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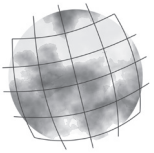

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CONTENT

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SMART SPECIALISATION AND THE INTERNAL POTENTIAL OF REGIONS IN POLAND

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Abstract
The paper aims to verify identified regional smart specialisations in the context of internal potentials of regions in Poland. Regional smart specialisations were examined and compared with development potentials. There are three general topics regarding specialisations: 1) their number, 2) their multidisciplinarity 3) criteria for identification. The identification approach of smart specialisations is multidimensional and multisectoral, so the identified specializations are difficult to classify. In Poland's case there have been 81 regional smart specializations identified. Many of them cover a wide spectrum of sectors. All of them have been classified and examined by statistical methods. Identification of smart specializations should be connected with and dependent on endogenous potentials of regions. The aim was to compare regional strengths and the results of identification proposed in regional innovation strategies (RIS). The role of the new regional policy is to strengthen the competitive industries or branches. However, the identification of smart specializations often aims to strengthen underdeveloped sectors or a new ones, which can be verified in entrepreneurial discovery process in the future.

Key words
Smart specialisations, internal potential, Poland, region

INTRODUCTION AND TERMINOLOGICAL ISSUES

The prevalent view in contemporary regional policy is that territorial development depends on the competitiveness of regions and the possessed skill to make the most effective use of investment funding. Proponents of this kind of solution are rather against the direct supporting of weakly-developed areas, instead speaking up for the installing of conditions whereby development may spread out or diffuse (or trickle down) from areas experiencing growth. What is referred to in this context is the polarisation-diffusion model (*Polska 2030…* 2009). This concept derives from the theory of non-balanced regional development and assumes dynamic develop-

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ment in a given place, with the impacts of this in time spreading out (theoretically by way of diffusion) across the whole area of a region.

In practice, the above does not actually denote non-intervention on behalf of areas that are only more weakly-developed, as is made clear by the active pursuit in Poland of the concept of the Area of Strategic Intervention (*Obszar Strategicznej Interwencji*or *OSI*), in which the official definition has this as an area requiring outside intervention if full use of development potential is to be made (KSRR 2010). In fact, however, OSIs include both areas experiencing growth and problem areas. The stimulation of development and enhancement of investment opportunities in areas at risk of permanent marginalisation is in turn indicated in Poland's 2016 *Strategia na rzecz odpowiedzialnego rozwoju* ("Strategy for Responsible Development").

From the territorial point of view, "winner" regions usually come within one of three categories. Either they are large metropolitan regions, or they are certain kinds of area associated with industry or tourism (Pike et al. 2006). In general, peripheral regions are only developed to a limited extent, lacking strong centres of growth, and therefore needing to seek out the internal potential that may offer them some kind of competitive advantage. This all necessitates a more individualised approach to regions and the effective use of their internal resources. In other words, it denotes alternative development strategies conceptualised regionally and locally.

Technological progress and the ongoing increase in the significance of knowledge to the socioeconomic development of states on the Old Continent are shaping new needs where EU regional policy is concerned, not least in regard to the aforesaid, more-individualised approach. As has also been noted, the agent by which development may occur is the activated internal potential of the region, which can exert a favourable influence on the lives of inhabitants, and can permit the more effective utilisation of the area's own investment funding, as well as that coming in from beyond. Assumptions of this kind have been crystallised by way of the concepts of territorial capital (Camagni 2008), endogenous potential (Scott and Storper 2003) and local conditioning and local networking (Fujita at all, 1999).

The "territorial dimension" is one of the fundamental principles of the EU's current (2014-2020) Programming Period, which assumes a departure from the perception of a given territory by reference to its administrative boundaries, with greater attention instead paid to internal potential and resources, as well as barriers to development. Communications from the European Commission stress the major role that local specifics have to play, to the point where this may be denoting a new paradigm in regional development policy (e.g. *Komunikat…* 2010).

In practice, what this amounts to above all is the wise choice of those features specific to a given territory that offer the best opportunities for socioeconomic development to be achieved. Appropriate mobilisation and use of specific resources therefore represents one of the key conditions underpinning contemporary local

and regional development; and the resources in question may even be termed strategic.

Richard Florida's concept of the "learning region" is in turn founded on a conviction that a matter of key significance for an area's competitiveness is the skill to generate specific and strategic resources (Jewtuchowicz 2005). These are first and foremost skills and knowledge, and what are associated with them are the concepts of regional specialisation and smart regional specialisation.

In the view of M. Dzierżanowski (2014), regional specialisation denotes a dominant sector, or one determining a region's economic potential, the process of definition here entailing comparison of economic structure in a given region under study with those of a country's remaining regions.

A similar meaning is assigned to the concept of the "economic starter", which is a key branch underpinning development in a region (Dziemianowicz et al. 2014). In the most general sense, what is involved here is again the wise choice of a priority sector that can offer the best opportunities for the development of the given region; as naturally followed by the concentration of investment activity within that sector. Such a way of working raises the value for money achieved as public funds are spent. And, while the stimulation of development from the exterior is important, or even crucial; if an appropriate local base is lacking, even large amounts of external financial assistance can end up being wasted (A. Sobala-Gwosdz, 2005).

Similar conclusions were in fact arrived at in analyses pursued under a research programme on Polish society's living conditions – and the associated problems and strategies (Gorzelak 2008). It was noted there that the impact of external factors on local development is mainly dependent on the activeness of the local system in place already, with the existence of a favourable financial and investment-related impulse from the outside still needing to team up with endogenous capital if rational use of the latter is to be made, and tangible outcomes in terms of development achieved.

Smart specialisation is in turn "the filling of a newly-developing market or market niche, as well as a response to defined social needs, that requires the introduction of new technologies, products or services" (Dzierżanowski 2013, p. 7). A key role is here played by innovation, and by cooperation between firms and business institutions, R & D centres and science-and-technology parks. The founder of the "smart specialisation" concept – Dominique Foray – claims that this is a specific process in development policy entailing the making of choices, i.e. the determining of priorities for action based around technologies and knowledge, with a view to funding being concentrated in a small number of economic fields (Foray 2009; Foray *et al.* 2009). According to Foray, the shaping of appropriate conditions for smart specialisation requires that "space" be prepared to allow for the development of competitiveness. This "space" may actually be scientific-research

backup or innovation, as well as well-developed infrastructure, social capital and cooperation with local and regional-government bodies.

European Commission documents (e.g. *Strategie*…2014, Polish-language version) describe smart specialisation in terms of the identification of exceptional features and assets present in every country and region. The competitive advantage each region could enjoy is thus emphasised, and the aim is to focus regional partners and resources around a vision of a future that targets full achievement of that advantage. This also means a strengthening of regional innovation systems, a maximisation of flows of knowledge, and the promotion and propagation of benefits arising out of innovations within the entire regional economy.

The European Commission has in fact been proposing that smart specialisation be a precondition for the support of investment to strengthen research, technological development and innovation, and to improve access to ICT. With these aims in mind, it is recommended that strategies for smart specialisation be drawn up, with these entailing priority-setting with a view to competitive advantage being gained as regions' strong points in terms of research and innovation are brought together with the needs of business. In line with the 2014-2020 Financial Perspective, strategies taking smart specialisation into account were an *ex ante* precondition if funding from the ERDF and ESF was to be obtained. The determining of specialisations thus assumed major significance when it came to seeking assigned financial resources.

The concept of smart specialisation does not relate solely to the use of internal resources in a defined unit of territorial administration, but can also denote acquisition of skills and familiarity and expertise in given sectors of the economy or fields of activity, with a key element in this being modern scientific and technological solutions. Regional-level smart specialisation represents one response to the financial crisis and breakdown in economic development that have afflicted the EU Member States in recent times. Among the three priorities mentioned in the strategic document from the European Commission (Polish-language version: *Europa*… 2010) are "smart growth", "sustainable growth" and "inclusive growth", with the role assigned to the first of these three being to have regions specialise in particular areas of the economy, in such a way that they are able to compete, or become capable of competing, in the international arena.

Differences of approach to the identification of Polish regions' smart specialisations reflect regional authorities' ways of doing regional policy – by reference to sectors or on many planes at the same time. Under the first approach, a region looks through its economic structure to identify its strongest sectors, and then associates smart specialisations with them. In practice, this most often entails comparisons of levels of employment and/or gross value added in the different PKD Divisions by which the Polish economy is categorised. The second approach is in turn more complex, needing to identify branches enjoying a high innovation po-

tential but remaining weakly developed, and hence in need of stimulation. Under this approach, much weight is attached to the opinions of experts from various different fields, with entrepreneurs also needing to be interviewed for the same reasons. With this approach, specialisations emerging may well encompass many different fields of life, academia and the economy.

The choice of a smart specialisation fora region is based on unique features and internal resources, with account taken of the entrepreneurial tendencies among inhabitants, and activity as regards scientific and academic research in local centres of learning. The European Commission in fact developed a large guide for implementing institutions that offers a set of guidelines concerning the whole process of drawing up national and regional strategies for research and innovation in the interests of achieving smart specialisation. This is the so-called RIS3 Guide (or *Guide on Research and Innovation Strategies for Smart Specialisation*) (Polish-language version, *Przewodnik*… 2012). Unfortunately, however, research carried out in regions reveals that most of them actually make false associations whereby smart specialisations selected are identical to sectors or groups thereof that actually dominate in their economic structure already (Czyżewska and Golejewska 2014).

The work detailed here has thus aimed to achieve a fuller understanding of Poland's smart specialisation structures, as the links between these are regions' internal resources. Ultimately, the work was to answer a question as to whether the regional-level smart specialisations pointed out in strategic documents have any rational justification when it comes to regions' internal resources and research potential.

METHODOLOGY AND STUDY MATERIAL

The available information on regional governments' choices of smart specialisations is typically dispersed and frequently non-comparable. To access it at all, it was necessary to review regional planning documents with their accompanying annexes and appendices. The main source of information in each case was the Regional Innovation Strategy (*Regionalna Strategia Innowacji, RSI*), though analysis also extended to expert opinions and reports, detailed documents related to smart specialisations indicated in *RSI*s, plans for the development of entrepreneurship based on smart specialisations and websites of regional authorities (Table 1)

Among the smart specialisations it is possible to distinguish two general types, i.e. the leading specialisations and the facilitating ones. This division represents key information regarding the approach regional authorities take, as those authorities choosing to draw such a distinction were engaging in a prioritisation process. Moreover, Podlaskie voivodeship came up with the idea of the emerging specialisation, while Opolskie made reference to a potential specialisation. Nevertheless, given the somewhat enigmatic nature of these, they were not taken further account of as the study was elaborated.

Table 1 Smart specialisations by voivodeship

VOIVODESHIP AND SOURCE OF INFORMATION	SMART SPECIALISATION
Dolnośląskie *Ramy Strategiczne Na Rzecz Inteligentnych Specjalizacji Dolnego Śląska*(the Lower Silesian Strategic Framework for Smart Specialisation), dated 2015	The chemicals and pharmaceuticals branch Spatial mobility High-quality food Natural and secondary raw materials Manufacture of machines and appliances and materials processing ICT
Kujawsko-pomorskie Annex No. 5to*RSI WK-P 2014-2020*	Transport, logistics and trade – by water and overland The motor industry, technical means of transport, automation Equipment, moulds and products associated with the manufacture of plastics Cultural heritage, art and creative industries Medicine, medical services, health-resort tourism The best safe food – processing, fertilisers and packaging Bio smart specialisation–natural potential, the environment and power supply Information processing, multimedia, programming, ICT services
Lubelskie Annex No. 11 to the Competition Rules - *Indykatywna lista kodów PKD wpisujących się w Regionalne Inteligentne Specjalizacje Województwa Lubelskiego*	The bioeconomy Medicine and health Low-emission energy ICT and automation
Lubuskie *Obszary Inteligentnych Specjalizacji Województwa Lubuskiego*, 2014	The green economy Health and quality of life Innovative industry Business cooperation and assistance
Łódzkie *Wykaz Regionalnych Inteligentnych Specjalizacji Województwa Łódzkiego oraz wynikających z nich nisz specjalizacyjnych*, 2015	A modern textile and fashion industry (including design) Advanced building materials (including design) Medicine, pharmacy, cosmetics Power supply (including from renewables) Innovative agriculture and food industry ICT

Małopolskie *Inteligentne Specjalizacje Województwa Małopolskiego: Uszczegółowienie obszarów wskazanych w RSI WM 2014-2020*, 2015	Life sciences Sustainable energy ICT Chemicals Electrotechnics and the machine industry Production of metals and metal products, as well as products from non-metal raw materials Creative industries and rest and recreation
Mazowieckie *Regionalna Strategia Innowacji dla Mazowsza do 2020 roku*, 2015	Safe food Smart management systems Modern business services High quality of life
Opolskie See: http://rpo.ocrg.opolskie.pl/aktualnosc-75-specjalizacje_inteligentne_wojewodztwa.html	Chemical technologies (sustainable) Sustainable wood and construction technologies Machine and metal industry technologies Power industry technologies Food technologies
Podkarpackie Report on leading branches entitled *Wiodące branże województwa podkarpackiego –inteligentne specjalizacje regionalne*, 2014	Aviation and space Quality of life ICT (facilitating)
Podlaskie *Plan rozwoju przedsiębiorczości w oparciu o inteligentne specjalizacje województwa podlaskiego na lata 2015-2020+ (RIS3)*, 2015	The agricultural and food sector and sectors associated with it in the value chain The metal and machines and industry, boat making and sectors associated with them in the value chain The medical and life-sciences sector and sectors linked with them in the value chain eco-innovation, environmental science and sectors associated with them in the value chain (including renewable energy, resource-efficient construction and efficient processing of wood)
Pomorskie agreement entitled *Porozumienie na rzecz inteligentnej specjalizacji Pomorza*	Offshore and port-logistics technologies Interactive technologies in an information-saturated environment Eco-effective technologies in the production, dispatch, distribution and consumption of energy and fuels and in construction Medical technologies relating to diseases of civilisation and ageing
Śląskie See: https://rpo.slaskie.pl/czytaj/smarte_specialisatione_kody_pkd_2122014	Energy Medicine ICT

Świętokrzyskie Annex 1 to *Plan Wykonawczy do RIS3*	Resource-efficient construction (vertical) The metal-casting sector (vertical) Health-resort tourism (vertical) Modern agriculture and food processing (vertical) ICT (horizontal - facilitating) Sustainable energy development (horizontal - facilitating) The fairs and congresses branch (horizontal - facilitating)
Warmińsko-Mazurskie *Badanie potencjału innowacyjnego i rozwojowego przedsiębiorstw funkcjonujących w obszarze inteligentnych specjalizacji województwa warmińsko-mazurskiego*	Water management The wood and furniture industry High-quality food
Wielkopolskie See: http://iw.org.pl/obszary-inteligentnych-specjalizacji/	Biomaterials and food for the aware consumer (traditional economic specialisation) Interiors of the future (traditional economic specialisation) The industry of tomorrow (traditional economic specialisation) Specialised logistical processes (traditional economic specialisation; quality of life – challenges for the region) ICT-based development (traditional economic specialisation; quality of life – challenges for the region) Modern medical technologies (quality of life – challenges for the region)
Zachodniopomorskie *Wykaz inteligentnych specjalizacjiwojewództwa zachodniopomorskiego (Projekt)*, 2016	Large-scale marine or land construction Advanced metal products Wood and furniture products Environment-friendly packaging Products of chemical and materials engineering Modern food processing Multimodal transport and logistics IT-based products

Source: authors' own elaboration

In the cases of the seven voivodeships of Lubelskie, Małopolskie, Mazowieckie, Opolskie, Śląskie, Warmińsko-Mazurskie and Wielkopolskie, the smart specialisations were immediately assigned to the appropriate Sections and Divisions of Poland's official classification of economic activity, or *Polska Klasyfikacja Działalności*(PKD), specifically in line with the categorisations applying in 2007. This

made detailed study of the structure as regards specialisation a real possibility. In contrast, such data were lacking in the cases of the remaining regions, with the result that some analyses were confined to the regions which had determined their PKD Sections and Divisions.

It seems reasonable that voivodships should indeed identify their strongest suits, and then work to ensure that the development of smart specialisations is in line with these. The analysis reported on here allows the concordance between proposed specialisations and regions' economic potentials to be assessed. To do that, the research made use of multidimensional comparative analysis, in the course of a several-stage research procedure. The first such stage involved the assignment of all the smart specialisations to one or other of 10 categories (albeit with sub-categories also identified in two cases), albeit with certain specialisations seen to contain too many aspects to allow them to be assigned to just one category. The categories (and sub-categories) are:

1. Cultural heritage
2. The environment
3. Industrial production
    - Chemicals and plastics
    - The machine, electrical appliances, metal and motor industries
    - Energy and the extractive industries
    - The wood and furniture industry
4. Construction
5. Agriculture
6. ICT
7. Medicine
8. Business services
9. Transport and logistical services
    - Overland transport and logistics
    - Maritime transport and logistics
10. Needs of society and quality of life

In the case of industrial production a further division was used, into the sub-categories involving: a) The machine, electrical appliances, metal and motor industries, b) Energy and the extractive industries, c) Chemicals and plastics, d) The wood and furniture industry, and e) The textile industry. In turn, Transport and logistical services were divided into the sub-categories of: a) Overland transport and logistics, and b) Maritime transport and logistics.

Table 2 Categories of smart specialisation in the voivodeships

Voivodeship	Categories (sub-categories)
Dolnośląskie	chemicals and plastics, maritime transport and logistics, agriculture, the environment, energy and the extractive industries, the machine, electrical appliances, metal and motor industries, ICT
Kujawsko-pomorskie	maritime transport and logistics, the machine, electrical appliances, metal and motor industries, chemicals and plastics, cultural heritage, the environment, medicine, agriculture, energy and the extractive industries, ICT
Lubelskie	the environment, energy and the extractive industries, chemicals and plastics, the wood and furniture industry, medicine, ICT
Lubuskie	the environment, energy and the extractive industries, chemicals and plastics, the wood and furniture industry, agriculture, medicine, needs of society and quality of life, ICT, the machine, electrical appliances, metal and motor industries, business services
Łódzkie	the textile industry, construction, medicine, energy and the extractive industries, agriculture, ICT
Małopolskie	agriculture, medicine, energy and the extractive industries, ICT, chemicals and plastics, the machine, electrical appliances, metal and motor industries, the environment
Mazowieckie	agriculture, ICT, business services, needs of society and quality of life
Opolskie	chemicals and plastics, the wood and furniture industry, construction, the machine, electrical appliances, metal and motor industries, energy and the extractive industries, agriculture
Podkarpackie	the machine, electrical appliances, metal and motor industries, the environment, energy and the extractive industries, agriculture, medicine, ICT
Podlaskie	agriculture, the machine, electrical appliances, metal and motor industries, medicine, the environment, energy and the extractive industries, the wood and furniture industry, construction
Pomorskie	business services, maritime transport and logistics, ICT, energy and the extractive industries, construction, medicine
Śląskie	energy and the extractive industries, medicine, ICT
Świętokrzyskie	construction, the machine, electrical appliances, metal and motor industries, the environment, medicine, agriculture, ICT, energy and the extractive industries, business services
Warmińsko-mazurskie	the environment, the wood and furniture industry, agriculture
Wielkopolskie	agriculture, construction, the machine, electrical appliances, metal and motor industries, maritime transport and logistics, ICT, medicine
Zachodniopomorskie	the machine, electrical appliances, metal and motor industries, maritime transport and logistics, the wood and furniture industry, the environment, chemicals and plastics, agriculture, ICT

Source: authors' own elaboration

A next stage to the research entailed the selection of diagnostic indicators characterising each category and sub-category (Table 3). These allowed for the assessment and comparison of regions' internal potentials as regards the different categories. As indicators were selected, effort was made to ensure that these first and foremost characterised the potentials of the regions as regards innovation and R & D. However, statistical information of this kind relating to all voivodeships and categories is very much lacking. To avoid cases arising more or less randomly, most data were averaged for the 2010-2015 period.

Table 3 Diagnostic indicators by category of smart specialisation

CATEGORY	INDICATORS
1. Cultural heritage	• attendees at theatres and musical venues per 1000 in the population • graduates of arts studies per 1000 graduates in all fields (2015) • participants in artistic/entertainment events per 1000 in the population (2013-2015) • tourists making overnight stays per 1000 in the population • voivodeship budget for culture and protecting cultural heritage (PLN per inhabitant)
2. The environment	• total outlays on fixed assets in waste management (outlays on assets serving the protection of the environment expressed in PLN per inhabitant) • graduates in environmental studies per 1000 graduates in all fields (2015) • wastes recycled in thousand tonnes per inhabitant • gaseous air pollutants (excluding CO_2) not emitted thanks to pollutant abatement equipment installed at the most burdensome industrial plants – as a percentage of the pollution generated overall
3. Industrial production	**Energy and the extractive industries** • share of overall production of electricity accounted for by renewables • GVA in Section B [in million PLN] (2010-2014) • energy savings per inhabitant in PLN **The machine, electrical appliances, metal and motor industries** • trend for sold industrial output in Divisions of the economy C24, C25, C27, C28 and C29 (2011-2015) • share of total employment accounted for by Divisions C24, C25, C27, C28 and C29 (2010-2014) • percentage of all industrial enterprises (manufacturing metal products, machines and appliances) introducing product or process innovations (2013-2015)

3. Industrial production	**Chemicals and plastics** • trend for sold industrial output in Divisions C20 and C22 (2011-2015) • number of entities in the national economy entered on the REGON register in Divisions C20 and C22 and as a share of all businesses • share of total employment accounted for by Divisions C20 and C21 (2010-2014) **The wood and furniture industry** • trend for sold economic output in Division C16 (2011-2015) • graduates of forestry studies per 1000 graduates in all fields (2015) • m^3/ha harvest of merchantable wood per 100 ha of forest • percentage of national consumption of fibre board and chipboard (2015) • overall outlays on forestry ['000 PLN] (2014-2015) (*Leśnictwo*, *Statistics Poland*) **The textile industry** • trend for sold industrial output in Divisions C14 and C15 (2011-2015) • number of entities in the national economy entered on the REGON register in Divisions C14 and C15 and as a share of all businesses • share of total employment accounted for by Division of the economy C14 (2010-2014)
4. Construction	• output in construction and assembly – sales in PLN per inhabitant • graduates of studies relating to architecture and building per 1000 graduates in all fields (2015) • numbers of fast-growth enterprises in construction (2010-2014) (Selected indices of entrepreneurship in the years 2010-2014, from GUS – *Statistics Poland*) • investment outlays in Section F ['000 PLN] (2015)
5. Agriculture	• percentage of the country's commercial output from farming • graduates of agricultural studies per 1000 graduates in all fields (2015) • number of tractors of over 60kW per ha of farmland (2016) • index of the quality of productive agricultural space = *JRPP*) (2010) • **i**nternal outlays on R & D activity as regards the agricultural sciences (2015)
6. ICT	• share of all enterprises having their own website • graduates in teleinformatic technology studies per 1000 graduates in all fields (2015) • employment in Section J of the economy per 1000 people in work • mean number of ICT enterprises (2010-2014) (Selected indices of entrepreneurship in the years 2010-2014, from GUS – *Statistics Poland*) • investment outlays [in '000 PLN] in Section J of the economy (2015)

7. Medicine	• doctors enjoying the right to practice per 10,000 in the population • graduates of medical studies per 1000 graduates in all fields • medical doctorates underway per 1000 doctoral studies in all fields • Combined value [in '000 PLN] of projects for the adaptation, modernisation and purchase of medical equipment implemented under the Regional Operational Programmes for 2007-2013 (Report from *NIK* – Poland's Supreme Audit Office)
8. Business services	• number of conference halls with appropriate infrastructure (2009, 2013) • graduates in business and administration per 1000 graduates in all fields (2015) • jobs in divisions of the economy M69-M74 per 1000 people in work (2010-2014)
9. Transport services and Logistics	**Overland transport and logistics** • graduates of studies involving transport services per 1000 graduates in all fields (2015) • employment in divisions of the economy H49 and H52 (2010-2014) • percentage share of carriage of loads by road, by place of dispatch [%] (2010) • number of fast-growing enterprises in transport and warehousing (2010-2014) (selected indicators of entrepreneurship for 2010-2014, GUS-*Statistics Poland*) **Maritime transport and logistics** • international trade by sea recorded at ports (transit in thousands of tonnes) • % of total employment in a voivodeship accounted for by the maritime economy (2010-2013) • % share of the value of total fixed assets in a voivodeship accounted for by the maritime economy (2010-2013) • % share of all investment outlays in a voivodeship accounted for by outlays on the maritime economy
10. Needs of society and quality of life	• share of households with access to broadband internet (2011-2015) • share of residential buildings connected to technical infrastructure (in 2015) • people in households on social welfare per 10,000 in the population • graduates of studies involving social welfare and social services per 1000 graduates in all fields(in 2015) • internal outlays on R & D in the field of the social sciences (in 2015)

Source: authors' own elaboration

Calculations then made use of the following formula (Pluta, 1977):

1. First, the standardisation of variables was achieved using the formulae:

   a) Stimulant: $$y'_S = \frac{y_{ij}}{\max y_{ij}}, \quad j' \in S, j = 1,2,\dots,n$$

   b) Destimulant: $$y'_D = \frac{\min y_{ij}}{y_{ij}}, \quad j' \in D, j = 1,2,\dots,m$$

2. Then a summary index was calculated, as normalised using the formula:

$$S_i^n = \frac{\sum_j^n y'_S + \sum_{j=1}^m y'_D}{n+m}$$

   where:

   S is the normalised summary index
   y' is the value of the stimulant (S) or destimulant (D)
   y_{ij} is the value of variable Y for unit i (j of units)
   n is a stimulant
   m is a destimulant
   $n+m$ is the number of stimulants and destimulants

3. The process continued with the adoption of threshold values serving to indicate specialisations in line with the region's potential for specialisation as regards the categories defined:

$$W_S = \max S_i^n - \sigma$$

   where:

   W_S is the threshold value for the category
   $\max S_i^n$ is the normalised summary index
   σ is the standard deviation for the obtained S index values in the given category

   Results were also compared with the mean values for the S index in the given categories in order to point to any high-potential specialisations.

The last stage in the study involved the verification of values for the summary index in each of the categories or sub-categories, by setting them against the corresponding smart specialisation in the region selected. Where index values are high, it may be accepted that internal resources confirm the significance or relevance of the proposed specialisation. In the opposite case, a region's smart specialisation fails to find support or justification in the internal potential it actually possesses. That said, the multi-aspect nature of certain specialisations did hinder their full appraisal, hence the assumption adopted that at least one feature attesting to the high internal potential of a region should be deemed to confirm the justification for that specialisation to be selected.

RESEARCH RESULTS

The structure of smart specialisations in the regions

The regional authorities at voivodeship level identified a very broad set of smart specialisations (Fig. 1). The numbers per region were in the range from 3 (in Podkarpackie, Śląskie and Warmińsko-Mazurskie voivodeships) to 8 (in the cases of Kujawsko-Pomorskie and Zachodniopomorskie). These kinds of differences in numbers of specialisations help determine thrusts to development, as well as influencing scope when it comes to branches of the economy encompassed by innovation policy within the Regional Innovation Strategy framework. However, the very definition of smart specialisation implies that this should relate to, and draw on, unique features of a region, with competitive advantage being successfully shaped in this way. This leaves proposals for a large number of specialisations looking like unfocused activity, and hence an approach that misses the point and risks being characterised by ineffectiveness.

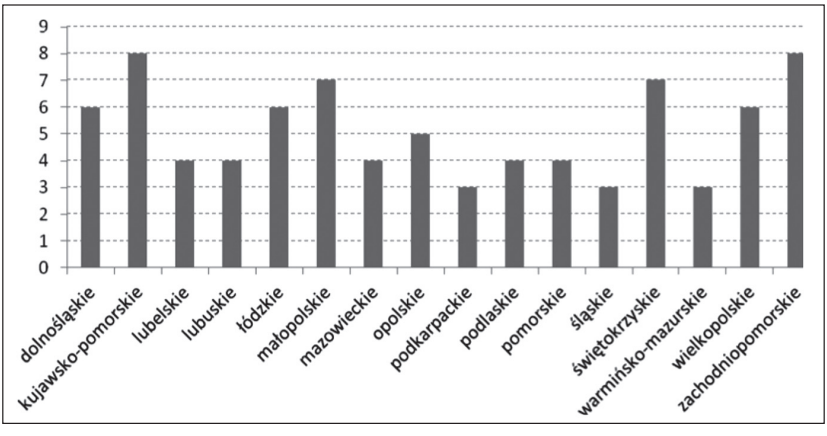

Figure 1
Numbers of smart specialisations by voivodeship, 2016

Taken together, the voivodeships have proposed 81 smart specialisations, including 67 that are leading ones and 15 that are facilitating. In terms of their categorisation, these first and foremost represents industry (36% of the total), with agriculture in second place (on 14%), followed by ICT (12%) and the environment (11%). Where the industrial sector is concerned it is specialisations in the energy and extractive industries sector that dominate, as well as the machine, electrical appliances, metal and motor industries.

In the seven regions in which the authorities assigned their specialisations to relevant sections and divisions of the PKD classification, a smart specialisation was on average associated with 3 PKD Sections and over 7.5 Divisions of that classifica-

tion system. Only in the case of three specialisations in Małopolskie voivodship was just a single PKD Section involved in each.

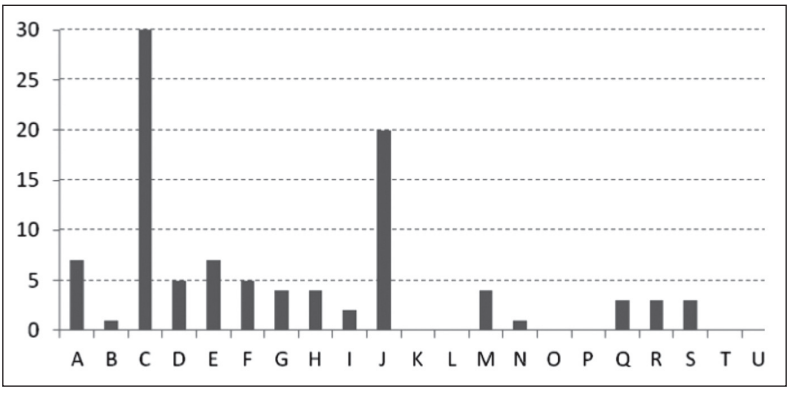

Figure 2
Number of Sections in the smart specialisations of Lubelskie, Małopolskie, Mazowieckie, Opolskie, Śląskie, Warmińsko-Mazurskie and Wielkopolskie voivodeships

Analysis of the numbers of Sections assigned to smart specialisations points to the clear dominance of manufacturing, which is present in over 90% of the specialisations. That Section is followed by ICT, which ought presumably to be an inherent internal feature of all smart specialisations. The remaining Sections are only represented to a very limited extent.

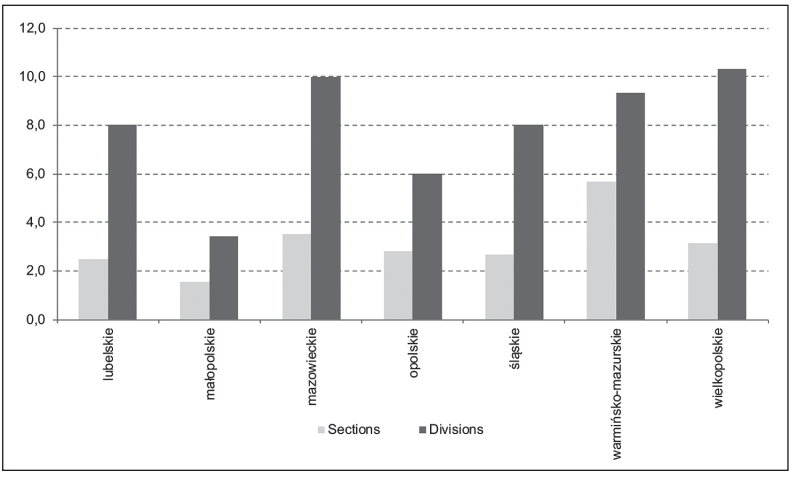

Figure 3
Mean numbers of Sections and Divisions of the PKD classification coinciding with a single smart specialisation in one of the selected voivodships (a Section or Division could be assigned repeatedly to different specialisations in a region).

Considerable differentiation was to be noted in terms of numbers of PKD Sections and Divisions per smart specialisation. In Małopolskie voivodeship, for example, one specialisation relates to less than two Sections on average, leading to a general assertion that the specialisations in this region are genuinely concentrated in given sectors of the economy. In contrast, in Warmińsko-Mazurskie voivodeshop, each specialisation has around 6 PKD Sections assigned to it on average. These would then seem to be multidisciplinary proposed specialisations. That said, it is hard to be sure which solution is more suitable or appropriate, given that smart specialisations may really differ in their nature; and while attention might be focused on a precisely-defined economic activity, the sectors of the economy associated with it need to be taken account of. Nevertheless, at least where the broad treatment of smart specialisations is concerned, there would seem to be a need for these to relate to only a relatively small number of PKD Sections, even if the number of Divisions within these might actually be quite large.

An analysis of the diagnostic indicators by categories of smart specialisation

The ***Cultural heritage*** category includes two specialisations, i.e. *cultural heritage, art and creative industries* in the case of Kujawsko-Pomorskie voivodship, and *creative industries and rest and recreation* in Małopolskie. A look at the summary index for this category reveals that the first region's value is just a little above average. The threshold adopted does not permit its being qualified as a leading region where cultural heritage is concerned. This is to say that there are regions (Małopolskie, Mazowieckie, Pomorskie and Zachodniopomorskie voivodeships) more attractive from this point of view, also possessing good infrastructure and various features of value from the point of view of tourism that typically work to further raise the level of cultural attractiveness. However, it is clear from this that the index value in the case of Małopolskie voivodeship does indeed justify the choice of this category by the regional authorities there.

Conceptually, smart specialisation attaches great importance to ***The environment*** *(or pro-environmental activity),* hence a lack of surprise that this category is put forward by as many as 10 among Poland's 16 voivodeships. However, the summary index in this case was founded upon concrete achievements concerning, for example, waste management, pollutant emissions and the training of personnel in the environmental protection field. When all that was taken account of only two voivodeships – Dolnośląskie and Małopolskie – were found to be achieving values above the threshold, with only the first of the two actually putting forward a smart specialisation associated with natural resources. Furthermore, it needs to be stressed that a specialisation entitled *Natural and secondary raw materials* relates, not only to environment-friendly activity, but also to renewable resources and the extractive industries. Regions that have above-average index values were in turn found to include Wielkopolskie andŚląskie voivodeships, but neither of these selected specialisations of relevance to this category. Rather, environmental

protection and natural resources were taken account of in the smart specialisations put forward by Lubuskie, Podkarpackie, Świętokrzyskie and Warmińsko-Mazurskie voivodeships, in all of which the values for the index in fact tended to be low. In the last three regions in particular, it is clear that highly valuable natural features are present, and that these should be simultaneously protected and put to use. However, this does not mean that they fit the smart specialisation model. The choices here may reflect the way in which authorities see smart specialisations as ways of improving the situation in neglected sectors of the economy, as opposed to providing further support for already-dynamic branches.

The category of ***Industrial production*** is represented in every region, and is made up of several sub-categories. In the case of the sub-category involving ***Energy and the extractive industries***, clearly pre-eminent values for the summary index are obtained for Śląskie voivodeship, which was in fact the only one to exceed the threshold set. Beyond that, it is possible to speak of strong potential in the cases of Kujawsko-Pomorskie, Podlaskie, Warmińsko-Mazurskie and Zachodniopomorskie voivodships, in each of which the index takes on above-average values. The sub-category under discussion was present in no fewer than 13 specialisations identified and proposed by 12 regions – leaving this as the second most-often indicated category/sub-category.

The second sub-category of ***The machine, electrical appliances, metal and motor industries*** is associated with more limited differences in values for the summary index. A specialisation linked with this sub-category was indicated by 10 voivodeships in 12 specialisations. The indicator in turn confirms the significance of this specialisation in the case of Lubuskie, Opolskie and Śląskie voivodeships (the regions of Lublin, Opole and Silesia). A high potential is also displayed by Dolnośląskie voivodship (Lower Silesia), while in the remaining regions the values assumed by the indicator fail to confirm qualification of this sub-category as a key branch. It should however be stressed that it is in regard to this group of industries that differences in the values obtained for the indicator analysed are most limited. Generalising, it may thus be said a specialisation in this sub-category on the part ofa region fails to find much justification.

When it comes to the ***Chemicals and plastics*** sub-category, a high value for the index is achieved by 6 voivodeships, i.e. Kujawsko-Pomorskie, Łódzkie, Mazowieckie, Podkarpackie, Śląskie and Wielkopolskie. However, in only the first region is a smart specialisation associated with this industrial sector pointed to. In turn, in the sub-category of ***The wood and furniture industry***, the threshold value is exceeded by four regions, i.e. Małopolskie, Mazowieckie, Warmińsko-Mazurskie and Wielkopolskie. The result of the analysis confirms the correct nature of the specialisation as identified in Warmińsko-Mazurskie voivodeship. In remaining voivodeships, no specialisation associated with this industrial sector is indicated. The results of analysis of the index for ***the textile industry*** overlap with the iden-

tified specialisation selected in Łódź voivodeship, i.e. *a modern textile and fashion industry*.

In the ***Construction*** category, values for the summary index exceeding the threshold are to be noted in the three voivodeships of Małopolskie, Mazowieckie and Śląskie. In turn, above-average values attesting to high potential characterise Dolnośląskie, Pomorskie, Świętokrzyskie, Wielkopolskie and Zachodniopomorskie voivodeships. Nevertheless, it was only in Świętokrzyskie, Wielkopolskie and Pomorskie voivodeships that smart specialisations in this category were proposed. Among other voivodeships with analogous specialisations that lack confirmation in terms of values for the index we find Łódzkie, Opolskie and Podlaskie. In turn, among the three voivodeships shown by the index to have developed construction to the highest level, not a single specialisation associated with this sector was identified and put forward.

The analysis of smart specialisations in the category of ***Agriculture*** poses certain difficulties arising out of conflicting or contradictory assumptions. On the one hand, regions point to the need for "safe", "high-quality" and "healthy" food, or "food for the aware consumer"; while on the other they see opportunities as lying in the development of "modern agriculture and food processing", which in turn suggests a focus on the intensive production of food achieved using industrial methods. The synthetic index in this category first and foremost takes account of the R & D potential for agriculture, as well as the quality of natural conditions suitable for developing this sector. This was the means by which we sought to identify regions possessing features that may actually support smart specialisations associated with farming. Among voivodeships with major potential to take advantage of this are Mazowieckie, Wielkopolskie and Lubelskie. Beyond that, it is possible to indicate Dolnośląskie, Kujawsko-Pomorskie and Warmińsko-Mazurskie voivodeships as places in which the summary index takes on above-average values. That said, it needs to be stressed that almost all of the voivodeships (except Śląskie) indicated diverse specialisations linking up with this category. Thus, in the remaining voivodeships the selection of smart specialisations associated with agriculture is a source of some reservations.

A category of fundamental importance to all innovation is of course ***ICT***. This was identified a distinct category of smart specialisation, though sometimes co-occurring with other categories (e.g. in the *Innovative industry* proposal from Lubuskie voivodeship). In the regional documents identifying smart specialisations that were subject to analysis, ICT gains frequent mention as an indispensable component. Nevertheless, in Lubelskie (Lublin) voivodeship, as well as the neighbouring Podkarpackie, a specialisation associated with ICT is described rather as facilitating or supplementing (cf. Table 1), while in remaining voivodeships specialisations arrived at in this category are considered to have a full role on a par with other specialisations.

In practice, the greatest potential as regards ***ICT*** is shown by Mazowiecki voivodeship, with this presumably reflecting the way that large firms in this sector have located in Warsaw. Lower values for the index, though ones that still exceed the average, characterise Dolnośląskie, Pomorskie, Śląskie and Wielkopolskie voivodeships. Specialisations associated with this category were in turn indicated by 13 regions (i.e. all the voivodeships except Opolskie, Podlaskie and Warmińsko-Mazurskie). However, it is *only* in the case of Mazowieckie voivodeship that a selection gaining confirmation in the analysed indices may be referred to.

ICT is important for the innovative development of all sectors of the economy, hence a justification for it to be developed in all regions. However, ICT as a separate smart specialisation should be offered equal treatment with other specialisations, hence only appearing in those regions where the required conditioning is present. A different thing is the treatment of ICT as an integral component of all other specialisations.

There is marked differentiation to the result for the ***Medicine*** category. It proved possible to identify 11 smart specialisations associated with this category, in 11 voivodeships. Regions standing out against the others in this regard are Łódzkie and Podlaskie voivodeships. In the case of the latter, the emphasis is on the so-called *"silver economy"*, not only associated with medicine, treatment and care of the elderly, but also integrating the production of health foods.

Services rendered to businesses are assuming ever-greater significance, in the contexts of *business-to-business* (B2B), *offshoring, business process outsourcing* (BPO) and so on. Where this category is concerned it is possible to note links with results obtained for the ICT category, given that business services make use of modern technologies and are often provided long-distance away, being mainly located in large centres where qualified personnel concentrate. Thus, while values for the summary index are found to be above-average in seven voivodeships, it is only in Mazowieckie that the threshold is passed. In Lubuskie, the need for this type of service to develop for example reflects the location close to the German border, while in Świętokrzyskie it can be linked with the activity of the Kielce Trade Fairs.

In the case of ***Transport services and Logistics***, threshold values were only calculated for overland transport. Maritime transport was a matter for just three voivodeships, so a classification for this sub-category served no purpose. Where overland transport is concerned, the threshold values for the summary index are exceeded in Mazowieckie, Pomorskie and Zachodniopomorskie voivodeships – a circumstance that can be linked to the major economic potential of the capital city and the Tri-City, as well as a border location and heavy traffic in the coastal zone. However, as the transport sector is a *sine qua non* condition for the proper functioning and development of any region, the selection of transport services as a smart specialisation looks dubious.

Needs of society and quality of life was a smart specialisation category applying to Mazowieckie and Lubuskie voivodeships. However, it needs to be stressed that "quality of life" as a notion is variously understood. In Wielkopolskie voivodeship, for example, it is considered to link up with the development of ICT, medical services and transport services. This leaves qualification of a given specialisation to this category as a task fraught with difficulty.

Table 3 Results of the multidimensional analysis by category

Name	Cultural heritage	The environment	Energy and the extractive industries	The machine, electrical appliances, metal and motor industries	Chemicals and plastics	The wood and furniture industry	The textile industry	Construction	Agriculture	ICT	Medicine	Business services	Overland transport and logistics	Maritime transport and logistics	Needs of society and quality of life
Dolnośląskie	0.56	0.69	0.23	0.73	0.55	0.45	0.36	0.59	0.45	0.57	0.42	0.68	0.33	n.d.	0.59
Kujawsko-Pomorskie	0.56	0.44	0.43	0.63	0.65	0.33	0.50	0.38	0.49	0.37	0.52	0.47	0.36	n.d.	0.67
Lubelskie	0.31	0.44	0.12	0.62	0.35	0.54	0.46	0.36	0.69	0.30	0.65	0.39	0.42	n.d.	0.65
Lubuskie	0.54	0.11	0.23	0.77	0.54	0.46	0.47	0.35	0.23	0.33	0.26	0.43	0.26	n.d.	0.48
Łódzkie	0.56	0.40	0.20	0.60	0.67	0.38	0.95	0.40	0.41	0.41	0.85	0.64	0.32	n.d.	0.59
Małopolskie	0.61	0.57	0.19	0.69	0.55	0.63	0.49	0.65	0.42	0.42	0.58	0.73	0.33	n.d.	0.67
Mazowieckie	0.64	0.36	0.09	0.54	0.60	0.70	0.46	0.74	0.81	0.92	0.55	0.96	0.80	n.d.	0.78
Opolskie	0.32	0.32	0.19	0.84	0.51	0.28	0.32	0.34	0.30	0.38	0.38	0.31	0.20	n.d.	0.47
Podkarpackie	0.31	0.24	0.17	0.66	0.58	0.49	0.38	0.45	0.30	0.39	0.36	0.43	0.22	n.d.	0.60
Podlaskie	0.54	0.36	0.41	0.66	0.50	0.49	0.50	0.42	0.38	0.37	0.72	0.39	0.19	n.d.	0.57
Pomorskie	0.74	0.45	0.25	0.62	0.56	0.44	0.46	0.52	0.30	0.48	0.61	0.68	0.70	0.97	0.76
Śląskie	0.54	0.53	0.69	0.76	0.62	0.43	0.46	0.66	0.24	0.51	0.54	0.70	0.54	n.d.	0.87
Świętokrzyskie	0.30	0.28	0.25	0.60	0.52	0.34	0.33	0.56	0.26	0.34	0.46	0.39	0.16	n.d.	0.52
Warmińsko-Mazurskie	0.46	0.27	0.41	0.58	0.29	0.67	0.36	0.48	0.58	0.34	0.20	0.44	0.17	0.04	0.57
Wielkopolskie	0.49	0.52	0.15	0.69	0.61	0.76	0.49	0.55	0.79	0.43	0.58	0.61	0.47	n.d.	0.70
Zachodniopomorskie	0.65	0.43	0.27	0.65	0.50	0.58	0.28	0.55	0.33	0.39	0.59	0.58	0.64	0.73	0.75
Mean	0.51	0.40	0.27	0.67	0.54	0.50	0.45	0.50	0.44	0.43	0.52	0.55	0.38	0.58	0.64
standard deviation	0.13	0.14	0.15	0.08	0.10	0.14	0.15	0.12	0.19	0.15	0.17	0.17	0.20	0.48	0.11
Ws (threshold value)	0.60	0.55	0.54	0.76	0.57	0.62	0.80	0.61	0.62	0.78	0.68	0.79	0.60	0.49	0.76
Difference between y max and y min	0.44	0.58	0.60	0.29	0.38	0.48	0.67	0.40	0.58	0.62	0.65	0.65	0.63	0.93	0.41

above-average S below-average S above the Wsthreshold value

Source: authors' own elaboration

CONCLUSIONS

Smart specialisation is a new concept and one of the tools forming part of EU regional development policy. It above all involves a wise choice of priority sector offering the best opportunities for development of a given region and for the concentration of activity within it. This kind of scheme works to raise the level of effectiveness with which public money is spent. The choice of smart specialisation is to arise out of analysis of a region's strong points and its greatest potentials, with the result being innovation and development founded upon knowledge, as supported by investment in the private sector.

The choice of smart specialisations is a complex process that need not denote a final choice. Rather it is a learning and discovery process for entrepreneurs, given that the specialisations selected reflect the present situation in part only, with a great deal of importance attached to the vision vis-à-vis development. The forecasting of development and *de novo* establishing of development priorities is a risky matter in the circumstances of dynamic socioeconomic change and rapid technological progress.

The analysis presented here reveals very varied approaches to smart specialisation on the part of regional authorities. Some are conservative in the way they identify their strong suits, while others are willing to take a more courageous stance to the shaping of their futures.

Analysis of the synthetic indices for the different categories or sub-categories sustains the idea that some regions' selection of smart specialisations were not associated with their strong points at all, but rather in fact with areas of neglect or at best weak development. In such cases, the proposals for specialisation were more about wish fulfilment than reality.

In line with the assumptions made *a priori*, a specialisation selected appropriately must be included in at least one category or sub-category with a value that passes the threshold (W_s). Compiled below (Table 5) are the smart specialisations selected in line with voivodeships' potentials. Also offered is an indication of the categories (or sub-categories) in which the index values exceed the threshold one, but no specialisation has been associated with them. These are potentially areas for which appropriate smart specialisations might be proposed.

Table 4 Appropriately selected smart specialisations and categories (sub-categories) associated with them in which the threshold value for the W_s index is exceeded; as well as potential categories (with W_s passing the threshold value) to which no specialisation has been attributed.

VOIVODESHIP	APPROPRIATELY-SELECTED SMART SPECIALISATION AND ITS CATEGORY[1]	POTENTIAL CATEGORY WITH HIGH W_s VALUE
Dolnośląskie	*Natural and secondary raw materials* – **The Environment**	Lacking
Kujawsko-pomorskie	*Tools, forms and products of plastic* – **Chemicals and plastics**; *Best safe food – processing, fertilisers, packaging* – **Chemicals and plastics**	Lacking
Lubelskie	*Biomanagement* – **Agriculture**	lacking
Lubuskie	*Innovative industry* – **The machine, electrical appliances, metal and motor industries**	Lacking
Łódzkie	*Modern textile industry and fashion (including design)* – **The textile industry** *Medicines, pharmacy and cosmetics* – **Medicine**	**Chemicals and plastics**
Małopolskie	*Creative industries and rest and recreation* – **Cultural heritage; The environment**	**The wood and furniture industry; Construction**
Mazowieckie	*Safe food* – **Agriculture** *smart management systems* – **ICT** *Modern business services* – **Business services** *High quality of life* – **Needs of society and quality of life**	**Cultural heritage** **Chemicals and plastics** **The wood and furniture industry** **Construction** **Overland transport and logistics**
Opolskie	*Technologies of the machine and metals industries* – **The machine, electrical appliance, metal and motor industries**	Lacking
Podkarpackie	Lacking	**Chemicals and plastics**
Podlaskie	*The medical sector, life sciences and the sectors associated with them in the value chain* – **Medicine**	Lacking

1 A specialisation could be represented by several categories. The compilation confines itself to those categories for which the Ws value exceeds the threshold

Pomorskie	*Offshore and port/logistic technologies* – **Maritime transport and logistics**	**Cultural heritage;** **Overland transport and logistics**
Śląskie	Power supply – **Energy and the extractive industries**	**The machine, electrical appliance, metal and motor industries** **Chemicals and plastics** **Construction** **Needs of society and quality of life**
Świętokrzyskie	Lacking	Lacking
Warmińsko-mazurskie	*Wood and furniture industry* – **The wood and furniture industry**	Lacking
Wielkopolskie	*Biomaterials and food for the aware consumer* – **Agriculture**	**Chemicals and plastics** **The wood and furniture industry**
Zachodniopomorskie	*Large-scale maritime and land construction* – **Maritime transport and logistics** *Multimodal transport and logistics* – **Maritime transport and logistics**	**Overland transport and logistics** **Cultural heritage**

Source: authors' own elaboration

Certain reservations are aroused by the specialisations taking in to many sectors of the economy, since the very definition of specialisation denotes that this should relate to a narrow group of economic activities somehow distinguishing the region when set against other territorial units. Furthermore, the research here shows that the choice of a large number of specialisations does not find its justification in regions' real potentials. A choice is therefore indicated, and this in close relation with a given region's economic potential, there being in this way a maximum of 2-4 smart specialisations in each.

An interesting example is Mazowieckie voivodeship, in which all of the smart specialisations selected can be assessed as correct or appropriate. This is a reflection of the economic strength of the Warsaw metropolitan area and the role played by Poland's capital city in both administration and business. In turn, in the case of Świętokrzyskie voivodeship, where the level of development of all sectors of the economy is at best "average", it is hard to point to any smart specialisation which could be specific to that region.

To sum up, the concept of smart specialisation is interpreted differently from one region to another. Hence the hard-to-justify selection of certain specialisations, with some not gaining confirmation in terms of regions' internal potential. A further problem is that certain voivodeships have selected too many such

specialisations. Also noteworthy is certain regions' selection of ICT as a separate specialisation, given that the latter would seem to be an integral, inherent part of all specialisations, in line with the very concept.

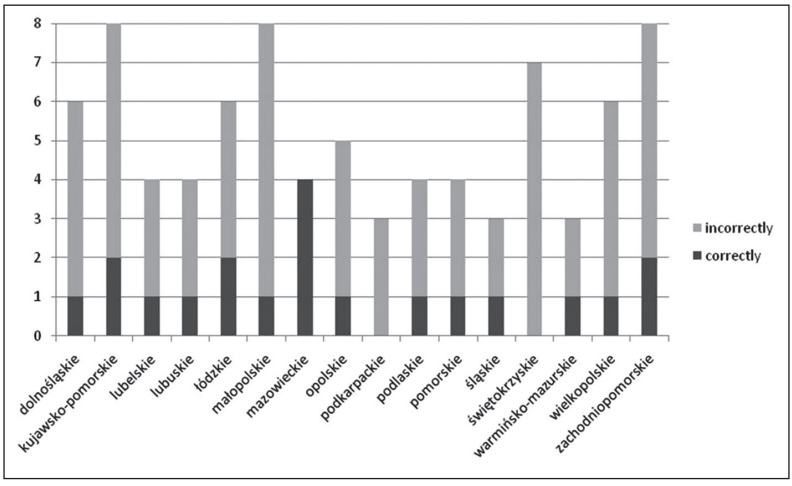

Figure 4
Number of smart specialisations selected

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SLOVAK ROMA VILLAGE OF ORIGIN AND EDUCATIONAL OUTCOMES: A CRITICAL EVALUATION

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Abstract
The immigration of relatively large numbers of Slovak Roma people to Sheffield since 2004 has highlighted some tensions around the settling of the new arrivals into the complex social, linguistic and cultural spaces of this diverse city. Schools have faced particular challenges welcoming the new children who manifest various issues in relation to their language competencies, prior educational experiences, truncated schooling and often lived experiences of social deprivation and marginalization. Based on data from an ongoing ethnographic study and drawing on Bronfenbrenner's (2005) 'Process-Person-Context-Time' (PPCT) framework, this paper presents the context of the two main sender villages of the Roma in Sheffield and forefronts some of the experiences of Slovak Roma children in secondary school as they negotiate prevailing English-only language ideologies and complex curriculum challenges. Findings show that, whilst the Roma pupils are making some headway in terms of school integration, they are often finding academic attainment a step too far, particularly in terms of formal educational outcomes. Furthermore, an analysis of educational attainment data by village of origin raises questions of contextual impacts on educational achievement.

Keywords
Education, Slovak Roma, Attainment, Bystrany, Žehra, Bronfenbrenner, Sheffield

INTRODUCTION

This paper focuses on the Slovak Roma community living in Sheffield, a community that has grown in size since Slovakia gained access to the EU in May 2004 (EU, 2007) and now represents some 6000 of the ca. 500,000 population of the city. Roma migration to Sheffield is fuelled by a combination of 'push' factors in Slovakia, e.g. lack of employment opportunities and discrimination (Mušinka & Kolesárová, 2012; Scheffel, 2013), and 'pull' factors in the UK, such as increased employment prospects and perceived better schooling (Brown, Martin, & Scullion, 2014); some 50% of the Roma are here for employment in a 'non-discriminatory labour market', though they often have to take self-employed or short-term work (European Dialogue, 2009; Runnymede Trust, 2012). The move from such settlements in Slovakia to other countries in the EU could be termed a natural move from 'periphery' to 'centre' in globalisation discourse (Blommaert, 2010). It should be noted, however,

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that a Sheffield-Bystrany link existed prior to 2004, with some families from the East of Slovakia having been relocated to the industrial areas of what was then Czechoslovakia, subsequently seeking asylum from there to 'the West' and arriving in the UK thereafter (MP Fieldnotes; see also: Znamenáčková, 2008).

Despite continued inwards and outwards migration there is now a sizeable settled community intent on making Sheffield home. Quite naturally, the Roma children attend local schools, with one local primary school in Page Hall having over 90% Roma children on roll. As an academic working in a Department of Education, I have been exploring how Roma children engage with the formal school processes and access the English secondary (high) school curriculum. This has meant investigating such aspects as 'school readiness', literacy skills and language issues, to include the use of Romani and Slovak and the efforts now to learn English, for many their third language.

Scrutinizing data in relation to school leaving examinations for the Roma 16-year olds, some patterns have emerged. On paper, some Roma pupils are achieving nothing, others are leaving with the most basic of qualifications at Entry Level and very few are achieving the normative Level Two qualifications for 16-year olds nationally. Whilst overall there is a tendency towards a lack of academic attainment across the Roma cohort, it is the comparisons in results in which the children from one of the key villages of origin are out-performing the children from another, that has provided the catalyst for this paper and prompted the following research questions: What levels of attainment do the Roma pupils achieve at the end of high school in Sheffield? What differences in attainment are there between the children from the two main sender villages? What could account for those differences in attainment?

The aim here is to attempt to shed light on possible factors accounting for the often-poor academic performance of the Roma pupils, with a more fine-grained focus on attainment *by village of origin*. However, it is also acknowledged that certain factors may militate against academic achievement of the Roma pupils, *regardless* of village of origin, for example, patchy school attendance, truncated school experiences, a general lack of literacy skills and a lack of English may all play a role in academic underachievement, coupled with school structures that broadly favour academically-inclined children. And in terms of evaluating in a quantitative fashion just what it is that sees children from Bystrany outperform those from Žehra, that is a virtually impossible task that needs to consider the Roma both as a diverse community and as individuals, with each individual being a unique blend of genotype and phenotype (a mix of nature and nurture if you will) so that any conclusions drawn here are tentative at best (Bronfenbrenner, 2005; Bronfenbrenner & Ceci, 1998; Bronfenbrenner & Evans, 2000; Jaeger, 2016).

In Section 2 of this paper, I will outline the research project to include the methods and participants. In Section 3, the theoretical framework is explicated

before the exemplar case study school is described in Section 4. In Section 5, I will turn attention to Eastern Slovakia and the two villages that send the majority of Roma to Sheffield – Bystrany and Žehra. In Section 6, I consider the levels of English of the Roma pupils. Section 7 presents the main findings in relation to school achievement and then conclusions are drawn in Section 8.

Section 2: THE RESEARCH PROJECT AND PARTICIPANTS

This ethnographic study commenced in January 2013 to explore the Slovak Roma community in Sheffield and track the Roma children through five years of high school education. In accordance with ethnographic approaches (Eriksen, 2004), the data collected have been both qualitative and quantitative and the tools for data collection are semi-structured interviews, classroom observations, fieldnotes, photographs, and secondary sources such as school policies, data sets and the corpus of research literature on the Roma. Fieldwork has been carried out in high schools in Sheffield and the source localities in Slovakia. The key participants in this project are the head teachers and teachers of the schools in Slovakia and Sheffield from where data has been collected, and those Slovak Roma pupils (and their families) from Bystrany and Žehra attending three high schools in Sheffield; qualitative and quantitative data are aggregated to protect the identity of the pupils and schools.

Section 3: THE THEORETICAL FRAMEWORK

Uri Bronfenbrenner's 'Process-Person-Context-Time' (PPCT) framework (Bronfenbrenner, 2005, 2009) supports this study in considering the developing [Roma] child within the closer family, wider community and beyond. The 'engines of development' in the growth of the child are the 'proximal processes', 'regular ongoing, complex reciprocal interactions between the developing person and the people, objects and symbols present within a given microsystem' (Jaeger, 2016, p. 168).

In terms of reciprocity, the individual character of the developing child is vital; Bronfenbrenner classifies this according to 'demand', 'resource' and 'force' characteristics (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 1998). Demand characteristics are age, ethnicity, gender and behaviour traits that invite or discourage positive or negative reactions that are key in influencing proximal processes. Resource characteristics may not be so readily apparent and include a low birth weight, past severe illness, abilities and knowledge, and force characteristics are combinations of cognitive, emotional, social and motivational factors linked to temperament and personality that may facilitate or militate against proximal interactions. The developing individual then, can have agency in the proximal process of development, and from an early age during close interactions e.g. 'feeding or comforting a baby, playing with a young child' (Bronfenbrenner & Morris, 1998, p. 996). The developing baby/child will provoke reactions based upon his/her

individual characteristics thus influencing reciprocal reactions in the immediate developmental context.

The PPCT framework distinguishes five systems: the microsystem, the mesosystem, the exosystem, the macrosystem and the chronosystem. The microsystem is the site of 'pattern of activities, roles, and interpersonal relations experienced by the developing person' with examples including the home, school and peer group (Bronfenbrenner, 2005, p. 147), with the 'stable' family being the key desirable microsystem in terms of being relatively predictable and thus conducive to development, rather than an unstable and chaotic family life which has the opposite effect (Jaeger, 2016, p. 165). The mesosystem is the relationships and links between the microsystems, such as between the child's home and school and the child's peer group and family. The exosystem introduces the wider community and, according to Bronfenbrenner, 'at least one setting that does not ordinarily contain the developing person' (Bronfenbrenner, 2005, p. 148), such as the father's workplace which can have a positive effect on the child's development, such as through a pay rise, or negatively, such as from reduced hours or redundancy (and think of the Roma man who loses his job and suddenly moves the family on to another location). The macrosystem is the 'distal' layer, the wider social, cultural, political and economic environment that the child is born into and brought up in, manifested in the type and character of national government and the policies pursued in terms of the economy, health, education, and, in our case, explicit or implicit polices affecting the Roma – migration, benefits, housing etc.; as Bronfenbrenner puts it, 'the macrosystem may be thought of as a societal blueprint for a particular culture, subculture or other broader social context' (Bronfenbrenner, 2005, p. 150). The final aspect of Bronfenbrenner's framework, the chronosystem, refers to the dimension of time in relation to the developing child and changes in the environment: the birth of a sibling, entering a school, going through puberty or severe illness, anything that alters the 'existing relationship between person and environment, thus creating a dynamic that may instigate change' (Bronfenbrenner, 2005, p. 119).

It has to be stated that, for the purposes of this project, Bronfenbrenner's work is helpful, though it may be virtually impossible to answer concretely the question of how someone's genetic make-up, coupled with environmental contexts, influences their cognitive stimulation and growth and eventual academic potential, never mind that potential being ultimately realised. As Scarr (1996) points out: '…both personal and instructional differences, or genetic and environmental differences are involved... the theoretical and methodological abilities to parse causation is the major challenge…' (Scarr, 1996, p. 10 my emphasis).

Section 4: THE EXEMPLAR CASE STUDY SCHOOL

To provide an insight into high school education in Sheffield and a multilingual school working with the Roma in particular, I present Ridgeway School (pseudonym), one of the participating schools, as an exemplar case study.

Ridgeway is a coeducational secondary school located in the north-east of Sheffield, South Yorkshire. In 2016/2017 the school had 1023 pupils in the age range 11-16, making it an average sized secondary academy (Department for Education, 2015). The proportion of disadvantaged students supported through the pupil premium[1] is 61.6%, over twice the national average, with 40.9% of the pupils eligible for free school meals[2]. According to school data, some 35.3% of the pupils do not have English as their first language and the proportion of students (16.5%) who have 'special education needs or a disability' is above average. Many of the pupils in school are 'White British' (49%), then Pakistani heritage (11%), Roma and other Eastern European (10%) and about 25% 'Other', with many of the 'other' pupils being of various ethnic, cultural and religious backgrounds.

In the residential areas close to the school, 1,500 Slovak Roma live in Page Hall and there were 1843 Roma pupils attending Sheffield schools in April 2014, of which 891 lived in the Page Hall region (Sheffield City Council, 2014). As a result, Ridgeway has about 100 Slovak Roma pupils at any given time, with a few from Czechia. They come from the two main source localities of Bystrany and Žehra (examined below), as well as other villages in Eastern Slovakia, e.g. Harakovce, Jablonov, Rudňany, Poráč and Spišsky Štvrtok.

The total Roma population at Ridgeway fluctuates throughout the year as parents and their children return to Slovakia or travel elsewhere in the UK for shorter or longer periods – sometimes to return to Ridgeway or to be replaced by new arrivals. Figure 1 highlights this trend for Year 7 (the first year of high school) 2015-16, with the original Roma entry of 23 rising and then falling to 22 pupils over the course of the year as marked by six data capture points. It is interesting to note the changes as well in the non-Roma EAL cohort (inward/outward movement is not an essentially Roma practice) and the relative stability of the 'other pupils' cohort.

The words of one Ridgeway teacher illustrate this churn of pupils: '…on the Monday after Christmas several new Slovak Roma arrived unannounced' (Teacher 1: 16/01/15). And this from the Headteacher at Bystrany Elementary School: 'Last week, eight pupils left for the UK and four returned' (Headteacher: 24/4/15). This fluidity can militate against attendance and is a barrier to effective planning of lessons and other activities when teachers are unsure as to who will be turning up at school.

1 Extra funding for disadvantaged pupils, e.g. Special Educational Needs (https://www.gov.uk/guidance/pupil-premium-information-for-schools-and-alternative-provision-settings).

2 A free school lunch is provided for pupils whose parents/carers qualify, e.g. through being unemployed (https://www.gov.uk/apply-free-school-meals).

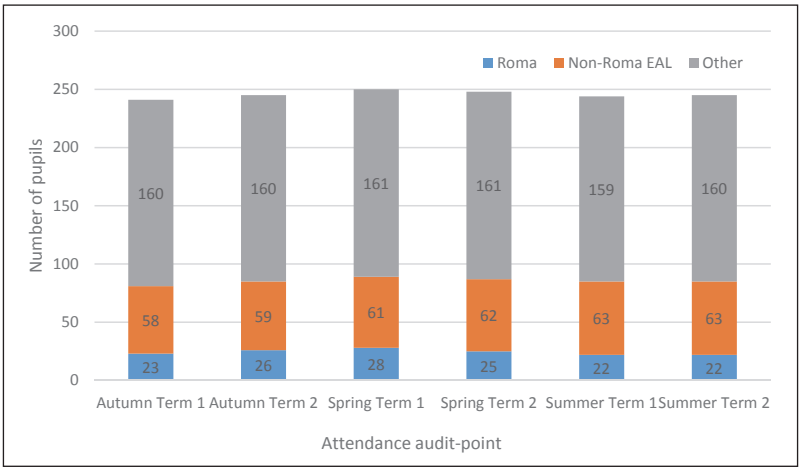

Figure 1
Change in Y7 pupil numbers over one year

Ridgeway offers the full National Curriculum range of subjects[3] to potentially all of its pupils. However, as the English language is a fundamental tool for accessing the curriculum, Roma and other migrant children are tested for English, literacy and reading skills and allocated support classes of English accordingly[4]. The tension between learning English as the dominant language of the host society, and learning the curriculum subjects such as maths, geography, history and so on, is not a new one (Conteh, 2012). What is clear is that if a child is mainly studying English, then he/she must forego a broad curriculum provision and thus will be making no progress in those subjects, relative to the rest of the peer group.

Section 5: THE SENDER VILLAGES OF BYSTRANY AND ŽEHRA

To contextualise the sender villages first of all, most of the Slovak Roma in Slovakia tend to live towards the east and south-eastern part of the country, with populations residing in small communities and settlements clustered around towns and cities such as Košice and Prešov, and then occupying various locations tracing a broad

3 The compulsory national curriculum subjects are the 'core' and 'foundation' subjects. Core subjects are: English, maths, science. Foundation subjects are: computing, physical education, citizenship. Schools must also offer at least one subject from each of these areas: arts, design and technology, humanities, modern foreign languages. They must also provide religious education (RE) and sex education at key stage 4 (https://www.gov.uk/national-curriculum/key-stage-3-and-4).

4 These are structured according to New to English (NtE) classes: NtE1 (basic level), NtE2 (intermediate level) and NtE3 (advanced), where the English language is boosted and regular curriculum lessons slowly introduced as the levels of English improve.

crescent south and west towards the southern fringes of the region of Banská Bystrica and the border with Hungary (Škobla et al, 2014). That said, there are pockets of Roma residing in most regions of Slovakia; according to Klimovský et al:

> '*…Roma communities that contain the minimum of 30 persons have been identified in 1,070 municipalities… ca. 54% live in concentrated Roma settlements: 233 of them are territorially segregated… 324 of them are located in the periphery of the municipal residential areas, and 246 of them are located within the municipal residential areas… almost half of the overall Roma population (around 46%) live dispersed among the majority population*' (Klimovský, Želinský, Matlovičová, & Mušinka, 2016, p. 30).

It must also be noted that each Roma community, whilst broadly falling within one of three categories of 1. integrated within the majority population, 2. marginalized but peripheral to the majority population, and 3. territorially segregated from the majority population, will in and of itself be different, i.e. not all territorially marginalised settlements are the same. And again, within one Roma community there will be a social and economic hierarchy characterized, for example, by families who are economically relatively well off, such as the family receiving remittances from abroad who are renovating their home, as opposed to the family where social ills prevail, poverty is endemic and income derives solely from the state (see e.g.: Mušinka & Kolesárová, 2012; Scheffel, 2013; Škobla et al, 2014).

Space does not permit a full ethnographic account of the villages of Bystrany and Žehra and more contextual details will emerge in the findings section, below, but to provide some context for the purposes of this paper, both villages lie in rural locations in Eastern Slovakia, just 5.83km apart by road, 3km in a direct line. The village of Bystrany comprises of some 3314 inhabitants, of whom about 2772 are Roma (Škobla et al, 2014). The village centres on the church and Mayor's office, with the village store nearby. The Roma settlement could be classified as 'marginalized but peripheral to the majority population' (Klimovský et al., 2016) but this is actually a village in demographic flux, shifting towards a Roma-majority population both within the Roma settlement (of course) and also within the 'majority population' village, as homes are purchased by the Roma with remittances from abroad.

The elementary school is an excellent educational facility well run by a dynamic, engaged and politically active Romani-speaking Head teacher with many years of experience; this school as a 'microsystem' does much to drive the positive development of the Roma children and their families. On multiple visits to the school I have been impressed with the quality of the teachers and teaching, the resources, the committed staff, the high expectations of behaviour, the links to the Pastor and outreach work in the settlement, and the robust curriculum conforming to Slovak norms. The Roma settlement is separate but in close proximity to the main village, and a 14-minute walk away from the main High school. Within the settlement

there are two grocery shops, three sets of traditional three-story apartment blocks facing 'Sheffield Square'[5], and the rest of the settlement consists of closely-sited detached houses lining the road that loops through the settlement. There is much evidence of internal and external renovation: new build, in-fill (building houses between other houses where space allows), new bathrooms and kitchens (proudly shown to me), connections to the water supply, and expansion – the settlement is spreading southwards, and, according to residents, money earned in Sheffield and elsewhere is being reinvested in the homes in Bystrany and helping improve the shared spaces. The settlement would now be unrecognisable from observations made pre-2004 (Bader & Kunčíková, 2006; Znamenáčková, 2008).

Žehra represents a Roma settlement that has been pushed to the extreme spatial limits of the village boundary; it is 'territorially segregated'. From the heart of the main village of Žehra to the Roma settlement it is 1km, with the main (essentially) non-Roma village having a population of about 229 and the Roma settlement having approximately 1744 inhabitants (Škobla et al, 2014)[6]. The settlement occupies a flat site located between a narrow tributary of the river Hornád and the main 547 road to Spišské Podhradie and can be considered as having three parts. Firstly, there is the small primary school located at the southern end, across the road from the settlement; secondly, there is the main locus of housing consisting of 12 units of apartments, arranged in four rows of three, and four terraces of single-storey housing totalling some 42 homes. Within this part of the village are a small community centre, social worker's office and Catholic chapel located in one building, a newly built Apostolic Church and two village shops, one run by a non-Roma woman and the other a brand new shop (still being completed in April 2017) run by a Roma family. The third part of the village is situated back across the main road again, to the northern end of the settlement, and consists of self-built rudimentary homes constructed of logs or blocks strung sporadically along the roadside for about 500 metres. Some of these homes have basic sanitation, others do not: 'I was able to peer into a little wooden house, the owner and his family were there, it was very small indeed but pleasantly done out – a fridge but no electricity, beds, a tap protruding from the wall' (Fieldnotes, 1/4/16). This mix of housing consisting of apartments, houses and basic homes reflects a social and economic stratification in that, for the most part, the poorer families seem to occupy the most basic and isolated homes, the wealthier families occupying the houses or apartments.

5 'Sheffield Namestie' features a stone amphitheatre with a decorative Roma symbol of a wheel, apparently all built by the Roma from proceeds of working in Sheffield.

6 By way of clarification, the Roma settlement is also referred to as Dobrá Vôľa ('good will') which is the name of the tiny settlement on the crossroads between the main village and Roma settlement. For the purposes of this paper, the Roma settlement will simply be referred to as 'Žehra'.

For example, there are signs that the single story homes are being improved and extended with remittances from abroad whereas there is little evidence of home improvement across the road in the most marginalized houses. The primary school is well equipped, run by a teacher and her assistant for children to age 6, including provision for Year '0', the 'catch-up' year for Roma children to ensure they are school-ready for elementary school (Slovak Ministry of Education, n.d.). Progression to elementary school means taking the trip by bus or on foot[7] to Spišské Vlachy.

To conclude this section, there is a qualitative difference between Bystrany and Žehra, with one village enjoying the benefits of remittances from abroad and close access to an excellent school and the other, more remote, seeing relatively little of the benefits of those working in Sheffield, with school access potentially problematic beyond six years of age. Reasons for the divergent educational outcomes of the Roma pupils in Sheffield may lie in these social, economic and educational contrasts.

Section 6: THE ROMA PUPILS AND LEVELS OF ENGLISH

The Roma pupils obviously share the family experiences in terms of, for the most part, being born and raised in Slovakia and then migrating to Sheffield at a certain life stage. This means that each child has a unique experience of immediate family and community life in the Roma settlement ('osada'), village or town in Slovakia. Furthermore, each child has a unique educational trajectory in Slovakia/England in terms of attendance (or not) at a day care centre, a kindergarten or primary school (Materská Škola), a secondary school (Základná Škola) and beyond. In addition, each child has a unique combination of a variety of Romani, Slovak and English, including children born and brought up in the UK who hold Slovak passports but are often more conversant in English. However, literacy skills in *all* languages are usually woefully short of target, see for example Figure 2, below, which shows the National Curriculum (NC) level of English reading at Ridgeway School for a sample of the Roma, non-Roma EAL and English native speakers at age 12. It must be noted that an 11/12-year old child would be expected to have achieved a National Curriculum Level 4, and by the time they are 14 years of age they should have reached Level 6.

Only four Roma children of the 13 tested[8] have managed to score on the National Curriculum reading levels, thus evidencing a general lack of skill in English literacy. Three pupils attained a Level 3 meaning they can '…read a range of texts fluently… read independently… responding to fiction and non-fiction…show

7 Walking from Žehra to Spišské Vlachy Elementary School involves a perilous journey of some 2.5km on foot, with no footpath (MP Fieldnotes: April, 2015).

8 According to Figure 1 there should be around 22 Roma pupils in Year 7 in the summer term, which leaves at least 9 unaccounted for in the graph in Figure 2.

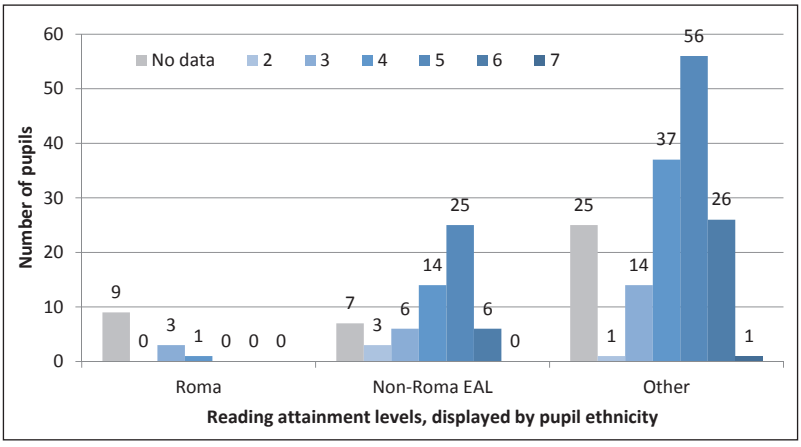

Figure 2
Reading Assessments Y7 summer term

understanding… locate sources and find information…', and one pupil reached a Level 4: '… shows understanding of significant ideas, themes, events and characters… beginning to use inference and deduction… texts reflect the time and culture in which they were written.' ('National Curriculum in England', 2013). Nine pupils are down simply as 'no data', i.e. unable to achieve a Level 1, and, to put this in perspective, Level 1 requires pupils to 'recognise familiar words in simple texts…use knowledge of sound-symbol relationships to read words and establish meaning… in response to poems, stories and non-fiction by identifying aspects they like… (ibid). It should be noted however that such assessments are designed for *native* speakers of English and, presumably, those that have not had their schooling interrupted, and are not intended for measuring levels below this – the Roma pupils *will* have made progress, including the nine for whom there is 'no data'. Both the non-Roma EAL and 'Other' cohorts seem to be making some headway with some pupils attaining as expected for this stage in their education. To conclude, language and literacy skills are crucial for formal schooling and through a combination of factors, the Roma children in this study are often lacking.

Section 7: THE MAIN FINDINGS

In this section I present the attainment data that prompted this paper and address the three questions: 1. How well do the Roma children attain at the end of high school? 2. What differences in attainment are there between the children from the main sender localities? 3. What could account for the differences in attainment?

In terms of the attainment of the Roma children, data were compiled from the three participating Sheffield schools; the focus of the data is attainment at age

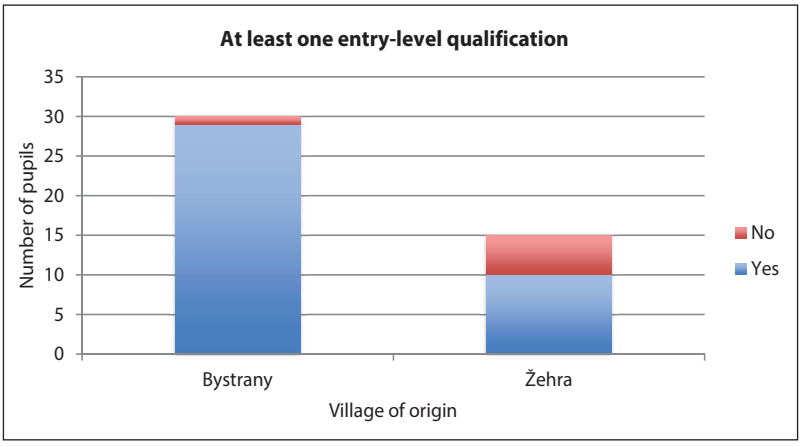

Figure 3
Attainment at Entry Level

16. Figure 3 shows the number of pupils gaining a pass at Entry Level, sorted by the villages of Bystrany and Žehra. Entry level is the basic award for those working below grade G at GCSE (General Certificate of Secondary Education, the 'standard' qualification at age 16)[9].

The number of pupils entered from Bystrany is 30, with 15 entered from Žehra. In total, some 39 children from the two villages have managed to attain an Entry Level award and six in total were unsuccessful. What is evident is that more children from Bystrany (29) were successful than for Žehra (10) and only one child from Bystrany failed to gain the qualification, whereas it was five from Žehra, representing 30% of those entered from that village. A few points need to be made at this stage: what is not known is how many Roma pupils were *not* entered at all for this award. Furthermore, we do not have a subject-specific breakdown to allow us to see those subjects that the Roma were more or less successful at. What is clear is that whilst the pupils from Bystrany have held their own, some from Žehra have found this level a struggle.

Moving up from Entry Level, Level 1 qualifications provide 'basic knowledge and skills, the ability to apply learning with guidance… and may be linked to job competence' (nidirect, 2015). Pupils attaining Level 1 will be operating at GCSE grade D-G level; Figure 4, below, presents the attainment at Level 1.

9 Entry Level focuses on 'basic knowledge and skills, the ability to apply learning in everyday situations' (nidirect, 2015). Pupils working at this level focus on assessed units of work that can be written, oral or practical and focus on 'non-traditional subjects' such as literacy, numeracy, life skills and practical and vocational subjects.

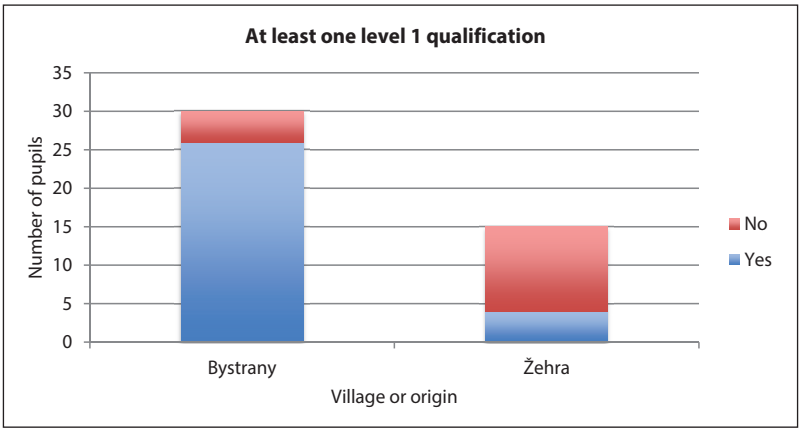

Figure 4
Attainment at Level 1

We see that 30 pupils achieved at least one Level 1 qualification, 26 from Bystrany and four from Žehra. Of the pupils who did not achieve an award at this stage, 11 were from Žehra and four from Bystrany. The increase in academic challenge, albeit still a relatively low one, has highlighted the difference between the two village cohorts with Bystrany outperforming Žehra; in percentage terms 87% of Bystrany pupils attained the Level 1 award compared with 27% from Žehra. In terms of failure, 73% of Žehra pupils failed to achieve this award compared with a failure rate of 15% for Bystrany. Again non-entry data and subject specific breakdowns would have been useful.

The final graph represents attainment at Level Two, equivalent to GCSE, the *normative* school leaving qualifications at age 16. Achieving Level Two means pupils are working in the GCSE A*-C range, providing 'good knowledge and understanding of a subject, the ability to do a variety of tasks with some guidance or supervision and are suitable for a variety of roles' (nidirect, 2015).

With the academic challenge increased further, only one pupil from Žehra has managed to achieve a Level Two qualification and 14 have failed to register a pass grade. For Bystrany, 30 pupils were entered and of these, 21 have passed at least one Level Two qualification, with nine failing to. Overall, out of 45 pupils entered for Level Two qualifications, 22 managed to pass at least one, and 23 failed to achieve at least one pass grade. The overall picture, representing the culmination of compulsory school-age education in England for these pupils, is not optimistic, but the Village split highlights stark differences in the capacities of the children from each village. Bystrany pupils entered for the Level Two examinations have managed in many ways to hold their own, with 21 out of 30 successful to some degree. The data for Žehra show that only one pupil managed to register at least

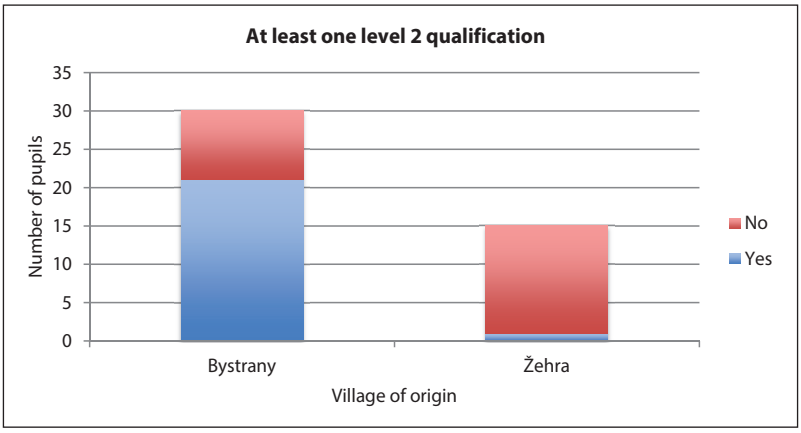

Figure 5
Attainment at Level 2

one Level Two score, a sad return from 15 pupils entered. So what could account for these differences in attainment?

Reflecting back on Figure 2, it is clear that the Roma children are struggling with the learning of English as a foundation for their engagement with academic study, referred to as 'Cognitive Academic Language Proficiency (CALP)' (Cummins, 2007), and some Roma pupils are learning English to the detriment of curriculum subjects which can only have a negative bearing on achievement in examinations later on. Many then, lack the linguistic foundation to make headway in learning and making progress in their subjects to attain the normative Level Two qualifications[10]. Once the pupils do reach the examination stage, all examinations are conducted in English, often necessitating a familiarity with abstract 'examination language', key being to understand what exactly is being asked before one can answer the question.

Reflecting on the differences between the attainment of the Bystrany and Žehra pupils, I return to Bronfenbrenner and contexts of development. We have seen that the relatively higher attainers come from Bystrany, a set of microsystems and a mesosystem that is, in many ways, an integrated Roma and non-Roma settlement, with the main settlement just on the edge of and yet well within walking distance of the village amenities, even if these are few. If proximal processes are the 'engines of development', then these are qualitatively evident in Bystrany, with the strong links between Roma parents and school, and also between the Roma community and the Roma mayor and mayor's office, between the Pastor and Head

10 NB: Pupils progress in schools in the UK chronologically, not by attainment reached. Therefore, pupils do not repeat school years if they have not attained as expected.

teacher, and the Pastor and Roma community, and various combinations thereof comprising a 'mesosystem'. The components of the mesosystem in Bystrany will be reinforcing behaviours that lead to the positive development of the Roma child.

Contrast this with Žehra and the remote, more marginalized lives of the Roma there – there is nothing of the bustling life of Bystrany[11]; there is not a prominent well-appointed Mayor's office centrally located and accessible, the village shop feels like visiting a small prison where goods are dispensed through railings and the Roma social worker, once part of a team of four (Roma and non-Roma) some three years ago, is now isolated in her work – work that would have been conducted in Slovak in the past, not just Romani. The elementary school is in an adjacent town and the necessity to travel to and from school there can militate against attendance. Whilst the microsystems of family, primary school, chapel, social centre and apostolic church are present, there are few of the tangible interactions between the individual microsystems in the mesosystem that could foster child development. It might not come as a surprise then, that the pupils from Bystrany outperform the pupils from Žehra, notwithstanding other factors. For example, how much impact has engaging with the English school system influenced the results given that all teaching and assessment has been conducted in English, probably the third language of many of the Roma children?

Whilst I would argue that the village contexts, the microsystems and mesosystems, must have had an effect on the school outcomes, I have only been able to research that which is visible and accessible to me. What Bronfenbrenner would argue is that whilst various aspects of the mesosystem and context of development of the child are important, it is what goes on in the home that is crucial – those early interactions between mother and baby, primary caregiver and immediate family and developing baby. Added to this, and fuelling development, is the stimulus provided in the form of toys etc. (Biro, Smederevac, & Tovilovič, 2009). Indeed, one of the major findings of Biro et al is that *poverty* alone is not a significant factor in the negative development of a child if the parents prioritize the care and development of that child. In other words, the pupils from Žehra could be theoretically performing as well as those from Bystrany. My belief is that the pupils from Žehra are underperforming not solely because of perhaps more impoverished surroundings in material terms, but an impoverishment of proximal processes and marginalized existence. However, the picture remains unclear, subject to further research to include more home visits in both villages to explore the proximal processes at work in the home and community. A starting point would be the homes of the children

11 I have just returned from a field trip to Slovakia (1-13 April 2018) and at the time of writing there has been a sudden flurry of building activity within the settlement at Žehra. Three new blocks of apartments are under construction, with some of the workers drawn from the Roma community. This may herald a positive upturn in the fortunes of the people of Žehra.

who managed to attain the Level Two qualifications and compare them with the home lives of those who did not manage to attain academically.

In terms of the exosystem, 'a setting not ordinarily containing the developing person' (Bronfenbrenner, 2005, p. 148), I was particularly struck with the visible evidence of home improvements in Bystrany, with many of the houses undergoing some form of renovation, others being built from scratch. It was obvious that the father's work (it is usually the father that works) in countries such as the UK, Germany and France, as evidenced by the car registrations observed in the settlement, is having a positive effect. And the positive uplifting effect of regular employment and family income is a key exosystem for Bronfenbrenner. The Roma families in Bystrany have been able to improve their homes and subsequently their living conditions and lives to some extent, which in turn will have a positive effect on the mood of the household, something that will communicate itself to the developing child. And what of Žehra? We know that many families from Žehra are also in the UK, indeed, they live in the same streets as the Bystrany Roma, and send remittances home. But the apartment blocks and low-rise houses in the main part of the village do not lend themselves readily to improvements, though some of the low-rises have been extended front and rear. However, the trend seems to be for the better off families to simply move out of the village and relocate elsewhere, such as to Spišské Vlachy. This represents something of a drain on social, economic and cultural capital as these more motivated families move out; the village loses some of its more aspirational inhabitants who could act as positive reinforcing models in the mesosystem. The developmental impacts upon both those that move out of the settlement and those that remain will require further research. I would hypothesise that the 'loss' of the more dynamic and socially and economically better-off families has a detrimental effect on the rest of the Žehra community.

The macrosystem for the Roma from both villages is similar in terms of the 'societal blueprint' and the wider social, cultural and political environment that the child is brought up in. Once the child leaves school in Slovakia and attempts to enter the world of work, he/she will have difficulty in making the transition to being an independent and productive member of society, reflecting the current 'societal blueprint', whether explicit or implicit, for the marginalized Slovak Roma in Slovakia (Mušinka & Kolesárová, 2012). The knowledge of this situation will feed back down to the children and parents and impact on how well the children engage with education. As the Headteacher of Bystrany Elementary School says, it is so hard for her and her staff knowing that no matter how hard they work with the children, they will end up unemployed if they stay in Slovakia.

The final aspect to consider is Bronfenbrenner's chronosystem and the impact of time on the developing Roma children. During the first two years of the project, we have seen the UK move from membership of the EU, to voting to leave in the

next couple of years. The Roma have taken full advantage of the right to move to Sheffield to work, live and educate their children and now they are faced with uncertainty as they wonder if they will be able to stay. It is reported that some families have already moved back to Slovakia because of the Brexit vote, thus interrupting the children's school studies. To put this in context in relation to Bronfenbrenner's chronosystem, those Roma children who went through the English education system between 2004 and 2017 will have had a different experience to those who started their English education pre-Brexit and will conclude it, or not, post-Brexit.

Section 8: CONCLUSIONS

My overarching hypothesis is that, genotypes notwithstanding, the level of development of a village and context of upbringing has an impact on the academic potential of a child. This has been supported by the data in relation to the two villages, demonstrating that the pupils from Žehra have struggled to attain academically, whereas a higher proportion from Bystrany has managed to succeed across the three levels. The more tangible of Bronfenbrenner's microsystems and mesosystems in both Bystrany and Žehra are indicative of developmental levels, with Bystrany having simply more 'going on' than Žehra, with a greater intensity of building work, renovation and a sense that the settlement, whilst geographically on the edge, is in fact an integral part of the village. One key to development in Bystrany appears to be the well-managed school, in the words of the Headteacher: "I will achieve a 100% pass rate with these children if they have not been to England…" (Interview: 22/4/16); the strong school-home link is instrumental in the development of the child. What requires further research is the 'hidden' proximal processes, those more immediate and early interactions between mother/caregiver and baby and the close proximal processes in those crucial early years of development. It would seem that such processes are either well-established in the homes of Bystrany to some degree, or perhaps lacking more in the homes of Žehra. And reflecting the point made above, a crucial intervening event in many of the children's lives is the migration to Sheffield, which may have a limiting effect on educational outcomes.

One could argue that it is shocking that children can go through school and come away with nothing, at least on paper. I think questions need to be asked of educational policy makers and school leaders. I think seeking to identify the proximal process and interrelated mesosystems that boost child development in marginalized Roma communities would help us to better support the Roma families to maximise their children's potential. My view is that something has to be having a positive effect in the context of Bystrany, whereas the opposite may hold true in Žehra. But I also realize that apart from the evidence presented here,

much of this research is problematic. Each child participant is an individual bundle of genes (genotype) and product of his or her own family, wider family, village and community context (phenotype). Even within Bystrany and Žehra each child will have a unique experience- consider for example, the three basic types of accommodation within Žehra. The character of each child in terms of its 'demand', 'resource' and 'force' characteristics ensures this uniqueness of experience. Any attempt to isolate these multitude variables is fraught with problems. And what of the key early proximal processes, those first interactions between mother and child, and the subsequent development of that child, how can we ensure we capture these for analysis? And how much stimulus of what type and for how long is sufficient to maximise cognitive potential? The answers are not easy, I would argue, but when it comes to ensuring better outcomes for the Roma children, we need to pursue them.

Whilst I would not venture to argue that the results of this research could be necessarily generalised to the wider population, I would suggest that certain trends apparent here might be observable elsewhere. The Roma children at the heart of this research have, for the most part, struggled academically, have wrestled with school education in a language that is not their own and have often come from lower and more marginalized SES backgrounds. This will be a familiar picture to many professionals and academics working with and for the Roma both here and in Slovakia, and beyond. There are Roma families and children living in territorially marginalized settlements in Slovakia, and those living closer to or within the majority population. Some of the contextual detail of the Bystrany and Žehra Roma will also be familiar or 'relatable' to those working with the Roma in other communities. One final point to make is that children in the UK from low SES backgrounds *whatever* their ethnicity, may also find school a struggle, have language and literacy issues and not attain the highest grades. Therefore, professionals and academics working with children in lower SES environments may find much that resonates in this paper.

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THE USE OF CENTROGRAPHIC MEASURES IN ANALYSING THE DISPERSION OF HISTORIC FACTORIES, VILLAS AND PALACES IN ŁÓDŹ (POLAND)

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Abstract
The paper presents a proposal to investigate the distribution of historic villas, palaces and factories listed in the register of historic monuments using centrographic measures. Information about the monuments have been projected onto a map as points, which were analysed using the GIS tools in ArcGIS 10.4.1 software. The study included the following measures: Spatial Mean or the centre of gravity, Spatial Median, Standard Distance, Standard Deviational Ellipse. This allowed a discussion on the validity of using centrographic measures for this type of analysis, and a spatial analysis of the distribution of the city's historic buildings in relation to its spatial layout and the tourist space, in which these monuments serve as one of the main assets.

Key words:
Centrographic measures, historic buildings, tourism space, GIS, Poland

INTRODUCTION

Centrographic measures have been used for two centuries to search for the "centre of area" and "centre of population" (Hayford 1902), as well as to analyse the distribution of points in space. (Lefever 1926, Sviatlovsky and Eells 1937, Yuill 1971). At the turn of the 20th and 21st centuries, owing to the possibilities offered by the Geographic Information Systems (Mitchell 2005), the number of applications of these measures for spatial analysis significantly increased (Fischer et al 1996, Wong 1999). They were used, among others, to analyse changes in the center of gravity of cities and urban population in Poland in the 20th century (Jażdżewska 2006), distribution of accommodation facilities (Nalej 2014), as well as spatial research of cultural heritage (Lechowski 2011, Wang et al 2014, Qiana, Kanga, and Wenga 2016). The centrographic measures will be recommended to spatial analysis of the heritage, for example castle ruins (Matlovičová K and Husárová 2017) or murals (Jażdżewska 2017).

The analysis of distribution has been applied to immovable monuments, such as factories, villas and palaces listed in the municipal register of historic monuments

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of the city of Łódź. In this context villas mean residential buildings, mostly small, with an adjacent garden. On the other hand, palaces are more elegant residential buildings with no defensive features, the residences of rulers, lords or patricians.

The aim of the work was the spatial analysis of monuments using cetrographic methods and an attempt to answer the question whether these measures aptly describe the distribution of the examined monuments, refer to the urban development of the city and the tourism space of Łódź described by Liszewski in 1999.

RESEARCH AREA

The research area is Łódź, the third largest city in Poland, developed in the 19th century, the age of industrialisation. Łódź – known as the Manchester of the East – was dominated by the textile industry. Over a century, it was transformed from a small agricultural town into a city of several hundred thousand inhabitants (Liszewski 1997). There was an influx of entrepreneurs from abroad (Silesia, the Czech Republic, Saxony, France, Germany and other areas of Western Europe), as well as from different areas of the Kingdom of Poland, who built new factories and residential buildings for themselves and their workers. Unlike medieval cities, with their defensive walls, churches, fortresses, etc., these structures are the cultural heritage listed in the register of historic monuments (Liszewski 1992, 2009). Industry came to the city after 1815, with the main axis of development along the meridional Piotrkowska street. The impressive brick factories gave the city a distinctive industrial character (fig. 1). Most of them no longer serve any manufacturing functions, but their appearance reminds the city of its history. Entrepreneurs also constructed magnificent villas, sometimes even palaces for themselves and their families (fig. 2).

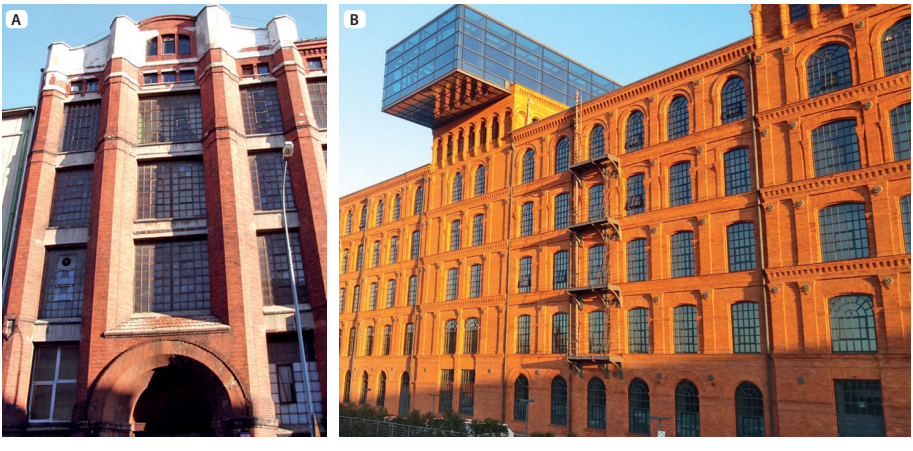

Figure 1
a) Former Adolf Daube factory (currently an office building)
b) Izrael Kalmanowicz Poznański factory (currently the Hotel Andels)

Most of the city's monuments that stand out are associated with the "industrial era" and their arrangement refers to the spatial development of the city.

The term "monument" can be interpreted in many ways. A Polish legal act from 2003 (Journal of Laws no. 16, item 1568) indicates that the term "monument" is understood as *"real estate or movable property, their parts or complexes, being man-made or related to human activity and being a testimony of a bygone era or event, whose preservation is in the public interest due to their considerable historical, artistic or scientific value"*.

Figure 2
The former palace built for the son of Łódź factory owner Izrael Kalmanowicz Poznański (currently the Academy of Music)

DATA SOURCES

Data on historic buildings were obtained from the list of address cards of the municipal register of monuments of the city of Łódź, available in the form of a table with the name of the object and its address (street name and number). The source of data necessary to find objects on the map was the Address Database of the Łódź Voivodship (BAWL), available through the Łódź Voivodeship Geoportal, in the form of a WMS browsing service[1]. Another source of data was field research done in 2016 by a student of geoinformation Roksana Graczyk, during which photographic documentation of the objects was made, followed by the creation of three *shape*-type point layers for the historic factories, villas and palaces. The whole study was developed in ArcGIS 10.4 software, in which the appropriate geodatabase was created.

1 http://geoportal.łódźkie.pl

To interpret the results of analyses, historical maps of the city of Łódź were used, along with vector maps with street networks, the city's boundaries and scientific literature on the subject of tourism space in Łódź (Liszewski 1999)

RESEARCH METHOD

The monuments presented on the map were represented as points in the city space, which is why spatial analysis methods intended for research on discrete objects presented as points were used. The most important information was the geographical coordinates of the points (x, y) and the type of the monument. Centrographic measures selected (Ebdon 1988):

- Spatial Mean or the centre of gravity
- Spatial Median,
- Standard Distance
- Standard Deviational Ellipse.

The ArcGIS software was used, in which these measures were defined as follows (Table 1):

Table 1 Centrographic measures description

Tool	Description
Central Feature	Identifies the most centrally located feature in a point, line, or polygon feature class. Accumulated distances are measured using Euclidean or Manhattan Distance
Mean Centre	Identifies the geographic centre (or the centre of concentration) for a set of features.
Median Centre	Identifies the location that minimizes overall Euclidean distance to the features in a dataset.
Standard Distance (SD)	Measures the degree to which features are concentrated or dispersed around the geometric mean centre.
Directional Distribution	Creates standard deviational ellipses to summarize the spatial characteristics of geographic features: central tendency, dispersion, and directional trends.

Source: Mitchell (2005)

RESULTS

Centrographic measures can be presented in numerical form in a table (table. 2 and 3) and in spatial form on a map (Fig. 3-10). Owing to this, it is possible to analyse individual types of monuments and to compare the dispersion of each of them.

The distribution of factory buildings in Łódź was analysed first (Fig. 3,4). They appeared as one of the first buildings in industrial Łódź. Three presentation points

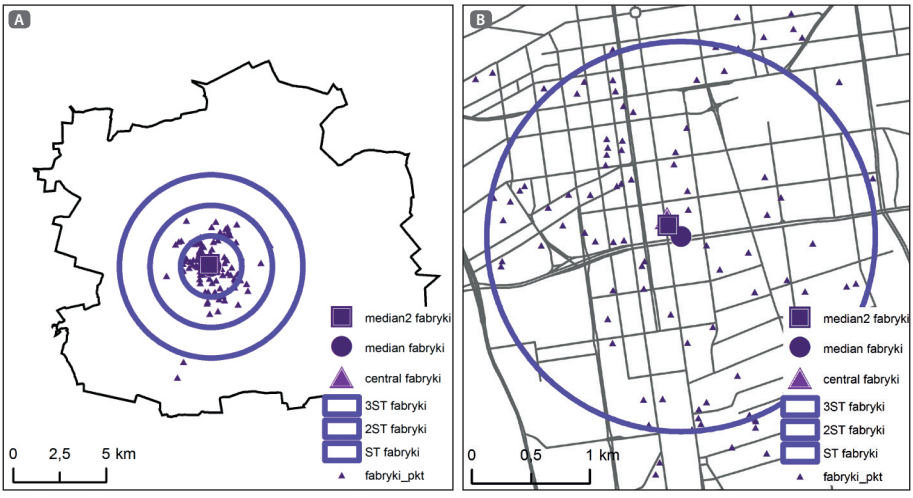

Figure 3
a) Spatial Central Tendency and Dispersion
b) Historical factories in Łódź

(Central Feature, Mean Centre, MedianCentre) are located very close to each other (maximum distances are only 130 m) which can be seen as a testament to the even distribution of points around these measures. The circle with a radius of 1647 m representing one standard deviation (SD) of the distance from *the geometric mean centre* contains 68.8% of objects, the other 2SD has a radius of 3294 m and contains 98.2%, and the third 3SD with a radius of 4941 m – 98.8%. Four factory facilities, which were located at a distance further than 3SD, lie in the area of Ruda Pabianicka. It is a unit that was incorporated into the city in 1939, and previously functioned as an independent town.

The standard deviational ellipse is extended longitudinally, which is probably due to the existence of historic monuments located in Ruda Pabianicka on the list. They cause the ellipse to have the longer axis at an angle of 175° (Figure 4).

Villas built by Łódź townspeople and factory owners were created as the industry developed and the owners grew rich. Many of them were built in the vicinity of factory buildings, which is confirmed by measures of dispersion of points.

The three points presenting the average measures are located very close to each other which can testify to the even dispersion of points around these measures (Fig. 5). The circle (r = 3243m) representing one standard deviation of the distance from *the geometric mean centre* is much bigger than the one for historic factories, which contains 79% of objects, while the next 2SD contains 90%, and the third 3SD 99.6%.

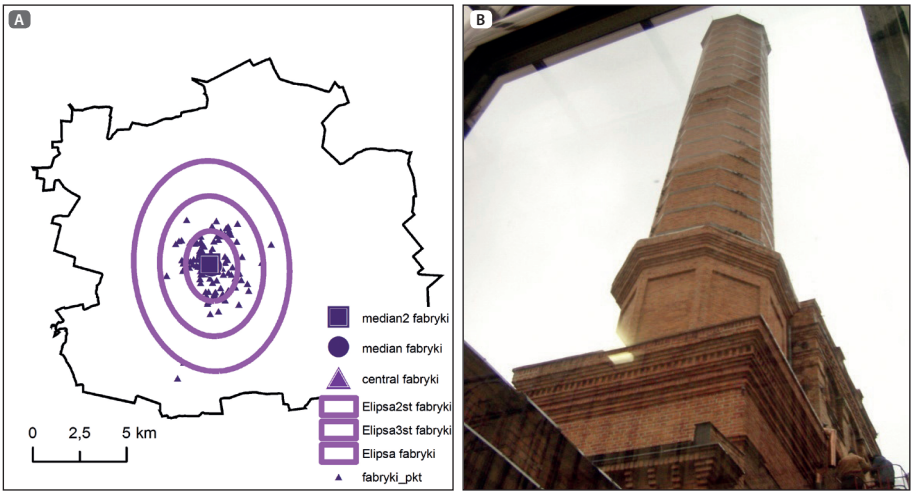

Figure 4
a) Distribution of historical factories in Łódź
b) Element of the Ludwik Geyer factory (now the Central Museum of Textiles in Łódź)

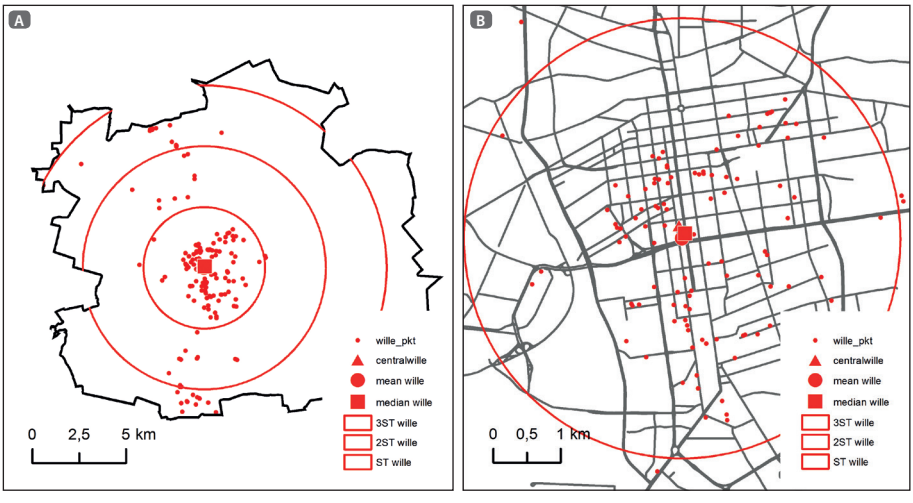

Figure 5
a) Spatial Central Tendency and Dispersion
b) Historical villas in Łódź

The area of one SD and the standard deviation ellipses are located within the city limits, but the subsequent ones go beyond these limits (Fig. 5. 6), which confirms the large dispersion of historic villas in Łódź. The ellipse is sloped at an angle similar to that representing historic factories (Table 3).

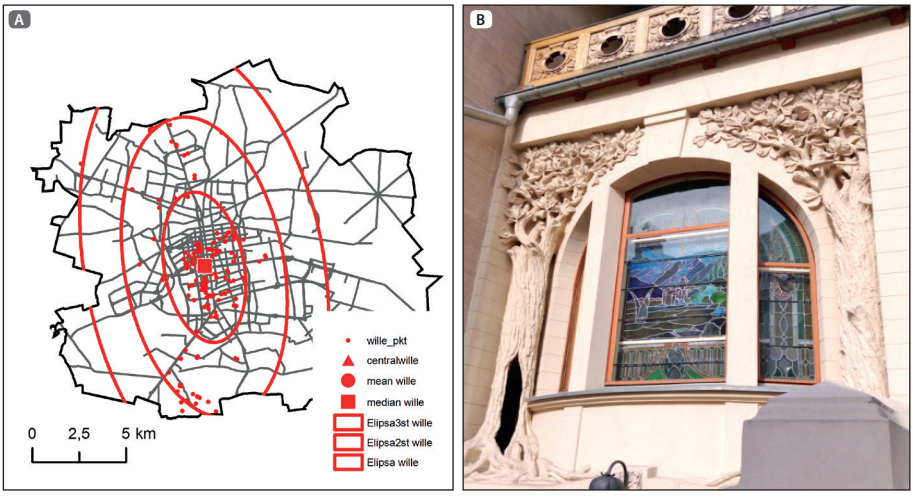

Figure 6
a) Distribution of historical villas in Łódź
b) Villa of Leopold Kindermann and his wife Laura Eliza Feder (now Municipal Art Gallery)

The palaces of factory owners in Łódź lie mainly in the city centre (Fig. 7), 91% of them are within the range of a circle with a radius of 2527 m representing one SD. Points representing their averages (Central Feature, Mean Centre, Median Centre) are located along Piotrkowska Street, (distances between them are approx. 350 m), which may mean the uneven distribution of points around these measures (Fig. 7).

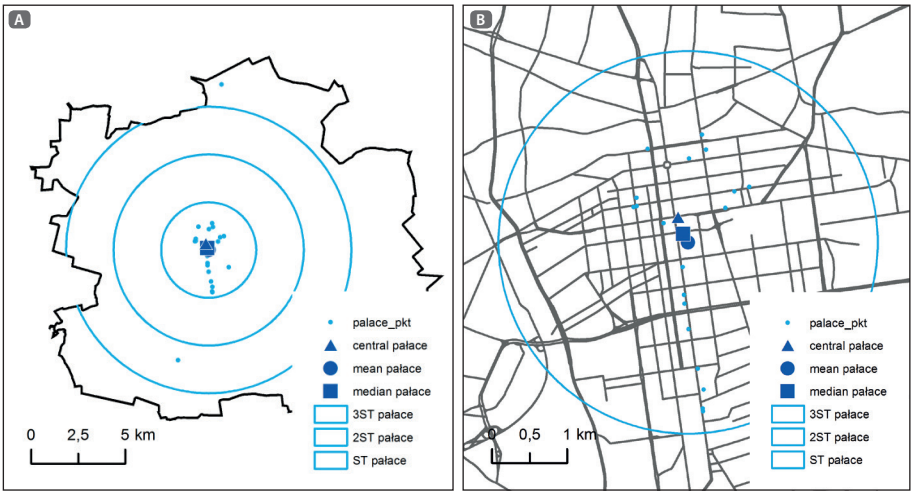

Figure 7
a) Spatial Central Tendency
b) Dispersion historical palaces in Łódź

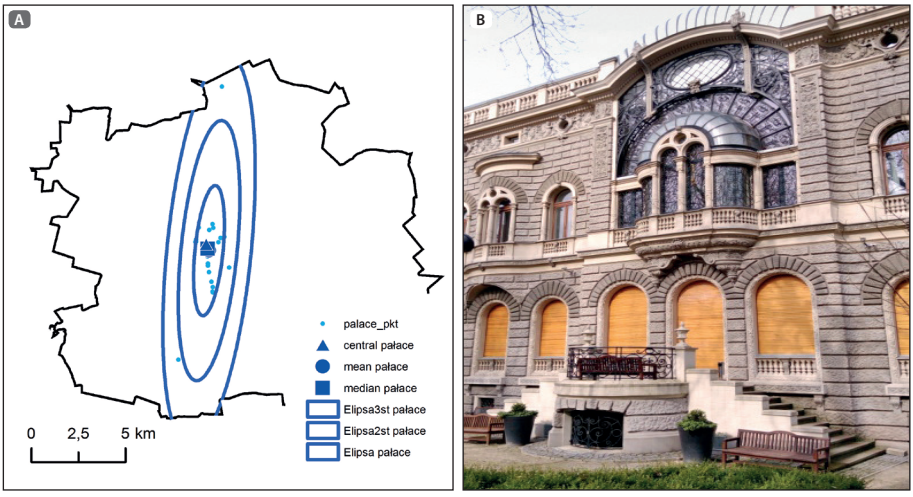

Figure 8
a) Distribution of historical palaces in Łódź
b) A fragment of the former palace of Karol Poznański (currently the Academy of Music)

Standard deviational ellipses is much narrower than the previous one and heavily stretched meridionally (Fig. 8). This is due to the existence of two historic palaces at the northern and southern edges of the city (previously outside of the city's administrative borders) in the dataset. Their location causes the shape of the ellipse to be so elongated.

Table 2 Standard distance and distribution indices for figures 3-8

Objects	Standard Distance [m]			Ellipse Area [km ^{2}]		
	1 SD	2 SD	3 SD	1 SD	2 SD	3 SD
factories	1647.1	3294.3	4941.4	8.14	32.57	73.29
villas	3243.0	6485.9	9728.9	27.15	108.61	244.38
palaces	2526.6	5053.2	7579.9	8.18	32.71	73.61
palaces corrected	1240.0	2480.1	3720.1	3.28	13.13	29.5

Source: author's work

Calculated values of centrographic measures for Łódź monuments are included in Tables 2 and 3. The most compact group of monuments in Łódź are the factories, as evidenced by the value of the standard deviation of 1647 m and the area of the standard deviational ellipses of 8 km^2. The second group of monuments with similar dispersion are palaces, with a higher standard deviation value of 2526 m and a similar area of the ellipse 8 km^2. The most dispersed were historic villas, with

the standard deviation value of 3243 m and the area of the standard deviational ellipse of 27 km^2. Indicators representing 2SD and 3SD confirm these observations, and it can additionally be pointed out that in relation to the city's area (293.2 km^2), the area of the ellipse for historic buildings occupies over 80% of the city's area.

This is due to the fact that some of the villas were built as "second homes" in a forested suburban area. In the 19th and early 20th centuries, Łódź had very polluted air, as most factories and residential buildings used coal for production and heating, so wealthier residents moved temporarily to these villas.

Table 3 Ellipse Indices for figures: 4, 6, 8, 9.

Objects	Axis length [m]			Angle of Rotation	Share of objects in the ellipse	
	longer	shorter	ratio		1 SD	2SD
factories	1874.61	1382.75	1.36	175,4°	66,1%	98,2%
villas	4062.91	2127.50	1.91	169,8°	74.5%	96.3%
palaces	3494.60	745.25	4.69	5.7°	73.9%	91.3%
palaces corrected	1632.8	639.9	2.55	174.4°	38.0%	100.0%

Source: author's work

It is also worth noting that all ellipses have an elongated meridional axis, but the proportions between the length of the longer and the shorter axes differ (Table 3). The ratio of lengths indicates whether the dispersion is even, if the lengths of both axes are similar, their ratio is close to 1. Such situation occurs in the case of historic factories (1.36), while the opposite is true for the ellipse representing palaces (4.69).

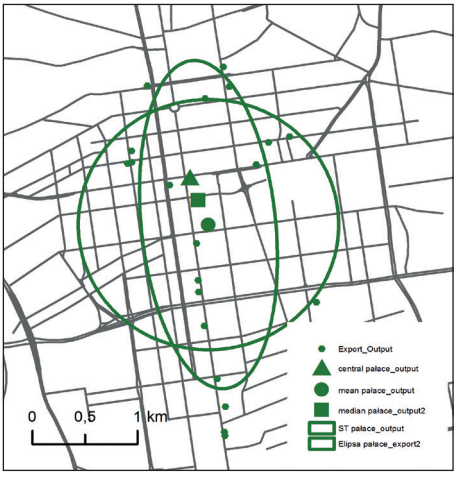

Figure 9
Spatial Central Tendency and Dispersion historic palaces in Łódź (corrected)

It can be discussed whether it would not be sensible to exclude "outlier" objects from the collection of historic palaces, as they have a large influence on average measures, in particular the two palaces that cause such a strong extension of the ellipse. Removing them causes the statistic values to change significantly (Tab. 1. 2.). The value of the standard deviation is only 1240 m, the surface of the ellipse is 3.28 km^2 (the smallest

of all), and the ratio of the axis lengths is 2.55 (Fig. 9). It should be noted that it better reflects the dispersion of these historic palaces in the city space, in the context of the distribution of tourist assets.

CONCLUSIONS

The calculated statistics, and in particular the layout of the standard deviation ellipse is similar to that in the studies by Lechowski (2011) and Nalej (2014), which shows the specificity of the city where the development axis was not a market as in medieval towns, but Piotrkowska Street. They also allow to confirm the thesis that the city was characteristic for the construction of residential buildings of factory owners close to their factories. They are within the limits of the perimeter railway (Fig. 10), which limits the city from three sides and has hampered its spatial development for a long time (Liszewski 1997).

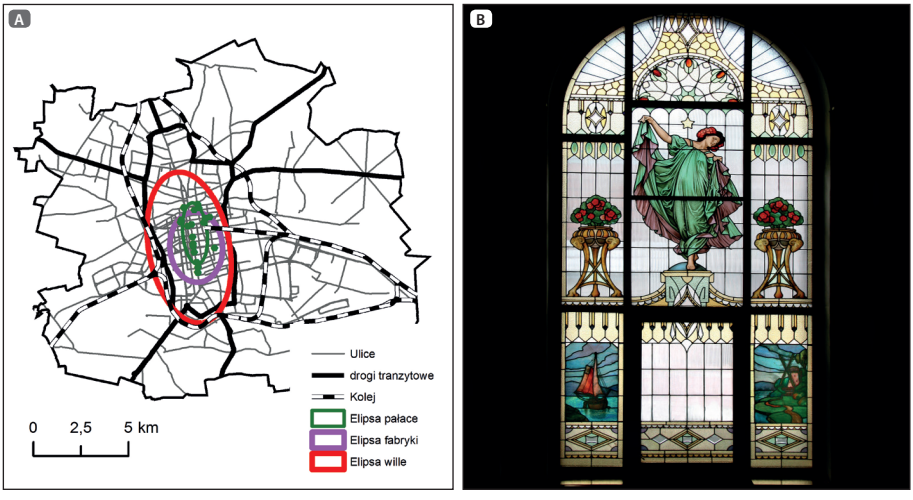

Figure 10
a) Distribution of historical factories, villas, palaces in Łódź
b) Stained glass "Flora" in palace of Maksymilian Goldfeder

The ellipses representing historic factories and palaces of Łódź manufacturers include the area of tourist assimilation designated for Łódź by S. Liszewski in 1999, which may confirm the validity of their use for the study of historic buildings, which are also tourist attractions.

The centrographic measures applied correctly describe the dispertion of points (historic objects) in the city space and give an opportunity for correct interpretation. We should, however, consider the cases when "outliers" are included in the set of points. These measures use the arithmetic mean, which is very sensitive to

such values. Therefore, it is recommended to check the set and possibly exclude the "outliers" from calculations and in-depth analyses.

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PRESENT STATUS OF EAST FOREST-STEPPE OF UKRAINE WITH REFERENCE TO RAVINE-BEAM SYSTEM OF «MITRISHIN OVRAG»

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Abstract
The results of the field and analytical research stages regarding the assessment of the current state of eroded soil in the "MitrishinOvrag" ravine-beam system of the Dergachevsky district of the Kharkov region are presented. It is established, that the soil cover of the investigated areas is represented by varieties of washed and washed soils of slope soil formation, and the forest characteristics of these soils are determined. It is shown that on the lands of the ravine-beam system "MitrishinOvrag" at the present time there is a rather constant process of soil formation, without active manifestation of erosion processes, which is confirmed by the results of analytical determinations of the granulometric composition, acidity level, total humus content and gross forms of NPK.

Key words
Eroded soils, granulometric composition of soil, humus, acidity

INTRODUCTION

The intensification of erosion processes and their spread over large areas lead to significant soil degradation, to large losses in the national economy and, in general, to the risk of the safe development of society. Because of erosion processes, the fertility of soils and the effectiveness of fertilizers applied to the soil are reduced, rivers and canals are silted, washed away and filled with shallow land.From erosion, theland fund annually loses large areas that turn from rich landscapes with fertile soils to "barren lands" and deserts. This means that the creation of an effective system of soil protection from erosion is a priority task of the national economy, without its solution it is impossible to achieve sustainable land use and, in general, the safe development of forestry and agriculture (Gordienko et al. 2005,Timchenko et al. 2010, Koco et al. 2016; Zverková, Zverková2013).

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An important part of the complex of measures to combat erosion are the measures of melioration of forests to protect the soil from erosion. Forestry plays a dominant role in regulating and maintaining favorable environmental parameters and ensuring sustainable development of regions on this basis. Basics of the future effectiveness of protective forest plantations are laid even at the stage of their design and transmission of the project to nature. The viability and durability of these plantations depends on how justified the decisions of designers (Regulations 2009; Vilček et al. 2013; Migunova 2007).

The aim of the research was to determine the state of forest plantations, their erosion conditions, and also to change the properties of eroded soils and their forest productivity under the influence of forest plantations.

ANALYSIS OF RESULTS OF RECENT STUDIES

We studied the category of eroded soils on the soils of theravine-beam system "MitrishinOvrag" of the Dergachevsky district of the Kharkov region. The Mitrishinsky ravine was created in 1962 as a sample of the anti-erosion object of the ravine-gully in the Kharkov region on the initiative of URIFFM. In the 60s of the 20th century, various forest cultures were created on this site (Teleshek 1963).From 1991 to 2011 studies on this object were almost never carried out. In 2012, we have re-established studies to determine the current state of erosion activity in the sites under investigation, and on this basis to find the ways of the most reliable and effective ways to combat erosion and flushing of soils of these lands.

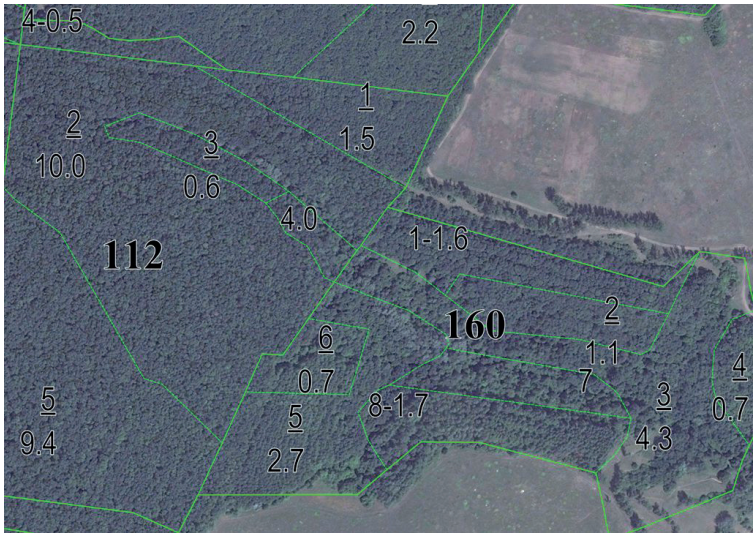

Figure 1
The ravine-beam system "MitrishinOvrag" *(based on Google Maps)*

The ravine-beam system "MitrishinOvrag" is a long erosion formation, 2.5 km long from the floodplain to the watershed. Its catchment area exceeds 600 hectares (Fig.1). The middle part (120 ha) is treeless, and the banks are steep (15-350) convex forms of southern and northern exposures. From the east to the ravine-beam system "MitrishinOvrag" adjoined the land of the former collective farm Kirov Dergachevsky district of the Kharkov region.These lands are located on a fairly steep slope of the right bank of the river Kharkiv, at the foot of which is the village of Tsirkuny. The average annual losses of arable land from water erosion on the investigated site were up to afforestation of 0.8-1.2 ha per year. Products of erosion (melkozem) in the volume of 1200 m3 were taken annually to the valley of the Kharkov River, where they damaged roads, household plots, gardens and floodplain lands.

METHODOLOGY DESCRIPTION

The purpose of our research was to determine the state of forest plantations, their anti-erosion effectiveness, as well as changes in the properties of eroded soils and their overall forest productivity under the influence of forest plantations.

The studies were based on classical methods and methodological approaches of soil science, agrochemistry, forest science, forest taxation, typology and mathematical statistics. Along with standard methods, Field-Map advanced measurement technology (which was provided by the staff of the Forestry Monitoring and Certification Laboratory of the URIFFM) was used to conduct field works and inventory forest plantations. With the help of Field-Map, a network of trial plots was designed. When using the GPS receiver in the field GPS equipment, we solved the navigation problems and local coordinates were fixed to the global coordinate system, which enabled us to build a map of the terrain on the screen with real-time measurements, placing all the measured objects on it directly Work in the forest. When using a laser rangefinder-altimeter in the set, the slope of the relief of the investigated territory, the distribution of height and stocks of stands were determined.

During our research, four test areas (TS) were laid in the "MitrishinOvrag" ravine-beam system (Fig.2):

1 - the area of the upper part of the ravine;
2 - zone of the middle part of the ravine;
3 - zone of the lower part of the ravine - thalweg;
4 - opposite weakly-hollow zone of the upper part of the ravine.

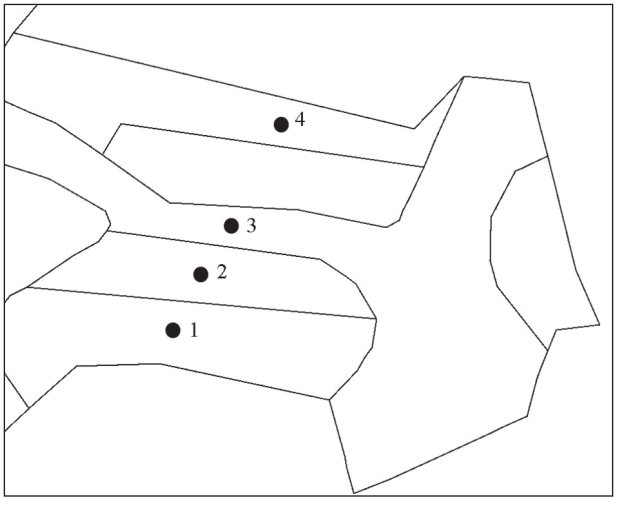

Figure 2
Scheme of laying trial plots in the ravine-beam system "MitrishinOvrag"

On each TS, the composition of tree and shrub vegetation is described, its taxation characteristics are given, soil sections are laid and described, soil samples are selected. Sampling of soil samples was carried out from each genetic horizon of four soil sections, which were laid in the zone of influence of erosion processes of different intensity on soils. Soil samples were analyzed according to generally accepted methods (Sokolova 1975, Arinushkina 1970, Regulations 2003,Regulations 2005).

RESULTS OF THE RESEARCH

The soil cover of the sites studied is represented by varieties of soils of slope soil formation (washed off and washed): dark gray podzolized weakly washed soils on forests (TS 1, 4) and dark gray podzolized ones on red-brown clays (TS 3). We also describe the soil formed under the influence of the alluvial soil-forming process - alluvial sod-layered soil (TS 2).

Maternal breed of the investigated soils because of differentmaintenance of dispersible faction(≤ 0,001 mm) on the scaleof N.A. Kaczynskogocharacterized by such grain-sizecomposition:TS 1 - heavy loam with a fraction of physical clay 53.26-53.66%, TS 2 - sandy loam (13.15-16.33%), TS 3 - loam medium (42.24%), TS 4 - loam medium (43.66%) (Table 1).Soil samples analyses were performed at the Laboratory of Analytical Environmental Research, V. N. KarazinKharkiv National University.

Table 1 The granulometric composition of the studied soils of the ravine-beam system "MitrishinOvrag"

№ TS	Horizon	Depth (cm)	Content of particles of different sizes (%)			The name of the granulometric composition of soils
			> 0,01 Mm	< 0,01 Mm	< 0,001 Mm	
1	He	10-20	57,75	42,25	25,55	Middle Loam
	HI	50-60	51,71	48,29	36,63	Heavy Loam
	Ih	70-80	51,07	48,93	36,23	Heavy Loam
	Pi(h)	95-100	46,74	53,26	36,9	Heavy Loam
	Pk	110-130	46,34	53,66	35,97	Heavy Loam
2	He	0-15	65,79	34,21	20,91	Middle Loam
	Ph	25-35	78,24	21,76	19,12	Light Loam
	P/D	40-50	83,67	16,33	14,24	Sandy loam
	P/D	60-70	84,06	15,94	15,58	Sandy loam
	P/D	90-100	86,85	13,15	11,97	Sandy loam
3	He	10-20	52,75	47,25	26,31	Heavy Loam
	Hi	50-60	77,35	22,65	14,26	Light Loam
	HI	70-80	60,59	39,41	24,29	Middle Loam
	HI	95-100	69,52	30,48	19,05	Middle Loam
	Ph	110-130	57,76	42,24	27,89	Middle Loam
4	He	10-20	64,17	35,83	15,68	Middle Loam
	Hi	40-50	56,31	43,69	25,99	Middle Loam
	Ih(p)	70-100	50,93	49,07	34,18	Heavy Loam
	Pk	160-165	56,34	43,66	25,58	Middle Loam

The fractional composition of the mechanical elements of the humus horizon of the investigated soils reflects the quantitative indices of the granulometric composition of the parent rock, but some of its features are noted. The main difference between the upper and lower parts of the profile of the dark gray podzolized weakly washed soils (sections 1, 4) with respect to the profile of the soddy alluvial layered soil (section 2) and dark gray washed (section 3) is the decrease in the silt in the humus-eluvial horizons in comparison with The parent rock (see Table 1).

The accumulation of silty particles in the humus horizon of alluvial turf soil and dark gray soiled is the result of the sod process, and also lessive - the mechanical movement of clay particles from the upper part of the slope, that is, the result of slope soil formation.

For dark gray podzolized weakly washed soils of the upper parts of the slopes, differentiation of the profile is observed according to the type of glow-reduction of the content of mud particles in the upper part of the profile and their accumulation in the middle. However, in this case, the sod process and the process of glowing, now occurring under the influence of forest vegetation, are superimposed on the active in the past process of flushing out mineral particles from higher flat areas located above the ravine.

On the whole, the granulometric composition of individual soil horizons in the investigated areas varies from sandy loam to heavy loam and varies depending on the genesis of the soils and the prevailing elementary soil processes. Analyzing the level of actual acidity of the studied soils in the humus-eluvial horizons, it can be noted that in the overwhelming majority they are characterized by a weakly acid reaction (Table 2).Soil samples analyses were performed at the Laboratory of Analytical Environmental Research, V. N. Karazin Kharkiv National University.

Table 2 The acidity level of the studied soils of the ravine-beam system "MitrishinOvrag"

№ TS	Horizon	Depth (cm)	pH Aqueous	Degree of acidity and alkalinity
1	He	10-20	5,6	Moderately acidic
	HI	50-60	6,2	Weakly acidic
	Ih	70-80	6,3	Weakly acidic
	Pi(h)	95-100	6,2	Weakly acidic
	P(k)	110-130	6,1	Weakly acidic
2	He	0-15	5,6	Moderately acidic
	Ph	25-35	5,2	Sour
	P/D	40-50	5,3	Sour
	P/D	60-70	4,9	Sour
	P/D	90-100	5,0	Sour
3	He	10-20	6,8	Close to neutral
	Hi	50-60	6,8	Close to neutral
	HI	70-80	6,7	Close to neutral
	HI	95-100	6,8	Close to neutral
	Ph	110-130	6,8	Close to neutral
4	He	10-20	5,4	Sour
	Hi	40-50	6,1	Weakly acidic
	Ih(p)	70-100	5,4	Sour
	Pk	160-165	7,8	Moderately acidic

The maximum acidity values for dark gray podzolized soil on forests under pine plantations are fixed in the upper horizons of the soil, which gradually decrease with the approach to the parent rock (from moderately acidic reaction to weakly acid).

For soddyaluvial soil (section 2), the degree of acidity increases from moderately weakly acid in the horizon He to acidic in the parent rock, which is quite logical given the genesis of these soils.

The acidity of the dark gray soil on the red-brown clays (section 3) remains at the same level in all horizons (close to neutral), while the dark gray in the forests (section 4) varies from acidic and slightly acidic to moderately alkaline, which is explained by the chemical composition Maternal breeds.

The content of general humus and its total reserves is an integral index of soil formation. According to the obtained data, the content of humus in the investigated series of soils is within the "very low" range (according to the parameters of the humus state proposed by L.Grishina and D.Orlov) (Table 3). Low values of humus can be explained by the prolonged and intensive impact of erosion processes on the soils of the ravine-gully landscape studied, as a result of which significant losses of humus occurred. Forest vegetation significantly contributed to the attenuation of erosion processes and activated the processes of humus accumulation. However, it should be borne in mind that 50 years is a rather insignificant period in order to speak of a significant increase in the humus content. Most likely, this period can be called a period of stabilization of humus formation with a tendency to accumulate it.

Despite the closeness of the location of the studied soils and approximately the same age of the landscape, the soils differ in the level of humus content of the He horizon and in the total reserve of humus, which decrease from the upper weakly sloping slopes to the middle parts and the soils of the thalweg. Thus, while in the humus-accumulative horizon of soils with weakly sloping slopes, the humus content is 1.60 and 1.65%, then 1.19% on the slope, and 0.88% on the thalweg.

The results of humus content indicate that higher values are characteristic of soils with a more or less stable level of soil formation - on the upper parts of weakly sloping slopes, while soils with an unstable level on slopes and thalwegs are distinguished by a decrease in the content of organic matter.Soil samples analyses were performed at the Laboratory of Analytical Environmental Research, V. N. Karazin Kharkiv National University.

The C:N ratio, which characterizes the enrichment of organic matter to nitrogen, in the humus-eluvial horizon of the investigated soils, on the whole indicates a sufficiently high supply of nitrogen and a diagnostic system. L. Grishina and D. Orlov is the middle (cut 1), high (cut 2) and very high (cut 3). The C:N ratio in the humus-eluvial horizon of section 4 reaches 14, which characterizes it as very low in nitrogen supply.

Table 3 Parameters of the humus state of the investigated soils of the ravine-beam system "MitrishinOvrag"

№ TS	Horizon	Depth (cm)	Humus content (%)	Carbon content (C) (%)	Nitrogen content (%)	C:N	Enrichment of humus Nitrogen, by the ratio C:N
1	He	10-20	1,60	0,926	0,091	10	middle
	HI	50-60	0,21	0,049	0,085	0,6	very high
	Ih	70-80	0,21	0,049	0,020	2,5	very high
	Pi(h)	95-100	0,03	0,017	0,020	0,9	very high
	Pk	110-130	0,03	0,017	0,007	2	very high
2	He	0-15	1,19	0,689	0,111	6	high
	Phi	25-35	0,28	0,162	0,020	8	middle
	P/D	40-50	0,05	0,029	0,007	4	very high
	P/D	60-70	0,13	0,075	0,033	2	very high
	P/D	90-100	0,10	0,058	0,033	2	very high
3	He	10-20	0,88	0,510	0,133	4	very high
	Hi	50-60	0,70	0,405	0,800	0,5	very high
	HI	70-80	0,64	0,371	0,073	5	high
	HI	95-100	0,75	0,434	0,080	5	high
	Ph	110-130	0,10	0,058	0,032	2	very high
4	He	10-20	1,65	0,955	0,067	14	very high
	Hi	40-50	0,80	0,463	0,060	8	high
	Ih(p)	70-100	0,49	0,284	0,020	14	very high
	Pk	160-165	0,36	0,208	0,098	2	very high

Comparing the soils with respect to the content of the total forms of NPK and Ca, it can be stated that high concentrations (especially in the He horizon) are characteristic of the soiled soil, which is quite natural (Table 4). At the same time, the growth of nutrients occurs not only due to their additional mechanical injection with soil particles, but also because of their migration along the profile associated with a sufficiently high level of water supply of placer soils.Soil samples analyses were performed at the Laboratory of Analytical Environmental Research, V. N. Karazin Kharkiv National University.

Table 4 The supply of nutrients to the studied soils of the ravine-beam system "MitrishinOvrag"

№ TS	Horizon	Depth (cm)	Content of common forms (%)			
			N	P_2O_5	K_2O	CaO
1	He	10-20	0,09	0,08	0,31	0,32
	HI	50-60	0,085	0,04	0,33	0,36
	Ih	70-80	0,02	0,04	0,42	0,34
	Pi(h)	95-100	0,02	0,05	0,40	0,35
	Pi(k)	110-130	0,01	0,04	0,40	0,35
2	He	0-15	0,11	0,05	0,31	0,32
	Phi	25-35	0,02	0,03	0,23	0,27
	P/D	40-50	0,01	0,02	0,15	0,195
	P/D	60-70	0,03	0,015	0,17	0,20
	P/D	90-100	0,03	0,015	0,14	0,16
3	He	10-20	0,13	0,11	0,50	0,42
	Hi	50-60	0,80	0,05	0,28	0,24
	HI	70-80	0,07	0,08	0,45	0,34
	HI	95-100	0,08	0,07	0,35	0,30
	Ph	110-130	0,03	0,06	0,41	0,37
4	He	10-20	0,07	0,08	0,30	0,26
	Hi	40-50	0,06	0,08	0,43	0,34
	Ih(p)	70-100	0,02	0,08	0,46	0,38
	Pk	160-165	0,10	0,06	0,31	6,68

In general, the upper humus horizons of soils of the ravine-beam system are sufficiently provided with the basic elements of their biological absorption and migration. The exception is sandy loamy alluvial soils), which is related to their genesis.Thus, the lowest amounts of potassium and phosphorus are found in sandy-loamy alluvial soil (with the exception of the No horizon), which is entirely due to the mineralogical composition of the parent rocks of alluvial origin. The content of potassium and calcium in the profiles of the remaining soils is quite stable due to their heavy granulometric composition. On afforested areas, the calcium content naturally increases sharply (from 0.3 to 6.7%).

Thus, our studies have revealed that a fairly stable process of soil formation, without an active manifestation of erosion processes, is currently taking place on the lands of the ravine-beam system "MitrishinOvrag". This is evidenced by the genetic horizons of slope soils, which are homogeneous in color and structure,

fixed by tree and shrub vegetation, where the active movement of the soil mass along the slope ceased with the beginning of the soil-forming process under the influence of forest and grass vegetation. The thickness of the upper humus horizons ranges from 36 in the upper part of the slope to 105 cm in the lower part. Fresh ravines, razmoin, naked areas, outcrops of parent rocks, significant areas with uncovered vegetation are not observed. Moreover, all the surveyed areas are characterized by the presence of a well-developed, abundant natural renewal of various tree and shrub species (mainly vegetative and also of seed origin): red and common oak, hazel, maple, acacia, common ash, hazel, mountain ash, As well as a fully viable undergrowth of these breeds (Lisnyak A. A. 2015).

It is indisputable that the plantations of the main layers of various sections of the ravine-beam system in the vast majority do not differ in significant timber reserves (especially commercial quality), but their basic meliorative soil protection function is the consolidation of operating gullies, they have been and continue to be effectively carried out, resulting in active erosion processes Terminate or significantly slow down. It should be noted that forest plantations of this unique site require sanitary cuttings, thinning to improve the condition and growth of trees and shrubs, increase the forestry and anti-erosion effect of forest plantations.Cuttings care should promote the formation of healthy and sustainable protective plantations, which for a considerable period will perform an important soil protection function.

CONCLUSIONS

The laid ecological slope row of the soils of the ravine-beam system "Mitrishin Ovrag", where wood cultures were created in the 60s of the 20th century, allowed us to trace the intensity of erosion processes for today. It is established that the soil cover of the investigated areas is represented by varieties of washed and washed soils of slope soil formation, however, for today a fairly stable process of soil formation is taking place, without active manifestation of erosion processes.

The main difference between the upper and lower parts of the profile of the investigated soils is the decrease in the silt in the humus-eluvial horizon in comparison with the parent rock, and the granulometric composition of individual soil horizons varies from sandy loam to heavy loam and varies depending on the genesis of the soils and the prevailing elementary soil processes. The supply of basic nutrients is higher in the upper humus horizons, while downward along the profile, they decrease and increase the inorganic (mineral) proportion, which is also related to their genesis.The level of the actual acidity of all investigated soils in the humus-eluvial horizons is within the limits of a weakly acidic and close to a neutral reaction. The results of the content of total humus indicate that its higher values are observed on the upper parts of weakly sloping slopes, while on the slopes and thalwegs the soils are distinguished by a decrease in the content of organic matter.

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INTERNATIONAL MIGRATIONS OF POLISH PENSIONERS IN THE CONTEXT OF THE CUMULATIVE CAUSATION THEORY

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Abstract
Nowadays we deal with both rapid population ageing and considerable increases in international migrations of people over 65. Consequently, the aim of this paper is to present the destinations Polish pensioners choose when moving abroad. The most popular destination country is Germany, which results from the family networks binding pensioners with this country. This fact is confirmed by the cumulative causation theory, which argues that a combination of several factors is necessary for migrations to occur. Pensioners face low incomes, and after retirement they seek opportunities to raise them. However, going abroad to work is not easy due to lack of knowledge of foreign languages. Mobility is facilitated by existing migration networks, i.e. migrants move to join their families and friends.

Keywords:
Migration**,** migration of retirees in Poland, directions of migration, Cumulative causation theory

INTRODUCTION

In the 21st century, population ageing occurs at a high pace. In the developed countries this phenomenon has been observable for many years: since 2004, seniors in Europe have outnumbered the youngest population aged 14 and less (Alén et al. 2012). Statistics show that in 2020, 25% of EU citizens will be 60 or older, and the number of pensioners will grow every year. This phenomenon will be a serious burden for the social insurance system, healthcare and welfare services. In Poland, likewise, the demographic balance is negative and population ageing is a noticeable trend. According to the Main Statistics Office, in 2017 Poland is inhabited by almost 9 million people who have reached the retirement age and they account for over 20% of the whole Polish population.

Another phenomenon of similar importance as population ageing are migrations (e.g. Molnár 2017, Bujdosó et al. 2016). Worldwide, as stated by Ptak (2012),

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about 27 million of migrants who are 65 and older move from one country to another nowadays, which accounts for almost 13% of all international mobility.

Consequently, it seems worthwhile to describe the destinations of international migrations by Polish pensioners and the major motivation for their mobility, which is the aim of this paper. It is hypothesized that, in contrast to pensioners from Western Europe, Polish pensioners do not go abroad with tourism in mind, but for economic reasons.

The research focuses on people who have reached the legal retirement age (60 for women and 65 for men in Poland), and they will be referred to as pensioners or seniors throughout the paper. The period under analysis covers the years after the economic transformation, i.e. 1990-2016.

THEORETICAL BACKGROUND

The cumulative causation theory (Massey at al. 1993), combining elements of a number of various other theories, is one of the major sociological approaches to migration. It assumes that migration waves are stimulated directly, showing that a few reasons have to coincide for migrations to occur. As argued by Górny and Kaczmarczyk (2003), the cumulative causation theory is based on the notion of the social capital and it is devoted to migration dynamics. The author of this theory focuses on the development of the migration process, its reasons and consequences of subsequent migrations. According to Massey, each individual migration creates networks (social capital) among people with whom the migrant is somehow connected, and this increases the probability of further migrations from the same society. When the networks (social capital) are well-developed, a migrant is able to profit the most from his/her migration. The author calls this cumulative causation. Górny and Kaczmarczyk (2003) enumerate possible reasons for migrations:

1) development of connection networks,
2) changes in the structure of income distribution,
3) changes in land selling and buying,
4) changes in agriculture, especially introduction of machines,
5) changes in values and in perceptions of mobility,
6) changes in incomes,
7) social perception of work.

The fact that Massey defined these reasons is very significant, because it becomes obvious that drawing conclusions about migration exclusively on the basis of the "classical" economic factors (such as differences in wages) may be very confusing.

DATA

This study makes use of quantitative analysis of secondary sources. The research involved taking stock of available on-line and published sources of data, and purchase from the Main Statistics Office of the data on migrations of Polish pensioners in the years 1990-2013. We may assume that these data might slightly underestimate the phenomenon, as not every migrant has registered his/her mobility in accordance with the legal regulations. However, this underestimation is probably considerably smaller for seniors than for younger, working-age migrants.

RESULTS

The process of migrating abroad by Polish seniors has varied over time. Until 1992, it stayed at the level of about 800 emigrants annually. 1993 displays a sudden peak with the outflow of 1837 persons, and since then the outflow rate has been decreasing until 2010, with some small fluctuations. It is mainly emigration by women that is responsible for this variety, as emigration by men has stayed at the constant level of about 300 persons annually.

Until 1989, going abroad was very difficult for Poles, and this is true not only for work-related mobility, but also for tourism. When it became possible to go abroad, young Poles as well as seniors seized the opportunity to seek better income. Just like young people, pensioners also wanted to work abroad, in particular those pensioners who, due to their profession, had been able to retire early. In addition, 1993 was the year when many people born before World War II, during the baby boom, became entitled to retire. This also contributed to the high number of emigrants.

The migration balance for emigrations and immigrations is negative, except for 1992 and 2016. The lowest value was recorded in 1993 and it amounts to -1055 persons (see Figure 1). This shows that Polish pensioners were likely to choose life outside the borders of Poland.

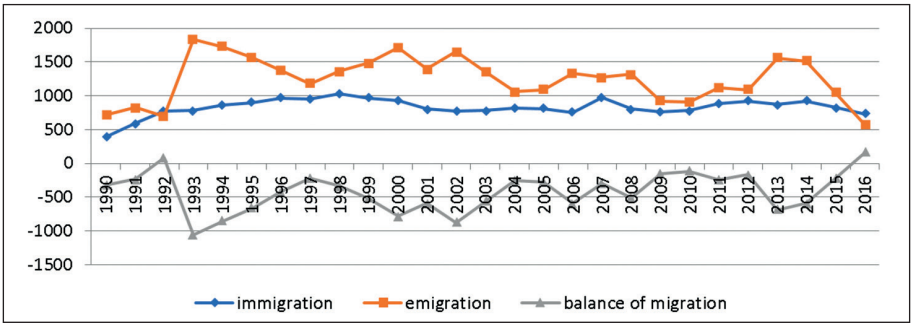


Figure 1 Inflow and outflow of pensioners from Poland and the migration balance for the years 1990-2016, in persons
Source: prepared by the author on the basis of data from the Main Statistics Office

EMIGRATION OF POLISH PENSIONERS

Germany is the most popular destination country among Polish pensioners: in the years 2001-2005, as many as 4695 moved there (see Table 1). The dominance of Germany over other migration destinations is very clear, for example only 336 persons moved to the USA, and 168 – to Canada in the same period.

Table 1 Total emigration of Polish pensioners in the years 2001-2005 and 2006-2010

COUNTRY	Total number of emigrants in years 2001-2005
Germany	4695
United States	336
Canada	168
Australia	52
Sweden	44
France	37
Great Britain	35
Austria	27
Italy	12
Czechia	10
Denmark	8
Greece	7
Switzerland	6
Ukraine	6
Netherlands	4

COUNTRY	Total number of emigrants in years 2006-2010
Germany	4066
United States	704
Canada	245
Great Britain	115
Australia	107
France	93
Sweden	84
Austria	59
Italy	41
Belgium	23
Spain	22
Czechia	22
Netherlands	22
Greece	19
Switzerland	18

Source: prepared by the author on the basis of data from the Main Statistics Office

Likewise, also in the years 2006-2010 emigration to Germany was clearly the biggest, amounting to 4066 migrants (Table 1). The USA and Canada gained more popularity than before, attracting 704 and 245 migrants, respectively. This resulted from facilitated visa procedures and improving knowledge of English.

The outflow of pensioners to Germany has been high throughout the whole period under analysis. This results from many factors, among others from geographical closeness, the high standard of living and the early migration of their children. Easy availability of jobs for pensioners also plays a significant role. A great advantage, especially for the youngest pensioners, is the possibility to obtain a German pension. The basic pension can be obtained by a person who has reached the retirement age and has worked in Germany for 60 months. This right

has often been used by coal miners. It is observable that in the years 2006-2010 the pensioners who migrated to Germany mainly came from the Silesian and Opole Provinces (see Figure 2).

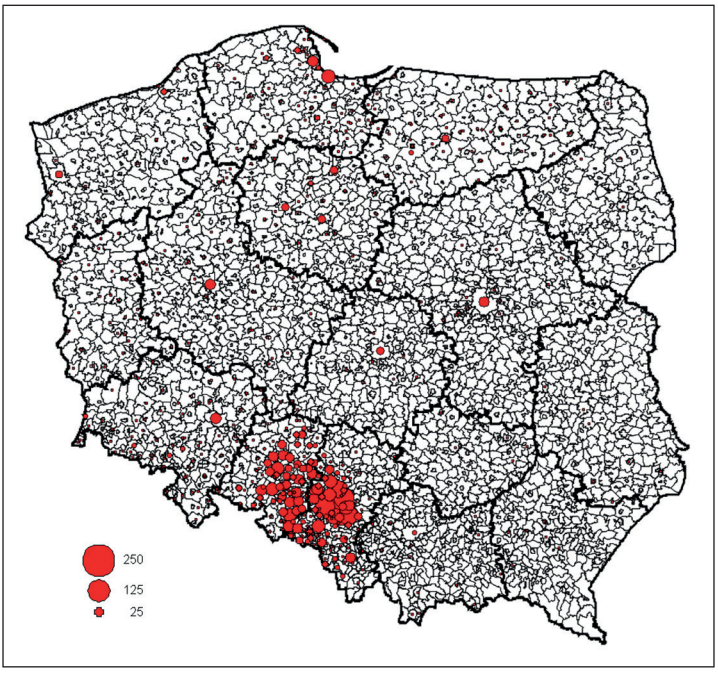


Figure 2
Municipalities from which pensioners emigrated to Germany in 2006-2010
(Total number in persons)
Source: prepared by the author on the basis of data from the Main Statistics Office

EMIGRATION OF PENSIONERS FROM WESTERN EUROPE

International migrations of pensioners are observable in various regions all around the world. In Europe, pensioners from the north tend to move to the Mediterranean, especially to Portugal, Italy, Greece, Turkey, and Spain. In addition, also Oceania, Australia, New Zealand and countries of Eastern Asia enjoy some popularity as migration destinations. Migrations are facilitated by the fact that pensioners from Northern Europe can afford to buy homes and land abroad, and the main driving forces are warm climate, beautiful landscapes as well as healthier and slower pace of life in the destination countries (Rodriguez et al. 1998, King et al. 1998). This is confirmed by the study by Longino and Bradley (2001), who compared migrations of seniors in Japan, Italy, Great Britain and the USA and noted that as societies become more prosperous, mobility of seniors drives them to the mildest climate zones.

Comprehensive studies on this topic are rare, and the more important ones include the work of Warnes (1994), who uses secondary data to show the growing importance of the south of Europe as a migration destination for pensioners from Northern Europe. Also the study by Jurado and Sánchez (1990) presents the economic consequences of immigration by Northern Europeans to Mijas (Costa del Sol), one of the most densely populated municipalities in Spain. Research carried out in Mijas by Jurado and Sánchez (1990) shows a significant share of seasonal migrants, because as many as 44% of their respondents stayed outside Spain for more than three months each year. Also Myklebost (1989) estimates that 15 thousand Norwegians spent the whole winter 1987/88 or its significant part in Spain. Such seasonal migration may be the first step towards permanent migration (Cribier 1980). Valenzuela (1991) calculates that there are more than 500 thousand foreign owners of second homes in Costa del Sol and Costa Blanca, half of them being British and the other half – German.

Research on all types of British buyers of fixed property in France was conducted by Buller and Hoggart (1992, 1994, 1995). Their studies show that the number of purchases by Britons rapidly increased from 2 thousand in 1980 to 14 thousand in 1989. Estate agencies played the key role in attracting buyers to particular regions and municipalities (Williams, King, Warnes 1997).

DISCUSSION

Research carried out in developed countries, among others by Deller (1995), focuses on the economic contribution of pensioner migrants. Deller discusses policies aimed at increasing the number of pensioners coming to Maine. The study is based on the Regional Economic Models. Comparing the simulated influence of such policies with the baseline level, economic multipliers are generated, which can be used for future analyses of policies.

Haas and Serow (1993), in turn, created a heuristic model of pensioner migration and validated it using questionnaire data from 586 migrants to the western part of North Carolina.

Research by Williams and Jobes (1990) shows a strong connection between the reasons for mobility as such and the reasons for choosing the Gallatin Valley. They also discovered a correlation between the socioeconomic status of respondents and their reasons for mobility. Families with higher status identified economic factors and the standard of living as the main reasons for choosing the Gallatin Valley, whereas families with lower status only mentioned the standard of living. This research shows the roles played by economic motivations as well as standard of living expectations, the latter being of particular importance for migrants with lower social status. This may signal the emergence of migrations in which the search for a higher standard of living is the main motivation, while economic security remains an important aspect for some migrants.

Kakaš and Bleha (2017) analyze migrations of seniors in the Slovakia, using detailed migration data and describing variations of such migrations throughout the last 25 years. Applying statistical regression models, they identify important migration factors. They also show the degree to which senior migrants are selective and the degree to which seniors reflect the general migration tendencies related to the economic transformation.

Spatial behaviours of Polish emigrants are closer to the ones of pensioners from the Slovakia. Polish pensioners predominantly choose Germany as their migration destination. During the decade 2001-2010, over 8.7 thousand Polish seniors moved to Germany. The total result is more than 8 times higher than the equivalent emigration data for the next most popular destination country, i.e. the USA (1040 persons). This is not surprising, considering the difficulties faced by Polish migrants to the USA, such as the necessity to obtain the US visa and a tiring plane journey, which may constitute a health risk for seniors.

Another important issue is the fact that Polish migrants moving to Germany predominantly come from the region which has very strong historical links to Germany. Figure 1 shows that these migrants had inhabited Upper Silesia and the Opole Region before they moved. This area belonged to Germany before World War II, and inhabitants of Upper Silesia and the Opole Region often have family and friends in Germany, whom they join in the first place. They undertake work taking care of their own grandchildren, but often their poor financial condition makes them seek employment as caretakers of unrelated seniors. Official statistics show that in 2009 the Polish Social Insurance Office (ZUS) transferred abroad 25 thousand pensions, and in 2014 – already 43 thousand. We must at the same time bear in mind that many migrants do not ask for international transfers. Numerous migrants are young pensioners who retired from professions enabling early retirement, i.e. coal miners, soldiers, police officers, etc. Their migrations, however, are not reflected in our statistics that focus on age, and often they are only temporary.

International mobility of Polish pensioners has been discussed, among others, by Kałuża-Kopias (2015), who points out that elderly migrants move outside Europe much more often than young people (aged 20-34). In the years 2002-2013, about 90% of Polish emigrants aged 20-34 settled in Europe, whereas the equivalent share among migrants aged 65 and more amounted to 75-80%. Seniors aged 65 and more were 1.7 times more likely to settle outside Europe than Poles aged 20-34. Unlike young migrants, seniors were much more likely to choose Germany or the USA rather than Great Britain. In 2013, 58% of Polish senior emigrants (aged 65 and more) moved to Germany, and only less than 6% moved to Great Britain. Among emigrants aged 25-29, however, 35% moved to Germany and 30% to Great Britain.

As argued by Hołowiecka and Grzelak-Kostulska (2012), poverty is less widespread among pensioners than among families raising children. This is confirmed, among others, by Szukalski (2008) and Szatur-Jaworska (2010): the relative prosper-

ity of the elderly, as compared with other groups, has improved in Poland over the last 20 years. Szatur-Jaworska (2010) states that the average income of pensioner households amounts to about 100-105% of the overall average income. In 2015, the average pension paid by the Polish Social Insurance Office (ZUS) amounted to almost 2100 PLN, while half of the pensioners received 1800 PLN and less.

Table 2 Average income from pensions in selected EU countries in 2014 (in EUR)

ORDER	COUNTRY	WOMEN PENSION (in EUR)	MEN PENSION (in EUR)
1	Luxembourg	2207	4017
2	Austria	1530	2498
3	Netherlands	1356	2239
4	Sweden	1509	2146
5	Denmark	1962	2126
6	France	1263	1970
7	Germany	1035	1871
8	Ireland	1171	1859
9	Finland	1356	1849
10	Belgium	1209	1754
11	Italy	1126	1669
12	Great Britain	1004	1662
13	Spain	831	1255
14	Greece	712	953
15	Slovenia	673	890
16	Portugal	606	880
17	Malta	627	761
18	Czechia	432	502
19	Poland	**358**	**474**
20	Slovakia	390	422

Source: prepared by the author on the basis of www.ec.europa.eu

Nevertheless, when we compare Poland with Western Europe, where the average pension amounts to about 2000 EUR, Polish pensions are much lower and they only score the 19th position within the ranking. Consequently, instead of migrating to the Mediterranean, which offers wonderful climate and numerous tourist attractions, Polish seniors are compelled to migrate to countries where they can improve their finances (see Table 1).

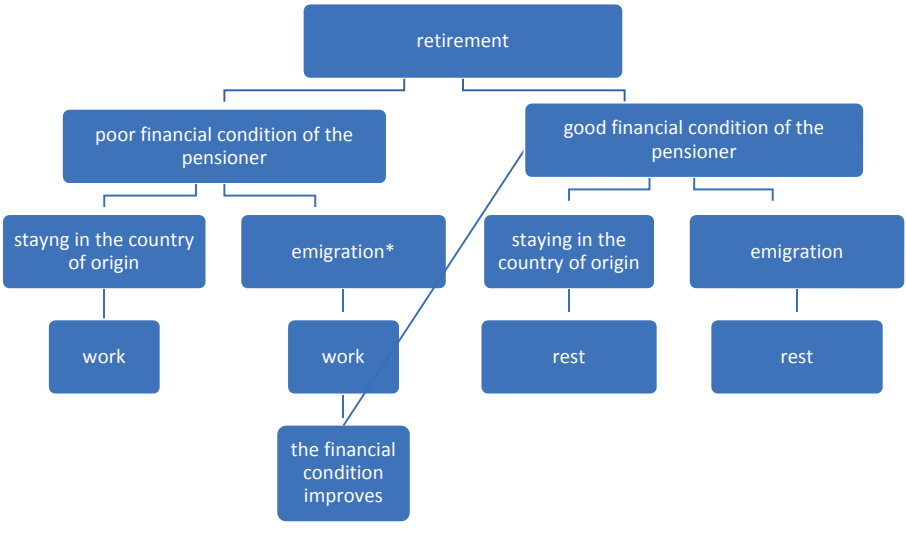
This fact is confirmed by the cumulative causation theory (Massey et al. 1993), which argues that several reasons are necessary for migrations to occur, such as

growing differences in the standard of living, decreasing supply of land in the countryside, emigrants' desire to keep up a higher standard of living, existing migration networks. In the case under analysis, we deal with growing divergence in the standard of living and existing migration networks. Pensioners face low incomes, and after retirement they seek opportunities to raise them. Although going abroad to work is not easy due to lack of knowledge of foreign languages, it can be facilitated by the existence of migration networks. Emigrants move to join their families and friends.

CONCLUSIONS

The increasing role of pensioners in the society and pension security create favourable conditions for research in many European countries. However, migrations of seniors constitute a new research field in Central and Eastern Europe. Poland has been characterized by a negative immigration and emigration balance among seniors, which has become more acute after 1992. This results first of all from economic factors, such as seeking new employment and seniors' desire to improve their standard of living. Migrations are facilitated by existing connection networks between the migrants' former domiciles and their destinations.

Figure 3 illustrates the above considerations. After retiring, each senior chooses between two paths, and the decision depends on his/her financial condition. S/he may stay in the country of origin or move abroad. The former may be connect-



*functioning migration networks are a precondition for migration

Figure 3 Possible choices pensioners can make after retirement
Source: author

ed with employment in a sector of the so-called "silver economy", but the latter guarantees a faster improvement of the finances. For seniors, moving abroad is difficult due to lack of knowledge of foreign languages and fears related to living in a foreign environment. These obstacles may be overcome by means of the existent migration networks, which usually come in the form of family and friends living abroad. Thanks to them, a senior is not afraid of mobility, because they provide him/her with accommodation and the first job. When the financial condition of the pensioner migrant improves, s/he will usually return to the home country and face the same choice that a person with a satisfactory financial condition makes after retirement. Such pensioners also have two paths to choose from: staying in the country of origin or going abroad. In this case, however, pensioners may have a rest, as they do not need to seek additional employment.

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