced the concept of 'sustainable tourism' into coastal tourism. The term was first defined in 1992 at the Earth Summit in Rio de Janeiro. However, the 'mass tourism' model for coastal tourism did not fail as a whole as the system was able to replace the less attractive sectors of what it supplied with new products, at prices that were even more competitive. Major investments in hotel and transportation infrastructure were made along the coasts of the Mediterranean as it was necessary to somehow protect these elements from the risk of total deterioration. At the beginning of the 21st century, international terrorism began to have its effects on coastal tourism. This either occurred directly through attacks on foreign bathers in Tunisia or indirectly as the climate of uncertainty and risk discouraged tourists from the non-European countries of the Mediterranean. In the 2007–2015 period, the international economic crisis left tourists with less money to spend. Therefore, they chose products with a clearly defined price, such as cruises, or they chose more affordable locations. Terrorism and the economic crisis had converging effects, as both caused a concentration on European shores of tourists who had previously begun to show interest in other products and other areas, thus delaying the long-presaged downfall of the product.

Therefore, data for 2001–2011, a period in which two crises – terrorism and the economic crisis – overlapped, reveal an increase in tourism, both in absolute and relative terms even if not homogeneously from region to region (see Figure 1). From Table 1, we can observe a significant difference in the distribution of the number of employees in the tourism sector across various regions of Italy. Essentially, approximately half of the workers are concentrated in only five regions, the same five regions where marginally more than half of the tourist overnights are concentrated. In 2001, in Trentino Alto Adige, there were 778 overnight stays for every worker in the tourism industry, and in Veneto, it was 480 overnights, while in Southern Italy, there were 230 overnight stays per worker in Calabria, and 200 in Sicily. This difference in the Southern regions is owing to the less efficient and seasonal tourism industry in the regions. In other cases, such as Piedmont with 101 overnight stays per worker, Lombardy with 124, and Latium with 187, the high number of employees is a result of the existence of large cities, where tourism services – except for accommodation – are also used by residents and commuters.

Figure 1

Percentage change in the number of tourism workers and tourist overnights by regions of Italy, 2001–2011



Source: Own elaboration based on Istat census reports for 2001 and 2011.

Table 1

Number of tourism workers and tourist overnights by regions of Italy

Region	Tourism worker		Tourist overnight		Absolute change	
	2001	2011	2001	2011	Tourism worker	Tourist overnight
	thousand					
Piedmont	86.3	104.7	8,699.4	12,845.1	18.4	4,145.7
Val d'Aosta	7.5	10.6	3,254.4	3,126.2	3.1	–128.2
Lombardy	198.6	253.7	24,569.0	33,123.6	55.1	8,554.5
Trentino-Alto-Adige	49.3	74.1	38,350.6	44,160.1	24.7	5,809.5
Veneto	120.4	151.5	57,771.6	63,401.3	31.1	5,629.7
Friuli-Venezia Giulia	31.5	31.8	9,570.7	8,949.6	0.3	–621.2
Liguria	53.4	64.8	15,252.6	14,060.6	11.5	–1,191.9
Emilia-Romagna	114.0	132.7	37,406.8	38,619.3	18.7	1,212.6
Tuscany	103.3	122.5	38,089.8	43,684.8	19.2	5,595.0
Umbria	19.7	23.6	5,889.6	6,037.0	3.9	147.4
Marche	31.2	40.0	13,210.0	11,024.2	8.7	–2,185.8
Latium	155.4	195.3	29,037.2	30,681.0	39.8	1,643.8
Abruzzi	24.4	35.1	6,666.3	7,422.4	10.7	756.2
Molise	4.4	6.0	699.3	680.5	1.6	–18.8
Campania	87.3	105.5	20,962.6	19,555.0	18.2	–1,407.6
Apulia	49.7	63.7	9,304.3	13,505.7	13.9	4,201.4
Basilicata	8.0	10.9	1,690.4	1,963.5	2.9	273.1
Calabria	26.0	30.6	5,974.6	8,548.3	4.6	2,573.7
Sicily	68.6	87.1	13,730.4	14,057.9	18.4	327.5
Sardinia	36.4	39.5	10,193.5	11,448.7	3.1	1,255.2
Italy (total)	*1,275.5*	*1,583.5*	*350,323.1*	*386,894.7*	*308.0*	*36,571.6*

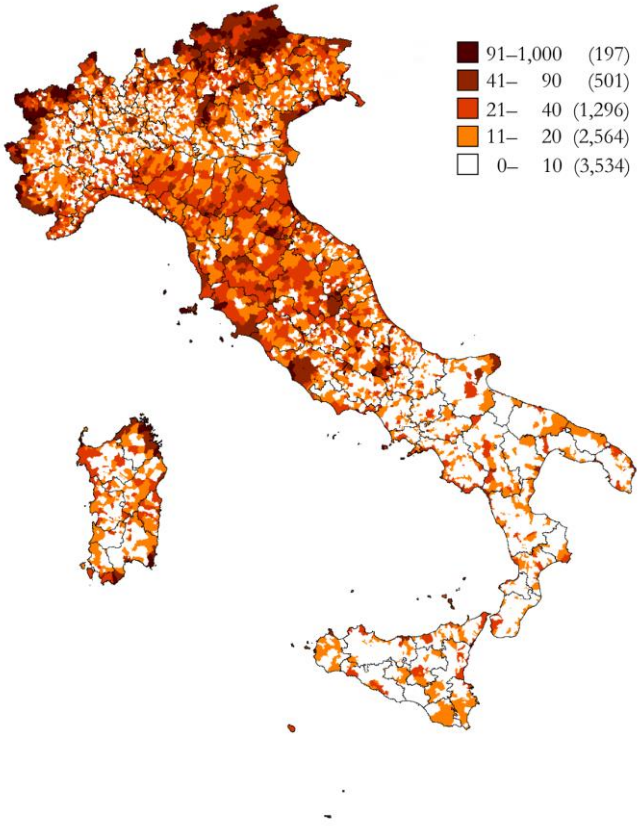
Note: Deviations from the total result from rounding.
Source: Own calculation based on Istat census reports for 2001 and 2011.

Italian tourist overnights decreased (–7%), while foreign tourist overnights increased (14%) during the 2000–2014 period (Becheri 2016). Tourism data in coastal areas are perhaps less reliable owing to the percentage of those not registered and as the percentage of second homes and visiting friends and relatives, is high. Becheri (2016) believes that the coastal tourism crisis is the result of a conjunctural, but also structural economic crisis. The sea tourism product needs a redefinition through its integration with many possible neighbourhood supplies. An intense debate has developed at an international level on the presence and evolution of second homes, their significance, and their social and economic impact (Hall–Müller 2004).

The number of tourism workers per thousand residents is high only in the Northern and Central regions. There, with the exception of certain municipalities in the Po Valley, the number of tourism workers in relation to the population is high, both in the Alpine areas and in the Apennine hinterland. In the Southern regions, despite an equally beautiful landscape, and even more favourable climate and significant natural and cultural assets, the percentage of people who work in tourism is negligible, except small areas along the coast, particularly in Sardinia (see Figure 2a). Between 2001 and 2011, the values marginally changed throughout the country, but declined mainly in Sardinia and the other regions of the South (see Figure 2b). In 70% of the 7,980 Italian municipalities, the numbers have remained stable or have dropped.

Figure 2a

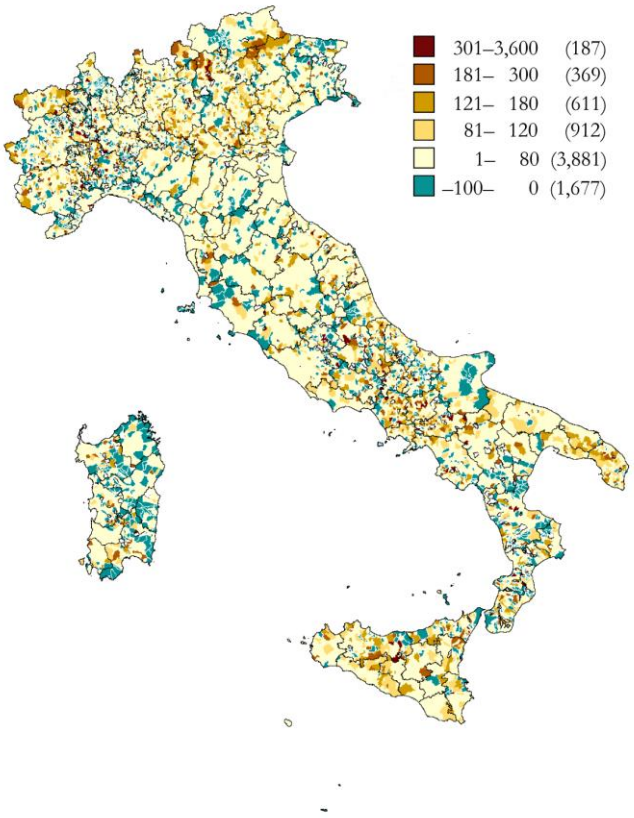
Number of tourism workers per 1,000 residents by municipalities of Italy, 2011



Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2011.

Figure 2b

Percentage change in the number of tourism workers by municipalities of Italy, 2001–2011



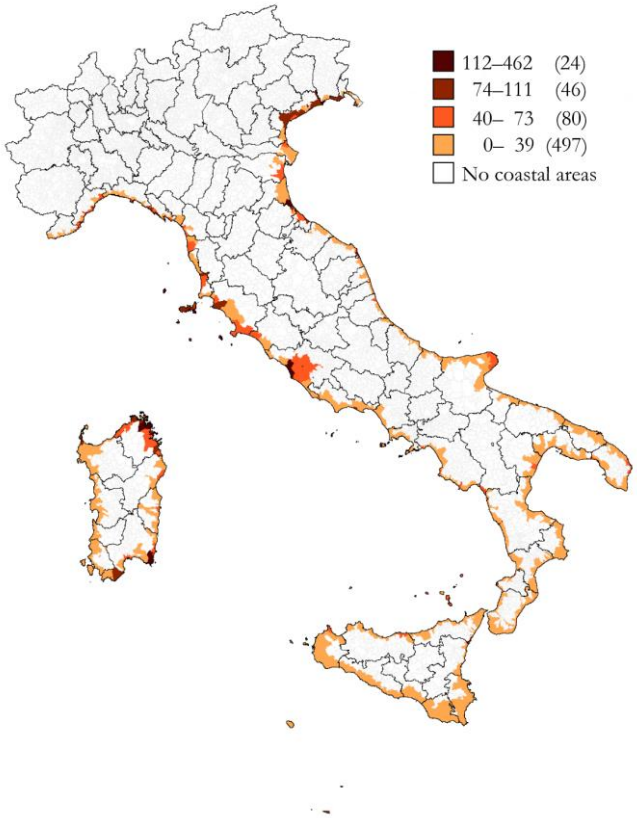
Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2001 and 2011.

In 2001, coastal and marine tourism was creating significant employment numbers in relation to the number of residents in only 9% of the municipalities. These are municipalities that form a part of the nationally and internationally renowned tourism system, such as Veneto's Jesolo, Caorle, Lignano Sabbiadoro, and Grado; Emilia-Romagna's Bellaria, Rimini, and Riccione; and Tuscany's island of Elba (see Figure 3a). From 2001 to 2011, the trend was stable or negative for 76% of municipalities, while only 7% showed positive movement (see Figure 3b). Additional analysis has been conducted to find the rate of employees of small companies (those with fewer than 20 employees) per one thousand residents. We can observe employment in small businesses, in relation to the number of inhabitants in the Alps as well as in Central Italy in the inland area between the coast and peaks of the Apennines

(see Figure 4a). Between 2001 and 2011, the figures for employment in small businesses were mostly negative. Only 5% of municipalities recorded a positive trend (see Figure 4b).

Figure 3a

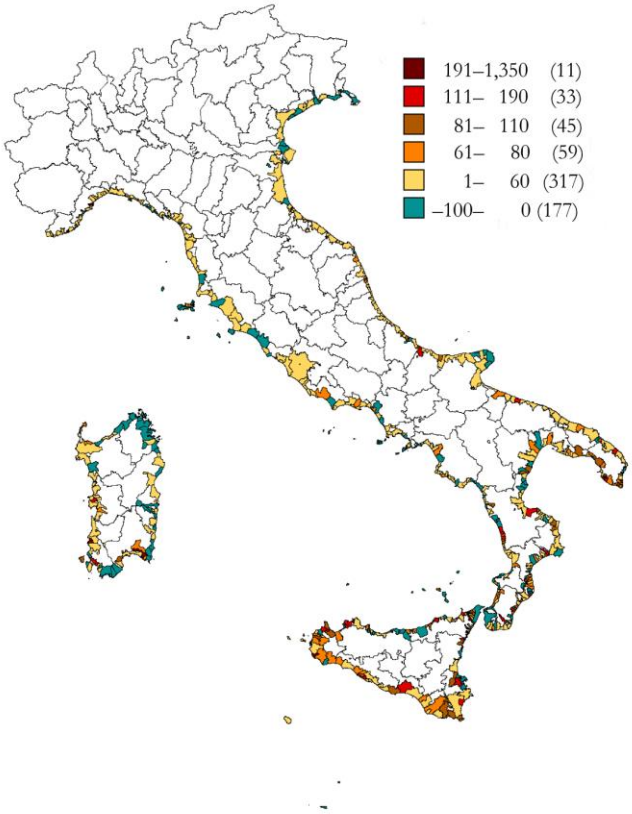
Number of coastal and marine tourism workers per 1,000 residents by coastal municipalities of Italy, 2011



Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2011.

Figure 3b

Percentage change in the number of coastal and marine tourism workers by coastal municipalities of Italy, 2011–2001

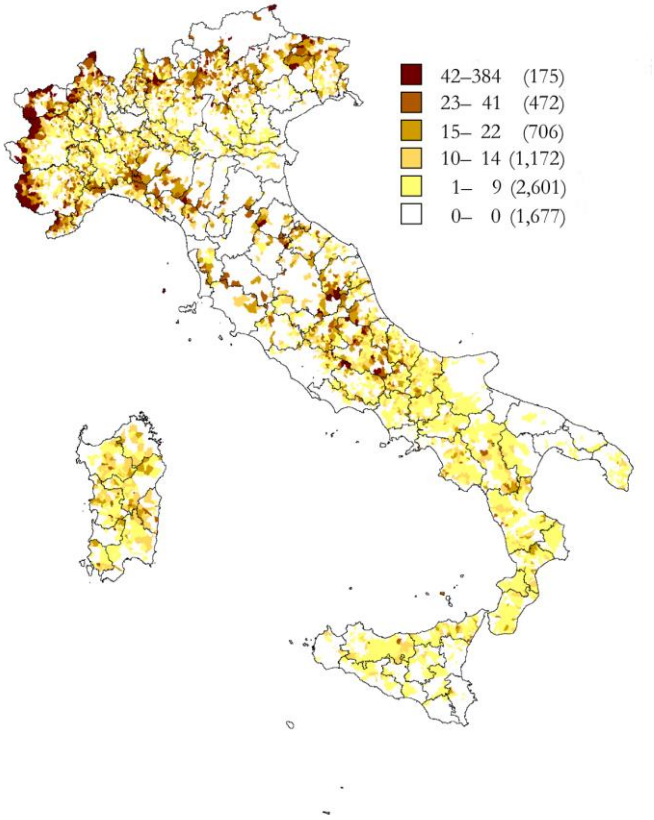


Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2001 and 2011.

In the region of Latium, the relationship between tourism workers and residents in the municipality shows that tourism's contribution is mainly concentrated in a small number of municipalities that account for 14% of the region total (see Figure 4a). These most significant values are concentrated around mountain tourism, historic towns in the hilly areas, and spa areas. Tourism activity is more important in the area of coastline north of Rome. The changes seen during the 2001–2011 period are predominantly negative. 80% of Latium's municipalities recorded no change or even negative change. All the municipalities on Latium's coast saw a drop in tourism employment in relation to the resident population (see Figure 4b).

Figure 4a

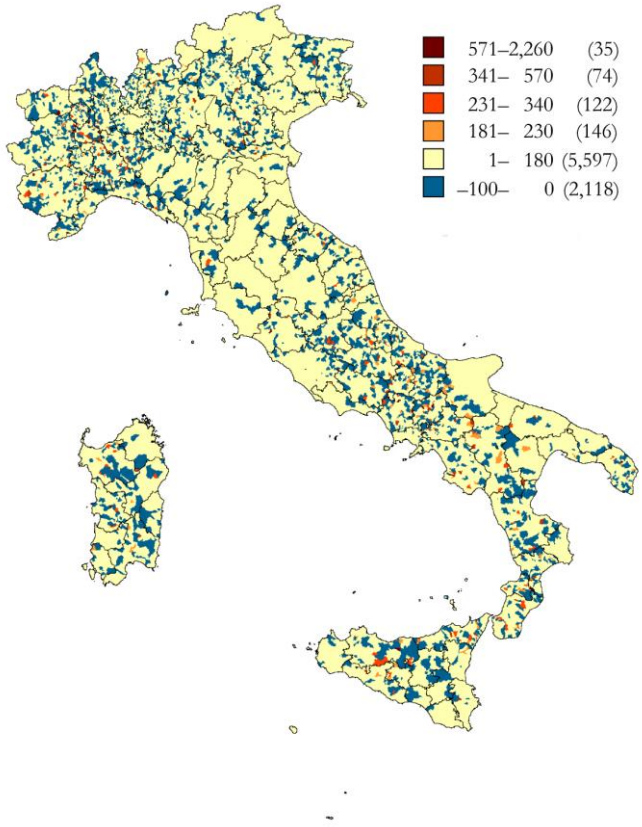
Number of tourism workers employed by SMEs per 1,000 residents, by municipalities of Italy, 2011



Note: SMEs have less than 20 employees. The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2011.

Figure 4b

Percentage change in the number of tourism workers employed by SMEs, by municipalities of Italy, 2001–2011

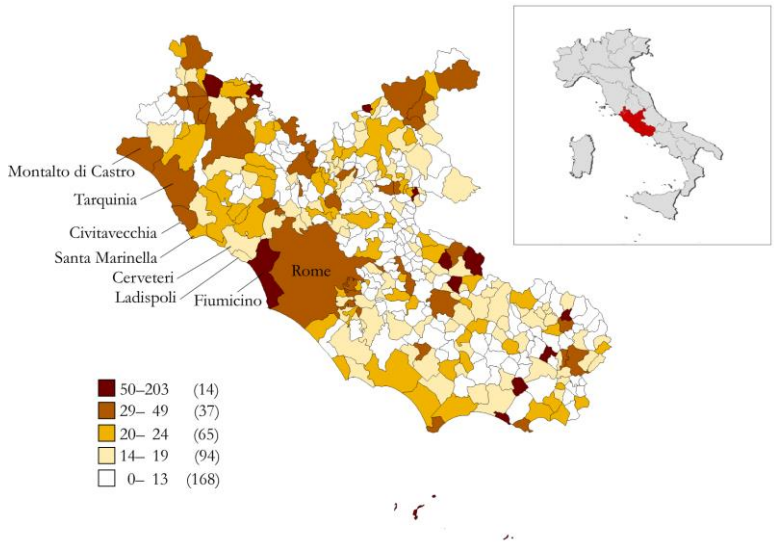


Note: SMEs have less than 20 employees. The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2001 and 2011.

The locations of SMEs show three main areas: 1. coastal zones where the presence of workers in relation to the resident population is irrelevant; 2. low hilly areas where only a few municipalities show a significant percentage of workers; 3. higher hilly areas where municipalities have a higher percentage of workers (see Figure 5a). A comparison between 2001 and 2011 data reveals a decrease in the percentage of employees in small businesses in most of Latium's municipalities (see Figure 5b).

Figure 5a

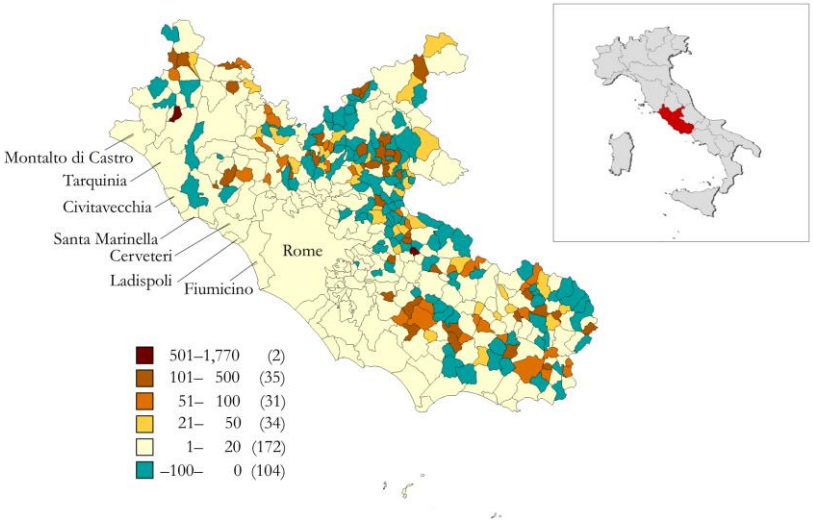
Number of tourism workers per 1,000 residents by municipalities of Latium, 2011



Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2001 and 2011.

Figure 5b

Percentage change in the number of tourism workers by municipalities of Latium, 2011–2001



Note: The numbers of municipalities are indicated in brackets.
Source: Own elaboration based on Istat census reports for 2001 and 2011.

The coastal area of northern Latium between Rome and the municipality of Montalto di Castro on the border of Tuscany has been selected as it is currently experiencing a dip in economic activity, and therefore presents potential for a new phase of regional development, particularly in relation to the three aforementioned transit points of Italian and international tourism. Approximately 42 million passengers travelled through Fiumicino Leonardo da Vinci airport in 2016. That same year, more than 2 million travellers came through the port of Civitavecchia via cruises, as well as merely under 2 million in transited to Sardinia. In Rome, in 2015, approximately 25,000 stays in accommodations were reported. Altogether, approximately 72 million Italians and foreigners passed through the area. It is striking to note that there has not yet been success in creating the conditions to bring even a small percentage of passengers into the area to transform them from people in transit to visitors and tourists. After the end of the World War II, the northern coastal area was occupied mainly by second homes. The owners of these houses resided in Rome and went to spend their summer holidays in seaside resorts. From the 1970s and 1980s onwards, there has been a gradual trend towards renting these houses in the winter months. Between the end of the 1990s and the early years of this century, the second homes were rented throughout the year to the immigrant communities that worked in Rome (Montanari–Staniscia 2011).

The only urban area north of Rome organised for permanent residence was Civitavecchia. The realisation of transportation infrastructure, including the Roma–Civitavecchia motorway and the opening of the Cerveteri–Ladispoli stop on the Roma–Genova railway line laid the foundations for turning second homes into primary homes. This transformation accelerated during the years of the economic crisis, as the cost of housing and the cost of living in general were lower in the coastal areas outside Rome than in the central areas of Rome (Montanari–Staniscia 2011). Considering the same economic reason, many communities of immigrants settled in the municipalities along the coast. The largest is in the municipality of Ladispoli, with approximately 18.5% of the population. The largest foreign community is from Romania, followed by those from Poland and India. The next are Montalto di Castro (13.2%), Fiumicino (12.2%), Santa Marinella (10.2%), Cerveteri (8.9%), Tarquinia (5.2%), and Civitavecchia (5.0%). Most area companies are not offering services for tourists but only for users with the second homes. There are relatively few lodging facilities for tourists. Near the coast, there are numerous farms, and there is a brisk fishing industry in the sea just beyond the coast. These activities do not involve any product integration and coordination, thus there are no guidelines to follow for any type of marketing. It is also a territory rich in cultural heritage, layered with the history of the Etruscan civilisation, the Roman Empire, and artefacts from middle ages. These are important findings, but the area's cultural resources are not given sufficient attention and value. Before the recent developments, the coast offered a natural environment of great value; only scraps that remain now need to be restored in order to reintroduce the continuity of the original

ecosystem. The changes from 2001 to 2011 for the main types of tour operators have been analysed for the seven municipalities in the area as well as for Rome. In Table 2, we have shown the types with negative change.

Table 2

Number of the resident population and various tourism workers in the northern coastal municipalities of Latium and absolute change in their number

Number of the resident population/tourism workers and absolute change in their number	Municipality							Rome
	Montalto di Castro	Tarquinia	Civitavecchia	Santa Marinella	Cerveteri	Ladispoli	Fiumicino	
Resident population, 2011	8,770	16,016	51,229	17,403	35,207	37,293	67,626	2,617,175
Absolute change, 2011–2001	1,117	854	1,197	2,452	8,435	7,325	17,091	70,371
Tourism sector operators (total), 2011	*343*	*473*	*1,452*	*348*	*642*	*554*	*13,685*	*127,109*
Absolute change (total), 2011–2001	*–1*	*–31*	*138*	*–62*	*230*	*107*	*4,965*	*20,511*
Hotel and hospitality sector operators, 2011	52	33	75	40	5	52	435	16,084
Absolute change, 2011–2001	1	–46	1	–84	3	–29	8	10,140
Catering and food service sector operators, 2011	173	325	945	240	391	392	2,273	49,899
Absolute change, 2011–2001	34	33	390	36	146	151	824	17,441
Passenger transport, and hiring, renting or leasing sector operators, 2011	35	33	260	4	181	30	10,777	35,133
Absolute change, 2011–2001	7	–2	–298	–6	52	–5	4,052	–1,100
Museum sector and other cultural exhibition operators, 2011	76	68	68	54	45	68	137	20,321
Absolute change, 2011–2001	–50	–16	–25	–14	15	–19	27	2,921
Travel agency sector and tour operators, 2011	7	14	104	10	20	12	63	5,672
Absolute change, 2011–2001	7	–	70	6	14	9	54	235

Source: Own calculation based on Istat census reports for 2001 and 2011.

The entire category of cultural activities for tourism and recreation is negative. The passenger transport sector is also negative, though it has certainly increased since the beginning of the century for cruise operations out of Civitavecchia. Some companies also use Civitavecchia as a departure port for cruise ships. Cruise passengers arrive at Fiumicino Airport and then go to Civitavecchia, or take taxis to Rome while the ship is stopped in the harbour. In the future, rental cars could bring cruise passengers to visit the coast's cultural and natural resources. Rather, it appears that these activities are drawing visitors to the municipalities away from the coast. Exploitation of the coast has also contributed to erosion. This would best be addressed by protecting and restoring the surviving shore areas that have already been identified by the European Commission, but have not yet been offered protection by the Italian authorities. The way in which coastal and seaside tourism has been packaged no longer corresponds to the demand. Indications that the product is failing can already be seen, though the effects have been dampened by the increase in Italian users who have turned their backs on non-EU Mediterranean countries for safety reasons. The problem can be addressed and solved by integrating various types of tourist products and services offered in a horizontal network. The various independent sectors could draw-up agreements for collaboration to offer a structured product on Latium's northern coast involving all the participating companies. The network of companies will be able to offer a greater wealth of products and services, overcome the low visibility of small companies, and strengthen their ability to negotiate with global players, such as tour operators, airlines, and cruise lines.

Conclusions

The global economic crisis created numerous problems for all production sectors. To verify the effects of the crisis on tourism companies, we have examined the number of employees between 2001 and 2011, the years for which sufficiently detailed, analogous data are available. In any case, we know that Italian entrepreneurs in the tourism industry have been trying to handle the crisis by cutting down on fixed–term jobs and diversifying the activities of the most experienced and specialised workers who could be essential during the period of economic recovery. Therefore, the crisis has weighed on employment significantly more than the official statistics are able to show. The recent crisis, similar to previous ones, has however allowed us to reflect on the changes in the market and on how the product supplied should be reformulated. Besides these changes, there is also the doubt and controversy caused by the European Directive 2006/123/EC, also known as the Bolkestein Directive, which allows all European citizens to start a business on public land in any EU country. The problem is particularly experienced in in coastal areas, as all of Italy's beaches are the property of the state. All these problems can

be solved by more (environmentally) appropriate use of coastal areas, by promoting a product that is new in integrating with the territory offering it, and by establishing horizontal cooperation between all the tourism professionals, all offering in their own way a variety of material and immaterial cultural assets that represent the territory well.

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STUDIES

Modelling inter- and intra-regional tourism flows in Spain – a spatial econometric approach

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Domestic tourism is one of the most important types of tourism in Spain, but also one of the most neglected and under-researched. The objective of this study is to 1. describe the domestic tourist flows in Spain for the year 2016 and 2. shed some light on the factors that drive this form of tourism. To describe domestic tourism, a destination-origin matrix is constructed, and the coefficients of tourist attraction for each region are calculated. The analysis of the driving factors is based on the estimation of a gravity model and a spatial autoregressive (SAR) model. The SAR model has the advantage of accounting for spatial interactions' effects among regions. The authors' empirical findings reveal that spatial regional dependence matters when modelling domestic tourist flows. Moreover, the level of income at both the origin and destination regions, and the characteristics of the region of destination, such as the quality of beaches, level of accessibility, and the number of museums, theme parks and natural parks are also positively associated with domestic tourism. On the contrary, distance and relative prices between the regions of origin and destination exert a negative effect. The estimates of the SAR model allow the quantification of the total, direct and spillover effects of these factors. According to this quantification, it is found that the demand for inter-regional domestic tourism is unitary income elastic and highly price elastic.

Keywords:
domestic tourism,
spatial autoregressive model,
elasticities,
Spain

Introduction

It is widely recognised that tourism is a key strategic sector for the economic, social, and cultural development of many countries (UNWTO 2010, Medina-Muñoz et al. 2016). This is particularly the case for Spain, with tourism being one of its most important and fastest growing economic sectors. The significant relevance of tourism for Spain is reflected in the latest outlook of the Spanish travel and tourism sector released by the World Travel and Tourism Council (WTTC 2017). According to this report, the total contribution of the sector to the Spanish economy was 158.9 billion euros in 2016 (14.2% of the gross domestic product [GDP]), and is expected to rise by 3.8% in 2017. This growth rate is significantly above the one foreseen by the European Commission for the global Spanish economy in 2017 (2.8%). The importance of the tourism sector in the Spanish economy has grown since 2010. Essentially, the sector has played a determinant role in reducing the negative impact of the economic crisis over the past years, and is currently one of the drivers of economic recovery (Cuadrado-Roura–López-Morales 2014, LaCaixa 2017). The travel and tourism industry employed approximately 14.5% of the labour force (2.6 million of jobs) in 2016. More than 80,000 new jobs have been created in the sector in 2016, which represents 15.1% of all jobs generated over the same period in Spain (Exceltur 2017). The unemployment rate in Spain is, after Greece, the highest in the European Union (EU) (18.5% in 2016), and more than twice the average rate registered in the EU area. According to the information contained in the surveys conducted by the Spanish Sociological Research Centre, the high level of unemployment has been recurrently perceived in the last ten years as the most important problem that the Spanish population is facing. Tourism is viewed by the Spanish political authorities as a strategic sector to promote growth, create new jobs, and consequently, reduce the high rate of unemployment.

Spanish policy-makers have designed and implemented different policies in the last few years to promote research, development, and innovation (R&D&I) activities, both in the academia and in the tourism sector. For instance, the *Spanish Tourism Plan Horizon 2020* as well as *the National Science and Technology Strategy 2013–2020* aimed at improving the competitiveness of the sector through, in particular, R&D&I activities that could be used by the tourism sector and would contribute to increase productivity and employment in the short- and medium-terms.

Most of the existing research on tourism in Spain has so far focused on explaining international tourist inbounds (see references included in Álvarez-Díaz et al. 2016). The economic importance that international tourism has for the Spanish economy explains the scientific interest for this topic.[1] Most of these studies rely on time series or panel data and show that income of those who travel and the adjusted

[1] According to Bankia (2016), Spain received 75.3 million foreign visitors in 2016 and obtained revenues of more than 77.6 billion euros.

relative prices are the main determinants of international tourism.[2] The estimated elasticities provided by researchers are essential for policy-makers and tourism managers to understand how changes in income and relative prices affect the international demand for tourism to Spain.

In contrast, the domestic demand for tourism has not been significantly studied despite the fact that it represents a substantial portion of total tourism activities in Spain (INE 2017). In 2016, the total expenditure of domestic flows amounted to 28.15 billion euros (INE 2017). Guardia-Gálvez et al. (2014) discuss this lack of evidence and emphasise the need to stimulate more research on the underlying determinants of domestic tourism. A better understanding of the domestic tourism flows would complement the existing knowledge on international tourism, and help national and regional governments to design and implement more effective tourism policies.

To the best of our knowledge, only two recent studies have modelled the domestic demand for tourism in Spain. Guardia-Gálvez et al. (2014) employ a gravity model to characterise the explanatory variables that determine the domestic travel flows between the Spanish regions. Their results suggest that the population of the regions, at both origin and destination, and the income of the origin region have a positive and significant influence on domestic tourism in Spain. The estimated income elasticity is greater than one, which suggests that domestic demand for tourism is a luxury good. On the other hand, the distance between regions exerts a negative effect. Other factors such as relative prices and the characteristic of insularity are not significantly associated with the tourism flows. In the second study, De la Mata and Llano-Verduras (2012) use different specifications of the gravity model to explain the intra- and inter-regional trade flows of the accommodation, restaurant, and travel agency sectors. The results show that some socio-economic and geographic characteristics (such as temperature, beach, and capital of the state) of the destination regions are important pull factors for domestic tourism. The variable *distance* is also included, and shows a significant and negative effect. In one of the gravity modelling specifications, the authors control for spatial autocorrelation. As the presence of spatial autocorrelation is not conclusive, the authors recommend undertaking further research on this issue by using alternative modelling specifications.[3]

The present study attempts to contribute to the limited literature on the determinants of domestic flows in Spain. The objectives of the study are twofold. The first one is to provide a detailed description of the tourist flows between and within the Spanish regions (inter-regional and intra-regional tourism, respectively) for the year 2016. In order to consider both inter- and intra-regional tourism, an

[2] Other determinants such as relative prices in substitute destinations (tourist competitors) and special events (terrorist attacks, changes in visa policy, and the Arab Spring) have also been found relevant to explain the international tourism demand for Spain (Álvarez-Díaz et al. 2016).

[3] The authors affirm that the presence of spatial dependence to explain tourist flows is not conclusive as they find a positive and significant effect in 2001, but no effect in 2007.

origin-destination (O-D) matrix is constructed based on the surveys conducted by the Spanish National Statistics Institute (INE). This matrix reflects the number of tourist trips from one Spanish region to another (inter-regional tourism), and to the same region (intra-regional tourism). Based on the O-D matrix, pairwise coefficients of regional tourist attractions are calculated. These coefficients are useful to identify the favourite destinations for the residents in each Spanish region.

The second objective of the paper is to model the domestic flows in Spain and study what the main determinants of inter-regional and intra-regional flows are. In particular, the main interest of this study is to provide to policy-makers and tourism managers the estimates of the income and price elasticity of demand for domestic tourism in Spain. The econometric approach is based on the O-D econometric models explained in LeSage and Pace (2008). More precisely, a SAR model and a gravity model are specified, estimated, and compared. Whilst the gravity model is the most commonly used model in the literature, the SAR model accounts for the presence of spillover effects in tourism (i.e. the existence of spatial interaction effects among regions). That is, it takes into account the fact that tourism demand in one specific region could benefit from the tourism demand experienced in neighbouring regions. Spillover effects are rather common in tourism. Yang and Wong (2012) define this concept in the context of tourism research as the indirect or unintentional effects that a region's tourism exerts on tourism flows to other regions.[4] Griffith and Jones (1980) is one of the first studies to discuss these spatial spillover effects in the literature. Since then, only a few studies have included spatial spillover effects when modelling the domestic demand for tourism (among them are the aforementioned study of De la Mata and Llano-Verduras (2012) for Spain, Marrocu and Paci (2013) for Italy, and Bo et al. (2017) and Yang and Wong (2012) and Yang and Fik (2014) for China). In totality, the literature has so far not reached a consensus on the significance of spatial spillover effects in tourism (Bo et al. 2017). Drawing on this, the originality of the current work is thus not only to shed more light on the determinants of domestic tourism, but also to provide empirical evidence on the presence/absence of spatial spillover effects in tourism in Spain by exploiting an SAR model.

The remainder of this study is structured as follows. Chapter 2 provides a brief description of the domestic tourism in Spain, distinguishing between inter-regional and intra-regional flows. The coefficients of tourist attractions are shown and commented. Chapter 3 describes the SAR and gravity models (the latter used as a benchmark), as well as the variables used in this study. Chapter 4 presents the main results and the discussion. Chapter 5 provides a sensitivity analysis of our results to different modelling specifications, and finally, Chapter 6 offers some conclusions and political implications.

[4] These authors explain several reasons why tourism flows to one geographic region are dependent on flows to other regions (e.g. productivity spillovers, market access spillovers, joint promotion, negative events, and from the demand side, the existence of tourists with multi-destination travel plans).

Description of the domestic inter-regional and intra-regional flows

Description of the total domestic tourist flows

The purpose of this chapter is to characterise the flows of domestic tourism in Spain. Spain is administratively and politically decentralised into 17 regions (called autonomous communities) and 2 autonomous cities (Ceuta and Melilla). Therefore, the total number of regions considered in this study is $n=19$. Figures 2a and 2b show the names and geographical localisations of each of these regions.

To study the Spanish regional flows, an O-D matrix is constructed. This matrix is based on the household panel survey FAMILITUR, which is regularly conducted by the INE. The matrix is derived from the 2016 survey and provides information about the bilateral tourism flows from the n regions of origin to each one of the n regions of destination. In other words, it registers the number of trips made by the residents in one specific region to another region or to their own region. The matrix is square and its size is n rows by n columns, where the rows represent the regions of destination and the columns are the regions of origin. The diagonal elements of the matrix represent the intra-regional flows, while the off-diagonal elements register the inter-regional flows.

According to the O-D matrix and the information provided by the INE database, the residents in Spain made 182 million trips in 2016, 91.4% of which had Spain as the main destination (domestic tourism).[5] Travelling by car is the most common mode of transport for domestic tourism (approximately 82.4% of the total domestic trips). The average expenses per person and day is estimated to be 44 euros. This amount is noticeably lower than what is spent in the context of trips abroad (96 euros per person and day). Most of the residents lodged in non-market accommodations (63.9% of domestic trips).[6]

Table 1 shows the distribution of domestic tourist trips (inbound and outbound trips) across the Spanish regions for the year 2016. The regions are ranked twice, based on the percentage of inbound and outbound trips, respectively. Regarding the inbound trips, the top five regions account for 61.1% of the total domestic inbound trips. The most visited region is Andalusia (Andalucía) (19.11%), followed by Catalonia (Cataluña) (13.47%), Valencia (10.34%), Castilla–León (10.33%), and Madrid (7.85%). On the other hand, the least visited destinations are the autonomous cities of Melilla (0.02%) and Ceuta (0.03%), and the region of La Rioja (1.43%). It is interesting to note the low percentage of domestic tourism to Balearic Islands (Islas Baleares) (3.24%). This archipelago, similar to Canary Islands (Islas Canarias), is

[5] The O-D information is not included, but it is available upon request. The information provided by the INE can be consulted on the webpage www.ine.es

[6] The non-market accommodation refers to accommodations at housing properties, timeshare lodges, or at friends' and relatives' homes.

focused more on international tourism than on domestic tourism. On an average, for domestic trips to Canary Islands, Madrid, and Balearic Islands, the amount spent by a person and per day is twice what is spent when the trip destination is Castilla–La Mancha, Castilla–León, and Extremadura.

Table 1

Ranking of Spanish regions by the number of regional domestic tourist trips, 2016

	Region of destination	Number of inbound trips, million	Share in total, %	Region of origin	Number of outbound trips, million	Share in total, %
1	Andalusia	31.76	19.11	Madrid	31.22	18.79
2	Catalonia	22.39	13.47	Andalusia	26.95	16.21
3	Valencia	17.18	10.34	Catalonia	24.84	14.95
4	Castilla–León	17.17	10.33	Valencia	14.24	8.57
5	Madrid	13.04	7.85	Castilla–León	10.61	6.38
6	Castilla–La Mancha	12.18	7.32	País Vasco	9.45	5.68
7	Galicia	9.72	5.84	Galicia	8.50	5.11
8	Aragon	8.01	4.82	Castilla–La Mancha	7.82	4.71
9	Canary Islands	5.71	3.44	Aragon	6.33	3.81
10	País Vasco	4.86	2.92	Canary Islands	5.28	3.18
11	Extremadura	4.76	2.86	Asturias	4.05	2.44
12	Cantabria	4.17	2.51	Murcia	3.96	2.38
13	Asturias	4.17	2.51	Extremadura	3.82	2.30
14	Murcia	3.76	2.26	Navarra	3.01	1.81
15	Balearic Islands	3.24	1.95	Balearic Islands	2.51	1.51
16	Navarra	2.59	1.56	Cantabria	2.05	1.24
17	La Rioja	1.43	0.86	La Rioja	1.15	0.69
18	Ceuta	0.04	0.03	Ceuta	0.27	0.16
19	Melilla	0.04	0.02	Melilla	0.16	0.10

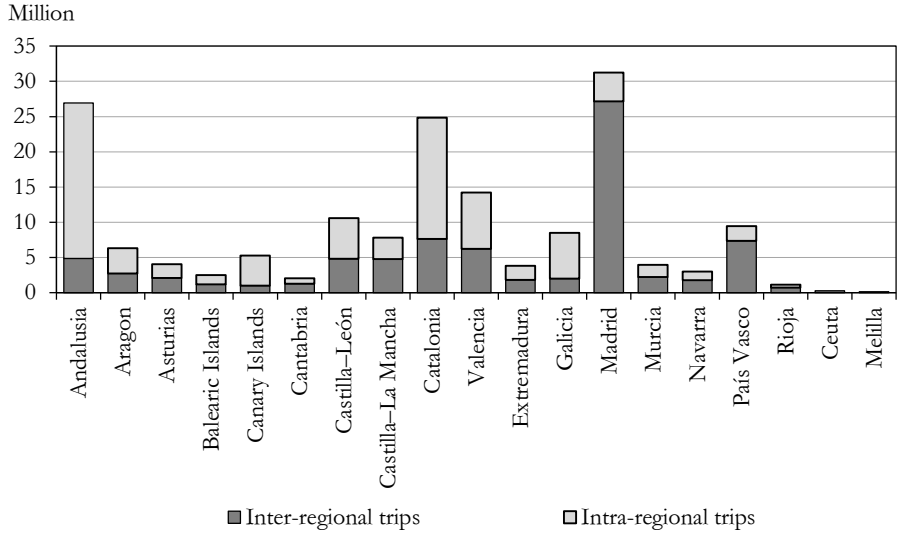
Note: Here and hereinafter, the word 'regions' refers to the 17 regions and 2 autonomous cities of Spain. Deviations from 100.00% result from rounding.

Source: Own calculation based on the O-D matrix constructed from the 2016 FAMILITUR survey.

With regard to the domestic outbound flows, most of the trips were made by the residents of Madrid (18.79%), Andalusia (16.21%), and Catalonia (14.95%). The residents of Ceuta (0.16%), Melilla (0.10%), and Cantabria (0.69%) show the lowest inclination to travel. The residents of Balearic Islands, Canary Islands, and Cantabria spend more than 60 euros per day and person, whilst those from Andalusia, País Vasco, Aragon (Aragón), and Murcia spend marginally less than 50 euros per day and person.

Figure 1a

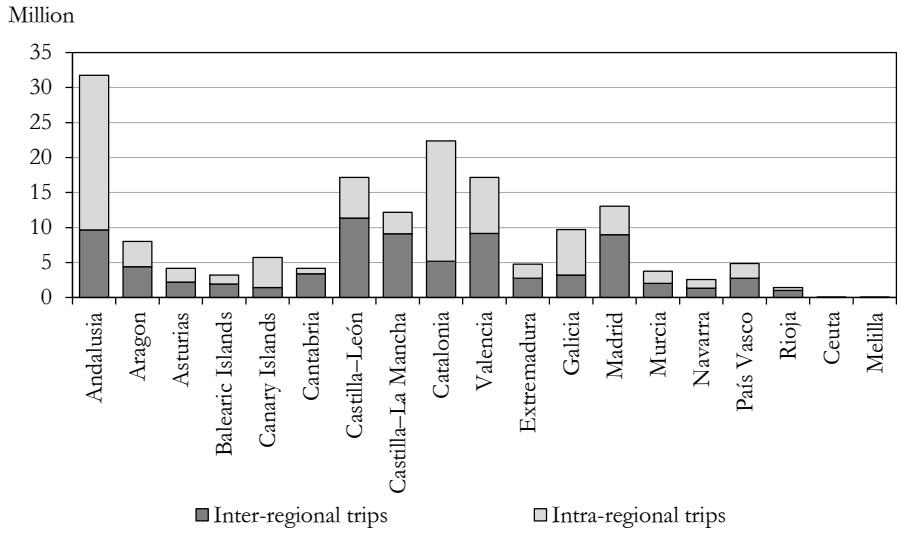
Number and distribution of regional domestic tourist trips by regions of origin (outbound trips), 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Figure 1b

Number and distribution of regional domestic tourist trips by regions of destination (inbound trips), 2016



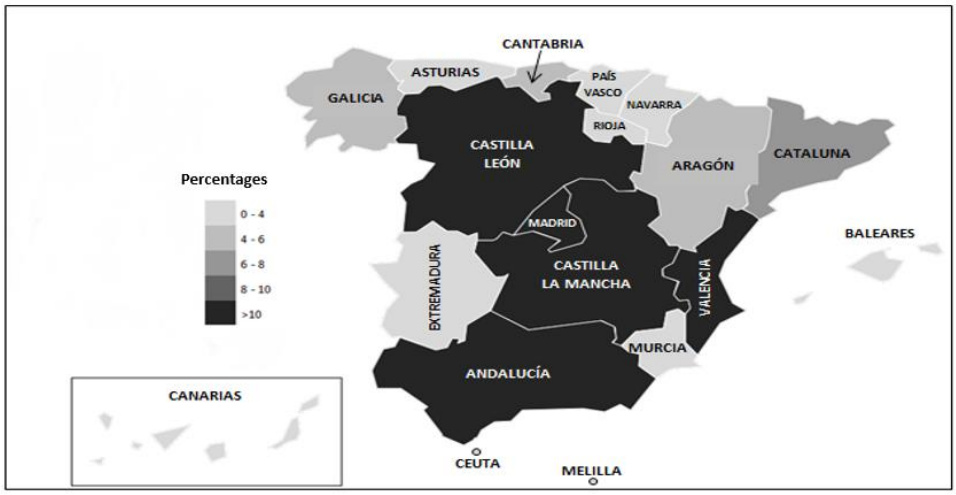
Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Description of the inter-regional domestic tourist flows

The inter-regional domestic tourism amounted to 80.14 million trips in 2016 (48.21% of the total domestic trips). As can be observed in Figure 2a, most of the trips are concentrated in four regions of destination: Castilla–León (14.18%), Andalusia (12.07%), Valencia (11.43%), and Castilla–La Mancha (11.38%). Figure 2b shows that Madrid accounts for a very high share of the trips to other regions (33.87% of the total outbound trips), followed far behind by Catalonia (9.17%) and País Vasco (9.17%). Considering that these regions are the richest in Spain, this descriptive analysis suggests that income may be one of the push determinants of the demand for inter-regional domestic tourism. Figure 3a graphically indicates the regions that originate and receive most of the inter-regional trips. This figure also displays the net inter-regional flows. País Vasco, Catalonia and particularly Madrid show a negative flow, meaning that they generate more trips than what they receive. Figure 3b presents the outbound trips for each region once we remove the distorting effects caused by the population size. Madrid is the region that has the highest outbound intensity (4.24 trips per capita), followed by País Vasco (3.39 trips) and Ceuta (3.16 trips). The lowest intensity is found in Andalusia (0.58 trips per capita) and Canary Islands (0.47 trips).

Figure 2a

Percentage of inter-regional domestic tourist trips by regions of destination (inbound trips), 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

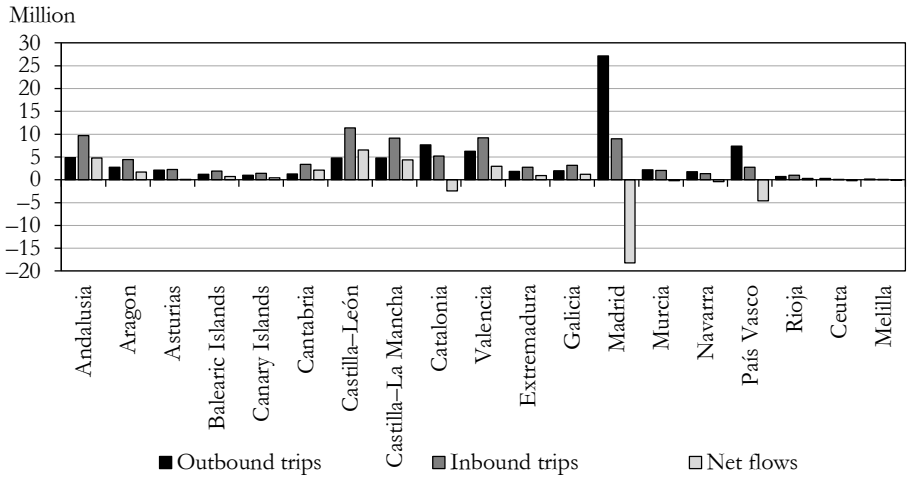
Figure 2b

Percentage of inter-regional domestic tourist trips by regions of origin (outbound trips), 2016

Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Figure 3a

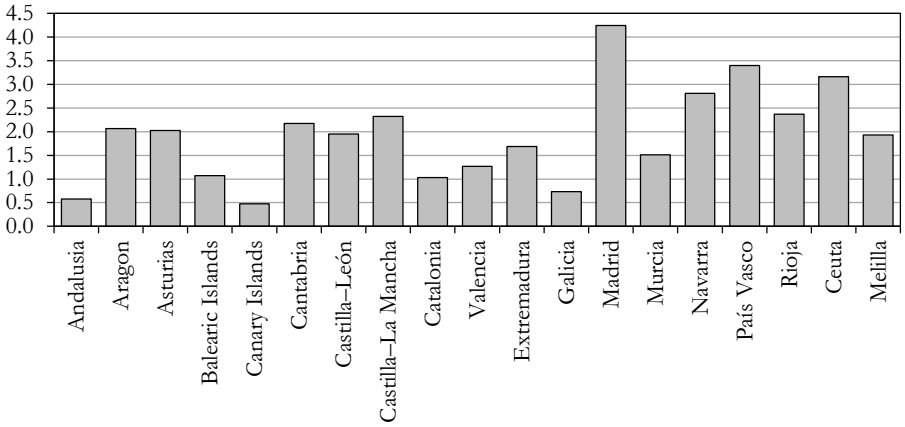
Number of inter-regional domestic tourist trips and net flows by regions, 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Figure 3b

Number of inter-regional domestic tourist trips per capita, by regions of origin, 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Following the methodology explained in Guardia-Gálvez et al. (2014) and Dominguez-Pérez (2016), the O-D matrix allows the calculation of the inter-regional coefficients of tourist attraction. These coefficients indicate the relative level of tourist attraction of each region and are calculated as follows:

$$ca_{i,j} = \frac{\left(\dfrac{\text{Domestic trips from region } j \text{ to region } i}{\text{Total of domestic trips received in region } i} \right)}{\left(\dfrac{\text{Number of domestic trips generated in region } j}{\text{Total number of domestic trips}} \right)} . \quad (1)$$

A region i is considered 'attractive' for residents in region j if the coefficient $ca_{i,j}$ is greater than one; in other words, if inbound trips from region j to region i represented as a fraction of the total inbound flows received by region i is greater than the total outbound trips of region j over the total of trips generated in Spain. Table 2 displays the coefficients of tourist attraction. The rows represent the regions of destination, and the columns the regions of origin. For example, we observe that the region of Aragon is an attractive destination for residents in neighbouring regions, such as Catalonia ($ca_{\text{Ara,Cat}} = 3.78$), Valencia ($ca_{\text{Ara,Val}} = 2.11$), Navarra ($ca_{\text{Ara,Nav}} = 2.11$), La Rioja ($ca_{\text{Ara,Rio}} = 1.70$), and País Vasco ($ca_{\text{Ara,PV}} = 1.32$). More generally, we find that Madrid, País Vasco, and Catalonia have the highest number of coefficients greater than one, which suggests that these regions are the most attractive ones for inter-regional tourism. In addition, it appears that there are some neighbouring effects. Indeed, with the only exceptions of the Balearic Islands and Canary Islands, the highest values for the coefficients of tourist attractions are ob-

served in the neighbouring regions of the regions under scrutiny.[7] Finally, as already commented in Guardia-Gálvez et al. (2014), the magnitude of the coefficients of attraction appear to strongly depend on the geographical distance between regions, and on the population and economic strength of the region of origin.

Table 2

Index of inter-regional tourist attraction by regions of destination, 2016

	AND	ARA	AST	BAL	CAN	CANT	CYL	CM	CAT	VAL	EXT	GAL	MAD	MUR	NAV	PV	RIO	CEU	MEL
AND	–	0.44	0.55	1.52	2.04	0.40	0.54	1.29	1.12	1.21	3.68	0.64	1.05	2.27	0.53	0.38	0.42	6.84	6.06
ARA	0.41	–	0.17	0.35	0.09	0.54	0.68	0.63	3.78	2.11	0.41	0.24	0.38	0.21	2.91	1.32	1.70	0.08	0.11
AST	0.78	0.66	–	0.33	0.65	2.52	2.62	0.43	0.48	0.51	0.54	5.14	1.01	0.19	1.25	0.97	0.71	0.14	0.13
BAL	2.13	0.41	0.54	–	1.21	0.44	0.54	0.51	3.42	1.59	0.12	1.11	0.58	0.64	0.35	0.53	0.73	0.14	0.54
CAN	1.70	0.55	1.42	2.19	–	0.73	0.93	0.33	2.38	0.58	0.32	3.91	0.66	0.59	0.65	0.93	0.44	0.26	0.84
CANT	0.19	0.53	1.42	0.04	0.42	–	3.16	0.19	0.38	0.22	0.22	1.06	0.51	0.13	1.07	4.65	1.66	0.06	0.00
CYL	0.45	0.54	1.89	0.30	0.23	1.88	–	0.57	0.39	0.28	0.71	1.08	1.66	0.21	0.72	1.51	0.97	0.07	0.14
CM	0.60	0.30	0.10	0.24	0.19	0.08	0.15	–	0.27	1.53	0.44	0.09	2.18	0.98	0.21	0.05	0.08	0.08	0.12
CAT	1.39	4.83	0.71	4.65	1.77	0.95	0.78	0.58	–	1.92	0.52	0.92	0.53	0.74	2.24	1.01	1.81	0.19	0.15
VAL	0.95	1.72	0.44	0.59	0.38	0.29	0.95	2.18	1.45	–	0.22	0.55	1.08	2.71	0.69	0.49	0.84	0.12	0.30
EXT	2.79	0.31	0.36	0.29	0.49	0.61	0.98	0.89	0.42	0.36	–	0.43	1.55	0.24	0.21	0.68	0.04	0.30	0.34
GAL	1.02	0.65	4.97	0.78	3.08	1.40	3.01	0.43	1.12	0.34	0.47	–	0.72	0.50	0.40	0.96	0.75	0.21	0.23
MAD	2.48	0.99	1.44	1.97	2.51	1.51	1.74	2.56	0.87	1.48	2.13	2.37	–	1.20	0.77	0.74	1.01	0.36	0.81
MUR	1.97	0.48	0.47	0.38	0.10	0.14	0.33	2.04	0.73	3.83	0.26	0.28	0.90	–	0.20	0.05	0.18	1.36	1.10
NAV	0.62	2.94	0.74	0.14	0.37	0.69	1.55	0.28	1.29	0.42	0.27	0.17	0.43	0.20	–	3.82	5.27	0.27	0.25
PV	1.27	1.14	1.26	0.80	1.15	5.05	2.57	0.32	1.44	0.81	0.55	1.21	0.49	0.26	5.16	–	4.17	0.10	0.06
RIO	0.18	1.28	0.83	0.54	0.14	1.77	0.94	0.15	0.23	0.28	0.18	0.51	0.44	0.15	2.60	5.98	–	0.04	0.00
CEU	15.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	–	13.32
MEL	12.70	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	3.62	0.00	0.00	0.00	16.73	–

Note: The abbreviations used in the table stand for the following: AND – Andalusia, ARA – Aragon, AST – Asturias, BAL – Balearic Islands, CAN – Canary Islands, CANT – Cantabria, CYL – Castilla–León, CM – Castilla–La Mancha, CAT – Catalonia, VAL – Valencia, EXT – Extremadura, GAL – Galicia, MAD – Madrid, MUR – Murcia, NAV – Navarra, PV – País Vasco, RIO – Rioja, CEU – Ceuta, MEL – Melilla. The rows represent the regions of destination; the columns show the regions of origin. Values greater than 1 are in grey cells; they refer to strong tourist attraction.

Source: Own calculation following the instructions given in Guardia-Gálvez et al. (2014) and Domínguez-Pérez (2016), and using the O-D matrix based on the 2016 FAMILITUR survey.

[7] It is interesting to highlight the strong neighbouring effect observed for the cases of Ceuta and Melilla. These cities are located in Africa, and not well linked with the rest of Spain. The coefficients of attraction for Ceuta show values greater than one, and extremely high only for the flows from the regions of Andalusia and Melilla ($ca_{\text{Ceu,And}} = 15.22$ and $ca_{\text{Ceu,Mel}} = 13.32$). This means that Ceuta is only an attractive destination for these two regions; but this is not a surprising finding given that the only connection of Ceuta to mainland Spain is by boat to Andalusia and by road to Melilla. The same can be observed in the case of Melilla.

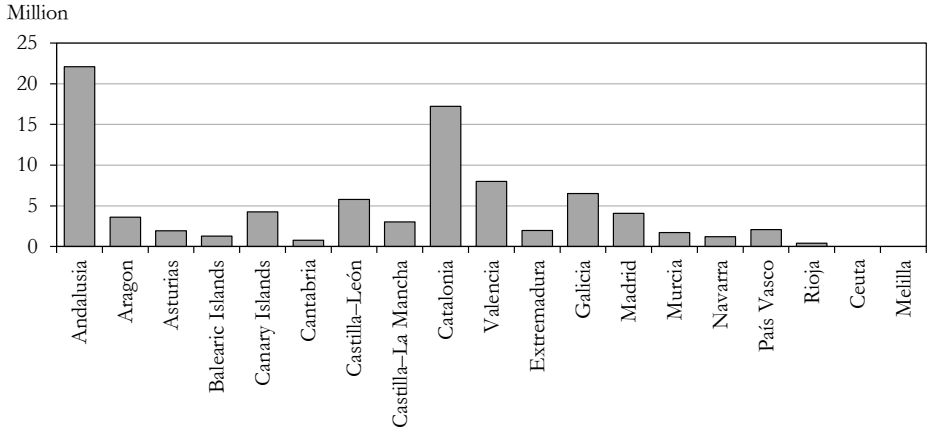
Description of the intra-regional domestic tourist flows

The intra-regional domestic tourism is an important component of the flows of domestic tourism. This type of tourism corresponds to more than 86 million trips in 2016; that is 51.79% of the total number of domestic trips. However, the amount spent per person and day is equal to only 31 euros, a figure low in comparison to the 52 euros per person and day in the case of inter-regional trips.

According to Figure 4a, the residents of Andalusia and Catalonia are the ones who travel the most within their respective regions (22.08 million of trips for Andalusia and 17.21 million of trips for Catalonia). Figure 4b depicts the intensity of intra-regional tourism after controlling for the population size of the regions.

Figure 4a

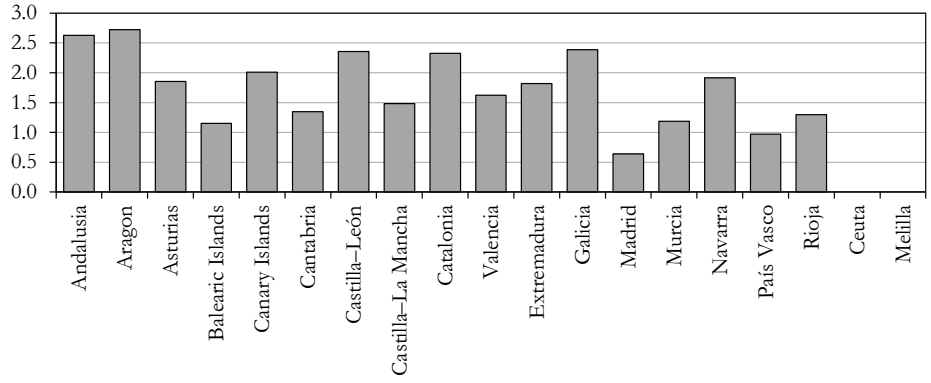
Number of intra-regional domestic tourist trips, 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Figure 4b

Number of intra-regional domestic tourist trips per capita, 2016



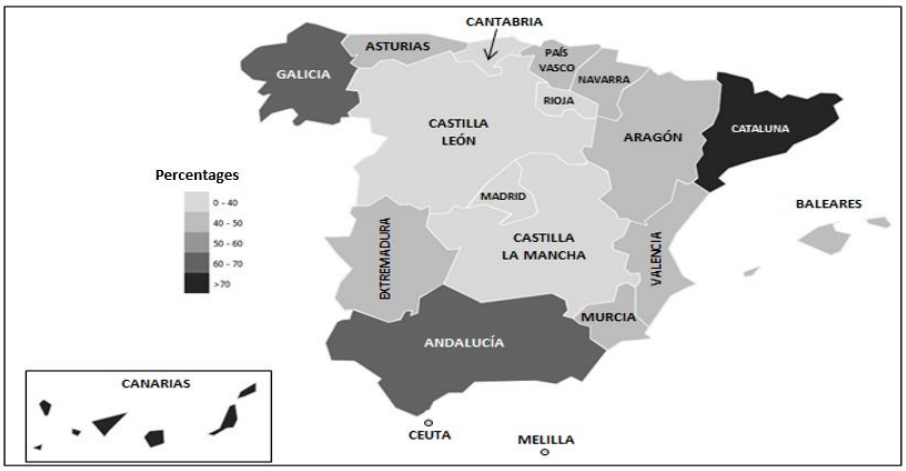
Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

The highest intensity of trips is observed for the residents of Aragon (2.72 intra-regional trips per capita), Andalusia (2.63 trips per capita), Galicia (2.38 trips per capita), and Catalonia (2.33 trips per capita), while on the contrary, the lowest intensity of trips is registered for the residents of Madrid (0.69 trips per capita) and La Rioja (1.30 trips per capita).

Figures 5a and 5b graphically illustrate the relative importance of intra-regional domestic tourism. In the case of inbound trips (see Figure 5a), the share of intra-regional trips with respect to the total number of domestic trips is the highest in the regions of Catalonia (76.87%), Canary Islands (74.80%), and Andalusia (69.54%). The lowest percentages of intra-regional tourism are found in the regions of Madrid (31.28%) and La Rioja (28.31%). Figure 5b shows the corresponding figures for the outbound trips. Andalusia, Canary Islands, and Galicia are the regions of destination with the highest percentages of domestic trips being intra-regional (81.95, 80.90, and 76.59%, respectively), whilst on the contrary, Madrid shows the lowest proportion (13.04%).

Figure 5a

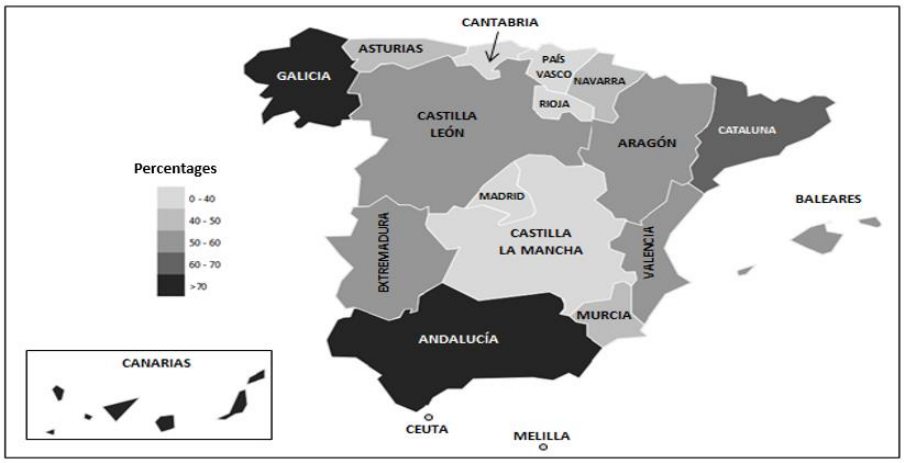
Percentage of intra-regional domestic tourist trips in the total number of domestic inbound trips, 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Figure 5b

Percentage of intra-regional domestic tourist trips in the total number of domestic outbound trips, 2016



Source: Own elaboration based on the O-D matrix derived from the 2016 FAMILITUR survey.

Econometric model and variables

The econometric modelling procedure assumes that the domestic tourist flows for Spain in the year 2016 can be appropriately represented by the following SAR model:

$$Y = \mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}} \cdot \boldsymbol{\beta}^{D}_{Inter} + \mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}} \cdot \boldsymbol{\beta}^{O}_{Inter} + \gamma \cdot D + \theta \cdot P + \mathbf{X}_{\mathbf{Intra}} \cdot \boldsymbol{\beta}_{Intra} + \varrho \cdot \boldsymbol{W} Y + \mathbf{U}, \quad (2)$$

where Y measures domestic tourism and is proxied by the logged number of tourist trips from a region of origin (i) to a region of destination (j). The matrices $\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$ and $\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$, and the variables D and P denote the determinants of inter-regional flows. $\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$ includes measures of the economic characteristics (GDP per capita) and accessibility (number of airports) of the regions of destination as well as proxies for their cultural, recreational, and natural attractiveness. More specifically, attractiveness is measured with an indicator of beaches' quality, number of theme and national parks, and number of museums in the destination region under consideration. Equation (2) also includes dummies for island and autonomous cities as both may exhibit specific patterns to be accounted for.

The matrix $\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$ includes the characteristics of the region of origin that are likely to affect domestic flows. This comprises of the GDP per capita as well as the population size and level of accessibility (number of airports) of the region of origin. As previously stated, we also include dummy variables for regions of origin that are either island or autonomous cities. The geographical distance (D) and relative pric-

es (*P*) between regions are also included in equation (2) in order to account for travelling cost and cost of living differences between regions of destination and origin. On the other hand, we assume that intra-regional flows can be explained by the variables grouped in the matrix $\mathbf{X}_{\mathbf{Intra}}$, namely, the GDP per capita, population size of the region, and the two dichotomous variables indicating if the region is an island or an autonomous city.[8] Note that the variables GDP per capita, *P*, and population are transformed into logarithms so that their coefficients can be directly interpreted as elasticities.

The selection of the variables included in the matrices $\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$, $\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$, $\mathbf{X}_{\mathbf{Intra}}$ follows Marrocu and Paci (2013), Guardia-Gálvez et al. (2014), and De la Mata and Llano-Verduras (2012). Table 3 provides a detailed description of each of the variables used in equation (2) as well as their data sources, whilst Table 4 displays the summary statistics of the explanatory variables at the regional level.

Table 3

Variables used in the SAR model to explain the inter-regional flows in Spain

Variable	Definition	Description	Source
Region of destination ($\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$)			
GDP per capita	Natural logarithm of the regional GDP per capita in the region of destination in 2015	Indicator of the economic development level of the region of destination (quality of public services and institutions)	INE www.ine.es
Blue Flag beaches	Number of Blue Flag beaches in the region of destination, 2015	Indicator of the capacity to attract 'sun-and-beach' visitors	FEE www.blueflag.global
Museums	Total number of museums in the region of destination, 2015	Indicator of the capacity to attract cultural visitors	MECD www.mecd.gob.es
Theme parks	Total number of theme parks in the region of destination, 2015	Indicator of the capacity to attract recreational tourism	TOURESPAÑA www.spain.info/en
Natural parks	Total number of national natural parks in the region of destination, 2015	Indicator to measure the capacity of the natural amenities to attract visitors	MAPAMA www.mapama.gob.es

(Continued on the next page.)

[8] The variables were transformed to adapt them to an O-D modelling framework. Thus, *Y* was obtained from the vectorisation of the O-D matrix, and *D* and *P* from the vectorisation of the symmetric $n \times n$ matrices of geographical distances and relative prices, respectively. The matrices $\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$, $\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$, and $\mathbf{X}_{\mathbf{Intra}}$ were accordingly transformed by using the Kronecker product. Moreover, the main diagonal of the matrices $\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$ and $\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$ was set to zero to isolate the intra-regional trips. Considering the same reason, the off-diagonal of $\mathbf{X}_{\mathbf{Intra}}$ was set to zero to not consider the inter-regional trips. For a more detailed explanation of these transformations, the reader referred to Lesage and Pace (2008) and Marrocu and Paci (2013).

(Continuation.)

Variable	Definition	Description	Source
Region of destination ($\mathbf{X}^{\mathbf{D}}_{\mathbf{Inter}}$)			
Airports	Total number of airports in the region of destination, 2016	Indicator that approximates the level of accessibility of the region of destination	AENA www.aena.es
Island	Dummy variable that takes value 1 if the region of destination is an island	Indicator that takes into consideration whether the region of destination is an island (Balearic Islands and Canary Islands)	Own calculation
Autonomous city	Dummy variable that takes value 1 if the region of destination is an autonomous city	Indicator that takes into consideration whether the region of destination is an autonomous city (Ceuta and Melilla)	Own calculation
Region of origin ($\mathbf{X}^{\mathbf{O}}_{\mathbf{Inter}}$)			
GDP per capita	Natural logarithm of the regional GDP per capita in the region of origin, 2016	Indicator of the level of income of residents in the region of origin	INE www.ine.es
Population	Natural logarithm of the population in the region of origin, 2016	Indicator of the size of the population in the region of origin	INE www.ine.es
Airports	Total number of airports in the region of origin, 2016	Indicator that approximates the level of accessibility of the region of origin	AENA www.aena.es
Island	Dummy variable that takes value 1 if the region of origin is an island	Indicator that takes into consideration whether visitors come from an island (Balearic Islands and Canary Islands)	Own calculation
Autonomous city	Dummy variable that takes value 1 if the region of origin is an autonomous city	Indicator that takes into consideration whether visitors come from an autonomous city (Ceuta and Melilla)	Own calculation
Bilateral variables			
Relative prices	Natural logarithm of the relative consumer price index (tourism and hospitality) between the region of origin and the region of destination, 2015	Proxy of the relative cost of living between the region of origin and the region of destination	INE www.ine.es
Geographical distance	Geographical distance in kilometres between the region of origin and the region of destination	Proxy of the cost of travelling from region of origin to the region of destination (transport and opportunity costs)	Own calculation

Note: The abbreviations used in the table stand for the following: INE – Spanish National Statistics, FEE – Foundation for Environmental Education, MECD – Spanish Ministry of Education, Culture and Sports, MAPAMA – Spanish Ministry of Agriculture, Food and Environment, TOURESPAÑA – a tourism agency that is dependent on the Spanish Ministry of Energy, Tourism and Digital Agenda, AENA – a Spanish airport operations company. The geographical distances between regions were calculated by using MATLAB, based on the regions' longitude and latitude.

For several variables, 2015 data were used as the values for 2015 and 2016 are similar or, in many cases, the same, and assuming that visitors have made their decisions according to their perceptions formed in the previous year.

Table 4

Main descriptive statistics of the regional-level variables

Variable	Mean	Standard deviation	Maximum	Minimum
Intra-regional tourism flows (number of visitors)	4,530,480	5,823,391	22,086,482	0
Inter-regional tourist flows				
to the region (number of visitors)	4,217,877	3,604,605	11,367,619	39,957
from the region (number of visitors)	4,217,877	6,016,794	27,145,486	163,513
Geographical distance (kilometre)	564.16	468.07	2,170	0
Relative prices (consumer price index) (euro)	100.05	0.43	101.77	99.27
GDP per capita (euro)	22,260	4,806.5	31,708	15,882
Number of museums	28	21	84	1
Number of Blue Flag beaches	30	44	131	0
Number of national parks	1	1	4	0
Number of theme parks	2	3	8	0
Number of airports	2	2	8	0
Dummy variable	Frequency			
Autonomous city	10.53%			
Island	10.53%			

Source: Here and in the following tables, own calculation.

The parameters to be estimated in the model are γ, θ, ϱ, and those included in the vectors $\boldsymbol{\beta}^{D}_{Inter}$, $\boldsymbol{\beta}^{o}_{Inter}$, and $\boldsymbol{\beta}_{Intra}$. We opt for a SAR econometric specification in order to control for spatial dependence at the tourist destination.[9] The possible existence of spillover effects are captured by the term $\mathbf{W} \cdot Y$, with $\mathbf{W}$ being the queen contiguity-weighting matrix.[10] Therefore, $\mathbf{W} \cdot Y$ is the weighted average of the tourism flows of neighbouring regions. The parameter ϱ is the SAR parameter, which measures the degree of spatial dependence among the regions of destination. If $\varrho = 0$, then the specification of the model (2) is the same as the one of the gravity

[9] LeSage and Pace (2008) find two main motivations for the use of spatial econometric models. The first one is that spatial dependence can be interpreted as a long-run equilibrium of an underlying spatiotemporal process. The second motivation is to avoid the effect of omitted variables that exhibit spatial dependence.

[10] The matrix $\mathbf{W}$ is an exogenous pre-specified spatial matrix with fixed weights, which is the most widely used approach within a linear regression framework (Vega–Elhorst 2015). More specifically, the elements of $\mathbf{W}$ ($\mathbf{w_{ij}}$) are set to be one if region *i* shares its border with the region of destination *j*, and zero otherwise. The rows of this matrix have been normalised to sum to unity.

model. The gravity model is one of the most popular specifications when it comes to the study of regional international flows of goods, migration, investment, and more recently, tourism (Morley et al. 2014). For comparison purposes, in Chapter 4, we also report the results when a gravity model is employed. The gravity model is used as a benchmark to compare the performance of the proposed SAR model and verify the existence of significant spatial spillover effects. Finally, the last term of equation (2), the vector **U**, is the disturbances of the model, which is assumed an independent and identically distributed random variable.

Unlike the case of the gravity model, the estimated parameters of the SAR model do not provide a direct interpretation of the impact of the explanatory variables on *Y*. The reason for this is that, due to the presence of the spatially lagged term ($\mathbf{W} \cdot Y$), the parameters of the model do not represent the true partial derivatives of Y with respect to changes in the explanatory variables. LeSage and Pace (2009) show that the partial derivative matrix of Y with respect to the k^{th} explanatory variable in the i^{th} region is given by

$$\frac{\partial Y}{\partial X_{ki}} = \left(\mathbf{I}_n - \varrho \cdot \mathbf{W}\right)^{-1} \cdot \left(\beta \cdot \mathbf{I}_n\right) , \tag{3}$$

where $\mathbf{I}_n$ is the $n \times n$ identity matrix. Despite the complexity of the calculation, the advantage of such a procedure is that the total impact on domestic flows, that is, Y produced by any change in one of the explanatory variables can be decomposed into two effects: direct and indirect effects.

The direct effect reflect the impact on domestic tourism of any change in one of the explanatory variables originated in a region, while the indirect effect measures the impact of the same variable in its neighbouring regions. LeSage and Pace (2009) propose to use the average of the elements of the main diagonal as a summary indicator of the direct effect, and the average of the off-diagonal elements as a summary of the indirect effect. The total effect is calculated as the sum of the direct and indirect effects. In order to identify the statistical distribution of these impacts, the same authors recommend the use of some efficient computational simulation method to assess the statistical significance of the estimated direct, indirect, and total effects. In this paper, we decide to use the same bootstrap procedure as the one explained in Ferson et al. (2013) and Álvarez-Díaz and Gupta (2016).[11]

Empirical results

Table 5 shows the estimation results of the parameters of equation (2).

[11] More specifically, the procedure begins with the construction of 10,000 artificial samples by resampling with replacement of the original data. These artificial samples are used to obtain 10,000 estimates for each one of the parameters of our model represented in equation (2).

Table 5

Econometric estimates of the gravity and SAR models

Variable	Gravity model		SAR model	
	Point estimate	Confidence interval	Point estimate	Confidence interval
Inter-regional tourism				
Region of destination				
GDP per capita	0.820	[0.026, 1.670]	1.151**	[0.284, 2.011]
Blue Flag beaches	0.005***	[0.002, 0.009]	0.005**	[0.002, 0.009]
Museums	0.009	[–0.003, 0.020]	0.011*	[–0.001, 0.022]
Theme parks	0.137***	[0.080, 0.193]	0.151***	[0.096, 0.204]
Natural parks	0.490***	[0.207, 0.816]	0.561***	[0.261, 0.898]
Airports	0.186**	[0.049, 0.334]	0.171**	[0.039, 0.319]
Island	0.105	[0.053, 0.338]	1.176**	[0.402, 2.114]
Autonomous city	–7.363***	[–8.478, –5.923]	–7.246***	[–8.369, –5.853]
Region of origin				
GDP per capita	1.343***	[0.558, 2.055]	1.090***	[0.240, 1.772]
Population	0.763***	[0.593, 0.904]	0.676***	[0.458, 0.896]
Airports	0.230***	[0.084, 0.424]	0.232***	[0.087, 0.424]
Island	0.056	[–0.424, 0.787]	0.099	[–0.547, 0.943]
Autonomous city	–0.264	[–1.175, 0.798]	–0.201	[–1.124, 0.823]
Bilateral				
Relative prices	–3.615**	[–5.805, –1.337]	–3.944***	[–6.066, –1.653]
Geographical distance	–0.003***	[–0.004, –0.002]	–0.003***	[–0.004, –0.002]
Intra-regional tourism				
GDP per capita	2.306***	[1.293, 3.329]	2.333***	[1.271, 3.297]
Population	0.844**	[0.271, 1.163]	1.116***	[0.513, 1.537]
Island	–0.324	[–0.806, 0.001]	1.370	[–0.001, 2.789]
Autonomous city	–13.000***	[–16.397, –0.001]	–10.866***	[–12.790, –0.010]
$\boldsymbol{W} \cdot Y$	–		0.096***	[0.048, 0.151]
Adjusted R^2	0.853		0.857	
Log-likelihood ratio	–634.698		–629.725	
Likelihood ratio test	9.95***			
Lagrange multiplier test	21.87***			
Moran's I test	5.36***			
Wald test	104.66***			

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The bootstrap confidence interval is based on the bias-corrected and accelerated (BCa) method, with a level of confidence of $1- a= 0.95$.

The first column reports the estimation of the gravity model ($\varrho = 0$), along with the statistical significance and associated bootstrap confidence intervals. The second column displays the results obtained using the SAR model ($\varrho \neq 0$). The gravity model is estimated by ordinary least squares (OLS), whilst the SAR model is estimated by using the method of maximum likelihood with a numerical Hessian approach to compute the confidence intervals and associated t-statistics (LeSage and Pace, 2008).[12] Both the models explain approximately 86% of the total variation of domestic flows, and the coefficients associated with the explanatory variables are sensibly the same in the two specifications.[13] However, the SAR parameter ϱ of the SAR model is statistically significant, which suggests the existence of spatial spillover effects among the regions of destination in Spain. The domestic tourism of a given region benefits from the domestic tourism in its neighbouring regions. More precisely, the trips in a given region of destination increase by almost 0.1% if the number of inbound trips in its neighbours increases by 1%. This result shows that spatial dependence matters and should be taken into account when modelling domestic demand for tourism.[14] This also implies that the gravity model would suffer from a problem of misspecification as it omits certain significant spatial effects. This finding is also confirmed by the results of the likelihood ratio test and Lagrange multiplier test reported at the bottom of Table 4: the null hypothesis of no spatial effects is clearly rejected with a $p < 0.01$. The residuals of the non-spatial gravity model were also tested for spatial autocorrelation using Moran's I and significant amounts of positive spatial autocorrelation were statistically detected.

In what follows, we will thus only comment on the results based on the SAR model. As shown in Table 5, column 2, most of the explanatory variables are statistically significant and have the expected sign. Distance and relative prices are both negatively associated with inter-regional tourist flows. Conversely, the GDP per capita of the region of destination and origin, population of the region of origin, number of airports both at destination and origin, quality of the beaches, and the cultural, recreational, and natural attractiveness of the regions of destination have a positive and significant influence on the number of inbound trips. Islands benefit from more domestic tourism than mainland Spanish regions, whilst the opposite is found for autonomous cities. Finally, the GPD per capita and size of the population are also both positively associated with intra-regional tourism.

Table 6 reports the total, direct, and indirect effects of each of the explanatory variables included in equation (2), as well as their corresponding statistical signifi-

[12] The OLS estimation in the case of the SAR model produces biased, inconsistent, and no-efficient estimates (Dall'Erba–Le Gallo 2008).

[13] The bootstrapping confidence intervals overlapping implies that we cannot reject the null hypothesis that the estimates are statistically equal.

[14] This finding is also corroborated by the value of Moran's I statistic test computed on tourism flows. Moran's I test rejects the null hypothesis of absence of spatial autocorrelation in the dependent variable ($p < 0.01$).

cance derived from the bootstrap procedure. According to these estimates, we can assess the impact of changes in the characteristics of the regions of origin, relative prices, accessibility, and characteristics of the regions of destination on the domestic tourism flows to Spain.

Table 6

Direct, indirect and total impact estimates based on SAR model estimates

Variable	Total impact	Direct impact	Indirect impact
Inter-regional tourism			
Region of destination			
GDP per capita	1.267**	1.153***	0.114
Blue Flag beaches	0.006*	0.005***	0.001*
Museums	0.012*	0.011*	0.001
Theme parks	0.167***	0.152***	0.015**
Natural parks	0.618***	0.562***	0.056*
Airports	0.188**	0.171**	0.017
Island	1.295**	1.178**	0.117
Autonomous city	–7.980***	–7.261***	–0.719***
Region of origin			
GDP per capita	1.200***	1.092***	0.108**
Population	0.744***	0.677***	0.067*
Airports	0.256**	0.233***	0.023
Island	0.109	0.099	0.010
Autonomous city	–0.221	–0.201	–0.020
Bilateral			
Regional prices	–4.343***	–3.952***	–0.391***
Geographical distance	–0.003***	–0.003***	–0.0002***
Intra-regional tourism			
Log(GDP per capita)	2.569***	2.337***	0.231**
Log(Population)	1.229***	1.118***	0.111**
Island	1.508***	1.373**	0.136***
Autonomous city	–11.965***	–10.887***	–1.078***

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The p-values were empirically estimated by using the bootstrap technique, and Kernel method was employed to estimate the empirical probability density function.

Characteristics of the regions of origin

The total effect of the GDP per capita in the region of origin, when it comes to explaining inter-regional tourism, is highly significant and equal to 1.20. It implies that, should the residents' income increase by 1%, then the number of inter-regional

trips would increase by 1.20%. Given that the bootstrapped confidence interval associated with this elasticity is [0.39, 2.02], the income unitary elasticity assumption cannot be rejected. This finding corroborates the elasticities reported by other authors. De la Mata and Llano-Verduras (2012) and Guardia-Gálvez et al. (2014) report estimated income elasticities equal to approximately 1 (0.90) and less than 2 (1.8), respectively. In the case of Italy, Marrocu and Paci (2013) found an elasticity income for inter-regional tourism equal to nearly 1 (0.92). The decomposition of the total effect into direct and indirect effects suggests that if the income of the residents in the region of origin increases by 1%, then the number of trips to the region of destination increases by 1.092% (direct effect), and by 0.108% in its neighbouring regions (indirect effect). The income elasticity is significantly higher in the case of intra-regional tourism (2.57 versus 1.20). This finding is also in line with Paci and Marrocu (2013) who report estimated income elasticities of 2.13 and 0.92 for intra- and inter-regional domestic tourism in Italy, respectively.

Similar to Guardia-Gálvez et al. (2014), we find that the population size in the region of origin is positively associated with inter-regional tourist flows. If the population in the region increases by 1%, then the number of trips to this region will rise by 0.74%. Contrarily to Guardia-Gálvez et al. (2014), the elasticity is significantly less than 1.[15]

Relative prices

The estimated price elasticity of the demand for inter-regional tourism amounts to –4.34, which implies that the demand for domestic tourism in Spain is highly elastic. The direct and indirect effects are equal to –3.95 and –0.39, respectively. Guardia-Gálvez et al. (2014) report a price elasticity for inter-regional tourism that is marginally lower, ranging between –3.76 and –3.91, depending of the method of estimation. However, note that this may be owing to the fact that the authors only take into account the direct effects, ignoring the spillover effects.

Accessibility

The distance between the region of origin and destination is a factor commonly included in the models of international and inter-regional domestic tourism (Marrocu and Paci, 2013). Our findings reveal that each additional kilometre separating the origin from the destination regions reduces the number of inter-regional tourist trips by 0.003%. Our estimate supports previous studies that consider distance as a proxy for the physical, temporal, and monetary cost of travelling (Guardia-Gálvez et

[15] The bootstrap confidence interval at 95% estimated for the population income was [0.51, 0.98], which does not include the value 1. Therefore, the null hypothesis that the population elasticity is equal to 1 can be rejected at the 5% level of significance.

al. 2014, De la Mata and Llano-Verduras 2012, Marrocu and Paci, 2013).[16] The second accessibility variable included in the model, that is the number of airports in the province, which is along these lines, is also a significant pull and push factor for inter-regional domestic tourism.[17]

Characteristics of the regions of destination

If the GDP per capita in the region of destination increases by 1%, the number of inbound trips in the region increases by 1.15% (direct effect) and by 0.11% in its neighbouring regions (indirect effect). However, the spatial spillovers are not significantly different from zero. As the GDP per capita should act as a proxy for the quality of public services (e.g. health care, public transport, infrastructures, or security) and social institutions (e.g. law enforcement, less corruption, or more polite and friendly residents), this result underlines the importance of the economic development in the region of destination as a significant pull factor of domestic tourism.

The variables associated with the cultural (number of museums), recreational (number of theme parks), beaches' quality (number of Blue Flag beaches) and natural attractiveness (number of natural parks) of the regions of destination have a positive and significant effect on the number of inter-regional tourist trips. Considered in total, the direct and indirect effects of all these factors are statistically significant, except for the indirect effect of the variable that approximates cultural attractiveness. These results are perfectly in line with the findings of Marrocu and Paci (2013). However, note that the significant effect of recreational activities that we observe for Spain contrasts with the results of Stracqualursi and Agati (2017) who report no association of this variable with domestic demand in Italy.

The effect of insularity on tourist flows is a source of controversy in the existing literature on the determinants of domestic tourism in Spain. De la Mata and Llano-Verduras (2012) who find a negative effect for the inflows of the islands, argue that this is caused by the larger costs of transportation incurred when travelling to those regions and by the islands' focus on foreign rather than national tourism flows. Conversely, for Guardia-Gálvez et al. (2014), the condition of insularity does not have any negative effect on the flows of domestic tourists and this is due to the gradual reduction of air travel costs. In contrast, our results suggest that islands benefit from 1.18% more tourist trips than the mainland regions. Similarly, the insularity is also positively associated with domestic intra-regional trips. The residents of the island regions tend to travel more within their region than those of the mainland regions.

[16] However, note that some authors, such as Baxter (1979), argue that longer distances could exert a positive effect owing to the satisfaction associated with travelling long distances.

[17] Most of the domestic trips made in Spain in the year 2016 had cars as the main mean of transport. Nevertheless, as Paci and Marrocu (2013) point out, the degree of accessibility of the regions by car is already taken into account with the geographical distance in kilometres between each pair of regions.

Robustness and sensitivity analysis

In this section, we discuss the sensitivity and robustness of our results to check that the main findings of our study are not driven by the model specification. More specifically, we check if our results are sensitive to the most important modelling assumptions assumed in our study: the choice of the SAR model and the queen contiguity matrix as spatial weights matrix.

First, different econometric specifications could have been used to model the spatial interaction effects between regions. Gibbons and Overman (2012) criticise the SAR and favour the spatial lags of X (SLX) model, which consists of augmenting the gravity model with the spatial lags of the explanatory variables. One of the reasons behind Gibbons and Overman (2012)'s preference for the SLX specification is owing to the so-called 'reflection problem' associated with the estimation of an SAR model; that is, the fact that ρ reflects changes in the observed and unobserved characteristics of the neighbouring regions and as such does not provide any causal information on the effect of the outcome value of the neighbouring regions. The choice of the SAR model in our study was largely driven by the existing empirical evidence on modelling domestic tourism flows based on the O-D approach. Both Marrocu and Paci (2013) and De la Mata and Llano-Verduras (2012) rely on this linear spatial econometric model, and hence for comparison purposes, we opted for the SAR specification. In Table 7, we report the results obtained when two alternative spatial models are estimated: the spatial error (SE) model and the SLX model. A simple comparison appears to indicate that our estimates are not sensitive to the choice of the spatial model. The selection of alternative modelling specifications does not cause significant divergences with respect to our results. In fact, according to the bootstrap analysis, the null hypothesis of equal parameters of the models is not rejected at the 10% level of significance. The only exception is found for the variable 'Island at destination'. In this case, we can infer that the parameter of the SAR model is significantly higher than the parameters of the SE and SLX models. However, for the latter models, the estimates reflect that the parameters associated with the variable 'Island at destination' were not statistically significant.

Additionally, the most important variables to explain domestic tourism flows in Spain were statistically significant in the gravity and SAR models, as well as in the SE and SLX models. To be more precise, for all models, the variables price, distance, GDP per capita, and population in the region of origin were statistically significant to explain tourism flows between regions (inter-regional tourism). In the case of intra-regional tourism, the variables GDP per capita and population were significant in the four estimated models. It is worth noting that the SE term in the SE models is statistically significant, but in the SLX model, none of the lag explanatory variables were significant.

Table 7

Econometric estimates of the SE and SLX models

Variable	SE model		SLX model	
	Point estimate	Confidence interval	Point estimate	Confidence interval
Inter-regional tourism				
Region of destination				
GDP per capita	0.707	[–0.242, 1.358]	1.681**	[–0.269, 3.873]
Blue Flag beaches	0.003*	[0.001, 0.007]	0.005	[–0.003, 0.016]
Museums	0.008	[–0.001, 0.020]	0.001	[–0.003, 0.016]
Theme parks	0.140***	[0.099, 0.199]	0.089	[–0.057, 0.216]
Natural parks	0.414**	[0.185, 0.757]	0.525	[–0.151, 1.271]
Airports	0.218***	[0.086, 0.345]	0.287*	[0.074, 0.528]
Island	0.183	[–0.277, 0.933]	–0.706	[–2.588, 1.104]
Autonomous city	–6.863***	[–8.040, –5.630]	–8.566***	[–9.938, –6.902]
Region of origin				
GDP per capita	1.243***	[0.536, 1.937]	1.155***	[0.308, 1.851]
Population	0.712***	[0.540, 0.937]	0.759***	[0.548, 0.978]
Airports	0.296***	[0.147, 0.448]	0.287**	[0.074, 0.528]
Island	–0.107	[–0.662, 0.579]	0.119	[–0.543, 0.969]
Autonomous city	–0.056	[–0.953, 0.930]	–0.286	[–1.197, 0.759]
Bilateral				
Relative prices	–3.069**	[–5.068, –0.48]	–4.953**	[–9.159, –0.636]
Geographical distance	–0.003***	[–0.004,–0.002]	–0.003***	[–0.004, –0.002]
Intra-regional tourism				
GDP per capita	1.878***	[0.647, 2.773]	2.838***	[1.064, 5.404]
Population	1.273***	[0.500, 1.909]	1.197***	[0.532, 1.764]
Island	0.721	[–0.050, 1.932]	0.379	[–30.971, 20.955]
Autonomous city	–10.606***	[–13.130, –8.760]	–10.668***	[–12.875, –8.643]
Spatial lag variable				
GDP per capita	–		–0.137	[–1.645, 5.048]
Prices	–		0.060	[–9.817, 3.731]
Blue Flag beaches	–		0.004	[–0.006, 0.016]
Museums	–		–0.014	[–0.083, 0.044]
Theme parks	–		0.050	[–0.089, 0.189]
Natural parks	–		1.003	[–0.338, 2.741]
W ·error	0.784***	[0.537, 1.250]	–	
Adjusted R^2	0.87		0.85	
Log-likelihood ratio	–605.5316		–630.2894	

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The bootstrap confidence interval is based on the BCa method, with a level of confidence of $1- a= 0.95$.

Second, as a priori, we do not know the form of the spatial interactions taking place between regions; as such, the choice of the spatial weights matrix is not obvious (Partridge et al. 2012, Vega and Elhorst 2015). To capture the spillover effects, we have used as exogenous pre-specified weighting matrix, the queen contiguity–weighting matrix. In this case, the regions are considered as neighbours if they share a common border. The contiguity matrix is one of the oldest and most frequently used weighting matrices in empirical applications (Anselin 1988, Abreu et al. 2004). Moreover, the most recent literature focused on analysing domestic tourism flows from an O-D approach has used this type of weighting matrix (see the studies of Marrocu–Paci 2013, De la Mata–Llano–Verduras 2012).

Other weighting schemes could have been used, such as those based on distance and binary distance matrices; but the effect of geographical distance between two regions is already controlled in our model through the inclusion of the variable distance.[18] In our opinion, the contiguity matrix used in our study appears to be the most appropriate to describe and capture the spatial effects and neighbouring interactions that exist in the domestic demand for tourism in Spain. However, in order to be sure that our results are not sensitive to the choice of the spatial matrix, we have re-estimated equation (2) whilst considering two different alternative specifications for the weighting matrix. The first one is a standard radial distance matrix that considers neighbours to those regions whose distance is less or equal to 300 kilometres. The second one is a binary distance matrix as defined and used in Dall'Erba and Le Gallo (2008). This matrix is another radial distance matrix that takes into account the inverse of the squared distance between regions, and the lower quartile of the great circle distance distribution is used as the cutting value. In Table 8, we report the estimates of equation (2) when these two alternative spatial weights' matrices are employed. The estimates of the main explanatory variables appear to be relatively robust. Considering the case of inter-regional tourism, the estimates are stable in terms of magnitude, sign, and statistical significance for the variables distance, prices, GDP per capita at origin, population, and theme parks and airports at both origin and destination. In the case of intra-regional tourism, this stability is observed for the variables GDP per capita, population, and autonomous city.

[18] The simultaneous inclusion of the variable distance and a weighting matrix based on distances causes distorting effects in the significance of the SAR coefficient (ϱ). More specifically, we have estimated the SAR model defined in equation (2) using an inverse distance weighting matrix. In this case, ϱ was not statistically significant. We obtained a similar result when an inverse quadratic distance matrix was established. However, ϱ becomes significant when the variable distance is omitted. These results are not presented here to save space, but they are available upon request.

Table 8

Sensitivity of the estimated SAR model in different spatial weighting schemes

Variable	Contiguity matrix	Radial distance weights matrix	
		Bandwidth 300 kilometres	As explained by Dall'Erba and Le Gallo (2008)
Inter-regional tourism			
Region of destination			
GDP per capita	1.151**	0.530	0.746
Blue Flag beaches	0.005**	0.007***	0.001
Museums	0.011*	0.007	0.001
Theme parks	0.151***	0.125***	0.185***
Natural parks	0.561***	0.482***	0.293*
Airports	0.171**	0.276***	0.481***
Island	1.176**	0.671	–0.794*
Autonomous city	–7.246***	–6.510***	–6.292***
Region of origin			
GDP per capita	1.090***	1.056***	0.665
Population	0.676***	0.680***	0.492***
Airports	0.232***	0.219***	0.148**
Island	0.099	0.103	0.021
Autonomous city	–0.201	–0.141	0.169
Bilateral			
Relative prices	–3.944***	–2.584*	–2.624**
Geographical distance	–0.003***	–0.003***	–0.002***
Intra-regional tourism			
GDP per capita	2.333***	1.667**	1.491**
Population	1.116***	1.150***	0.922**
Island	1.370	1.258	1.801
Autonomous city	–10.866***	–10.082***	–10.369***
$\mathbf{W} \cdot Y$	0.096***	0.127***	0.404***
Adjusted R^2	0.857	0.855	0.870
Log-likelihood ratio	–629.725	–632.104	–617.978

Note: * p < 0.1, ** p < 0.05, *** p < 0.01.

Whilst our results are robust to alternative spatial econometric models and spatial weight matrices, we should be diligent before providing a causal interpretation to our results. Indeed, the SAR and SLX specifications will be biased if there are some omitted variables correlated with both tourism flows and the explanatory

variables included in equation (2). In other words, these spatial econometric models provide consistent estimates if and only if the explanatory variables of equation (2) are exogenous. Whilst some of the characteristics of the origin and destination regions, such as the geographical characteristics are clearly predetermined, other variables, namely, relative prices and GDP per capita are likely to be endogenous. Tackling this potential endogeneity issue would require the usage of natural experiments to provide exogenous variation in the endogenous variables, which is beyond the scope of this paper (Gibbons–Overman 2012).

Conclusions

Domestic demand for tourism is extremely important for the economy of Spain in terms of economic growth and employment. However, despite its economic importance, the number of studies dedicated to studying the determinants of domestic tourism flows in Spain is still very limited. Thus, there is a growing need to update and expand our knowledge on this topic in order to help policy-makers and managers of the tourism industry to design and implement policies and strategies that promote the competitiveness and profitability of this sector. The present study contributes to fill the existing information gap by first describing the domestic tourist flows in Spain for the year 2016, and second, by identifying the most influencing factors of domestic tourism.

The description of domestic tourism was based on the construction of an O-D matrix, which compiles the number of tourist trips that the residents of a specific region made to another region (inter-regional tourism) or within their own region (intra-regional tourism). In general, most of the inter-regional trips are concentrated in the destination regions of Castilla–León, Andalusia, Valencia, and Castilla–La Mancha. On the other hand, the residents of Madrid, Catalonia, and País Vasco have the highest propensity to visit other regions. Considering that these regions are the richest in Spain, this result suggests that income could play a determinant role to explain inter-regional tourism.

The O-D matrix also allows us to calculate the inter-regional coefficients of tourist attraction. The analysis of these coefficients shows that there is a clear neighbourhood effect among regions; that is, neighbouring regions are more attractive than those located farther away. Second, the level of attractiveness of a region also depends on the distance, population, and economic size of the regions of origin. Regarding intra-regional tourism, the analysis of the O-D matrix reveals that residents of Andalusia and Catalonia are the ones who travel the most within their respective regions.

The second step of analysis aimed at explaining such flows. To this end, a SAR model based on an O-D approach was used to identify the most influencing factors of domestic tourism in Spain. The estimation of an SAR model allows us to

quantify the total, direct, and indirect (spillover) effects. The main results, contributions, and political recommendations derived from the econometric analysis are summarised as follows:

– There is a significant spatial spillover effect among the regions of destination in Spain. The domestic tourist inbounds of a region benefits from the tourism received by its neighbouring regions. This finding is important from an academic point of view owing to two inter-related reasons. The first one is that spatial dependence matters and plays an important role in determining tourist flows. The second reason is that tourism researchers must include spatial effects to model domestic tourism demand. The omission of the spatial effect implies that the commonly used gravity model is not well specified, and hence produces biased estimates.
– The income elasticity of demand for inter-regional domestic tourism is equal to 1, which implies that the domestic tourism increases or decreases in the same proportion as the income of the residents. In the case of intra-regional tourism, this elasticity is higher (2.57). These estimates are relevant for national and regional policy-makers as they can be used for forecasting the demand for domestic tourism. In this regard, according to the estimates provided by this study and the predictions of the European Commission concerning the Spanish economic growth, the inter-regional domestic tourism in Spain is expected to grow at the rates of 2.8% in 2017 and 2.4% in 2018.[19] Furthermore, intra-regional tourism should increase by 7.2 and 6.17%, respectively, in 2017 and 2018.
– The demand for interregional tourism is highly elastic (–4.34). The demand strongly reacts if the level of relative prices rises in the region of destination. In other words, domestic tourists are very price sensitive, which is also indicative of a strong competition among regions for attracting domestic tourism.
– Our results show that distance, which approximates the effect of physical, temporal, and monetary travelling cost, is negatively related to domestic tourism. According to our estimate, the number of tourist trips is reduced by 0.003% for each kilometre separating the regions of origin and destination.
– The level of wealth in the region of destination has a positive and significant effect on inter-regional tourist flows. The cultural, recreational, and natural characteristics of the regions are important factors of tourist attraction. Our results suggest that political authorities must preserve the quality of the beaches and extend the cultural offer of the regions. Similarly, our study empirically supports the importance of theme parks, and above all, natural parks as driving factors of domestic tourism.

[19] The European Commission foresees that the Spanish economy will grow at 2.8% in 2017 and 2.4% in 2018. This information can be obtained from the webpage: https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-performance-country/spain/economic-forecast-spain_en.

– Despite the fact that most of the domestic trips are made by car, our results reveal that the number of airports in a region has a positive and significant effect on regional inbound and outbound tourism. Enhancing the importance of airports and facilitating flight connections among regions should contribute to promote domestic tourism.
– The characteristic of insularity is a pull factor for domestic tourism. On the contrary, the autonomous cities of Ceuta and Melilla benefit from less domestic tourism from the other regions of Spain, presumably owing to bad or expensive transport connections.

Our results are robust to different assumptions on the modelling specifications, and provide modest but new and clear evidence of the most relevant push and pull factors of domestic tourism. However, further research is needed to even better characterise and understand the factors that drive the demand for domestic tourism in Spain.

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Congress tourism and fair tourism of Slovakia – quantification, spatial differentiation, and classification

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Congress tourism and fair tourism are two of the most profiting types of tourism from the perspective of economic benefits. According to the research in the field of tourism, they are part of meetings, incentives, conferences, and exhibitions (MICE) tourism. Developed countries with developed tourism focus on the importance of MICE. They also compete with one another. From the perspective of congress tourism, Slovakia is an attractive country due to its location in Central Europe, membership to the EU and Schengen, good transportation accessibility and political stability. This paper evaluates the development and importance of congress tourism and fair tourism as well as briefly evaluates the history of the development and potential of Slovakia, and characterises the accommodation infrastructure of these types of tourism in Slovakia. The conclusion summarises the most important findings of the analysis of congress centres as well as the findings of the identification of the main resorts of fair tourism in Slovakia.

Introduction

Congress tourism and fair tourism are two of the most profiting types of tourism from the perspective of economic benefits. Both are part of MICE tourism. Countries with developed tourism focus on the importance of MICE. These international destinations also compete with one another. Congresses are characterised by relatively high economic benefit and represent a way to promote cities (often on an international level) or countries that host them. These two types of tourism can also 'fill in' the off-season parts of the year and enable resorts to redistribute the tourist occupancy and create profit equally throughout the year. Both fair tourism and con-

gress tourism are economically oriented types of tourism that are bound to the existence of suitable conditions (material and technical basis) for their realisation. It is not only typical of the facilities such as exhibitions or congress resorts, but also their accompanying infrastructure or services, such as transportation system and accommodation (Vystoupil et al. 2006).

Slovakia is attractive for the needs of these types of tourism due to its location in Central Europe, membership to the EU and Schengen, good transportation accessibility, and political stability. Many of the resorts have additional services available, such as wellness and spa facilities, attractive regional products (cuisine, folklore, etc.), and attractive cultural and architectural sites (United Nations Educational, Scientific and Cultural Organisation [UNESCO] sites). These types of tourism are demanding material and personnel capacities, and the resorts need to have specific infrastructure.

This paper presents a brief overview of congress tourism and fair tourism, and evaluates their development and importance as well as briefly evaluates the development, potential of Slovakia and characterises the accommodation infrastructure of these types of tourism in Slovakia. The conclusion summarises the most important findings of the typing of congress resorts as well as the findings of the identification of the main resorts of congress tourism and fair tourism in Slovakia. Resorts are compared on a regional level and spatially differentiated on the level of resorts.

Theoretical basis and literature review

The concept of MICE tourism is widely used within the field of tourism. MICE tourism is considered the fastest growing sector of tourism of the recent past (Dwyer–Forsyth 1997, Mistilis–Dwyer 1999, 2000, Sangpikul–Kim 2009). Matlovičová et al. (2015) understand this concept as business trips during which a traveller uses tourist services. Some authors consider MICE to be a part of event tourism, business tourism, or business events (Getz 2008, Getz–Page 2016, Rogerson 2005 in Caber et al. 2017). Business tourism, where the trip is undertaken for business and not for leisure purposes, is a major segment of the tourism market and is vitally important to the economies of many countries worldwide (Mair 2010). Davidson (1994) in Swarbrooke–Horner (2001) considers business tourism concerned with people travelling for purposes that are related to their work. This paper analyses only part of business tourism, specifically congress tourism and fair tourism.

Congress tourism is a part of tourism focused on 'exchange of expert and scientific knowledge and experience combined with travelling of people within the congress locality' (Orieška 2001). Pekez-Pavliško et al. (2016) point out that this type of tourism is also labelled as a type of convention tourism (Yoo 2005) or convention

and meetings tourism. It experienced tremendous growth during the past decade, and today, it is truly global in nature (Yoo–Weber 2005, Yoo 2005). According to Spiller (2014), foundations for the modern convention industry or convention tourism were laid only in the past two centuries, particularly in the United States and in Europe. During the late 19th and early 20th centuries, industrialisation spread throughout the United States as well as in Western Europe. With the growth of industry and commerce, the need for meetings between businesspersons and entrepreneurs has been materialised. Scientific and technological revolution, development of education and information technology had strong influences on the development of congress tourism in the 20th century. The positive influence is mutual as stated by Dwyer–Forsyth (1997) that meetings and conventions are a source of continuing education and training and are a forum for developing and maintaining professional contacts. Conferences draw together leading national and international specialists and practitioners in their fields, including world leaders in science, medicine, and business, strengthening a nation's internal capabilities in each profession (Dwyer–Forsyth 1997).

According to Spiller (2014), congress tourism is one of the most buoyant sectors of the tourism industry. Attendees of congresses are demanding guests with high purchasing power; therefore, they need the provision of all necessary conditions for quality work, but also for quality leisure time (Gregoric et al. 2016). A significant benefit of congress tourism is its time of organisation of the events. The season does not play an important role. It is popular among accommodation service providers as it successfully fills hotel capacities during the off-season. It is generally held in spring or autumn seasons when hotel facilities need to fill in their free rooms (Kasagranda 2015, Matušiková–Plavčanová 2014, Šušić–Mojić 2014).

Events in congress tourism can vary in size. Carey (1999) and Rogers (2003) explain that a congress is a regular meeting of a large scale, the coming together of large groups of attendees, where they discuss a particular issue over the course of several days. Conferences are also intended for discussions, exchange of experience, and problem solving, but generally on a smaller scale than congresses (Rogers 2008). Colloquiums and seminars are even shorter in time and smaller in scale. These events are appealing to professionals owing to the ability to present and discuss topics in a smaller circle of people.

The development of congress tourism requires a quality congress-tourism offer, which will satisfy the needs of the attendees and organisers of the congress. The quality of the congress or conference is dependent on many factors, many of which are the quality of the organisation of the event and the quality of the facility hosting the event. Congress tourism as a part of MICE tourism is a multifaceted industry. Its activities require, to a varying extent, many different players (Mistilis–Dwyer 2000): transport (international and domestic), accommodation, provision of pre- and post-conference tour opportunities, specific venues-purpose built centres

and hotels, services of professional conference and exhibition organisers, catering services, social programs for delegates and attendees, specialised technical support such as audio-visual services, and exhibition facilities for products.

Kuo et al. (2010) evaluated the satisfaction of the attendees of congress tourism at international congresses in Taiwan. The authors point out that the satisfaction of the attendees is dependent on a wide range of segments, such as hotel lodging, transportation, restaurants, tours, sightseeing, and entertainment. According to the authors, hotel services are critical to the success of the conference industry. The first contact or impression of international conference attendees is the one they have with hotel services, and this directly affects their satisfaction with international conferences. It is not only about the quality of the accommodation, but also about helpfulness, flexibility, awareness of the personnel, language and organisational capabilities as well as the ability to solve unexpected problems and satisfy special requests of the attendees of the events. Wei and Huang (2013) highlight that the planners of international conferences are advised to consider the conference-specific demands of the attendees when developing food service schemes. On such occasions, food is largely provided in the form of buffets that feature flexible options to feed a diverse body of attendees. Congress resorts are beginning to explore more options for attractive food display as food-conscious conference attendees are now demanding more than a quick bite (Wei–Huang 2013). The attendees of the conferences appreciate local products (cuisines as well as souvenirs).

One of the essential elements is the technical equipment of the accommodation facilities for the purpose of congress tourism. These facilities need to have sufficient number of larger and smaller conference rooms equipped with necessary audio-visual equipment as well as Internet connections (Schlentrich 2008). Information technologies have started to be an important precondition for the localisation of congress tourism. Mistilis and Dwyer suggested in 2000 that the rapid growth of MICE tourism, combined with increasing competition, makes information technology an imperative tool for marketing, distribution, promotion, and coordination.

Owing to the importance of this type of tourism, we can state that congress tourism helps the hotel industry to survive and it supports regional conditions. Congress tourism can constitute an important factor in developing the image of a place, region, or country where congress events take place, as both private and public entities are interested in the development of congress tourism (Orieška 2007). Regions have good odds in becoming more visible when choosing the appropriate social program with the usage of local products and local atmosphere. Few examples of these programs are thematic excursions in nature or around the place of the event, trips to the local employers, tasting of local products, offer of local handmade products, and shows of local bands (preferably folk bands). Even negative phenomena that are present in the location of the congress can attract attention of the attendees of these events.

The other parts of MICE tourism are fairs and exhibitions. According to Mydlová and Tolmáči (2013), fairs and exhibitions belong to the oldest communication tools that have been present since the time of ancient Rome to the present era of multimedia society. Similarly, Davidson (1994) in Swarbrooke–Horner (2001) states that a visit to these events is one of the oldest forms of tourism; men have travelled for this purpose of trade since the early times. The higher necessity to organise exhibitions emerged from the beginning of the industrial revolution. The first industrial exhibitions (both expert and for the public) took place from the middle of the 18th century. The first exhibition in continental Europe titled Waarenkabinet (display of goods) took place in Prague in 1791. The exhibition took place in the honour of the coronation of Leopold II. The organisation of these events soon started to occur on almost an annual basis in Paris and soon after in other cities and countries of Europe at the turn of the 18th and 19th centuries.

The development of exhibitions is inextricably coupled with the development of the economic fields that exhibitions serve as trade, information exchange, and network platforms (Jin et al. 2010). The praxis supports the significance of fairs and exhibitions, even in the 21st century and in the time of globalisation. A new type of industry ('fair industry' or 'exhibition industry' or within tourism as 'fair tourism' or 'exhibition tourism') grows around this complex medium and creates a global network of organisations and associations that control the direction of the industry. The growth of the industry was manifested in the rise of the numbers of fairs and exhibitions (UFI 2017). Global Association of the Exhibition Industry (UFI) was founded in Milan, Italy in 1925 by 20 leading European international trade fairs. UFI had 211 members (exhibition centres) in 2000, 540 members in 2010, 675 members in 2015, and 668 members in 2017 (until May). The association was present in 272 cities in 83 countries until May 2017. The attendees of the exhibitions have similar needs to the attendees of congresses, such as higher standards of services, sufficient knowledge, and need of a professional approach. According to Gúčik (2001, 2010), Plesník (1999), Novacká et al. (1999), and Krogmann (2002, 1999a, 1999b), they are clients with higher average expenditure in tourism.

The economic impact of congress or fair tourism is highly significant owing to the low economic and foreign exchange pressure on the industry (Grado et al. 1997). According to Bradley et al. (2002), tourists of meeting events are major users of the entertainment and accommodation facilities of the locations they visit. Congress and fair tourists spend more money on an average than leisure tourists do. The same authors emphasise that the potential for direct and indirect job creation associated with meetings tourism has been recognised as high. The importance and growth of congress tourism and fair tourism, which are reflected by the construction of centres and buildings for conferences and conventions, are not only witnessed in the major cities of the world, but are also increasing in secondary and tertiary tourist cities and locations (Oppermann 1996 in Martín et al. 2017).

There are several definitions for congress tourism. Orieška (2004) defines it as a type of tourism that is only very occasionally the result of a decision of an individual attendee. The motive of the attendee is mainly driven by his/her work necessities. Zelenka–Pásková (2012) and Malá (2002) consider congress tourism to be a form that is executed based on the visitors' motive. This motive can be primarily related to work and other activities, where leisure and regeneration are often only an additional service (sometimes entirely absent). Congress tourism is focused primarily on the exchange of expert, scientific, and other experiences.

Owing to the ongoing debate about inclusion of major forms or types of tourism into specific categories, authors of this article decided to identify it as a type of tourism according to Kasagranda (2016), Šauer et al. (2015), and Lew et al. (2011). This type of tourism is a wider concept that includes both types (the determining criterion is the course of the event) and forms (the determining criterion is the course of the motivation) of tourism. The authors consider congress tourism and fair tourism to be a type of tourism.

The term 'tourist resort' is another problematic term owing to its problematic spatial delimitation in geographical literature/research of tourism. Many authors discussed this problematic delimitation (Holešinská 2012, Kasagranda et al. 2016, Mariot 2001, Šíp 2005, Vystoupil et al. 2016, etc.). The authors of this article understand the term tourist resort as an administrative unit (commune/city) with tourist attractions, sufficient tourist infrastructure, and with accommodation facility with a specific bed capacity.

Methodology

The authors base their characteristics of congress tourism on research of some Slovak and Czech authors (Čuka–Šenková 2012, Krogmann 1999a, 1999b, Malá 2002, Orieška 2001, 2004, Vincze 2015, Vystoupil et al. 2006, 2011, and Zelenka–Pásková 2012). These authors address congress tourism as one of the essential components of tourism. There are many aspects that are absent in the geographic research of tourism, such as the spatial quantification of data and its identification (within the structure of Slovak tourism, differentiation on regional level or level of individual resorts) or two-way comparison and categorization of both congress and fair resorts. The authors' goal is to present a simple spatial analysis of congress tourism and fair tourism.

The theoretical portions of this article present an overview of the approaches to the solution of congress tourism and fair tourism in foreign countries as well as in Slovakia. The main goal of this article is to outline the main research questions when identifying MICE tourism and its connection to congress tourism and fair tourism.

In the introduction of the analytical part of this paper, the authors identify the brief development of congress tourism and fair tourism in a Slovakian context according to Esterhay (2010), Komora (2016), Kačírek and Tišliar (2014), Jančura

(2011), and Kršák et al. (2009). The brief development is followed by an outline of the brief characteristics of the potential of territory according to Matušikova–Plavčanova (2014), Slovakia.Travel (2017), and ICCA (2017).

The authors followed few logical steps when delimiting resorts of congress tourism and fair tourism. The first step was to identify the resorts of tourism according to Mariot (2001) and Vystoupil et al. (2011, 2016). As such, the SO SR (2017) database was used for the identification of 753 administrative units with mass accommodation facilities in 2015. In the second step, the authors used the database of MTC SR (2017a) and Slovakia.Travel (2016) to single out resorts that have facilities of congress tourism according to the Ministry of Transport and Construction of the Slovak Republic. There were totally 74 resorts identified (9.8%) with 33,604 beds from a total of 198,585 beds in Slovakia in 2017 (the share of beds used in congress tourism was 16.9%).[1] Regional differentiation was created within the internal structure of the resorts of congress tourism. Infrastructure was evaluated (number of facilities of congress tourism in resorts, number of apartments and beds) and subsequently, the number and visit rate of the congress events were evaluated and spatially differentiated on a regional level.

The main part of this article is dedicated to the spatial analysis of congress tourism and fair tourism in Slovakia. The authors used the modified methodology of Vystoupil et al. (2006, 2011) and used the following criteria for the identification of the most important resorts of congress tourism:

– identification of 753 administrative units with mass accommodation facilities together with 74 resorts of congress tourism,
– identification of the number of accommodation facilities in these resorts.
– allocation of the number of apartments, mainly the number of beds,
– allocation of the area of conference space in the resort or its close proximity.

A total of 15 very attractive resorts of congress tourism was identified (see Table 3). These 15 resorts account for 66.4% of all the bed capacity of resorts of congress tourism (from a total of 74). These very attractive resorts were given the status of international, national, supra-regional, and regional significance, according to secondary criteria. The other 59 resorts of congress tourism were categorised as 'other resorts of congress tourism'.

Resorts characterised as international dispose superstructures that are suitable for congress events of global importance. They have excellent transportation accessibility, excellent accommodation and congress capacities, and have connections to

[1] The authors do not challenge the ability of other resorts to host congresses (outside the 74 resorts). The authors assume that the application of the mentioned criteria represent limits for movement from local to regional significance. Databases of MTC SR (2017) or Slovakia.Travel (2016) has 209 subjects of congress tourism. Slovak Convention Bureau is one of the key organisations for organising congresses of great importance. The authors assume that the centres (having good infrastructure) that organise the most significant congresses are present in the database.

international organisations/institutions and companies. They dispose excellent preconditions for the development of congress tourism as well.

Resorts of national importance have relatively large number of international clientele, above standard number of more luxurious accommodation capacities, sufficient superstructure for the purpose of a major congress with international participation of at least European importance. These resorts are also important centres of tourism.

Resorts of supra-regional importance dispose sufficient infrastructure for organising a significant congress. These resorts are categorised according to Vystoupil et al. (2016) and are centres of tourism with higher than regional significance. More luxurious accommodation facilities are present in their territory (hotels with four plus stars). International visitors are common in these resorts with sufficient capacity of congress space.

Resorts of regional importance are often used for organising congresses with at least national attendance for companies and institutions that are present in the region. They dispose at least basic superstructure for the realisation of similar events.

The other resorts that dispose congress facilities are identified according to the database of SO SR (2017) and MTC SR (2017a, 2017b) as 'others'.

Resorts of fair tourism were more easily quantified in Slovakia than it was in the case of resorts of congress tourism. Slovakia was a part of Hungary (and Austria-Hungary) for a long time, and subsequently a part of Czechoslovakia. There were more significant resorts of fair tourism in close proximity such as Vienna, Budapest, Prague, and Brno. As such, Slovakia did not develop a tradition of fair tourism. The authors used listed criteria to determine the potential resorts of fair tourism (methodology of Vystoupil et al. 2006, Vystoupil et al. 2011):

– dimension of the indoor exhibition area used for fair/exhibition purposes,
– number of regular events in a year,
– tradition of fairs in the tourist resort (counting the year of the oldest organised event).

If the mentioned methodology used for the identification of resorts of fair tourism in Czech Republic is applied to Slovakia, three resorts can meet the minimum criteria (Trenčín, Košice, and Banská Bystrica), while Nitra can meet the more strict criteria and only Bratislava can partially meet the toughest criteria. None of the fair resorts in Slovakia can be compared to the most significant fair resorts of the V4 countries and Austria, such as Vienna, Budapest, Warsaw, Krakow, Graz, or Brno. Two resorts of fair tourism are relevant in Slovakia from an international perspective: Bratislava and Nitra. These two are thoroughly characterised in the results.

There is important information that is necessary to mention at the end of this methodical part. The authors processed the most detailed available statistical database that reflects the present condition of congress tourism and fair tourism in Slovakia when identifying tourist resorts. The Ministry of Transportation and

Construction of the Slovak Republic as well as the Statistical Office of the Slovak Republic probably dispose more specific data on the level of individual resorts, congresses, and fair events (database of superstructure of resorts of tourism, number of visitors of congress events in the resorts of tourism, percentage of international visitors, characteristics and internal categorization of fairs/congresses, their distribution and multiplicity throughout a year, etc.). Such data, under the information of the mentioned institutions, are secret and private data, which can be published only after previous generalisation. According to what was mentioned, the data was not provided for the purpose of this article even after multiple enquires. It is also necessary to mention that similar analysis would exceed the extent of this article and it was not its main goal.

Results

The development and importance of congress tourism and fair tourism in Slovakia

The main positive factor of the development of congress tourism in Slovakia was the development of university education (the foundation of many faculties of Comenius University and other universities as the ones in Žilina [1953], Banská Bystrica [1954], Košice and Nitra [1959]) and other scientific or technological institutions (e.g. Slovak Academy of Sciences in 1953) in the after war period. Socialism, owing to its ideology, helped to develop tourism in Slovakia due to its necessity to organise smaller or larger events of the Communist party.

Congress events (various conferences, symposiums, scientific, expert, or politically motivated programmes) took place in different parts of Slovakia with various periodicity, but without commercial character. Congress tourism in the present definition started to develop in Slovakia after the economic transformation of 1990. Liberalisation of the market along with relieving of the social environment (freedom of grouping, opening of borders) enabled the formation of congress tourism as a specific and essential form of tourism in general.

The success of the development of congress tourism is connected to its year-round feasibility that applies to the region of Tatras (Esterhay 2010) or many spa resorts.

The development of exhibitions dates back to 19th century as well. The most significant fair in Hungary was the Hungarian industrial exhibition in 1841 in Pest. The exhibition lasted nearly a month and was attended by 14,425 paying visitors (Komora 2016). It was soon followed by other exhibitions (in 1843 and 1846). The exhibition continuity was halted by the revolutionary years of 1848–1849 and after the suppression of the revolution, a repression of public life took place in Hungary. Slovakia as a part of Hungary started to organise exhibitions of regional character. Industrial exhibitions in Košice and Prešov in 1846 are considered the first modern exhibitions of fair character in Slovakia (Komora 2016). The devel-

opment of fairs in Hungary (in the Slovak part as well) was halted for social, economic, and political reasons after the revolutionary years of 1848–1849. Other countries of the world experienced a rapid development of fair tourism. A 'World Fair' tradition started in London in 1851. Central Europe was not without involvement as participants' from Central Europe were part of the World Fairs and the Fifth World Fair took place in the nearby Vienna in 1873. The number of fairs that took place in Hungary, as well as in the region of Slovakia, started to increase by the second half of the 19th century. Exhibitions were numerous, mainly in Bratislava, Kežmarok, and Košice. Numerous one-off events took place in cities such as Rimavská Sobota, Oravský Podzámok, Nitra, Martin, Trnava, Komárno, Liptovský Mikuláš, Prešov, Žilina, and Spišská Nová Ves. The most significant event that took place in Hungary was without doubt the Millennial Fair in Budapest in 1896. The exhibition hall with an area of 55 ha was visited by 5.8 million visitors in 6 months. With these numbers, the Millennial Fair resembled the fairs around the world (Komora 2016). The largest fair in the region of Slovakia was the Second Provincial Agricultural Fair that took place in Bratislava in 1902. The exhibition area was in the present Sad Janka Kráľa area in Petržálka (22 ha) and was visited by 180,000 visitors in 20 days (Komora 2016, Kačírek–Tišliar 2014). An industrial exhibition took place in Žilina in 1903. It was the largest exhibition of its kind in the region of Slovakia with an exhibition area of 10 ha and with 60,000 visitors in 6 weeks. The popularity of economic exhibitions was in decline in the next period. The continuity of exhibitions was than halted by the First World War (Kršák et al. 2009).

With the formation of Czechoslovakia, the position of Slovakia changed rapidly. Fairs experienced a renaissance owing to an increased effort to present the development of Slovakia in the new political situation. The most significant of all the events was the Bratislava Fair that took place between 1921 and 1942. The importance of these events was weakened by the economic crisis from 1930 (Jančura 2011). Several regional exhibitions took place in Slovakia in the interwar period (Bratislava, Malacky, Liptovský Hrádok, Zvolen, Košice, Nitra, Trnava, etc.). All these were affected by the economic crisis. In 1938, there was a unique attempt to create a new fair centre in Košice by building a new exhibition area and by organising the 'Exhibition of the East of ČSR'.

After the Second World War, the development of fairs and exhibitions was halted owing to the changing political relations after the communists took over in Slovakia. Bratislava started to organise exhibitions after 1967 when exhibitions of chemical products 'Incheba' (later renamed as International Chemical Fair [INCHEBA]) took place (Kršák et al. 2009). The present exhibition area of Incheba was not planned and built until the late 1970s. Soon after its completion, it started to host other events, such as INTERCAMPING, FLORA, and POLYMARKET. Trenčín started to host exhibitions, sooner than Bratislava, from 1963. It hosted the

exhibition of "Trenčín mesto módy" (Trenčín the City of Fashion) for which it later built a separate exhibition area. Nitra has become the third fair resort in Slovakia. Nitra has been hosting the agricultural exhibition 'Agrokomplex' since 1973. The largest exhibition area in Slovakia was built for this event (143 ha). Exhibitions have returned to Košice since 1981, specifically 'Košické výstavné trhy' (Košice Exhibition Markets).

The change of the regime and the economic transformation after 1990 presented a new impulse for the development of fairs in Slovakia. All the three major fair resorts (in Bratislava, Nitra, and Trenčín) had to be adapted to the growing competition by raising the number of events that they hosted. Banská Bystrica has hosted exhibitions as well from 1993. Exhibitions in Slovakia had to be accustomed to challenging international competition, changes in the market, as well as demand of the public. The two largest exhibition areas INCHEBA EXPO in Bratislava and AGROKOMPLEX in Nitra, in reaction to the changing market, started to open to the dynamically developing congress tourism.

Potentials for the development of congress tourism and fair tourism in Slovakia

According to Čujková (2012) in Matušíková–Plavčanová (2012), the Slovak agency for tourism considers congress tourism strongly important. As such, it has created the Department of Congress Tourism, whose main responsibility is to move Slovakia from the position of one of the least known convention destinations in Europe to the position of an interesting, attractive, and competitive destination. This brings a tremendous challenge for the future.

Based on Slovakia.Travel (2017), Slovakia is a unique country located in the middle of Europe. It is a perfect destination for meetings, incentives, congresses, and events. The modern cities and their surroundings are supported by infrastructure, quality, and service. The countryside is full of unspoiled natural beauty. You will come across a multitude of outstanding cultural treasures, and taste delicious Slovak food and drinks which, with the influence of Hungarian, Austrian, and Czech regional cuisines, is exceptional. The same source indicates 10 strong points of Slovakia: stability of the destination; its scenery; cities and towns; thermal water and spas; gastronomy, traditions and folklore; great location and easy to reach Bratislava; history, culture and heritage; active holidays and busy cultural and social life; and not limited to the capital city.

Overview of congress and fair resorts

The International Congress and Convention Association (ICCA) (2017) measured the number and performance of congresses in Slovakia in 2016. Slovakia was ranked 63rd in the world in the number of congresses hosted (32nd in Europe). In comparison with the other V4 countries, Slovakia was ranked the worst (world ranking:

Poland was the 17th, Czech Republic was the 29th, and Hungary was the 33rd). Austria was ranked 12th in the world and 8th in Europe. The position of Slovakia moved down in ranking by six places in comparison with 2013. There were totally 33 congress events in Slovakia (of which 21 were in Bratislava). According to ICCA (2017), Bratislava ranks 120th in the world (moved up in the ranking by 14 places in comparison to its 2015 rank). Bratislava is ranked as the worst V4 capital (Prague is the 11th, Budapest is the 16th, and Varsaw is the 30th). Vienna belongs to the most significant world congress resorts as it is ranked as the second world congress centre right after Paris.

Facilities of congress tourism are organised into an organisation called the Slovak Convention Bureau. This organisation benefits from its membership to the national touristic organisation, Slovak Agency for Tourism (from 1 January 2017, the competences moved to the Ministry of Transportation and Construction of Slovak Republic [MTC SR]) and partnership with key service providers of MICE. In 2016, the organisation associated 4 hotels classified as 'professional organisers of congress events' (all in Bratislava), 5 'organisations of destination management' (4 in Bratislava and 1 in Pezinok), and 10 hotels with category of 'congress and conference facility member of SCB in Slovakia' (7 in Bratislava, 2 in Vysoké Tary, and 1 in Nitra). MTC SR (2017a) or Slovakia.Travel.sk (2016) agency (that worked until recently) also have a registry of the congress resorts of tourism. According to both these registers, there were totally 208 facilities in 74 resorts of tourism in 2015 (see Table 1).

The highest number of resorts can be found in the Žilina region (17) when spatially differentiating the resorts on the level of regions, than in Prešov region (13) and Banská Bystrica region (11). According to Vystoupil et al. (2016), these regions are characterised by high share of beds in city, mountain, and spa resorts. These resorts have very good infrastructures of bed capacities with exceptional additional services. They are primarily oriented towards luxurious clients and hotels of mainly five-star facilities. Congress tourism can play a dominant position on the visit rate of these resorts mainly in the off-season in the near future.

Bratislava is the most significant resort of congress tourism and fair tourism in Slovakia. There are many reasons why is it so. It is the capital and the resort of major scientific and expert institutions, universities, or seats of board of directors of major companies. The city benefits from the close proximity to Vienna, an international airport, good highways and railroad connection, close proximity to cultural and historical landmarks, and has sufficient number of accommodation capacities suitable for the needs of MICE tourism. The INCHEBA EXPO area, which regularly hosts CONECO exhibition, is in the close vicinity of the city resort.

Žilina, Košice, and Nitra are other important resorts of congress tourism in Slovakia. All these cities are more than just the capitals of their regions. Košice is 'the capital' of the East Slovakia with good infrastructure. Žilina has the University of Žilina, formerly known as the University of Transportation. This university was the

only university in the former Czechoslovakia, which awarded a degree in transportation. Nitra is the seat of more universities and has the national exhibition area AGROKOMPLEX (Krogmann 1999a, 2002).

The other cities are predominantly resorts of congress tourism. These cities benefit from the environment or specifically natural environment. Many of them benefitted from the development of spas or were considered as a good access point to the mountains in the past. As such, many of these cities have had a good infrastructure necessary for the development of the present tourism (spa resorts Piešťany, Vysoké Tatry, Trenčianske Teplice, Bojnice, and Bešeňová; access point to the mountains/valleys of Tatry and Nízke Tatry, specifically Poprad, Demänovská dolina, Stará Lesná, etc.). These resorts were not originally used for the needs of congress tourism, but the owners of the facilities of tourism realised the potential of the locality and the facility to adjust to the needs of congress tourism.

Accommodation infrastructure, guests and visitors of congress and fair resorts

According to Slovakia.Travel (2016), there were 74 congress resorts with 208 mass accommodation facilities with a total number of 33,604 bed capacities in 2015 (see Table 1). The bed capacities of congress tourism accounts for 16.9% of the total share of mass accommodation facilities in Slovakia. The highest number of resorts is in the Žilina region (17), Prešov region (13), and Banská Bystrica region (11). The share of these resorts amounts to 55.5% among all resorts of congress tourism. The reasons for this were discussed in the previous part. The highest number of beds is concentrated in cities or villages (based on their significance) in the region of Bratislava and Prešov (Vysoké Tatry, Poprad, Stará Lesná, etc.). These resorts combined to 53.1% of the total share of the bed capacities of congress resorts (see Table 1 and Figure 1) and 49.4% of the total share of all bed capacities in congress tourism. This situation is understandable based on the importance of both resorts in the structure of tourism in Slovakia. The regions of Nitra, Trnava, Trenčín, and Košice (see Table 1 and Figure 1) are characterised by one well-equipped resort. These resorts are the economic resorts of the regions or have sufficient facility infrastructure that is – according to categorization of Vystoupil et al. (2016) or Kasagranda et al. (2016) – oriented predominantly on the wealthy clientele.

Table 1

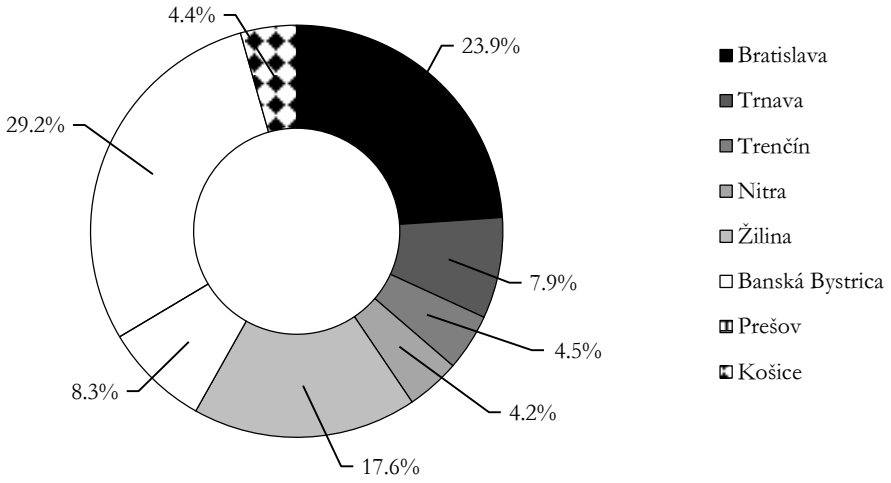
Characteristics of resorts with congress centre in Slovakia, 2015

County/region	Number of resorts	Distribution of the number of resorts, %	Number of accommodation facilities	Distribution of the number of accommodation facilities, %	Number of rooms	Distribution of the number of rooms, %	Number of beds	Distribution of the number of beds, %
Bratislava	5	6.8	46	22.1	4,439	30.7	8,043	23.9
Trnava	8	10.8	17	8.2	1,3	9.0	2,662	7.9
Trenčín	6	8.1	14	6.7	570	3.9	1,501	4.5
Nitra	9	12.2	14	6.7	578	4.0	1,419	4.2
Žilina	17	23.0	31	14.9	1,986	13.8	5,913	17.6
Banská Bystrica	11	14.9	20	9.6	1,039	7.2	2,789	8.3
Prešov	13	17.6	51	24.5	3,91	27.1	9,798	29.2
Košice	5	6.8	15	7.2	621	4.3	1,479	4.4
Slovakia	*74*	*100.0*	*208*	*100.0*	*14,443*	*100.0*	*33,604*	*100.0*

Note: Here and in the following tables and figures, the deviations from 100.0% result from rounding.
Source: Own calculation based on MTC SR (2017a) and Slovakia.Travel (2016).

Figure 1

Distribution of beds in resorts of congress tourism by counties/regions of Slovakia, 2015



Source: Own calculation based on MTC SR (2017a) and Slovakia.Travel (2016).

There are two regions of *fair resorts* in Slovakia that are partially capable to withstand international competition. The first group of resorts is located in Bratislava (due to INCHEBA EXPO arena with 27 events in 2015) and the second is in Nitra (with AGROKOMPLEX exposition area with 26 events in 2015, its history is related to Slovak Agricultural University in Nitra). The other fair resorts such as Trenčín, Košice, and Banská Bystrica do not exceed regional character.

Table 2

Number and distribution of the participants and events of congress tourism in Slovakia

County/region	Number of participants		Change in the number of participants, %	Distribution of the number of participants, %		Number of events		Change in the number of events, %	Distribution of the number of events, %	
	2016	2015		2016	2015	2016	2015		2016	2015
Bratislava	199,819	234,047	–14.6	39.5	46.8	2,010	2,081	–3.4	39.9	42.9
Trnava	49,679	38,800	28.0	9.8	7.8	496	372	33.3	9.8	7.7
Trenčín	20,426	17,811	14.7	4.0	3.6	251	222	13.1	5.0	4.6
Nitra	13,154	22,857	–42.5	2.6	4.6	181	223	–18.8	3.6	4.6
Žilina	86,701	61,791	40.3	17.1	12.4	767	650	18.0	15.2	13.4
Banská Bystrica	65,038	58,014	12.1	12.8	11.6	658	701	–6.1	13.1	14.4
Prešov	41,241	43,157	–4.4	8.1	8.6	428	458	–6.6	8.5	9.4
Košice	30,256	23,170	30.6	6.0	4.6	245	148	65.5	4.9	3.0
Slovakia	*506,314*	*499,647*	1.3	*100.0*	*100.0*	*5,036*	*4,855*	3.7	*100.0*	*100.0*

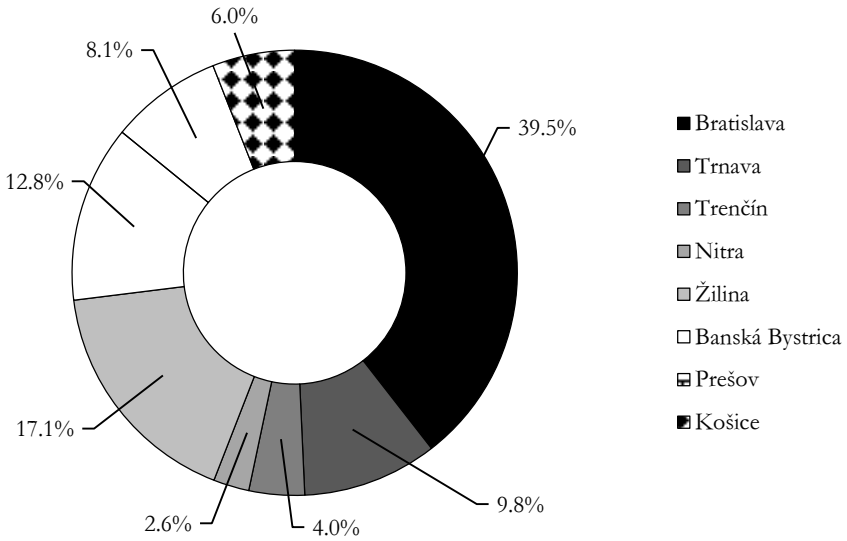
Source: Own calculation based on MTC SR (2017b) and SO SR (2017).

The Bratislava region dominates the number of attendees of congress tourism (with a total share of 46.8% in 2015 and 39.5% in 2016 of the total attendance of congress tourism in Slovakia) (see Table 2 and Figure 2). The Žilina region is second in the number of attendees of congress tourism (see Table 2 and Figure 2) with its congresses focused on industry and transportation. The city of Žilina seats a university that was at the prelude of the millennia, the most important university focusing on transportation in entire Czechoslovakia. Žilina resort is also one of the most important industrial centres of Slovakia. The Banská Bystrica region ranks third with a total share of attendees above 10% (see Table 2 and Figure 2). This region is specific. Two particularly attractive resorts of tourism are located here (Donovaly a Brezno–mainly part of Tále), each with history and developed infrastructure (both belong to the top 15 resorts of congress tourism). Besides these, there is the economic, political, educational resort and the regional capital Banská Bystrica. The city

of Banská Bystrica is not as significant as it was in the past, but suitable infrastructure remained for the possible use of congress tourism.

Figure 2

Distribution of the number of congress participants by counties/regions of Slovakia, 2016



Source: Own calculation based on MTC SR (2017b) and SO SR (2017).

The other regions are characterised by one or two significant economic resorts or have extremely attractive resorts of tourism, as mentioned in the previous part. Košice is the economic, scientific, and other centres of Košice region and of the entire East Slovakia. Piešťany is a well-developed centre of spa tourism of the Trnava region that focuses on more lucrative national and international clientele. It has excellent accommodation and other accompanying infrastructure that can be used (in combination with spa tourism that is the main type of tourism in the resort) for the purposes of congress tourism as well.

Classification of congress and fair resorts

The authors identified 15 resorts that exceeded local significance from a total of 74 resorts of congress tourism in Slovakia (20.3% of all the resorts). These resorts account for 66.4% of the total bed capacity of the congress resorts of tourism in Slovakia (22,314 from a total of 33,604 beds).

The rest of the 59 resorts were classified as 'Others'. These resorts represent 33.6% of the total share of bed capacity of the congress resorts of tourism in Slo-

vakia. These resorts are distributed relatively equally around Slovakia (see Figure 3). These resorts can be divided predominantly into two types of resorts when compared to the research of Vystoupil et al. (2016) and Kasagranda et al. (2016) (both concentrated on typisation of resorts of tourism). The first type of resorts according to Kasagranda et al. (2016) are the resorts of city tourism that fulfil the function of economic, social, educational, and other centres (such as Zvolen, Trnava, Trenčín, Prešov, and Dunajská Streda). The second type of resorts are particularly attractive resorts characterised according to Vystoupil et al. (2016) as resorts of spa (Rajecké Teplice, Turčianske Teplice, Sliač, etc.), resorts of summer recreation by water (Sládkovičovo, Šamorín, Štúrovo, Levice, Kolárovo, etc.), and mountain resorts of summer and winter recreations (Oščadnica, Ružomberok, Zázrivá, Pribylina, etc.). All these resorts have infrastructure oriented for more lucrative clientele with good hotel capacities and sufficient capacities of the congress and meeting rooms.

The city of Bratislava is the only resort of congress tourism in Slovakia with an *international significance*. It has 7,292 beds in 39 facilities that represent 21.7% share of the bed capacity of the congress resorts of tourism in Slovakia (see Table 3 and Figure 3). The position of Bratislava was mentioned many times in the previews parts of this text. It is an economic, cultural, educational, political, and other centre of Slovakia with very good infrastructure, numerous congress spaces, and good accessibility, among other features. Its position is strengthened by the fact that it is in close proximity to Vienna and Budapest, and by the river Danube. Bratislava is ranked at the bottom when compared to the major congress centres of V4 countries and Austria according to ICCA (2017). All the four capitals (Vienna, Prague, Budapest, and Warsaw) belong to the global top 30 centres of congress tourism. Bratislava is ranked 120th in terms of international significance.

Vysoké Tatry is the only resort of congress tourism in Slovakia with *national significance*. The city is very specific. There are 29 congress facilities with 5,556 beds (16.5% of total share of congress resorts of tourism) with an above average number of congress and meeting spaces. Vysoké Tatry is, in terms of area, the second largest resort in Slovakia. It comprises of three parts: Štrbské Pleso, Starý Smokovec, and Tatranská Lomnica (totally 15 settlements) that are natural centres of tourism in the Vysoké Tatry mountain range. This resort is the second most visited resort of tourism in Slovakia after Bratislava. The same applies for its infrastructure. There are a number of hotels that are oriented on wealthy national and international clientele and an airport Poprad–Tatry is in close vicinity. It can be assumed that owing to its natural and infrastructural advantages, this congress centre of tourism will develop and will exceed national significance.

Table 3
Overview of the most important resorts of congress tourism in Slovakia, 2015

Resort	Number of accommodation establishments	County/ region	Number of beds	Number of rooms	Distribution of beds by the top 15 resorts, %	Distribution of beds by all resorts, %	Dimension
Bratislava	39	Bratislava	7,292	4,111	32.7	21.7	International
Vysoké Tatry	29	Prešov	5,556	2,216	24.9	16.5	National
Piešťany	8	Trnava	1,716	911	7.7	5.1	Supra-regional
Demänovská dolina	4	Žilina	1,058	368	4.7	3.1	Supra-regional
Košice	10	Košice	1,033	452	4.6	3.1	Supra-regional
Žilina	6	Žilina	897	416	4.0	2.7	Supra-regional
Poprad	6	Prešov	837	379	3.8	2.5	Supra-regional
Bešeňová	4	Žilina	588	177	2.6	1.7	Regional
Brezno	4	Banská Bystrica	572	221	2.6	1.7	Regional
Banská Bystrica	3	Banská Bystrica	555	276	2.5	1.7	Regional
Senec	4	Bratislava	507	207	2.3	1.5	Regional
Trenčianske Teplice	4	Trenčín	495	235	2.2	1.5	Regional
Martin	4	Žilina	487	189	2.2	1.4	Regional
Nitra	5	Nitra	404	202	1.8	1.2	Regional
Stará Lesná	3	Prešov	317	132	1.4	0.9	Regional
Top 15 resorts	*142*	–	*22,314*	*10,492*	*100.0*	66.4	–
Other (59)	66	–	11,290	3,951	–	33.6	–
Total (74) resorts)	*208*	–	*33,604*	*14,443*	–	*100.0*	–

Source: Own calculation based on MTC SR (2017a) and Slovakia.Travel (2016).

Piešťany, Demänovská dolina, Košice, and Žilina a Poprad are the five congress resorts of tourism in Slovakia with *supra-regional significance*. There is total of 34 facilities with 5,541 beds (16.5% of the total share of congress resorts). The resorts of supra-regional significance (see Table 3 and Figure 3) can be divided into two groups. The first group consists of Košice and Žilina as natural economic, cultural, social, and other centres of the regions. Košice is the counterpart of Bratislava

and the most important centre of East Slovakia. Žilina is an important industrial centre of the Považie region. International investors have economic interests in both these centres. As such, the congresses take place in both these cities. Both the cities have major investors (US Steel in Košice or KIA motors in Žilina), educational institutions (Pavol Jozef Šafárik University in Košice, University of Žilina), and therefore have the potential for organising expert oriented smaller congresses with international attendance. The second group of supra-regional significance consists of specially attractive resorts of tourism (Piešťany as the most important spa resort in Slovakia and Demänovská dolina a Poprad as particularly attractive resorts of winter and summer mountain recreation) that concentrate on wealthy clientele. These resorts have a high share of international tourists, excellent accommodation infrastructure, and above average accommodation capacities of the higher category. The surroundings have good additional infrastructure.

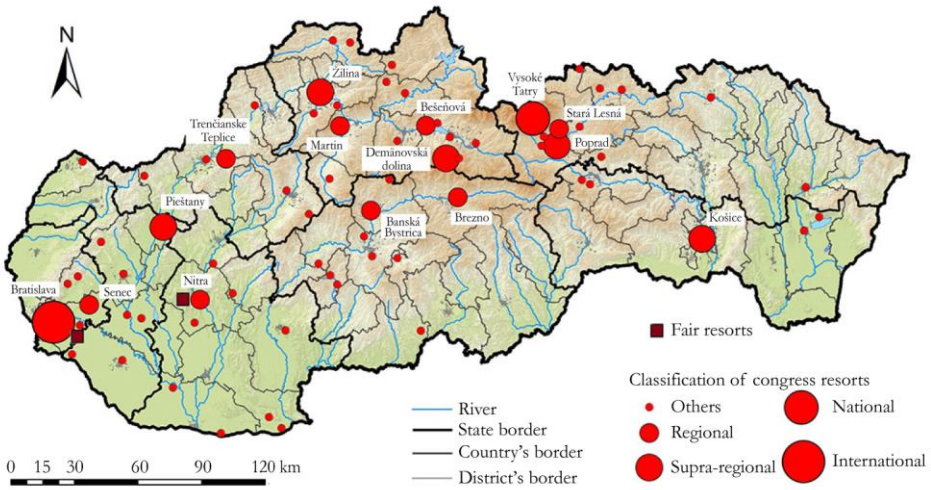
Eight congress resorts of tourism in Slovakia have *regional significance* (see Table 3 and Figure 3). There are a total of 31 facilities with 3,925 beds (11.7% of total share of congress resorts). The centres of regional significance can be divided into two groups as well. The first group consists of Banská Bystrica (educational and economic centre of Central Slovakia), Nitra (regional capital with important agricultural university and area suitable for fair events), and Martin (centre of Turiec region, seat of Jessenius Medical Faculty of Comenius University, Ecco Martin, and close proximity to the sub-contractors of KIA Motors). The second group consists of Bešeňová (resort of summer recreation by water in close proximity of Vysoké Tatry), Brezno (mainly recreational area of Tále with golf course in Nízke Tatry), Senec (resort of summer recreation by water in close proximity to Bratislava), and Trenčianske Teplice (spa resort of tourism – venue of regular international film festivals).

It is necessary to point out this short categorization of congress resorts of tourism that all 15 congress resorts with higher than regional significance are particularly attractive resorts. These resorts have an important role in the structure of Slovak tourism. They are visited by a large number of foreign tourists, they have exceptionally good infrastructure, and congress tourism can play a significant additional function to their main functions (city, spa, high mountains, and other types of tourism).

The authors of this article would like to repeat that there are currently two significant resorts of fair tourism in Slovakia, Bratislava and Nitra. Both these centres organise smaller fairs and exhibitions. Neither of them can be compared to the most important centres of fairs in the region of V4 countries and Austria as are Vienna, Prague, Budapest, Brno, Warsaw, and Krakow. Mostly national visitors attend these exhibitions. As such, most of these fairs do not have higher than regional or supra-regional significance. In addition, the number of organised events is lower in comparison to the previously mentioned fair centres.

Figure 3

Classification of congress and fair resorts in Slovakia



Source: Own elaboration based on MTC SR (2017a, 2017b); SO SR (2017) and Slovakia.Travel (2016).

Conclusions

Congress tourism and fair tourism are in this contemporary economically advanced and globalised world an integral part of MICE tourism and tourism in general. Experts and the public can discuss the theory behind their inclusion in the form or type of tourism. It is the task of all the science disciplines (economy, sociology, geography, management, etc.) to use appropriate methods of their own disciplines. As such, the role of geography is to evaluate spatial phenomena, to quantify and analyse infrastructure and visit rate, and create categorizations and compare the internal structure of congress tourism on a national, regional, or topical level.

It is necessary to begin the evaluation of the development of congress tourism in Slovakia with fairs, as congress tourism is relatively a new phenomenon with high significance mainly in the present globalised world. For objective reasons, the development of exhibitions and fairs in Slovakia lags behind other former Austria-Hungary nations (mainly Austria, Czech Republic, and Hungary). This is partially the reason why there are no internationally important centres of fairs in Slovakia. Five centres of fairs were created in Slovakia. Bratislava and Nitra are the most significant centres among them. It is important to observe that fair tourism started to develop from the 19th century, but its present form is the result only of the past few decades.

Congress tourism and fair tourism are presently an important part of Slovak tourism. The infrastructure of congress tourism constituted 16.9% of the total share

of bed capacities of mass accommodation facilities in 2015. This parameter is the most important part of the primary infrastructure of tourism in the conditions of all regions of Slovakia. The Bratislava region has the highest significance in the indicators of infrastructure as well as visit rate of events. The regions of Prešov and Žilina are second and third respectively, from the perspective of infrastructure; and the regions of Žilina and Banská Bystrica are second and third respectively, in terms of the number of organised events and visit rate. There are resorts in Slovakia with extraordinary infrastructure for the development of congress tourism, but this type of tourism plays only an additional role (e.g. for spa tourism or summer or winter mountain recreation). These characteristics are reflected in the statistics of the regions. As such, the characterisation on a lower level (identification of resorts of congress tourism) is important. The most important centre is Bratislava as the capital city and the economic, science, social, political, and other centre of the entire country with the best infrastructure as well as the highest number of events and visit rates in Slovakia. Bratislava is a centre with international significance and exceptional location between Vienna, Budapest, and Brno. Vysoké Tatry can be defined as a congress resort with national significance and good infrastructure potential that far exceeds the number of events and visit rates of the congresses. It is important to highlight two of the few supra-regional resorts (Piešťany, Demänovská dolina, Košice, and Žilina a Poprad) and these are Košice and Žilina. These are resorts with good infrastructure and high number of organised events and visit rates. Both are not only centres of tourism, but are also economic centres of their regions as well. Eight regions with regional significance (Bešeňová, Brezno, Banská Bystrica, Senec, Trenčianske Teplice, Martin, and Nitra a Stará Lesná) can be divided into two types of centres. The first type has excellent infrastructure, but low number of events (Bešeňová, Trenčianske Teplice, Brezno, and Stará Lesná). The second type has higher standards of infrastructure and comparably higher number of events as well as visit rates (Banská Bystrica, Martin, Senec, and Nitra). The other 59 resorts of congress tourism constitute 34.9% of the total share of bed capacities.

Fair centres do not have sufficient infrastructure for special significance in comparison to the resorts of congress tourism. This type of tourism only constitutes an additional function to the primary tourist function. Spatial differentiation on a regional level does not provide relevant data with any type of relevance, therefore it is almost insignificant. Five potential resorts of fairs were identified in Slovakia (Bratislava, Nitra, Trenčín, Košice, and Banská Bystrica). Only two of these (Bratislava and Nitra) have sufficient infrastructure to host more significant fair events.

The authors want to highlight that according to ICCA (2017), Vienna (2nd in Europe and globally), Prague (9th in Europe and 11th globally), and Budapest (12th in Europe and 16th globally) can be considered as global metropolises of congress tourism in the international confrontation of the most significant congress centres of the V4 countries and Austria (Prague, Budapest, Warsaw, Bratislava, and Vienna).

These three are followed by Warsaw (19th in Europe and 30th globally) and Bratislava (66th in Europe and 120th globally).

It is questionable as to what will the status of the centres of congress tourism look like in the system of Slovak tourism. We can only assume that the significance of the Slovak centres of tourism will grow in international confrontation.

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Investigating the background of radical right-wing mobilization in Hungary with regional statistical methods

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Recent electoral trends illustrate the rise of radical right-wing support in Western Europe. In addition, part of the phenomenon is the rise of Islamic fundamentalism, the presidential campaign, and the result of the election in the United States. During the past several years, most of the radical right-wing parties have been able to expand both votes and parliamentary representation, thus threatening to render the formation of governments. In order to understand the significance of these developments, it is necessary to discuss the origins, background, and evolution of these parties. This study provides an overview of the regional features of voting behaviour in post-socialist Hungary and it attempts to show the processes that lead to voting for radical right parties. Different types of radical right-wing parties have appeared in post-socialist Central and Eastern Europe in several waves and with different intensities. In Hungary, the parliamentary elections held in 2010 resulted in a substantial rearrangement among the parliamentary parties. Left-liberal parties became significantly weaker, while the national radical party (Jobbik) got into the Hungarian National Assembly with a robust voters' support. The expansion of the radical right continued in 2014 when Jobbik won its second parliamentary term. The mainstream right-wing party Fidesz started to become more radical after the dangerous gain of Jobbik to stop them from further rising. The purpose of this Hungarian case study is to provide a picture about the performance of the radical right-wing parties and their main topics (minorities, immigration) to mobilise voters. It focuses on the impact of Roma minority spatial distribution on Jobbik's electoral results.

Keywords:
national radicalism,
minorities,
Roma people,
geographically weighted
regression,
electoral geography

Introduction

To understand the nature of radicalisation is a challenging issue owing to its complexity. The domestic and international actors of the scientific life closely monitor the strengthening of radical right parties in Europe. Research often articulates the dangers, causes, and possible effects of this phenomenon. The apathy prevailing in our society, the mistrust towards the political elite, and the generally perceptible sense of fear – both in an economic and a physical sense – can provide a fertile breeding ground for radical right-wing parties. Radicalisation can be related to migration, the economic crisis, and the looting of political parties. The latter was observed in Hungary in the aftermath of the 2008 financial crisis. The parliamentary elections held in 2010 resulted in a strong rearrangement in Hungary's parliamentary party structure. Many of the ruling parties since 1990 have disappeared and their seats have been occupied by new parties. Thus, after the break-up of the bipolar party system, a third force (Jobbik – Movement for a Better Hungary) appeared in 2010. In other European countries, the radical right-wing parties have already been strengthened, which are more stable than their Eastern Central European counterparts.

In Western Europe, migration is primarily linked with the strengthening of national radical parties, while in Eastern Europe, the primary source of voters' mobilisation is the conflict between ethnic groups (Ignazi 2003, Giugni–Koopmans 2007, Sprinzak 1991). However, the situation changed after 2015. In terms of illegal migration, Hungary lies primarily in the migration path of migrants coming from the Middle East, and the country is currently facing big migratory pressure since 2015. The refugee camp in Budapest and the sightseeing of migrants on the rails and on the highways were published news reports. This was compounded by the deterrent effect of the terrorist attacks and disorder in Western Europe, which resulted in the inevitability of the ideal of peaceful inclusion and solidarity. In response to the violent acts, the Hungarian government transported immigrants to closed camps and completely closed the southern green border.

The Hungarian government, which has been confronted with the immigration policy of the European Union (EU), has found allies in the Visegrád Four countries, but also has a number of supporters in the West of Europe to curb migration (e.g. Bavaria, the United Kingdom), in addition to the increasing activity of the extremist xenophobic parties and movements, who were the ones who raised the Hungarian prime minister on to their flag. The rise of radical ideals, including the radical right parties, is one of the current challenges of our time and the effects can be traced globally. This shows the strengthening of Islamic fundamentalism and partly a response to this is the strengthening of the Dutch Liberation Party, the French National Front, the German Alternative für Deutchland, and the Austrian Freedom Party. However, we can also include the United States' presidential campaign.

The emergence of radical right parties in Western Europe is linked to immigration (Hirsch-Hoefler et. al. 2010, Giugni–Koopmans 2007, Sprinzak 1991), and primarily to the impoverished, sloping (lower) middle class and labourers who reject a multi-cultural society. Within the far-right party family, they also distinguish the parties belonging to the traditions of fascism, as well as the parties rejecting them and responding primarily to post-industrial social demands (Ignazi 2003). The process of national radicalisation in response to migratory pressure is also observed in Israel. Four main features of the radical right parties in Israel – similar to their European counterparts – are nationalism, exclusion (xenophobia), anti-democraticism, and moral conservatism (Pedahzur–Perliger 2004). In the post-socialist countries, the radical right-wing parties, unlike the Western-European far-right parties, are mainly characterised by traditional nationalism and intolerance against national minorities rather than immigrants. These radical right parties had more middle-class support (Whitefield 2002).

Bustikova and Kitschelt (2009) emphasise the important role of the irredentist aspirations as well. They claim that countries with the greatest potential for radical right mobilisation are those with small-entrenched ethnic minorities, as well as those with irredentist claims against their neighbours, whether they are old or new states, in addition to where both conditions coincide, the potential grid/group mobilisation should be particularly strong. The authors suggest that the potential of the radical right for group mobilisation does not increase linearly with the size of the largest minority as a larger minority has the capacity to inflict major damage on the majority and its political organisations or controls are more economic assets and one or all of the relevant parties of the largest ethnic group need their support to build a winning governing coalition.

Many electoral geographic investigations have dealt with territorial differences in voter behaviour (Angelusz–Tardos 2004, Csatári 2003, Hajdú 2006, Hegedűs 2007a, 2007b, Horváth 2004, Hubai 2001, Ignácz–Szabó 2014, Szabó 2010, 2014), changing voting patterns and cleavages by ethnic voting (Szabó–Tátrai 2016), and bias of the electoral system (Johnston 2002, Kovács 1991, 2000, Vida 2016, Vida–Kovács 2017). This study investigates the attitude towards minorities and considers the question of the role of minorities in the strengthening of radical right parties in general. The paper would like to provide an answer to the voting pattern of the Hungarian Jobbik influenced by the spatial distribution of Roma population in particular.

Detecting the indicators of national radicalisation

The concept of radical right can be interpreted as a cultural and political ideological approach. In political ideological interpretation, it is characterised by strong group identity and homogeneous national consciousness ('we group'), romantic, and populist ultranationalism. Owing to their anti-establishment profile, radical right-wing parties question liberal democracy and its individualistic principles. Conse-

quently, they are generally located at the edge of the political spectrum of liberal democracies. In cultural terms, it can be associated with various ethnic, religious, or gender-based exclusion, which includes impatience and scapegoating against minorities. In addition, it also displays anti-elitist marks that reflect the questioning of the actual political elite and representative democracies (Minkenberg 2015).

Kasprowicz (2015) breaks the concept of the radical right into three groups. She distinguishes them as 1. right-wing nationalists, 2. right-wing radicals, and 3. right-wing extremists. Nationalists criticise political and social order, but support democratic structures. Radicals are characterised by anti-xenophobia, the resistance to a threatening multi-cultural EU and the criticism of the democratic system. The most extreme right side is openly neo-Nazi, which is a cause of national decline and calls for democracy and pluralism.

Radicalism is closely linked to the extreme manifestations of intra-social conflicts. One of the best-known conflict theories are (neo) Marxism, which is characterised by Marx's (and Engels) work. According to them, societies are unsteady as they are systems that can change. Marx states that any system with inequality has the potential of conflict and revolution (Marx 1986). As a result of this neomarxist approach, at the end of the 20th century, social geographic differences and their spatial implications, such as movements facing the global processes, have come to the forefront of geography (Boros 2012).

In light of this, we can state that the economic crisis and uncertain social climate – including the unpredictable end of the migration crisis – is the most beneficial for radical right-wing parties. According to many researchers on the subject, one of the main causes of the strengthening of radical right-wing parties is illegal immigration (Ignazi 2003, Hirsch-Hoefler et al. 2010, Giugni–Koopmans 2007, Koopmans 2015, Sprinzak 1991). This finding is confirmed by Switzerland (Fitzgerald–Lawrence 2011), Austria, the United Kingdom, France, Denmark, Norway, the Netherlands, the Balkans (Bulgaria, and Macedonia), and only partially by Sweden, Belgium (Coffé et al. 2007, Poznyak et al. 2011), and Germany which have started to move in this direction (Glorius 2017). Hungary and Poland could also be listed here, but the national radicalisation of Hungary has taken a significant turnaround during the economic crisis and the growing number of crimes committed by the Roma minorities. Furthermore, this situation is compounded by the current migration pressure. However, the latter did not increase the support of the radical Jobbik more than the mainstream right-wing Fidesz – Hungarian Civic Alliance. This is similar to Poland's case where the radicalisation of mainstream right-wing Law and Justice (PiS) can be traced, and many similar processes can be observed across Europe, which have led to the political shift of the larger mainstream right-wing parties (Minkenberg 2015).

In the post-socialist countries, over the past 26 years, various radical right-wing parties have emerged in different waves with different intensities, whose popularity

was primarily built on the renovation of historic grievances and directed against minorities (Whitefield 2002). However, as a result of the migration crisis that has been centred since 2015 (Kocsis et al. 2016), an anti-immigrant radicalism has begun that was only experienced in Western Europe previously. This topic was completely taken away by the mainstream right-wing Fidesz from the radical, but moderating Jobbik, thus the claims of Michael Minkenberg realised that proves the mainstream right-wing party have radicalised to curb the radical right-wing party (Minkenberg 2015).

Critical parties looking for a novel response to the challenges of globalisation in Hungary include Jobbik, and LMP (Politics Can Be Different), which have been voted parliamentary parties since 2010. However, the urban and folk contradictions remain with regard to the social embeddedness of the new parliamentary parties. It transpires the classical cleavages of the political division after the change of the regime (city-village, secular-religious) and the attitude towards socialism (Körösényi 1998, Tóka 2005). However, LMP and Jobbik are differently related to supranational organisations. Among the LMP and Jobbik voters, the different attitudes towards the EU can be observed. Voters of the LMP are more for EU membership (but 18% of them oppose that), whereas anti-unionism is mostly characterised by voters of the Jobbik, although membership to the EU is still supported by 58% (Bakonyi et al. 2011). Nevertheless, their positions were certain in the critics of globalisation and approximately in their migration policy too. In 2010 and 2014, Jobbik was still a right-wing radical party according to Dominika Kasprowicz's definition. Thus, in my statistical analysis, I relied on the results of parliamentary elections held in 2014 as in 2014, Jobbik became more successful nationwide, mainly in Central and Southern Transdanubia where it previously achieved weaker results.

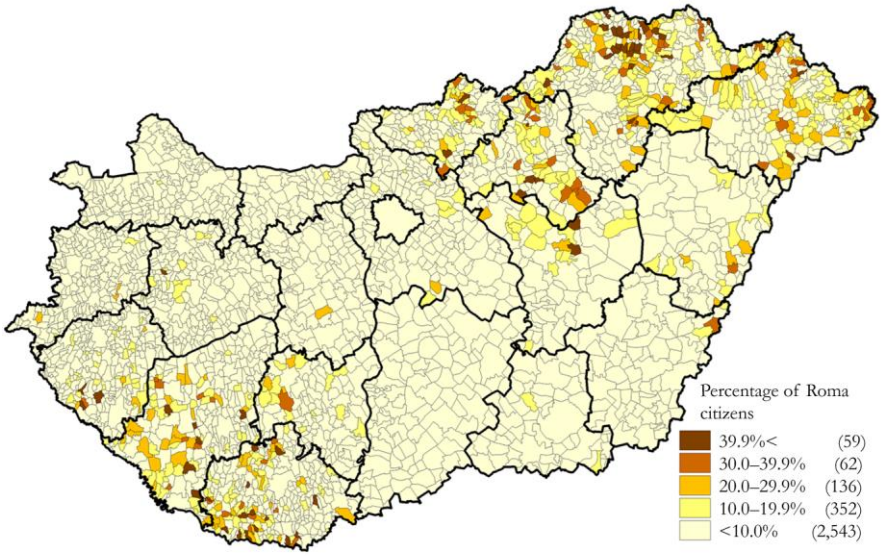
In addition to the growth of globalisation and social differences, the already mentioned growing immigration and a group of minority can be the biggest source of conflict between the majority society and the ethnic or immigrant population (Bustikova–Kitschelt 2009). In Hungary, the largest ethnic minority is the Roma ethnic group, thus the ratio of Roma people at the settlement level may provide a good indicator for the opportunities of radical right Jobbik. I relied on the data of Census 2011, which is based on self-assessment. However, based on the literature, they are either more likely to admit being Roma living in smaller settlements ('peripheries of the peripheries') nor those living in Budapest. Theories of contradictory expectations (Virág 2010, Havas 1995) describe rather complementary processes than mutually exclusive processes. However, this is not true for all the Roma people. Csaba-Zoltán and Závecz's uniform Roma model did not reveal any significant results. For both the Vlach gypsies and Beas gypsies, it was true that if the respondent does not reside in Budapest, then he or she will be more likely to admit himself or herself Vlach or Beas gypsy than when he lives in

the capital. However, in the case of Romungrons, there is an opposite tendency (Csaba–Závecz 2011).

The number of Roma population can only be estimated by relying on various surveys. In the year 1971, the number of people living in Roma households was estimated at approximately 320,000, in 1993 at 468,000, and in 2003 between 520,000 and 650,000 (Kemény 2004). However, the number of Roma people recorded in Census 2011 was only half of the number measured in Kemény's (2003) survey. According to the census data, 315,101 people declared themselves belonging to the Roma minority, who were mostly concentrated in the regions of Northern Hungary and Southern Transdanubia (see Figure 1). In order to identify the territorial well-identified differences, I verified the census data to gain an idea of the extent to which the presence of a Roma minority contributed to the strengthening of Jobbik. The distortions in self-reported census results can lead to unified variations in all rural settlements in the country, which is confirmed by the literature that people living outside Budapest are more likely to admit being gypsies. As my surveys include settlement-level analysis, the loss of identity or denial of self-declaration in Budapest has less influence on my results.

Figure 1

Spatial distribution of the Hungarian Roma ethnic group, 2011



Note: The numbers of settlements are indicated in brackets.
Source: Own calculation and elaboration based on Census 2011 data.

Analysing the relationship between the national radicalisation and the percentage of Roma minority in the case of Hungary

To highlight the relationship of ethnic group size to radical right-wing party success, the political geographers use regional statistical methods. Bustikova and Kitschelt (2009) claim that large minorities induce fairly moderate behaviour among majority parties, whereas smaller minorities create incentives for more aggressive and possibly violent ethnic appeal as collective action is easier among smaller ethnic minorities. Therefore, they expected to observe the highest potential for radical right mobilisation in countries with relatively small ethnic groups. On the other hand, in countries with a large ethnic minority and with contested state building, the reservoir for the radical right-wing is parched. In their theoretical argument, they state that countries with an ethnic minority comprising of 10% of the population are more prone to radical right mobilisation than a large (50%) minority (Bustikova–Kitschelt 2009).

However, these results can be questioned as they deal with a very small number of countries, which constrains the statistical techniques based on the asymptotic properties of large-*N* samples. As such, I expect to revalidate these basic findings with large-*N* samples of 3,150 settlements. In the Hungarian case, the Roma minority fits well in this model as Hungary is approximately split as 90-10 between majority and minority, and has hosted a vibrant radical right-wing party since the financial crisis of 2007–2008.

When I used geographically weighted regression (Fábián 2014) to model the dependent variable, I am generally interested in predicting values or understanding the factors that contribute to dependent variable outcomes. I am also interested in examining how spatially consistent (stationary) relationships exist between the dependent variable and each explanatory variable across the study area. Examining the coefficient distribution as a surface shows where and how much variation is present. In addition, the method of regression analysis can be used to map the relationship between election results and the various socio-economic indicators. Understanding this variation shows us that some variables may not be globally significant as in some regions, they are positively related, and in others, they are negatively related.

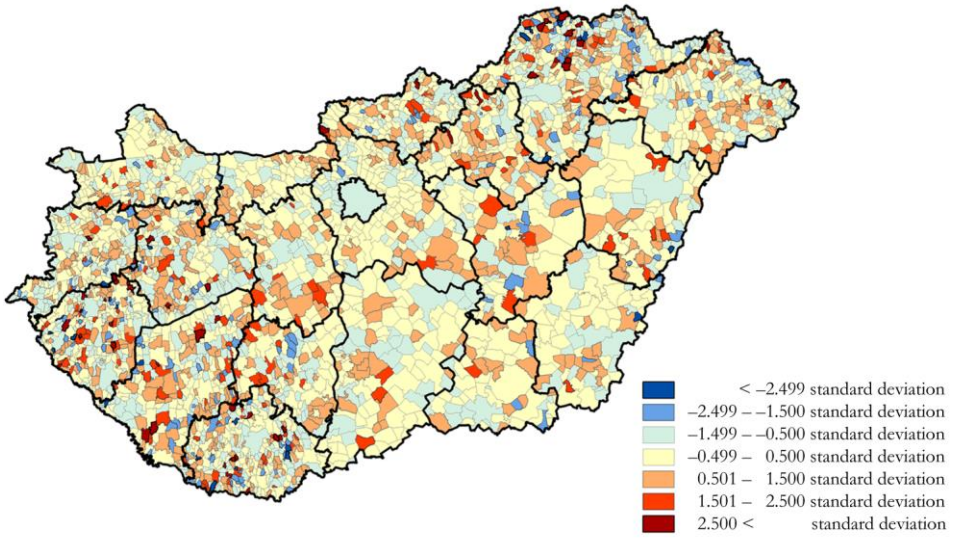
Regression analysis allows us to model, examine, and explore spatial relationships and can help explain the factors behind the observed spatial patterns. When we want to understand why people are voting for radical right-wing parties in certain regions of the country or what factors contribute to higher than expected rates, then we have to model spatial relationships. However, regression analysis can also be used for prediction and modelling the factors that may contribute to radicalisation.

The regression analysis has also shown neighbouring relationships that could not be solved by analysing individual settlements. As there are settlements that do not

have a Roma minority, there is a remarkable link between the two indicators, such as Nyomár and Ziliz in the neighbourhood of Edelény, or Szorgalmatos in the Szabolcs-Szatmár-Bereg County, which do not have a Roma minority, but the regression analysis shows a correlation (see Figure 2). This is attributable to the fact that in all the surrounding settlements, there is a greater number of Roma minority (5–20%).

Figure 2

Geographically weighted regression analysis of the votes for Jobbik in 2014 and the proportion of Roma citizens in the population in 2011



Source: Own calculation and elaboration based on valasztas.hu and Census 2011 data.

To define the overall territorial differences, I conducted a hot spot analysis from the spatial statistics methodology (Bochsler 2010, Dusek–Kotosz 2016, Tóth 2003). Adopting this methodology, other research has shown the distortions of constituencies, territorial differences in party preferences, and the impacts on political representation (Vida–Kovács 2015). Getis–Ord's local G_i^* statistics provide a value to each territorial unit and a clear spatial response to the spatial concentration of participation rates and the support of political parties (Getis–Ord 1992).

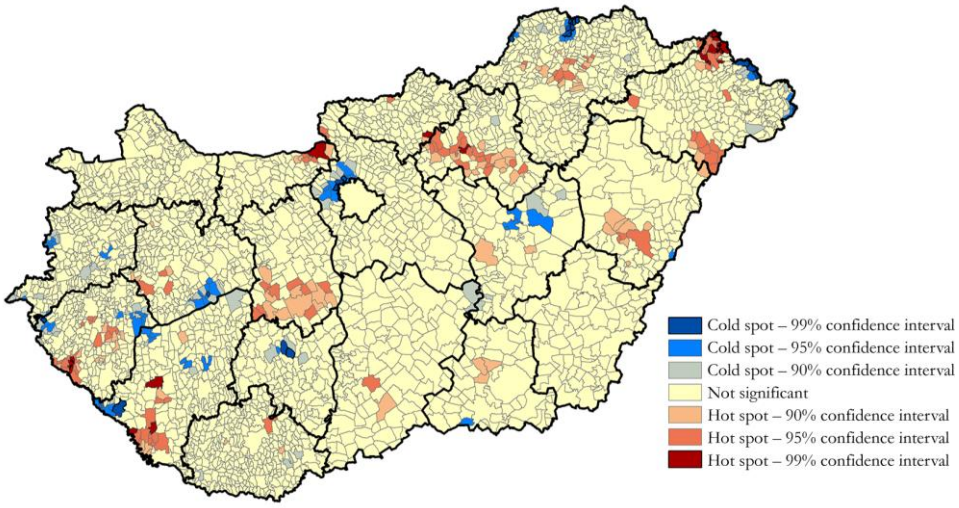
With Getis–Ord's hot spot analysis, we obtain a detailed, mosaic map that delimits microregions based on neighbourhood matching (see Figure 3). This tool works by considering each feature within the context of neighbouring features. A feature with a high value is interesting, but may not be a statistically significant hot spot. To be a statistically significant hot spot, a feature will have a high value and be surrounded by other features with high values as well. The local sum for a feature and its neighbours is compared proportionally to the sum of all the features. When the local sum is very different from the expected local sum and the difference is too

large to be the result of a random chance, then it is a statistically significant score results. When this correction is applied, statistical significance is adjusted to account for multiple testing and spatial dependencies.

Radicalisation is measured in the most perceptible method in Northern Hungary, in a group of settlements surrounding Miskolc and in Heves County as well. This may occur as this area lay on the commuting route of the Roma minority between the county seat and their home. There is also an array of ethnically less-proportioned blocks, as well as the surroundings of a block of settlements belonging to the Romas between Edelény-Szendrő and Encs.

Figure 3

Cold and hot spots based on Getis–Ord's settlement-level statistics and the geographically weighted regression analysis of the votes for Jobbik in 2014 and the proportion of Roma citizens in the population in 2011



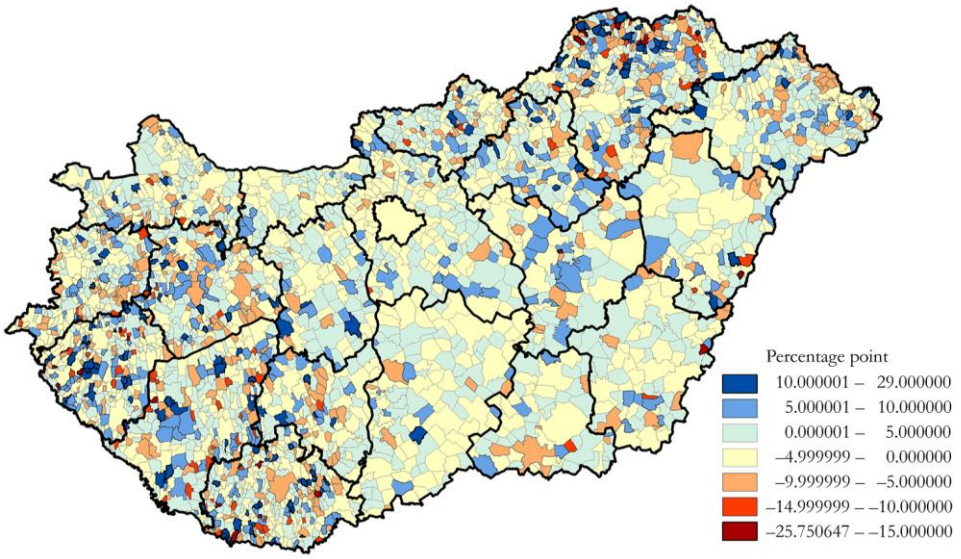
Source: Own calculation and elaboration based on valasztas.hu and Census 2011 data.

In the results of the geographically weighted regression tool, the residuals show the difference between measured and predicted results. These differences between measured and predicted results show where Jobbik's support is lower than the preliminary assumptions anticipated. This map provides a visual representation of how well the model's predicted values explain the variation in the observed dependent variable values. However, the predicted values will rarely match the observed values exactly. The difference between the observed *y*-values and the predicted *y*-values are called the residuals. These estimates can be used to map the areas where Jobbik should get more votes or where the party can gain their votes in the future if ethnical conflicts play a role in the motivation of votes. This model is interpretable similar to a risk mapping that focuses on the possible ethnic conflicts

between the majority and the Roma minority. These possible ethnic conflict sources are marked in red (see Figure 4).

Figure 4

Residuals of the geographically weighted regression analysis of the proportion of votes for Jobbik in 2014 and the proportion of Roma citizens in the population in 2011



Source: Own calculation and elaboration based on valasztas.hu and Census 2011 data.

However, it also shows that our basic assumption has not been fulfilled. According to this, the greater presence of the Roma minority has contributed to the strengthening of Jobbik. These are possible sources of conflicts detected by the geographically weighted regression analysis that can provide a favourable breeding ground for radical right-wing parties' policies. However, on the basis of the 2014 election results, a significant part of these red marked settlements can be characterised by the dominance of Fidesz.

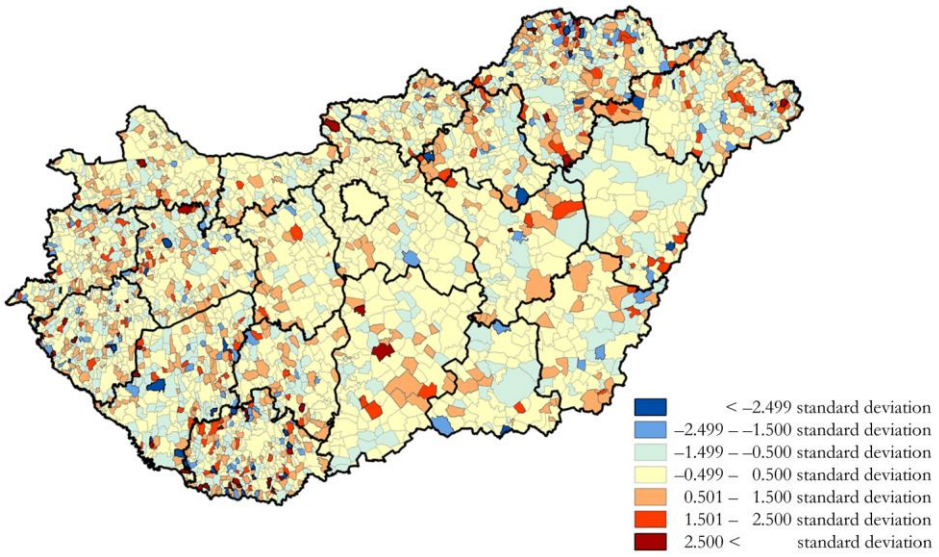
In many cases, the results of the statistical analysis were not as expected, as in several settlements, Jobbik significantly underperformed in comparison to the results of the model. It can be stated that the election results of Fidesz tend to correlate directly with the Roma-populated areas (see Figure 5), while in the case of Jobbik, the regression analysis resulted in a greater correlation in the neighbourhood of Roma settlements and in the surroundings of peripheral regions where Roma people are a majority.

The cities of Pécs, Eger, Szeged, and Veszprém, and the smaller cities of Kazincbarcika and Ajka can be included in the group of potentially radicalising regions based on the regression model (see Figure 4). Certainly, only radicalisation

of ethnic conflicts may arise. However, many other factors may also affect radicalisation, which require further testing.

Figure 5

Geographically weighted regression analysis of the votes for national conservative Fidesz in 2014 and the proportion of Roma citizens in the population in 2011

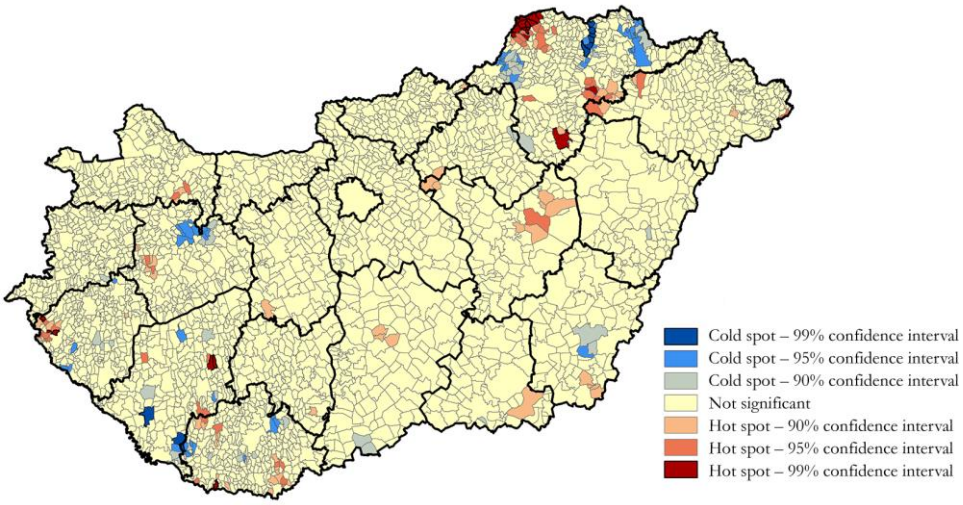


Source: Own calculation and elaboration based on valasztas.hu and Census 2011 data.

The results of regression analysis also show that salient support of Fidesz can not always be connected with those settlements where Roma people are a majority as there are several settlements in Northern-Hungary (Borsod), which favoured other parties, such as the Socialists. In the Upper Tisza Valley and the northern part of Borsod-Abaúj-Zemplén County, the correlation between the presence of the Roma people and the proportion of Fidesz votes is most evident (see Figure 5). The areas identified by the Hot Spot analysis show a much smaller correlation with Jobbik's results, which can be attributed to the northeastern areas where the results are clearly separable (see Figure 6).

Figure 6

Cold and hot spots based on Getis–Ord's settlement-level statistics and the geographically weighted regression analysis of the votes for Fidesz in 2014 and the proportion of Roma citizens in the population in 2011



Source: Own calculation and elaboration based on valasztas.hu and Census 2011 data.

In addition to the study of Bustikova and Kitschelt, I have examined the possible explanatory factors of the relationship between the Roma and Jobbik voters based on the invasion-successional cycle model. The four-phase invasion-successional cycle model of Clay (1979) and Ley (1980) is based on the exchange of local community living in the city in which a group (B) moves into a given area where a social group (A) has been used ('invasion'). Further, slowly, vacant dwellings are leased and gradually (B) becomes dominant ('succession'). This process is reinforced by the significant social status difference between the two groups, and households belonging to group B do not prefer to live in co-habitation (A) (neighbourhood relations) (Friedrichs 1998). Schelling (1971) added this process to the so-called tipping effect, the essence of which is to define a breakpoint (25%) in the process of exchanging the ratio of the two different social groups in an urban district, which will change the dynamics of the process and the slow exchange process with turbulence takes place.

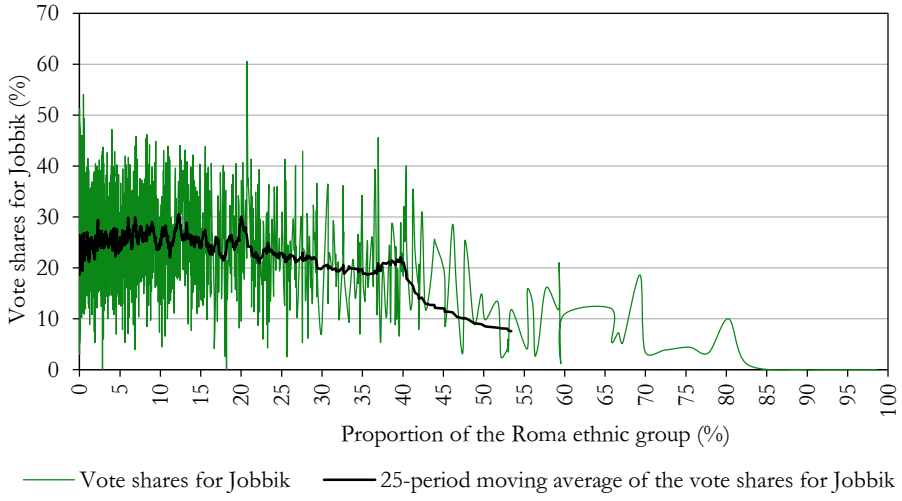
This model was constructed on the basis of the exchange of urban social groups and gentrification, but the exchange of a village's social groups takes place in a similar manner, only in a reverse manner and it also generates many conflicts (Boros et al. 2016, Fabula et al. 2017, Kovács et al. 2013). The proportion of the wealthier population is not increasing, but the poorer proportion is increasing. Havas (1999) in his study elaborately analysed the factors that had transformed the composition

of small villages into the population of a lower status existing in the 1960s, but even more so in the 1970s. As a result of the deteriorating infrastructure, the willingness to move increased and it was supported by local policies that directed the residents of the destroyed Roma colonies to these small settlements from district centres. He observed that 20% of Roma people are the critical limit when conflicts multiply, the pace of non-Romas moving significantly, and that is why the process of ghettoisation is likely to become irreversible (Havas 1999). In the 1990s, ghettoisation continued and differences in living conditions between settlements were increased by the spread of segregated education (Ladányi–Szelényi 2004, Virág 2003a, Virág 2003b).

From electoral geographic point of view, it appears that after the Roma population was dominated by a particular settlement, Jobbik's election results rapidly decreased. Though these measurements do not analyse a concrete transformation process, it fits well into the breakpoint effect that can be measured between 40–42% in the invasion-successional cycle model (see Figure 7). In addition, the so-called tipping effect can be observed after the 20% threshold, when Jobbik reaches its maximum results and after that, it steeply drops.

Figure 7

Vote shares for Jobbik and the settlement-level proportion of the Roma ethnic group in the population, 2014



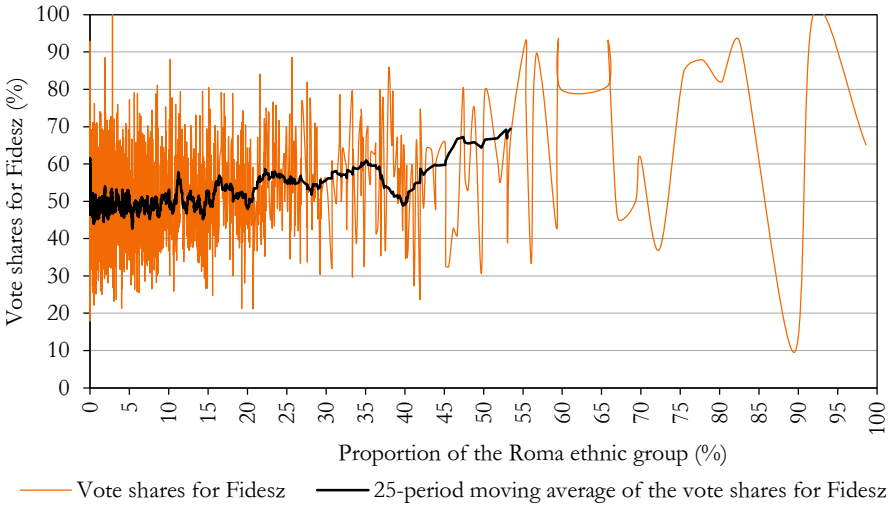
Source: Own calculation and elaboration based on valasztas.hu data.

In contrast, Fidesz's graph of results move counter in comparison to the ratio of Jobbik's graph. This means that with an increase in the proportion of Roma people, the rate of Jobbik voters decrease, while the results of Fidesz increase (see Figure 8).

To reduce the large differences between the various settlements, I determined the moving averages for 25 settlements to illustrate the main trends. Based on these, it can be stated that the results of the two parties called the national and right-wing parties are almost altered with barely visible differences in the first quarter of the settlements. However, when the ratio of the proportion of Roma population is more than 20%, the two parties' results move in a clearly opposite direction, which is particularly pronounced after the breakpoint of 40%.

Figure 8

Vote shares for Fidesz and the settlement-level proportion of the Roma ethnic group in the population, 2014



Source: Own calculation and elaboration based on valasztas.hu data.

Conclusions

In the last decade, Europe has been facing increasing problems and one of these problem's sign is the rise of far-right and radical right-wing political parties. National radicalisation has gained ground globally and in Hungary too, particularly after the 2010 parliamentary elections, where the antecedents include a global and more escalated local crisis. When Jobbik came to parliament, it did not lose its former supporters and even improved its achievements in 2014, and became one of the major challengers of the largest national conservative party. Fidesz responded with radicalisation and received increasingly more issues from the Jobbik program. Finally, with the escalation of the migration crisis, Fidesz launched itself into an anti-immigrant campaign before the 2016 referendum.

In response to the radicalisation of Fidesz, Jobbik launched its right centre on the political palette, trying to win voters from the mainstream parties. However, other political formations have also emerged as a result of the diminishing support for Fidesz and the reversal of the Jobbik. Apart from this, the 2010 and 2014 elections did not show the Jobbik moderate people's party programme, but relied on the radical voters' camp. Therefore, I used the results of 2014 to reveal the link between Jobbik's national radical voters and the ratio of the Roma minority. In order to do so, based on preliminary research, I hypothesised that in those settlements where the minority population was more than 50%, there is less chance of radicalisation; on the other hand, settlements where 10% of the population make up minorities, there is a greater chance of radical revolution.

Based on the results, the hypothesis proved that the Jobbik election results in 2014 increased to a certain level with an increase in the proportion of the Roma minority. But the potential of Jobbik for group mobilisation does not linearly increase with the size of the largest minority because tipping effect can be observed after the 20% threshold, when Jobbik reach its maximum results and after that, it steeply drops. Subsequently, in the settlements where the Roma population had reached 40%, the radical party's support was repeatedly increased. In the case of Romas living in settlements higher than 40%, there is a continuous decline in the election results of Jobbik. Thus, the breakpoint between 40–42% can be traced back to the exchange of social groups, similar to the case of gentrification.

In totality, it can be verified that the territorial distribution of the largest minority in Hungary played a role in the strengthening of the Jobbik. The ratio of Roma people does not exceed 40-50% nationwide, thus they do not have the same significance that would force the parties to represent them and they do not have high-level organisations, autonomous provinces, such as the Catalans or the Baltic and Ukraine Russians. Accordingly, they fit in the model of Bustikova and Kitchelt, in which 50-50% ethnicities are less suitable for radicalisation, while countries with much smaller minority create incentives for more agressive ethnic appeals and radicalisation. Considering this in more detail, we can state that this 10% limit can be extended to 20%, which follows a downward trend and in excess of 40%, the presence of minorities gradually reduces the possibility of national radicalisation. In further investigations, it is important to examine the role of other socio-economic indicators underlying the radicalisation.

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Spatial distribution of the top 500 companies on regional and county levels in Hungary – a repeated analysis

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Keywords:
regional development, agglomeration economies, assessment of enterprises with best sales performance, export, sub-national scale

The aim of this research is to investigate how the spatial distribution of 500 companies with best sales performance has changed since 2014 in Hungary. Thus, the analysis elaborated by Csete–Szabó (2014) is repeated. Subsequent to the analysis, the change in performance of enterprises on a regional level is linked to economic polarisation: the sharply widening inequality of income and wealth. In order to provide a broader view on the Hungarian economy, the article evaluates the effect of the allocation of development funds for the 2007–2013 programming period as the development funds have a dominant role forming the income generation patterns of the country. The primary research consists of an analysis on the change in the number and total (gross) sales value of the top 500 companies (companies with the best sales performance in a specific reference year) on NUTS 2 and NUTS 3 levels. Moreover, it demonstrates the sectoral diversity of regions and interprets the concrete enterprise ranking in the case of the first quarter, reflecting the five most dominant regions that have the largest share in the total (gross) sales value among the top 500 companies. Finally, the relation of changes in gross value added (GVA)/capita and in total (gross) sales value of the top 500 companies is interpreted. The results of the research indicate that the spatial distribution of the 500 companies with best sales performance is in perfect accordance with the generally accepted regional inequalities' pattern of the country, which is due to the location choice of the export-oriented companies. If we consider

the headquarters of the enterprises, 78% from the total sales value of the top 500 companies is linked to five NUTS 3 regions, and the importance of the capital is outstanding. The result of the research indicates the importance of agglomeration economies, which is the result of interaction among economies of scale, transportation costs, market size, and information as Paul Krugman (1991) explains in the 'new economic geography' theory. The repeated analysis has indicated that both the total (gross) sales value of the top 500 companies (by 15%) and GVA/capita (by 19.5%) have increased during the period, and the ranking of NUTS 2 regions has not changed. Thus, the changes in gross domestic product (GDP)/capita and in the total sales value of the top 500 companies on NUTS 3 level have common tendencies. Considering the cumulative share of the total (gross) sales value of the top 500 on a regional level, the inequalities have marginally decreased, but large differences still exist.

Introduction

Currently, we face the increasing role of transnational companies in the global economy. At times, it is threatening that factors which influence economic development (capital flow among countries, delocalisation of international enterprises, remittances) are not under the control of governments (Csete–Szabó 2014, Shera–Meyer 2013), thus the long-term resilience of regions is highly affected by the location choice of global or transnational companies led by specific management groups. Nevertheless, different trade or economic unions, and local economic development initiatives are of high importance in raising the attractiveness of locations and enhancing development. While the entry of new enterprises and broadening production triggers economic development immediately, the policies for decreasing regional inequalities may require a longer period to influence the wealth of regions. Hungary became a member state of the European Union (EU) in 2004 and through the system of the 4 freedoms and access to EU funds, it gained the opportunity to promote economic development and strengthen economic, social, and territorial cohesion. Between 2007 and 2013, Hungary received 7,849.2 billion Hungarian Forint (hereinafter HUF) for development purposes. From 2014, several ex post evaluations have been undertaken assessing the effectiveness of the development

funds. Regarding the effectiveness of funds, it could be stated that the cohesion purpose of the regional policy was less successful and the territorial differences have continued to exist among the regions.

In 2014, Csete and Szabó conducted a research on how the Hungarian top 500 companies affect regional development, an examination of income generation at sub-national scale. The research results have indicated that the spatial distribution of the 500 companies with best sales performance is in perfect accordance with the generally accepted regional inequalities' pattern of the country: the hegemony of the capital, increasing differences between the capital and rural areas, emergence of the 'West–East decline', variant development patterns of microregions and settlements (Dusek–Lukács–Rácz 2014, Nemes Nagy–Tagai 2011, Obádovics 2013, Pénzes 2012). Assessing the regional disparities in the country on NUTS 2 level, Dusek–Lukács–Rácz (2014) explain that Central Hungary is the most advanced region of Hungary, followed by Western Transdanubia and Central Transdanubia, and with significant lag Southern Transdanubia, Southern Great Plain, Northern Great Plain, and Northern Hungary tailing the list.

The problem of increasing differences and income inequalities in Hungary is one of the most important challenges that must be answered according to the 'Parliament Resolution No. 1/2014 (I. 3.) OGY[1] National Development 2030 – National Development and Territorial Development Concept' which by the emergence of the 'dual economy' (less multi- and trans-national companies work with higher efficiency than the less viable small and medium enterprises sector which employs more people) is not merely an economic, but more a territorial issue as larger companies prefer territories near Western European markets. Kukely (2008) in his Ph.D. dissertation explains how foreign direct investments have reformed the Hungarian inequality patterns after the regime's change in 1989. He explains that not merely the first location decision of the transnational companies caused differences, but the reinvestment of those companies, which already had plants in the 2000s, also caused differences.

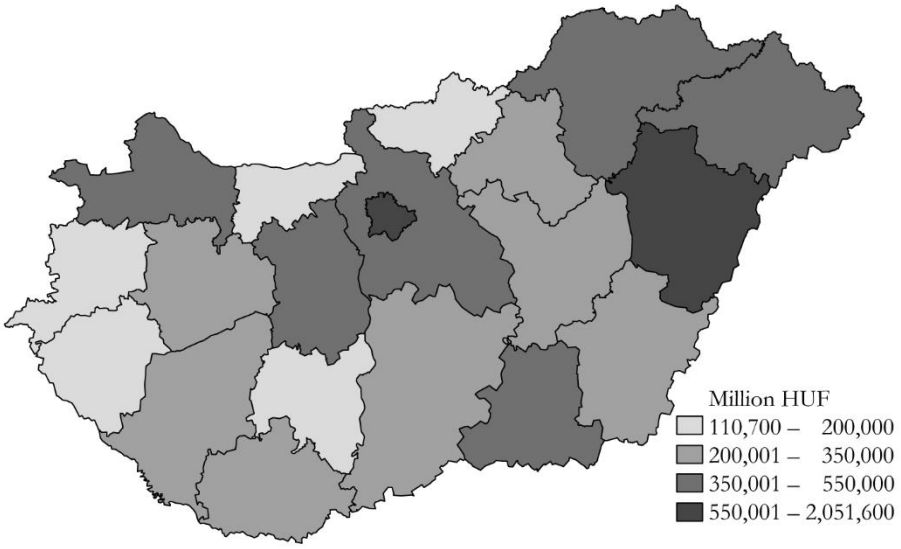
Comprehending the results of the ex post evaluations, this research article aims to review how the territorial development of the country can be explained by the distribution of the Hungarian top 500 companies. At first, some facts about the fund allocation are necessary to provide insights into the Hungarian development policy between 2007 and 2013.

Figures 1 and 2 indicate the allocated funds in the fourth programming period of the EU (2007–2013) and the funds per capita for 2014. (The 'Reports and queries system tool' [REQUEST®] of the Hungarian Government provides data about projects with an approved budget.)

[1] 'OGY' stands for Hungarian National Assembly ('Országgyűlés' in Hungarian). The official translation of the Parliament Resolution could be found at https://regionalispolitika.kormany.hu/download/b/c9/e0000/OFTK_vegleges_EN.pdf

Figure 1

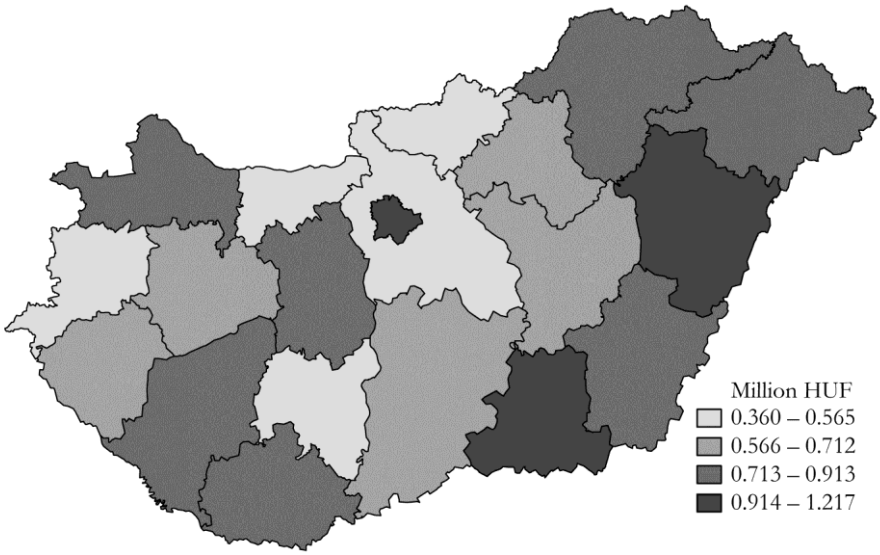
Allocated funds in Hungary, 2007–2013



Source: Own elaboration based on REQUEST® and Hungarian Central Statistical Office (HCSO) data.

Figure 2

Funds per capita in Hungary, 2014



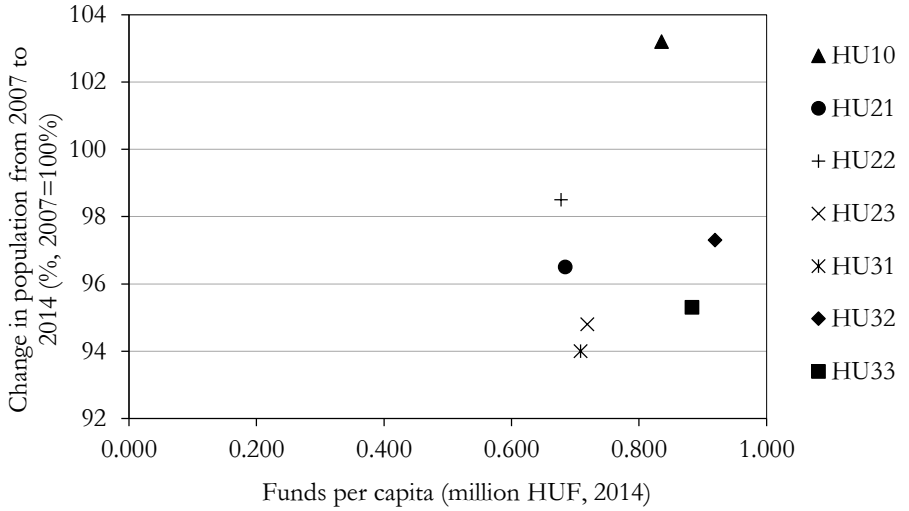
Source: Own elaboration based on REQUEST® and HCSO data.

Next, some main indicators are interpreted in relation to the regional inequality patterns of the country. In each case, the amount of funds per capita is presented in

relation to the year after the programming period, namely 2014. Increasing population is a good indicator for the development of a region (Szentes 2011, Tomka 2011). Funds allocated could contribute to increasing the GVA of firms, which could lead to increasing demand for employees. Unfortunately, the amount of funds allocated did not influence the decline in population.

Figure 3

Population change and funds per capita by NUTS 2 regions of Hungary



Source: Own calculation based on REQUEST® and HCSO data.

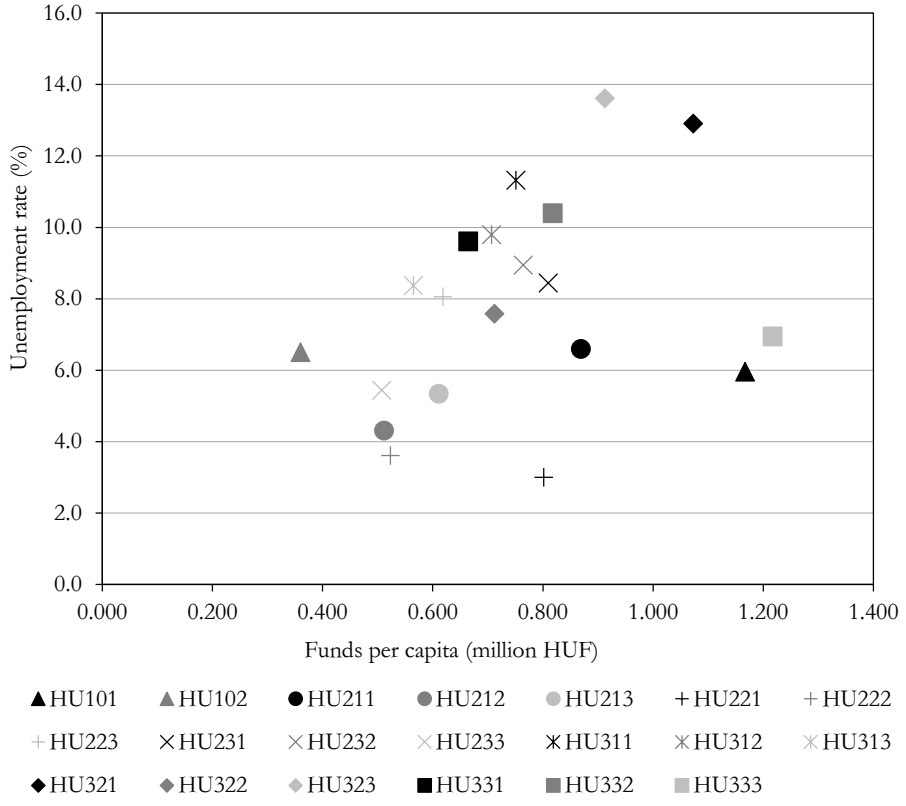
Abbreviations: Central Hungary (HU10), Central Transdanubia (HU21), Western Transdanubia (HU22), Southern Transdanubia (HU23), Northern Hungary (HU31), Northern Great Plain (HU32), Southern Great Plain (HU33).

There exist more barriers against regional cohesion. A generally accepted fact is that in less developed regions, enterprises have less funds for development. Moreover, several enterprises do not want to apply for funds as they cannot assume that they can meet the requirements for receiving the funds in the maintenance phase, after the realisation of the concrete project (for instance, hiring employees on long-term basis) (EC 2016). Consequently, more allocated funds have not guaranteed a decrease in unemployment, nor an increase in the GDP/capita.

On the NUTS 3 level (19 counties and the capital), it can be observed that despite the higher funds per capita, general economic indicators (unemployment rate for instance) have not improved significantly.

Figure 4

Unemployment rate and funds per capita by NUTS 3 regions of Hungary, 2014



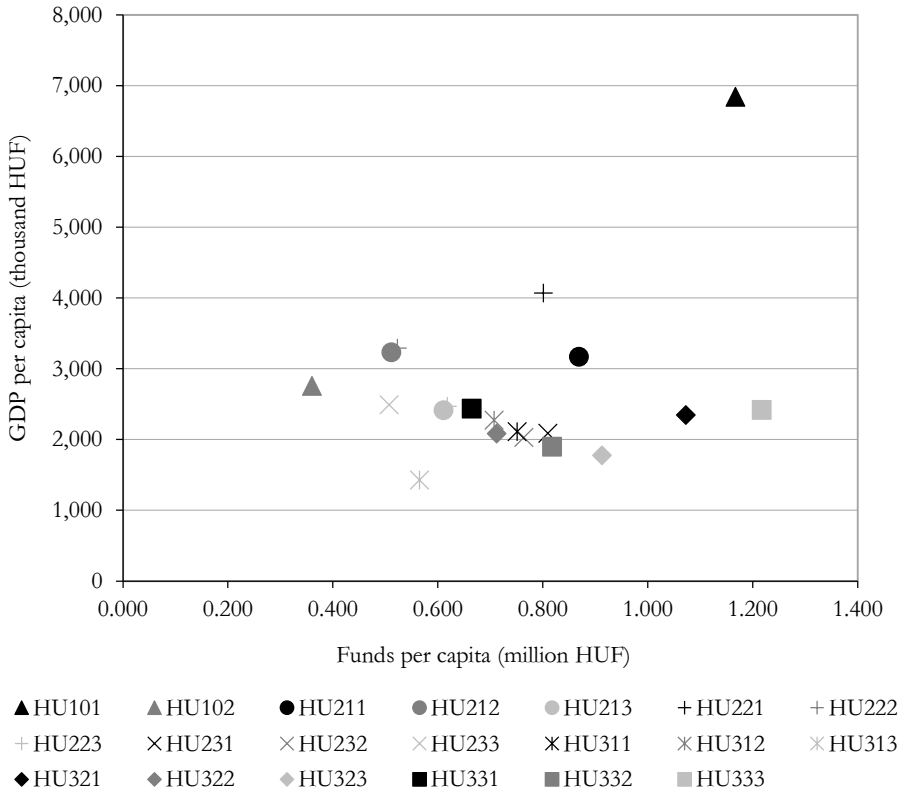
Source: Own calculation based on REQUEST® and HCSO data.

Abbreviations: Budapest (capital) (HU101), Pest County (HU102), Fejér County (HU211), Komárom-Esztergom County (HU212), Veszprém County (HU213), Győr-Moson-Sopron County (HU221), Vas County (HU222), Zala County (HU223), Baranya County (HU231), Somogy County (HU232), Tolna County (HU233), Borsod-Abaúj-Zemplén County (HU311), Heves County (HU312), Nógrád County (HU313), Hajdú-Bihar County (HU321), Jász-Nagykun-Szolnok County (HU322), Szabolcs-Szatmár-Bereg County (HU323), Bács-Kiskun County (HU331), Békés County (HU332), Csongrád County (HU333).

Concerning the GDP per capita and funds per capita value, the capital achieves exceptional performance in comparison with counties close to Western Europe and counties in Transdanubia, whereas the ones in the Great Hungarian Plain close the ranking.

Figure 5

GDP per capita and funds per capita by NUTS 3 regions of Hungary, 2014



Source: Own elaboration based on REQUEST® and HCSO data.

Abbreviations: Budapest (capital) (HU101), Pest County (HU102), Fejér County (HU211), Komárom-Esztergom County (HU212), Veszprém County (HU213), Győr-Moson-Sopron County (HU221), Vas County (HU222), Zala County (HU223), Baranya County (HU231), Somogy County (HU232), Tolna County (HU233), Borsod-Abaúj-Zemplén County (HU311), Heves County (HU312), Nógrád County (HU313), Hajdú-Bihar County (HU321), Jász-Nagykun-Szolnok County (HU322), Szabolcs-Szatmár-Bereg County (HU323), Bács-Kiskun County (HU331), Békés County (HU332), Csongrád County (HU333).

From the analysis, it is evident that the amount of fund allocated could result in different development patterns in the case of various regions. The growth and development theories in regional economics emphasise on different factors triggering economic growth, and points out that space has special importance on long-term development. Csete–Szabó (2014) emphasise the importance of export for regional development (export-led growth) as the 500 companies with best sales performance are, to a significant extent, export oriented and their empirical findings resemble the secondary research outcomes on the development of NUTS 2 and NUTS 3 regions

in Hungary. In their study, the correlation between the total sales value and sales value from export activities is 95%. Thus, it means that the economically viable and strong enterprises' performance is determined by their export activity. The concentration of these companies does not merely explain the inequality patterns of the country, but also points out that the more favourable income level of developed regions is due to exports.

Economic polarisation versus regional (cohesion) policy

The EU and its regional (cohesion) policy aim at reducing regional disparities among member states with the goal to strengthen economic, social, and territorial cohesion. The effectiveness of the integration is equivalent to the convergence performance – the progress of integration of new EU MS – what is expressed by the catch-up potential (or catch-up capacity), which the growth premium is derived from the growth rate of the convergence country that continuously exceeds the one of the developed countries (Halmai–Vásáry 2012). Both, on national and subnational levels, the widely accepted indicator for assessing the convergence performance is the development of GDP per capita. From the analysis, it is evident that in the fourth programming period of the EU between 2007 and 2013, the cohesion purposes had not been realised in the country. A question arises: If convergence is blocked, then what forces could be more powerful in forming regional inequalities? An answer could be plant location preferences of dominant enterprises, transnational companies (Szentes 2011). As Paul Krugman (1991) explains in the 'New Economic Geography' theory, the agglomeration economies these days are the result of interactions among economies of scale, transportation costs, market size, and information. If the importance of these factors increases, the concentration will grow in the economy.

Data and method

Each year, the Hungarian Weekly (HVG), an economic and political magazine issues a list of companies that have achieved the greatest sales value during the previous business year: this contains the top 500 companies with best sales performance. The names of the enterprises, their total (gross) sales value, sales value from export activities, and the sector they operate in are listed. Moreover, the weekly issues a report on their spatial distribution as well. However, it is important to note that concerning the spatial distribution, the ranking considers the seat/headquarter of the enterprises, thus multi-locational companies working in a network could not appear in a multiple territorial scale. Unfortunately, this is a barrier of the resent research.

To develop the database, the data from the printed weekly has been digitalised (published in November 2016, based on the companies' result in 2015) into MS Excel. During digitalisation, I regularly checked the accuracy of the data and

reliability of the presented information. With the help of the HVG's analysis, I was able to compare the territorial total values, in addition to the total values with respect to economic sectors, thus I have been convinced of the accuracy of the data used for the research. For dynamic analysis, I used the dataset developed for the research article published in 2014, based on the top 500 list in 2013. Using the functions of the MS Excel program, calculations were undertaken. The other data pool I used for the primary research was the regional statistics of the Hungarian Central Statistical Office.

Results

The distribution of the number of top 500 companies from 2013 to 2016 has not changed significantly. The dominance of the capital as well as regions near the western borderline has remained unchanged. Among the less developed regions, the number of enterprises in the Southern Great Plain has increased.

Table 1

Number of the top 500 companies by NUTS 2 and NUTS 3 regions of Hungary

NUTS 2/NUTS 3 region	2013	2016	Change, 2013=100%
Central Hungary (HU10)	292	287	98.3
Budapest (HU101)	216	216	100.0
Pest County (HU102)	76	71	93.4
Central Transdanubia (HU21)	61	63	103.3
Fejér County (HU211)	26	28	107.7
Komárom-Esztergom County (HU212)	26	25	96.2
Veszprém County (HU213)	9	10	111.1
Western Transdanubia (HU22)	35	35	100.0
Győr-Moson-Sopron County (HU221)	21	20	95.2
Vas County (HU222)	12	13	108.3
Zala County (HU223)	2	2	100.0
Southern Transdanubia (HU23)	14	13	92.9
Baranya County (HU231)	5	4	80.0
Somogy County (HU232)	6	4	66.7
Tolna County (HU233)	3	5	166.7
Northern Hungary (HU31)	30	29	96.7
Borsod-Abaúj-Zemplén County (HU311)	22	20	90.9
Heves County (HU312)	6	7	116.7
Nógrád County (HU313)	2	2	100.0

(Continued on the next page.)

(Continuation.)

NUTS 2/NUTS 3 region	2013	2016	Change, 2013=100%
Northern Great Plain (HU32)	37	33	89.2
Hajdú-Bihar County (HU321)	17	14	82.4
Jász-Nagykun-Szolnok County (HU322)	13	11	84.6
Szabolcs-Szatmár-Bereg County (HU323)	7	8	114.3
Southern Great Plain (HU33)	31	40	129.0
Bács-Kiskun County (HU331)	14	19	135.7
Békés County (HU332)	3	4	133.3
Csongrád County (HU333)	14	17	121.4
Total (Hungary)	*500*	*500*	–

Source: Own calculation based on HVG (2013, 2016).

The total sales value of the top 500 companies increased in the case of Budapest, and Fejér, Veszprém, Győr-Moson-Sopron, Vas, Zala, Tolna, Borsod-Abaúj-Zemplén, Heves, Nógrád, Hajdú-Bihar, Jász-Nagykun-Szolnok, Szabolcs-Szatmár-Bereg, Bács-Kiskun, Békés, and Csongrád counties (NUTS 3 regions). The performance of Bács-Kiskun County is extremely outstanding, where the Mercedes-Benz Manufacturing Hungary Ltd. operates.

Table 2

Aggregated total (gross) sales value of the top 500 companies by NUTS 2 and NUTS 3 regions of Hungary

NUTS 2/NUTS 3 region	Total (gross) sales value, million HUF		Change, 2013=100%
	2013	2016	
Central Hungary (HU10)	28,890	32,287	111.8
Budapest (HU101)	23,368	27,156	116.2
Pest County (HU102)	5,522	5,131	92.9
Central Transdanubia (HU21)	4,898	5,000	102.1
Fejér County (HU211)	2,291	2,419	105.6
Komárom-Esztergom County (HU212)	2,106	1,916	91.0
Veszprém County (HU213)	501	665	132.7
Western Transdanubia (HU22)	2,980	4,433	148.8
Győr-Moson-Sopron County (HU221)	2,334	3,451	147.9
Vas County (HU222)	592	921	155.6
Zala County (HU223)	54	61	113.0
Southern Transdanubia (HU23)	1,110	1,067	96.1
Baranya County (HU231)	137	121	88.3
Somogy County (HU232)	728	671	92.2
Tolna County (HU233)	245	275	112.2

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NUTS 2/NUTS 3 region	Total (gross) sales value, million HUF		Change, 2013=100%
	2013	2016	
Northern Hungary (HU31)	2,505	3,007	120.0
Borsod-Abaúj-Zemplén County (HU311)	1,862	2,113	113.5
Heves County (HU312)	583	828	142.0
Nógrád County (HU313)	60	66	110.0
Northern Great Plain (HU32)	2,839	3,033	106.8
Hajdú-Bihar County (HU321)	1,122	1,178	105.0
Jász-Nagykun-Szolnok County (HU322)	1,319	1,398	106.0
Szabolcs-Szatmár-Bereg County (HU323)	398	457	114.8
Southern Great Plain (HU33)	1,603	2,795	174.4
Bács-Kiskun County (HU331)	751	1,822	242.6
Békés County (HU332)	93	125	134.4
Csongrád County (HU333)	759	848	111.7
Total (Hungary)	*44,825*	*51,622*	115.2

Source: Own calculation based on HVG (2013, 2016).

The next two tables show the ranking of NUTS 3 regions based on the total (gross) sales value in 2013 and 2016. I have divided the regions into quarters. Budapest, and Pest, Győr-Moson-Sopron, and Fejér counties (NUTS 3 regions) lead the list, but Nógrád and Zala counties are close to them. If we consider the cumulative share, it is obvious that there are significant inequalities of income distribution of the companies.

Table 3

Ranking of NUTS 3 regions by total (gross) sales value and their share in the total (gross) sales value of Hungary, 2013

Rank	Quarter	NUTS 3 region	Total (gross) sales value, million HUF	Share in the total (gross) sales value of Hungary, %	Cumulative share, %
1.	Q1	Budapest (HU101)	23,368	52.1	52.1
2.		Pest County (HU102)	5,522	12.3	64.5
3.		Győr-Moson-Sopron County (HU221)	2,334	5.2	69.7
4.		Fejér County (HU211)	2,291	5.1	74.8
5.		Komárom-Esztergom County (HU212)	2,106	4.7	**79.5**

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Rank	Quarter	NUTS 3 region	Total (gross) sales value, million HUF	Share in the total (gross) sales value of Hungary, %	Cumulative share, %
6.		Borsod-Abaúj-Zemplén County (HU311)	1,862	4.2	83.6
7.		Jász-Nagykun-Szolnok County (HU322)	1,319	2.9	86.6
8.	Q2	Hajdú-Bihar County (HU321)	1,122	2.5	89.1
9.		Csongrád County (HU333)	759	1.7	90.8
10.		Bács-Kiskun County (HU331)	751	1.7	**92.4**
11.		Somogy County (HU232)	728	1.6	94.1
12.		Vas County (HU222)	592	1.3	95.4
13.	Q3	Heves County (HU312)	583	1.3	96.7
14.		Veszprém County (HU213)	501	1.1	97.8
15.		Szabolcs-Szatmár-Bereg County (HU323)	398	0.9	**98.7**
16.		Tolna County (HU233)	245	0.5	99.2
17.		Baranya County (HU231)	137	0.3	99.5
18.	Q4	Békés County (HU332)	93	0.2	99.7
19.		Nógrád County (HU313)	60	0.1	99.9
20.		Zala County (HU223)	54	0.1	**100.0**
Total (Hungary)			*44,825*	*100.0*	–

Note: Here and hereinafter, deviations from 100.0% result from rounding. The numbers in bold represent the cumulative shares of the quarters in order to demonstrate the inequality among territorial units.

Source: Own calculation based on HVG (2013).

Table 4

Ranking of NUTS 3 regions by total (gross) sales value and their share in the total (gross) sales value of Hungary, 2016

Rank	Quarter	NUTS 3 region	Total (gross) sales value, million HUF	Share in the total (gross) sales value of Hungary, %	Cumulative share, %
1.		Budapest (HU101)	27,156	52.6	52.6
2.		Pest County (HU102)	5,131	9.9	62.5
3.	Q1	Győr-Moson-Sopron County (HU221)	3,451	6.7	69.2
4.		Fejér County (HU211)	2,419	4.7	73.9
5.		Borsod-Abaúj-Zemplén County (HU311)	2,113	4.1	**78.0**

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Rank	Quarter	NUTS 3 region	Total (gross) sales value, million HUF	Share in the total (gross) sales value of Hungary, %	Cumulative share, %
6.		Komárom-Esztergom County (HU212)	1,916	3.7	81.7
7.		Bács-Kiskun County (HU331)	1,822	3.5	85.3
8.	Q2	Jász-Nagykun-Szolnok County (HU322)	1,398	2.7	88.0
9.		Hajdú-Bihar County (HU321)	1,178	2.3	90.2
10.		Vas County (HU222)	921	1.8	**92.0**
11.		Csongrád County (HU333)	848	1.6	93.7
12.		Heves County (HU312)	828	1.6	95.3
13.	Q3	Somogy County (HU232)	671	1.3	96.6
14.		Veszprém County (HU213)	665	1.3	97.9
15.		Szabolcs-Szatmár-Bereg County (HU323)	457	0.9	**98.7**
16.		Tolna County (HU233)	275	0.5	99.3
17.		Békés County (HU332)	125	0.2	99.5
18.	Q4	Baranya County (HU231)	121	0.2	99.8
19.		Nógrád County (HU313)	66	0.1	99.9
20.		Zala County (HU223)	61	0.1	**100.0**
Total (Hungary)			*51,622*	*100.0*	–

Note: The numbers in bold represent the cumulative shares of the quarters in order to demonstrate the inequality among territorial units.

Source: Own calculation based on HVG (2016).

Table 5

Ranking of NUTS 2 regions by total (gross) sales value and their share in the total (gross) sales value of Hungary

Rank	NUTS 2 region	Total (gross) sales value, million HUF		Share in the total (gross) sales value of Hungary, %		Cumulative share, %	
		2016	2013	2016	2013	2016	2013
1.	Central Hungary (HU10)	32,287	28,890	62.5	64.5	62.5	64.5
2.	Central Transdanubia (HU21)	5,000	4,898	9.7	10.9	72.2	75.4
3.	Western Transdanubia (HU22)	4,433	2,980	8.6	6.6	80.8	82.0
4.	Northern Great Plain (HU32)	3,033	2,839	5.9	6.3	86.7	88.4
5.	Northern Hungary (HU31)	3,007	2,505	5.8	5.6	92.5	93.9
6.	Southern Great Plain (HU33)	2,795	1,603	5.4	3.6	97.9	97.5
7.	Southern Transdanubia (HU23)	1,067	1,110	2.1	2.5	100.0	100.0
Total (Hungary)		*51,622*	*44,825*	*100.0*	*100.0*	–	–

Source: Own calculation based on HVG (2013, 2016).

The total (gross) sales value of the top 500 companies increased from 2013 to 2016. The ranking of NUTS 2 regions has not changed. Considering the cumulative share of the total (gross) sales value of the top 500 on a regional level, the inequalities have marginally decreased, but large differences still exist.

The economic performance of the regions' income generation could be explained by sectoral issues. Next, the sectoral diversity of the NUTS 3 regions will be examined, presenting the regional inequalities.

Considering the number of enterprises, wholesale, service industry, automotive industry, energetics, food and tobacco industry, and agriculture sectors are the most dominant. Meanwhile, three sectors, namely energetics (21.2%), automotive industry (16.4%), wholesale (14.2%) comprise of more than half of the total sales value of top 500 companies. As such, we can conclude that even in the distribution of top 500 companies either from territorial, sectoral, and income generation point of view, significant differences exist. Among the three most dominant sectors, the automotive industry's total sales value is due to export activities. Besides the automotive industry, more than 80% of the total sales value comes from export activity of the electronics industry, machine engineering, and metalworking.

Table 6

Sectoral distribution of the top 500 enterprises and the share of sectors in the total (gross) sales value of Hungary and in that of Hungarian export activities, 2016

Sector	Number of enterprises	Share in the total (gross) sales value of Hungary, %	Share in the total (gross) sales value of Hungarian export activities, %
Wholesale	114	14.2	35.0
Service industry	62	5.6	50.0
Automotive industry	53	16.4	94.0
Energetics	49	21.2	41.0
Food and tobacco industry, agriculture	41	3.6	44.0
Transport	28	4.3	34.0
Chemical, rubber and plastic industries	26	4.6	70.0
Construction and materials industries	26	2.3	14.0
Electronics industry	25	5.9	87.0
Retail	24	5.0	1.0
Machine engineering	20	10.8	96.0
Metal working	10	1.1	86.0
Light industry	10	0.7	66.0
Pharmaceutical industry	6	2.2	7.9
Telecommunications and postal services	6	2.1	9.0
Total	*500*	*100.0*	–

Source: Own calculation based on HVG (2016).

Concerning the sectoral diversity of regions, we can state that all the sectors represented in Central Hungary, Central and Western Transdanubia, Northern Hungary as well as Northern Great Plain have a more complex sectoral composition compared with those in Southern Transdanubia and the Southern Great Plain. If we consider the headquarters, 78.0% from the total sales value of the top 500 companies is linked to the five most dominant NUTS 3 regions, where the share of Budapest was 52.6%. Their success is not only owing to a high number of enterprises from the group, but also enterprises with a good ranking. (See Tables 2–5.)

In the final stage of the research, the importance of the top 500 companies in the formulation of GVA/capita is examined. The change of the sales value (gross) on NUTS 3 level of the top 500 companies listed in 2013 and 2016 is compared with the change in GVA/capita. In case of the GVA/capita, regional values from 2015 and 2015 are selected as the top 500 list contains data from the previous business year. On a country level, both the total sales value and GVA/capita have increased during the period. Bács-Kiskun County has shown the largest increase, both in terms of the total sales value of the top 500 companies and GVA/capita.

Table 7

Total (gross) sales value of the top 500 companies and GVA/capita by NUTS 2 and NUTS 3 regions of Hungary

NUTS 2/NUTS 3 region	Total (gross) sales value of the top 500 companies, million HUF		Change, 2013=100%	GVA/capita, thousand HUF		Change, 2012=100%
	2013	2016		2012	2015	
Central Hungary (HU10)						
Budapest (HU101)	23,368	27,156	116.2	6,313	7,070	112.0
Pest County (HU102)	5,522	5,131	92.9	2,381	2,835	119.0
Central Transdanubia (HU21)						
Fejér County (HU211)	2,291	2,419	105.6	2,698	3,585	132.9
Komárom-Esztergom County (HU212)	2,106	1,916	91.0	2,911	3,488	119.8
Veszprém County (HU213)	501	665	132.7	2,055	2,513	122.3
Western Transdanubia (HU22)						
Győr-Moson-Sopron County (HU221)	2,334	3,451	147.9	3,319	4,566	137.6
Vas County (HU222)	592	921	155.6	2,702	3,334	123.4
Zala County (HU223)	54	61	113.0	2,447	2,843	116.2
Southern Transdanubia (HU23)						
Baranya County (HU231)	137	121	88.3	1,909	2,183	114.3
Somogy County (HU232)	728	671	92.2	1,830	2,128	116.3
Tolna County (HU233)	245	275	112.2	2,248	2,571	114.3

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NUTS 2/NUTS 3 region	Total (gross) sales value of the top 500 companies, million HUF		Change, 2013=100%	GVA/capita, thousand HUF		Change, 2012=100%
	2013	2016		2012	2015	
Northern Hungary (HU31)						
Borsod-Abaúj-Zemplén County (HU311)	1,862	2,113	113.5	1,782	2,438	136.8
Heves County (HU312)	583	828	142.0	1,884	2,397	127.2
Nógrád County (HU313)	60	66	110.0	1,270	1,462	115.2
Northern Great Plain (HU32)						
Hajdú-Bihar County (HU321)	1,122	1,178	105.0	2,168	2,482	114.5
Jász-Nagykun-Szolnok County (HU322)	1,319	1,398	106.0	1,867	2,222	119.0
Szabolcs-Szatmár-Bereg County (HU323)	398	457	114.8	1,587	1,870	117.9
Southern Great Plain (HU33)						
Bács-Kiskun County (HU331)	751	1,822	242.6	2,028	2,617	129.1
Békés County (HU332)	93	125	134.4	1,660	2,011	121.2
Csongrád County (HU333)	759	848	111.7	2,169	2,542	117.2
Total (Hungary)	*44,825*	*51,622*	115.2	2,889	3,454	119.6

Source: Own calculation based on HVG (2013, 2016) and HCSO regional statistics.

Conclusions

The results of the research indicate that the spatial distribution of the 500 companies with best sales performance (top 500 list) is in perfect accordance with the generally accepted regional inequalities' pattern of the country. The concentration of the companies not merely explains the inequality patterns of the country, but points out that the more favourable income level of developed regions is due to the export performance. The analysis shows how the change in performance of enterprises on regional level could be linked to economic polarisation: the sharply widening inequality of income and wealth; the distribution of the number of top 500 companies from 2013 to 2016 has not changed significantly, the dominance of the capital as well as regions near the western borderline have remained. If we consider the cumulative share of the distribution of the sales value (gross) of companies on a regional level, it is obvious that there are significant inequalities of income distribution of the companies. If we consider the headquarters of the enterprises, 78% from the total sales value of the top 500 companies is linked to five NUTS 3 regions, and the importance of the capital is outstanding. After the fourth programming period of the

EU, several ex post evaluations have been undertaken, assessing the effectiveness of the development funds. Having assessed the effectiveness of funds, it can be stated that the cohesion purpose of the regional policy was less successful; the territorial differences have continuously existed among the regions. The results of the research indicate the importance of agglomeration economies, which is these days a result of interaction among economies of scale, transportation costs, market size, and information as Paul Krugman (1991) explains in the 'New Economic Geography' theory. The repeated analysis has shown that both the total (gross) sales value of the top 500 companies (by 15%) and GVA/capita (19.5%) has increased during the period and the ranking of NUTS 2 regions has not changed. Thus, the change in GVA/capita and the total sales value of the top 500 companies on NUTS 3 level have common tendencies. Considering the cumulative share of the total (gross) sales value of the top 500 on a regional level, the inequalities have marginally decreased, but large differences still exist. Considering the number of enterprises, wholesale, service industry, automotive industry, energetics, food and tobacco industry, and agriculture sectors are the most dominant. Meanwhile three sectors, namely, energetics (21.2%), automotive industry (16.4%), and wholesale (14.2%) comprise of more than half of the total sales value of the top 500 companies. All the sectors of the top 500 companies are represented in Central Hungary, while the sectoral diversity of Central and Western Transdanubia, Northern Hungary as well as Northern Great Plain are more complex in comparison with Southern Transdanubia and the Southern Great Plain.

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APPENDIX

Table 1

Allocated funds, 2007–2013, and funds per capita by NUTS 2 and NUTS 3 regions of Hungary, 2014

NUTS 2/NUTS 3 region	Allocated funds, million HUF	Funds per capita, million HUF
Central Hungary (HU10)	2,492,900	0.835
Budapest (HU101)	2,051,600	1.167
Pest County (HU102)	441,300	0.360
Central Transdanubia (HU21)	727,700	0.684
Fejér County (HU211)	362,900	0.869
Komárom-Esztergom County (HU212)	153,000	0.512
Veszprém County (HU213)	211,800	0.611
Western Transdanubia (HU22)	667,000	0.678
Győr-Moson-Sopron County (HU221)	362,700	0.801
Vas County (HU222)	132,900	0.523
Zala County (HU223)	171,400	0.618
Southern Transdanubia (HU23)	653,600	0.719
Baranya County (HU231)	300,500	0.810
Somogy County (HU232)	238,500	0.764
Tolna County (HU233)	114,600	0.507
Northern Hungary (HU31)	825,100	0.708
Borsod-Abaúj-Zemplén County (HU311)	501,400	0.751
Heves County (HU312)	213,000	0.707
Nógrád County (HU313)	110,700	0.565
Northern Great Plain (HU32)	1,360,000	0.919
Hajdú-Bihar County (HU321)	576,300	1.073
Jász-Nagykun-Szolnok County (HU322)	270,500	0.712
Szabolcs-Szatmár-Bereg County (HU323)	513,200	0.913
Southern Great Plain (HU33)	1,122,900	0.883
Bács-Kiskun County (HU331)	341,300	0.664
Békés County (HU332)	287,200	0.818
Csongrád County (HU333)	494,400	1.217
Total (Hungary)	*7,849,200*	0.796

Source: Own calculation based on REQUEST® and HCSO data.

Table 2

Number of enterprises by sector in the NUTS 2 and NUTS 3 regions of Hungary, 2016

Sector	Hungary	Central Hungary (HU10)		Central Transdanubia (HU21)			Western Transdanubia (HU22)		
		HU 101	HU 102	HU 211	HU 212	HU 213	HU 221	HU 222	HU 223
Energetics	49	30	1	2	1		1		
Automotive industry	53	1	4	7	7	4	7	5	
Wholesale	114	64	22	4	2		2		
Machine engineering	20	5	2	1	3	1			
Electronics industry	25	2	5	4	3	1		2	
Service industry	62	48	9				2	1	
Retail	24	12	7	1		1			
Chemical, rubber and plastic industries	26	4	2	1	5	1	1	1	
Transport	28	16	4		1		1	1	2

Sector	Hungary	Southern Transdanubia (HU23)			Northern Hungary (HU31)			Northern Great Plain (HU32)			Southern Great Plain (HU33)		
		HU 231	HU 232	HU 233	HU 311	HU 312	HU 313	HU 321	HU 322	HU 323	HU 331	HU 332	HU 333
Energetics	49	1	1	1	3	1		3					4
Automotive industry	53				2	4	2		2	1	6	1	
Wholesale	114	1		1	1	1		4	2	2	4		4
Machine engineering	20	1			1			1	4				1
Electronics industry	25		2	1	2	1		1	1				
Service industry	62							1			1		
Retail	24				1				1	1			
Chemical, rubber and plastic industries	26				6					1	2		2
Transport	28			1	1							1	

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Sector	Hungary	Central Hungary (HU10)		Central Transdanubia (HU21)			Western Transdanubia (HU22)		
		HU 101	HU 102	HU 211	HU 212	HU 213	HU 221	HU 222	HU 223
Food and tobacco industry, agriculture	41	11	5	1	3	1	2		
Construction and materials industries	26	10	3	2			3	2	
Pharmaceutical industry	6	5							
Telecommunications and postal services	6	4	2						
Metal working	10	2	2	3		1	1		
Light industry	10	2	3	2				1	

Sector	Hungary	Southern Transdanubia (HU23)			Northern Hungary (HU31)			Northern Great Plain (HU32)			Southern Great Plain (HU33)		
		HU 231	HU 232	HU 233	HU 311	HU 312	HU 313	HU 321	HU 322	HU 323	HU 331	HU 332	HU 333
Food and tobacco industry, agriculture	41	1	1	1	2			3		1	4	1	4
Construction and materials industries	26								1		2	1	2
Pharmaceutical industry	6							1					
Telecommunications and postal services	6												
Metal working	10				1								
Light industry	10									2			

Source: Own elaboration based on HVG (2016).

Abbreviations: Budapest (capital) (HU101), Pest county (HU102), Fejér county (HU211), Komárom-Esztergom county (HU212), Veszprém county (HU213), Győr-Moson-Sopron county (HU221), Vas county (HU222), Zala county (HU223), Baranya county (HU231), Somogy county (HU232), Tolna county (HU233), Borsod-Abaúj-Zemplén county (HU311), Heves county (HU312), Nógrád county (HU313), Hajdú-Bihar county (HU321), Jász-Nagykun-Szolnok county (HU322), Szabolcs-Szatmár-Bereg county (HU323), Bács-Kiskun county (HU331), Békés county (HU332), Csongrád county (HU333).

Table 3

Sectoral diversity of the first-quarter NUTS 3 regions of Hungary, with company ranks, 2016

Sector	Budapest (HU101)	Pest County (HU102)	Győr-Moson-Sopron County (HU221)	Fejér County (HU211)	Borsod-Abaúj-Zemplén County (HU311)
Energetics	2., 4., 10., 13., 14., 20., 29., 41., 48., 52., 53., 55., 63., 67., 92., 125., 146., 158., 171., 191., 194., 199., 245., 331., 345., 346., 355., 378., 482., 500.	302.	132.	249., 304.	148., 175., 216.
Automotive industry	135.	42., 102., 190., 262.	3., 83., 133., 201., 211., 329., 429.	35., 54., 93., 179., 195., 372., 420.	30., 232.
Wholesale	32., 34., 36., 38., 57., 60., 66., 68., 70., 76., 87., 106., 107., 108., 109., 112., 122., 128., 138., 140., 152., 157., 160., 161., 167., 168., 174., 181., 182., 198., 203., 218., 233., 241., 244., 246., 264., 265., 272., 273., 292., 305., 320., 336., 354., 356., 357., 365., 370., 384., 405., 422., 425., 431., 432., 437., 443., 453., 463., 472., 488., 496., 497., 498.	16., 39., 51., 69., 81., 126., 155., 180., 184., 214., 263., 281., 295., 317., 327., 366., 409., 414., 451., 468., 474., 492.	267., 351.	219., 231., 363., 448.	404.
Machine engineering	1., 130., 347., 398., 440.	248., 252.		371.	104.
Electronics industry	139., 223.	110., 113., 215., 332., 340.		65., 222., 415., 454.	28., 162.
Service industry	22., 33., 85., 100., 111., 124., 154., 170., 173., 177., 185., 193., 196., 200., 213., 229., 234., 251., 255., 256., 261., 275., 276., 278., 319., 326., 342., 343., 362., 377., 379., 380., 390., 406., 411., 419., 421., 424., 433., 434., 444., 460., 473., 476., 479., 481., 485., 490.	242., 247., 253., 270., 280., 309., 333., 397., 426.	176., 221.		
Retail	26., 156., 166., 207., 282., 306., 311., 330., 338., 381., 407., 418.	9., 27., 56., 89., 137., 169., 293.		18.	375.

(Continued on the next page.)

(Continuation.)

Sector	Budapest (HU101)	Pest County (HU102)	Győr-Moson-Sopron County (HU221)	Fejér County (HU211)	Borsod-Abaúj-Zemplén County (HU311)
Chemical, rubber and plastic industries	82., 149., 189., 291.	350., 456.	374.	45.	17., 19., 95., 314., 367., 395.
Transport	12., 47., 49., 62., 72., 74., 96., 105., 117., 142., 143., 289., 316., 323., 361., 450.	318., 383., 438., 442.	402.		376.
Food and tobacco industry, agriculture	78., 79., 86., 147., 178., 296., 352., 410., 461., 493., 494.	84., 97., 235., 322., 368.	187., 423.	101.	303., 413.
Construction and materials industries	75., 121., 123., 136., 165., 186., 210., 386., 401.,478.	226., 358., 392.	294., 427., 457.	382., 471.	
Pharmaceutical industry	21., 24., 77., 447., 469.				
Telecommunications and postal services	7., 73., 151., 257.	64., 220.			
Metal working	364., 439.	449., 475.	150.	46., 120., 227.	436.
Light industry	259., 458.	258., 373., 464.		118., 290.	

Note: Colour code: red – ranks of the top 100 companies, navy blue – ranks of the top 101–200 companies, green – ranks of the top 201–300 companies, brown – ranks of the top 301–400 companies, light blue – ranks of the top 401–500 companies.

Source: Own elaboration based on HVG (2016).

Territorial distribution of highly educated individuals in Hungary after 1990

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Keywords:
territorial distribution, educational level, regional inequalities

Knowledge-intensive activities, such as business services are nowadays more and more concentrated in big cities or city regions. These activities require skilled labour, so young graduates in particular are present in these areas, while in rural areas labour force is less qualified. The study investigates whether this concentration phenomenon can be observed in Hungary, or rather regional equalization takes place. The authors analyse the spatial distribution of the population's educational level, in particular the spatial distribution of graduates. Their investigation is based on the 1990, 2001 and 2011 censuses of settlement level. The study analyses the evolvement of education and its impact on regional inequalities at different regional levels (settlement, micro-regional and county levels) by using basic statistical and concentration indices.

Introduction

Today, the economic growth and development of regions primarily depend on the quality of the human capital available, which is an important resource, particularly in the case of knowledge-intensive activities (Pike–Rodrígues-Pose–Tomaney 2006, Stimson–Stough–Nijkamp 2011, Todaro–Smith 2012). Knowledge-intensive activities operate efficiently mostly in a *spatially concentrated* manner. They are inexpensive and reliable if the number of both innovative firms and the related institutions and their employees reach a *critical mass* in a particular industry/business in the

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region (city), where they have agglomeration externalities (Capello 2015, Dicken 2015, McCann 2013).

The quality of human capital is assessed using various methods; the simplest method is with *education level*, or with the number of years spent in training. Teperics et al. (2016) examined the territorial characteristics of four dimensions of learning in order to map learning regions in Hungary in 2011. One of the four dimensions was formal learning, which can be measured by the educational levels reached. They found that its index is in a significant positive relationship with personal income tax per capita, and in a significant negative relationship with the unemployment rate on settlement level. The education level is not only important in terms of the economic growth of regions, but it also strongly influences an individual's situation and well-being. A higher level of education can entail lifestyle, health, and cultural advantages, in addition to more favourable job opportunities (Todaro–Smith 2012). Researchers use different educational levels of the population as explanatory variables in the models of economic growth (Benos–Zotou 2014), sharing economy (Dudás et al. 2017) and international labour-mobility (Kincses 2015). Eurostat reports educational attainment as an indicator of urbanization (Brandmueller et al 2017).

In Hungary, following the regime change of 1990 and the transition to a market economy, new territorial processes can be observed (Barta et al. 2005, Dusek et al. 2014, Gál 2016, Lengyel 2004, Lengyel–Leydesdorff 2011, Róbert 1991, Sánta et al. 2015, Timár 2007). Adapting to the new challenges, the education level of the population considerably improved (Rechnitzer–Smahó 2006). Kiss, Tagai, and Thelbisz (2008) analysed spatial distribution of the population with certain educational levels based on census data between 1930 and 2001. They found that territorial disparities decreased along this period, although this process was slowing down.

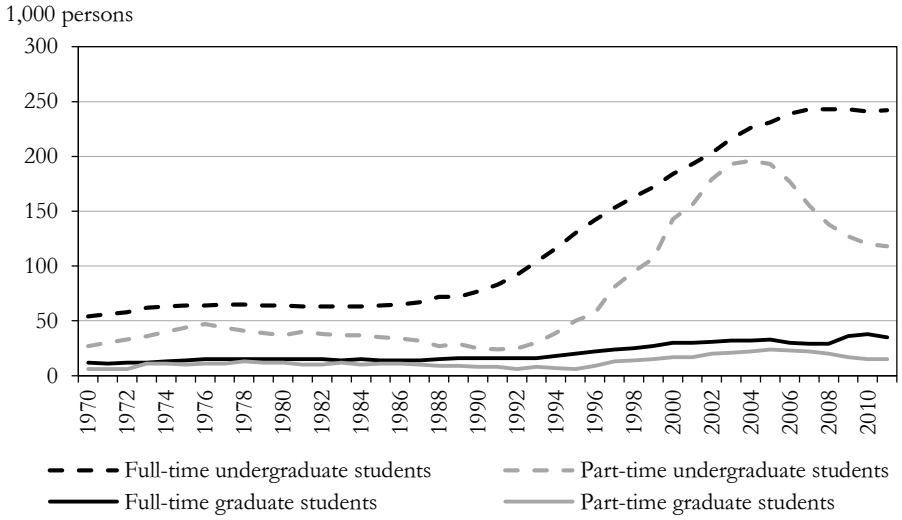
In the socialist period before the regime change, from 1970 to 1988, the number of students in tertiary education barely changed, fluctuating between 90,000 and 110,000 persons, where two-thirds were full-time students (see Figure 1). In this period, 20,000-25,000 students obtained university degree annually, 50-60% of them as full-time students. After 1990, the number of students increased sharply, due to an increase in the number of students with general certificate of secondary education as a requirement for tertiary education on the one hand, while university capacities considerably increased on the other hand. From 2000, 50,000-55,000 persons gain university degree annually, where the rate of graduated full-time students reaches 70%.

The rate of highly educated individuals increased from 10.1% in 1990 to 18.0% in 2011, when it almost doubled. Despite a substantial increase in the number of newly graduated students, this rate was far below the 28 member states in the European Union (EU28) average of 23.7% in 2011; Hungary is at the 21st position amongst the EU28. The rate of secondary school graduates increased from 28.7 to

49.0%, while the rate with no grades of primary school decreased from 1.2 to 0.6%.

Figure 1

Change in the number of undergraduate and graduate students in the Hungarian higher education



Source: Hungarian Central Statistical Office, STADAT Table 2.6.

The development of the Hungarian higher education after the regime change can be divided into three stages (Kozma–Tőzsér 2016). In the first stage of 1988–1993, several new higher educational institutions were established, mainly foundation and religious colleges. There was a quantitative explosion in the second stage of 1994–2004, where public higher educational institutions substantially increased the number of students, particularly in part-time programmes. In the third stage starting from 2004, the growth slowed down and stalled. Primarily, the number of part-time and graduate students declined in this stage.

The basic research question is: how did the rise in the education level, particularly in tertiary education, affect territorial differences? Did they continue to decrease or increase in the past two decades? Did it result in spatial concentration or territorial levelling? Did these processes take place in a similar manner at each territorial level?

Our paper aims to analyse the education level of the population, in particular the rate and spatial location of highly educated individuals, as well as the development of related territorial differences after 1990. We focus on tertiary education on the score of the fact, that a higher education level presumes all the education levels below.

First, we describe the data collection process and the applied methodology, and then we present the specificities of the change of education level by settlement (LAU 2) and by the type of settlement. Following this, we analyse the tendency of territorial differences in the tertiary education of the population at subregional (LAU 1) and county (NUTS 3) levels.

Data collection and methodology

In Hungary, only the census provides exact settlement data for analysing the education level of the population, thus we used the data of the last *three censuses* (1990, 2001, and 2011) (HCSO 1993, 2003, 2013). We completed our research on various spatial division levels; we aggregated our LAU 2 data on LAU 1, NUTS 3, and regional (NUTS 2) territorial levels. In order to compare the three dates, we uniformly applied the *settlement structure of 2011*, thus in the case of settlement unions and separations over the studied period, we distributed our data in proportion to the population, and aggregated it. We calculated 3,176 settlements in total, where 23 districts of Budapest, which is the capital, are included in the database separately.

We can apply different indices to analyse territorial differences according to the education level of the population (Dusek–Kotosz 2016, Fischer–Getis 2010). In the calculation of the rates on which the analysis is based, we compared the highest completed level to the corresponding age group and we relied on the documents of the Hungarian Central Statistical Office for constraints and concepts (HCSO 2011).

In our analysis, we applied the following types of completed educational levels:

– population with no grades of primary school (their rate in the population over the age of 10),
– population with completed primary school (their rate in the population over the age of 15),
– population with completed secondary school, or vocational or apprentice school (their rate in the population over the age of 18),
– population with tertiary education (college or university) (their rate in the population over the age of 25).

We applied the following *indicators/indices* to calculate the development of territorial differences, focusing on different aspects (Nemes Nagy 2005, 2009, Dusek–Kotosz 2016, Fischer–Nijkamp 2014):

– weighted coefficient of variation:

$$V = \left[\frac{1}{\bar{y}} \sqrt{\frac{\sum (y_i - \bar{y})^2 f_i}{\sum f_i}} \right] * 100,$$

where y_i stands for the rate of a particular education level in the i^{th} settlement, $\bar{y}$ denotes the rate of a particular education level nationally, and f_i indicates the population of the i^{th} settlement in a particular age group.

– Hoover index (index of dissimilarity):

$$h = \frac{\sum_{i=1}^{n} \left| x_i - q_i \right|}{2},$$

where x_i and q_i are distribution coefficients, x_i specifies the rate of a particular education level in the i^{th} settlement, within the national education level in question, and q_i is the rate of the population of a particular age group in the i^{th} settlement within the national value.

The Hoover index shows the percentage of people with a degree which should be transferred between territorial units so that their territorial distribution is equal to the distribution of the population in the age group in question.

– Gini coefficient (Gini index):

$$G = \frac{1}{2\bar{x}\left(\sum_i f_i\right)^2} \sum_i \sum_j f_i f_j \left| x_i - x_j \right|,$$

where x_i denotes the rate of highly educated individuals in the i^{th} settlement, $\bar{X}$ indicates the rate of highly educated individuals at national level, and f_i stands for the population of a particular age group in the i^{th} settlement.

The Gini index is also an index of dissimilarity; it compares the average deviation of the rate of every observation unit from all other units to the average. In other words, it measures the size of the area bounded by the Lorenz curve and square diagonal. It describes the relative extent of the concentration.

Education level of the population based on settlement data

Based on the census data, the rate of population in the corresponding age group, with *no grades of primary school* declined from 1.2 to 0.6% from 1990 to 2011 (see Table 1). The rate of the population completing at least *8 grades of primary school* increased from 78.1 to 95.1% by 2011, which is a fairly high value. These two phenomena were enforced by the fact that the rate of non-educated individuals was the highest among older people, which means that demographic changes such as mortality reduced the *no grades* rate and enhanced the proportion of population with at least 8 completed grades of primary school. The rate of the population completing *secondary school* increased from 28.7 to 49.0%. As such, approximately half of the population has a certificate. The rate of the population completing *tertiary education* also increased substantially; it reached 19% by 2011. This is a high proportion, but it is below the average of the EU (announced by the Eurostat for the ages of 25–64): the EU average is 22.4%, while it is 21% in Hungary in this age group. The question is: How did the national processes affect territorial differences?

Table 1

Population having achieved a certain level of educational attainment as percentage of the corresponding age group

Level of educational attainment	1990	2001	2011
No grades of primary school	1.2	0.7	0.6
8 grades of primary school	78.1	88.8	95.1
Secondary school	28.7	38.2	49.0
College/university	10.1	12.6	19.0

Note: The table shows cumulative education level figures assuming that a respondent in a category further down the table will have an equivalent education to all the categories above.

Source: Own calculation based on HCSO census data.

The indices of territorial dissimilarities calculated on the basis of the settlement data of the population with the highest education level are as follows (see Table 2):

– *Weighted coefficient of variation*: In terms of settlements, the variation of the education level decreased, except for the *no grades of primary school*, whose rate became minimal (see Table 1), in line with the national trend. The variation of 8 grades of primary school significantly decreased as elementary education was almost fully provided, while the rate of population completing primary school increased from 78.1 to 95.1%. Although to a smaller extent, the variation of secondary school and university graduates by settlement decreased, and the latter can still be considered significant.

– *Hoover index*: The values of this index calculated on the different levels of education show a continuous decline, but significant differences can still be found, particularly in the case of people with university/college degree. 28.1% in 1990, 27.1% in 2001, while only 23.9% of the highly educated individuals should have been transferred between settlements to equal the education level distribution to the territorial distribution of the population over the age of 25.

– *Gini index*: The values of the index indicate that in the case of the population with different education levels, the settlement differences decreased by 2001 in comparison to 1990 and then they further declined in 2011, although to a smaller extent. Compared to 2001, a major decrease can be observed in the case of secondary school and tertiary education in 2011. Thus, the relative extent of concentration decreases, which also implies a territorial levelling process of the education level.

In the case of all the three indices of dissimilarity, settlement differences measured on the basis of the highest completed education level decreased, except for the otherwise small number of people completing no grades of primary school. The specific differences between settlements decreased dynamically in the case of 8 grades of primary school and secondary school, while they declined more moderately in the case of tertiary education, where a certain levelling tendency is outlined

for settlements in terms of the highest education level of the population. The competitiveness of the economy of settlements and regions is primarily influenced by qualified human capital; therefore, we provide a more detailed analysis on the territorial distribution of the settlement of highly educated individuals and its tendencies.

Table 2

Three dissimilarity indices by level of educational attainment

Dissimilarity index	1990	2001	2011
Weighted coefficient of variation (%)			
No grades of primary school	106.6	138.5	146.1
8 grades of primary school	12.0	8.1	3.7
Secondary school	47.7	41.7	33.5
College/university	72.4	69.0	59.7
Hoover index			
No grades of primary school	29.4	32.1	30.1
8 grades of primary school	5.1	2.8	1.4
Secondary school	20.4	17.9	14.3
College/university	28.1	27.1	23.9
Gini index			
No grades of primary school	0.40	0.44	0.42
8 grades of primary school	0.07	0.04	0.02
Secondary school	0.27	0.24	0.19
College/university	0.38	0.37	0.33

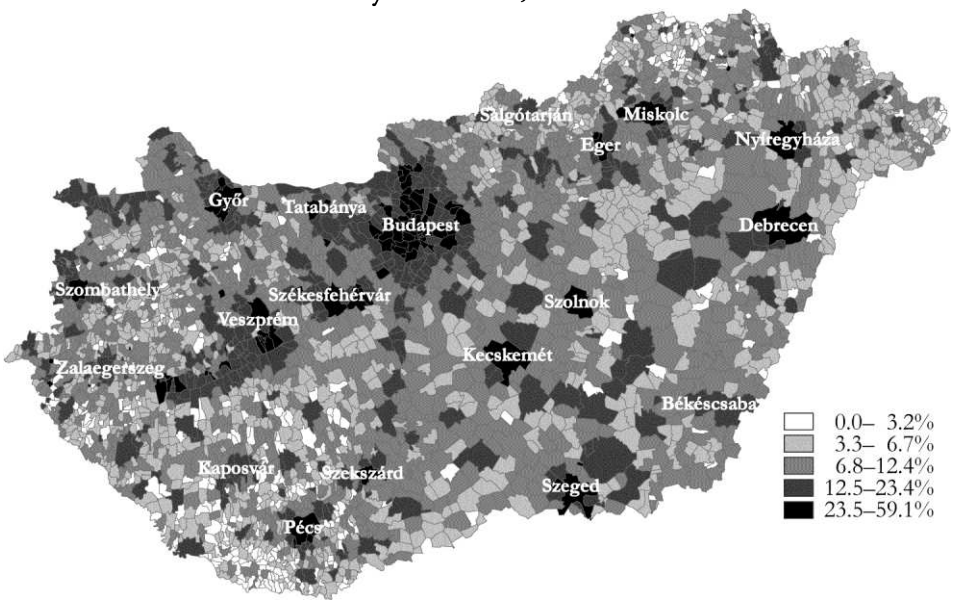
Source: Own calculation based on HCSO census data.

Spatial distribution of highly educated individuals

In 2011, *the rate of highly educated individuals* was related to the size and spatial location of settlements (see Figure 2). Budapest and its agglomeration, as well as the county seats with larger universities, stand out in all three points of time. The provincial university towns, which are also region centres, function as an 'island'; the rate of people with university/college degree is much lower in the areas around these larger towns. Similarly, the regions of small villages having a labour force with a low level of tertiary education, and the regions along the southern and eastern borders are spatially separated.

Figure 2

Rate of highly educated individuals in the total population, by settlement, 2011

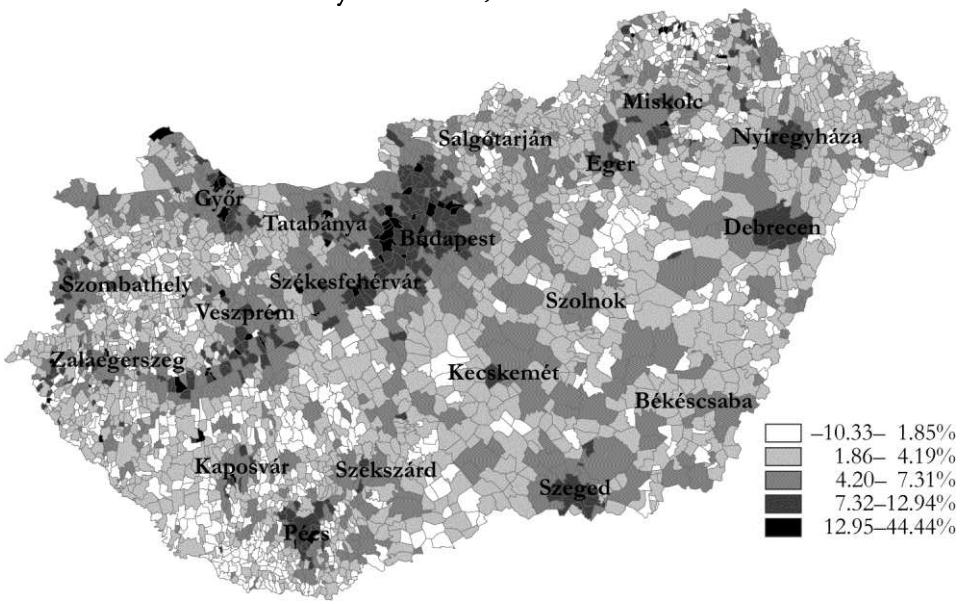


Source: Own elaboration based on HCSO census data.

Between 2001 and 2011, the rate of people with university/college degree increased in Budapest and its agglomeration to the greatest extent, the increase exceeds even the 35 percentage points in several places (see Figure 3). This rate also increased, to a smaller extent, between 7–10 percentage points in the county seats with larger universities. The rate of tertiary education increased to a smaller degree in two thirds of the settlements, particularly in smaller ones. The effect of motorways is noticeable; improving accessibility and mobility became important in many higher educational professions, and this is presumably the reason why the settlements alongside motorways have a more qualified population. There are also larger contiguous rural regions, internal peripheries characterised by a slow change.

Figure 3

Change in the rate of highly educated individuals in the total population, by settlement, 2001–2011



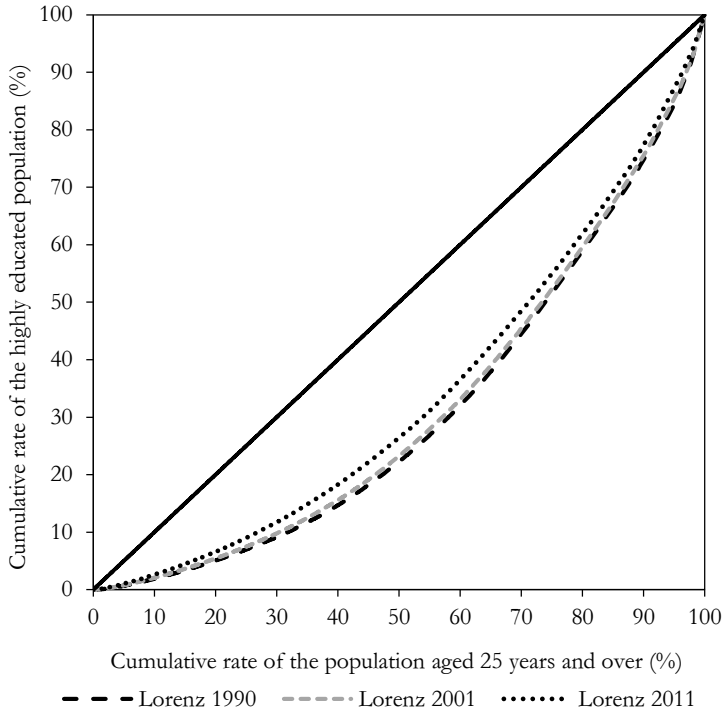
Source: Own elaboration based on HCSO census data.

In line with the Gini index, the *Lorenz curves* calculated on the distribution of highly educated individuals (for the data, see Table 1) also indicate a levelling process, even if it is only of a low degree (see Figure 4). On the basis of the curve, it can be established that settlement differences decreased by 2001 in comparison to 1990, and then continued to decline in 2011, although the change became slower.

All the described indices of dissimilarity indicate that the settlement differences of highly educated individuals decreased over the last period. The question arises whether the basic types of settlement are also characterised by this levelling process.

Figure 4

Lorenz curves of highly educated individuals, based on settlement data



Source: Own elaboration.

We classify the settlements into four types: the capital, towns of county rights (there are 23 such in Hungary), the other towns, and villages (see Table 3). As shown, the number of people with degrees increased by about one and a half times in each type. The greatest extent of growth is in the villages, where it almost doubled, but considering its rate, it is still only half (7.9%) of the national average (15.5%). The high rate of the capital characterises both points of time; it is approximately double the national average, which also indicates that approximately one third of the Hungarian university/college graduates worked in the capital in 2011. There is a decrease in differences among the types, although it can be clearly observed that the rate of population completing tertiary education increased moderately in towns of county right.

Table 3

Number of highly educated individuals aged 7 and over and their rate in the total population, by settlement type

Settlement type	Number of individuals with university/college degree, thousand		Increase, %	Rate of individuals with university/college degree in the total population, %	
	2001	2011		2001	2011
Capital	320.9	467.6	45.7	19.1	28.9
Town of county rights	262.4	376.3	43.4	13.4	19.8
Other town	232.6	372.8	60.3	7.8	12.7
Village	118.1	222.9	88.7	4.1	7.9
Total	*934.1*	*1 439.7*	54.1	9.8	15.5

Source: HCSO http://www.ksh.hu/nepszamlalas/tables_regional_00, Table 4.1.4.1.

The analysis of settlements data shows that there is a levelling process among the settlements throughout the periods considering the specific indices of education level. The change at lower education levels was significant between 1990 and 2001, while the increase in the rate of secondary and tertiary education characterises the period between 2001 and 2011. However, the concentration of the population with university/college degree is in larger towns, particularly in the capital and in towns of county rights, which is still prominent and corresponds to the international experience of the spatial concentration of knowledge-intensive activities.

Highly educated individuals at subregional and county levels

The indices of dissimilarity studied confirm the presence of a levelling process of educational attainment at settlement level over two decades. Nevertheless, it also needs to be considered that in the case of the population with university/college degrees, the place of living and the workplace is often separate, several urban regions are characterised by suburbanisation processes. Consequently, it is useful to analyse the statistical subregions (LAU 1), of which Hungary has 175, and the counties (there are 19 units of NUTS 3 level). The population of Budapest was 1,745,000 persons in 2013, the population of the second most populated subregion is much smaller (258,000 persons of Miskolc); due to the dominance of the capital in terms of settlement network, it is practical to analyse the indices with and without Budapest (Lengyel–Szakálné Kanó 2012). Teperics et al. (2016) found that the index based on the education level is in correspondence with the hierarchy of settlements owing to the differences in accessibility to public and higher educational institutions. Although we could study city-regions in this framework too, we were first interested in gaining a general picture on a subregional level.

In the examined period, each territorial dissimilarity index decreased at the subregional level as well (see Table 4). The levelling process was more dynamic with Budapest included, than without the capital. In the case of highly educated individuals, the levelling process marginally accelerated after 2001.

Table 4

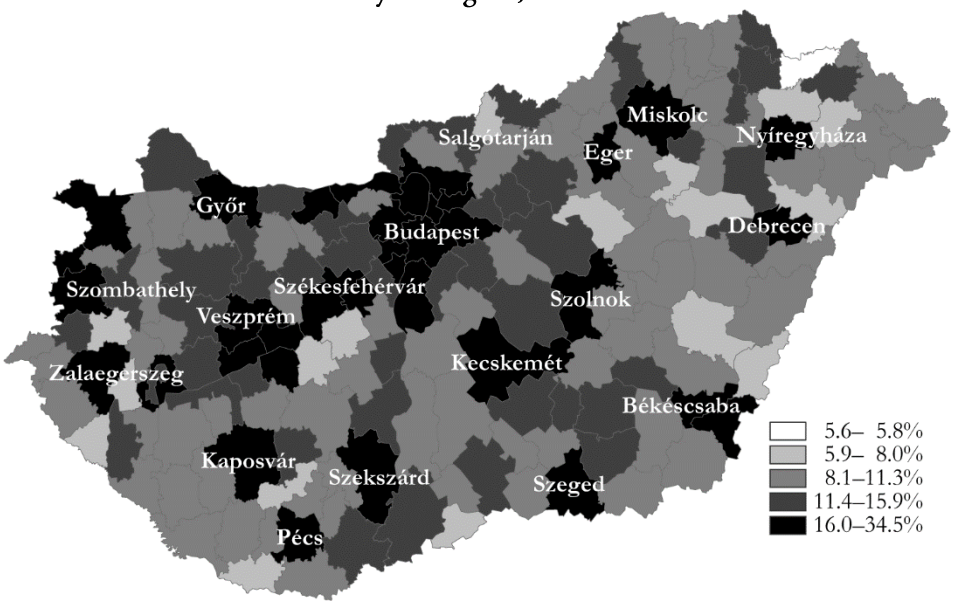
Three dissimilarity indices of highly educated individuals at subregional level

Dissimilarity index	1990	2001	2011
Calculated with data of Budapest			
Weighted coefficient of variation (%)	54	53	48
Hoover index	23	23	21
Gini index	0.30	0.29	0.27
Calculated without data of Budapest			
Weighted coefficient of variation (%)	43	45	41
Hoover index	19	19	18
Gini index	0.24	0.25	0.23

Source: Own calculation.

Figure 5

Rate of highly educated individuals in the total population, by subregion, 2011



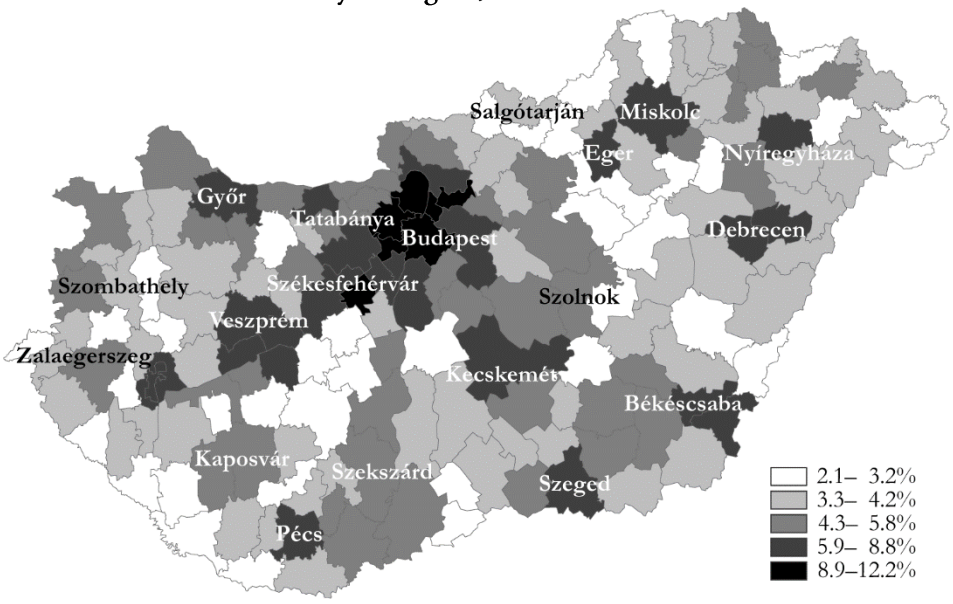
Source: Own elaboration based on HCSO census data.

Apart from the capital (which we consider as a subregion), the rate of the population completing tertiary education was the highest in three subregions, Budaörs, Szentendre, and Pilisvörösvár (over 30%) in 2011 (see Figure 5). It also shows a high rate of the subregions of larger provincial university towns (Szeged, Pécs, Debrecen, Eger, and Veszprém).

There is a very dynamic change between 2001 and 2011, where the values fluctuate on a scale of 2–10 percentage points (see Figure 6). The rate of highly educated individuals increased by at least 10 percentage points in the agglomeration of the capital, where there is a high degree of concentration in the areas around Budapest. Thus, the extent of growth is most substantial in the agglomeration of Budapest and the larger provincial university towns, but they are not characterised by the highest rate of growth as the increase was over 60% in the case of 73 rural subregions. This latter phenomenon reflects the process towards levelling.

Figure 6

Change in the rate of highly educated individuals in the total population, by subregion, 2001–2011



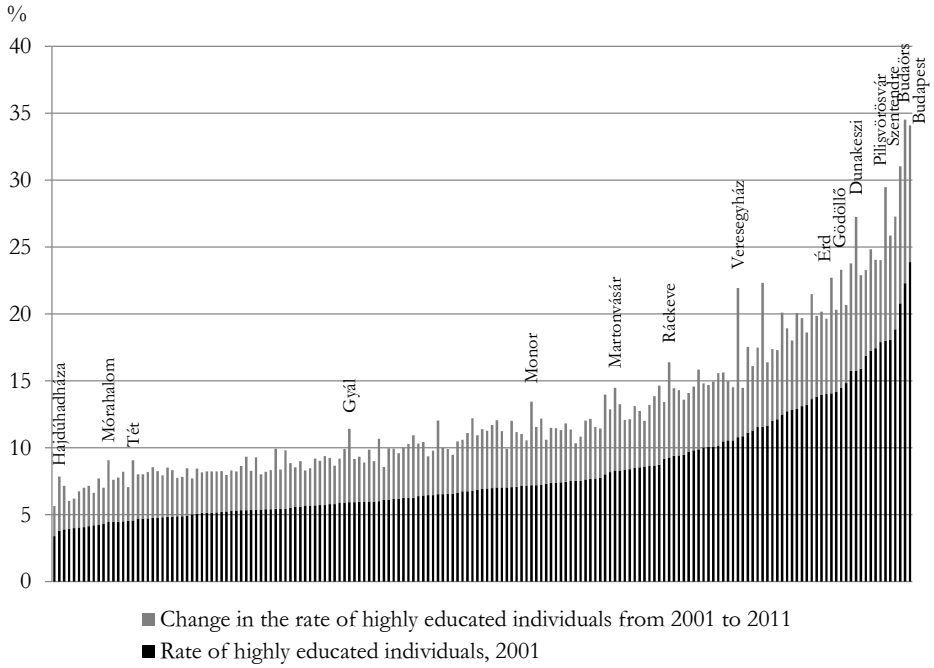
Source: Own elaboration based on HCSO census data.

The rate of highly educated individuals increased in each subregion between 2001 and 2011, but the rate of growth was generally higher in the subregions with a lower level of education (Hajdúhadháza, Mórahalom, Tét, etc.) than in those where the rate of highly educated individuals was originally higher (see Figure 7). Subregions with centres in the Budapest agglomeration (Gyál, Tét, Monor, Martonvásár,

Veresegyház, Gödöllő, Érd, Dunakeszi, Pilisvörösvár, Szentendre, and Budaörs) also have higher growth rate of highly educated individuals, which suggests the presence of suburbanisation.

Figure 7

Rate of highly educated individuals and its change by subregion centre



Note: The figure highlights only those subregion centres that were mentioned in the text.
Source: Own elaboration.

We can write a logarithmic regression equation on the *rate increase of highly educated individuals* by subregion, which helps to verify β convergence. In terms of the period of 2001–2011, the following regression equation describes the correlation with a good approximation:

$$\ln y_{2011} - \ln y_{2001} = 0.1939 - 0.1012 \cdot \ln y_{2001} + u$$
$$R^2 = 0.2500;\ p_{\beta_1} = 1.86 \cdot 10^{-12},$$

where u denotes the error term, p indicates the significance level of β_1. The relationship indicates that the level of subregions is also characterised by a territorial levelling process. The coefficient of $\ln y_{2001}$ is significantly negative. In other words, in the case of the subregions with a lower rate of highly educated individuals in 2001, the examined index increased from 2001 to 2011 at a higher *rate* than in those subregions where the initial value was higher. The *extent* of growth would obviously

show a reciprocal correlation: the extent of increase was the greatest in Budapest (considering the capital as a subregion, where the rate of 23.9% in 2001 increased to 34.1% in 2011, while it rose from 12.6 to 19% at the national level) and in the subregions of its agglomeration, which indicates a very dynamic spatial process.

As mentioned, agglomeration economies and the presence of a critical mass are of major importance in global competition (Capello 2015, McCann 2013). We categorise the subregions into five types on the basis of their population number (see Table 5). In the capital and in the subregions with a minimum of 100,000 inhabitants, the rate of highly educated individuals significantly exceeds the national average throughout the periods; it varies similarly to the average in the subregions with 50,000–99,000 persons, while it falls behind the average in the subregions with a lower number of inhabitants. In terms of the size of subregions, a certain process of levelling can be observed; mostly, the growth rate of the capital slowed down (due to the mentioned suburbanisation processes), while that of the other subregions was over the national average.

Table 5

Percentage and change in the number of highly educated individuals in the population over 25 by the size of subregions

Subregion size	Rate of highly educated individuals in the population over 25, %			Change, %		
	1990	2001	2011	2001/1990	2011/2001	2011/1990
Budapest	19.1	23.9	34.1	16.7	46.3	70.9
Population of 100 thousand or more	11.6	14.6	21.4	37.6	59.0	118.8
Population of 50–99 thousand	8.3	11.0	16.9	42.7	61.3	130.2
Population of 20–49 thousand	5.7	7.1	11.4	29.7	61.8	109.9
Population of 19 thousand or less	4.3	5.6	9.2	31.3	60.7	110.9
Total	10.1	12.6	19.0	29.2	55.6	101.0

Note: The subregions were categorised by their 2011 population.
Source: Own calculation.

The decrease in the differences related to education level characterises not only the settlement and subregional data, but there is a *certain levelling process among the counties* as well (see Table 6). The value of the Gini index calculated on highly educated individuals decreased at each territorial level; the smallest dissimilarity is found among the counties, while the differences are rather bigger in the case of subregions and settlements. Evidently, the institutions of local public administration, and the organisations of higher education, health care, and various public ser-

vices are concentrated in larger towns, county seats in particular, and provide for the entire population of the county.

Table 6

Gini index based on the rate of highly educated individuals in the total population and its change by territorial level

Territorial level	Rate of highly educated individuals in the total population, %			Change 2001/1990, %	Change 2011/2001, %
	1990	2001	2011		
Settlement	0.38	0.37	0.33	–3	–11
Subregion	0.30	0.29	0.27	–1	-9
County	0.21	0.20	0.19	–4	–5

Source: Own calculation.

One explanation for territorial levelling may be the significant expansion of higher education after 1990, and the popularity of correspondence courses and adult education. Prior to 1990, 8–10% of the given age groups studied in higher education and there was no demand for university graduates in the socialist planned economy. With the transition to a market economy, not only the young people entered higher education in large numbers, but the employers also expected their workers to train themselves, for instance, in the public sector. The number of people with tertiary level qualifications was an annual average of 24,000 at the beginning of the 1990s, which gradually increased and reached 57,000 by 2005; since then it has marginally decreased and it is approximately 50,000–53,000 persons per year. The number of people with a *degree in adult education* increased dynamically from 1995, in the period 2003–2008, over 20,000 persons per year acquired tertiary level qualifications, which decreased to 10,000-15,000 from 2009. The demands for higher education in correspondence and distance learning were generated mainly by the labour market requirements towards rural employees with no degrees (e.g. public employees). In our opinion, it had a major role in territorial levelling that a large number of degrees could be gained in settlements far from higher educational institutions alongside job commitments, while the people completing full-time training work mostly in larger towns, particularly in Budapest.

Conclusions

Our research aimed to analyse the education level of the population and its territorial changes in Hungary over the period of 1990–2011. Our study particularly focused on highly-qualified labour force, highly educated individuals, as qualified human resources have major importance in a knowledge-based economy (Gál 2010, Pike et

al. 2006, Stimson et al. 2011). We used statistical methods widely applied in regional sciences to analyse territorial processes and differences.

In Hungary, the number and rate of educated people continuously increased from 1990. More specifically, the rate of the population with secondary and tertiary qualifications showed a substantial growth. The analysis of the data revealed that not only the rate of educated people increased in a particular age group at the national level, but simultaneously, there was a slow territorial levelling process at each studied territorial level: at the level of settlements, subregions, and counties.

The literature of regional science suggested that the population with university/college degree is concentrated in larger towns and it leads to an increase in territorial differences; thus, we find it surprising that the rate of the population with degrees increased everywhere, even in less advanced regions, and it led to a decrease in territorial dissimilarities. Its profound explanation requires further research; we assume that territorial levelling can be partially explained by the fact that the number of people with degrees employed in the public sector increased in less advanced regions as well, owing to further training in several cases. In the small towns of less developed regions, a reindustrialisation process generated by foreign direct investments started after 2004, accompanied by related business services, which require a labour force with knowledge in foreign languages and university degree. Completed tertiary education is also becoming increasingly important for agricultural enterprises operating in the settlements of rural regions. While suburbanisation earlier emerged primarily in the agglomeration of the capital, subsequent to 2000, it developed in the majority of the 23 towns of county rights; a part of the population that moved to the smaller settlements in the surrounding area have completed tertiary education. Another factor facilitating levelling is that higher educational institutions were also established in smaller provincial towns from the mid-1990s.

The changes occurring over the two decades studied prognosticate the expected future tendencies: we assume that the territorial levelling process of the population completing secondary school continues, although at a slower pace, while the territorial levelling of the rate of highly educated individuals is expected to stop and urban concentration processes will intensify. In our opinion, it is already reflected by the decreasing number of certificates gained in correspondence courses over the last years.

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