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RECOMMENDATION FOR A TYPOLOGY OF CITIES AND MUNICIPALITIES IN CROATIA ACCORDING TO DEVELOPMENT LEVEL

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Abstract
The goal of this paper is to create a typology of municipalities according to development level, using what little data are available. Both economic (municipal income, employment, and entrepreneurship) and demographic (educated and immigrant population) indicators are used. Three economic types of municipality were defined using three economic indicators: income per capita (used as the main indicator); number of residents per entrepreneur; and share of employed in the total population. Following this, we defined demographic types of municipalities, using the three aforementioned economic indicators as well as two demographic indicators: average education level of the population and share of immigrants in the total population. Education level of the population is more important than employment or entrepreneurship for economic development. The typology indicates an above-average level of development on the Adriatic coast and islands, as well as in large cities and the immediate surroundings of Zagreb. In contrast, the typology also shows below-average development levels in southeastern Slavonia and northwestern Croatia. Areas of special state concern, such as those that were occupied during the Croatian War of Independence, have above-average municipal income and below-average education levels, employment, and entrepreneurship. Tourism, activities in large cities, and (paradoxically) state subsidies in areas of special state concern contribute the most to development level, while industry and (especially) agriculture do not make significant contributions to development level. The tradition of managing population size is no longer significant for development level, because a large number of sparsely-populated "new" municipalities have significantly higher incomes than "old" municipalities. This paper should serve as a supplement to the frequent discussions regarding the optimization of Croatia's system of local government units.

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Key words
Typology of municipalities and cities; economic development index; synthesized development indicators; economic typology of municipalities; demographic typology of municipalities; optimization of the system of local self-government units.

INTRODUCTION

The goal of this paper is to determine types of Croatian municipalities and cities in relation to development level. The ability of a municipality to reach its goals is largely determined by its capacity for development, especially because lack of intervention in the scope of its normal function can generate long-term negative consequences. For example, the lack of such interventions in the social sphere can lead to both short-term and long-term negative consequences for families, which is also reflected in the economic and social development of the community (Ajduković et al. 2019). A good typology of municipalities is also important for methodological planning of future studies in various research areas, especially for those studies that use stratified sampling or are interested in examining multilevel effects that happen due to the nesting of data (Lorah, 2018).

In this paper, we will attempt to determine the causes of differences in development level among Croatian regions. The choice of criteria for determining types of municipalities according to economic development level was narrowed. Over the last 30 years, the issue of territorial organization has been especially important and has developed turbulently. Croatian public administration has been observed through the lens of economies of scale. This sort of reform took place in the northern part of Western Europe (Belgium, Denmark, Finland, Norway, Sweden, Holland, Germany, and Great Britain). The consequences of territorial consolidation in Western Europe were also felt in Eastern Europe (Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia). The fall of the Berlin Wall (1989) marked the beginning of an opposing trend in Eastern Europe: territorial fragmentation, as a result of pressures from local areas and also partially as a reaction to their prior forced union. The political atmosphere after 1990 leaned heavily toward fragmentation of local self-government units, which in some states went to the level of the "right" of everyone, even the smallest settlement, to their own separate local self-government unit. In this light, attempts to maintain larger territorial units of local government were regarded as "attacks" against local autonomy (Swianiewicz et al. 2017).

A wide-spread discourse about territorial organization was begun, with an emphasis on administration efficiency and economic sustainability. The majority of research on the topic confirms the link between economic success of administration and the size of a municipality. For example, strong industrial development

in Lodz, Poland has significantly demographically and economically increased the size of the city, and influenced the appearance and to what extent certain industrial areas are built up (Jaždžewska and Kotlicka, 2020). Large centers enjoy additional advantages in the time of globalization. Namely, agglomerations of large size and regional economic specialization have long been global phenomena, but the processes of agglomeration and regional specialization associated with globalization have increased in intensity in recent years (Scott and Storper, 2003). The factor of mobility is a key element in the creation of agglomerations (Fujita and Krugman, 2004). Of the numerous local government units (municipalities and cities) in Croatia, less than half (240 out of 556) succeed in covering over 75% of their expenses with their own income, which indicates that only 43% of local government units are somewhat sustainable, while the rest are dependent on the central state government to a significant extent (Koprić, 2010). The emphasis on achieving balanced regional development can be seen in the routing of public funding toward regions with below-average development and low socio-economic status in southeastern Slovakia, rather than to its more developed northwestern regions, via Local Action Groups (LAGs) (Klamár et. al. 2019). In Croatia, a frequent opinion is that municipalities that are too small demographically or economically find it difficult to effectively manage themselves, in part due to the fact that their own administrative bodies are often too large.

Immediately prior to the shaping of Croatia's new territorial organization in 1993, the main flaw of the territorial organization inherited from Yugoslavia with its 105 municipalities was its expressed polarization of industrial development, in which the primary importance was held by a municipality's main center, i.e. municipal industrial monocentrism (Feletar and Stiperski, 1992). Throughout Croatia, municipal monocentrism resulted in the tendency to place as many functions as possible in the main center of the municipality, which often meant that municipal administration did not pay enough attention to the other settlements within the municipality (Glamuzina and Glamuzina, 1998). The main intent of the creators of the post-1993 territorial organization was to weaken municipal monocentrism, with the goal of opening more opportunities for development of more settlements in Croatia via reduction in the size of municipalities. As the number of municipalities grew from 105 to over 500, the average distance from a given settlement to the municipal center greatly decreased. The problematic relationship between the size of a municipality and administrative efficiency is complex and, as such, is only briefly touched upon. Research with the goal of optimizing the system of municipalities can find important starting points and conclusions in the typology of municipalities according to economic development level in this paper.

DATA AND METHODS

The first instrument of regional development policy in Croatia is the development index (Perišić and Wagner, 2015), which consists of human development (income, employment, and education) and the development of administrative units (municipal income and population change) (Marcelić, 2015). In this case, analysis identified three types of development level: the first type is found in eastern Croatia and Dalmatinska Zagora; the second type is found along the coast; and the third is found in northern Croatia (Marcelić, 2015). One study of models for calculating the development index for local and regional self-government units recommends the use of a unique composite development index, based on six indicators: average net income per capita; average gross income per capita; average unemployment rate; general population change; aging index; and education level (tertiary education) (Denona Bogović et. al. 2017). In research of 50 small municipalities (up to 5,000 inhabitants according to the 2011 population census) in Šibenik-Knin and Split-Dalmatia counties, calculations were made that should be tested and perhaps worked into a development index; the following indicators were used to determine this development index: average net income per capita; average gross income per capita, unemployment rate; general population change; and education level (Bačelić-Grgić, 2016). Using multivariate classification of regional and local self-government units according to socio-economic development level, it was confirmed that the majority of local self-government units that lag in terms of development are found in central and eastern Croatia, while the most developed are found in Primorje-Gorski Kotar and Istria counties, along with the City of Zagreb (Perišić, 2014).

The greatest methodological challenge while writing was the choice of criteria and data that would be used as indicators of development level. The difficult part was that the majority of data for indicators of economic development level are available on the state or county level, while data on the municipal or city level is limited. The basic data in the analysis that indicates the level of development of a municipality or city is municipal income per capita. We first analyzed the state of each local self-government unit according to three economic indicators: income per capita (the main indicator); employment level in the total population; and number of residents per entrepreneur. In doing this, we wanted to determine to what extent the level of entrepreneurship and employment were linked in relation to a given area's development level (income per capita). Using a combination of above-average and below-average values of the three aforementioned economic indicators, we obtained eight different types of municipalities and cities. Thus we obtained economic types of municipalities. Next, we calculated demographic types of municipalities using the aforementioned economic indicators combined with two demographic indicators: average education level of the population and share

of immigrants in the total population. In this step we were attempting to determine the extent to which education level and share of autochthonous population were linked with the level of development. Using a combination of above-average and below-average values of the aforementioned demographic indicators it was possible to define eight different types of municipalities. Thus we obtained two sets of types of municipalities: the first with emphasis on economic indicators, and the second with emphasis on demographic indicators. The significance of indicators in describing certain occurrences, i.e. the strength of positive or negative links between indicators was obtained using the Pearson correlation coefficient of linear correlation between all pairs of indicators. In this way, the indicators that showed the strongest positive correlation with income per capita (the main indicator for determining the level of development of a municipality or city) were determined. The complexity of regional research that leads to the creation of typologies of municipalities according to certain criteria is expressed, and is partially a consequence of temporal and ideological efforts (Matlovič and Matlovičová, 2020).

All analysis was done using Excel and R v3.5.1 programming packages. For geographic displays, the rgdal package (Bivand et. al. 2020) and ggplot2 (Wickham, 2016) were used. Within the framework of the analysis, fundamental descriptive characteristics for each indicator were calculated and the division of municipalities into categories was performed by sorting each variable used into quartiles.

RESULTS

Changes in local self-government in Europe and Croatia

Numerous changes in the organization of local self-government have been happening throughout Western Europe since the 1970s, while similar change did not begin to take place in Eastern Europe until after the fall of authoritarian regimes at the end of the 20th century. Territorial organization of local self-government is often inherited and regarded as a complex developmental and political problem. The European Economic Community started to studiously work on the problem of administrative regions and local self-government units in 1974. In Denmark, this meant reducing the number of municipalities; for example, there were plans to regionalize historical provinces into regional units in Holland, as well as plans regarding formal developmental regions in France (Žuljić, 2001). The major financial and economic crisis of 2008 spurred a wave of restructuring of organization of local self-government in Europe (Swianiewicz et al. 2017). All of these changes influenced government on all levels in the majority of European countries, from the lowest level (municipal or city), to mid-level (county or provincial) to high-level (regional) local self-government. Clearly, not all countries have the same number of governmental levels in local self-government. Larger states typically have complex systems of local self-government, i.e. two to three levels of local self-government,

while smaller countries often have only one or two (at most) levels of local self-government. These changes sometimes also include reorganization of the entire state structure of local self-government on various levels. During the 2008 economic crisis, the aforementioned changes mainly had the goal of reducing the number of local self-government units (municipalities and cities) by grouping some together and improving inter-municipal cooperation. This resulted in a major reduction in the number of local self-government units and an increase in geographic (spatial), demographic (population), and economic (business capacity) size. In 2014, Europe had 106,000 fewer municipalities in relation to the previous era. The changes that often included increasing the size of municipalities did not move forward at the same speed in all parts of Europe. Thus, there has been a constant tendency toward reducing the number of local self-government units in certain Western European countries. In post-communist Europe, the tendency towards territorial fragmentation, i.e. spatial reduction of local self-government, was dominant until 2006, and was followed by a decade of significant reforms of local self-government.

The size of local self-government units significantly varies among European states. The average size of the lowest level of English local self-government (municipality) is nearly 100 times larger than the average French equivalent. From this, we can conclude that there is no typical or prevalent European "model" of territorial organization on the lowest level of local self-government. The issue of legal and territorial organization of local self-government has given rise to discussion and conflict of varied and often completely opposing attitudes in political and professional arenas of several European countries (Swianiewicz et al. 2017).

In the area of former Yugoslavia, there has been a significant increase in the number of local self-government units. The 1993, the territorial organization of Croatia consisted of 488 municipalities and cities, which grew to 566 in 2006. This was a huge amount of growth in relation to the number of municipalities in Croatia from 1963 to 1993 (between 104 and 111) (Malić and Stiperski, 1993). In Serbia, the number of regions increased (from 10 to 25), while in Slovenia and North Macedonia there are three times more municipalities today than in 1991. Bosnia and Herzegovina is divided into two entities, of which only the Federation of Bosnia and Herzegovina is divided into cantons (counties).

After the dissolution of Czechoslovakia there was an increase in the number of regions in Czechia (from 8 to 14) and in Slovakia (from 4 to 8). The opposite took place in former East Germany (DDR): East Germany was divided into 14 administrative units (Bezirk), but the area of former East Germany adopted the West German model of territorial organization of local self-government after reunification in 1990, whereby six federal states were created. Administrative counties continue to exist in most federal states of Germany, but were partially disbanded after 1999 and now are only found in North Rhine-Westphalia, Baden-Württemberg, Bavaria, and Hessia (Klarić, 2016).

In contrast with post-communist Eastern Europe, the states that emerged from the collapse of the Soviet Union have largely retained the territorial structure of local self-government from the socialist era. Russia, Ukraine, and Belarus are divided into nearly the same number of provinces as they were 50 years ago, and local self-government units in Estonia, Lithuania, and Moldavia cover the same area as "raions" from the USSR era. Only in Latvia have there been any larger changes in territorial organization of local self-government, whereby the 33 raions from the USSR era have since been divided into 118 municipalities.

Numerous European states have not altered the size of territorial local self-government units. Significant changes after 1990 were undertaken by Great Britain, Denmark, Iceland, Albania, Poland, and Greece. Denmark, Albania, and Poland created significantly spatially larger units of self-government on the regional level, while Iceland and Great Britain created smaller territorial units. Greece has two levels of self-government under which numerous smaller territorial units have been formed, but changes have tended towards transferring power from lower levels to higher levels of governance. From this, we can conclude that real reduction in the number of self-government units, i.e. growth in the average size of local self-government units, has only happened in the case of Danish regions, Polish voivodships, and Albanian counties (Klarić, 2016).

In regards to the situation in Croatia, the Constitution of the Republic of Croatia from 1990 and the Law on the Areas of Counties, Cities, and Municipalities (1992) stated that, in place of 103 municipalities and nearly 4,000 local communities, there shall be a new territorial organization of local self-government units: 418 municipalities and 69 cities as local self-government units of the first level of governance; and 20 counties plus the City of Zagreb (which also has the status of county) as units of the second level of governance. Between 1993 and 2006 (when the last changes to Croatia's territorial organization were made), 58 new municipalities were formed and 58 municipalities gained the status of city; This meant that Croatia had 429 municipalities, 126 cities and the City of Zagreb, i.e. 555 local self-government units of the first level, along with 20 counties and the City of Zagreb on the second level, giving a total of 576 local and regional self-government units. Namely, all municipalities and cities belong to counties, and only the City of Zagreb has both city and county status.

Under the former territorial organization (1963–1993), the territorial unit "kotar" was eliminated (1967), and all of its functions were transferred the 111 municipalities. The dynamic nature of territorial organization can be seen in the fact that the number of self-government units changed from 8 to 111 over just 21 years (1946–1967) (Malić and Stiperski, 1993). Despite the fact the municipality is the most stable territorial unit of local self-government in both Croatia and Europe, the number thereof has changed remarkably over the last 70-odd years. In Croatia, this oscillation was in the range of 104 to 555 municipalities. The reasons for this

change vary, and political and traditional motivations are most often mentioned (Hrženjak, 2009).

Municipalities and cities provide public services in their self-governance areas. These services are indirectly created by the needs of local residents that are not directly, i.e. constitutionally or legislatively, ordained by state institutions. Counties, on the other hand, provide regional services. The law states that the status of city can be obtained by settlements that are in the center of their county or those that have more than 10,000 residents. The law also, however, allows settlements to gain the status of city if there is a special reason (historical, economic, geo-transitory, etc.), which is the case with 42% of settlements that have the status of city (Ivanišević, 2000). The difference between municipality and city is in the highest level of local tax (prirez) that can be levied, which is 10% in municipalities, 12% in smaller cities, 15% in larger cities, and 18% in Zagreb.

The average number of residents for municipalities in Croatia is a bit more than 3,000, and cities have an average of a bit over 18,000 residents. The median value is 2,983.5 residents per municipality, which means that 50% of municipalities in Croatia have less than 2,983.5 residents. The Municipality of Civljane has the fewest residents (239) out of all Croatian municipalities, while the Municipality of Viškovo has the most residents (14,445). A total of 30 municipalities have less than 1,000 residents. In contrast, Croatia has large/populous municipalities, i.e. cities like Zagreb, Split, Rijeka, Osijek, and other large urban areas. Among cities, Zagreb has

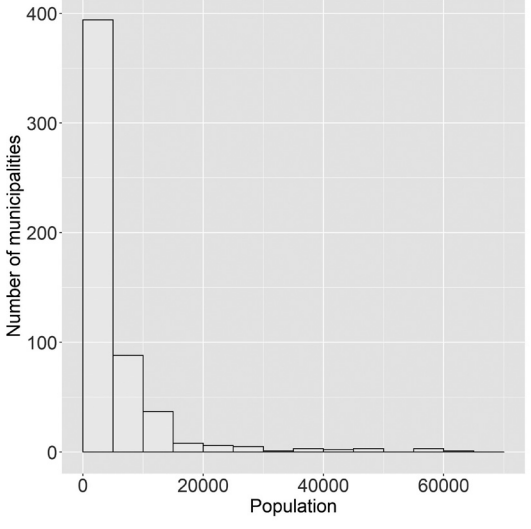

Fig.1
Distribution of population among Croatian municipalities and cities
Source: authors

the most residents (790,017), while Komiža has the fewest (1,526). According to the table below, we can see that the distribution of population among municipalities is decidedly asymmetrical (Fig. 1). By comparing the average demographic size of municipalities with their equivalents in other European states, it is clear that the average size is similar. In France and Switzerland there are municipalities with 100 residents, but such small municipalities do not represent a problem to the state because they are led by local citizens who serve the municipality on a voluntary basis (Hrženjak, 2009).

Indicators of development level of municipalities and cities

In this paper, income per capita was used as the main indicator, along with four other indicators: 1) number residents per entrepreneur; 2) share of employed in the total population; 3) average education level of the population; and 4) share immigrants in the total population.

1) **Municipal income per capita.** Distribution of income of municipalities and cities per capita is asymmetrical and has a median value of 2,672 kuna (1 euro roughly 7.5 kuna) per capita (Tab. 1). The highest income per capita was documented in coastal and island municipalities, while the highest concentration of weakly-developed municipalities is found in southeastern Slavonia and northwestern Croatia (Fig. 2). A small concentration of municipalities with very high income per capita is found in and around Zagreb. The leading municipalities in terms of income are smaller Adriatic municipalities such as Sutivan, Vir, and Baška, with over 15,000 kuna per capita. The City of Zagreb has 8,071 kuna income per capita, while the other macro-regional cities have lower income per capita: Rijeka with 5,029 kuna per capita; Split with 3,949 kuna per capita; and Osijek with 3,220 kuna per capita. All of the cities with more than 10,000 residents that also have more income per capita than Zagreb are located on the Adriatic Sea (Umag, Dubrovnik, Rovinj, and Opatija). Municipalities with the lowest income per capita (below 1,300 kuna) are mainly found in the continental part of Croatia and have lower populations.

Tab. 1 Municipal income per capita in 2016 (in Kuna)

Variable	N	Min	Max	M	SD	C	Q1	Q3
Income per capita	556	721	16.591	3.542	2.460	2.672	1.898	4.300

Legend: N – number of municipalities; Min – minimum value; Max – maximum value; M – arithmetic mean; SD – standard deviation; C – median; Q1 – result from the first quartile; Q3 – result from the third quartile

Source: *authors*

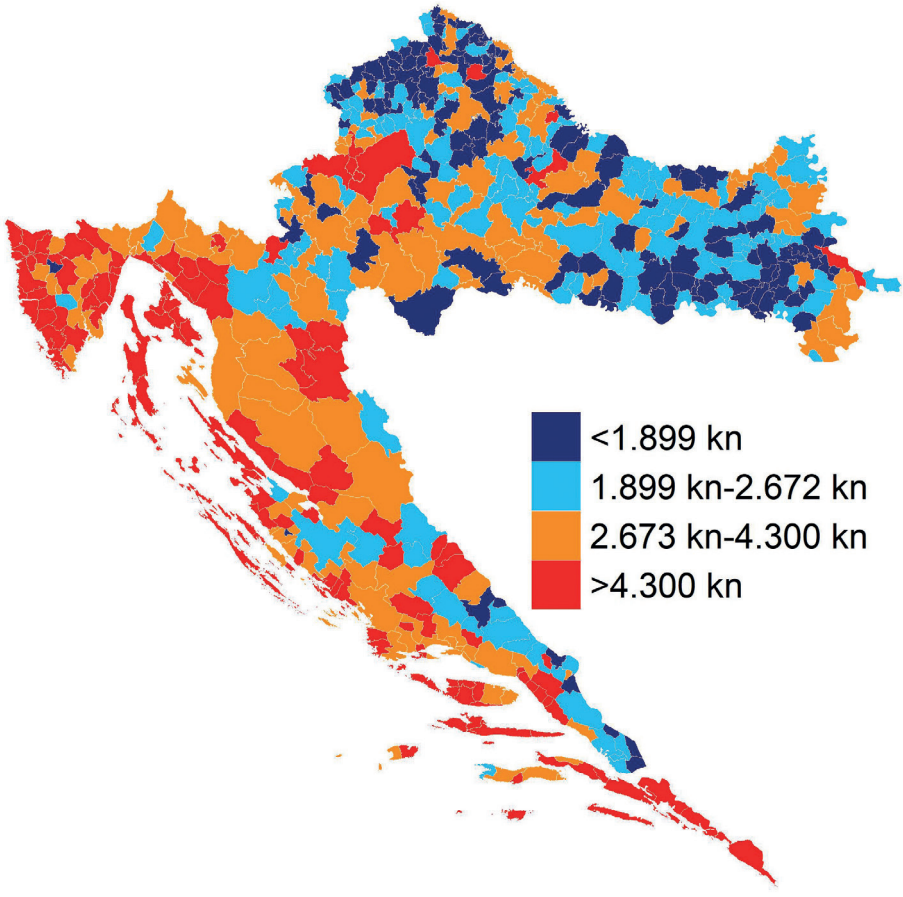

Fig. 2
Spatial distribution of municipalities according to income per capita
Source: authors

2) **Number of residents per entrepreneur.** This data indicates the level of entrepreneurship in a given municipality. The distribution of this parameter is also asymmetrical, and the median for Croatia is 85.8 residents per entrepreneur (Tab 2.). The spatial distribution shows that for this indicator, the most successful municipalities are found along the coast and in central Croatia, especially in and around Zagreb. The largest concentration of local self-government units with low levels of entrepreneurship is in Slavonia, in parts of central Croatia, and in mountainous areas around the country. The greatest levels of entrepreneurship (less than 18 residents per entrepreneur) were documented in a few smaller municipalities and cities. The lowest levels of entrepreneurship (more than 500 residents per entrepreneur) were found in smaller continental mu-

nicipalities. Of the four macro-regional centers, Zagreb has the highest level of entrepreneurship (23 residents per entrepreneur), followed by Split (28), Rijeka (30), and Osijek (45).

Tab. 2 Number of residents per entrepreneur

Variable	N	Min	Max	M	SD	C	Q1	Q3
Residents per entrepreneur	556	3	826	115.0	98.9	85,8	50.6	146.1

Legend: N – number of municipalities; Min – minimum value; Max – maximum value; M – arithmetic mean; SD – standard deviation; C – median; Q1 – result from the first quartile; Q3 – result from the third quartile

Source: *authors*

3) **Share of employed in the total population.** This share is more symmetrical than the two previous indicators, and is distributed around an average value of 32% (Tab. 3). At the regional level, the number of employed decreased between 2009 and 2016 in all Croatian counties. The uneven regional development of Croatia, characterised by the polarisation of economic activities, is also manifested in the unequal reduction of the number of employed persons (Braičić, Lončar, 2018). In the most successful municipalities employment in the total population is over 50%, while the same value can be under 10% in the weakest municipalities. The spatial distribution shows high levels of employment in the northern and western parts of Croatia (Istria and Kvarner), in Zagreb and its surroundings, and in southern Dalmatia. Municipalities with the lowest levels of employment in the total population were documented in Slavonia, Lika, Banovina, Kordun, Dalmatinska Zagora, and northern Dalmatia. Of the four macro-regional centers, Zagreb has the highest level of employment in the total population (41%), followed by Rijeka (39%), Split (36%), and Osijek (36%).

Tab. 3 Share of employed in the total population

Variable	N	Min	Max	M	SD	C	Q1	Q3
Employment	556	0.06	0.56	0.32	0.074	0.32	0.26	0.37

Legend: N – number of municipalities; Min – minimum value; Max – maximum value; M – arithmetic mean; SD – standard deviation; C – median; Q1 – result from the first quartile; Q3 – result from the third quartile

Source: *authors*

4) **Average education level of the population.** The population of the majority of municipalities and cities in Croatia has finished 9–10 years of education, i.e. primary school and 1-2 years of secondary school. Higher education levels (more

than 9.72 years of education) were found in western (Istria and Kvarner), central, and northwestern Croatia, and on the central and southern Dalmatian islands (Tab. 4). Lower education levels (below 9.72 years of education) were documented in Slavonia and mountainous areas of Croatia. Of the macro-regional centers, Zagreb had the highest average education level (12.0 years), followed by Split (11.8), Rijeka (11.6), and Osijek (11.4).

Tab. 4 Average education level of the population

Variable	N	Min	Max	M	SD	C	Q1	Q3
Employment	556	5.90	12.08	9.78	0.87	9.72	9.21	10.39

Legend: N – number of municipalities; Min – minimum value; Max – maximum value; M – arithmetic mean; SD – standard deviation; C – median; Q1 – result from the first quartile; Q3 – result from the third quartile

Source: *authors*

5) **Share of immigrants in the total population.** The distribution of the share of immigrants in the total population is asymmetrical and most municipalities and cities have a low share of immigrant population (Tab. 5). The lowest share of immigrants in the total population was found in municipalities in northwestern Croatia (Međimurje, Hrvatsko Zagorje, and upper Podravina), the interior of Istria, and Dalmatinska Zagora. The highest share of immigrants in the total population was documented in areas of Croatia that were occupied during the Croatian War of Independence (1990–1995) along the border with Bosnia and Herzegovina, in Zagreb and it surroundings, the western coast of Istria, and in some parts of the Dalmatian coast. Among the macro-regional centers, Zagreb has the highest share of immigrants in the total population (47%), followed by Rijeka (41%), Osijek (29%), and Split (25%).

Tab. 5 Share of immigrants in the total population

Variable	N	Min	Max	M	SD	C	Q1	Q3
Employment	556	0.04	0.92	0.24	0.15	0.22	0.14	0.29

Legend: N – number of municipalities; Min – minimum value; Max – maximum value; M – arithmetic mean; SD – standard deviation; C – median; Q1 – result from the first quartile; Q3 – result from the third quartile

Source: *authors*

Significance of economic and demographic indicators in describing development level

A positive link between income per capita and the number of entrepreneurs (0.108), residents per entrepreneur (-0.391), and employment (0.195) (Tab. 6) was determined. This means that higher income per capita is expected in areas that have more total entrepreneurs, more entrepreneurs per resident, and higher employment. A positive link between income per capita, and higher employment and entrepreneurship levels is expected in particular. Higher income per capita is expected in local self-government units with higher populations, in contrast to local self-government units with lower populations, but this is a very weak link that can be disregarded. In comparing demographic data (education level and share of immigrants), we see a significantly stronger positive connection between income per capita and the aforementioned demographic indicators (number of entrepreneurs and employment level). There is also a very strong positive connection between average education level (0.407) and income per capita, i.e. economic development level. If we go deeper, we see an even stronger link expressed between income per capita and two categories: the share of the population with an associate or vocational degree (bachelor's) in the total population (0.542) and the share of the population with a university degree (master's) in the total population (0.505). In principle, the average education level is higher in areas with higher population, higher income, more entrepreneurs, higher entrepreneurship (fewer residents per entrepreneur) and higher employment.

The other demographic indicator—share of immigrants in the total population—has an expressed positive connection with income per capita (0.158), but a much stronger link with education level (0.407). This shows that income levels are somewhat higher in areas with more immigrants or fewer autochthonous residents. It is to be expected that people will relocate to areas with better economic indicators. Some weakening of the positive relationship between the share of immigrants and income per capita is due to the fact that the highest share of immigrants in the total population of municipalities and cities was recorded in the economically underdeveloped part of Croatia along the border with Bosnia and Herzegovina, which was occupied during the Croatian War of Independence (1990–1995).

The main conclusion that emerged was that the average education level and especially the share of the population with tertiary education in the total population were the most important positive indicators of the level of municipal income per capita, i.e. of economic development level.

Tab. 6 Pearson correlation coefficient of economic and demographic indicators

No.	Indicator	1	2	3	4	5	6	7	8	9	10	11
1	Population, 2011	1										
2	Income per capita, 2016	.077	1									
3	Number of entrepreneurs	.989	.108	1								
4	Number of residents per entrepreneur	-.097	-.391	-.094	1							
5	Employment	.095	.195	.099	-.447	1						
6	Average education level	.237	.407	.210	-.529	.548	1					
7	Share of the population with 3 years of secondary school education in the total population	-.080	.233	-,072	-.335	.277	.485	1				
8	Share of the population with 4 years of secondary school education in the total population	.224	.421	.190	-.504	.385	.899	.363	1			
9	Share of the population with an associate/vocational degree in the total population	.175	.542	.158	-.494	.370	.826	.346	.813	1		
10	Share of the population with bachelor's or master's degree in the total population	.370	.505	.340	-.506	.416	.875	.261	.828	.847	1	
11	Share of the population with a PhD in the total population	.507	.395	.493	-.343	.312	.620	.171	.563	.576	.738	1
12	Share of immigrants in the total population	.092	.158	.080	-.037	-.233	-.030	-.099	.082	.118	.099	.158

All values of Pearson coefficients of 0.092 or higher are significant ($p<0.05$)
All values of Pearson coefficients of 0.118 or higher are significant ($p<0.01$)

Source: *authors*

Types of municipalities and cities according to level of development

1) **Typology of municipalities/cities according to economic indicators.** Types of municipalities and cities were calculated according to the main indicator (IPI – income per capita) and two other economic indicators (IPE – number of residents per entrepreneur and EMP – share of employed in the total population). Using a combination of above-average and below-average values of the aforementioned economic indicators we obtained eight different types of municipalities and cities. Municipalities/cities that have above-average values according to all three indicators (red) are those with the most entrepreneurs and entrepreneurship, higher employment, and are generally successful in terms of business and income (Fig. 3). Such municipalities/cities are mostly found in Istria, Kvarner, larger Dalmatian municipalities, Zagreb and its surroundings, Osijek, and in the vicinity of certain larger cities. Conversely, municipalities with below-average values according to all three indicators (black) dominate in Slavonia and parts of Dalmatinska Zagora, and are found in some parts of Bjelovar-Bilogora and Hrvatsko-Zagorje counties.
   There are a large number of local self-government units in northwestern Croatia that have below-average income per capita, but also have an above-average concentration of entrepreneurs and total employment (green). This type of municipality is rare in other parts of Croatia. These are areas with lower incomes in which work-intensive industry dominates. A very interesting type of municipality is represented by those that have above-average income despite also having below-average employment and concentration of entrepreneurs (blue). These municipalities dominate in Lika, Ravni Kotari, and the southeastern part of Pannonian Croatia (Srijem). The type of local self-government units that have above-average income and above-average employment, with a below-average concentration of entrepreneurs (orange) are mostly found along the Adriatic coast, and "trail" the type that has above-average values for all three types (red). It is expected that the 20 county centers will be of the type where all three values are above-average (red), due to their function as their county's "engine," but there are exceptions. The type with below-average income and employment (purple) describes both Slavonski Brod and Požega, while the type with below-average employment (orange) describes Krapina, Vukovar, and Vinkovci.

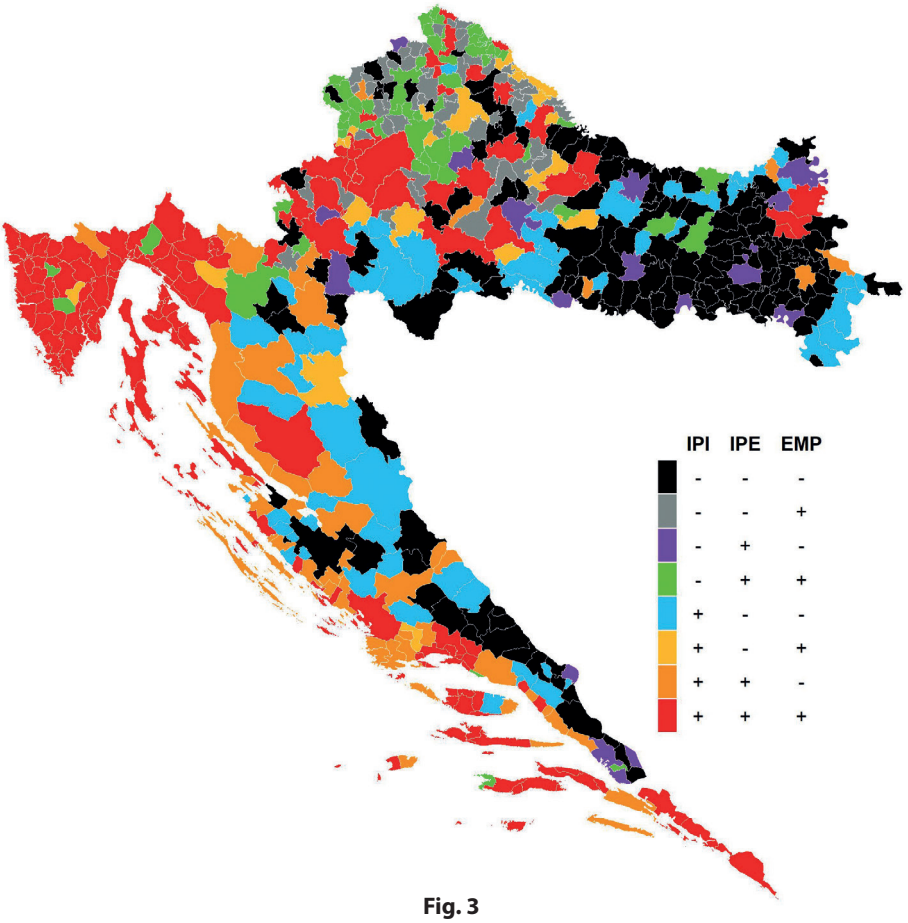

Fig. 3
Spatial distribution of types of municipalities and cities in relation to economic indicators.

Legend:
IPI – income per capita; IPE – number of residents per entrepreneur;
and EMP – share of employed in the total population. A "+" indicates above-average,
and a "-" indicates below-average.
Type 1 (red) = more-developed municipalities/cities according
to all three economic indicators
Type 2 (orange) = developed municipalities/cities with weaker employment
Type 3 (light orange) = developed municipalities/cities with weaker entrepreneurship
Type 4 (blue) = developed municipalities/cities with weaker employment
and entrepreneurship
Type 5 (green) = less-developed municipalities/cities with stronger employment
and entrepreneurship
Type 6 (purple) = less-developed municipalities/cities with stronger entrepreneurship
Type 7 (grey) = less-developed municipalities/cities with stronger employment
Type 8 (black) = less-developed municipalities according to all three economic indicators
Source: authors

2. **Typology of municipalities/cities according to demographic indicators.** Types of municipalities and cities were calculated in relation to the main indicator (IPI – income per capita) and the other two economic indicators (SCH – average education level of the population and IMI – share of immigrants in the total population). It is important to note at this point how the average education level of the population indicator was confirmed earlier in the paper to have the greatest positive connection, out of all analyzed indicators, with municipal income per capita. Using a combination of above-average and below-average values of the three economic indicators, we were able to define eight types of municipalities and cities. Municipalities/cities that had above-average values for all three economic indicators (red) were those that had the highest average education level, the highest share of immigrants in the total population, and were successful in terms of business/income (Fig. 4). These municipalities/cities were mostly found along the Adriatic coast, in Zagreb and its surroundings, and in or around certain larger cities. In contrast, municipalities with below-average values of the aforementioned indicators (black) dominate in parts of northwestern Croatia, along the Sava River in Slavonia, and in parts of Dalmatinska Zagora.

   The interior of Istria, Gorski Kotar, Lika, and parts of the continental area of Croatia are dominated by the type which show an above-average development level and education level with a higher share of autochthonous population. It follows that such above-average developed centers are not attractive to the broader population as a place to resettle. In contrast to the previous type of municipality, we have those with a below-average development level and an above-average share of immigrants in the total population (grey). This type is often found throughout Slavonia and in some places in the eastern part of central Croatia. In northwestern Croatia we often find the type of municipality that has a below-average development level, a higher share of autochthonous population, but also an above-average education level (purple). In some places in the Pannonian part of Croatia we have municipalities that have a higher share of autochthonous population, an above-average education level, but a below-average development level (green).

   Like in the economic typology, the demographic typology shows a number of county centers with below-average values. The type with a below-average share of immigrants in the total population (orange) describes Čakovec, Krapina, Pazin, and Šibenik, while the type with below-average income per capita describes Slavonski Brod and Požega.

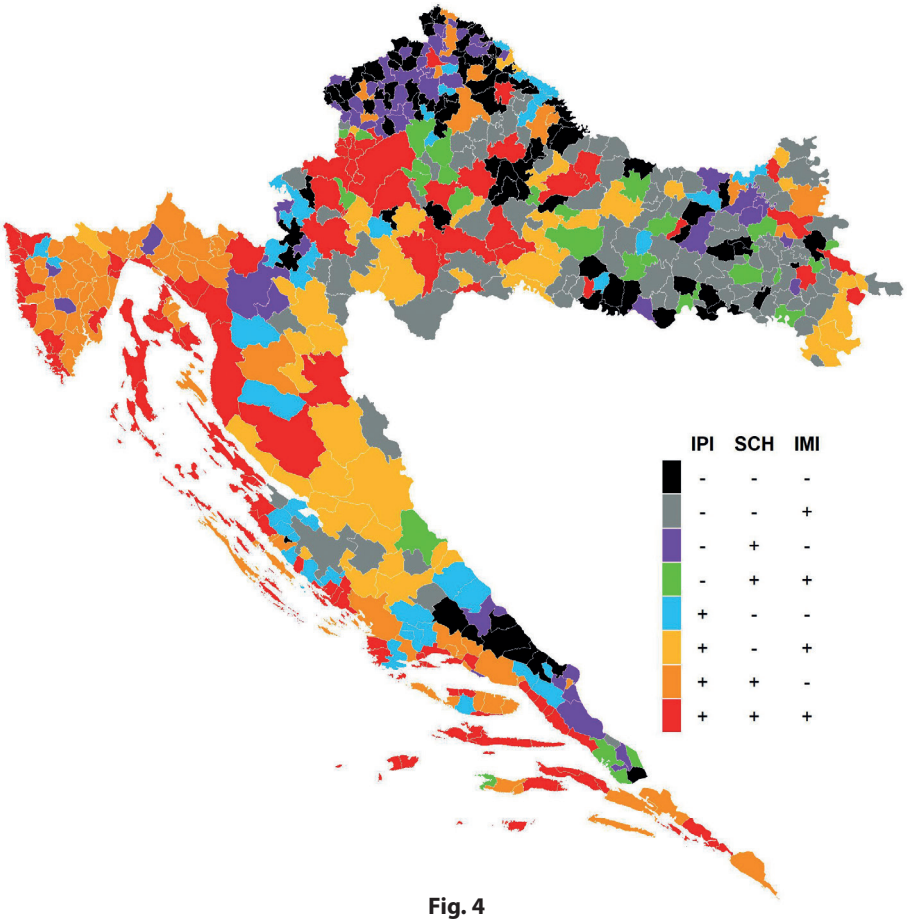

Fig. 4
Spatial distribution of types of municipalities and cities in relation to demographic indicators

Legend:
IPI – income per capita; SCH – average education level of the population;
and IMI – share of immigrants in the total population. A "+" indicates above-average,
and a "-" indicates below-average.
Type 1 (red) = more-developed municipalities/cities according to both
demographic indicators
Type 2 (orange) = developed municipalities/cities with weaker immigration
Type 3 (light orange) = developed municipalities/cities with a weaker education level
Type 4 (blue) = developed municipalities/cities with weaker immigration
and education level
Type 5 (green) = less-developed municipalities/cities with stronger immigration
and education level
Type 6 (purple) = less-developed municipalities/cities with a stronger education level
Type 7 (grey) = less-developed municipalities/cities with stronger immigration
Type 8 (black) = less-developed municipalities according to both demographic indicators
Source: authors

DISCUSSION

The dominance of municipalities/cities which show the highest levels of development according to both economic and demographic indicators along the Adriatic coast and islands has provoked some surprising conclusions. According to Croatian law, islands are areas of special state concern, but the data of this paper indicates that these are areas of relative economic and social prosperity. This in turn prompts the important question of the role of certain economic activities vis-à-vis the results of this analysis. Successful regions usually are also large metropolitan regions, or are connected to strong industrial or tourism development (Bański and Mazurek, 2018). There are four main elements of territorial capital that make a positive contribution to regional development: entrepreneurship; receptivity; creativity; and transit infrastructure (Camagni and Capello, 2013). Regional innovativeness is the fundamental factor for economic development (Capello et al. 2014). In Croatia, tourism stands out as the leading economic activity, i.e. the activity that contributes the most to the development of local self-government units. According to the detailed statistical method known as Tourism Satellite Account (TSA), the effect of tourism on the total economy can be measured. Various estimates of the influence of tourism on the GDP of Croatia hover around 18%, but the share in 2016 was much lower according to TSA assessment (11.4%). The same method used to exactly calculate the contribution of tourism to the GDP of Croatia in 2016, giving a total of 16.9% (Dobrota, 2019). The total contribution is the sum of direct and indirect factors. The complex system of tourism is one of the most influential and significant geographic and socio-economic phenomena in Croatia. The influence and significance of tourism can be seen in its direct, indirect, and incentivized role in the socio-economic development on the local, regional, and state levels. The influence of tourism can also be seen in employment in tourism, demand for goods and services on the part of foreign tourists, share of imports, its role in investment, image, its contribution to state GDP, and in other indicators (Vojnović, 2018). In smaller centers where tourism is the main engine of development, numerous economic subjects from the selfsame sector dominate economic life and are the reason behind above-average results on the national level. Furthermore, numerous households are active in tourism, foremost in terms of renting housing capacity/lodgings to tourists. In Croatia in 2019, there were 18.2 million foreign tourists, who accounted for 95 million overnight stays (Ministry of Tourism, 2020), while Croatia itself has a bit over 4 million residents. While foreign tourists accounted for the bulk of measured tourism statistics, domestic tourists tallied a respectable 2.4 million registered arrivals and nearly 14 million overnight stays. Most tourist arrivals and overnight stays took place on the Croatian coast and islands, which have a population of roughly 1 million, but if we disregard cities with tens of thousands of inhabitants, the normal population of the numerous coastal and island tourism

areas drops to around 500,000. From this comparison we can conclude that tourism traffic in these small settlements is large enough to generate above-average results in terms of economic development on the national level. It goes without saying that other economic activities develop in these settlements alongside tourism, such as agriculture or industry. Rovinj is a city that is very developed thanks to its extremely highly-developed tourism supply, but it also boasts well-developed industry. Another example is Kali, a center of marine activities that exports tuna to Japan, which contributes to its economic development alongside tourism.

Analysis of the indicators shows that agriculture is not such a strong factor for economic development level. Though financial incentives amount to roughly 1.3% of GDP (Grupacija Svjetska Banka, 2019), Croatian agriculture is undergoing a process of structural transformation that includes modernization of agriculture, significant increases in productivity, reduction in the share of agricultural workers in total employment, and the agricultural sector is becoming increasingly associated with poverty. Furthermore, the contribution of agriculture to GDP is noticeably smaller (Grupacija Svjetska Banka, 2019). In the market-industrial economy, only a low percent of the total number of workers are employed in agriculture (Obadić, 2001), so agriculture can not be expected to contribute significantly to state GDP. The domination of municipalities and cities with below-average levels of development in Slavonia shows how agriculture lacks the power of tourism in terms of economic development. The main areas for food production have below-average levels of development, low employment, and below-average education levels.

The area where industry is exceptionally important is northwestern Croatia, however, this area is also dominated by below-average development and education levels, which show that Croatian industry does not generate sufficient developmental power by itself. There is also the pressing problem of weakening competitiveness of the Croatian manufacturing industry, which is a consequence of its unfavorable technological structure that is characterized by the domination of low-tech industry (Rašić Bakarić and Vizek, 2010). The Croatian manufacturing industry accounted for only 14.9% of GDP and 17.7% of employment in 2015 (Prester and Rašić Bakarić, 2017). This shows the relatively weak share of the manufacturing industry in Croatia's economy and its below-average level of development. This is partially a consequence of presence of industry dependent on cheap labor that, despite its dwindling presence over the last 30-odd years, is still quite widespread in Croatia.

It is a phenomenon that mountainous areas of Croatia (Lika, Banovina, Kordun) show above-average development levels (income per capita) despite below-average employment, entrepreneurship, and education levels. Such areas are of special state concern, which allows us to account for above-average values by citing various state incentives.

Frequent discussions regarding the need to achieve effective administration of local self-government units or optimize systems of local self-government come to the same conclusion: the number of municipalities should be reduced, especially those that can not support themselves economically and depend on the central state government for financial aid. This problem is very complex and it is questionable whether a simple reduction in the number of municipalities would be an effective measure by itself. Prior to deciding the number of municipalities or potentially reverting to a system similar to the previous one (1963–1992), the following data must be taken into account. Above-average values of municipal income per capita were documented for 189 municipalities and cities (49 of which were in the top 25%--Q1), i.e. for 34% of all local self-government units (Tab. 7). Of the "old" 105 municipalities, 49 of them generated above-average values and 29 of those numbered among the top 25% according to development level (Q1). Of the "new" municipalities, 140 of them generated above-average values for municipal income per capita. From this we can conclude that 140 "new" municipalities generate more municipal income per capita than 56 "old" municipalities, i.e. more than half of the "old" municipalities are below-average today. It is interesting that the leading 23 municipalities according to municipal income per capita are all low population "new" municipalities and cities.

Tab. 7 "New" and "old" municipalities and cities according to municipal income per capita, as a measurement of the development level of municipalities and cities.

Municipalities and cities	Number of municipalities and cities	Above- average municipal income per capita (Q1 = >4300)	Above- average municipal income per capita (>3542)	Below- average municipal income per capita (<3542)
"Old municipalities and cities" and the City of Zagreb	105 (19 %)	29 (21 %)	49 (26 %)	56 (15 %)
"New municipalities and cities"	451 (81 %)	110 (79 %)	140 (74 %)	311 (85 %)
Total	556 (100 %)	139 (100 %)	189 (100 %)	367 (100 %)

Legend: "New municipalities and cities" = municipalities and cities formed between 1993 and 2006 under the new territorial organization of local self-government (1993 to present; and "Old municipalities and cities" = municipalities and cities that were part of the previous system of territorial organization (1963–1992), which continued to exist under the new system of territorial organization, but covered a smaller area.

Source: *authors*

CONCLUSIONS

For the needs of typology of municipalities and cities in Croatia according to level of development we used five indicators: income per capita; share of employed in the total population; number of entrepreneurs per resident; average education level of the population; and share of immigrants in the total population. The Pearson correlation coefficient was highest among the indicators income per capita and average education level of the population. The level of development was higher in municipalities and cities where the population was more educated, where there were more immigrants, higher employment, and more entrepreneurs; there were, however, numerous exceptions according to one or more indicators.

In the economic typology we used the indicators: income per capita; share of employed in the total population; and number of entrepreneurs per resident. For the demographic typology we used the indicators: income per capita; average education level of the population; and share of immigrants in the total population. Classes of types of economic development dominate the Adriatic coast and islands, in Zagreb and its immediate surroundings, larger cities, and partly in the areas that were occupied during the Croatian War of Independence. The strength of the influence of larger cities on their wider surroundings is modest, and even Zagreb does not significantly spread its above-average level of development to the rest of central Croatia. Types of below-average economic development level dominate in Slavonia, partly in Dalmatinska Zagora, and in northwestern Croatia. Types of development level according to demographic criteria largely match the results of the economic typology.

Three activities contribute to development level (municipal income per capita): tourism; activities of large cities; and (to an extent) state subsidies for sparsely-settled municipalities and areas that were occupied during the War. Industry and especially agriculture are not activities that contribute to above-average development levels. Numerous low-population and "new" (created after 1993) municipalities are significantly more developed than the "old" (pre-1992) municipalities.

REFERENCES

AJDUKOVIĆ, M., RAJTER, M., REZO, I. (2019). Obiteljski odnosi i roditeljstvo u obiteljima različitog prihoda: kako je život u visokom riziku od siromaštva povezan s funkcioniranjem obitelji adolescenata? *Revija za socijalnu politiku,* 26, 1, 69-95.

BAŃSKI, J., MAZUREK, D. (2018). Smart Specialisation and the Internal Potential of Regions in Poland. *Folia Geographica*, 60, 1, 5–30.

BIVAND, R., KEITT, T., ROWLINGSON, B. (2020). rgdal: Bindings for the 'Geospatial' Data Abstraction Library. R-package version 1.5-10. https://CRAN.R-project.org/package=rgdal

BAČELIĆ-GRGIĆ, I. (2016). *Karakteristike malih općina u Republici Hrvatskoj s obzirom na indeks razvijenosti*. Graduate thesis. Split: University of Split.

BLAŽEVIĆ, I. (1980). Utjecaj turizma na proces litoralizacije i na transformaciju agrarnog pejzaža u Istri. In *Spomen-zbornik proslave 30. obljetnice GDH*. Zagreb: Geographical Society of Croatia, pp. 25-38.

BRAIČIĆ, Z., LONČAR, J. (2018). Spatial concentration and regional distribution of economic activities in the Republic of Croatia. *Croatian Geographical Bulletin*, 80, 2, 33-54.

CAMAGNI, R., CAPELLO, R. (2013). Regional Competitiveness and Territorial Capital: A Conceptual Approach and Empirical Evidence from the European Union. *Regional Studies*, 47, 9, 1383-1402.

CAPELLO, R., CARAGLIU, A., FRATESI, U. (2014). Modeling Regional Growth between Competitiveness and Austerity Measures: The MASST3 Model. *International Regional Science Review*, 1-38.

DOBROTA, A. (2019). Izravan udio turizma u BDP-u je 11,4 posto, uz ukupan utjecaj na gospodarstvo Hrvatske od 16,9 posto. In *Cimerfraj.hr*. [accessed on 6 April 2020]. Retrieved from: https://www.cimerfraj.hr/ aktualno/tsa-statistika-2016

DENONA BOGOVIĆ, N., DREZGIĆ, S., ČEGAR, S. (2017). *Studija evaluacija postojećeg i prijedlog novog modela za izračun indeksa te izračun novog indeksa razvijenosti jedinica lokalne i područne samouprave u Republici Hrvatskoj.* Rijeka: University of Rijeka. Rijeka: CLER - Centar za lokalni ekonomski razvoj Ekonomskog fakulteta Sveučilišta u Rijeci. Zagreb: Institut za razvoj i međunarodne odnose.

DRŽAVNI ZAVOD ZA STATISTIKU (2011). *Popis stanovništva Republike Hrvatske 2011*. Zagreb.

MINISTARSTVO FINANCIJA (2018). *Prihod općina 2016.* Zagreb.

MINISTARSTVO TURIZMA (2020). *U 2019. godini 21 milijun turista, 5 posto više nego u 2018., noćenja 2,4 posto više.* Retrieved from: https://mint.gov.hr/vijesti/u-2019-godini-21-milijun-turista-5-posto-vise-nego-u-2018-nocenja-2-4-posto-vise/20762. Accessed on 6 April 2020.

FELETAR, D., STIPERSKI, Z. (1992). Međuzavisnost procesa industrijalizacije i promjena u prostorom rasporedu i pokretljivosti stanovništva u Hrvatskom zagorju. *Acta geographica Croatica,* 27, 141-161.

FINA, Financijska agencija (2020), Zagreb. Retrieved from: www.fina.hr. Accessed on 10 Mart 2020.

FUJITA, M., KRUGMAN, P. (2004). The new economic geography: Past, present and the future. *Papers in Regional Science*, 83, 139-164.

GLAMUZINA, M., GLAMUZINA, N. (1998). Problem centralnog naselja u općini Gradac. *Geoadria*, 3, 57-63.

GRUPACIJA SVJETSKA BANKA (2019). *Stanje sektora i analiza javnih izdataka za poljoprivredu i ruralni razvoj.* Zagreb: Svjetska banka.

HRŽENJAK, J. (2009). Napomene o lokalnoj I regionalnoj samoupravi u Hrvatskoj. *Hrvatska javna uprava,* 9, 4, 999–1010.

IVANIŠEVIĆ, S. (2000). Teritorijalna osnova lokalne i regionalne samouprave uz posebni osvrt na položaj Grada Zagreba i njegovu samoupravu. *Hrvatska javna uprava,* 2, 4, 585-601.

JAŻDŻEWSKA, I., KOTLICKA, J. (2020). Application of Cluster Analysis in Urban Morphology Research. The Example of Industrial Plots in Łódź (Poland). *Folia Geographica*, 62, 2, 5-21.

KLAMÁR, R., MATLOVIČ, R., IVANOVÁ, M., IŠTOK, R., KOZOŇ, J. (2019). Local Action Group as a Tool of Inter-municipal Cooperation: Case Study of Slovakia. *Folia Geographica*, 61, 1, 36-67.

KLARIĆ, Z. (2016). Geografski aspekti teritorijalnog ustroja Hrvatske i usporedba s drugim europskim zemljama. *Hrvatski geografski glasnik,* 78, 2, 49-75.

KOPRIĆ, I. (2010). Karakteristike sustava lokalne samouprave u Hrvatskoj. *Hrvatska i komparativna javna uprava: časopis za teoriju i praksu javne uprave,* 10, 2, 371-386.

LORAH, J. (2018). Effect size measures for multilevel models: Definition, interpretation, and TIMSS example. *Large-Scale Assessments in Education*, 6, 1, 1-11.

MALIĆ, A., STIPERSKI, Z. (1993). Političko-teritorijalni ustroj i centralitet naselja Republike Hrvatske. *Acta Geographica Croatica*, 28, 67-83.

MARCELIĆ, S. (2015). Kritička analiza hrvatskog indeksa razvijenosti: tri tipa razvoja i njihov regionalni položaj. *Revija za socijalnu politiku,* 22, 3, 309-333.

MATLOVIČ, R., MATLOVIČOVÁ, K. (2020). First and second order discontinuities in world geographical thought and their primary reception in Slovak geography. *Folia Geographica*, 62, 1, 52-76.

OBADIĆ, A. (2001). Značaj industrije za gospodarski razvitak. *Ekonomski pregled*, 52, 9-10, 1100-1112.

PERIŠIĆ, A. (2014). Multivarijatna klasifikacija jedinica lokalne i regionalne samouprave prema socioekonomskoj razvijenosti. *Društvena istraživanja,* 23, 2, 211-231.

PERIŠIĆ, A., WAGNER, V. (2015). Indeks razvijenosti: analiza temeljnog instrumenta hrvatske regionalne politike. *Odabrani prijevodi,* 30, 15, 1-24.

PERKOVAC, Ž. (1993). *Turizam i geoprostor Poreštine*. Pazin: IKD Juraj Dobrila.

PRESTER, J., RAŠIĆ BAKARIĆ, I. (2017). Analiza strukturnih obilježja prerađivačke industrije Republike Hrvatske. *Ekonomski pregled,* 68, 4, 341-383.

RAŠIĆ BAKARIĆ, I., VIZEK, M. (2010). Analiza konkurentnosti i strukturnih obilježja prerađivačke industrije Republike Hrvatske. *Ekonomski pregled,* 61, 5-6, 241-270.

SCOTT A. J., STORPER M. (2003). Regions, Globalization, Development. *Regional Studies*, 37, 6-7, 579-593.

SWIANIEWICZ, P., GENDŹWIŁŁ, A., ZARDI, A. (2017). *Territorial reforms in Europe. Does size matters? Territorial Amalgamation Toolkit*. EU: Council of Europe.

VOJNOVIĆ, N. (2018). Intenzitet turizma u vodećim hrvatskim turističkim gradovima i općinama. *Geoadria,* 23, 1, 29-50.

WICKHAM, H. (2016). ggplot2: Elegant Graphics for Data Analysis. Springer-Verlag New York, 2016.

ŽULJIĆ, S. (2001). Regionalno i teritorijalno ustrojstvo Hrvatske u razdoblju između godina 1945.-2000. *Ekonomski pregled,* 52, 1-2, 3-28.