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## RURAL INFRASTRUCTURE AND THE ROLE OF SOCIAL CAPITAL IN SERBIA

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### Abstract

*The starting point of this research is the assumption that infrastructural development in Serbia could be the key to economic growth. The aim of this research is to present an overview of the level of development in rural Serbia with a focus on infrastructure. The research compares twelve rural Serbian districts on the basis of data about the three categories economic performance, infrastructure development and social capital. Outcomes of the research are an analysis of the relations between the three categories and a comparison of the Serbian districts. The two main findings of this research are that the positive influence of infrastructure on economic development is not convincingly proven for Serbia and that the relation between economic development and social capital (measured by election data) turns out to be negative instead of positive.*

**Key words:** *Rural development, rural infrastructure, social capital*

### Introduction

This paper focuses on rural districts in Serbia. It compares the districts on the basis of data about the economic performance, the infrastructure development and the level of social capital. Serbia is an interesting country to look at, mainly because of its history as a former Yugoslavian country and its future accession to the EU. The status of Kosovo (under UNSCR 1244) is of major debate, therefore Kosovo will not be included when talking about Serbia.

The research is limited to rural areas first of all because high unemployment levels and poverty in rural areas in Serbia cause migration to the cities. Depopulation takes place in the rural areas, leading to economic and social problems in these areas as well as in the big cities. Another reason for focusing on rural regions is that rural development is an important part of the EU legislation and a large budget is spent

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on rural policies. Already in the pre-accession period Serbia receives financial aid for bringing its rural policies into conformity with the EU rural policies. Infrastructure is an important part of rural development. It is thought that infrastructure development contributes to economic development. As the quality of the road network in Serbia remains weak, it is interesting to look at infrastructure and its relation with economic development.

The aim of this research is to present an overview of the level of development in rural Serbia with a focus on infrastructure. The research looks at the relation between infrastructure and economic development and the possible influence of social capital. The outcomes can complement to the literature already existing about rural areas in Serbia and can be useful in the pre-accession period of the country. Furthermore, the outcomes will contribute to the discussion about the importance of investing in rural infrastructure.

The remainder of the article is organised as follows. Sections 2 and 3 give a theoretical overview and Sections 4 and 5 describe the data analysis. Finally, Section 6 contains the conclusion and discussion.

## **Infrastructure**

Infrastructure development is one aspect of rural development policies. Different sources give different definitions of infrastructure. The definition of the UNDP (2008) is very broad, describing four key types of infrastructure that have an influence on human development: energy, transport, telecommunication and the environment. Also the interpretation of the World Bank (2010) is very extensive. Indicators used by the World Bank to describe infrastructure range from rail lines and electric power consumption to internet subscribers and daily newspapers.

Infrastructure in this research is limited to a more narrow definition, namely the road network (motorways, highways, secondary roads and rural roads). Well-developed infrastructure is generally described as very important for economic growth and rural development. The positive effects of infrastructural development mentioned by UNDP (2008), Nemes (2005), ERF (2010) and Escobal (2005) among others can roughly be divided into benefits for trade, society, investment and employment. Concerning trade, a well-developed road network improves access to the market, lowers transaction costs and stimulates trade with other regions. For society well-developed infrastructure stimulates the freedom of movement and social integration, thereby lowering isolation. Moreover, regional inequalities are lowered and the rural population gains more income due to improved trade. A region that is easily accessible due to developed infrastructure can attract more investments from outside the region and can gain more income from the tourist sector. Finally, well-developed infrastructure has shown to be important for employment: jobs are created, unemployment is lower and there are opportunities to commute to work and to find a job in non-agricultural sectors.

## Social Capital

Social capital, together with other forms of capital, explains the increase or decrease of productivity. Well-developed social networks and interaction make lives more easy and productive and social capital is therefore used as a factor to explain economic success. Different definitions of social capital, including those of Durlauf (2004), Putnam (2000), Danchev (2005) and Paldam (2000), have been developed. First of all, researchers talk about a group of people, socially connected with each other. They share certain ways of interaction, knowing what they would do for each other. The way they interact stimulates them to work together, increase their productivity and reach common goals. The interaction occurs under common rules and norms, trust in each other and reciprocity.

Social capital is defined in this research as *the interaction in a group, like norms, trust and reciprocity, stimulating the achievement of a common goal*. As it is very difficult to find useful and sufficient data concerning levels of social capital in Serbia, this research selects one variable used to measure social capital, namely election turnouts. Election turnouts reflect the trust citizens have in their government and this trust is an important aspect of social capital. Bronisz and Heijman (2010) among others indicate election turnouts as a way of measuring social capital. Literature reviews show that social capital stimulates economic growth and therefore it is expected that richer districts have higher election turnouts (as an indicator of the level of social capital).

The role social capital could play in the development of rural infrastructure can go two ways. First of all, the development of infrastructure is less complicated when all the actors involved in building a road can work together without problems. The second role social capital can play is in the use of the road network. Modern roads between two rural communities are of no use when the two communities do not interact, i.e. when there is no trade or shared activity. A high level of social capital could therefore increase the benefits from infrastructure development.

## Methodology

In this study a data analysis will be performed consisting of two parts. Data is collected from the Statistical Office of the Republic of Serbia about twelve districts in Serbia. The first analysis will rank the districts according to their performance on the following three categories: infrastructure development, economic development and election turnouts (as a variable for social capital). The second part will analyse relations between the three categories. The research is based on data analysis mainly because it is an objective and efficient way to compare the districts in a short period of time.

This study is limited to twelve of the 24 districts in Serbia. The districts are selected according to the typology of Bogdanov et al. (2008). As this research focuses on rural areas, all districts with municipalities that are categorized as urban are left out of the research.

The following twelve districts remain:

|               |                 |           |           |
|---------------|-----------------|-----------|-----------|
| ▪ West Bačka  | ▪ Central Banat | ▪ Raška   | ▪ Pirot   |
| ▪ North Bačka | ▪ Kolubara      | ▪ Toplica | ▪ Zaječar |
| ▪ North Banat | ▪ Zlatibor      | ▪ Pčinja  | ▪ Bor     |

Three categories are of importance for this research: infrastructure, economic development and social capital. For all three categories data is collected.

With this data indexes have been made. The indexes are computed from the standardized values of the variables. Data about the economic performance of the districts consists of the GDP per capita, net wages and unemployment level. It will show differences in income and job opportunities between the districts as variables for the level of economic development. The index of economic development is calculated as follows: Economic Development ECODEV =  $(zGDP+zUnempl_r+zWage)/3$ . Unemployment is in this case reversed, because it has a negative influence on economic development. The index for infrastructure is the average of the standardized values of: length of roads, modern surfaced roads as percentage of total roads, length of highways, length of highways with modern surface, length of regional roads, length of regional roads with modern surface, length of local roads and length of local roads with modern surface. This index will give a good overview of the quality and quantity the regional infrastructure. The index for social capital consists of election turnouts for local governments, as this is one of the main variables for social capital mentioned in the literature and it reflects the trust people have in their government.<sup>2</sup>

All data is retrieved from the Statistical Office of the Republic of Serbia (RZS, 2009 and 2010). The advantage of using one source is that differences in measurement are minimized. For the analysis, the statistical programme SPSS is used. For looking at the relations between variables the Pearson correlation coefficient is used. The significance level is 0.05 unless mentioned otherwise.

## Results

In Table 1 the districts are ranked according to their scores on election turnouts and the indexes of economic development and development of infrastructure. The most notable ranking can be seen in the economic development column. There is a very clear distinction

<sup>2</sup> In fact Social Capital is a complex multivariate concept. However, due to a lack of data we have confined ourselves to election turnouts as the single indicator for social capital. This would be an interesting area for future research.

between regions in the north and regions in the south. When Serbia would geographically be divided into two parts, Kolubara and Bor would be at the borders of the northern part and Zaječar and Zlatibor would be the beginning of the southern part. Concerning economic development, all districts in the northern part have positive indexes and all districts that are located in the south have negative indexes. This indicates that the northern part of the country has a better developed economy than the south.

Concerning election turnouts a geographical distinction is less clear, but in general it could be said that in the south more people vote. Some rankings are totally opposite compared to economic development. West Bačka is ranked number 1 when looking at economic development, but number 12 when looking at election turnouts. Vice versa, Pirot and Toplica have the lowest index for economic development but the highest for election turnouts.

Concerning infrastructure development, it is harder to make a general statement. The district with the highest index is Kolubara, whereas Bor scores the lowest. The numbers 10, 11 and 12 in the ranking are located each in different parts of the country: the north, the middle and the south. Therefore also geographically it is hard to find a relation.

*Table 1 - The ranking of the districts*

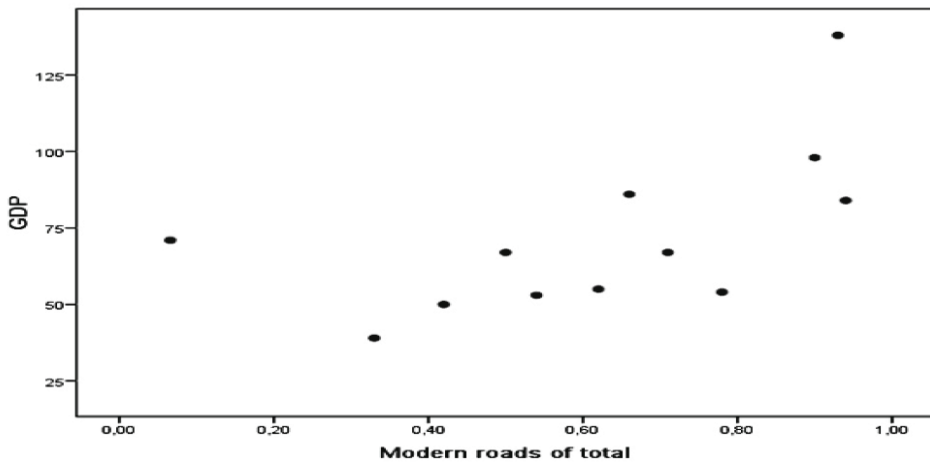
| District      | Economic Development Index | Rank | Social Capital Index | Rank | Infrastructure Index | Rank |
|---------------|----------------------------|------|----------------------|------|----------------------|------|
| North Bačka   | 0.919                      | 2    | -0.433               | 8    | -0.133               | 10   |
| Central Banat | 0.376                      | 6    | -0.993               | 11   | 0.016                | 8    |
| North Banat   | 0.886                      | 3    | -0.013               | 6    | 0.022                | 7    |
| West Bačka    | 1.128                      | 1    | -1.338               | 12   | 0.033                | 6    |
| Kolubara      | 0.545                      | 4    | 0.623                | 4    | 0.768                | 1    |
| Bor           | 0.443                      | 5    | -0.903               | 9    | -1.153               | 12   |
| Zaječar       | -0.379                     | 8    | -0.989               | 10   | 0.113                | 5    |
| Zlatibor      | -0.020                     | 7    | -0.128               | 7    | 0.304                | 2    |
| Raška         | -0.801                     | 9    | 0.729                | 3    | 0.258                | 3    |
| Toplica       | -1.091                     | 12   | 1.249                | 2    | -0.116               | 9    |
| Pirot         | -1.029                     | 11   | 1.916                | 1    | -0.329               | 11   |
| Pčinja        | -0.978                     | 10   | 0.281                | 5    | 0.217                | 4    |

When looking at the data about the twelve districts, is it clear that the northern districts perform better on economic development than the southern districts. They have higher GDP's per capita, higher net wages and lower unemployment levels. Ranked on the first place is the district West Bačka and ranked on the last place is Toplica. Noticeable when looking at the development of infrastructure is that the districts in the north have lower road densities than the south, but in turn have the best quality of roads. An explanation for the low road density can be found in the geographical characteristics of the north: the area consists of flatland, with a small number of settlements with a high population density. Kolubara is the district ranked on the first place, Bor comes in last. Against the expectations gained from the literature, the regions which score low on economic development have the highest election turnouts. West Bačka, which was

ranked on the first place concerning economic development, is ranked on the last place concerning election turnouts. Pirot has the highest election turnouts.

The main question to be answered in this paragraph is the following: Is there a relation between the development of infrastructure and the economic development in the Serbian districts? The correlations between the GDP per capita and the variables of infrastructure development (length of roads, roads per km<sup>2</sup> and modern roads) were calculated. It was found that significant correlations exist between the GDP and roads per km<sup>2</sup> as well as between the GDP and modern roads. The relation between the GDP and the modern roads as a percentage of total roads is positive (correlation coefficient of 0.582), as expected. It is more remarkable that the relation between GDP and roads per km<sup>2</sup> is negative (correlation coefficient of -0.651), meaning that districts with higher GDP's per capita have less kilometres of roads per square kilometre. A significant relation between length of roads and GDP per capita only exists when a 0.10 significance level is used. Again, the correlation coefficient is negative (correlation coefficient of -0.509). An explanation could be found in the numbers and sizes of the settlements. The data indeed shows that the richer districts have fewer settlements and more inhabitants per settlement. This indicates that fewer roads are needed to connect the settlements with each other. Figure 1 shows the correlation between the variables GDP and modern roads. It is a positive correlation, with two districts that can be considered as outliers.

*Figure 1 - Correlation between GDP per capita and percentage modern roads of total roads*



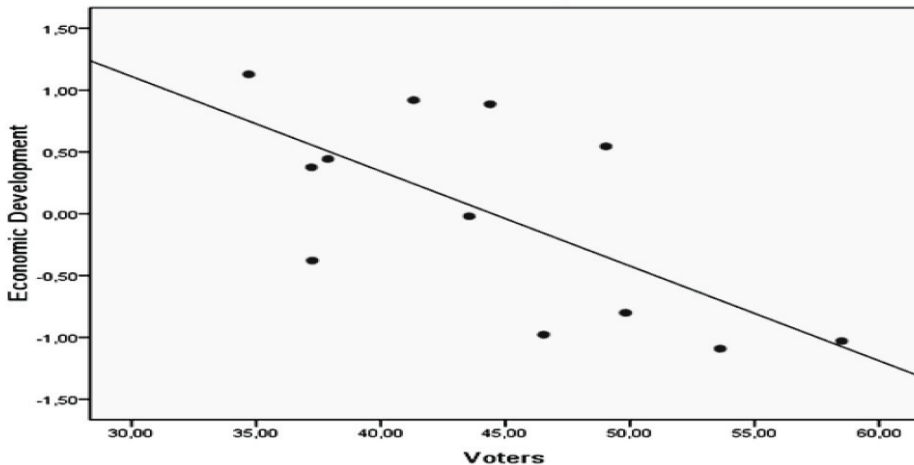
*(Source: SPSS output and RZS, 2009 and 2010)*

The question in this paragraph is whether there is a relation between the election turnouts and the economic development. The answer to this question is yes, but it is not the positive relation which was expected. As social capital is thought to stimulate economic growth, it was expected that economically more well-developed regions would have higher election turnouts. But, between the variables 'voters' with 'GDP' and 'voters' with 'net wages' a significant negative correlation was found (correlation coefficients of -0.581 and -0.710). Also the correlation between voters and the index for economic development is significantly negative. When the GDP in a district is high, the election turnouts are low. With reservation, when substituting election turnouts for social capital, this indicates that higher economic development in Serbian regions is intertwined with lower levels of social capital. Figure 2 below shows this relationship.

An explanation for the negative correlation shown in Figure 3 could be that election turnouts and therefore social capital are higher in smaller communities. Indeed, when looking at the correlation between election turnouts and the average population per locality, this relation is significantly negative (a correlation coefficient of -.635). More people in a community indicate a lower level of election turnouts.

Next, the correlation between the size of the communities and economic development has to be checked. The hypothesis now is that small communities have high levels of social capital (which is already shown) and lower levels of economic development (which has to be proven). New tests show a significant positive correlation (coefficient 0.808) between the level of economic development and the size of the settlements, meaning that larger localities perform better economically. It can therefore be concluded that the negative relationship between economic development and election turnouts can be explained by the size of the settlement: higher election turnouts exist in economically less developed and smaller communities.

*Figure 2 - Correlation between economic development and election turnouts*



*(Source: SPSS output and RZS, 2009 and 2010)*



## Conclusion

The starting point of this research was the assumption that rural infrastructure development in Serbia could be the key to economic growth. To get an overview of the situation concerning the development of rural areas in Serbia, information about the economy, infrastructure and election turnouts was collected. This last variable was used as an indicator for the level of social capital.

According to the literature, both infrastructure development and social capital stimulate economic growth. It was found that the importance of good infrastructure can roughly be divided into benefits for trade, society, investment and employment, for example more investments and lower unemployment. The importance of building social capital lies in the way people interact. If people trust each other and understand the rules and norms under which they interact, they will be stimulated to work together, increase their productivity and reach common goals.

The research compared twelve Serbian districts on the basis of data about the three categories economic performance, infrastructure development and election turnouts. First of all, it was found that a significant correlation exists between the GDP per capita and the amount of modern surfaced roads. But when looking at total kilometres of road, it seems that the economically least developed districts have the most kilometres of road per square kilometre. An explanation can be found in the fact that these districts have more but smaller settlements, therefore more roads are needed to connect these settlements with each other. The quality of these roads is low, especially in the south of Serbia.

A significant correlation does exist between election turnouts and economic development, but it is not the positive relation as expected when reading the literature. It was expected that social capital would stimulate economic growth and therefore richer districts were expected to have higher levels of social capital. But it is found that the poorest districts have the highest level of social capital. An explaining factor is the size of the settlements. It was already discussed that levels of social capital are higher in rural areas than in urban, because social capital is more easily built in smaller communities. In small, rural communities, the levels of bonding social capital are high, with strong family ties and traditional societies. When looking at the research areas, the poorer districts have smaller communities than the richer districts and therefore higher levels of social capital.

The two main findings of this research are that the positive influence of infrastructure on economic development is not convincingly proven for Serbia and that the relation between economic development and social capital (measured by election data) turns out to be negative instead of positive. For further research it would be interesting to look deeper into social capital in rural areas and find more variables for measuring social capital.



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