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HOW TO EVALUATE LOCAL ECONOMIC DEVELOPMENT PROJECTS FROM A PEOPLE-CENTRED PERSPECTIVE? AN ANALYTICAL FRAMEWORK BASED ON THE CAPABILITY APPROACH

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Abstract

The present paper argues that the capability approach of Amartya Sen provides a meaningful contribution in understanding, evaluating and improving the well-being effects of local development projects. It focuses on what people can actually achieve, instead of what they have; and places equal attention to the process and the outcomes of the development process. The paper develops an analytical framework to evaluate local development projects, which is fine-tuned for middle and high income settings and allows comparison between cases. The framework is applied to three local development projects in a middle-sized city in Hungary. We found that the rich informational basis of the capability-based perspective helps to identify the places for intervention: the barriers, which prevent people from actually using the newly created means (the results of the development projects), and the valued options of citizens either unaddressed or neglected by the development projects.

Keywords**:** Capability approach, local development, analytical framework, opportunity aspect, process aspect

INTRODUCTION

Contemporary discussions in regional science about development are often organized around the idea of competitiveness (Capello, 2009). The ability of a locality to achieve and sustain a role in the international division of labour (in the territorial competition generated by globalization) seems to be a vital consideration (Begg, 1999; Cox, 1995; Lever, 1999). Accordingly, local economic development projects – like building an industrial park, a shopping mall or upgrading a touristic attraction – are dominantly evaluated from a competitiveness or growth-centred paradigm. Here the question is: to what extent the given project contributes to the competitiveness (employment or economic growth) of the region? This dominant approach is reflected – inter alia – by the World Bank's documents: "[t]he

purpose of local economic development is to build up the economic capacity of a local area to improve its economic future and the quality of life for all." (Swinburn, Goga, & Murphy, 2006).

While the rhetoric often highlights *quality of life* and *livable cities*, the task of the players in local economic development is still very much to operate the *urban growth machine* (Kirkpatrick & Smith, 2011). This approach is perceived to be value-free, assuming that while people may disagree about values, there is no real reason to disagree about growth or competitiveness (Bajmócy & Gébert, 2014). Furthermore, the competitiveness-based approach assumes a positive relationship between real income growth (or performance in global competition) and common good or well-being: whatever well-being is for individuals, it is definitely expanded by income growth.

The limitations of this competitiveness-based approach are easy to identify. First, the content of quality of life or well-being of local inhabitants remains vague. However, another sub-discipline of economics, the so-called welfare economics analyses these notions in detail. Second, the growth-centred view cannot be perceived as value-free since the desirability of increasing income is a value in itself (Hausman & McPherson, 1997). In addition, to make an evaluative judgement about the collective well-being effects of the development projects, interpersonal comparison must be carried out. For this purpose, a commitment towards an informational basis of comparison is inevitable, which is again a value choice (Bajmócy & Gébert, 2014). Third, the competitiveness-based approach is supported by the ideology that conflates urban growth with common good and well-being of local inhabitants. However, this relationship between real income and well-being is questioned from many perspectives (Easterlin, 1974; Stiglitz, Sen, & Fitoussi, 2009).

There are two kinds of arguments about the relationship between well-being and real-income. According to the first type, the positive relationship between real-income and well-being exists, but economic growth has externalities, unintended side-effects. Therefore, the costs of growth may outweigh its benefits, even on a city-wide level (Greenwood & Holt, 2010; Kirkpatrick & Smith, 2011). According to the other type of arguments, real-income in itself is just *means* to achieve well-being (Sen, 2005). What really matters are individually valued doings and beings, like reading, writing, going for a holiday, being educated or taking part in the life of the community, etc. Accordingly, the relationship between real-income and valuable doings and beings is not direct. There are several conversion factors that influence how people can use their means in order to achieve different functionings. For instance, a person may not be able to attend education in case she or he suffered from racial, religious or gender discrimination, even if she or he had the necessary income to pay for it

Therefore, the competitiveness-centred approach provides a view about local economic development projects that is too narrow, since these projects are embedded in complex social, economic and environmental situations. This is especially true in times when the global economy is shaken by fiscal crises (Greenwood & Holt, 2010; Kirkpatrick & Smith, 2011).

The present paper builds on the capability approach of Amartya Sen (1999) to provide an alternative (people-centred) approach to analyse and evaluate local economic development projects. As a consequence, it fits into an emerging stream of literature (Bajmócy & Gébert, 2014; Biggeri & Ferrannini, 2014b; Crocker, 2007), which attempts to approximate regional science and the capability approach. The paper attempts to contribute to the present discussions about local development in three ways. (1) First, it provides an evaluative framework of development initiatives that focuses on the expansion of people's real opportunities (capabilities). This way it assigns a substantive meaning to well-being. (2) On this basis, it develops a framework that gives equal attention to the process aspect of local development instead of just focusing on its outcomes. (3) Finally, it provides a capability approach based empirical evidence from a relatively high income region, contrary to the majority of capability-based local analyses. Carrying out analyses in high income setting on the basis of the capability approach (either regarding poverty or well-being) has just begun to appear in the literature (Rippin, 2016; Vizard & Speed, 2016). The majority of related empirical findings still derive from low income setting (many of these attempts will be mentioned later in the paper).

In the second section of the paper we provide a brief overview of the capability approach and argue that it is appropriate to be used as a basis of an evaluative framework. The third section describes the analytical framework we developed based on the capability approach. In the fourth section we apply this framework to evaluate three local economic development projects in Szeged, Hungary. Finally, we draw our conclusions.

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majority of capability-based local analyses. Carrying out analyses in high income setting on the basis of the capability approach (either regarding poverty or well-being) has just begun to appear in the literature (Rippin, 2016; Vizard & Speed, 2016). The majority of related empirical findings still derive from low income setting (many of these attempts will be mentioned later in the paper).

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The capability approach

The capability approach is a theory of well-being. It was initially developed by the Nobel-laureate Amartya Sen in the 1990s, who formulated strong critiques against mainstream economics. In contrast with the utilitarian, growth or competitiveness-centred views, the capability approach focuses on the real opportunities of people: what they can actually do and what they can actually be with the help of their means (Sen, 1999). These feasible options are called *capabilities*. In the capability approach, human development means the broadening of capabilities, i.e. creating more and more opportunities to choose from.

The central notion in Sen's approach is the term "*capability*", which refers to the actual freedom to achieve valuable doings and beings. For this purpose people need *means* (e.g. income, infrastructure). But the possession of means does not imply the freedom to achieve our goals. A number of *conversion factors* may influence how we can use our means. Conversion factors can be manifold, for instance, personal characteristics like age, gender; environmental characteristics, like pollution; and social behaviours, like racial discrimination (Sen, 1999).

So from the perspective of the capability approach, real income is just means to achieve valuable doings and beings but not and end in itself. For example, a disabled person cannot achieve the same opportunities as a healthy one with the same amount of wealth because the person with disability has to spend (probably a lot of) money on special medical devices or treatments. Therefore, less remains for a disabled person to achieve her own goals than for a healthy person (Sen, 1999).

In the capability approach, *agency* is a special capability it means the ability to further our own goals (Alkire, 2007). Sen emphasizes that people are agents of change and not just simple patients (recipients) of the development processes. As a consequence, in the capability approach, public participation and deliberation have special importance: they provide the

opportunity for people to act as agents of change and can help to determine the most valuable opportunities for the involved/affected community. However, it is apparent that people do not have equal possibilities to further their ends. Therefore the idea of empowerment (to make people capable of acting as agents) is central for the capability approach (Mayo, 2004).

The capability approach is a normative and value-laden approach. It means that it gives a substantive meaning to the notion of well-being. It is also committed to the value of choice. Capability is the freedom to choose something valuable (for instance the freedom to choose to be educated) and it is not the achievement itself (to be educated). Sen (1995) emphasizes that values need to be made explicit and be scrutinized through social deliberation. The capability approach is pluralistic in the sense that it takes into consideration diverse social values via social deliberation and realizes that people are of different characteristics.

The capability approach has had impacts on several fields of social sciences. It has been used to evaluate human development of countries or regions and development projects in low-income countries; to assess poverty; to analyse impact of technological change; to scrutinize the situation of disabled people; and to consider gender inequality and social norms (Alkire, 2007).

In the literature, there are several examples of analysing development projects in low-income countries in line with the capability approach (Biggeri & Ferrannini, 2014a; Cotula, 2008; Frediani, 2007; González, Aristizábal, & Díaz, 2008; Hartono, 2012; Hodgett, 2008; Kerstenetzky & Santos, 2009; Nieto & Munoz, 2012; Pellissery & Bergh, 2007; Schischka, Dalziel, & Saunders, 2008). These studies conclude that the analysed development projects in low-income countries usually follow some kind of "project-logic". The projects are often unsuccessful because they focus only on providing means (in most of the cases physical infrastructure). Decision-makers do not assess unintended side-effects, underestimate the complexity of social situations, do not take notice of hidden social relations, sometimes intensify social inequalities, and homogenize people. In contrast, the capability approach focuses on *how* people can use their means and what kind of values they have.

Analytical framework

There already are a number of analytical frameworks to evaluate local economic development projects on the basis of the capability approach (Biggeri & Ferrannini, 2014b; Frediani, 2007; Hartono, 2012). However, these frameworks are fine-tuned for analysing projects that provide basic opportunities (e.g. housing or sanitation) in low-income countries. In addition, these frameworks were not developed to serve as a basis for the comparison of different cases on a unified basis.

Figure 1 Analytical framework based on the capability approach

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              ┌─────────────────────────────┐
              │  Development as expansion of │
              │         capabilities         │
              └─────────────────────────────┘
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Opportunities
1) Available doings and beings
2) Means
3) Conversion factors
4) Opportunity-gap

Process

1) Values made explicit
2) Agency
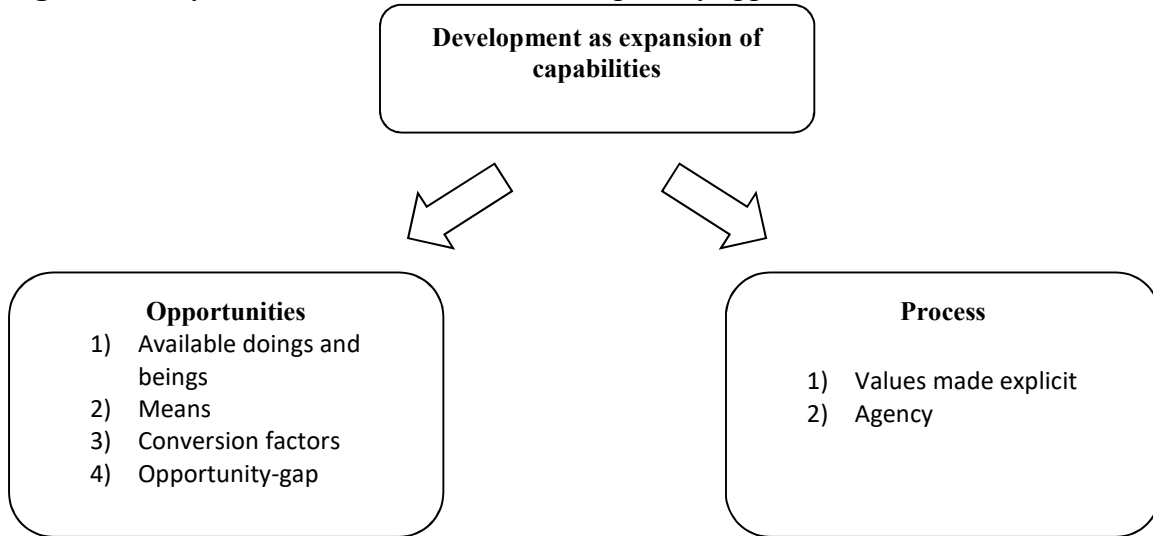
Source: own construction

The main goal of our framework is to evaluate local economic development projects *in middle or high income countries,* and in the same time to allow comparison with the previously documented case studies (Fig. 1.). The basis of the framework is the understanding of *development* as the *expansion of capabilities*. The two building blocks are based on Alkire's (2007) idea about the opportunity aspect and the process aspect of development. The *opportunity aspect* refers to the widening of the set of valuable choices for the local inhabitants. The *process aspect* highlights that the processes through which development is accomplished also matter, beside the "doings and beings" made available. Accordingly, the questions of "what" to develop must be supplemented by the questions of "who" and "how".

The first element of the opportunity aspect of our analytical framework reveals the valuable *doings and beings* made available by the development projects. It shows what stakeholders can actually do with their newly available means. For instance, solar power plants allow local inhabitants to use electric devices, watch television, or read at night (González, et al., 2008).

The capability approach is built on the distinction between possessing certain means and actually being able to use them. Although the capability approach focuses on the valuable doings and beings, the means made available by the development projects also require attention. The same set of means may make very different opportunities available depending on the context in which they are used.

Most the development projects are means-based. They focus on the provision of means instead of how people can actually use them (Frediani, Boni, & Gasper, 2014). The difference between a competitiveness-based and a capability-based evaluation becomes apparent here. Means are understood here as resources, which can be used to broaden the individual's capabilities. Means can be tangible (e.g. a building) or abstract (e.g. laws).

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The next element of the evaluative framework is the group of *conversion factors*. Conversion factors can be personal or external. They influence how individuals can use their means, how they can achieve valuable doings and beings (Sen, 1999). Individuals have the actual opportunity to achieve functionings, if (1) they have access to the necessary means *and* (2) the circumstances are adequate to use them. Thus, conversion factors are often barriers which prevent people from utilizing their means to pursue their own ends. One of the most important messages of the capability approach for decision makers is that it is necessary to identify and remove these conversion factors. This again highlights that according to the capability approach development demands more than only providing resources for communities.

The fourth element of the opportunity aspect of our analytical framework is the so-called *opportunity-gap*. Opportunity-gap is the set of choice options, which are unavailable for the community at the moment but they have good reasons to value them (Biggeri & Ferrannini, 2014a). The notion of opportunity-gap is relevant for the evaluative framework because it can reveal those capabilities that are valuable but missing. For example, a community may value recreation opportunities on the riverside but without the necessary infrastructure – roads, showers, benches, trash cans, toilettes – they cannot actually achieve them (or at least not at the required standard). In this case the task of decision-making is to realize the valuable functioning (to have recreation activities on the riverside), and make these opportunities available by identifying and breaking down the barriers.

The opportunity gap also highlights that the members of the community may not be equally able to achieve a given opportunity. For instance, if a public building is not accessible, then people with certain disabilities will have reduced possibilities to access the given public services.

The idea of the opportunity-gap also embraces those capabilities which are threatened due to the local development initiatives. Usually, development projects both create and destroy opportunities at the same time. Valuable but disappearing opportunities also need to be taken into consideration during the evaluation of local economic development.

The second building block of our framework is the *process aspect*. According to the capability approach, the process aspect is important because people are not simple recipients or patients of development but active agents who can act according to their reasons (Frediani, et al., 2014; Sen, 1999). On the one hand, people may assign value to the fact that they were able to actively participate. This way, taking part in the development process becomes a component of well-being. On the other hand, participation may help people to bring about outcomes that are more desirable for them (Sen, 1999).

According to Sen, the *values* of individuals must be *made explicit* and must be openly discussed (Sen, 1995). This has two reasons. First, none of the development interventions are value neutral, not even the economic growth-centred policy decisions (Bajmócy & Gébert, 2014; Hausman & McPherson, 1997). Therefore, the values must be made explicit and must be the subject of open public debates. Second, people's values often influence how they can use their available means. Accordingly, the success of development depends on the values of local inhabitants. For instance, in the case of the upgrading of a marketplace, the preferred infrastructure and programmes will highly depend on whether the market is understood to be a competitor of the shopping malls or a traditional community place.

The opportunity to further our own ends is called *agency*. It is one of the most important components of the capability approach. Therefore, a development process should aim at helping people to be able to pursue the common good, articulate their values, opinions and take an active part in the development process. As a consequence, not just the achieved functionings or the actual choice options (capabilities) matter, but also the process, through which the community achieved those capabilities.

In our evaluative framework, the process aspect consists of two elements: agency and the values made explicit. It is not easy to evaluate the extent of agency: the extent of freedom to influence the decisions about one's life. The literature suggests some approaches to tackle this problem, such as Arnstein's ladder (and its modified versions) about actual political participation (Arnstein, 1969; Pretty, 1995) or the distance from the power center (Maier, 2001). We decided to use Gaventa's (2006) power cube, which is based on the literature of power structures. In Gaventa's understanding, political influence means the "capacity to participate effectively in shaping the social limits that define what is possible" and power means "network of social boundaries that delimit fields of social action" (Gaventa, 2006, p. 26). These notions seem to be close to the idea of "freedom for agency", thus we believe it is appropriate to integrate the power cube into our analytical framework about the expansion of capabilities.

The power cube consists of three dimensions the spaces, forms and levels of power. Under *spaces of power* Gaventa (2006) understands those opportunities or channels through which citizens can act in order to influence decisions, discourses and relationships in their life. It is important to emphasize that the spaces of power are not fixed. They are dynamically changing instruments made by humans to use power.

There are three different kinds of spaces in the power cube: closed, invited and claimed spaces. A *closed space* is a space of decision-making, in which a closed group makes the most important decisions behind closed doors without involving any other actors into the process. For instance, a city council can be a closed space, if it does not invite any other stakeholders

into the decision-making process. Part of the civil society works in order to disrupt or open up these spaces and to ensure publicity and transparency. *Invited space* means that the main decision-making institution invites other actors, individuals or organizations into the process. Invited spaces usually have some kind of organized form, like a residential forum. *Claimed spaces* are those spaces of power that are claimed by less powerful groups of the society. It means that they act upon to gain space in decision-making. People with similar values and mind-sets but without power join forces to achieve a common goal. Those spaces can be manifold: from social movements, through founding non-governmental organisations (NGOs) to community spaces like a local pub, where people discuss certain issues.

These spaces are linked together and are dynamically changing. For instance, a local, bottom-up social movement can transform into a formal organisation (an NGO) and become an invited player in decision-making. Claimed spaces have significance, because these are the spaces through which new values, ideas or opinions can be channelled into decision-making.

The second dimension of the power cube is the *forms of power* (Gaventa, 2006). On the basis of its manifestations, it differentiates between visible, hidden and invisible forms. *Visible power* denotes the observable and defined form of power (e.g. formal rules, structures; authorities, institution and other official mechanism of decision-making). *Hidden power* means the capacity to influence the agenda of decision-making. Power is not just a capacity to make a decision in a case but to prevent the case from arising as a problem at all (Lukes, 1974). Generally, less influential groups are left out because of the mechanisms of hidden power. *Invisible power* refers to the capacity to determine the psychological or ideological boundaries of political participation and to influence the interpretations of problems and the norms of overall acceptance. Sometimes, serious problems are missing not just from the political agenda but also from the perceptions of the stakeholders. These channels affect how people think about their position in the world, what they believe to be acceptable. For example, it is a common phenomenon, that the local elite dominate the development projects in low-income countries (Frediani, 2010). Although they use the projects according to their own self-interest, for the local inhabitants this situation is the status quo, and they do not think that it could change or that they should speak out for their own interests.

The third dimension of the power cube is the *levels of power*. According to Gaventa (2006) the level can be local, national or global. In the literature, there are arguments for initiating political participation at local level but others claim that participating at the global level is inevitable because nowadays power is concentrated in the hands of global actors (Nussbaum, 2011). Nevertheless, in case of evaluating local development projects, the local level always plays a vital role.

The three dimensions of power draw attention to the different strategies or spaces where civil society can intervene and gain power in decision-making. Some of the NGOs work between visible and formal spaces; for example, they take part in residential forums or deliver official opinion about development plans. Other parts of the civil society focus on mobilizing people, developing collective action plans to overcome difficulties about hidden power and raise awareness for social problems. An action can be for example a photo-voice exhibition about the life-circumstances of local segregated groups. Other civil groups make efforts to approach invisible forms of power so that they emphasize social values like equality or religious tolerance.

The power cube is created by putting together the three dimensions. The individual components can be analysed one by one or together with the others. The categories within the dimensions are not strictly separated; on the contrary, they are part of an adaptive continuum. In our paper, we use the dimension of spaces to demonstrate our results but we also take into consideration the other two dimensions.

METHODOLOGY AND CASE DESCRIPTION

The objective of our empirical research is to evaluate local economic development projects from the aspect of the capability approach with the help of our analytical framework. So the focus of our research is to reveal the social, economic and environmental circumstances and to understand the link between them.

This pursuit called for a qualitative and inductive research design, but it incorporated abductive elements as well, because we attempted to understand specific explanations of concrete cases through the interpretations of the local actors, to find the best possible accounts of social phenomena (Blaikie, 2000; King, Keohane, & Verba, 1994).

We analysed three cases with the help of our people-centred evaluative framework: (1) the building of a shopping mall, (2) the building of a water park and spa, and (3) the rebuilding of a marketplace. All the three cases are located in Szeged, a middle-sized city in Hungary, being a regional centre with 161 000 inhabitants.

The shopping mall (called Árkád) was constructed between 2010 and 2013. It is now the biggest shopping mall of the region. The site, on which it was built, had served as premises for a hemp-spinning factory, a post office, an apartment building and a kindergarten. The shopping mall is owned by a private company.

The new water park and spa (called Napfényfürdő Aquapolis) is situated near the city centre at the riverside. Previously on the site, there had been an old thermal bath and swimming pool used for professional and amateur sporting. Now, the new water park and spa

is a complex of different wellness services connected to water. 20% of the spa is owned by a wellness hotel, which is connected to the spa; the other 80% is in the possession of the city. The spa was constructed between 2008 and 2014.

The rebuilt marketplace (called market on the Mars square) is the biggest marketplace of the city. The venue has been functioning as a market since the middle of the 20th century. It is near the city centre and is located next to a regional and local bus station. The renewal had been on the political agenda since the 1990's but it was realized only in the past few years. The reconstruction took place between 2004 and 2012.

The empirical research consists of two steps. First, local documents – press releases, reports, court orders, open letters and contracts – were analysed with the help of content analysis. It helped to identify the stakeholders of the projects. Second, we conducted semi-structured in-depth interviews with the stakeholders. We carried out so-called "traveller" interviews, where the structure of the conversation is strongly shaped by the interviewee, she is the one who introduces new topics; the interviewer only asks for more information in connection with topics that have already emerged (Brinkmann & Kvale, 2015). In the first phase of interviewing, we asked the stakeholders identified through the content analysis. Afterwards, we continued with snowball sampling.

Altogether 31 interviews were conducted for the three cases between 2013 October and 2014 April. Since Szeged is a middle-sized city, all the interviewees were affected by all of the three projects, at least as users. Among the interviewees, there were 9 civic activist, 4 simple users, 10 local politicians, and 8 experts. Certainly, these categories refer to the most relevant role of the interviewees; the boundaries are not always sharp. For instance, a civic activist can also be a user, or a local politician can take part in bottom-up initiatives. Experts are locals who are connected to the development project as a consequence of their expertise, like water management engineers, architects, economists working for local public institutions and managers of the project. Among the interviewees, there were 29 men and 2 women.

RESULTS

We demonstrate the results of the three case studies jointly, in accordance with the analytical framework and we support the results with quotes from interviews. We numbered our interviews from V1 to V31. Besides numbers, we also indicate in the text the most important role of the interviewee. We first focus on the opportunity aspect, then evaluate the process aspect of the projects.

The analysed projects created the following means: the shopping mall (and reconstructed streets nearby), the water park and spa complex and the marketplace. The *opportunity aspect* of the framework showed that all three projects made some kind of opportunities available. The shopping mall allowed the opportunity to go shopping in modern and comfortable environment, to park the car near the city centre and to use it as a community space.

"An opinion showed up, that this shopping mall wasn't necessary for the city. But this is probably not true because there was a market demand. People are looking for a certain service level and there was a demand for developing the infrastructure too." [V28, politician]

The water park and spa brought about the capability of swimming and other recreation activities.

"The spa complex is valuable in itself, the fact that there is this opportunity in town is valuable. Especially for families with kids. Slides, slides and slides are the three most important advantages of the complex." [V19, user]

The renewed marketplace allowed people to do the shopping in modern environment and to use a special community space and get connected with sellers.

"Lot of people said that the marketplace became prettier. This is one aspect, the aesthetic one." [V8, civil activist]

In case of the shopping mall the opportunity aspect also highlighted that retailing outside of the mall (in the city centre) became much harder. Local inhabitants with an average income, especially pensioners stayed out of using the mall. Interviewees missed the opportunity to preserve the features of the old hemp-spinning factory, which was totally destroyed during the construction. Some of the interviewees also missed the opportunity of real participation in the planning process.

"The shopping mall destroyed the city centre. The retailers in city centre should have been asked about this." [V23, civil activist]

"Before they signed the conservation agreement on the old hemp-spinning factory, they [the investors] already had demolished the building. The chief architect – or whoever – should have questioned this. But the capitalist ambition was operating." [V21, civil activist]

In the case of the water park and spa, the neighbouring campsite on the riverside became unusable because the wells of the old campside were attached to the new spa and the camping remained practically without water. Some of the interviewees argued that it would have been much more useful to renovate the old campsite than to build a new and expensive water park and spa, because the camping, which also has swimming pools, could provide cheap recreation services for local inhabitants.

"There was some kind of spa-building »frenzy« in Hungary, that is why a lot of spas were built. This was the trend for a while [...] Three of the five biggest water parks of Europe are in Hungary." [V19, user]

"The campsite was crushed by the new spa because the remaining territory cannot be used for camping, it would be uneconomical." [V22, politician]

According to some of the interviewees, local inhabitants complained about the scarcity of swimming pools for sports in town. Hence, the city needed a swimming pool for sport instead of an expensive water park and spa complex. In other words, while the opportunities of having a thermal bath or enjoying the slides have widened, the opportunity to pursue swimming as sport has shrunken.

"The public functions disappeared from the scope of services [of the spa], there are completely different users now. It does not have the conventional swimming pool function anymore; the goal is to attract exclusive guests. I don't know, where the locals can go if they just want to swim." [V8, politician, civil activist]

Interviewees missed the unified cityscape, the traditions connected to the river and the partnership in the process.

"They [the decision-makers] didn't listen to the professional arguments during the process. It was a make-believe consultation, they didn't take it seriously." [V17, expert]

In the case of the marketplace, part of the local society was crowded out of the new marketplace, especially pensioners and people with low-income. Local inhabitants missed the real sense of a marketplace selling "lángos" (a Hungarian local speciality similar to fried dough) as well as old local retailers and producers.

"They took away that feature of the old marketplace, where old pensioners could put out some eggs, parsley and a chicken for sale; they sell everything and out of the same money do the shopping there." [V7, user]

Some of the interviewees stated that the infrastructure does not meet the requirement of a well-functioning marketplace and that the retailers of the old market were left out from the development project.

"The practice of the city council is limited to the minimum mandatory [participatory] processes prescribed by the law. It does not meet the standards of European Union or the norms of the quoted development policy documents." [V8, politician civil activist]

Conversion factors were very similar in all of the cases. Low income of local inhabitants, lack of necessary rules, lack of unified cityscape, inadequate handling of common wealth.

"They should figure out what is the function of the city centre. [...] The same is true for the riverside. There is no unified conception about it. They pretend liberalism, but in fact, it is just poorly conceived." [V13, expert]

In the case of the marketplace the set of conversion factors was larger. On top of low income and inadequate handling of common wealth, small room, rules for primary producers, proximity of the bus station and the shopping mall, knowledge about the necessary

regulations and the lack of transparency during planning could also be identified as conversion factors. The results of the opportunity aspect are summarized in Table 1.

> *"One of the biggest problems is that the primary producers are not forced into competition. How does it look like, that somebody is allowed to vend for free [without having to pay rental] in the market while others are not? This is exactly the opposite of the concept of market." [V10, expert]*

> *"The plans about the market changed almost every month." [V1, civil activist]*

> *"It cannot be expected from a simple merchant to run around with the Civil Code under her arm." [V6, civil activist]*

Table 1 Opportunity aspect of case studies

	Shopping mall	**Water park and spa**	**Marketplace**
Means	Building of the shopping mall, Streets beside the shopping mall	Water park and spa complex	Market halls, Marketplace, Parking lot
Available doings and beings	Shopping in a modern, comfortable shopping mall, Parking near the city centre, Using community space.	Swimming, Using slides.	Shopping and buying food, Enjoying community space.
Opportunity-gap	Retailing in city centre, Inhabitants with average income are excluded, Preserving old industrial buildings, Breathing clean air, Participating in the process.	Using the riverside near the spa for recreation, Swimming as a sport, Having unified cityscape, Participation in the process.	Inhabitants with low income are excluded, Having the „real sense of a marketplace", Using the building in an appropriate way.
Conversion factors	Income, Lack of regulations and a unified concept of the cityscape.	Income, Lack of regulations and a unified concept of the cityscape.	Income, Regulations about primary producers, Bus station, Being familiar with regulations, Complicated development process

Source: own compilation

The second building block of the analytical framework is the *process aspect*. The first element of the process aspect, the *values* are different in each case. Conflict between the different values was most conspicuous in the case of the shopping mall. Here economic efficiency conflicted with the value of preserving an industrial monument (the building of the old hemp-spinning factory).

> *"Is there a profitable function of an old building at all? Should it be a university or a library? It could have been a community function, but if everything has community functions, then it will not be sustainable in the middle- or longrun. For me, it was an acceptable compromise." [V28, politician]*

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Furthermore, there were different opinions about taking responsibility for certain actors' economic situation. According to an opinion, it is the task of the decision-makers to support the retailers in the city centre in the market competition. But another opinion emphasised that it is the retailers' responsibility to adapt to the new circumstances brought about by the shopping mall.

> "In my opinion, they killed the retailers in the city centre. Only active support could put them back into position." [V23, civil activist]

> "They [the retailers in the city centre] need to adapt. If they sold »gadget« until now, then they should sell »widget« from now on." [V21, civil activist]

In the case of the water park and spa, values about common wealth were decisive.

> "The whole project masks the sale of a public property that is situated near the city centre, which is one of the most valuable assets of the town, without competition; thus bypassing the regulation of property management." [V9, politician, civil activist]

Different values about the role of the marketplace played an important role in the decision-making about the infrastructure. On the one hand, a market is similar to a shopping mall: you can buy all kinds of goods from vegetables to bedroom furniture. On the other hand, a market is a special community space, where you can buy fresh groceries usually from the producers themselves, you can have a chat with friends and you can have a nice lunch of "lángos" (fried dough) or of sausages.

> "We have to compete with multinational companies. [...] As a matter of fact, they [the buyers] just have to adapt to the fact that there are not just groceries here but clothing, furniture and bathroom apparel as well." [V2, expert]

> "It would really matter, if the attitude of the management changed, if it was a high-standard producers' market, also providing an opportunity for a leisure activity: you can go shopping and also have "kürtős kalács" [a special Hungarian sweet bread]. But here, it is not allowed to roast the meat on a barbecue tray, though it would attract customers." [V7, user]

The most important decisions about the development projects were made in closed spaces. The most influential actors were the city council, the investors and other public bodies such as the National Development Agency or the National Public Health and Medical Officer Service. The hidden forms of decisions, i.e. those players, who can shape the agenda of decision-making, also had an influence in all of the cases. This result is supported by the fact that there were hardly any debates during city council meetings, the members of the city councils often referred to opinions of other actors, especially experts. Because of these hidden forms of power certain members of the city council looked for additional channels – like bottom up initiatives – to enforce their interests and express their opinions.

> "The city council, the public procurement procedure and the local regulations all affected the project. Commissions [of the city council] as well. We had to ram the costs down the throat of the city council." [V3, expert]

Activities of citizens primarily took place in claimed spaces. The communication with the stakeholders of the projects was limited to unidirectional forms (e.g. providing information at residential forums or info texts on websites). And in most of the cases, the provided set of information was not comprehensive.

"We cannot really talk with the management of the marketplace; they have an excuse for everything. Once, we got together with the Agricultural Association and 20-25 producers but to no avail." [V7, civil activist]

Civic activists claimed space for themselves through press conferences, by collecting signatures, or launching petitions. For instance, civic cooperation was set up to save the building of the old hemp-spinning factory; a petition was launched by the city centre retailers against the shopping mall, and civic activists collected signatures for reconsidering the plans of the marketplace. The results of the process aspect are summarized in Table 2.

Table 2 Process aspect of case studies

		Shopping mall	Water park and spa	Marketplace
Agency	**Closed spaces**	City council, Investors	City council, Investors	City council, Head of the project-company, Regional authorities
	Invited spaces	Architects, Designers, Local media	Architects, Designers, Real estate experts, Water management experts	Staff of the local government, Architects, designers, Merchants
	Claimed spaces	Civil collaboration for the hemp-spinning factory building, Petition of the retailers in city centre.	Collection of signatures for petitions by a local NGO, Official prosecution, NGO's protests and press conferences.	Civil suits of the owners of kiosks and stalls, Collection of signatures for a petition by a local NGO.
Values made explicit		Efficiency and income growth versus preserving cultural heritage, Taking responsibility for those falling behind in the market	Income generation versus providing cheap services to local inhabitants	Importance of primary producers versus importance of retailers

Source: own compilation

On the whole, we found two very different perspectives about participation. Actors with access to closed spaces argued that participation does not have too much sense, due to the lack of demand for it; and due to the fact that people do not have enough competence or they

cannot agree on anything at all. On the other side, stakeholders who mainly operated in claimed spaces argued that they were left out of the processes and their efforts seemed to be pointless for themselves.

Another general phenomenon was that public participation took place too late. Civil activists drew attention to opportunity-gaps in connection with the analysed development projects, but usually their reactions were belated. By the time civil activist managed to claim spaces for themselves, the most important decisions had already been made in the closed spaces.

CONCLUSIONS

The present paper argues that the capability approach provides a meaningful alternative to the dominating competitiveness or growth-centred views for understanding and evaluating local development projects. We argue that relying on the capability approach provides significant advantages: (1) it gives a substantive meaning to well-being (2) and utilizes an informational basis for the analyses that is wider than the usually considered set of information, and therefore more adequate to assess the effects of the development projects on well-being. The capability approach emphasizes the actual freedom of local inhabitants to achieve doings and beings, which people have reasons to value. We elaborated an analytical framework in order to evaluate local economic development projects and applied this framework for three cases in Szeged, Hungary.

The paper contributes to an emerging stream of literature that attempts to approximate regional science with the capability approach literature, in order to provide a deeper understanding of the link between local development and the well-being of the citizens. On this basis, it developes a framework that gives equal attention to the process aspect of local development instead of just focusing on its outcomes.

During the empirical analysis, the capability approach based perspective sheds light on a number of factors that may hinder the capacity of development projects to increase the well-being of citizens. It makes clear that providing means (e.g. a new marketplace, a water park or a shopping mall) for the citizens does not imply that they will actually be able to use these means to achieve valuable doings and beings.

The analysed cases reflect the logic of the "urban growth machine": their most important focus was how to generate income in the city and how to establish physical infrastructure and

the necessary business climate for a growing economy. On the whole, they treated stakeholders as "patients", as passive recipients of development.

From the capability perspective it becomes clear, that these projects had complex impacts on the city: they made various opportunities available, but also destroyed some important ones. The evaluative framework identifies the conversion factors, which influenced the use of the realized infrastructure. These are typically the level of income, the lack of unified cityscape and indistinct decision-making mechanisms. The most important decisions were made in closed spaces, where hidden forms of power had special influence. Civil activism in connection with the projects took place in claimed spaces.

Thus the rich informational basis of the capability-based perspective helps to identify the places for intervention, namely the conversion factors, the barriers, which prevent people from actually using the given means (the results of the development projects). It also reveals the lacking opportunities of local inhabitants. Therefore, the additional set of information taken on board by the capability approach (compared to the competitiveness-centred view) seems to be relevant and necessary for planning and evaluating local development initiatives.

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TOURISM AND DIVERSITY

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Abstract

Cultural attractions are often linked to unique features of the host population, and are often related to a national minority or a segment of the population that preserved their traditions. Ethnically or religiously varied countries may often have such unique attractions, that seem exotic and appealing to tourists. Multiculturality is often an attraction for tourism, offering generally an authentic experience for visitors of different backgrounds. Besides, an ethnically or linguistically varied population can also provide a linguisticaly more skilful labour force, that is more sensitive to the needs of visitors coming from different cultures, and thus create a more comfortable environment for them.

The issue of multicultural societies has recently become a sensitive issue, due to global mass migration. There is a belief that ethnic or cultural fractionalisation would necessarily bring about difficulties of understanding and cooperation, leading to lower economic performance, less stable economic and social processes and, ultimately a slowdown of economic output. The resulting conflicts, difficulties may frighten away tourists and lead to the vulnerability of the tourism sector in very heterogeneous countries. On the other hand, ethnic fractionalisation and the resulting cultural diversity can be welcome as valuable resources as the varied pool of knowledge, traditions, skills, customs, that can enhance innovative ideas and creativity.

In the present paper evidence is looked for the relationship between ethnic, linguistic and religious diversity and tourism performance in a cross-country statistical analysis of 155 countries of the world. Statistical analysis of 155 countries show, that although there is a tendency of lower tourism performance with greated fractionalisation of the society, the most popular and successful tourism destinations are often multicultural and multiethnic societies.

Keywords: ethnic diversity, cultural diversity, religious diversity, language diversity, tourism arrivals, tourism receipts, TTCI

INTRODUCTION - PROBLEM OUTLINE

Tourism attractions are various, including visiting friends and relatives, health, leisure and entertainment, love of nature, and culture. Cultural tourism, as a major tourism motivation, includes visits to tangible and intangible cultural resources, with the intention to gather new information and experiences to satisfy the visitors' cultural needs. These cultural needs can include the solidification of one's own cultural identity, by observing the exotic "other". Cultural traditions are often linked to unique features of the host population, and are often related to a national minority or a segment of the population who preserve their traditions. Ethnically varied countries may often have such unique attractions, e.g. the folklores of native Indians in the US or in South America, aborigines in Australia, the Schvabish minority in

Hungary, the gipsies in many European countries, the Chinatowns in European and American metropolises. The ethnic folklore includes crafts, celebrations, costumes, food, and many other items that seem exotic and appealing to tourists.

Another such speciality may be the various religious traditions – e.g. the Jewish festivals, music, art, food, Muslim buildings and crafts objects, as carpets, textiles, calligraphy, silvers.

Language can be another aspect of cultural attraction. The French speaking communities in Canada attract visitors from France, and also provide an opportunity for non-French visitors to learn French during their holidays. The German speaking minorities in Europe or in Latin-America can contribute to tourism by providing easily accessible language linkages to tourists coming from the German speaking parts of the world. The same is true for Spanish, Arabic, Chinese, and several other languages.

Multiculturality is often an attraction for tourism, offering generally an authentic experience for visitors of different backgrounds. Besides, an ethnically or linguistically varied population can also provide a linguisticaly more skilful labour force, that is more sensitive to the needs of visitors coming from different cultures, and create a more comfortable environment for them.

The issue of multicultural societies has recently become a sensitive issue. Global mass migration to the more affluent countries of the world poses the problem of ethnically increasingly different populations in these countries. The resulting ethnic diversity may go together with cultural fractionalisation, if the new, ethnically different immigrant population will not, or cannot become integrated, keeping strictly to their traditional home culture, customs and marrying within their own subgroup. In this case ethnic differences may survive long after the arrival of the immigrants in the host country, and cultural diversification is maintained in every level of life.

There is a belief that ethnic or cultural fractionalisation would necessarily bring about difficulties of understanding and cooperation, lower economic performance, less stable economic and social processes and, ultimately a slowdown of economic output. The resulting conflicts, difficulties may frighten away tourists and lead to lower performance of the tourism sector in very heterogeneous countries. On the other hand, ethnic fractionalisation and the resulting cultural diversity can be welcome as a pool of valuable resources comprising knowledge, traditions, skills, customs, that can initiate innovative ideas and creativity.

In the present paper evidence is looked for the relationship between ethnic, linguistic and religious diversity and tourism performance in a cross-country statistical analysis of 155 countries of the world. The main objective is to find patterns of diversity that distinguish

countries that are successful actors in the international tourism scene from those, who are less prosperous in this respect.

LITERATURE REVIEW

Diversity and economic performance

Human resources play a crucial part in the performance of the services sectors, including tourism. The quality of human resources is a key component service quality. Educational attainment, innovative capacity, talent, creativity all contribute to better services and higher economic performance. Generally, people in richer countries have better access to educational resource, and are more educated on average (UNDP, 2010).

Access to education is a major factor in development, but there are several limitations that influence the way how people can access activities, services and functions that are important for them. A person may not be able to attend education – even if she or he had the necessary income to pay for it – in case of racial, religious or gender discrimination. Ethnic and religious tolerance are important social values and are often related to the preservation of cultural heritage (Gébert, Bajmóczy & Málovics, 2017).

The structure of the society, including any types of inequalities – gender, race, religion, social situation – is a determining factor in developing the quality of human resources, and therefore in contributing to the output and income of firms, or of national economies (Barnett & Kincaid, 1983; Burger-Menzel & Syring, 2013; Adler & Gundersen, 2008; Vollmer & Wolf, 2015; Florida, 2005). However, creativity, talent, and innovation often come from heterogeneous, diverse soceties. In culturally mixed groups of the population the level of creativity may be higher due to the different backgrounds, experiences, attitudes and behavioural traditions, and creativity is a key resource of contemporary economies (Yencken, 1988; Landry, 2000; Florida, 2005; Ságvári & Dessewffy, 2006). Therefore, a multicultural society, if well managed, can be a valuable asset, but if people of different backgrounds are unwilling or unable to communicate, the result may be lack of cooperation and slow growth.

The effects of ethnic fragmentation across countries was studied by Easterly and Levine (1997) who stated that, ceteris paribus, more ethnically fragmented countries grow less, as is revealed by the poor economic performance of Africa. Similarly, Collier and Gunning (1999) also emphasised the role of ethno–linguistic fractionalization in the lack of social capital, productive public goods, and other growth enhancing policies in Africa.

Fractionalisation has negative effects on growth and productivity mainly in nondemocratic regimes (Collier, 2000), ethnic fragmentation is negatively correlated with the quality of

infrastructure, literacy, and school attainment, and they are positively correlated with infant mortality (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999; Alesina et al., 2003). Alesina and LaFerrara (2005), in analysing nearly 100 countries for ethnic and linguistic fragmentation, found that fragmentation may have a positive effect on the growth of per capita incomes in developed and wealthy societies, but generally, increasing fragmentation correlates with lower growth of GDP/capita.

Although most of the relevant literature agrees on the negative effects of ethnic fractionalisation on various aspects of development, there are some opposite opinions and results, as is shown in studies about the USA states and cities (Sparber, 2007; Putnam,2007), supporting the view that ethnic diversity, on balance, is an important social asset.

VanAlstine, Cox and Roden (2013) analysed the relationship of linguistic, ethnic and religious fragmentation to the Human Development Index (HDI) for 2003, with indicators of economic freedom, income inequalities, and population and area of the analysed countries as control variables. Their findings showed no significant relationship between the level of development and ethno-linguistic fragmentation, but a significant negative impact of religious fragmentation was established. However, when countries were segmented according to their level of development, a significant positive impact of religious fragmentation was found in the highest income quartile. Alesina- Harnoss and Rapoport (2016a) established a negative impact of ethnic fractionalisation on development, by assessing the relationship between the proportion of foreign-born population and the per capita GDP, segmenting the population by the level of education, and using population and index of democracy as control variables. Alesina, Michalopoulos and Papaioannou (2016b) found that the per capita real GDP depends most on ethnic fractionalisation when income inequalities are high, while the impact of the historical past (type of colonisation, or state foundation, etc.) was not significant on income levels.

Diversity is not always detrimental for development, and ethnic homogeneity is not a requirement for high incomes and development indicators, and the best condition for development is often a medium-level level diversity (Bacsi, 2017a). In a cross-country study of 155 countries a statistically valid negative relationship was established between high ethnic diversity and development, measured either by HDI or by per capita GNI for 2014 and 2015, but no such relationship was found for countries with lower values of ethnic fractionalisation, i.e. for two thirds of the countries analysed. Therefore multiethnicity and variety can often be a beneficial factor for development, on the global level. A more detailed analysis about the joint relationship between cultural, ethnic, linguistic and religious diversity and the level of development provided quantitative evidence for the fact, that while linguistic, ethnic and

cultural fragmentation has a slight negative effect on the level of development, religious fragmentation may be beneficial to GNI or HDI (Bacsi, 2017b).

Measuring Diversity

Diversity can be measured in many ways, but one of the most popular formulas is the adaptation of the population diversity index (see Steele, 2008 for details), applied by Greenberg (1956) to measure linguistic fractionalisation. Assuming, that there are n segments of the population, the formula for the Diversity Index is DI = 1- Σs_i^2 (i=1..n), where s_i is the proportion of the population belonging to group i of the society. Thus the index measures the probability of two randomly selected individuals belonging to different groups. If there is only one such group (i.e. all the population belongs to the same ethno-linguistic group – total homogeneity) the index has the value of 0, while if each individual belongs to a different group, then the index is equal to 1. The formula is often used for measuring ethnic, linguistic and religious fractionalisation, too.

It is not easy to determine the exact proportions of the various groups in a society. One of the most widely used database is by Alesina and LaFerrara (2005), containing ethnic and linguistic information collected from the 2001 edition of the Encyclopedia Britannica, and the CIA World Factbook. In their study the ethnic and linguistic fractionalisation indices were compared to GDP per capita (on purchasing parity base) data published by the World Bankfor the years 1960-2000. A weak negative correlation was found between the annual growth rate of GDP per capita and the measure of fractionalisation. Similar results were found by Fearon (2003), who assessed the ethnic and cultural diversies for 160 countries of the world, applying ethnic and linguistic differences and similarities as the basis of cultural diversity.

A linguistic fractionalisation index is regularly published for most countries of the world by Ethnologue (2016), using the Greenberg- formula. Several studies analysed the relationship between linguistic diversity and development, and usually a negative relationship has been found. As Nisnevich (2013) demonstrated, there is a weak negative correlation ($\rho = -0.247$) between the annual growth of per capita GDP and the value of the language diversity index, but while there are many countries both very poor and highly linguistically diverse, 7 of the 9 wealhiest countries all have medium to high LDI values suggesting that some level of linguistic diversity is economically useful. Harmon-Loh (2010) gives a detailed overview of the trends of language diversity worldwide, presenting continent-wide series and patterns, and discussion on many methodological questions.

Sociocultural diversity and tourism: benefits or hindrances

Culture, together with tourism, is a growing sector of the economy. International tourism enhances understanding between nations and peoples, or can generate conflicts due to cultural misunderstandings.

Cultural and ethnic tourism have been showing an increasing trend in world tourism. The main attractions of cultural tourism are built and physical objects (buildings, objects of arts), values revealed in everyday lifestyle (customs, food, drinks, celebrations), and events and festivals. Heritage tourism builds on historical, archeological, architectural and religious sites, including rural architecture, battlefields, historic graveyards, etc. Ethnic tourism has two main directions: one is motivated by the feeling of homesickness and nostalgia towards one's place of birth, the desire to find one's own roots. The other is to explore and understand a strange, special, exotic culture, either in distant lands or within one's own country, visiting a community of an ethnic minority, and experiencing an authentic culture (Csapó & Matesz , 2007).

Culture can be a tourist attraction in its many forms including high culture, popular culture and, increasingly, ethnic culture, as is seen in the examples of Chinatowns, Little Tokyos, Thai Towns throughout the world (Lin, 2008).

The cultural activities are increasingly concentrating in ethnically diverse neighbourhoods. As the case of Harlem, USA shows, tourism-based development can be a positive driver for economically backward communities. Harlem, as a tourist destination started to emerge in the 1980s based on the attractions of Black America, with its culture, music, entertainment traditions. Although at first the increasing number of visitors did not result in increased tourism spending, by now multiculturalism has become an economically attractive option, together with the saturation of the traditional tourism markets. Cultural tourism has gone beyond the visits to museums, theatres and high art events, and has started to include anthropological concern, with ethnicity and heritage being in the centre of this perception. A nice example of this shift is the 'I love New York' campaign in 2001, with its theme of diversity, and cultural connections to African-American, European, Asian, Hispanic, Native-American ethnicities (Hoffmann, 2003).

Cultural, ethnic and heritage tourism in the Asia-Pacific Region has grown dramatically since the 1980s. Ethnic minority culture – including material and performed culture and traditions - has become a major focus of tourism not only in the developed world, but in China, as well (Doorne, Ateljevic, & Bai, 2003). The system of global production and consumption has led to the homogenisation of cultures, and this generated a need to actively search for „differentness" by way of tourism (Sharpley, 1996).

Ethnic attributes can be considered as an asset, and tourism can promote its restoration, preservation and fictional recreation (McCannell, 1992). Looking at the history of ethnicity an idea of the „us/they opposition" is prevalent as well as the double approaches of bio-genetic race and socio-genetic culture. Ethnicity in the 20th century most often focused on the bio-genetic physical traits, as inherited features, distinguishing them from the cultural traits, which are of learned character.

Ethnic tourism and heritage tourism are closely linked, but while ethnic tourism points out differences of the host and the tourist community, heritage tourism focuses on one's own past (Blum, 2007). The experience of ethnic theme parks show, that tourists often view ethnic minorities as backward and primitive. The theoretical foundations of ethnic tourism are presented, illustrated by some good examples from the Far-East (Nate-Chei, 2009).

Ethnic diversity also contributes to the richness in religious architecture- cathedrals, mosques, temples -, as is illustrated by the example of Sydney, Australia (Collins & Kunz, 2007). However, although Sydney is often referred to as „the world in one city", the promotion of the metropolis as a tourism destination has rarely built on its diversity.

Immigrant communities have often greatly contributed to the cultural, artistic and economic stability of a host community (Landry & Bianchini, 1995: p.28). Examples from the UK and Canada show that in transnational communities created by immigration, immigrants can often be viewed not only as passive recipients of welfare support but as active agents of regeneration of the economy (Shaw, 2007). This is illustrated by the success of Asian restaurants, the cultural festivals that celebrate the food, drinks, music, craftswork, of Pakistani, Indian, Caribbean, and other Afro-American traditions (Urry, 1990: p.44).

Although cultural diversity as a tourist attraction is a well accepted concept, relatively few studies have dealt with the empirical analysis of tourism and diversity interactions. One such example is the study by Das and DiRienzo (2009), on the relationship between the Travel and Tourism Competitiveness Index and ethnic fractionalisation. The Travel and Tourism Competitiveness Index computed by the World Economic Forum is an important information about the current performance and capacity of a country to be successful in tourism. The value of this index has been tested in a cross – country analysis of 127 countries to see, whether it has any relationship to ethnic or cultural diversity (Das & DiRienzo, 2009). Findings showed, that there is a significant negative relationship between ethnic diversity as of 1985-2001 and the logarithm of TTCI for 2009, when relationship was controlled for economic freedom and level of democracy. However, the study revealed, that the interaction of ethnic diversity and per capita level of GDP is also significant. This means that higher incomes can mitigate the negative impact of higher ethnic diversity on tourism

competitiveness. This is not surprising, considering the fact, that tourism competitiveness is closely related to the quality of the built and natural environment, transport facilities, general infrastructure, health care institutions, and many other factors which depend on nation-wide investments. These investments naturally depend on the level of national income, on the one hand, and on the general support of the society on such nation-wide investments. In a more fractionalised society this support is more difficult to achieve.

A country's religious affiliation is also important in destination choice for international tourism. A cross-country study of 164 countries (Fourie, Rossello, & Santana Gallego, 2015), for the period 1995-2010, provided evidence that religious similarity have significant explanatory power in global tourism, and the presence of common religious minorities in the country has a positive impact on tourism flows. However, religious similarity was found to have a stronger positive effect. Australian tourists' intention to visit a particular country was found to be negatively correlated to the cultural or linguistic distance between the host and the home countries (Siew, Lee, and Soutar, 2007), even if adjusted for georgraphic distance.

Empirical research has revealed, that cultural and religious similarity is more beneficial for tourism performance, than multiculturality. The present paper attemtps to address this issue by statistical analyses of tourism performance and diversity data.

METHODOLOGY AND DATA

General description of methodology and data

The present paper uses demographic data and tourism indicators of 155 countries of the world to analyse possible relationships between tourism performance and ethnic, linguistic or religious fractionalisation. The number of countries involved were determined by data availability needed for the analysis.

For describing the ethnic and religious fragmentation of the studied countries the datasets of earlier research were taken: ethnic fragmentation indices for 2001 by Alesina and La Ferrara (2005), and by Fearon (2003) for 2001 or 2003. Linguistic diversity indices were available from Ethnologue (2016). Religious fractionalisation indices were used for 2001 by Alesina and LaFerrara (2005), and newer index was computed according to Greenberg's methodology for the present study based on the data published by the Pew Research Centre for the year 2010 (Pew Research Centre, 2012). For tourism data the World Bank database for the years 2014 and 2015, and the publications of the World Economic Forum (WEF, 2017) about the components of the Travel and Tourism Competitiveness Index (TTCI) were used for the years 2013, 2015 and 2017. Data on the population and GNI were downloaded

from the United Nations Department of Economic and Social Affairs. National GNI data for 2014 and 2015 were used as published by the World Economic Forum (WEF, 2017). Finally, data on the year of independence were collected from the CIA Worl Factbook (CIA, 2017).

It has to be mentioned that the analyses were carried out for the years 2014 and 2015 for the indicators of tourism performance, while the ethnic and religious fractionalisation indices are much older. However, these social traits do not show rapid substantial changes, and their general character tends to be nearly the same for year by year. Therefore the results of the analysis can identify relationships of tourism performance and fractionalisation reflecting long-term tendencies which may only slightly change within the time span of a couple of years.

Statistical tests and graphical assessments were done by MS-EXCEL and by SPSS. The methods used were simple descriptive statistics, correlation between input, control and output variables, and regression analysis for input, control and output variables. Assessment of distributions and frequencies, as well as classification of countries into categories were also made by input and output variables. Details of the techniques will be presented in the Results section.

Summary list of the data and variables were used in the analysis

Diversity measures – Input indicators:
- Cultural Diversity Index (CDI) – by Fearon (2003);
- Ethnic Fragmentation Index (EFIA) – by Alesina and La Ferrara (2005);
- Religious Fragmentation Index (RFA) – by Alesina and La Ferrara (2005);
- Religious Fragmentation Index (RFIPew) – based on the data by Pew Research Centre (2012;
- Language Diversity Index (LDI) – by Ethnologue (2016)

Control variables:
- The year when the country became an independent state (IND YEAR) – by CIA World Factbook (2017) , and its categorical variable (IND) as: IND =1: before 1900; IND=2: between 1901-1945; IND=3: between 1946-1989, IND=4: in 1990 or after) – CIA World Factbook (2017)
- Real GNI per capita for 2014 – WEF (2015)

- Population of the country as % of total world population (POP%) – by UN DESA (2017).

Data on Tourism performance - Output indicators:

All the following data are derived from the database of the World Economic Forum (WEF, 2015, 2017)

- *Data describing the importance of the country in the international tourism market:*
    - International Arrivals as % of total international arrivals of the world (Arriv%W)– 2014, 2015
    - International Tourism Receipts as % of total international receipts of the world (Receipts%W) – 2014, 2015
    - Travel and Tourism Competitiveness Index (TTCI) - 2015, 2017 (WEF, 2015, 2017)
- *Derived indicators for comparing countries according to their role in world tourism:*
    Using the Population of country as % of the world (Pop%), and the GNI of the country as % of total world GNI (GNI%) for 2014 and 2015 two differences were computed:
    - The difference of the country share in international tourism arrivals of the world and its share in world population: DiffArriv= Arriv%W - Pop%; for 2014, 2015
    - The difference of the country share in international tourism receipts of the world and its share in world total GNI: DiffRec= Receipts%W - GNI%; for 2014, 2015

ANALYSIS

The purpose of the analysis presented in the paper is to examine the countries of the world regarding their performance in tourism, and find out if their performance is related in any way (positive or negative) to the ethnic, linguistic or religious structure of their society.

The analysis uses data on the actual tourism performance of the countries analysed, meausing it on the one hand, as the percentage share of the country in the overall performance of world tourism – more precisely, in the total number of international arrivals in the world, and in the total international tourism receipts generated in the world. The other aspect of tourism performance is the importance of tourism in the national economies - which is measured by total international arrivals per inhabitant in the country, and total share of international tourism receipts in the GNI of the country. Besides the actual tourism performance (arrivals and receipts actually achieved), the tourism competitiveness of

countries will also be looked at. Travel and tourism competitive indices (TTCI) as computed annually by the World Economic Forum measure not only the actual arrival and receipt data, employment and GDP generated by tourism, but many other factors that make the country more attractive to tourists, or better capable of catering for tourist needs, and guarantee their health, safety and security. This way TTCI is a measure of not so much the actual tourism performance, but incorporates elements of potential success in tourism.

The present analysis will look at two aspects. The share of a country in the world total values of tourism performance adjusted for the size of the country can point out good performers and poor performers. The TTCI values (for several years), and their changes reflect the opportunities of a country to develop into a successful actor in world tourism. The exciting question is, whether these features have any relations to the sociocultural structure of the society regarding its ethnic, linguistic or religious heterogeneity or homogeneity.

The analysis is carried out in the following structure: first an overview of the variables will be presented, including the input variables (diversity measures), the output variables (measures of tourism performance and competitiveness), and a few control variables (level of general development measured by per capita GNI, and size of the country measured by its population as a percentage of the total world population).

The second step is to find correlations between the variable pairs – input, output and control variables. Third, an overall regression relationship is looked for between the output variables (tourism performance and competitiveness indicators) and diversity indicators and control variables.

The fourth step is to look at groups of countries according to their actual tourism performance and look for typical heterogeneity or diversity patterns within the groups of countries within each group.

Descriptive analysis

Diversity indices are available for altogether 155 countries. The values vary between 0 and 1. As descriptive statistics show (Table 1), the mean value of heterogeneity ranges from 0.293 (RFIPew) to 0.461 (LDI), the minimum values are 0 or very close to it for all types of diversity, the maximum values vary in the range from 0.733 (CDI) to 0.988 (LDI).

Skewness values are close to zero, and kurtosis values are close to -1, which is an indication that the diversity indicators do not follow a normal distribution. A normal distribution should have near-zero skewness and kurtosis, and if the absolute values of these statistics are more than twice the standard error, then data are not of a normal distribution. It is

also worth noticing, that standard deviations of the diversity indices are smaller than mean values.

Table 1 Descriptive Statistics for Diversity Indicators

	N	Min	Max	Mean	Std. Dev	Skewness	Skewness Std. Error	Kurtosis	Kurtosis Std. Error
CDI	155	.0000	.7330	.3047	.2105	.186	.195	-1.184	.387
EFIA	155	.0000	.9302	.4593	.2560	-.081	.195	-1.189	.387
RFA	155	.0023	.8603	.4377	.2314	-.183	.195	-1.081	.387
RFIPew	155	.0020	.7920	.2926	.1940	.289	.195	-.960	.387
LDI	155	.0000	.9880	.4612	.3007	.050	.195	-1.295	.387

Descriptive statistics for the output variables are shown in Table 2. Considering the variables measuring the importance of the countries in world tourism, the average value for the countrywise international arrivals compared to the world total is 0.65 – 0.75%, with maximum values around 8%, while regarding international tourism receipts the average is similar to arrivals (around 0.73 – 0.78 % of the word total), but the maximum value is twice as high, 17.619.4%. The Tourism and Travel Competitiveness index (on a scale of 1 to 7) has average values of 3.7-3.8, while the maximum index values are 5.3-5.4, none of the analysed countries are closer to the theoretical maximum of 7.

Table 2 Descriptive Statistics for the Output Variables of Tourism Performance

	N	Min	Max	Mean	Std. Dev	Skewness	Skewness Std. Error	Kurtosis	Kurtosis Std. Error
Arriv%W2014	155	.00	8.03	.6452	1.27683	3.550	.195	14.298	.387
Arriv%W2015	134	.00	7.78	.7463	1.33845	3.224	.209	11.566	.416
Receipts%W2014	137	.00	17.59	.7299	1.84497	6.453	.207	53.016	.411
Receipts%W2015	129	.00	19.41	.7752	2.04207	6.751	.213	56.271	.423
DiffArriv_2014	151	-16.47	7.15	.0115	2.08582	-4.786	.197	38.529	.392
DiffArriv_2015	142	-17.00	6.79	.0361	2.16857	-4.945	.203	38.464	.404
DiffRec_2014	137	-5.63	3.12	.0031	.97890	-3.312	.207	19.321	.411
DiffRec_2015	125	-5.47	3.31	.0065	.94808	-2.811	.217	16.850	.430
TTCI2017	127	2.44	5.43	3.7932	.70159	.318	.215	-.611	.427
TTCI2015	129	2.43	5.31	3.7178	.69630	.347	.213	-.695	.423

Comparing the importance of each country in world tourism to its size (population for DiffArriv or total GNI for DiffRec), the average values are around 0 (more tourism-oriented countries and less tourism-oriented countries balance their differences). The maximum values are around +7% for arrivals and +3% for receipts (meaning, that the most important country has 7% higher share in tourism arrivals than in the world population, and 3 % higher share in tourism receipts than in GNI of the world), while the minimum values are (-16.5%) – (-17.0%) in arrivals, and (-5.5%)-(-5.6%) for receipts.

It is worth noticing, that Skewness and Kurtosis values are very high absolute values except for TTCI, meaning that these variables are probably not of normal distributions. This must be considered in further statistical tests.

Correlations

To reveal relationships between tourism performance and sociocultural or religious heterogeneity the bivariate (pairwise) correlations will be looked at. Before doing this, it is useful to have a look at correlations among the five diversity indicators is useful to find out if there might be some collinearity among these variables.

Correlations of the input variables

As is seen in Table 3, there is quite strong positive pairwise correlation among cultural (CDI), ethnic (EFIA) and linguistic (LDI) diversity indices, indicating a certain level of collinearity. Weak, but significant positive correlations were found between religious diversity of 2001 (RFA) and each of CDI, EFIA, LDI. Finally, a medium positive significant correlation was found between the two religious diversity indicators, RFA and RFIPew, which is not surprising, assuming that the religious heterogeneity situation in 2001 (RFA) should have some relationship to the situation in 2010 (RFIPew).

Table 3 Correlation Among the Diversity Indices

Spearman's rho (N=155)		CDI	EFIA	LDI	RFA	RFIPew
CDI	Correlation Coefficient	1.000	.702**	.673**	.178*	.114
	Sig. (2-tailed)		*.000*	*.000*	*.027*	*.159*
EFIA	Correlation Coefficient	.702	1.000	.706**	.210**	.114
	Sig. (2-tailed)	*.000*		*.000*	*.009*	*.010*
LDI	Correlation Coefficient	.673**	.706**	1.000	.302**	.898
	Sig. (2-tailed)	*.000*	*.000*	.	*.000*	*.125*
RFA	Correlation Coefficient	.178*	.210**	.302**	1.000	.565**
	Sig. (2-tailed)	*.027*	*.009*	*.000*	.	*.000*
RFIPew	Correlation Coefficient	.114	.010	.124	.565**	1.000
	Sig. (2-tailed)	*.159*	*.898*	*.125*	*.000*	.

** Correlation is significant at the 0.01 level (2-tailed);   * Correlation is significant at the 0.05 level (2-tailed).

As collinearity of the CDI –EFIA-LDI variables and of the RFA – RFIPew variables may cause problems in some of the statistical tests, two new variables are introduced: CultDivMax=max(CDI,EFIA,LDI) gives the largest sociocultural diversity value for each country, while ReligDivMax =max(RFA,RFIPew) gives the largest of the two religious

diversity measures. In some of the analyses, instead of using all the three sociocultural variables, or both of the religious variables together, the CultDivMax or the ReligDivMax variables will be used.

Correlations of the output indicators to the input indicators

Bivariate correlations between the output indicators and the diversity indicators revealed the following patterns (Table 4):

- Ethnic diversity (EFIA) shows significant, but not too strong negative correlations to Arrivals values; i.e. the more diverse countries have less international tourist arrivals.

- Religious diversity (RFIPew) has significant, but weak positive correlations to Receipts as world % values, i.e. the more religious diversity goes together with higher tourism receipts. The other religious diversity index, RFA, has no correlation to arrivals, and weak positive significant correlation to Receipts values, i.e when religious diversity is higher, then the difference between the share of the country in world tourism receipts compared to its share in world GNI is smaller.

- Language diversity (LDI) has weak significant negative correlations to arrivals, i.e. the linguistically more diverse countries have lower share in international tourism arrivals compared to their population size.

Table 4 Correlations of Tourism Performance and Diversity

Spearman's rho		CDI	EFIA	LDI	RFA	RFIPew
Arriv%W2014, N=155	Correlation Coefficient	**-.301**[**]	**-.490**[**]	**-.357**[**]	-.084	.112
	Sig. (2-tailed)	*.000*	*.000*	*.000*	*.296*	*.167*
Arriv%W2015, N=134	Correlation Coefficient	**-.272**[**]	**-.479**[**]	**-.332**[**]	-.145[#]	.046
	Sig. (2-tailed)	*.001*	*.000*	*.000*	*.094*	*.597*
Receipts%W2014, N=137	Correlation Coefficient	**-.199**[*]	**-.436**[**]	**-.293**[**]	-.078	**.188**[*]
	Sig. (2-tailed)	*.019*	*.000*	*.001*	*.366*	*.028*
Receipts%W2015, N=129	Correlation Coefficient	-.173[#]	**-.403**[**]	**-.266**[**]	-.057	**.234**[**]
	Sig. (2-tailed)	*.051*	*.000*	*.002*	*.521*	*.008*

**. Correlation is significant at the 0.01 level (2-tailed);   *. Correlation is significant at the 0.05 level (2-tailed).
#: Correlation is significant at the 0.1 level (2-tailed).

Therefore it may be suspected, that there is some relationship between sociocultural and religious diversity on the one hand, and the tourism performance indicators, on the other, and

this relationship is mainly of adverse character for ethnic and language diversity, and positive for religious diversity. This means that higher ethnic or linguistic diversity coincides with lower performance, while higher religious diversity goes together with better tourism performance. However, these bivariate correlation coefficients are small, their absolute value ranges from 0.137 to -0.290, therefore these relationships may be quite weak.

Correlations to TTCI

The TTCI values (Table 5) have

- a weak to medium significant negative correlation to the sociocultural diversity indicators (CDI-EFIA –LDI - CultDivMax)
- a weak positive significant correlation to RFIPew
- a strong positive significant correlation to GNI per capita.
- a weak positive significant correlation to Pop percent.

Table 5 Correlations of TTCI to Diversity Indicators and Control variables

Spearman's rho		Pop %	GNI 2014	CDI	EFIA	LDI	RFA	RFIP ew	Cult Div Max	Relig Div Max
TTCI2015, N=129	Correlation Coefficient	.114	**.835****	-.165\#	-.446**	-.337**	.014	**.241****	-.403**	.037
	Sig. (2-tailed)	.199	.000	.061	.000	.000	.877	.006	.000	.678
TTCI2017, N=127	Correlation Coefficient	**.170**\#	**.819****	-.197*	-.477**	-.372**	-.023	**.243****	-.441**	-.003
	Sig. (2-tailed)	.056	.000	.027	.000	.000	.793	.006	.000	.973
Pop %, N=155	Correlation Coefficient	1.000	-.029	-.023	-.022	.071	-.072	-.074	.063	-.075
	Sig. (2-tailed)	.	.716	.772	.790	.380	.371	.361	.433	.352
GNI2014, N=155	Correlation Coefficient	-.029	1.000	-.266**	-.519**	-.399**	-.027	**.239****	-.489**	.008
	Sig. (2-tailed)	.716	.	.001	.000	.000	.743	.003	.000	.923

**. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).
\#: Correlation is significant at the 0.1 level (2-tailed).

Multiple regression for all countries

As bivariate correlations revealed some significant correlations between output and input variables, but none too strong, the next idea was to use a combination of them to estimate output indicators, i.e. tourism performance as arrivals and receipts,to see their joint impact, and possibly, interactions.

As it was seen earlier, there is a strong positive correlation among the sociocultural diversity indicators, CDI-EFIA-LDI, therefore at least one of them should be omitted. At first

the CDI variable will be omitted, as language and ethnicity can largely explain differences in culture.

RFA, the older religious diversity indicator has low correlation to sociocultural diversity indices, and medium positive correlation to RFIPew, the other religious indicator. This latter does not correlate to the sociocultural diversity indices, therefore it will be retained in the model, and RFA will be omitted.

However, control variables were also introduced: GNI per head and Population percent. At the first model tests the Independence year, and Region were also introduced as dummies, but none of these had any significant impact, therefore the following analyses do not deal with them.

Dependent variables were: LnTTCI – for 2015 and 2017 as measures of the international potentials of the countries; and LnArriv%W ad LnReceipts%W for 2014 and 2015 as measures of the actual performance in world tourism. Including all the 5 input and the above 2 control variables in the models, the following results were generated:

TTCI (or, lnTTCI) as Dependent variable

In the following models multiple linear regression is applied. In order to have valid results, several assumptions have to be tested.

- There is not too high multicollinearity among independent variables – this is tested by the regression procedure itself, the VIF values have to remain under 10.
- The residuals follow a normal distribution – this is automatically follows from the least-squares method used in fitting a regression line.
- The residuals show no autocorrelation (only for time series data), and their mean values are zero – this was also tested by the regression procedure graphically, and by descriptive statistics of residuals.
- The homoscedasticity of the residuals: plotting the standardised residuals against the standardised predicted values, the values are evenly scattered around zero - this was also tested during the regression procedure by the scatterplot of residuals.

Model 1: Following the example of Das and DiRienzo (2009) the model was tested with lnTTCI2015 and lnTTCI2017 as output variables respectively.

Input variables were: EFIA and CultDivMax. The choice of LDI was also tested.

Control variables were: GNI and Pop%

Results are shown in Table 6. VIF values were of 1.01 to 1.1 for the independent variables, i.e. multicollinearity does not reach critical levels. All the model versions complied with the assumptions required for the regression analysis procedure.

Table 6 Summary of regression models with ln TTCI

	Model 1a - Dependent : lnTTCI2015			Model 1b - Dependent: lnTTCI2017		
Adjusted R^2	.594			.598		
Regression F	F=63.351 (df=3.125) sig=.000			F= 63.469 (df=3.123). sig=.000		
	B*	*Beta***	*sig*	*B**	*Beta***	*sig*
(Constant)	1.239		.000	1.245		.000
CultDivMax	-.170	-.230	.000	-.169	-.273	.000
GNIP2014	7.239E-6	0.665	.000	7.134E-6	.659	.000
Pop percent	.017	.217	.000	.019	.245	.000
	Model 1c- Dependent: lnTTCI2015			Model 1d- Dependent: lnTTCI2017		
Adjusted R^2	.573			.559		
Regression F (df)	F= 44.003 (df=4.124). sig=.000			F=40.925 (df=4.124). sig=.000		
	B*	*Beta***	*sig*	*B**	*Beta***	*sig*
Constant	1.214		.000	1.240		.000
EFIA	-.144	-.192	.003	-.155	-.209	.002
RFIPew	.015	.015	.817	.027	.027	.677
GNI	7.145E-6	.656	.000	6.765E-6	.625	.000
PopPercent	.014	.176	.003	.015	.191	.002
	Model 1e - Dependent : lnTTCI2015			Model 1f - Dependent : lnTTCI2017		
Adjusted R^2	.601			.598		
Regression F	F=65.274 (df=3.125) sig=.000			F= 63.469 (df=3.123). sig=.000		
	B*	*Beta***	*sig*	*B**	*Beta***	*sig*
Constant	1.214	-	.000	1.245		.000
LDI	-.152	-.241	.000	-.169	-.273	.000
GNI	7.458E-6	.685	.000	7.134E-6	.659	.000
PopPercent	.018	.223	.000	.019	.245	.000

*: B is the unstandardised coefficient, **: Beta is the standardised coefficient

VIF values for all model versions were in the range of 1.0-1.5. Standardised residuals had mean=0.00, st.deviation varied between 0.98 and 0.99, and followed a homoscedastic pattern.

Results for Model 1:

All the tested sociocultural diversity measures had significant negative impact on lnTCCI, except RFIPew. This latter showed positive impact but not on a significant level. Therefore we may state that tourism competitiveness will decrease when ethnic, linguistic, or cultural diversity is higher. However, this may not be true for religious diversity, as its impact was not significant in any variable combination. It is also established, that the per capita income level,

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and the size of the population are both positively influence tourism competitiveness, the larger, or richer the country, the more competitive it is in the international tourism market.

As GNI turned out to be a variable of crucial importance in all the Model 1 regressions, the question arises whether its level can influence the impact of the diversity indicators themselves, to any extent. Therefore interaction terms were introduced for the significant diversity indices. The GNI x CultDivMax, GNI x EFIA, GNI x LDI interaction terms were introduced to the respective regression equations. In order to avoid collinearity of the interaction variable and the respective independent variables, the interaction terms were computed by way of centering the respective variables (i.e. deducting their respective means from each of them) before multiplying them. Table 7 summarises the results of the regressions.

Model 2: Interaction between GNI and the selected input variable (GNI x EFIA, GNI x CultDivMax, GNIx LDI) was introduced, when the impact of the input variable was found to be significant.

Table 7 Summary of regression models with ln TTCI and interaction

	Model 2a - Dependent: lnTTCI2015			Model 2b - Dependent: lnTTCI2017		
Adjusted R^2	,601			,595		
Regression F	F=49.75 (df=4,124) sig=.000			F= 47.260 (df=4,122), sig=,000		
	B*	*B**	*B**	*B**	*Beta***	*sig*
(Constant)	1,231		,000	1,269		,000
CultDivMax	-0.164	-0.211	,000	-0.188	-0.257	,000
GNIP2014	7.198E-6	0.661	,000	6.829E-6	0.631	,000
Population percent	0.017	0.221	,000	0.018	0.234	,000
Interact GNI x CultDivMax	-4.647E-6	-0.104	,068	-3.766E-6	-0.084	,144
	Model 2c - Dependent: lnTTCI2015			Model 2d- Dependent: lnTTCI2017		
Adjusted R^2	,580			,564		
Regression F (df)	F= 36.361 (df=5,123), sig=,000			F=33.599(df=5,121), sig=,000		
	B*	*Beta***	*sig*	*B**	*Beta***	*sig*
Constant	1,212		0.000	1.236		0.000
EFIA	-0.014	-0.187	0.004	-0.149	-0.200	0.003
RFIPew	-0.001	-0.001	0.982	0.011	0.011	0.869
GNI	6.994E-6	0.643	0.000	6.665-6	0.616	0.000
PopPercent	0.014	0.184	0.002	0.015	0.200	0.001
Interact GNI x EFIA	-4.545E-6	-0.102	0.087	-4.205E-6	-0.095	0.123

Table 7 (continued)

	Model 2e - Dependent: lnTTCI2015			Model 2f - Dependent : lnTTCI2017		
Adjusted R^2	,617			,610		
Regression F (df)	F= 52,516 (df=4,124), sig=,000			50.364 (df=4,122), sig=,000		
	B^*	$Beta^{**}$	sig	B^*	$Beta^{**}$	sig
Constant	1.209	-	0.000	1.234		0.000
LDI	-0.158	-0.251	0.000	-0.174	-0.280	0.000
GNI	7.599E-6	0.698	0.000	7.290E-6	0.673	0.000
PopPercent	0.017	0.213	0.000	0.018	0.237	0.000
Interact GNI x LDI	*-5.671E-6*	*-0.137*	*0.014*	*-5.133E-6*	*-0.125*	0.028

*: B is the unstandardised coefficient, **: Beta is the standardised coefficient
VIF values for all model versions were less than 1.5. Standardised residuals had mean=0.00, st.deviation varied between 0.98 and 0.99, and followed a homoscedastic pattern.

Results for Model 2:

Similar to the Model 1 series, the assumptions needed for applying multiple regression were tested. VIF values were all smaller tha. 1.5 independent variables, i.e. multicollinearity does not reach critical levels, and the assumptions for the standardised residuals also complied with requirements.

As is shown in Table 7, altogether, all of the models turned out to give a significant estimation, with adjusted R2 values above 0.55. Generally, a significant negative impact of the sociocultural diversity indices remained valid, but the interaction term turned out to be significant only for LDI (Model 2e and 2f in Table 7.). Therefore, no impact was found for the interaction between the ethnic or cultural diversity index and GNI. However, a small negative significant impact was identified for the interaction of GNI x LDI, i.e. a medium enhancing interaction effect was found for language diversity and per capita income. This means, that when there is language diversity, its impact is more negatively felt in countries with higher per capita incomes.

The model versions without interaction terms are quite similar to Das & DiRienzo (2009), in which the ethnic diversity index had a negative impact on the Tourism and Travel Competitiveness index, GNI per capita and Population had positive impacts. However, regarding the mitigating effects of interaction, our results are just the opposite of what Das and DiRienzo found for EFIA.

This means, that GNI did not have a mitigating effect in relation to sociocultural diversity, and in the case of language diversity larger per capita incomes actually enhanced the negative

effect of language diversity on competitiveness. RFIPew had no significant impact, it had no effect on tourism competitiveness.

Dependent variable: Arriv %W, Receipt %W

When analysing Arriv%W ad Receipts%W as dependent variables, results are very similar to the TTCI regressions. Again, sociocultural diversity turned out to be of negative impact on arrivals and tourism receipts, and no significant interaction was identified with GNI. As results were similar with independent variables CultDivMax, EFIA, and LDI, and for the years 2014 and 2015, only the 2014 data and the variable EFIA are presented below. Interaction terms were not found to be significant for any of the diversity indicators, not even for LDI.

Table 8 Regression models with interaction

	Model 3a - **Dependent : lnArriv%W_2014**			Model 3b - **Dependent : lnRec%W_2014**		
Adjusted R^2	0.494			0.465		
Regression F (df)	F= 33.996 (df=4.131). sig=.000			30.55250.364 (df=4.132). sig=.000		
	B*	*Beta***	*sig*	*B**	*Beta***	*sig*
Constant	-2.164		.000	-2.836		.000
EFIA	-1.116	-.163	.023	-1.257	-.149	.030
GNI	6.669E-05	.599	.000	6.885E-05	.550	.000
PopPercent	.200	.268	.000	.270	.297	.000
Interact GNI xEFIA	5.938E-05	.133	.053	-3.219E-05	-.063	.326

For notations see Table 7

Therefore we may conclude, that there is a significant negative impact of sociocultural diversity indicators on the actual tourism performance of countries, with respect to their weight and importance in the world tourism market.

COUNTRY GROUPINGS BY TOURISM PERFORMANCE

However, the question arises, whether these overall results may hide important differences among countries, i.e. some marked differences between touristically active and important countries and touristically not so important countries. Therefore new variables were introduced to measure the performance of the countries in this respect.

- DiffArriv_2014 (and 2015) = Arrivals % of World - Population %

- DiffRec_2014 (and 2015) = Receipts % of World – GNI % of World

DiffArriv measures the percentage difference of the country share in international arrivals in the world minus the country share in the total world population. A positive value indicates that the country receives more international tourists than would be expected if arrivals were proportional to its population. Similarly, DiffRec meaures the percentage difference of the country share in world tourism receipts minus the country share in the total GNI of the world. Again, a positive value means that the countr y receives a higher share in tourism receipts than its share in total world GNI.

As histograms show in Figure 1, the differences move within the range of (-5) –(+10) percentage points for DiffArriv for both years, and in (-4) – (+4) percentage point for DiffRec for both years, with two countries being outliers in the lower end of their respective ranges. The two outliers for DiffArriv are China and India while the outliers for DiffRec are China and Japan. For these reasons these three countries will be handled as outliers and will not be included in the following analyses.

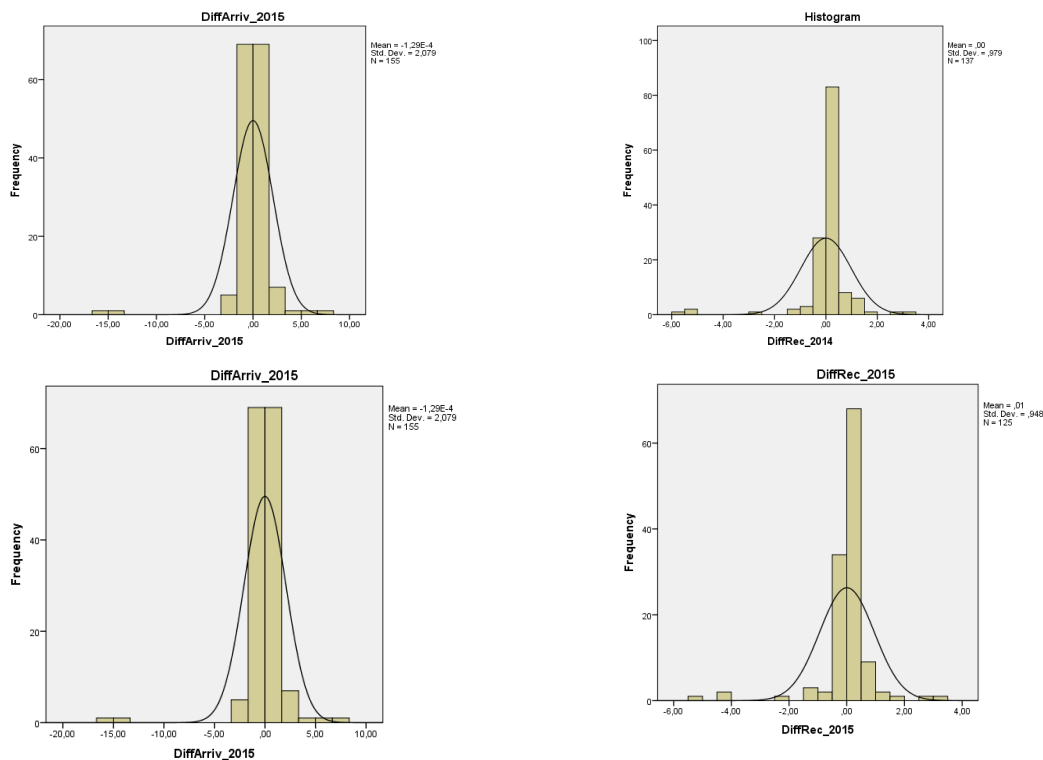**Figure 1** Histograms of DiffArriv and DiffRec variables

Table 9 Means and Standard Deviations with and without the outlier countries

Together with outliers	N	Minimum	Maximum	Mean	Std. Dev	Skewness	Kurtosis
DiffArriv_2014	151	-16.47	7.15	.0115	2.0858	-4.786	38.529
DiffArriv_2015	155	-16.59	7.12	-.0001	2.0795	-4.984	40.505
DiffRec_2014	137	-5.63	3.12	.0033	.9792	-3.312	19.332
DiffRec_2015	125	-5.47	3.31	.0065	.9481	-2.811	16.850
CDI	155	.000	.733	.3047	.2105	.186	-1.184
EFIA	155	.0000	.9302	.4593	.2560	-.081	-1.189
LDI	155	.000	.988	.4612	.3007	.050	-1.295
RFA	155	.0023	.8603	.4377	.2314	-.183	-1.081
RFIPew	155	.0020	.7920	.2926	.1940	.289	-.960
Without outliers	N	Minimum	Maximum	Mean	Std. Dev	Skewness	Kurtosis
DiffArriv_2014	148	-2.59	7.15	.2189	1.1251	2.493	13.462
DiffArriv_2015	152	-2.59	7.12	.2062	1.0978	2.581	14.318
DiffRec_2014	134	-5.07	3.12	.0928	.7165	-2.185	24.060
DiffRec_2015	122	-4.49	3.31	.0966	.7032	-1.384	19.682
CDI	152	.000	.733	.3053	.2088	.173	-1.176
EFIA	152	.0000	.9302	.4646	.2546	-.099	-1.186
LDI	152	.000	.988	.4605	.2993	.054	-1.291
RFA	152	.0023	.8603	.4363	.2326	-.171	-1.095
RFIPew	152	.0020	.7920	.2883	.1927	.314	-.927

The means and standard deviations of the diversity indicators have only slightly changed after omitting the three outlier countries. The descriptive statistics for DiffArriv and DiffRec however, are considerably changed (Table 9).

Table 10 Correlations without the 3 outlier countries

Spearman's rho		CDI	EFIA	LDI	Cult Div Max	RFA	RFIPew
DiffArriv_2014, N=148	Correlation Coefficient	**-.227**[**]	**-.474**[**]	**-.472**[**]	**-.386**[**]	-.032	.116
	Sig. (2-tailed)	.006	.000	.000	.000	.700	.159
DiffArriv_2015, N=152	Correlation Coefficient	**-.243**[**]	**-.469**[**]	**-.481**[**]	**-.400**[**]	-.021	.139[#]
	Sig. (2-tailed)	.003	.000	.000	.000	.796	.088
DiffRec_2014. N=134	Correlation Coefficient	-.120	**-.302**[**]	**-.278**[**]	**-.175**[*]	-.031	.154[#]
	Sig. (2-tailed)	.166	.000	.001	.043	.720	.076
DiffRec_2015, N=122	Correlation Coefficient	-.120	**-.269**[**]	**-.249**[**]	**-.164**[#]	-.049	.122
	Sig. (2-tailed)	.189	.003	.006	.071	.588	.180

For notation see Table 5

The overall bivariate significant correlations between the DiffArriv and DiffRec values on the one hand, and the diversity indicators on the other, are all negative, suggesting that diversity is detrimental to the performance of the countries in the international tourism sector (Table 10). Both the DiffArriv and the DiffRec values are negatively correlated to ethnic and linguistic diversity and also to the maximum sociocultural diversity variable, but they do not show any significant relationship to religious diversity at 5% level. At 10% level a slight positive impact of RFIPew can also be noted.

However, as correlations are not too strong, the question arises, whether overall averages might hide more specific features and effects for subgroups or segments of countries. In other words: is there any difference in the diversity patterns between touristically more successful and less successful countries?

Grouping the countries according to DiffArriv2015 - as this is the difference variable with the most valid cases in it - two groups are created:

1. Group 1 (GR1): DiffArriv2015 ≤0.0% (77 countries)
2. Group 2 (GR2): DiffArriv2015 > 0.0% (75 countries)

Comparing the DiffArriv and DiffRec variables by this grouping, the means considerably differ among groups for tourism performance, and also for the sociocultural diversity indices, but not for religious diversity (see Table 11 and Table 12). This means, that there is some definite difference in the sociocultural diversity patterns between touristically successful countries and less successful ones, but no such difference can be identified for religious diversity.

Table 11 Descriptive statistics for tourism performance and diversity for the two groups

|		N	Mean	Std. Dev	Std. Error	Minimum	Maximum
DiffArriv_2014	<= .00	73	-.3768	.59808	.07000	-2.59	.00
	.01+	75	.7986	1.21488	.14028	.01	7.15
	Total	148	.2189	1.12510	.09248	-2.59	7.15
DiffArriv_2015	<= .00	77	-.3562	.58015	.06611	-2.59	.00
	.01+	75	.7836	1.20274	.13888	.01	7.12
	Total	152	.2062	1.09783	.08905	-2.59	7.12
DiffRec_2014	<= .00	60	-.0697	.37000	.04777	-2.60	.52
	.01+	74	.2245	.88620	.10302	-5.07	3.12
	Total	134	.0928	.71648	.06189	-5.07	3.12
DiffRec_2015	<= .00	50	-.0658	.34789	.04920	-2.26	.34
	.01+	72	.2094	.85312	.10054	-4.49	3.31
	Total	122	.0966	.70323	.06367	-4.49	3.31
CDI	<= .00	77	.3622	.223866	.025512	.000	.733
	.01+	75	.2468	.175135	.020223	.000	.624
	Total	152	.3053	.208820	.016938	.000	.733
EFIA	<= .00	77	.586448	.2414747	.0275186	.0000	.9302
	.01+	75	.339417	.2026574	.0234009	.0392	.7517
	Total	152	.464558	.2546165	.0206521	.0000	.9302
LDI2016	<= .00	77	.59039	.292936	.033383	.000	.988
	.01+	75	.32719	.243211	.028084	.000	.871
	Total	152	.46052	.299347	.024280	.000	.988
RFA	<= .00	77	.422582	.2418604	.0275625	.0023	.8192
	.01+	75	.450299	.2234472	.0258015	.0035	.8603
	Total	152	.436258	.2326017	.0188665	.0023	.8603
RFIPew	<= .00	77	.261653	.2013147	.0229419	.0040	.7139
	.01+	75	.315584	.1807134	.0208670	.0020	.7920
	Total	152	.288263	.1927020	.0156302	.0020	.7920
Cult Div Max	<= .00	77	.6709	.22680	.02585	.00	.99
	.01+	75	.4122	.21326	.02463	.04	.87
	Total	152	.5433	.25500	.02068	.00	.99

The nonparametric Mann-Whitney U-test and the Wilcoxon-test also prove what the mean values suggested (Table 12). The significance test shows for CDI, EFIA, LDI, and CultDivMax, that the p-values are all less than 0.05, therefore the median values of the

sociocultural fragmentation values significantly differ between the two groups. Regarding religious diversity no such difference was found.

Table 12 Test of significant differences of group medians between two groups

	CDI	EFIA	LDI	RFA	RFIPew	Cult Div Max	Relig Div Max
Mann-Whitney U	2157.000	1372.500	1509.000	2858.000	2558.000	1256.000	2852.000
Wilcoxon W	5007.000	4222.500	4359.000	6098.000	5798.000	4106.000	6092.000
Z	-3.019	-5.827	-5.339	-.508	-1.583	-6.245	-.530
Asymp. Sig. (2-tailed)	.003	.000	.000	.611	.114	.000	.596

**Figure 2** Group means for tourism importance and for diversity indicators
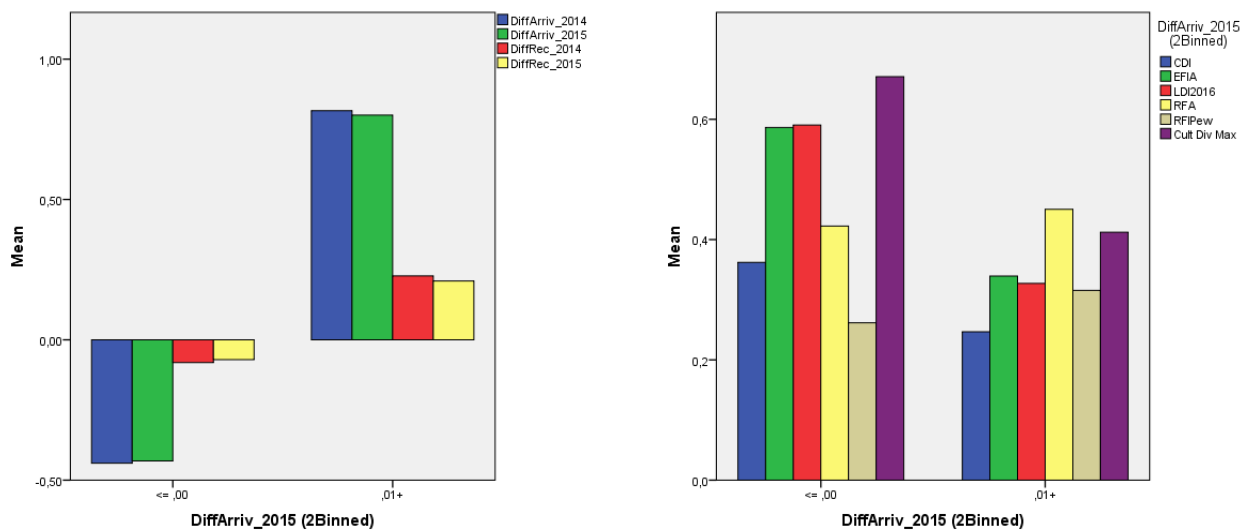
Another interesting feature of the present grouping is, that while the second group shows higher mean values for DiffArriv and DiffRec for both years, this is not true for all the diversity measures. The mean values for CDI, EFIA, LDI and CultDivMax are all higher in Group 2, but not for RFA and RFIPew. For religious diversity the lower mean values are in Group 1, where DiffArriv and Diff Rec values are negative; the higher religious diversity mean values are associated with Group2, where all DiffArriv and DiffRec values have a positive mean value (Figure 2).

Looking at the distributions of the diversity indicators in the two groups (Figure 3), the EFIA, LDI and CultDivMax sociocultural diversity values tend to accumulate in the higher value ranges for the first group and in the lower value ranges in the second group. However, this is quite opposite in the case of the religious diversity index RFIPew. Its values tend to be more in the lower range for the first group and more in the medium-high range for the second group. This figure underlines the conclusions driven from the group means. The countries, which perform worse in world tourism, tend to have higher sociocultural diversity, but lower

religious diversity, but countries with better tourism performance tend to have lower sociocultural diversity values and higher religious diversity.

Figure 3 Distributions of diversity measures according to the three groups
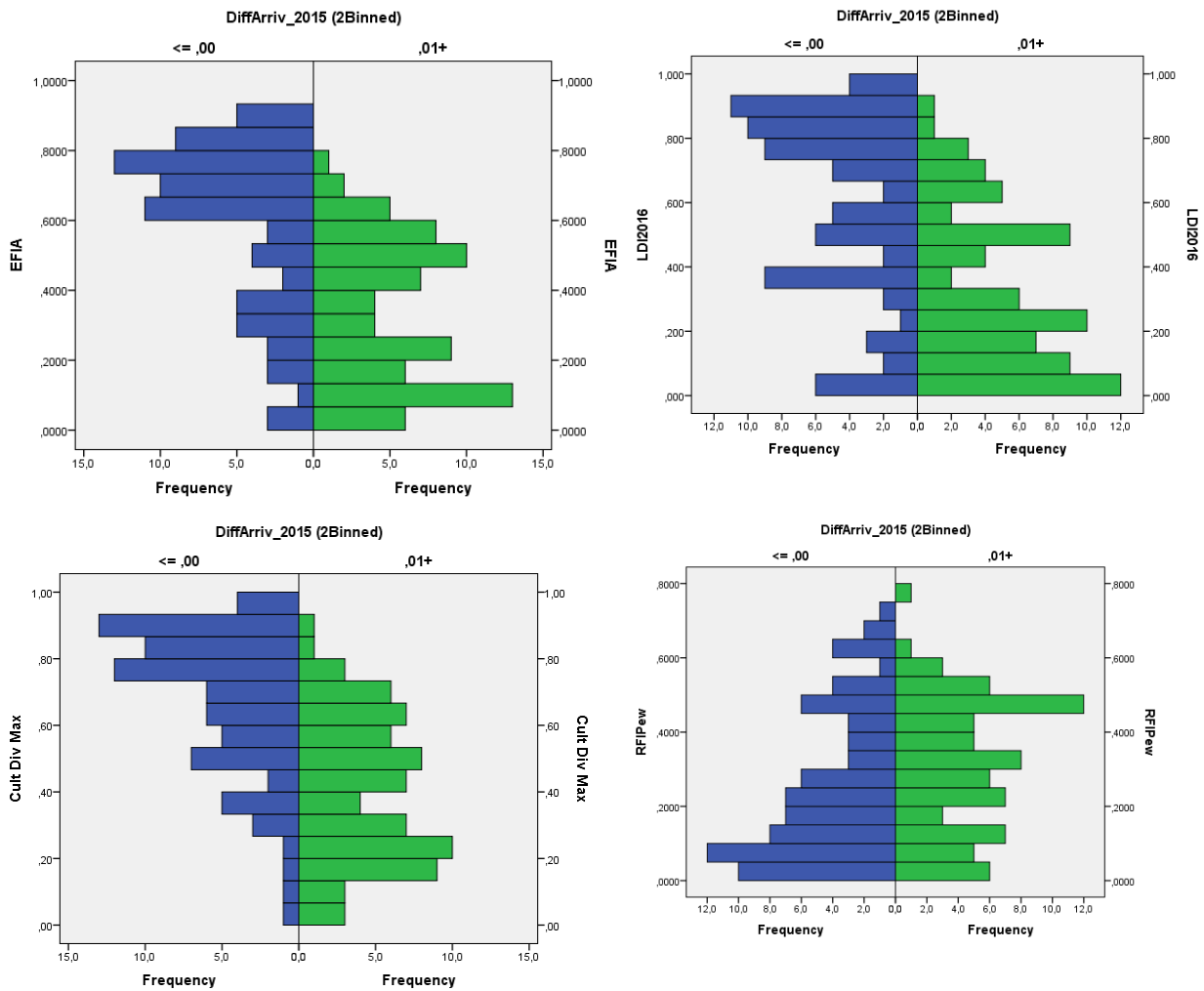
Another interesting feature of Figure 3 is the shape of the distributions for the two country groups. The distributions seem to be quite opposite for Group1 and Group2 countries. While EFIA, LDI and CultDivMax have the highest frequencies at higher diversity values for Group1 countries, in Group2 their highest peaks tend to occur at low diversity figures – although the distribution is seemingly multimodal, having a second peak at medium diversity levels. However, in the case of RFIPew the peak in Group 1 occurs at low religious diversity with a second peak at medium diversity, and for Group 2 the peak is at high diversity, while medium to low diversity values are also quite frequent. This means that countries who perform better in world tourism tend to have higher religious diversity, and low or medium sociocultural diversity – though many of them still can be quite heterogeneous in religion.

Countries which are poorer performers in world tourism often have low religious diversity and high sociocultural diversity values.

DISCUSSION AND CONCLUSIONS

The analysis has shown that the ethnic, linguistic fractionalisation, and the maximum sociocultural fractionalisation have a significant impact on the Travel and Tourism Competitiveness Index of countries, i.e., their degree of competitiveness in the international tourism sector. The impact of these sociocultural variables is similar on tourism arrivals and tourism receipts measured as % of the world total value. On the contrary to that, religious diversity did not have any significant impact on tourism competitiveness, arrivals and receipts.

The explanation for the negative impact of ethnicity and language diversity may be, that diversity may hamper the nations' ability to achieve nation-wide development projects, i.e. development of the transportation infrastructures, or of other public infrastructural networks, but the existence of good quality infrastructure is obviously necessary for better tourism performance. Therefore greater diversity leads to less development in related areas. Contrary to the findings by earlier research (Das & DiRienzo, 2009), no evidence was found for the mitigating effects of higher levels of GDP per capita. This may be due to several factors. Das and DiRienzo analysed tourism competitiveness data for 2007, while diversity data were derived from 1985. This is a 22 year lag, during which the original ethnically diverse population could be nicely integrated into affluent societies, where income levels allowed for efficient intergration strategies. Our ethnic diversity data were derived from the year 2001, and tourism competitive indices were for 2015 and 2017 – i.e. a 14-16 year lag. However, this period contained the 2008-2009 world crisis, and the migration crises of the recent years, which changed the financial and social resources to build on the beneficial impacts of intergration.

Generally no definite impact of religious diversity was found. However, splitting the countries into two groups (poor performers and good performers) religiouos diversity tended to be higher among good performers and lower among poor performers. This is similar to the earlier findings by Bacsi (2017a), in which the author also found evidence for the beneficial impacts of high religious diversity on the level of per capita GNI, and on the human development index.

As the analysis of the country grouping revealed, both ethnic, linguistic, and religious diversity distributions seem to follow a bimodal distribution in the group of touristically more successful countries. This may suggest to the possibility, that this groups contains two segments with two different distributions, one with a peak at low diversity levels, and another at medium to high diversity levels. This means, that there may be countries for which high tourism performance goes together with high diversity, while for others top tourism performance occurs with mainly low diversity values. To reveal typical features of these segments is the issue of further research.

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APPENDIX

List of countries according to the groups based on DiffArriv2014 (Outliers: China. India. Japan)

GR	No	Casecode	Country	DiffArriv_2015	CDI	EFIA	LDI	RFA	RFIPew	Cult Div Max
1	1	48	Indonesia	-2.590	0.522	0.735	0.816	0.234	0.230	0.820
1	2	71	Pakistan	-2.530	0.289	0.710	0.755	0.385	0.070	0.760
1	3	31	Nigeria	-2.310	0.660	0.851	0.891	0.742	0.519	0.890
1	4	128	Brazil	-2.220	0.020	0.541	0.099	0.605	0.203	0.540
1	5	67	Bangladesh	-2.160	0.141	0.045	0.395	0.209	0.185	0.400
1	6	13	Ethiopia	-1.140	0.562	0.724	0.862	0.625	0.485	0.860
1	7	59	Philippines	-1.020	0.116	0.239	0.842	0.306	0.155	0.840
1	8	10	Dem Repc of Congo	-0.960	0.628	0.875	0.948	0.702	0.082	0.950
1	9	66	Vietnam	-0.620	0.210	0.238	0.267	0.508	0.642	0.270
1	10	76	Iran	-0.600	0.542	0.668	0.642	0.115	0.010	0.670
1	11	38	Tanzania	-0.550	0.564	0.735	0.871	0.633	0.499	0.870
1	12	20	Kenya	-0.470	0.601	0.859	0.927	0.777	0.270	0.930
1	13	140	Iraq	-0.460	0.355	0.369	0.761	0.484	0.020	0.760
1	14	73	Afghanistan	-0.460	0.679	0.769	0.790	0.272	0.006	0.790
1	15	130	Colombia	-0.430	0.020	0.601	0.019	0.148	0.140	0.600
1	16	154	Sudan (-2011)	-0.420	0.698	0.715	0.362	0.431	0.174	0.710
1	17	65	Uzbekistan	-0.400	0.442	0.413	0.476	0.213	0.064	0.480
1	18	44	Myanmar	-0.400	0.419	0.506	0.522	0.197	0.347	0.520
1	19	40	Uganda	-0.370	0.647	0.930	0.927	0.633	0.235	0.930
1	20	70	Nepal	-0.360	0.542	0.663	0.754	0.142	0.335	0.750
1	21	52	Korea, North	-0.350	0.002	0.002	0.000	0.660	0.459	0.000
1	22	61	Taiwan	-0.340	0.169	0.274	0.489	0.685	0.714	0.490
1	23	136	Venezuela	-0.340	0.020	0.497	0.040	0.135	0.193	0.500
1	24	150	Algeria	-0.300	0.000	0.339	0.360	0.009	0.041	0.360
1	25	147	Syria	-0.300	0.235	0.540	0.360	0.431	0.136	0.540
1	26	16	Ghana	-0.280	0.388	0.673	0.858	0.799	0.410	0.860
1	27	23	Madagascar	-0.280	0.192	0.879	0.789	0.519	0.265	0.880
1	28	151	Egypt	-0.260	0.000	0.184	0.503	0.198	0.097	0.500
1	29	149	Yemen	-0.250	0.078	0.000	0.581	0.002	0.018	0.580
1	30	19	Ivory Coast	-0.240	0.557	0.820	0.900	0.755	0.648	0.900
1	31	4	Burkina Faso	-0.220	0.354	0.738	0.721	0.580	0.546	0.740
1	32	1	Angola	-0.220	0.242	0.787	0.770	0.628	0.177	0.790
1	33	30	Niger	-0.210	0.600	0.652	0.578	0.201	0.032	0.650
1	34	25	Mali	-0.210	0.590	0.691	0.867	0.182	0.144	0.870
1	35	6	Cameroon	-0.210	0.733	0.864	0.974	0.734	0.468	0.970
1	36	28	Mozambique	-0.180	0.285	0.693	0.921	0.676	0.609	0.920
1	37	72	Sri Lanka	-0.160	0.386	0.415	0.446	0.485	0.486	0.450
1	38	8	Chad	-0.150	0.727	0.862	0.933	0.641	0.529	0.930

1	39	24	Malawi	-0.140	0.294	0.674	0.692	0.819	0.298	0.690
1	40	17	Guinea	-0.140	0.490	0.739	0.748	0.265	0.275	0.750
1	41	35	Somalia	-0.140	0.290	0.812	0.363	0.003	0.004	0.810
1	42	90	Belarus	-0.130	0.228	0.322	0.411	0.612	0.411	0.410
1	43	134	Peru	-0.120	0.506	0.657	0.339	0.199	0.149	0.660
1	44	148	United Arab Emirates	-0.110	0.650	0.625	0.707	0.331	0.388	0.710
1	45	2	Benin	-0.110	0.400	0.787	0.933	0.554	0.627	0.930
1	46	116	Haiti	-0.100	0.000	0.095	0.000	0.470	0.233	0.100
1	47	5	Burundi	-0.100	0.040	0.295	0.002	0.516	0.159	0.300
1	48	41	Zambia	-0.100	0.189	0.781	0.830	0.736	0.047	0.830
1	49	33	Senegal	-0.090	0.402	0.694	0.778	0.150	0.069	0.780
1	50	152	Libya	-0.090	0.127	0.792	0.557	0.057	0.066	0.790
1	51	62	Tajikistan	-0.080	0.492	0.511	0.276	0.339	0.064	0.510
1	52	12	Eritrea	-0.080	0.398	0.652	0.672	0.425	0.470	0.670
1	53	34	Sierra Leone	-0.080	0.534	0.819	0.842	0.540	0.348	0.840
1	54	58	Papua New Guinea	-0.080	0.000	0.272	0.988	0.552	0.016	0.990
1	55	32	Rwanda	-0.070	0.000	0.324	0.091	0.507	0.126	0.320
1	56	64	Turkmenistan	-0.070	0.328	0.392	0.385	0.233	0.131	0.390
1	57	131	Ecuador	-0.060	0.480	0.655	0.182	0.142	0.112	0.660
1	58	127	Bolivia	-0.060	0.662	0.740	0.565	0.209	0.116	0.740
1	59	22	Liberia	-0.060	0.644	0.908	0.898	0.488	0.248	0.910
1	60	39	Togo	-0.060	0.602	0.710	0.905	0.660	0.659	0.910
1	61	26	Mauritania	-0.050	0.272	0.615	0.228	0.015	0.018	0.620
1	62	7	Cent African Rep	-0.050	0.511	0.830	0.959	0.792	0.192	0.960
1	63	121	Guatemala	-0.040	0.493	0.512	0.517	0.375	0.092	0.520
1	64	104	Moldova	-0.040	0.401	0.554	0.389	0.560	0.051	0.550
1	65	143	Kuwait	-0.040	0.540	0.660	0.605	0.675	0.423	0.660
1	66	122	Honduras	-0.030	0.167	0.187	0.039	0.236	0.221	0.190
1	67	133	Paraguay	-0.030	0.039	0.169	0.386	0.212	0.061	0.390
1	68	9	Congo	-0.030	0.562	0.875	0.810	0.664	0.253	0.870
1	69	126	Argentina	-0.020	0.000	0.255	0.165	0.224	0.259	0.260
1	70	14	Gabon	-0.020	0.382	0.769	0.846	0.667	0.395	0.850
1	71	18	Guinea-Bissau	-0.020	0.568	0.808	0.859	0.613	0.661	0.860
1	72	15	Gambia	-0.010	0.548	0.786	0.776	0.097	0.094	0.790
1	73	11	Djibouti	-0.010	0.404	0.796	0.473	0.044	0.061	0.800
1	74	56	Mongolia	0.000	0.227	0.368	0.172	0.080	0.565	0.370
1	75	42	Zimbabwe	0.000	0.141	0.387	0.534	0.736	0.235	0.530
1	76	99	Bosnia and Herzegovina	0.000	0.146	0.630	0.694	0.685	0.522	0.690
1	77	68	Bhutan	0.000	0.518	0.605	0.828	0.379	0.391	0.830
2	1	103	Macedonia	0.010	0.432	0.502	0.487	0.590	0.494	0.500
2	2	132	Guyana	0.010	0.460	0.620	0.514	0.788	0.498	0.620
2	3	118	Trinidad and Tobago	0.020	0.380	0.648	0.597	0.794	0.510	0.650
2	4	120	El Salvador	0.040	0.180	0.198	0.000	0.356	0.210	0.200
2	5	124	Nicaragua	0.040	0.095	0.484	0.052	0.429	0.248	0.480

2	6	47	Fiji	0.050	0.553	0.548	0.608	0.568	0.503	0.610
2	7	87	Slovakia	0.060	0.293	0.254	0.247	0.566	0.252	0.290
2	8	74	Armenia	0.070	0.124	0.127	0.140	0.458	0.030	0.140
2	9	75	Azerbaijan	0.070	0.187	0.205	0.197	0.490	0.060	0.200
2	10	144	Lebanon	0.070	0.195	0.131	0.198	0.789	0.478	0.200
2	11	37	Swaziland	0.070	0.143	0.058	0.209	0.444	0.214	0.210
2	12	21	Lesotho	0.070	0.057	0.255	0.260	0.721	0.062	0.260
2	13	27	Mauritius	0.080	0.448	0.463	0.216	0.639	0.590	0.460
2	14	29	Namibia	0.090	0.589	0.633	0.818	0.663	0.049	0.820
2	15	129	Chile	0.100	0.167	0.186	0.040	0.384	0.193	0.190
2	16	145	Oman	0.110	0.404	0.437	0.702	0.432	0.255	0.700
2	17	125	Panama	0.120	0.168	0.553	0.287	0.334	0.133	0.550
2	18	114	Cuba	0.120	0.020	0.591	0.001	0.506	0.566	0.590
2	19	84	Latvia	0.140	0.441	0.587	0.531	0.556	0.497	0.590
2	20	85	Lithuania	0.150	0.259	0.322	0.404	0.414	0.184	0.400
2	21	117	Jamaica	0.160	0.027	0.413	0.017	0.616	0.372	0.410
2	22	3	Botswana	0.160	0.161	0.410	0.441	0.599	0.434	0.440
2	23	119	Costa Rica	0.170	0.078	0.237	0.036	0.241	0.167	0.240
2	24	141	Israel	0.170	0.246	0.344	0.718	0.347	0.393	0.720
2	25	92	Finland	0.180	0.132	0.132	0.171	0.253	0.303	0.170
2	26	36	South Africa	0.190	0.530	0.752	0.871	0.860	0.318	0.870
2	27	88	Slovenia	0.200	0.170	0.222	0.167	0.287	0.352	0.220
2	28	57	New Zealand	0.200	0.363	0.397	0.291	0.811	0.540	0.400
2	29	50	Kazakhstan	0.200	0.620	0.617	0.514	0.590	0.441	0.620
2	30	53	Kyrgyzstan	0.200	0.624	0.675	0.463	0.447	0.213	0.680
2	31	135	Uruguay	0.210	0.000	0.250	0.089	0.355	0.499	0.250
2	32	54	Laos	0.210	0.020	0.514	0.691	0.545	0.470	0.690
2	33	101	Cyprus	0.220	0.359	0.094	0.202	0.396	0.400	0.360
2	34	45	Cambodia	0.230	0.150	0.211	0.116	0.097	0.061	0.210
2	35	81	Estonia	0.260	0.492	0.506	0.473	0.499	0.486	0.510
2	36	142	Jordan	0.290	0.049	0.593	0.498	0.066	0.055	0.590
2	37	83	Hungary	0.300	0.185	0.152	0.033	0.524	0.309	0.190
2	38	98	Albania	0.310	0.082	0.220	0.503	0.472	0.323	0.500
2	39	43	Australia	0.330	0.147	0.093	0.298	0.821	0.487	0.300
2	40	115	Dominican Republic	0.350	0.000	0.429	0.040	0.312	0.214	0.430
2	41	94	Norway	0.390	0.098	0.059	0.073	0.205	0.271	0.100
2	42	96	Sweden	0.410	0.189	0.060	0.226	0.234	0.473	0.230
2	43	93	Georgia	0.470	0.404	0.492	0.582	0.654	0.205	0.580
2	44	105	Romania	0.500	0.265	0.307	0.170	0.237	0.010	0.310
2	45	153	Morocco	0.520	0.360	0.484	0.461	0.004	0.002	0.480
2	46	155	Tunisia	0.530	0.033	0.039	0.018	0.010	0.010	0.040
2	47	97	Ukraine	0.560	0.258	0.474	0.497	0.616	0.276	0.500
2	48	100	Bulgaria	0.590	0.250	0.402	0.227	0.597	0.305	0.400
2	49	109	Belgium	0.600	0.462	0.555	0.701	0.213	0.500	0.700
2	50	80	Czech Republic	0.620	0.064	0.322	0.072	0.659	0.362	0.320

2	51	51	Korea South	0.660	0.004	0.039	0.010	0.489	0.646	0.040
2	52	107	Portugal	0.720	0.040	0.047	0.059	0.144	0.118	0.060
2	53	89	Switzerland	0.770	0.418	0.531	0.650	0.608	0.322	0.650
2	54	111	Ireland	0.780	0.157	0.121	0.089	0.155	0.150	0.160
2	55	91	Denmark	0.900	0.128	0.082	0.089	0.233	0.287	0.130
2	56	86	Poland	0.980	0.041	0.118	0.049	0.171	0.108	0.120
2	57	139	Bahrain	0.980	0.460	0.502	0.658	0.553	0.474	0.660
2	58	95	Russia	1.030	0.311	0.245	0.251	0.440	0.427	0.310
2	59	79	Croatia	1.050	0.185	0.369	0.102	0.445	0.125	0.370
2	60	60	Singapore	1.060	0.388	0.386	0.756	0.656	0.792	0.760
2	61	112	Netherlands	1.090	0.077	0.105	0.327	0.722	0.563	0.330
2	62	137	Canada	1.090	0.499	0.712	0.604	0.696	0.467	0.710
2	63	123	Mexico	1.160	0.434	0.542	0.109	0.180	0.093	0.540
2	64	146	Saudi Arabia	1.350	0.413	0.180	0.625	0.127	0.133	0.630
2	65	63	Thailand	1.370	0.431	0.634	0.752	0.099	0.128	0.750
2	66	102	Greece	1.950	0.050	0.158	0.130	0.153	0.217	0.160
2	67	82	Germany	1.970	0.090	0.168	0.310	0.657	0.464	0.310
2	68	55	Malaysia	2.220	0.564	0.588	0.735	0.666	0.550	0.740
2	69	113	United Kingdom	2.230	0.184	0.121	0.152	0.694	0.447	0.180
2	70	78	Austria	2.300	0.100	0.107	0.232	0.415	0.332	0.230
2	71	138	United States	2.670	0.271	0.490	0.346	0.824	0.359	0.490
2	72	77	Turkey	2.760	0.299	0.320	0.347	0.005	0.039	0.350
2	73	106	Italy	3.780	0.040	0.115	0.472	0.303	0.289	0.470
2	74	108	Spain	5.560	0.263	0.417	0.276	0.451	0.346	0.420
2	75	110	France	7.120	0.251	0.103	0.242	0.403	0.519	0.250
				Total N =152						

Outlier countries:

Casecode	Country	CDI	EFIA	LDI	RFA	RFIPew	DiffArriv_2014	DiffArriv_2015	DiffRec_2014	DiffRec_2015
46	China	.154	.1538	.536	.6643	.6435	-13.71	-13.76	-5.31	-5.47
69	India	.667	.4182	.914	.3260	.3460	-16.47	-17.00	-1.04	-1.10
49	Japan	.012	.0119	.035	.5406	.5416	-.47	.06	-5.63	-4.40

LESSONS LEARNT FROM THE MONETARY SYSTEM OF GUERNSEY

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Abstract

Bailiwick of Guernsey, situated in the English Channel off the coast of Normandy, just like Jersey and the Isle of Man, is an UK Crown dependency and an autonomous jurisdiction. These Crown dependencies are not members of the Commonwealth of Nations nor of the European Union. Furthermore, Guernsey is not part of France nor of the United Kingdom. This atypical status of Guernsey runs back several hundred years: from 1204 the island takes advantage of its special legal status and in general, it has not been managed badly. Despite all this, it cannot be considered as a totally independent, sovereign state. In addition to its special legal status, Guernsey is considered to be special in regard to its money system. According to a very popular story spread across the economic literature, the issuance of Guernsey pound prospered the island as some kind of a magic cure. While it is a considerable part, the current paper emphasize that it was not the only factor. The issuance happened in an economically declining period of Guernsey: after the Napoleonic wars the previous successful economic situation became worse mainly because of the actions of the British authorities that suppressed smuggling, a formerly thriving economic sector of the island. People established their living on this activity were hit hard, but as before, looked for opportunities where their unique status could be used efficiently, and thus, could stabilize their conditions (shipbuilding, vegetable production, tourism, etc.). Guernsey's money system, however, remains an important topic as its way of operation is indeed unusual in the global economy. Whereas money supply in most countries consists primarily of privately issued bank-debt money (about 95%), Guernsey (States of Guernsey) finance its public spending via quasi state issued money since 1817. This type of money system is usually termed as 'public money system' and receives a growing attention nowadays.

Keywords: Guernsey, Channel Islands, monetary system, local money, public money system

INTRODUCTION

Channel Islands are situated off the coast of Normandy consist of two Bailiwicks, Jersey and its islets (116 km^2 in area), the Dirouilles, Barnouics, Minquires and Ecrehous with the population of 98.069 and the Bailiwick of Guernsey (65 km^2) with Alderney (8 km^2), Sark (5 km^2) and Herm (1.3 km^2) and several smaller islands such as Jethou, Lihou, Burhou and Brecqhou with the population of 66,297.[1]The Channel Islands are Crown Dependencies distinguished from the colonial and other dependencies of the UK. At the head of the island's

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[1] CIA The World Factbook (2016)

government are the Lieutenant Governor, who is the Crown representative, the Bailiff, who is also appointed by the Crown, and the Deputy Bailiff. The head of the State is Queen Elizabeth II. The government of the UK is responsible only for the defence and foreign relations, in all other respects, including the setting of taxes, the islands are self-governing. Day to day relationship between the islands' governments and the UK is via the UK Home Office. Residents of the Channel Islands cannot vote in elections for the UK parliament. Jersey and Guernsey are governed by their own parliaments, the States, which can pass their own laws or pass UK laws as their own. (Zádori, 2011) Today, Channel Islands are one of the most important financial places in the world, where there is no value added tax, corporation tax or death duty and income tax is set at 20%. Stable government and calculable economic conditions have encouraged banking and finance industry is now the major industry of the islands having grown significantly since the early 1960's. The income per capita is one of the highest in the world. Unemployment rate is permanently low and tax and other revenues are able to meet all public expenditure needs. From 1066 to the present day the Channel Islands have remained possessions of the English Crown. The islands have a limited and special relationship with the EU through the Protocol 3, the United Kingdom's Act of Accession to the European Community in 1972.[2]

Past and present socioeconomic conditions of the Channel Islands

Until the end of the last ice age the islands were the part of the continental mainland just the rising sea level detached them from the coast of Normandy. The islands shared mainly the same cultural development of the neighbouring continent with permanent contacts. The islands became part of the Roman Empire around 56 AD. The Romans probably used the islands as a trading base especially Guernsey which had better deep anchorage than Jersey. Vikings took control of the area in 933 AD when Rollo's son, William the Longsword added the islands to the Duchy of Normandy. In 1066 when Edward the Confessor the king of the Anglo-Saxons died, William the Conqueror, Duke of Normandy, became English king (1066-1087), and the Channel Islands that belonged to Norman Duchy went under English surveillance (Johnston, 1994). 1204 is an important turning point in the history of the islands. This year King John was driven out of Normandy by the French King Philip II. This new situation forced the islanders to decide whether to continue allegiance to the French king or to go over to the English Sovereign. The fact that Channel Islands remained loyal to the English

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[2]Effects of Brexit are not clear in this moment butcertainly would influence the relationship between European Union and the Channel Islands

Crown was the result of the seigneurs' self-interest concerning their English and Channel Island holdings. In return for this loyalty in 1215 King John (the Lackland) granted certain rights and privileges that enabled them to be self-governing under a Bailiwick system (Johnston, 1994). The logic of the social and economic processes of the islands is basically not changing from this time: to sustain this special atypical 'in and out' status and autonomy is the key element of the success of Guernsey and Jersey (Zádori, 2008).

Until the end of the 15th century external connections and trade activities had not been so important in the economy of the Channel Islands, the economy was dominated by self-sufficiency. The islanders had relatively passive relationship with the sea, but from this time they began to participate in international trading activities more intensively and the active relationship became dominant, from legal trade and connections to the illegal way of commercial activities where both parties were profited from this special situation. Nearly in all economic activities the same processes could be follow up: a given economic activity is spreading and if the external and internal circumstances are changing the earlier activities start to decline which forces the islanders to find an another market niche where they could be successful. This was the situation with the neutral status of the islands with the development of the 'transmitting' sea trade, with the agricultural activities of different periods, cod-trade, privateering and smuggling, with the knitting industry, with ship-building and horticulture. From the end of the 19th century, the Channel Islands similar to lot of other parts of the maritime world were not able to cope with the new challenges of the steamboats, the 3W (wood, wind and water) based economy is slowly disappeared and the earlier flourishing sea trade is gone and a new diversification pressure forced the islanders to find their next development path (Zádori, 2011).

The natural beauty, mild climate and unique historical features of the Channel Islands attract visitors from the middle of the 19th century due to the proximity of the continent and England. Every historical period left its footprint in the islands created a specific collection of peculiar places of interests. "New hotels, boarding houses and holiday camps profited while a mild climate and lower taxes lured wealthy retirees to buy up and settle down" – wrote Moore about this period (Moore, 2005, 236. p). The expansion of tourism industry was only possible with the start of scheduled steamboat connections between England and the islands and between France and the islands and later from the 1930s with the opening of airports in Guernsey and Jersey. After World War II the islands became yet again one of the most popular targets of tourism in Europe, but in the middle of the 1950s it became clear again that the islands were not stand the international competition and there was another adaptation

pressure which resulted in another change. The challenge of the 1950s created a new direction to the Channel Islands: from the end of the 1950s they started to become financial centers. The logic of this adaptation was not new, this was only possible because of the special relation to their metropolitan partner where both side profited from this relationship. Before the 1950s financial activities hadn't been dominant and significant in the Channel Islands but there were many favorable factors which created good base for the new diversification processes (Zádori, 2010).

By the late 1950s and early 1960s there was a large flow of capital to the Channel Islands, new banks were formed, mainly in Jersey – these processes happened few years later in Guernsey. The successful example of Jersey made the situation of Guernsey and the third Crown Dependency, Isle of Man much easier, although they were strong competitors, all of them were focusing mainly on different fields: Jersey concentrated on international private banking and fund management, Guernsey hosted more insurance companies and grants bank licences to less highly capitalized banks, while the Isle of Man had insurance, private bank operations a shipping register and a free port at the airport (Le Rendu, 2004). Although by the 1980s Channel Islands became important offshore financial centers, in certain fields in spite of the high level autonomy the islands need the assistance of the UK which shows perfectly the mutual interdependence of the partners and the crucial need of maintaining this special relationship. Among others further cooperation is needed in connection with health care, police, customs, fire service, supervision, operation of the immigration office; maintaining the convertibility of the currency and the quality assurance of the education system in both cases.

THE SPECIAL MONETARY SYSTEM OF GUERNSEY

Guernsey (just like Jersey) has its own monetary system, although the pound is the official currency of Guernsey. Since 1921, Guernsey has been in currency union with the United Kingdom and the Guernsey pound is not a separate currency but is a local issue of banknotes and coins denominated in pound sterling, in a similar way to the banknotes issued in Scotland and Northern Ireland. It can be exchanged at par with other sterling coinage and notes.[3]

Until the early 19th century, Guernsey used predominantly French currency and used until 1921. Atypical banknotes were also produced by the States of Guernsey from 1827, denominated in pounds. In 1848, an ordinance was passed that the pound sterling should be legal tender. This was rescinded two years later and French currency, supplemented by local

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[3]http://onlinecoin.club/Info/Currencies/Guernsey_Pound_pre_decimal/

issues, continued to circulate. In 1870, British coins were made legal tender. Bank of England notes became legal tender in 1873. In 1914, new banknotes appeared, some of which carried denominations in Guernsey shillings and francs. After the First World War, the value of the franc began to fall relative to sterling. This caused Guernsey to adopt a pound equal to the pound sterling in 1921.[4]

The Guernsey pound, and other notes denominated in pound sterling (including those issued by the Bank of England, Scottish, Manx and Northern Irish notes and the Jersey pound) may be used in Guernsey. The Guernsey pound is legal tender only in the Bailiwick of Guernsey although it also circulates freely in Jersey but cannot be used in the UK.[5]

The Guernsey pound is highlighted as a magical economic tool in many books that deal with money systems or complementary currencies (Kennedy, Lietaer, Rogers 2012, Still, 2011, Brown 2008, Drábik 2003, Bánóczy, 2016).

Since most of these works use a common source (Grubiak, Grubiak, 1960) when describing Guernsey, they all simplify the story and state that the emergence of the Guernsey pound was the main factor that pulled the islands' economy out of trouble. Zádori (2008), however, challenges this train of thought. According to his consideration it is clear from literature that the islands use the benefits of their special legal status quite well since 1204. He believes, the time after Napoleonic wars was worse mainly because of the actions the British authorities took to suppress the smuggling that was formerly thriving. People established their living on this activity previously were hit hard, but as before, looked for opportunities where their unique status could be used efficiently, and thus, could stabilize their conditions (shipbuilding, vegetable production, tourism, etc.).

The small size and the special status of the islands are not beside the point at all. A method operable in this small island may prove to be ineffective in Hungary or the European Union. Aside from the special conditions, however, the management of the island's economy and its money creation process are definitely interesting fields that need to be investigated.

Complementary currency or something else?

While the Guernsey money often mentioned in books that mainly deal with complementary or local currencies (Kennedy et al., 2012, Drábik, 2003, Bánóczy, 2016), it is important to realize that it does not precisely belong to that category. Complementary currencies are monetary networks that operate in parallel to the national currency, and generally below the

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[4]http://everything.explained.today/Guernsey_pound/
[5]http://guernseypress.com/lifestyle/visitor-information/

national level. Groups, communities, towns, cities, regions and provinces can design and implement their own complementary currencies.[6]

The term 'local currency' refers to a subcategory within complementary currencies. Such currenciesseek to orient economic or social relations in a small "geopolitically defined space" (Blanc, 2011, p. 9). "This means local currencies first and foremost are designed to be used within a community, town or city. As so, they seek to facilitate and stimulate trade within a specific community and preserve and restore the social nature of trade and business. These currencies do not replace legal tender and are generally backed by legal tender. If the locality where local currencies operate is sufficiently large then these currencies are also referred to as 'regional currency'".[7]

Monetary theory and experiences related to local currencies in Argentina show that in times of financial instability and high unemployment local currencies can provide economic benefit for the given region. Experiences related to the 1990s in the USA, however, indicate that in times of stable economic and financial conditions, local currencies do not support significantly the region's economic development (Krohn, Snyder, 2008). Nevertheless, in regard to economic resilience, recent studies have demonstrated that the presence of complementary currencies can be beneficial in tranquil economic conditions as well (Lietaer, Arnsperger, Goerner, Brunnhuber, 2012).

In contrast, the Guernsey pound belongs to or rather close to a money system usually termed as 'public money system'[8]or 'sovereign money system'[9]and its beginning goes back to the early 19th century.

The emergence of the Guernsey Pound

At the close of the Napoleonic wars, Guernsey was in a pitiful financial (as well as general economic) condition. While the gross national revenue of the island was only £3,000, government debt stood at £19,137 with an annual charge for interest and ordinary expenses of £2,390 (Grubiak, Grubiak, 1960). Thus, only £610 per annum left to run the island. In other words, interest paid for the bank loans consumed 80% of the governmental income and Guernsey had not enough money to solve the problems it faced: "In 1816 its sea walls were

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[6]http://complementarycurrency.org

[7]http://community-currency.info/en/glossary/local-currency/

[8]A monetary system where money is exclusively issued by a central bank owned by the state or other public body. Sovereign Money system and Full reserve banking system are types of public money system.(Source of definition: A KPMG report commissioned by the Icelandic Prime Minister's Office, titled as „Money Issuance – Alternative Money Systems").

[9]A monetary system where only a state authority, such as a central bank, may create money as coin, notes or central bank deposits. (Source of definition: A KPMG report commissioned by the Icelandic Prime Minister's Office, titled as „Money Issuance – Alternative Money Systems").

crumbling, its roads were muddy and only 4 1/2 feet wide (Brown, 2008, p. 100). „...the roads were impassable in wet weather, there was little trade or employment for the poor and the sea was washing away large tracts of land." (Kennedy et al., 2012, p. 48). "Not surprisingly, people were leaving Guernsey." (Brown, 2008, p. 100).

In 1815, a well-respected committee of elders was assembled in order to find the financial resources for the building of the public market. The idea was to build the market near to the ports, so the products of the local farmers could be easily exported. The cost of the new facility would be £6,000 and the fixing of the dykes would require an additional £10,000.

Since further taxation of the already impoverished citizens of the island was not an option and taking additional loans from banks was also pointless (as the resulting higher interest charges could never be paid), the committee made an unusual yet not new recommendation:

"The committee recommends that the expense should be met by the issue of State Notes of £1 sterling to the value of £6,000 and that these notes will be available not only for the payment of the new market, but also for Torteval Church, roads to construct, and other expenses of the States." (Grubiak, Grubiak, 1960, p. 8).

As a protection against inflation the notes were issued with expiration date of April 1817, October 1817, and April 1818. These expiration dates meant that the notes could serve as legal tender only until the given date. After that the state would destroy them.

„In this manner, without increasing the States' debt, it will be possible to finish these works, leaving sufficient money in the Exchequer for other need." (Grubiak, Grubiak, 1960, p. 8).

Figure 1 Front of the Guernsey pound

Source: Johnston, P. (1994).

Once the citizens realized that these notes worked well, additional notes were issued in 1820 and 1821. By 1821, about £10,000 of debt-free Guernsey notes were in circulation.

In 1820, for instance, a remarkable market (mainly for fish and meat) was built and the cost of it was £5,500. Since £1,000 was already in hand, it was suggested to issue 4,500 £1 notes by the States. The project was completed in October 1822. By collecting £5 rent from each of the 36 shops in the market, the States could burn £180 worth of their £1 notes each year. With the help of an additional £300 a year from the tax on wines coming into the island, the States redeemed the original £4,500 in ten years (Johnston, 1994). This process was also referred to as "The Guernsey Swindle" in some economic textbooks because by the time the notes fell due, the States had earned enough money from the rents to honour them. They actually issued 'post datedcheques' to be paid from the projects future revenues.[10] In other words, they initiated a period of swift inflation followed by a period of slow deflation.

Olive and Jan Grubiak (1960, 1999), however, claims that it was the most advantageous method of meeting debts from the perspective of both the public and the States' finances. The citizens seemed to realize these benefits and eagerly looked for the new notes to use them.

In 1824, additional notes were issued in the value of £5,000 for the markets and another £20,000 for the reconstruction of Elizabeth College and some other schools.

In 1829, £48,000 Guernsey money was in circulation that increased to more than £55,000 by 1837.

„…it was stated over and over again by eminent men of those times that without the issue of States' notes, important public works, such as roads and buildings could not possibly have been carried out. Yet by means of the States' issue, not only were these works accomplished, but also the island was not a penny the poorer in interest charges. Indeed, the improvements had stimulated the flow of visitors to the island, and with increased trade, the island enjoyed its newfound prosperity." (Grubiak, Grubiak 1960, p. 8-9)

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[10]https://www.theislandwiki.org/index.php/The_Guernsey_Experiment

Figure 2 Back of the Guernsey note worth £1

Source: Johnston, P. (1994). A Short History of Guernsey. 4thEditon. Guernsey Press Co.

However, in 1826, the banking community lodged a complaint to the British Privy Council stating that Guernsey had no right to issue debt-free notes. Nonetheless, the Guernsey Financial Committee explained the situation and the matter was closed (Still, 2011).

Yet, in 1827, a new commercial bank opened, called "Old Bank". It started to issue its own banknotes in large amounts, so the island soon flooded with money. The island of Guernsey was afraid that this would lead to high inflation and their Guernsey pound would be blamed for that. So a committee was set up to negotiate with the banks. Although it remains a mystery what happened in these meetings(at least there is no publicly available information about it), the results are well-known: the government withdrawn £15,000 of Guernsey notes from circulation and limited its issuance to £40,000. This agreement remained in force until World War I. (Still, 2011).

Following World War I., banks were severely constrained in regard to the amount of money they could issue. All the bank money was spent on war efforts. The Guernsey pound, however, was not under such restriction (probably because the experiment with it was forgotten) and the island made use of this advantage. By the end of the war (1918), Guernsey had issued £142,000 and 40 years later, that had grown to £542,765.Today, there is no private bank note on the island, the official pound sterling circulates in parallel with Guernsey's State notes (Still, 2011).

Ellen Brown (2008) sums it up in the following way:

„Guernsey has an income tax, but the tax is relatively low (a "flat" 20 percent), and it is simple and loophole-free. It has no inheritance tax, no capital gains tax, and *no federal debt*. Commercial banks service private lenders, but the government itself never goes into debt. When it wants to create some public work or service, it just issues the money it needs to pay for the work. The Guernsey government has been issuing its own money for nearly two centuries. During that time, the money supply has mushroomed to about 25 times its original size; yet the economy has not been troubled by price inflation, and it has remained prosperous and stable." (Brown, 2008, p. 100)

Guernsey money as an inspiration for monetary reforms

The example of Guernsey is often mentioned by monetary reform advocates in an attempt to prove that the concept of 'public money system' or 'sovereign money system' is a valid solution to the current financial problems at the global as well as regional level.Although these systems are somewhat different from the case of Guernsey – since a reform necessary for a sovereign money system would remove the ability of banks to create money in the form of bank deposits when they make loans and would transfer that ability exclusively to the state – its story as an illustration for a public money system is likely to become more and more popular in the future.

Due to the great activity of non-profit organizations dedicated to promote sovereign money system and to the support gained from prominent economists and journalists, public discussion on adopting a similar money system has reached remarkable levels in recent years. The topic has entered the parliaments in Iceland, the United Kingdom, the Netherlands and Switzerland, where a referendum will be held on the matter (KPMG, 2016).

As highlighted and listed by Dyson, Hodgson and van Lerven (2016), academic coverage of the sovereign money system and comparable proposals for public money systems, such as full reserve banking, has also increased:

Benes and Kumhof (2012), economists at the International Monetary Fund, modelled Irving Fisher's original proposal (Fisher, 1935) as applied to the US economy in 2006 and found strong support for all of its claimed benefits. An earlier work by Joseph Huber and James Robertson (2000) updated Fisher's proposals to recognise that money, the payments system and banking in general is now electronic, rather than paper-based. The idea of public or sovereign money system – or at least some of its versions where the state or government may issue money – has also been supported by the Financial Times' chief economics commentator, Martin Wolf (2014a, 2014b), and highlighted by former chairman of the UK's

Financial Services Authority, Adair Turner (2012, 2014, 2015), former Bank of England Governor Mervyn King (2010, 2016), and a Vice-President of the European Central Bank, VitorConstâncio (2016).

Academic publications covering public money system seem to support the view that adoption of such a system would result in many economic as well as social benefits. The expected economic benefits include: reduction in public and private debt levels, safer banking system, greater economic stability, increased support to the real economy, more effective monetary policy, better government finances, lower inflation and decreased systemic risk and risk of bank runs (Dyson et al., 2016; KPMG, 2016). Social and environmental benefits include: tackling unaffordable housing, slowing the rise in inequality, improving democracy and improving sustainability. (Dyson et al., 2016)

While Guernsey seems to be a good example of a successful unconventional money system, we need to be aware that what works for one region, may not work the same way for another.

"The diversity and level of impact predicted in the academic research of public money systems indicates the importance of further research in this field. Thorough research is needed in areas such as the optimal structure of the public money system, a transition plan, payment system and monetary policy under the new system. Also, further research on the effects on public finances, financial markets, financial stability and the real economy is required." (KPMG, 2016)

SUMMARY

Bailiwick of Guernsey, similarly to Jersey and the Isle of Man is in a special position. It is an UK Crown dependency but not a member of the Commonwealth of Nations nor of the European Union. Furthermore, Guernsey is not part of France nor of the United Kingdom. The island has a long history of taking advantage of its special status. Each time a given economic activity that provided the well-being of the island started to decline – due to the changes in circumstances – the islanders found another market niche where they could succeed.

This was the case with the neutral status of the islands with the development of the 'transmitting' sea trade, with the agricultural activities of different periods, cod-trade, privateering and smuggling, with the knitting industry, with ship-building, with horticulture, and with the financial centers.

There is another reason, however, why Guernsey can be regarded as special and it is its monetary system. Contrary to most of the economies, the States here can issue their own currencies interest-free to finance their public spending. The birth of this monetary system dates back to the end of the Napoleonic wars when the economy was declining and the States could find no other option for financing the necessary reconstructions but to issue their own currencies.

Many believe that this was a critical factor in making the economy grow again and that it still plays a fundamental role in keeping it relatively stable.

Though we should not forget about the other factors that made the island's economy prosperous, and about the critics that was raised against the States monetary actions, it is worth to note that many economists, including more and more from the mainstream schools, has started to promote monetary systems similar to the one operating in Guernsey. In addition, it is important to realize that most of the

financial crisis occurred in the past were of a structural nature and therefore the development and study of structurally different monetary systems is a key element in achieving a more balanced and more predictable world.

The authors wish the current paper could, to some extent, contribute to that process.

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Original scientific paper

BROWNFIELD REGENERATION FROM THE PERSPECTIVE OF RESIDENTS: PLACE CIRCUMSTANCES VERSUS CHARACTER OF RESPONDENTS

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Abstract

Little attention is paid to the inhabitants' views of places where brownfields are localized. If the residents attract some attention in this matter, it is most often at global level, and no influence of responders' characteristics or of place of questioning on the perception of problems of brownfields is examined in more detail. However, there is a consensus among researchers that these variables have an immediate effect on perception. That is why we set the objective to assess the impact of inhabitants' characteristics and of the place of residence on the structure of preferences for various types of brownfields regeneration. Respondents were questioned in three zones (city center, vicinity of the city and the peripheral surroundings of the city) of two cities (497 respondents in Karviná and 833 respondents in České Budějovice, both Czech Republic). Socio-economic characteristics of the respondents were pursued and respondents commented on the extent of agreement with the use of existing brownfields in three defined zones of cities. The impact of origin of the resident (geographic characteristics) and of the character of the respondent (soci-economic characteristics) on a structure in preferences was studied sequentially by means of three methods of multidimensional data analysis (PCA, RDA, and Variation Partitioning). All methods led us to reveal a structure of four factors of preferences for regeneration: green/sport, housing/shopping, industry, and entertainment. Following the RDA the statistically significant variables to influence the structure of answers are both geographical variables – city, zone of a city – and three socio-economic variables – gender, age, and education. Preference for commercial-residential use of brownfields has a distinctive centre-periphery distribution within the city. The preferences of the revitalization through the reactivation of the industry are given primarily by the particular city, and the impact of both types of variables (characteristics of the respondent and the place of questioning) is significant, however the shared explainable variation is negligible (geographic variables explain 51.6% and characteristics of respondents 46.6%).

Keywords: brownfields, regeneration, perception, residents, Central Europe

INTRODUCTION

The issue of brownfields (as unused, abandoned, or neglected buildings or sites that were utilized previously) has recently been widely discussed (Burinskiene, Bielinskas, Podviezko, Gurskiene, & Maliene, 2017; Jigoria-Oprea & Popa, 2017; Longo & Campbell, 2017). Intensive discussion has taken place in many fields (Doick, Sellers, Castan-Broto, & Silverthorne, 2009; Simis, Awang, & Arifin, 2016; van Duijn, Rouwendal, & Boersema, 2016).

Thus, after years of debates, the question of brownfields formation and re-use is still an open issue (Nekolova, Hajek, & Novosak, 2016). Attitudes of stakeholders are still under study (Alexandrescu, Martinat, Klusacek, & Bartke, 2014), too. It is no surprise, that special attention is paid to the opinions and attitudes of enterprises, and of state and local administration representatives (Alexandrescu, Rizzo, Pizzol, Critto, & Marcomini, 2016; H. R. Kim & Jang, 2017; Pizzol et al., 2016; Rizzo et al., 2015). Likewise, the satisfaction of visitors with the regenerated brownfields was studied (Berki, 2017; Franz, Gueles, & Prey, 2008). Quite unexpected should be the fact, that a relatively low attention is paid to the opinions of the citizens, in the residence of which the brownfields are located. The importance of support of the local populations is pointed out to be a vital factor of success of any development (Lusticky & Musil, 2016).

For the above mentioned reasons, we have opt for the assessment of the impact of the citizens' characteristics and the impact of location on the structure of preferences for the particular type of brownfield regeneration to be the objective of this paper.

CONCEPTUAL BACKGROUND

As already mentioned above, studies dealing with the residents' opinion on regeneration of brownfields are quite rare in literature (Table 1). We can divide them into the two basic types:

- study of perception of brownfields regeneration by means of visual methods,
- study of perception of existing brownfields and residents' preferences for the revitalization of the brownfields.

Second type of studies decidedly predominates.

Table 1 Review of literature dealing with of residents' opinions

authors	dependent	independent	number of respondents	residents characteristic studied	geographical consequences studied
(E. J. Kim & Miller, 2017)	evaluation of scenes	preconception, health concerns	200	none	none
(Loures, Panagopoulos, & Burley, 2016)	evaluation of post-industrial land transformations	resident and geographical characteristic	450	age, gender, school level	parish of respondent origin
(Rink & Arndt, 2016)	evaluation of successive stages of scenes (acceptance, perception of threats, of usability, possible activities)	n.a.	281	none	none
(Kunc, Martinat, Tonev, & Frantal, 2014)	perception of brownfields	two cities	381 + 321	none	two cities
(Kunc, Navratil, et al., 2014)	perception of risks connected with brownfield, preferences for revitalization	location of brownfield, resident characteristic	not stated	age, tender, level of education	distance to brownfield prior to regeneration
(Maliene, Wignall, & Malys, 2012)	benefits and attractiveness of brownfield regeneration	two cities	50 + 50	none	two cities
(Doucet, van Kempen, & van Weesep, 2011a)	perception of regenerated brownfield	geographical consequences, age of respondents	364	age	far/close, high-income/low-income, two regenerated brownfields
(Greenberg, Craighill, Mayer, Zukin, & Wells, 2001)	willingness to move to housing built on brownfield sites	resident characteristic	779	age, gender, income	none

Kim and Miller (E. J. Kim & Miller, 2017) studied preferences for different brownfield scenes of residents for nearby brownfield sites. Six types of brownfield regeneration were examined – historical landmarks and maintained landscapes with scattered structures received the highest ratings, scenes with scruffy vegetation and plain modest rundown buildings revealed mixed preferences, and scenes with industrial remnants and crumbling industrial remnants were preferred the least. Impact of both residents' characteristic and geographical consequences were not studied.

Loures et al. (Loures et al., 2016) studied factors in landscape reclamation of resident of Lagoa, Portugal. Their main aim was to evaluate structure behind preferences for different regeneration of brownfield. The differences among residents' characteristic as well as

geographical consequences were not tested; however, it is evident from the table 4 there were great differences in perception especially regarding culture and safety among age categories as well as gender. It also seems that important differences are for mobility/accessibility item among places of residents' origin.

Rink and Arndt (Rink & Arndt, 2016) examined preferences for different successional stages of spontaneous succession and of afforestation on abandoned brownfield site in Leipzig, Germany. Households in six urban districts were selected as respondents of the survey. Authors did not test the differences possibly caused by the place of respondents' origin.

Kunc et al. (Kunc, Martinat, et al., 2014) aimed their study to the comparison of two cities. Factor compared were: awareness, urgency, rate of apprehension, brownfield regeneration policy, the most problematic localities and best practices. They found that the both cities are quite different in selected aspect. Strong negative perception by Ostrava residents in comparison to Brno residents was found. Brownfield policies as applied have caused more polarization of opinion in Ostrava than in Brno. Thus, the city is found as important factor of perception of brownfields, however, this differences were not tested by the authors.

Kunc et al. (Kunc, Navratil, et al., 2014) studied diversified structure of residents perception of South Centre of Brno, Czech Republic. They found that women are more sensitive towards environmental risks, and that younger respondents are more tolerant regarding drug dependency issues. Permanent residence distance from the studied area shows correlation for perception of air contamination by responders, who live closer to the South Centre. Gender as well as age were found not to be statistically important for preferences for new activities in South Centre. Negative correlation was identified between the locations of new usage as public recreation area.

Maliene et al. (Maliene et al., 2012) prepared detailed comparison of two waterfront brownfields – Liverpool, UK and Cologne, Germany. Results of questionnaire survey shows that regenerations are in both cities perceives as generally positive, but found was different level of satisfaction – results from Cologne were not as conclusive as Liverpool. Generally, the German public doubted that any of the city's economic and social factors would greatly benefit from the brownfield regeneration.

Doucet et al. (Doucet et al., 2011a) had concerned their work in testing the impact of geographical consequences on perception of the flagship waterfront regeneration the Kop van Zuid in Rotterdam, Netherlands. Spatial proximity was found to be the key factor influencing perception of particular brownfield regeneration. Age was also studied as predictor of

differences in perception of brownfield regeneration. Strong feelings of attachment towards a new flagship would diminish with older age groups. Authors found that both geographical consequences and residents characteristic are of importance for preferences for brownfield regeneration. However none of them were tested for statistical importance.

Greenberg et al. (Greenberg et al., 2001) studied willingness to move to housing built on brownfield sites in New Jersey, USA. Respondents thinking of moving to regenerated brownfield were relatively poor and young.

The above mentioned results of previous studies imply the importance of both the characteristic of respondents and the respondents' residence for their perception of various issues of brownfields regeneration. Researches bring miscellaneous results as for the respondents 'preferences for brownfield regenerations depending on location and character of particular brownfields under study.

Characteristics of respondents have been used as explaining variables disproportionately more often than characteristics related to the respondents' place of residence – in spite of the fact authors perceive the impact of the place of residence to be decidedly important (see the selection of respondents in most of studies.

MATERIAL AND METHODS

All data necessary to comply with the set objective were collected in a primary research by means of a questionnaire survey on a 1% representative sample.

Geographical data

The research was carried out among the citizens of two cities – Karviná and České Budějovice. These cities were selected in order to the meet the target of the paper – particularly identification of influence of various variables on the responders' answers in the survey of preferences of brownfields revitalization. Difference of attitudes of citizens of different towns and cities to the regeneration of brownfields has been already proved in the past (Kunc, Martinat, et al., 2014).

Karviná is a city located in the mining region in the eastern part of the Czech Republic. It has been city build on heavy industry and mining for the last 150 years. The recent development resulted in massive decline in population and high increase in the number of industrial brownfields (Martinat, Cyronova, Dvorak, & Klusacek, 2014; Martinat et al., 2016).

Brownfields represents in Karviná a great barrier for further development (Tureckova, Skrabal, Benda, & Martinat, 2016).

České Budějovice has been an important economic and regional centre of South Bohemian region of the Czech Republic. Brownfields in České Budějovice are mostly the former military sites and abandoned industrial objects. Many of them were already successfully redeveloped into shopping centres, administrative buildings or blocks of flats. Brownfields do not pose any important problem for the town development (Wernerova, 2008).

The 1% sample of residents in each city means 559 respondents from Karviná and 935 from České Budějovice. Final number of collected responses was from 497 residents from Karviná (which means a refusal rate of 9.0%) and 833 from České Budějovice (which correspond to a refusal rate of 10.9%).

The previously reported results state the place of survey to be an influencing factor for the perception of regeneration in a town (Doucet et al., 2011a; Doucet, van Kempen, & van Weesep, 2011b; Kunc, Navratil, et al., 2014). That is why each of the two cities was subdivided into three parts, in which respondents were questioned separately. Those parts were (i) city center including historic core with surrounding areas originated particularly in 19th century and the first half of 20th century; (ii) vicinity of the center encompassing particularly panel housing estate from the second half of 20th century; and (iii) peripheral surroundings of the city, i.e. areas representing an urbanized area, having however a rather rural character for it is a matter of original villages that have been absorbed by the city (Haggett, 2001). Numbers of respondents corresponded to the proportion of the citizenship in particular parts of each city.

Respondent data

The target group of the survey was the citizens of age (18 years and more). Respondents were invited to state some biological and socio-economical characteristics that could be related to the preference for brownfield regeneration. The first group represented gender (a bivariate variable, woman/man) and age (proportional variable, age expressed as number of years) and the second group encompassed household income (ordinal variable) and educational background (proportional variable/number of years of education);

Table 2 Data for respondents

	Karviná	České Budějovice
gender		
female	53.92%	51.50%
male	46.08%	48.50%
age *(mean)*	36.65 years	42.18 years
education *(mean)*	13.43 years	13.78 years
income		
up to 15 000 CZK	10.66%	9.24%
15 000 - 20 000 CZK	14.89%	13.21%
20 000 - 25 000 CZK	18.31%	14.05%
25 000 - 30 000 CZK	19.52%	15.97%
30 000 - 35 000 CZK	10.26%	15.73%
35 000 - 40 000 CZK	10.46%	13.21%
40 000 - 45 000 CZK	6.44%	6.96%
45 000 - 50 000 CZK	4.23%	5.88%
more than 50 000 CZK	5.23%	5.76%
n	497	833

Perception of brownfield regeneration

Perception of brownfield regeneration was studied similarly in three parts of the cities: (i) city center; (ii) vicinity of the center; and (iii) peripheral surroundings of the city. Possibilities of brownfield regeneration are immensely varied (Otsuka, Dixon, & Abe, 2013). Moreover the brownfields markedly vary according to the original use of the property, particularly between built-up area and compound in city surroundings (Frantal et al., 2015; Krejci, Dostal, Havlicek, & Martinat, 2016). For that reason two lists of brownfields were made – one for the brownfields in city centers and in vicinity of the center and another one for those in peripheral surroundings of the city.

The list of possible use for center and vicinity of the center included nine items: park, sports venue, apartment houses, commercial center, amusement center, industrial production, shopping arcades with apartments in upper floors, tourist accommodation (hotel, pension and the like), parking. The list for peripheral surroundings of the city included six items: restoration in the nature-like state, dumps, factory premises construction, starting a park, construction of an outdoor swimming facility, sports venue construction.

Respondents were asked to "state the degree of their agreement with the possibilities of brownfield regeneration". The degree of agreement with each possibility of brownfields regeneration was measured separately for each part of the studied city. This request resulted

into the list of statement on 24 items of regeneration possibilities. The degree of agreement was measured by means of a 4-point scale with the following options: 1=strongly disagree, 2=rather disagree, 3=rather agree, 4=strongly agree.

Statistical Analysis

Statistical processing draws on character of collected data and determined objective. Our aim was to assess the structure of preferences for the particular type of brownfield regeneration in different parts of cities. Since it represents groups of explained variables, the statistical processing should be based on multidimensional statistical methods (Robinson, 1998). Basic methods for such an assessment are Principal Component Analysis (PCA) and correspondence analysis (Quinn & Keough, 2002). The use of one of those methods is given particularly by the identified length of gradient calculated in multiples of the standard deviation (ter Braak & Smilauer, 2012). In our case here, the length was 1.1; we have used PCA then. To make the responses for dependent variables relative the preferences were centered prior the analyses. Since our objective is not only to assess the structure behind the preferences for the particular type of brownfield regeneration, but primarily to identify the relation of this structure on the character of respondents, the potential link between the structure of preferences and all studied independent variables was initially assessed based on biplot (ter Braak & Smilauer, 2012). The latter graph allows us to assess the mutual relation among explained variables and explaining variables that are passively projected into coordinates that are given by the structure of the explained variables.

However, the biplot based on results of PCA analysis of dependent variables is only a graphic representation without any possibility of statistical testing of the relations. In case we would like to test those relations, the employment of unconstrained method is necessary. For this reason the relation between the structure of dependent variables and the structure of independent variable was tested using Redundancy Analysis (RDA), which is an unconstrained extension of PCA analysis (Leps & Smilauer, 2003). Since we assume not all measured independent variables have to be statistically significant for the structure of preferences for brownfields regeneration, the RDA model encompassed only those variable contributing statistically significantly to the degree of explained variation of dependent variables. The selection was made by means of the method of forward selection of independent variables. Statistical significance was tested using Monte Carlo permutation test (ter Braak & Smilauer, 2012) that is based on testing a hypothesis of the non-existence of

differences between the structure of collected date and the structure of randomly arranged values of data (Good, 1995); 999 permutation (i.e.999 randomly arranged data) was used.

Results of the previous studies clearly show an existing influence of a larger number of variables on the perception of regenerations. Those, as mentioned above, are possible to divide into two different groups – variables connected with the respondent of the survey and variables connected with the place of survey. Results of RDA analysis show us a partial importance of those two groups of variables – particularly of the explained variation that is shared commonly by both those groups. Afterwards the analysis of two separate groups of independent variables – respondents' characteristics and location variables – was done. Variation Partioning for Two Groups was used in order to identify the importance of those two groups and their intersection for the preference for structure of particular possibilities of brownfield regeneration (Legendre & Legendre, 2012). Again the RDA analysis was employed with the same settings and a comparison of particular RDA models was done – separately for respondents' characteristics and for location variables.

All calculations of multidimensional analyses were done with the software CANOCO 5.0 (ter Braak & Smilauer, 2012); the implemented tool Var-part-2groups-Simple-effect was used for Variation Partioning (ter Braak & Smilauer, 2012).

RESULTS

The process of data treatment and analysis included three stages - (i) unconstrained multivariate analysis of dependent variables with passive projection of independent variables; (ii) constrained multivariate analysis with forward selection of independent variables statistically significant for the model; and (iii) variation partitioning for two groups of independent variables.

Three groups of regeneration of brownfields were identified in the first analysis (= PCA). Those groups have been named according the dependent variables as follows: industry, trade and housing, and sports and green areas (Figure 1). A completely separate group is "fun". On the contrary, it did not show in any way a tendency to create gradients associated with the place of localization of brownfields. Three main groups of variables correlate fairly well with the first two axes of the PCA. With the first axis of PCA (1st PCA axis explains 20.1% of variation in the dependent variables data) correlate best with the types of regeneration associated with residential and business features. In contrast, the regeneration of the restoration to the "natural" form hand in hand with sports types of usage are closest to the

other PCA axis (2nd PCA axis explains 12.2% of variation in the dependent variables data). Against these kinds of regeneration industrial regeneration types are distinguished along the second axis. Explaining variables were projected into the ordination diagram (biplot). From their positions in the ordination diagram, we can conclude that there is a link in the structure of preferences, types, and the areas of origin of the respondent.

On the opposite side of the 1st PCA gradient than where grow preferences for residential-business function of regeneration, is the origin of the respondent from the peripheral surroundings of the city. Against it – along the first axis of PCA – stands the origin of the respondent from the core of the city. By contrast, it came to the distinguishing of respondents from Karviná and from České Budějovice as well as men and women along a gradient of 2nd PCA axis

Figure 1 Biplot of dependent and independent variables under study. Results of PCA; first two axes shown
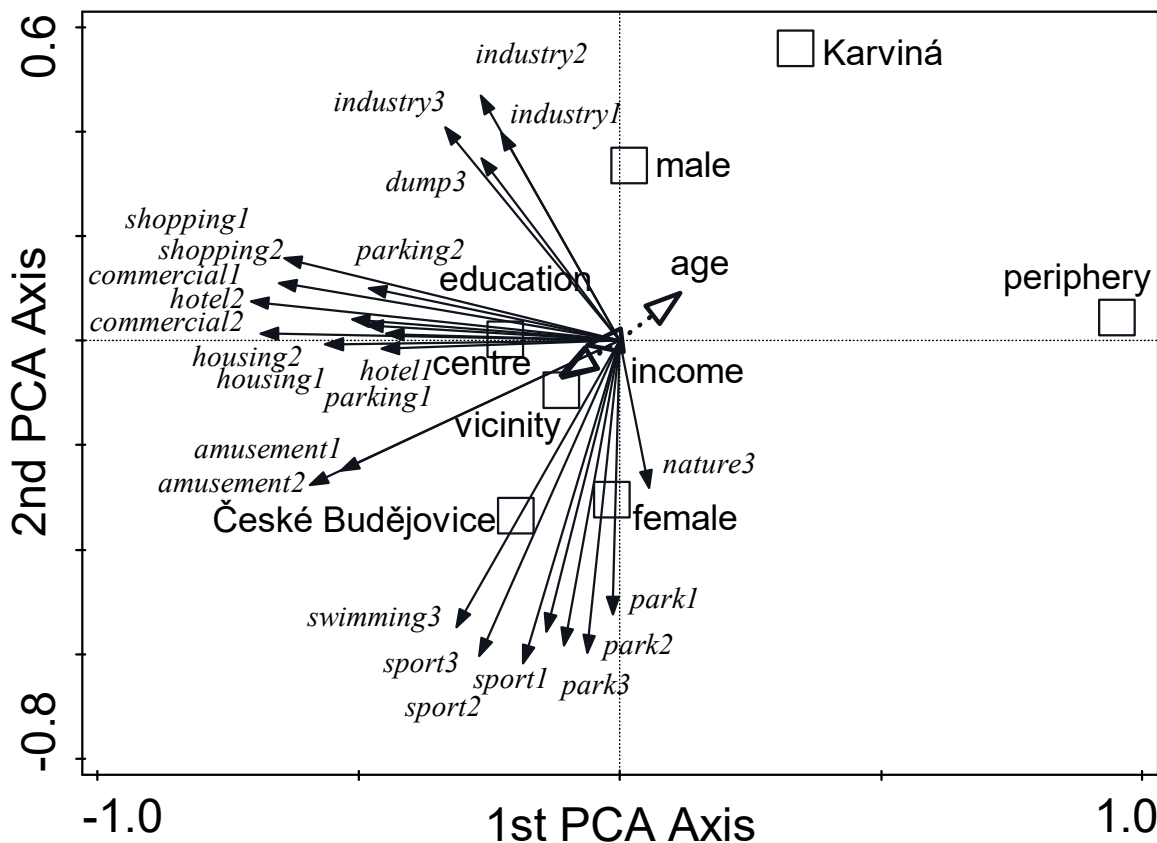
Notes: Dependent variables are in italics; city centre = 1, vicinity of the centre = 2, periphery of the city = 3; for city centre and vicinity: park = park, sport = sports venue, housing = apartment houses, commercial = commercial centre, amusement = amusement center, industrial = industrial production, shopping = shopping arcades with apartments in upper floors, hotel = tourist accommodation (hotel, pension and the like), parking = parking; for periphery: nature = restoration in the nature-like state, dumps = dumps, industry = factory premises construction, park = starting a park, swimming = construction of an outdoor swimming facility, sport = sports venue construction.

The statistical link between independent and dependent variables can, however, could be specified only by means of the constrained analysis. RDA has identified the statistical significance (at least p < .05) of the influence of all explaining variables on structure of preferences for brownfields regeneration, with the exception of household income (Figure 2, Figure 3). The clearly most important variable explaining the largest part of the explainable variation of the structure of preferences for brownfields regeneration of is a city of origin of the respondent (36.8%). An above-average rate of variation in the forest explained dependent variables was concluded only in case of age (24.8%) and of the area of origin of the respondent within the city (22.1%).

Figure 2 Biplot of independent variables under study. Results of RDA; first two axes shown; only significant independent variables entered RDA
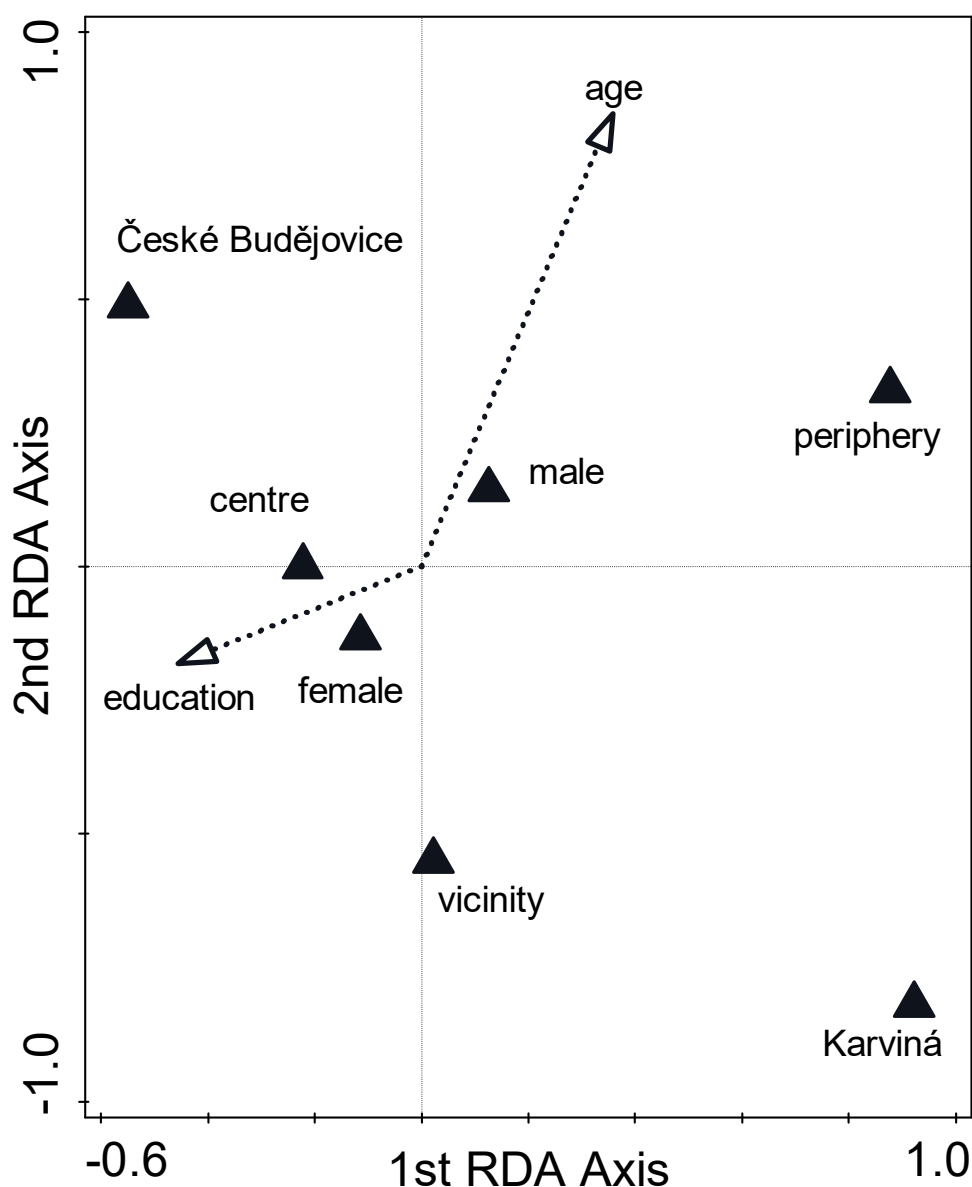
Figure 3 Biplot of dependent variables under study. Results of RDA; first two axes shown.
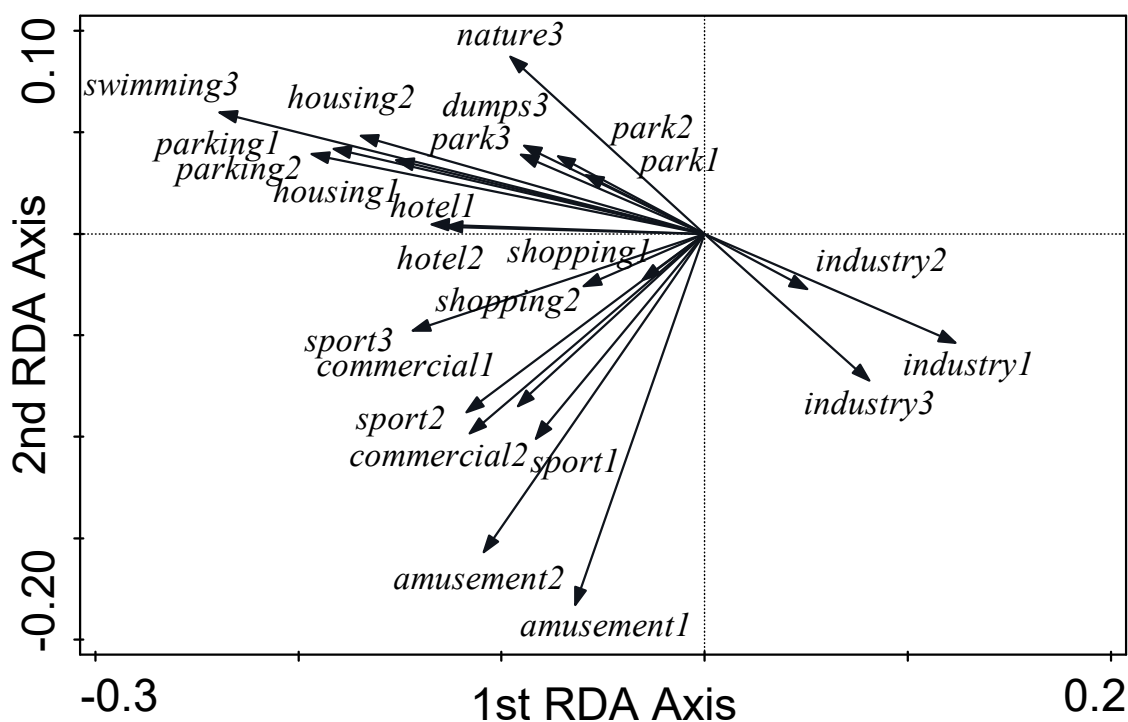
For notes please see Figure 1

The model of the RDA selected with one sole exception all studied variables. Since those variables belong to the group of variables that are related to the place of the respondent, a third test was performed with the aim to identify the relevance of both groups for explaining the variability in the responses of the responders to the preferences of the regeneration of brownfields. The result of the comparison of the two in parallel made RDA models (Figure 4) showed that the variability of the structure of preferences is statistically significantly explained by both the combination of all of the variables (F = 5.4; p < 0.001), and the group of variables that characterize the respondent (F = 4.3; p < 0.001) and a group of variables related to point (F = 6.9; p < 0.001). It follows that the location factors are statistically more significant elements of the influence on the structure of the preferences of the regeneration of brownfields. Adjusted variation explained is higher for localization variables (share = 56.6; proportion of total adjusted variation of 1.3%) than for the variables describing the inhabitants (share = 41.6; proportion of the total adjusted variation of the 0.9%). Quite surprisingly, the size of the shared variability is negligible (share = 1.9%).

Figure 4 Results of Variation Partitioning (comparison of two simultaneous RDA)
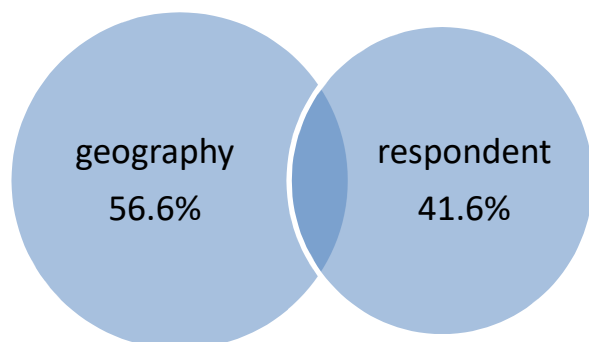
DISCUSSION

Multidimensional analysis of potential types of regeneration of brownfields in three specific areas of city made us to identify four closed group of brownfields regeneration – green/sport, housing/shopping, industry, and entertainment. Indirect ordination analysis has statistically proven that this differentiation is influenced by both the variables related to the respondent and the variables spatially oriented. From a larger amount of results the most interesting include: (1) preference for commercial-residential use of brownfields has a distinctive centre-periphery distribution, (2) preferences for the regeneration in the way of the reactivation of the industry are different between cities, (3) the effects of both types of variables (characteristics of the respondent and the place of survey) is significant, however, shared explainable variation is negligible.

Housing and shopping preferences

From the perspective of spatial structure of the city (Sykora & Mulicek, 2017), the most interesting result is the spatial aspect of perception of regeneration into a housing and shopping possibilities. This gradient in the analyzed data was identified in the PCA, as well as the RDA analysis. In both cases, it significantly correlates with the first axes of PCA and RDA. The position of the variable "place of survey" (city center– vicinity of the center – peripheral surroundings of the city) also correlates with the first axes of the PCA and the RDA. Higher level of preferences is among the residents of the city center, lower level was found in the population of the vicinity of the center and very low for the population of the peripheral surroundings of a city. So the inhabitants of city centers, when deciding on the suitability of the regeneration of brownfields, prefer the types of housing and shopping, and that in all parts of the city. In case of the population of peripheries of the cities it is the opposite.

It may be related to a perceived lack of housing on the part of inhabitants of city centers, which is usually caused by the price of housing (Ourednicek, Pospisilova, Spackova, Kopecka, & Novak, 2016) and can lead to the urban shrinking (Haase, Bernt, Grossmann, Mykhnenko, & Rink, 2016). Restoration of the residential function is then one of the basic tools of reurbanization (Haase, Herfert, Kabisch, & Steinfuhrer, 2012). This attitude may then increase the pressure on the processes of gentrification (Brade, Herfert, & Wiest, 2009; Rogatka, Chodkowska-Miszczuk, Bieganska, Sroda-Murawska, & Grzelak-Kostulska, 2016) and the creation of a business-commercial-residential blocks in the center of cities and their immediate vicinity (Bierzynski et al., 2011).

On the contrary, that lack of housing is not perceived on the periphery of cities. It may be related to processes of suburbanization that significantly interfere with social environment (Szczepanska, 2016) of rather rural or even traditional structures in peripheries of cities (Chodkowska-Miszczuk, 2014; Holesinska & Bobkova, 2015; Krzysztofik, Kantor-Pietraga, Runge, & Sporna, 2017; Novotny, Csachova, Kulla, Nestorova-Dicka, & Pregi, 2016; Nuga, Metspalu, Org, & Leetmaa, 2015). Construction of suburbia, which is usually affected by property developers and the banks rather than the local management, is generally seen more as a problem (Kahrik, Leetmaa, & Tammaru, 2012). Likewise, it is not very popular among residents of city surroundings, which is true even for cities under study (Kubes, 2015).

The problems of the construction of shopping centers are important in the area of post-socialist cities, as it fundamentally changed the spatial buying behavior of large cities and their hinterland (Klapka, Erlebach, Kral, Lehnert, & Micka, 2013; Kunc, Frantal, Tonev, & Szczyrba, 2012; Szczyrba & Fiedor, 2014). Shopping centers are often built on greenfields in a distance from an urbanized area of the city itself (Kunc, Krizan, Bilkova, Barlik, & Maryas, 2016; Maryas, Kunc, Tonev, & Szczyrba, 2014).

Industry preferences

A large number of brownfields in towns and cities has an industrial history (Frantal et al., 2015; Krzysztofik, Tkocz, Sporna, & Kantor-Pietraga, 2016; Longo & Campbell, 2017; Stasakova & Kulla, 2016). It is related to the processes of deindustrialization (Van Kempen & Murie, 2009) that affected in Europe particularly the cities of Eastern and Southeastern Europe (Heidenreich, 1994; Lorber, 2014), still grappling with a weak degree of competitiveness after the fall of the iron curtain and the controlled economy (Ianos, 2016). This deindustrialization in the major cities of the CEE countries is still in progress, unlike some rural spaces, where even the factors of "reindustrialization" appeared (Lengyel, Vas,

Kano, & Lengyel, 2017). Still, there are urban spaces, where "reindustrialization" is one of the significant elements of economic development. These areas are primarily "old" industrial areas – a typical example of CEE realm is Katowice conurbation, Poland, which is an area with original concentration of heavy industry associated with the mining of black coal (Krzysztofik, Kantor-Pietraga, & Sporna, 2013). Reindustrialization physically happened and going on especially in the automotive sector (Krzysztofik et al., 2016) and benefits from the cheap labor (Molnar, 2016).

In general, the former industrial complexes are the most commonly revitalized back into the form of industrial areas, however, the less risky areas are often also revitalized into a residential premises (Schwarz, Depken, Hanning, & Peterson, 2009). The revitalization of brownfields into a form of industrial use is specific in a complexity of influences on the decision-making process of a particular revitalization as economic, urbanistic and environmental criteria were found to be equally important for redevelopment to the industrial area (Burinskiene et al., 2017).

The regeneration into industrial sites has low support of the local population (Greenberg & Lewis, 2000; E. J. Kim & Miller, 2017) and low environmental value (Lafortezza, Corry, Sanesi, & Brown, 2008). On the other hand, it is a supported alternative from the perspective of state and local authorities, for it is an important element of development (Osman, Frantal, Klusacek, Kunc, & Martinat, 2015).

In our research, the support to the reidustrialization is clearly associated to the city. While in České Budějovice it is low, it is high in Karviná. This difference may be related to the nature of brownfields in both cities and with the problem of the industrial history and background of the town (Rall & Haase, 2011). While Karviná is a typical city in the industrial region of Ostrava (Mulkova, Popelka, & Popelkova, 2016) with high unemployment caused by the decline of industrial production (Martinat et al., 2016), České Budějovice is a city, albeit with a significant industrial history, where the deindustrialization did not fundamentally badly reflected on the socio-economic environment of the city (Wernerova, 2008). The structure of preferences depends then on the specific state of affairs of the place (in our case), in which the research is conducted.

Respondent vs. location

From the methodological point of view of research on perception of brownfields, the most interesting is the result of variation partitioning. The structure of preferences is explainable by

variables related with the characteristics of the respondent, and with the place where the respondent comes from. This finding itself is not too striking and it is assumable. A surprising result is a very small part of the jointly explained variability.

As mentioned above, a more important variable on the side of the variables associated with the place is the city of survey. So the inhabitants of different cities perceive their problems differently the specificity of the space is reflected in the responses of responders. Therefore, when making results from one city, we cannot automatically conclude the general validity of the responses of the respondents. On the other hand, it means that residents of a city perceive the issue of brownfields in relation to the situation of the city in which they live and have therefore a "relationship" to particular brownfields. Brownfields in both cases are not something that is strange for their own citizens, even if the degree of awareness among the population is very low. Even the second of used explaining variables associated with a location (the location of the questioning) has proven to be significant.

While the city is indicative for the perception of the importance of industrial sites and regeneration into free green spaces allowing sports activities, interviewing site in a city makes the affection of the respondent to the regeneration into a form of residential and business functions.

Both variables associated with the site of interviewing are more important for the explainable part of the structure of respondents answers as for their preferences for the type of regeneration of brownfields – they explain 1.36 times the value of the explained variability by the variables associated with the characteristics of the respondent.

The characteristics of the respondent, therefore, have less importance for the structure in the responses of the respondents. More important among the studied variables is particularly the age. This variable is then able to explain the last of four identified groups of preferences for brownfields regeneration, i.e. entertainment. Entertainment is more preferred by younger respondents. However, even other variables associated with the characteristics of the respondent have their importance for understanding variability in the responses – women more often than men prefer the type of regeneration into green/sport and entertainment. These types of regeneration are also more preferred by respondents with higher education.

CONCLUSION

We have succeeded, on examples of residents of two cities and originating from three parts of those cities, to identify four main factors in preferences the target use of brownfields.

However, their identification did not belong to the main objectives of this paper. Our target was primarily to assess the importance of the two groups of variables on such perception. The analyses of our research between residents imply that there is a statistically significant effect of variables from both categories on the structure in the preferences of residents. More significant is the effect of geographic variables – where the respondent comes from (from what city and what part of the city). The intersection of the influence of variables from both groups is negligible.

From a practical point of view, one of particular interesting finding is mainly the support to the reindustrialization, which is clearly linked with the city. A high support is in the city, where the industry (particularly heavy) and mining of hard coal represented the leading economic activity. Industrial (recent) history affects then the interest of the inhabitants in reindustrialization regeneration of brownfields. The second specific finding is the relation between place of residence of inhabitants and their preferences for regeneration into the form of housing and shopping. It has its importance primarily for planning the development of different sectors of the city.

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Original scientific paper

THREAT LIFE CYCLE AND ITS DYNAMICS

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Abstract

This article presents a discussion and reflection on the concept of monitoring the life cycle of threats. Furthermore, it indicates that due to the changing environmental conditions, for example, there may also be changes in the evaluation of not only the threat dynamics as a whole, but also of its various phases. This approach, with an emphasis on exploring the dynamics of each phase, is first tested on a hypothetical example. Subsequently, a verification of these considerations is conducted on the example of the development of specific threats - floods on two rivers.

Keywords: risk and uncertainty, risk management, crisis management, security, life cycle model, dynamic treatment model

INTRODUCTION

In the current terminology, the development of threats and risks is described and defined in various specified stages, which in terms of crisis management include the amount of already standardized activities and procedures (King, 2002).

In terms of effectively coping with a crisis, however, the question remains whether existing approaches, which describe the threat development, can truly capture its dynamics over time. This knowledge is liable to affect not only the managerial practices of crisis management, but also in particular the real need of the source of security crisis management in response to the dynamics of its development (the change in risk value) (Silva, & Klutle, 2016).

The notion of life cycle assessment is, besides the economic environment relating to the development of products (Hendrickson, & Horvath 1998), most frequently used in connection with the effects of the product on the environment (Jolliet et al., 2003). At present, it is often used in other scientific disciplines testing various hypotheses, e.g. biology (Erikson, 1980), psychology (Katz, & Kahn, 1978) developmental anthropology, and also in the area of security and terrorism. (Sedlačík, Odehnal, & Foltyn, 2015). This approach was the initial inspiration for particular reflection on the possible perception of natural hazards in terms of

their life cycle in a crisis management system and their subsequent monitoring as a complex process. A life cycle in its universality is a system of developmental stages or elementary stages, defined as the phase of growth, maturity and inhibition of tangible or intangible activities, i. e. the process starting with their creation and ending with their cessation. As the economic and production environment of companies and living organisms evolves, environmental changes to global or local environments occur. These changes may generate symmetric or asymmetric threats, the evolution of which may influence the entire life cycles. (Levitt, 1965).

Threat life cycle can be broadly defined in five phases – prenatal phase, phase of formation, incidence phase, phase of secondary effects, and phase of cessation. The cycle defined in this way allows the expression of certain assumptions on possible ways of threat adaptation to changing environmental conditions, representing a potential source for external and internal developmental variability of a threat. Environmental changes may significantly affect the overall progress of the threat life cycle, particularly of a natural character. The decisive evolutionary parameters influencing both internal and external threat dynamics include the criterion of "time".

Based on the life history of past threats it can be stated that the progress, and especially dynamics, of current threats have changed substantially. Today, crisis managers consider new concepts in their predictions, for example in the case of floods; they use the term "100-year or 1,000-year flood." In terms of threat development, which compared to the past means a completely different dimension of understanding of its course, the ensuing needs and their solutions. The above mentioned fact indicates not only that the life cycle changes as a whole, but also that progress and dynamism change within individual threat life cycle stages. For future crisis management it is important to see changes among the different stages of development, particularly in terms of the dynamics of their progress. Each threat's development phase may show a typical pattern of developmental changes. Individual phases may vary in the extent, rate, and nature of such changes. Transition, especially between stages of natural threats, may be affected, for example, by the extent of urbanization or other artificial human interventions in nature. Changes in the development of population lifestyle, disturbance in the balance of nature, etc., may have their impacts (Bumbová, Božek, & Čáslavský, 2012) also on the asymmetric life cycle development in the category of natural threats. Each type of threat may have a sequence of development, duration and dynamics of its stages different.

It is particularly significant for such an approach, being discussed in terms of the theory of crisis management, that it allows potential crisis situations to be inspected not only comprehensively, but also individually through different phases over time. This analytic-synthetic approach could allow a more efficient process of contingency planning, as well as the actual deployment of human, financial and material resources (Urban, 2014).

The following figure (Fig. 1) shows the threat's life cycle phases in connection with the phases of crisis management commonly defined in current literature.

Figure 1 Life-cycle phase
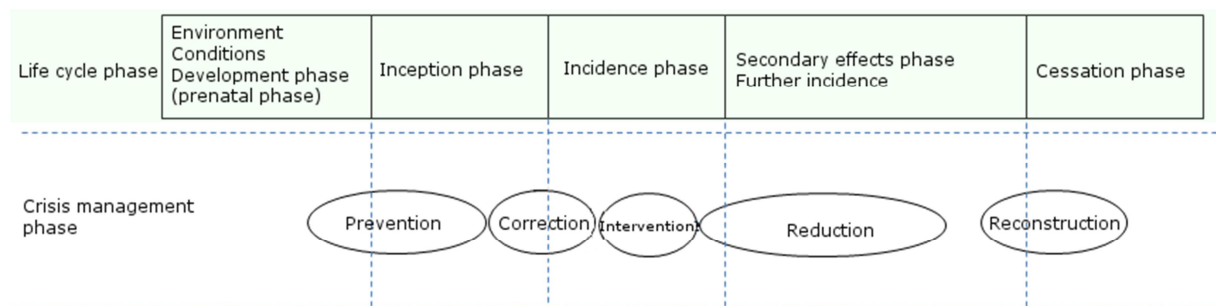
Source: Antušák & Kopecký (2003) and Hendrych (2008).

First, the so-called prenatal phase is a stage characterized by the development of conditions that pave the way of the emergence of new threats that are able to exert themselves and to have a negative effect on health, property, and the human environment. Preventive action is currently typical for crisis management, see picture above.

At the moment of imminent danger we talk, in terms of life cycle, about the stage of risk growth. For this phase the beginning of the growth of risk is typical, i.e. the likelihood that a threat with increasing time will have a negative impact on its surroundings. From the perspective of the crisis the elevation phase begins. For crisis management it means to launch first correction processes.

The next stage of the threat life cycle is "incidence". At this moment, hazard (e.g. river) begins to have negative effects on human environment (river begins to rise above its banks = flood threat). Threat goes from elevation to escalation and crisis management tries to intervene through active implementation of measures in order to reduce the risk of escalation and prevent a crisis situation from occurring.

The following phase of the life cycle is the phase of "further incidence and secondary effects" (swollen river remains in its culmination point and besides its own negative impacts it creates conditions for the occurrence of other threats; it has consequent impacts). The critical situation is in the phase of culmination and begins to pass into a state of consolidation. Crisis

management keeps reduction measures and directs the situation into the phase of restoration measures. Crisis situation ceases.

Cessation is the last stage of the threat life cycle. Due to environmental changes, the threat completely ceases, or is suppressed to a latent state. Under suitable conditions it moves to the phase of formation again.

Threat in the above discussed approach represents a multi-criterial function, the individual criteria of which are time, the probability of occurrence, and impact. Risk at different times and threat's different life cycle stages take different values. The knowledge of threat dynamics is substantial for the process of risk control and management. With a growing risk the requirement to adopt a measure that would move this risk to the area of a tolerable risk increases as well. Such measures (not only in the planning stage - preventive phase) require financial, material, and human resources. Based on the economic recognition that resources are limited, the threat assessment in terms of its life cycle allows focusing on the individual stages of risk so that we have resources allocated on a "just in time" principle, i. e. effectively.

Verification of the above mentioned considerations on threat evolution with particular emphasis on threat dynamics within each stage of its development will be conducted in two phases of testing. The first phase was based on the life-cycle model and the second phase was the data on real crisis situation from the past.

Mathematical modelling of a theoretical design of the threat life cycle function

Threat life cycle has its phases which have, in terms of time, their own sequence and continuity. The basic attribute that can be observed in these phases with respect to time, is the already mentioned level of risk, whose dynamics is captured graphically through the theoretical model of threat life cycle and its dynamics as shown in Figure 2. The first chapter includes a model which is constructed on the basis of model-set time shift values of threat development in its various phases. Thus the model allows pretesting of the expected dynamic shifts in the threat life cycle.

Figure 2 Threat Life Cycle Dynamics
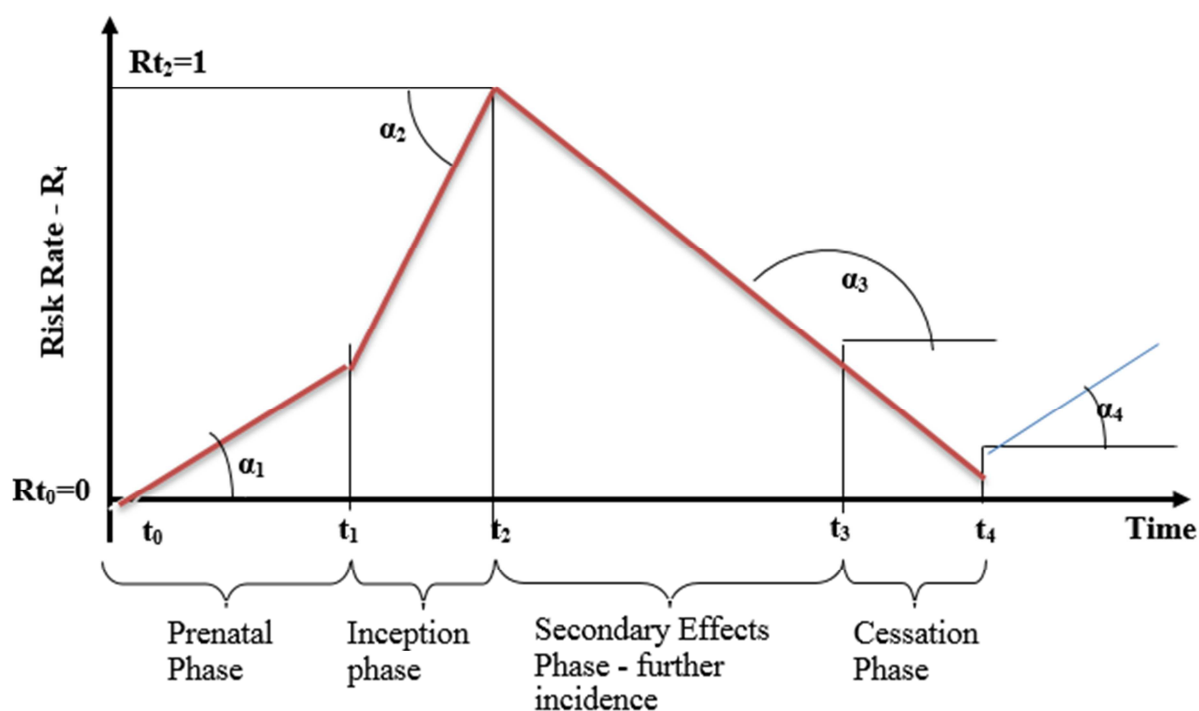
Source: Urban (2013), ti …time; Rt …risk rate at time t

Function introduced in the model defines the level of risk within each phase. When looking at the threat as a system variable in time, we get the typical curve of the course of threat risk within the entire life cycle. The function progress validity will be verified on the basis of two independent observations (real floods) in such a theoretically proposed model. The validity verification will either confirm or contradict the characteristic shape of threat life cycle function generally applicable also to other natural threats.

To verify the relationships above, a hypothetical model example with the following input values is considered. The initial time $t_0 = 0$ (the beginning of formation phase), with breakpoints at the times $t_1 = 0.5$, $t_2 = 0.8$ (the beginnings of other phases), with the transition time $t_3 = 1.6$ and the end time (threat cessation) $t_4 = 2$. Let us considered ten non-equidistant ordered pairs of values of time and degree of risk, which express the dynamic progress of threat in various stages of the life cycle, are considered: [0,0.1], [0.2,0.2], [0.5,0.3], [0.6,0.6], [0.7,0.9], [0.8,1.0], [1.0,0.8], [1.3,0.6], [1.7,0.3], [2.0,0.1].

METHODOLOGY – PIECEWISE-LINEAR APPROXIMATION FUNCTION

The above breakpoints [0.5,0.3] and [0.8,1.0] are included in the calculation always into both neighbouring approximation lines.

The first line $y = ax + b$ starting from the point [0,0.1] with the direction $a = \text{arctg } \alpha_1 > 0$ determined by the method of the smallest squares best conducted in the vicinity of the two

other points [0.2,0.2], [0.5,0.3]. The second approximation line $y = cx + d$, where $c = \text{arctg } \alpha_2 > 0$, will be determined by four points [0.5,0.3], [0.6,0.6], [0.7,0.9], [0.8,1.0]. Third approximation line $y = ex + l$ with a negative slope $e = \text{arctg } \alpha_3 < 0$ will lead near the five points [0.8,1.0], [1.0,0.8], [1.3,0.6], [1.7,0.3], [2.0,0.1].

Recall, that during a linear regression, i. e. during the approximation of given n points $[x_i, y_i]$, $i = 1,2, \dots, n$, in the plane by a line of equation of the direction form $y = kx + q$, a respective linear system of two equations by two unknown parameters k and q (i. e. normal system (1)) has the form as follows

$$k \sum_{i=1}^{n} x_i + qn = \sum_{i=1}^{n} y_i \,,$$

$$k \sum_{i=1}^{n} x_i^2 + q \sum_{i=1}^{n} x_i = \sum_{i=1}^{n} x_i y_i \,.$$

a) In case of the first approximation straight line, more specifically half line, y = ax + b, where k = a and q = b, the system of normal equations is obtained:

$$a \sum_{i=1}^{3} x_i + 3b = \sum_{i=1}^{3} y_i \,, \qquad a \sum_{i=1}^{3} x_i^2 + b \sum_{i=1}^{3} x_i = \sum_{i=1}^{3} x_i y_i$$

Because $\sum_{i=1}^{3} x_i = 0.7$, $\sum_{i=1}^{3} y_i = 0.6$, $\sum_{i=1}^{3} x_i^2 = 0.29$, $\sum_{i=1}^{3} x_i y_i = 0.19$, a set of equations is received in the form $0.7a + 3b = 0.6$, $0.29a + 0.7b = 0.19$

Solution of the system is a = 0.3947, b = 0.1079, the first approximate line (half line) thus has the equation f1: y = 0.3947x + 0.1079, so starting from the point [0,0.1079] and intersecting for example the point [0.5,0.3276].

b) Normal system (1) for the second approximation line $y = cx + d$, which is determined by four points [0.5,0.3], [0.6,0.6], [0.7,0.9], [0.8,1.0], has the form as follows

$$c \sum_{i=1}^{4} x_i + 4d = \sum_{i=1}^{4} y_i \,, \qquad c \sum_{i=1}^{4} x_i^2 + d \sum_{i=1}^{4} x_i = \sum_{i=1}^{4} x_i y_i.$$

Because $\sum_{i=1}^{4} x_i = 2.6$, $\sum_{i=1}^{4} y_i = 2.8$, $\sum_{i=1}^{4} x_i^2 = 1.74$, $\sum_{i=1}^{4} x_i y_i = 1.94$, a set of equations is received in the form

$$2.6c + 4d = 2.8 \,, 1.74c + 2.6d = 1.94.$$

Solution of the system is $c = 2.4$ a $d = -0.86$, so the second approximation line thus has the equation $f_2: y = 2.4x - 0.86$. It intersects for example points [0.5,0.34] and [0.8,1.06].

c) Normal system for the third approximation line $y = ex + l$, which is determined by five points [0.8,1.0], [1.0,0.8], [1.3,0.6], [1.7,0.3], [2.0,0.1], has the form as follows

$$e \sum_{i=1}^{5} x_i + 5l = \sum_{i=1}^{5} y_i \, , \quad e \sum_{i=1}^{5} x_i^2 + l \sum_{i=1}^{5} x_i = \sum_{i=1}^{5} x_i y_i.$$

Because $\sum_{i=1}^{5} x_i = 6.8$, $\sum_{i=1}^{5} y_i = 2.8$, $\sum_{i=1}^{5} x_i^2 = 10.22$, $\sum_{i=1}^{5} x_i y_i = 3.09$, a set of equations is received in the form

$$6.8e + 5l = 2.8 \, , \quad 10.22e + 6.8l = 3.09.$$

Solution of the system is $e = -359/486 \doteq -0.7387$ and $l = \frac{1901}{1215} \doteq 1.5646$, so the third approximation line thus has the equation $f_3: y = -0.7387x + 1.5646$, so it intersects e.g. points [0.8,0.9736] and [2.0,0.0872]. Then we find the intersection of the graphs of the first two approximation lines $y = 0.5862x$ and $y = 2.4x - 0.86$, which is the point A with the coordinates approximately [0.47,0.28], and also the intersection of the graphs of the other two approximation lines $y = 2.4x - 0.86$ a $y = -0.7387x + 1.5646$ which is the point B of coordinates approximately [0.77,0.99]. Standard error of approximation of chosen 10 points using the piecewise linear function is

$$S_f = \sqrt{\sum_{i=1}^{10} |f(x_i) - y_i|^2} \doteq \sqrt{0.0779} \doteq 0.279.$$

Figure 3 below shows the ten points in a plane considered at the beginning and the piecewise-linear approximation function.

Figure 3 Model Example - Threat Life Cycle Dynamics
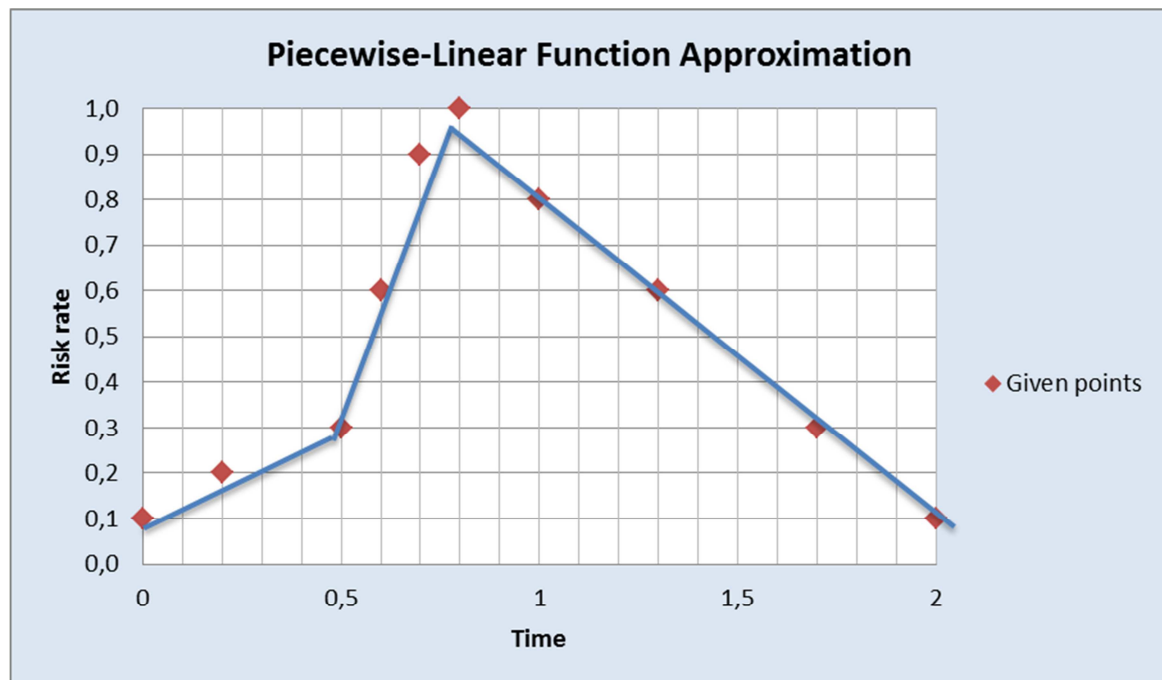
Source: own modelling

Piecewise-linear approximation function in the event of a model example demonstrates the expected risk development dynamics in threat lifecycle phases.

RESULTS - REAL EXAMPLES

The above-defined threat lifecycle model will be verified in the second stage of testing the risk dynamics development. The verification will be conducted in different phases on the data sets collected during the floods in the Czech Republic in 2013 - namely on two data sets concerning water levels of the Otava River in the town of Pisek and the Blanice River in Heřmaň settlement. The method of approximation was used for the testing while applying eight types of different functions (quadratic, cubic, etc.) – using the method of the least squares. A comparison of standard errors of these eight types of approximations implies that the significantly smallest approximation error is in case of approximation through linear toggle function, which is thus the most suitable approximation and was therefore used for the final testing. (Hasilová, 2014; Valis, Hasilova, & Leuchter, 2016).

Case 1 - The Otava River Floods in the Town of Pisek

Considered are implicit data of the Otava River levels included in the 2013 floods report (Písek Municipal Authority, 2013), (Votýpka, 2014). Data are presented in a diagram covering the time span from 30 May to 7 June 2013. Reading the diagram (Fig. 4) below, 17 data may be identified in the form of ordered pairs, the first element in which is the duration of crisis situation in the halves of day, which means it is equidistant, while the second element represents the water level in metres (rounded to nearest five centimetres): [0,1.1], [1,1.1], [2,1.15], [3,1.55], [4,1.85], [5,1.8], [6,2.2], [7,3.7], [8,4.5], [9,5.2], [10,4.85], [11,4.3], [12,3.95], [13,3.75], [14,3.45], [15,3.25], [16,3.15].

Intersections of partial linear functions – points [5,1.8] and [9,5.2] may be considered the breaking points. Relevance of points, as measured values, to the partial linear functions is determined by a graphical presentation of measured values, and so that the points [5,1.8] and [9,5.2] can be regarded as natural dividing points for each linear function.

Figure 4 The Otava River Levels in the Town of Pisek
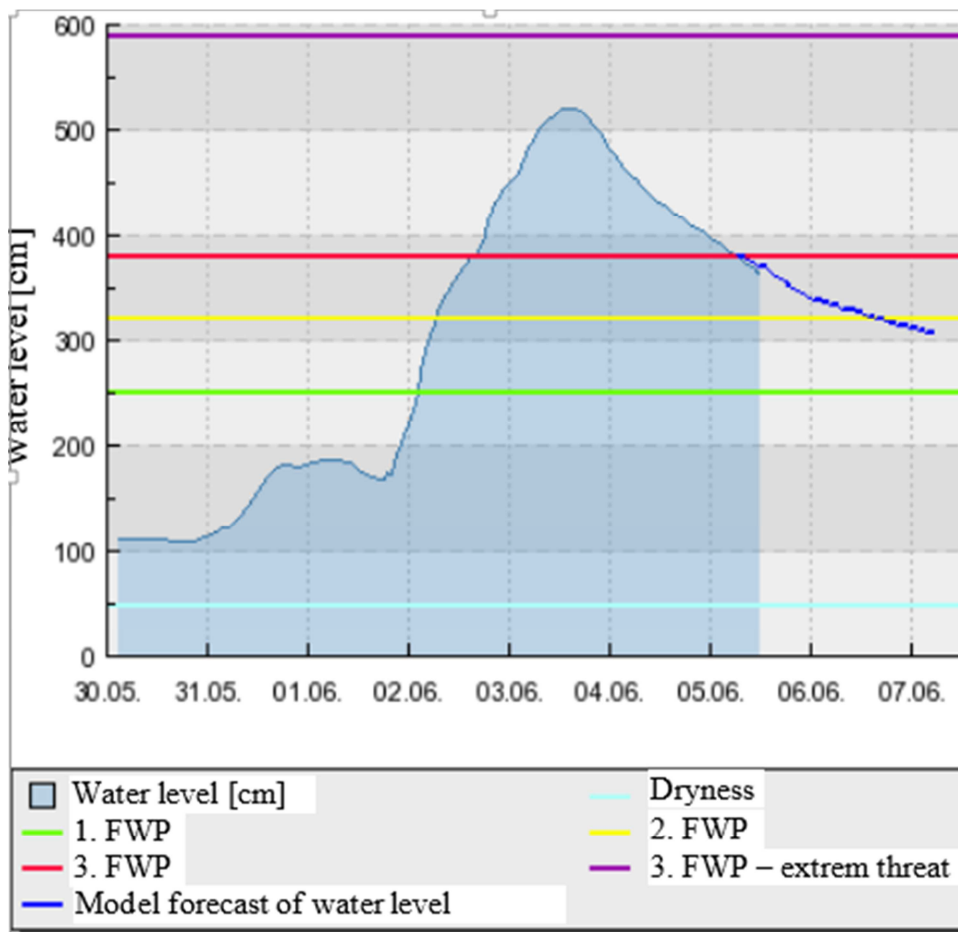
Source: Písek Municipal Authority (2013); FWP – flood warning phase

Piecewise-Linear Function Approximation

The first approximation straigh line $f_1: y = ax + b$ is determined by six points [0,1.1], [1,1.1], [2,1.15], [3,1.55], [4,1.85], [5,1.8], the second approximation straight line $f_2: y = cx + d$ is determined by five points [5,1.8], [6,2.2], [7,3.7], [8,4.5], [9,5.2] and the third approximation straight line $f_3: y = ex + l$ is determined by eight points [9,5.2], [10,4.85], [11,4.3], [12,3.95], [13,3.75], [14,3.45], [15,3.25], [16,3.15]. The related normal systems (1) get the forms as follows:

$$15a + 6b = 8.55 \, , 55a + 15b = 24.45 \, ,$$
$$35c + 5d = 17.4 \, , \quad 255c + 35d = 130.9 \, ,$$
$$100e + 8l = 31.9 \, , \quad 1292e + 100l = 386.2 \, .$$

a, c, e are real constants representing line directions, b, d, l are real constants representing the point at which the appropriate line crosses the y-axis. The solutions $a = 123/700$, $b =$

$69/70$, $c = 91/100$, $d = -289/100$, $e = -251/840$, $l = 6487/840$ determine the equations of each of the approximation lines:

$f_1: y = 0.1757x + 0.9857$, $f_2: y = 0.91x - 2.89$, $f_3: y = -0.2988x + 7.7226$.

The coordinates of the cross points of the lines f_1 and f_2 and the lines f_2 and f_3 are approximately [5.28,1.91] and [8.78,5.10]. Standard error Sf of piecewise-linear function approximation is:

$$S_f = \sqrt{\sum_{i=1}^{17}|f(x_i) - y_i|^2} \doteq \sqrt{0.4345} \doteq 0.6592.$$

The Otava River levels represented by the mentioned seventeen points in a plane and the piecewise-linear function approximation (broken line) are shown in the following diagram:

Figure 5 Threat Life Cycle Dynamics on the Otava River
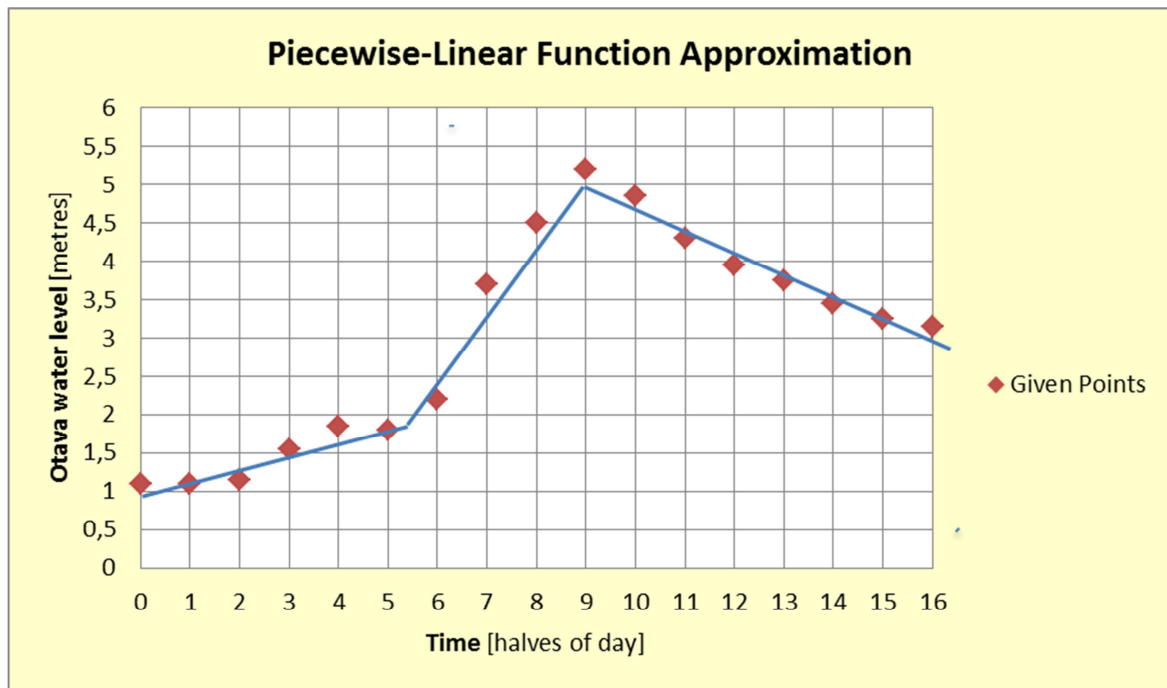
Source: own modelling

Approximation by Other Seven Types of Functions

The determined data will be approximated by seven types of functions in the following paragraphs:

quadratic function	$y = ax^2 + bx + c,$
cubic function	$y = ax^3 + bx^2 + cx + d,$
linear-exponential function	$y = a + bx + ce^{-x},$
linear-logarithmic function	$y = a + b(x + 1) + c \ln(x + 1),$
linear-irrational function	$y = a + bx + c\sqrt{x},$

linear-goniometric function

$$y = a + bx + c \sin x + d \cos x,$$

and broken rational function

$$y = a + \frac{b}{x+1} + \frac{c}{(x+1)^2}$$

The approximation by the least squares method will be done using the special packages of Maple 16 computer algebra system. The formulas for the approximation functions, approximation standard errors and Bayesian information criterion (BIC) together with the piecewise-linear function approximation are given in Table 1 below.

Table 1 The Otava River Water Level Data Approximation by Eight Types of Functions, Approximation Standard Errors and BIC

| Approximation function	Rough formula of the approximation function	Standard error	BIC
quadratic	$y = -0.0326x^2 + 0.7144x + 0.1410$	2.664	-6,345
cubic	$y = -0.0044x^3 + 0.0726x^2 + 0.0615x$ $+ 0.8771$	2.102	-11,502
linear-exponential	$y = 1.059 + 0.2741x - 0.0000003155e^x$	3.168	-0,464
linear-logarithmic	$y = 0.2033 - 0.03764x + 1.567 \ln(x+1)$	3.496	2,893
linear-irrational	$y = 0.2527 - 0.07929x + 1.289\sqrt{x}$	3.601	3,893
linear-goniometric	$y = 1.462 + 0.1909x$ $- 0.08946 \cos x$ $+ 0.005617 \sin x$	3.904	9,480
broken rational	$y = 4.8651 - 14.0515/(x+1)$ $+ 10.3747/(x+1)^2$	3.209	-0,0246
piecewise-linear	$y = 0.1757x + 0.9857, \quad x \in \langle 0, 5.28 \rangle$ $y = 0.91x - 2.89, \quad x \in \langle 5.28, 8.78 \rangle$ $y = -0.2988x + 7.7226, \quad x \in \langle 8.78, 16 \rangle$	0.659	-46,044

Source: own calculation

The comparison of the standard errors of the eight types of approximation imply that the least approximation error is for the piecewise-linear approximation function which makes this approximation most suitable one.

The Bayesian information criterion (BIC) is a criterion for model selection among a finite set of models; the model with the lowest BIC is preferred. In terms of the residual sum of squares (RSS) the BIC is:

$$BIC = n \ln \left(\frac{RSS}{n} \right) + k \ln n,$$

where n is the number of data points in x is the number of observations, or equivalently, the sample size; k is the number of free parameters to be estimated. If the model under consideration is a linear regression, k is the number of regressors, including the intercept. Piecewise linear function has the smallest value even of this criterion, therefore it is the best approximation. The graphs of all above-mentioned approximation functions are shown in Figure 6.

Figure 6 The Otava River Water Levels – Diagrams of Data and Approximation Functions
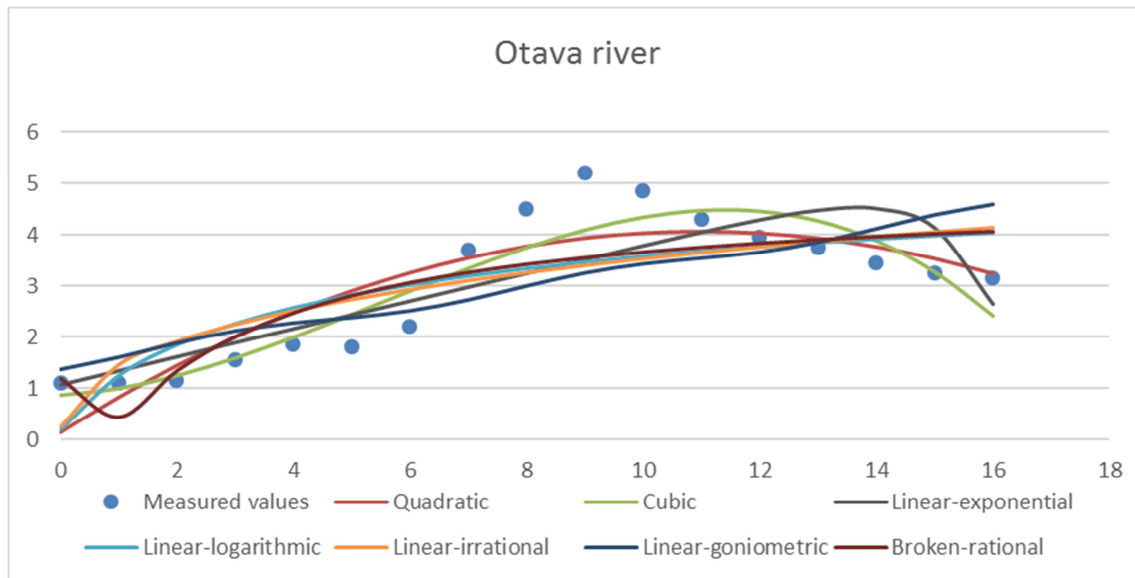
Source: own modelling

Case 2 – The Blanice River Levels in Heřmaň Settlement

The data on 17 water levels of the Blanice river in Herman settlement can be read from the graph in Figure 7, among other things. The data are in ordered pairs, where the first component is the duration of the crisis in half-days and the second component is the approximate height of the water level in meters (rounded up to five centimetres): [0,0.5], [1,0.5], [2,0.6], [3,0.75], [4,0.8], [5,0.75], [6,1.15], [7,2.05], [8,2.5], [9,2.75], [10,2.6], [11,2.45], [12,2.35], [13,2.3], [14,2.2], [15,2.15], [16,2.1].

   The points [5,0.75] and [9,2.75] may be considered the breaking points. The seventeen points will be first approximated by piecewise-linear function f composed of partial straight lines defined by the following equations in direction forms $f_1: y = ax + b$, $f_2: y = cx + d$ and $f_3: y = ex + l$, while the piecewise-linear function f will result from the lines linked in their crossing points. Here again, a, b, c, d, e, l represent real constants. The standard error S_f of this approximation will be compared to the standard errors of other functions. Then again the most suitable type of approximation will be selected.

Figure 7 The Blanice River Water Level in Heřmaň Settlement
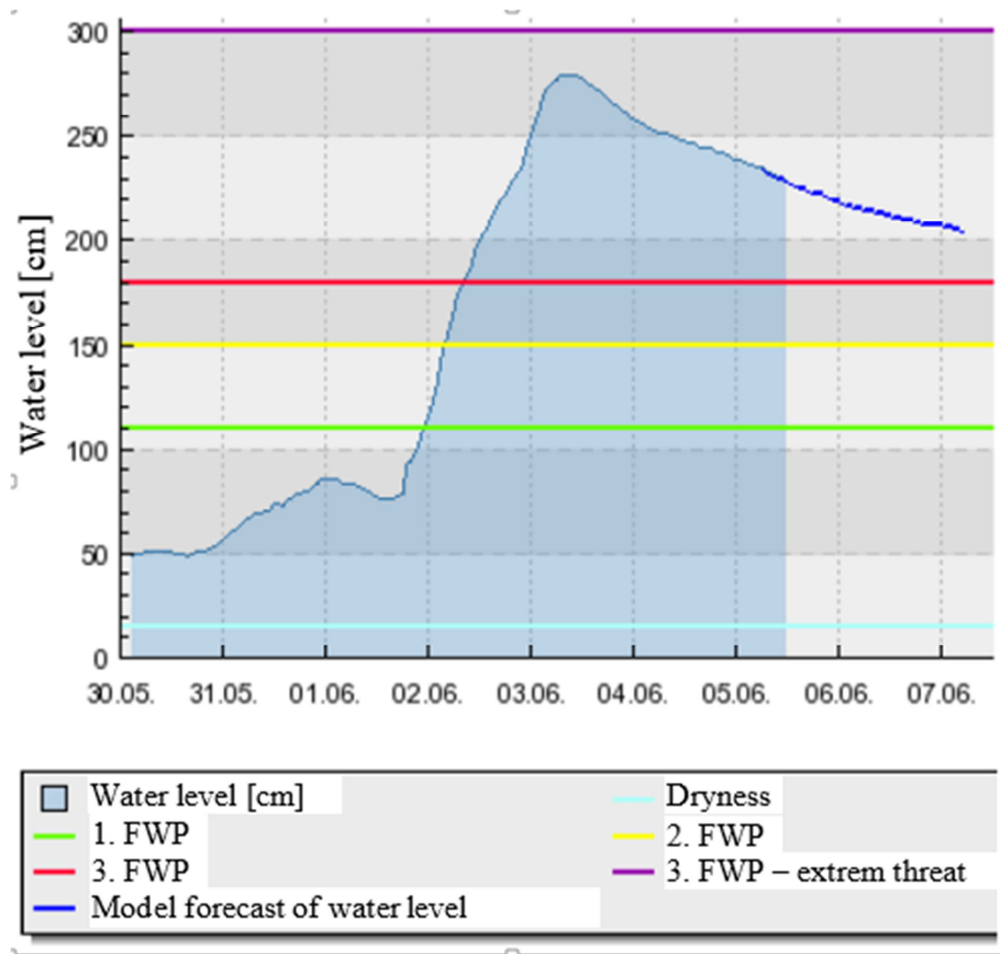
Source: (Písek Municipal Authority, 2013); FWP – flood warning phase

Piecewise-Linear Function Approximation

The first approximation line $f_1: y = ax + b$ is determined by six points [0,0.5], [1,0.5], [2,0.6], [3,0.75], [4,0.8], [5,0.75], the second approximation line $f_2: y = cx + d$ is determined by five points [5,0.75], [6,1.15], [7,2.05], [8,2.5], [9,2.75] and the third approximationline $f_3: y = ex + l$ is determined by eight points [9,2.75], [10,2.6], [11,2.45], [12,2.35], [13,2.3], [14,2.2], [15,2.15], [16,2.1]. The related normal systems (1) get the forms as follows:

$$15a + 6b = 3.9, \qquad 35c + 5d = 9.2\,, \qquad 100e + 8l = 18.9\,,$$
$$55a + 15b = 10.9, \quad 255c + 35d = 69.75\,, \qquad 1292e + 100l = 232.45\,.$$

The solutions $a = 23/350$, $b = 17/35$, $c = 535/1000$, $d = -1905/1000$, $e = -19/210, l = 5869/1680$ determine the approximation lines:

$$f_1: y = 0.0657x + 0.4857, f_2: y = 0.535x - 1.905, f_3: y = -0.0905x + 3.4935\,.$$

The coordinates of the cross points of the lines f_1 and f_2 and the lines f_2 and f_3 are approximately [5.09,0.82] and [8.63,2.71]. Standard error of piecewise-linear function

approximation $S_f = \sqrt{\sum_{i=1}^{17}|f(x_i) - y_i|^2} \doteq \sqrt{0.1131} \doteq 0.3363$. The seventeen points in a

plane and the approximations are shown in the Figure 8.

Figure 8 Threat Life Cycle Dynamics on the Blanice River
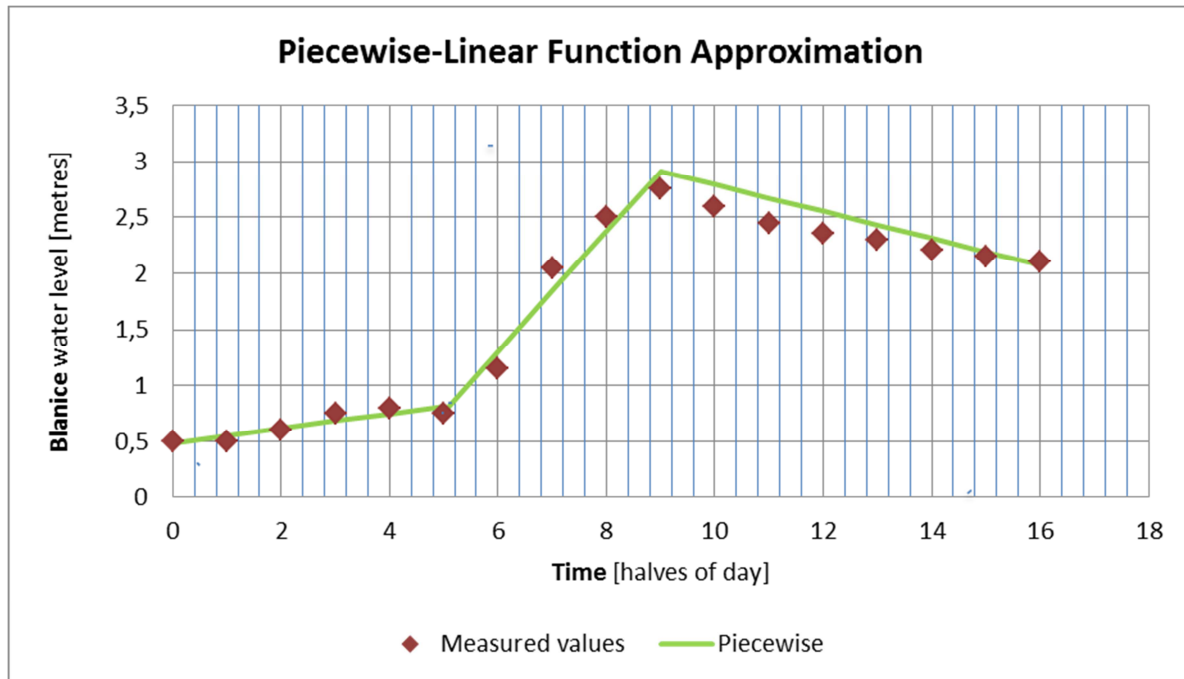
Source: own modelling

Approximation by Other Seven Types of Functions

The given data have been further approximated by the same seven types of functions as in case of the first case study using analogous procedure. Table 2 below contains formulas for the functions and standard errors of approximation by the least squares method using Maple 16 system.

Table 2 The Blanice River Water Level Data Approximation by Eight Types of Functions, Approximation Standard Errors and BIC

Approximation function	Rough formula of the approximation function	Stand.error	BIC
quadratic	$y = -0.01441x^2 + 0.3693x - 0.009701$	1.473	-26.501
cubic	$y = -0.002522x^3 + 0.04612x^2$ $+ 0.06495x + 0.4114$	1.132	0.2794
linear-exponential	$y = 0.3816 + 0.1776x - 0.000000152e^x$	1.598	-23.728
linear-logarithmic	$y = 0.08008 + 0.04801x$ $+ 0.6151\ln(x + 1)$	1.817	-19.353
linear-irrational	$y = 0.1094 + 0.03394x + 0.4953\sqrt{x}$	1.853	-18.701

Table 2 (continued)

Approximation function	Rough formula of the approximation function	Stand.error	BIC
linear-goniometric	$y = 0.5584 + 0.1387$ $- 0.01467 \cos x$ $+ 0.08726 \sin x$	1.928	-14.215
broken rational	$y = 2.9304 - 9.5033/(x + 1)$ $+ 7.1608/(x + 1)^2$	1.688	-21.873
piecewise-linear	$y = 0.0657x + 0.4857, \quad x \in \langle 0, 5.09 \rangle$ $y = 0.535x - 1.905, \quad x \in \langle 5.09, 8.63 \rangle$ $y = -0.0905x + 3.4935, \quad x \in \langle 8.63, 16 \rangle$	0.336	-65.375

Source: own calculation

The diagrams of all above-mentioned approximation functions are showed in Figure 9.

Figure 9: The Blanice River Water Level – Diagram of Data and Approximation Functions
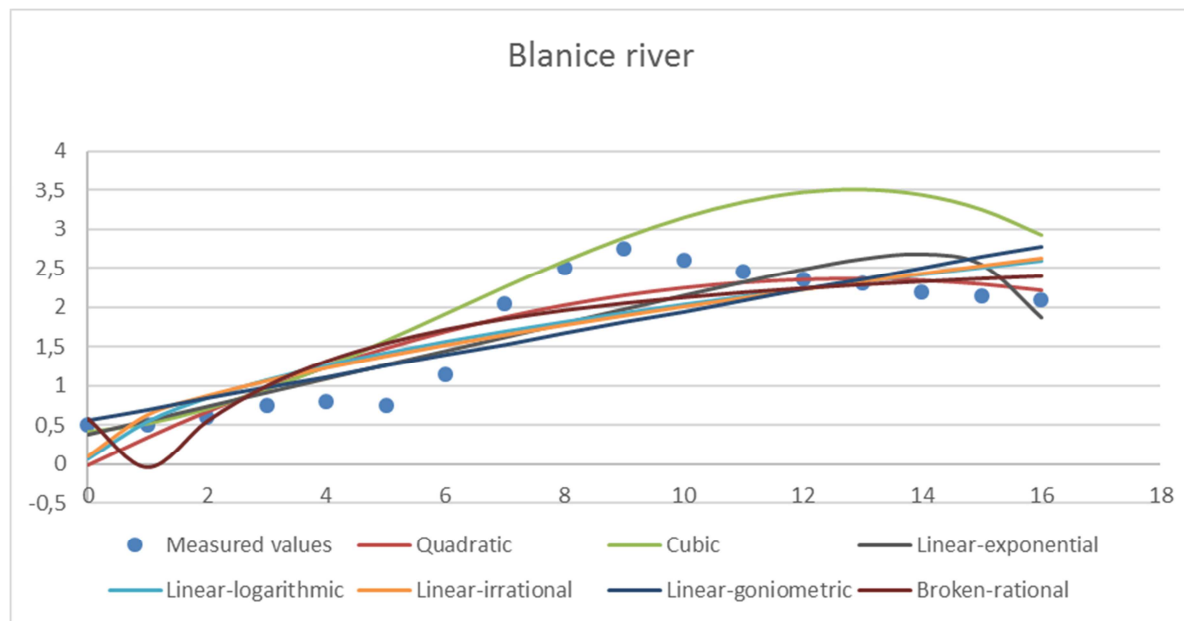
Source: own modelling

DISCUSSION AND CONCLUSION

Based on the comparison of approximation standard errors with the Bayesian information criterion and its outcomes shown in Tables 1 and 2 it may be stated that the piecewise-linear model of threat life cycle and risk dynamics presented at the beginning of the paper has been successfully verified on two sets of data as being the most suitable model out of all the considered approximations. The theoretical course (dynamics) of threat has been confirmed in individual phases of threat life cycle as indicated in Figure 2 "Threat life cycle dynamics" for a particular flood threat. The verification has been based on mathematical tools and tested data acquired during two floods (see Fig. 5 and Fig. 8).

The primary lesson learned by crisis managers is that the proven threat dynamics development in each of its phases has a significant value that can consequently affect the whole process of dealing with the threat.

Mathematical and statistical verification based on available realistic data on the 2013 floods in the Czech Republic, confirmed a match between the theoretical assumption and the actual course - the threat life cycle dynamics. It has been proven that it is possible not only to model the progress value of risk in individual developmental stages of threat, but also, through collecting systemically the necessary data in the process of risk communication, to create a possible basis for predicting the threat life cycle in relation to the examined area, when exact statistical methods are applied. This approach would allow monitoring of the life history (life story) of a threat, which has been historically evolving in the given territory. Taking the above mentioned contexts into consideration could contribute to a better prediction of threats depending on the evolution of life of the society.

Ultimately, such awareness can contribute to the improvement not only in the crisis management process, but also in the allocation of necessary financial and material resources for the different developmental threat stages in the context of eliminating their negative impacts.

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Original scientific paper

THE CZECH REPUBLIC SUGAR MARKET DEVELOPMENT IN THE CONTEXT OF THE PHASING OUT OF SUGAR QUOTA

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Abstract

The aim of the paper is to assess the current position and situation of the Czech sugar market actors. The new situation is expected due to the declared phasing of out of sugar quota with the EU Common Agriculture Policy. The analysis is based on secondary date from the statistics of the Czech Statistical Office and the Ministry of Agriculture of the Czech Republic. Czech Republic has a long strong tradition in sugar production. It lost a leading position in the sugar market in the past. The sugar industry has been affected by various factors during several periods. The last big challenge for the market was the restricting system of the Common Agriculture Policy of the European Union. The expected development of the sugar market in the no-quota environment could be a good opportunity for both Czech sugar beet producers and sugar beet manufacturers (sugar producers).

Keywords: sugar quota abolishment, market, sugar beet, European Union

INTRODUCTION

Quota limits on sugar production, defined at EU Member State level and further allocated over processing factories and individual sugar beet growers, have been in place since 1960s. The European agricultural market has been criticized for its heavy regulations and subsidization. The sugar market is one of the most regulated ones (Benešová, Řezbová, Smutka, & Laputková, 2015). One result of this policy was that the EU had been both the second largest importer and second largest exporter in the world market (Moyo, & Spreen, 2011). On the other hand, the impact of the EU Common Agriculture Policy (CAP) on the food prices has gradually weakened (Swinnen, Knops, & van Herck, 2015). It relates with several reasons, next to the other factors of world agriculture and world market development, we have also to admit that the CAP changed their priorities and concepts. The most important seems to be a change in the direct payment character as to their separation from production ("decoupling"), so that such payments would be conditional on the fulfillment of many

standards relating to environmental protection, animal welfare, food safety and food quality (Bečvářová, 2011).

The Czech sugar industry was influenced by a dramatic transition process, which was accompanied by many changes as for example: Many sugar factories reduced their production, or closed down completely; there were changes of ownership and increased role of foreign (often unpredictable) investors, modifications of sugar distribution nets and technological innovations (Krejčí, Havlíček, Klusáček, and Martinát, 2014).

In 2006, a reform of the Common Agricultural Policy (CAP) sugar regime brought a simplification of the quota structure, and incentives were offered to Member States that opted to reduce – or renounce altogether – their national quota limits. Quotas were prolonged until 2014/15, with no commitment to further renewal. Actually, they were finally prolonged till the end of 2016/2017 to be definitely abolished by 30th September 2017. The basic aim of Sugar reforms, which was submitted to the EU Commission and has been approved by the Council of Ministers in November 2005, was to minimize the price and production of sugar, mainly at the expense of the least competitive growers and sugar areas, increase the competitiveness and to make the European market more accessible for developing countries (Krouský, 2008).

In general terms, the EU CAP sugar regime led to an oligopolistic market situation in the European Union. Current EU sugar production is concentrated in five countries (France, Germany, Poland, Great Britain and Netherlands. Some countries discontinued sugar production (Portugal, Ireland, Latvia, Bulgaria and Slovenia). Other countries (including the Czech Republic) reduced the production (Baudisová, 2017). Majority of sugar quotas are controlled by companies headquartered in Germany, France, the Netherlands and the United Kingdom. In nowadays - the sugar quota system in the European Union is operated/controlled by only a few very powerful operators: Südzucker, Nordzucker, Tereos, ABF, Pfeifer & Langen, Royal Cosun and Cristal Union (Řezbová, Maitah, & Sergienko, 2015). Sugar in the EU has been one of the most heavily subsidized sectors (Gotor, & Tsigas, 2011).

The basic change in the sugar market from 1st October 2017 is then the end of production quotas, which was for the Czech Republic 372,459.207 t of sugar - divided among five sugar companies. The 1st October means the beginning of the period of unregulated sugar production in the EU as well as of the export of sugar to third countries. Sugar factories will no longer pay production batch of sugar (EUR 12/t) and fixed minimum sugar beet price (EUR 26.29/t) ceases to apply, by means of which the grower has so far been "protected". Also the over-quota sugar mode ends. This system set out how to deal with the "excess"

sugar. With regard to the export of sugar to third countries, quantitative restrictions on exports of the over-quota sugar ceases to apply. Other international agreements will not change and will continue to be in force.

System of the market order through production quotas has ensured a balance of supply and demand, so that there were no stronger price fluctuations. For many reasons a decrease of sugar prices should be expected (Burrell, Himics, Van Doorslaer, Ciaian, & Shrestha, 2014). . The reasons for the decline in sugar prices are, however, more numerous. In addition to the quota abolishing, there are excellent sugar beet yields in the zone of Central Europe and the high increase in some areas of growing countries. The price is, of course influenced also by the world price for sugar (Smutka, Rumánková, Pulkrábek, & Benešová, 2013). Further development of the EU sugar market depends also on behaviour of sugar producers from out of the European Union who have made imports thanks to the preferential access to the EU market (Meyer et al., 2016).

Another question is the link of growing sugar beet and the topical problems of sustainable development. Sustainability concerns have a fundamental economic aspect regarding competitiveness with cane sugar (Řezbová, Maitah, & Sergienko, 2015) and an environmental aspect including mainly the current issue of emissions and foreign chemical substances (Chochola, Pulkrábek, 2012).

The aim of the paper is to assess the current position and situation of the Czech sugar market actors.

METHODS

Secondary data were collected from the statistics of the Czech Statistical Office and the Ministry of Agriculture of the Czech Republic. Data were projected by means of Microsoft Excel.

In order to project the development trend, the polynomial function was imployed, as follows:

$$f: y = a_n n^n + a_{n-1} x^{n-1} + \dots + a_2 x^2 + a_1 x + a_0$$

where a_n, a_{n-1}, …, a_2, a_1, $a_0 \in R$, $a_n \neq 0$, are real cofficients

a_n = coefficient of degree n (for the highest square number),

a_k = coefficient of degree k,

a_1 = coefficient of linear term, $a_1 x$ linear term,

a_0 = absolute term.

RESULTS

The total volume of the processed sugar beet has increased in long term. After a several-years decrease in the early period of applying the Common Market Organization (CMO) in the Czech Republic (since 2000), the sugar beet production and procession regained and later even surpassed their previous quantities. The biggest quantity jump has come in 2011/2012, when the year-on-year increase of the quantity was 656,790 tons of the processed sugar beet, i.e 22.5%. Not only in case of the sugar beet production but even the sugar production achieved the best results in previous history of the Czech Republic (Froněk, Trnková, & Hanák, 2012). The overall increasing trend since 2008 was confirmed by the polynomial regression (see Fig. 1). The value of the regression coefficient (coefficient of determination) is high and the test was significant.

Figure 1 Evolution of the volume of processed sugar beet
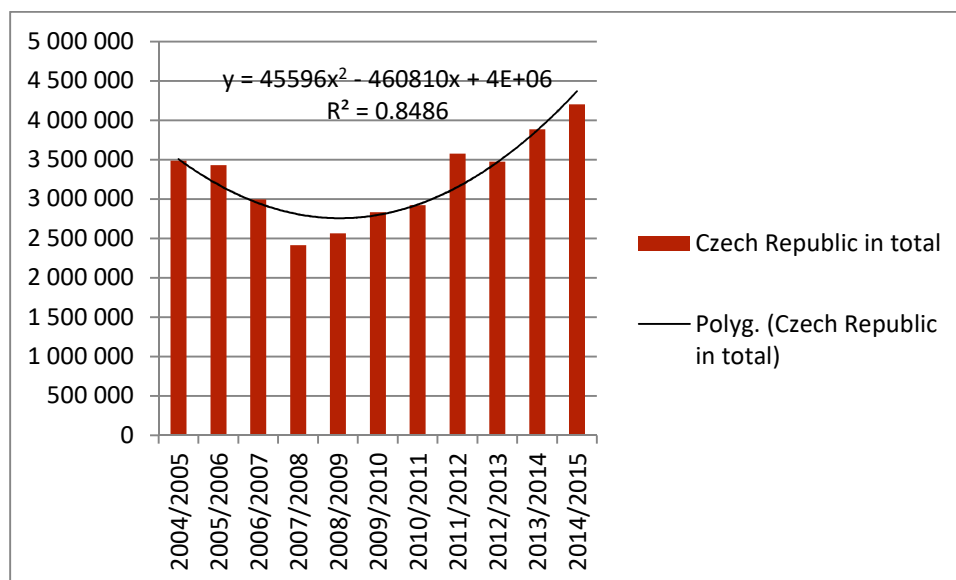
Variability in the volume of processed sugar beet is significantly (84.86%) explained by the evolution in time. This was achieved after the removal of significant outlying value in 2015/2016, where there was an important decrease in harvest areas and at the same time a significant decrease of the yield was recorded (see table). The yield was affected by significantly higher temperatures against the long-term normal (Gebler & Kožnarová, 2016). The range of harvest area is in the plans for the following years returning to the previous level. Beets are currently grown exclusively in the areas where they thrive. Both the yields and the sugar content are growing in the long term and are on a comparable level with the developed European countries (Reinbergr, 2017). The development of the volume of

processed sugar beet corresponds with the statistics on the yield (quantity of harvested tubers, Tab. 1) and the harvested area (Tab. 2).

Table 1 Yield of tubers

Campaign	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Yield (t/ha)	50.57	54.31	53.64	54.71	58.31	60.94	59.34
Campaign	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	
Yield (t/ha)	71.26	67.16	62.79	78.11	60.94	71.23	

Source: Statistika komodity cukr - cukrová řepa v České republice. 2016 Retrieved from http://www.cukr-listy.cz/dokumenty/mze/statistika-CZ-01112016.pdf

Table 2 Harvested area

Campaign	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Area (ha)	68 970	63 170	55 801	44 137	43 987	46 472	49 257
Campaign	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	
Area (ha)	50 184	51 727	52 691	53 771	44 978	52 340	

Source: Statistika komodity cukr - cukrová řepa v České republice. 2016 Retrieved from http://www.cukr-listy.cz/dokumenty/mze/statistika-CZ-01112016.pdf

Production of sugar constantly overpasses the needs of the country. Czech Republic is self-sufficient in this commodity and export sugar to other countries (as implied from the Tab. 1, 2 and 3).

Table 3 Country's consumption:

Year	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	2010/2011
Consumption (1,000 t)	336,3	451,8	514,0	395,5	351,3	393,1	437,1
Year	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	
Consumption (1,000 t)	497,9	518,8	418,2	437,9	416,2		

Source: Froněk, D. Trnková, J. and Hanák, J. (2012), Froněk, D. Trnková, J., Hanák, J. (2016), Adamec, R., Froněk, D. (2010).

Thanks to the fact that countries such as Hungary, Slovakia, Romania or Ukraine will be very probably in sugar production deficit even in future, Czech producers could look out for a very interesting market in the region of Central and Eastern Europe with up to 70 million potential customers. The undoubted advantage of the Czech Republic is also a greater distance from the sea that protects it from imports of white sugar and as well as from imports of raw sugar for further refining. The latter imports, indeed, are likely to be economically disadvantageous due to the proximity of raw and white sugar prices overall (Reinbergr 2017).

Table 4 Development of average consumer prices of crystal sugar (CZK)

	2nd week	7th week	11th week	15th week	19th week	24th week	28th week	32nd week	37th week	41st week	46th week	50th week
2016	15.66	15.62	16.06	16.48	16.64	16.72	17.86	18.23	18.70	19.32	19.42	20.34
2015	19.46	20.12	19.36	19.49	19.09	17.45	17.48	17.62	16.65	16.04	15.17	15.64
2014	24.27	24.02	23.90	23.09	23.29	22.63	21.72	21.62	20.97	19.67	19.72	19.40

Source of data: Czech statistical office - https://vdb.czso.cz/vdbvo2/faces/cs/index.jsf?page=statistiky&katalog=31779

Table 5 Development of average prices of producers of granulated sugar (CZK)

	January	February	March	April	May	June
2016	12,46	12,40	12,31	12,35	12,35	12,30
2015	12,74	12,43	12,29	12,02	12,01	12,01
2014	17,29	17,10	17,01	16,49	15,91	15,98
	July	August	September	October	November	December
2016	12,36	12,36	12,52	12,83	13,13	13,08
2015	11,88	11,87	11,81	11,95	12,18	12,35
2014	15,51	15,31	15,31	14,66	13,70	13,13

Source of data: Czech statistical office - https://www.czso.cz/csu/czso/setreni-prumernych-cen-vybranych-vyrobku-potravinarske-vyrobky-casove-rady

DISCUSSION

The growth (or regrowth) of the harvest area in the Czech Republic since 2009, hand in hand with the improving yield could promise a good potential of Czech producers for exporting sugar (seeing the fact the consumption of the domestic market is surpassed by the production. A question remained, what will be the evolution of the market after the EU quota abolition. If we would look for a parallel, we can see the situation after the recent milk quota abolition, even though the particular factors should not be absolutely the same (Kovářová and Procházková, 2017). There was a slight price reduction as expected by OECD and FAO (2014). However, the effect of the no-quota environment was not very visible in the context of influence of other factors of the dairy market (Salou et al., 2017).

A very few studies (compared to the studies preceding the phasing out of dairy quotas) have been devoted to the scenarios of the sugar market development after phasing out of sugar quotas. OECD-FAO Agricultural Outlook 2014 has predicted the possible development if both situations - the quotas will continue and the quota will be removed. In case of the sugar quota abolishing the sugar beet production is expected to rise as well as the production of isoglucose. The processing of the sugar beet for sugar is expected to increase at the expense of the ethanol production. The price could slightly decrease, but the world price would remain strongly volatile. A lower price of sugar could lead producers using sweeteners to switch from

other sweeteners to sugar. Lower price of sugar could also lead to the decrease of sugar import to the EU, as it would be no more cost-effective for cane sugar producers.

CONCLUSION

In the no-quota environment, sugar beet producers get a good opportunity to raise their production. Sugar beet manufacturers will be to consider their focus on sugar and/or ethanol production. Sugar production still seems to be more profitable than ethanol, so that with no limits to sugar production and a potential to market it the choice for sugar production could be expected. However, Czech sugar beet manufacturers have recently invested into the ethanol production technology. Namely in the periods of lower prices of sugar, there is a good potential to export sugar to our European countries who are not self-sufficient in the sugar production.

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Professional paper

THE WILLINGNESS AND PREPAREDNESS OF LOCAL GOVERNMENTS IN AP VOJVODINA/SERBIA TO GRIP AND USE DEVELOPMENT FUNDS OF THE EUROPEAN UNION

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Abstract

EU funds that are available in Serbia are modest both in volume and number, since Serbia received pre-accession status only in 2014. Before that, it was only a potential pre-accession country on the external border of the European Union. From the five components of IPA (2007-2013) Serbia could have utilised only the first two components in the pre-accession process: building of EU institutions (EXCHANGE I-IV, Regional Socio-Economic Development Programme) and enhancing cross-border cooperation As a conclusion we can say that although substantial sums were invested from the above mentioned resources into the economy of Vojvodina for its development, the main indicator – the GDP – has been increasing only slightly, while these projects have no effects on decreasing unemployment. In the overall economic situation, unemployment is primarily decreased by emigration, in which Vojvodina Hungarians take part at a rate above the average compared to their headcount, thus decreasing the economic power of the community through emigration.

Keywords: Vojvodina/Serbia, EU subsidies, local governments

INTRODUCTION

After the political changes in Serbia in 2000, the European Union provided programming opportunities to the Autonomous Province of Vojvodina already in 2003, followed by available development funds within PHARE CBC programme in 2004 and 2005, while the province as a bordering region of Hungary and Romania got additional development subsidies from 2006 to 2009 due to CARDS programmes.

In the 2007–2013 programming period, development resources were available to Serbia in two components of the IPA[1] programme (Transition Assistance and Institution Building; Cross-Border Co–operation). These funds were at disposal not only to Vojvodina, but to Serbia and its neighbours as well, within cross-border programmes, while they also enabled development projects inside the country. This programme has been of greater importance to

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[1] Instrument for Pre Accession Programme

Vojvodina, since it is bordering with Hungary, Romania, Croatia, and even with Bosnia and Herzegovina on a shorter border section, thus the implementation of IPA CBC programmes could have started (Ricz-Nagy-Juhász, 2015).

1. EU subsidies available in Serbia

EU funds that are available in Serbia are modest both in volume and number, since Serbia received pre-accession status only in 2014. Before that, it was only a potential pre-accession country on the external border of the European Union. In the following subsection we enumerate the most important EU programmes where municipalities from Vojvodina could apply.

IPA (2007-2013)

IPA is the Instrument for Pre-Accession provided by the EU, which substitutes a range of community programmes and financial resources intended for candidate and potentially candidate countries. It primarily helps the building of pre-accession institutional capacities, being expected to lead to positive and progressive development in the region and in the acceding states.

From the five components12 of IPA (2007-2013) Serbia could have utilised only the first two components in the pre-accession process: building of EU institutions (EXCHANGE I-IV, Regional Socio-Economic Development Programme) and enhancing cross-border cooperation.

Exchange I - IV

The topics of this programme are aimed at novel and effective management in local governments, involving developments in work organisation of financial, economic, educational, communal, environmental, and local government offices. EXCHANGE I was intended for improving innovative customer service in local governments, presenting local officers the best practices of local governments in EU Member States. In the framework of the Permanent Conference of Cities, EXCHNAGE II supported capacity building of local self-governments and the harmonisation of national and EU legislation, which resulted in the

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[12] The IPA 2007-2013 (IPA I) is made up of five different components: 1. Assistance for transition and institution building; 2. Cross-border cooperation (with EU Member States and other countries eligible for IPA); 3. Regional development (transport, environment, regional and economic development); 4. Human resources (strengthening human capital and combating exclusion); 5. Rural development.

completion of the Serbian Local Development Rules for the Serbian local authorities, containing the standards of local planning. EXCHNAGE III supported the participation of local governments in decentralisation processes in accordance with EU standards and their further capacity building.

Regional Socio-Economic Development Programme

The key objective of the IPA I Regional Socio-Economic Development Programme was to support balanced regional development in favour of EU accession through the promotion of regional development agencies, support for the development of inter-municipal relations and the promotion of Grant Schemes.

Until the completion of the RSEDP programme, the EU Delegation in Serbia had continuous cooperation with the Ministry of Economic and Regional Development and the National Agency for Regional Development, as well as with local governments and regional development agencies, in order to strengthen the capacities needed to prepare spatial development strategies that are in line with national development priorities and are reflected in local and regional programmes and projects, thus contributing to the creation of a business environment with same opportunities, competitive operation and balanced territorial development.

IPA I (Component 2) – Assistance to cross-border cooperation

Component 2 focuses on strengthening cross-border links through joint local and regional initiatives, aimed at sustainable economic, social and environmental development in the fields of environment and nature conservation, common cultural heritage protection, public health, fight against organised crime and safe border protection, as well as supporting local initiatives in the common border region.

Europe for Citizens (program directly from Brussels)

The aim of the programme is to get the citizens acquainted with the EU and its history, to present the differences and varieties within the EU, as well as to promote the conditions for citizens' and democratic participation, over building Europe awareness and European values, and preparing for intercultural dialogue.

SEE – South East Europe programme

This programme for interregional cooperation supported joint development projects of the Western Balkans and the Central and Eastern Europe. The SEE programme is the continuation of the CADSES programme.

2. The impact of EU subsidies in Serbia concerning local governments

The number of projects implemented by local governments (municipalities) was 256. However, regarding the size and spatial distribution of subsidies, there are large differences in Vojvodina. In the last planning cycle, the Local Government of Novi Sad realised 21 projects, but the project implementation of the municipalities of Vršac (18), Zrenjanin (15), Pančevo and Kanjiža (14) was also significant. By contrast, five local governments (Bačka Palanka, Bečej, Odžaci, Opovo and Srbobran) realised only one project each, while Titel had no EU projects at all (EUV, 2015).

Most of the project proposals (45) were realised in the field of economic development, slightly fewer projects were used for municipal development, or they were related to environmental protection, nature conservation and alternative energy sources (42-42), while the least number of projects were the educational ones.

Considering the theme of the projects, infrastructural development ones are predominant (31), followed by social and health protection (30), tourism (23) and cultural cooperation (15). With respect to municipalities, the largest investments were implemented in Vrbas and Kula (construction of a central sewage treatment plant for EUR 23.6 million).

According to the survey, in 92 of the 256 projects municipalities from Vojvodina were the lead beneficiaries.

Determining the total amount of projects is difficult because there is no consistent record of the projects belonging to different programmes. Based on the above mentioned study, the total value of EU projects in which Vojvodina municipalities participated in the period between 2007 and 2013 is EUR 120,575,188.29. It is estimated that about two thirds of this amount fall on municipalities from Vojvodina (EUV, 2015).

Figure 1 Projects financed by the EU according to their types, 2007–2013
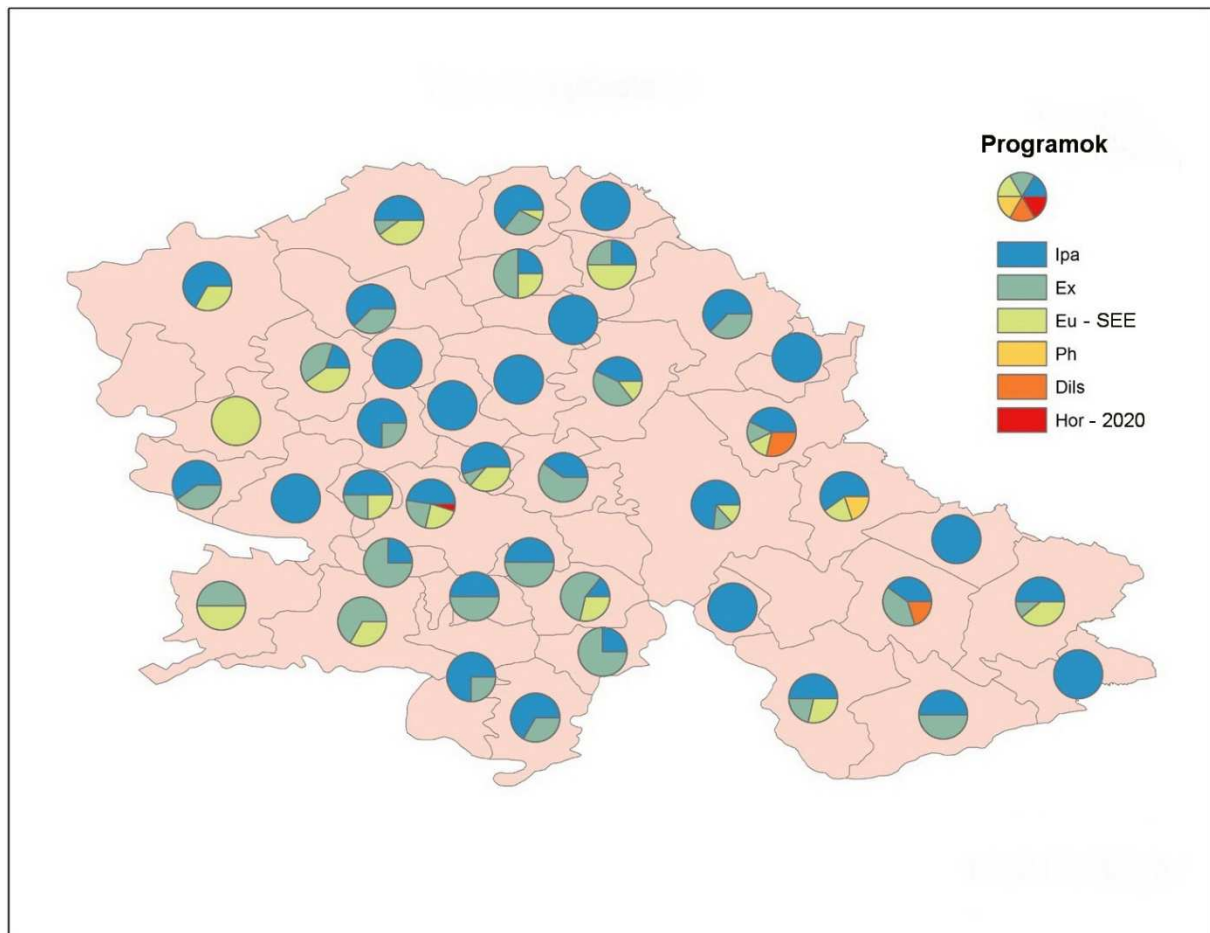
Based on the survey conducted by the Association of Independent Journalists of Vojvodina, the 44 municipalities used mainly IPA 2 (cross-border cooperation support) resources, together with some IPA 1 programmes (EXCHANGE I-IV), while there was considerably smaller interest in other available resources (EUV, 2015). No one has applied, for example, for the European Instrument for Democracy and Human Rights, the Lifelong Learning or the Youth in Action programmes. The Innovation and Competitiveness Framework Programme (CIP) was used only by the City of Novi Sad and the FP7 funds were only applied in Novi Sad and Subotica. Only a few municipalities (Subotica, Ada) applied for Europe for Citizens programme, but there were a lot more successful project applications the EXCHANGE, RSEDP or DILS programmes.

3. Evaluation of the EU projects of the municipalities from Vojvodina

During the research supported by the Regional Co-operation and Local Self-Government Secretariat of Vojvodina, we examined the effectiveness of EU subsidies in the case of 10 municipalities (Nagy-Ricz-Ribár-Nagy, 2015). In this analysis, we used a similar evaluation methodology as in a previous survey – the analysis of applications supported by CARDS and PHARE – after the completion of the 2004-2006 support cycle (Nagy I. – Ricz – Nagy M., 2015; Nagy-Kicosev, 2011). This paper presents the significance and impact of local government projects implemented during 2007-2013 on the basis of the results of the above-mentioned studies. The basic questions of the analysis relate to the establishment of partnerships for projects, sustainability of projects, financial and human resource capacity problems related to project implementation, and financial realisation. Moreover, the concrete results of territorial and local development are in focus, as well as to reveal what local governments have learned about the EU and EU funding, and what the other open issues and problems of project generation are.

When assessing the sustainability of projects, the survey was based on the following questions:

- To what extent has the partnership from the project remained after its implementation?
- Was successful project implementation followed by the establishment of new partnership, the formation of a partnership network?
- Do they employ new staff after the project has been implemented and when applying for new projects?

During the deep-drilling analysis of the 10 involved municipalities (Subotica, Pančevo, Zrenjanin, Vršac, Kanjiža, Temerin, Ruma, Bačka Topola, Novi Kneževac and Senta), those data of these towns have been taken into account, which make it possible to assess the effectiveness of the EU subsidies. The evaluation was based on the following indicators:

- The amount of the effective subsidies used by the municipalities (the participation rate of a municipality in each project and the share of the project value allocated to the municipality);
- The financial implementation of the project (this was important because due to re-financing, local governments could only claim the pre-financed support after full financial and content implementation, and it did not always happen).

The following items were taken into account during the evaluation (the score of sustainability rating is in brackets):

- formal communication with partners after project completion (1),
- joint participation with previous partners in new (unsuccessful) applications (IPA CBC, EXCHANGE and others) (2),
- contact and cooperation with new partners, which can be characterised by a series of discussions followed by several (at least 3) media (3);
- repeated joint (successful) application with previous partners (4),
- submission of successful applications with former and new partners on topics from the 1st or 2nd calls (EXCHANGE, IPA CBC and others) (5) (Nagy-Ricz-Ribár-Nagy, 2015).

During project generation, the partnership significantly determines the implementation of EU principles, the continuation of relations and cooperation. In most cases, the partnership is not finished after the project implementation; the relationship is maintained at protocol level or at the level of new project relations. In some municipalities, financial sustainability of a project depends on the maintenance of previous partnerships, but the lack of human resources can also significantly reduce functional relations between partners.

The phase following the implementation of the projects and the development of partnerships is the process of potential clustering – the involvement of new partners, which can be assessed as a positive consequence of the project generation process. Occasionally, the partnership works successfully apart from the project activities in other forms of cooperation even after the project development and implementation is finished. After the restoration of the Synagogue in Subotica, the investor and constructor partners from Szeged (engineers, architects) were interested in the continuation of the program, and after the construction of Bajmok-Bácsalmás border crossing the Provincial Urban Planning Institute urged further cooperation with the Hungarian partner.

Figure 2 Values of projects financed from IPA (Component 1 and 2) sources in period 2007-2013

Source: Nadj, 2016

The *sustainability* of the project means its subsequent development generating effect after its completion. Sustainability can ensure long-term socio-economic utilisation of the project's positive impacts and its incorporation into the development of society. In this respect, all the surveys conducted in Vojvodina show that the projects do not continue after their implementation.

Sustainability can be followed only in 50% of the realised projects of the examined municipalities, and the immanent impact of these projects can be achieved in the medium term: local authorities have recognised the institutions created by CARDS and IPA, their importance in regional development and their integration into the local government system. These institutions continue to operate as development agencies.

Tracking sustainability of infrastructure projects was much easier since the investments were completed after several cycles (planning, construction). Some of these exemplary investments are the river border crossing and customs office on the Tisa in Kanjiža, bicycle trails between Tiszasziget (HU) – state border – Novi Kneževac (SRB), market hall in Vršac with food testing laboratory (the latter is still not in use).

The series of negative examples includes a number of EXCHANGE programme projects, which were intended to assist local authorities with the introduction of information

technology (e-administration, application of geographic information systems etc.), but were not involved in everyday use. Employees themselves whose work would have been helped by the development did not support its introduction because, on the one hand, they should have learned the IT basics and, on the other hand, they would have been subject to constant monitoring. A SEE project of urban development also ended unsuccessfully as it was not supported by the local office of urban development because it did not consider the international research team to be competent to assess such a local development opinion.

Based on the survey with the sustainability indicators used above, it can be stated that the sustainability indicators of the projects of the examined municipalities was between1.25 and 3.25, despite the fact that the financial realisation reached 80-100%.

In terms of *financial realisation*, the majority of the examined towns scored 80-100%. Reduced financial closures can be triggered by bank transactions and exchange rate fluctuations, but they are often due to shortcomings in tenders, causing reduced reimbursement of pre-financed items. Most of the municipalities succeeded in acquiring the 15% of own contribution required from the applicants, as a subsidy of the Financial Secretariat of the Government of Vojvodina, thus fulfilling the contracted amount.

Based on the opinion of project participants, the following conclusions can be drawn from the implementation of the EU funds in the municipalities of Vojvodina:

- Project writing, participation in EU projects, project implementation in local governments depends to a large extent on the willingness of individuals to initiate, from the responsible administrative leaders in local governments or from those who see a chance in certain issues of EU regional policy;
- It is difficult to force municipal subjects to deal with project writing if it is not their job;
- Project designers and implementers have to work overtime without any financial implications;
- The project writers do not see themselves in the topics of the calls;
- The project designers do not see the importance of the development of local government;
- They work as a volunteer or employ others;
- There is no proper political interest behind the project generation;
- Often these projects are considered as sources of money laundering in local governments;

- They do not recognise the importance of the resources necessary for the implementation of strategic plans, and for education and training;
- Municipal employees have no capacity for project writing and / or do not know the language of project proposals (English);
- Or they do not know the national and European legal-strategic frameworks and documents.

As a conclusion we can say that although substantial sums were invested from the above mentioned resources into the economy of Vojvodina for its development, the main indicator – the GDP – has been increasing only slightly, while these projects have no effects on decreasing unemployment. In the overall economic situation, unemployment is primarily decreased by emigration, in which Vojvodina Hungarians take part at a rate above the average compared to their headcount, thus decreasing the economic power of the community through emigration (Ricz, 2012).

The national strategies, the provincial and municipal development plans that incorporate European principles are missing harmonisation and the ensuring of adequate resources, and they lack a sound and coherent economic vision. In the past planning periods there was not established an adequate consistency of policies or harmonisation of development, which could have resulted in a unified economic development policy and thus bringing slow economic growth.

In spite of the fact that in the preparation of the described EU programmes economic development received expressed priority, in practice there was no considerable economic development. And while successful projects were correctly implemented in most cases, it was impossible to indicate their long-term effects beside short-term impacts, since many of them were only "soft" projects.

Additional problems of the projects are in connection with the lack of human, material and organisational capacities, as well as with some difficulties concerning administrative procedures (EUV, 2015).

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