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CONDEMNED TO SUCCESS (FAILURE)? THE ALLOCATION OF EU FUNDS AMONG POLISH MUNICIPALITIES

Abstract

Objective: The aim of the paper is twofold. First, we investigate the mobility of Polish municipalities within the distribution of *per capita* EU fund expenditures over two terms of office: 2007–2010 and 2011–2014. The resulting joint distribution serves as the basis for some empirical analyses. Second, we consider the relationship between mobility and social capital in 16 Polish regions.
Research Design & Methods: We make use of a transition probability matrix and rank-rank regression. Additionally, we employ Spearman's rank correlation and Kendall's rank correlation. Both nation-wide and region-specific analyses are conducted.
Findings: The municipalities most (least) successful in attracting EU funds in the 2007–2010 period tended to maintain their positions in the 2011–2014 period. The relative and absolute mobility of municipalities – EU funds beneficiaries – differ considerably across regions. There is a significant negative correlation between within-region absolute mobility and the level of bridging social capital within regions.
Implications/Recommendations: The persistence of municipalities at the ends of the EU fund absorption ranking can facilitate forecasts of the spatial allocation of EU funds and, consequently, its effects.
Contribution: To the author's best knowledge, the study constitutes the first empirical analysis of within-distribution mobility of municipalities – EU funds beneficiaries. We also provide an initial study on the nexus between social capital and mobility within the ranking of EU funds beneficiaries. Adding to an earlier study by Swianiewicz *et al.* (2008), we show that the allocation of EU funds in Poland is affected by the level and structure of social capital.

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JEL Classification: H72, H77.

1. Introduction

The primary focus of EU cohesion policy is on NUTS level 2 regions. It is justified by the convergence of productivity and GDP *per capita* across countries combined with persistent disparities among regions within countries (Giannetti 2002; Baldwin & Wyplosz 2009, pp. 386–389; Bachtler *et al.* 2017). In Poland NUTS level 2 regions are equivalent to administrative regions (voivodeships). In the 2007–2013 programming period, Polish regional self-governments played a crucial role in allocating EU funds. They performed the role of managing authorities for 16 regional operational programs. They also took an active part in implementing some priority axes in central programs as well as funds for rural areas and the fisheries sector. One should bear in mind that the allocation of EU funds is further disaggregated within regional borders. Lower-level governments (districts and especially municipalities) accounted for prominent beneficiaries of EU funds. In this paper we consider EU fund expenditures by municipality. Municipalities represent the lowest self-government tier (NUTS level 5). In relation to the EU cohesion policy administrative framework in Poland, municipalities are grouped by region.

2. Related Literature

Our paper builds on two strands of literature regarding, respectively: the allocation of EU funds and social capital measures. There is an increasing number of studies that focus on the determinants of the distribution of EU funds at the municipal level. A few examples are: Veiga (2012) for Portugal, Muraközy and Telegdy (2016) for Hungary, and Banaszewska and Bischoff (2017) for Poland. These studies report average effects within the analysed samples, which aids the assessment of whether managing authorities meet allocation objectives. They also allow the political economy aspect of EU fund allocation to be identified. Nevertheless, previous analyses documenting average effects should be supplemented with detailed analyses of the distribution of variables of interest. As an illustrative example, in their assessment of the effects of EU funds in Poland, Misiąg, Misiąg and Tomalak (2013) obtain a general inverse relationship between the size of municipality and the amount of attracted EU funds *per capita*. At the same

time, the authors stress that the general relationship was driven by three regions (voivodeships): Małopolskie, Opolskie, and Podlaskie.

The existing literature says little about the mobility of EU funds beneficiaries within the distribution, which is equally crucial from a social welfare perspective. Kyriacou and Roca-Sagalés (2012) show that above a specific level of concentration of EU funds (estimated at 1.6% of a country's GDP), EU structural funds are likely to increase regional disparities. In a similar vein, Becker, Egger and von Ehrlich (2012) reveal that the reduction in EU fund support for NUTS 3 regions that already receive grants exceeding 1.3% of their GDP would not hamper their growth prospects. Given this result, they opt for a reallocation of EU funds across regions as a welfare-enhancing measure. This argument is relevant for Poland, as the concentration of EU funds there is among the highest in the EU.

Social capital is believed to be a fundamental factor driving economic growth and development (see, for instance: Knack & Keefer 1997, Woolcock 1998, Whiteley 2000). Besides this general consensus, there is an ongoing scholarly debate on how to properly measure social capital. Bednarek-Szczepańska (2013) offers a critical review of composite indices of social capital in Poland. Among the publications reviewed, only the one by Swianiewicz *et al.* (2008) provides indices of different types of social capital at the regional (voivodeship) level. The others report either a single measure of social capital and/or relate to lower-level statistical units (subregions, counties).

Swianiewicz *et al.* (2008) offer a unique study that incorporates both the perspective of EU funding policy and the area of social capital. Building on Putnam (1993), they construct composite indices of bridging and bonding social capital in Polish regions (voivodeships). The areas encompassed by these indices are listed in Figure 1. In regard to the 2004–2006 financial perspective, Swianiewicz *et al.* (2008) provide tentative evidence that bonding capital fosters EU fund absorption whereas bridging capital hinders this process.

Bonding capital
– family and friendship ties – neighbourly ties – religious practices

Bridging capital
– involvement in activities for the benefit of the local community – volunteering

Fig. 1. Components of the Indices of Bonding and Bridging Capital

Source: (Swianiewicz *et al.* 2008, pp. 83–102).

These considerations motivate the following research questions:

1) What are the levels of absolute and relative upward mobility in the EU fund utilization ranking in Poland overall and within 16 Polish regions?

2) Is the within-region mobility of municipalities – EU funds beneficiaries – correlated with the levels of bridging and bonding social capital?

We add to the empirical literature on EU fund distribution in Poland in two ways. To the author's best knowledge, we offer the first empirical analysis of within-distribution mobility of EU funds beneficiaries. To this end, we employ methods typical of studies on intergenerational income (wealth) mobility, such as Chetty *et al.* (2014b) and Chetty *et al.* (2014a). Second, we provide an initial study on the nexus between social capital and mobility within the ranking of EU funds beneficiaries. What makes the Polish case instructive is both the amount and the scope of EU support for municipal governments.

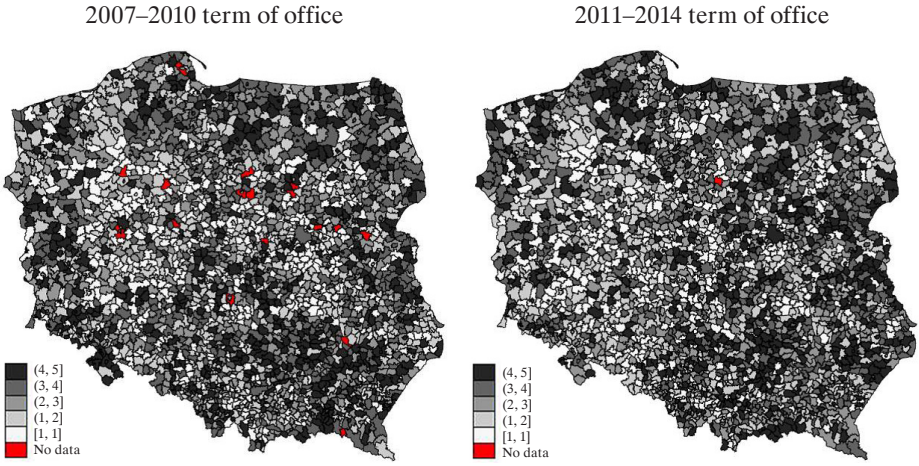
3. Data and Methods

In this paper, we investigate whether the set of municipalities (un)successful in attracting EU funds is persistent over time. The variable under investigation is *per capita* EU fund expenditures excluding co-financing, i.e. expenditures recorded in municipal budgets with 4th paragraph digit 1, 5, 7, and 8. The data encompass not only structural and cohesion funds but also funds for agriculture and fisheries, which are of particular importance in rural areas. The drawback of our approach is that we refer to the total amount of EU funds spent by municipalities. Unfortunately, the data reported to the Ministry of Finance cannot be broken down into funds allocated at the central and local level. Still, we argue that these types of funds are closely related (as complements as well as substitutes) so that one should focus on their joint allocation.

In order to ensure over-time comparability, the expenditures are expressed in real terms with the use of the GDP deflator. The data are from Ministry of Finance database and National Bank of Poland website. To relax the disturbance from short-term hikes (drops) in spent funds, expenditures are cumulated over four-year periods, consistent with two local government terms of office: 2007–2010 and 2011–2014. Because in the analysed period local elections took place in November and December, the election years (i.e. 2010 and 2014) are considered to be the last year of a given term-of--office. As a result, we obtain two observations for each municipality.

We use this joint distribution of (Y_i, X_i) (copula) to describe the mobility of EU funds beneficiaries.

Figure 2 shows the position of municipalities within quintiles according to their *per capita* EU fund expenditures over the 2007–2010 and 2011–2014 terms of office (where 1 represents the bottom quintile, 2 represents the second quintile and so on up to 5, which is the top quintile). A visual inspection shows that the ranks are spatially correlated. It is also evident that only few municipalities received no EU funds in the analysed period. Therefore, our sample includes virtually all Polish municipalities. Specifically, we use data for 2,459 out of 2,479 of the lowest-tier entities in the 2007–2014 period.



1 – bottom quintile, 2 – second quintile, 3 – middle quintile, 4 – fourth quintile, 5 – top quintile, no data – no EU funds spent.

Fig. 2. EU Fund Expenditures *per capita* in Polish Municipalities over the 2007–2010 and 2011–2014 Terms of Office

Source: author's own calculations based on Ministry of Finance data.

First, we calculate a transition probability matrix. We divide municipalities into five groups (quintiles). Then, we calculate the probabilities for a municipality reaching a specific quintile in the 2011–2014 term of office, conditional on its quantile rank in the 2007–2010 term of office.

Next, for the purpose of further analysis of the persistence of municipalities (un)successful in attracting EU funds over time, we employ rank-rank regressions. This time, for the 2007–2010 and 2011–2014 periods,

the numbers from 1 (bottom percentile) to 100 (top percentile) are assigned to each municipality. The regression is as follows:

$$EU\_funds\_pc\_percentile\_2011\_2014_i = \alpha + \beta\, EU\_funds\_pc\_percentile\_2007\_2010_i,$$

where: i – municipality.

The slope represents relative mobility, i.e. the difference between the 2011–2014 mean percentile rank of municipalities most successful in attracting EU funds in the years 2007–2010 versus municipalities least successful in that respect. Putting it differently, it shows the association between ranks in the 1st and 2nd election cycle. Importantly, the slope does not depend on the standard deviation of Y_i and X_i. The relative mobility is inversely related to the slope. The above regression can be also used to determine absolute upward mobility at a specific percentile. For example, at the 25th percentile the formula is $\alpha + 25\beta$. Absolute mobility increases with the obtained result (Chetty *et al.* 2014a, 2014b).

Regional (voivodeship) governments played a critical role in the allocation of EU funds in the 2007–2013 financial perspective (Banaszewska & Bischoff 2017). Taking into account this possible geographical variation, we extend our research by region-specific analyses. We do not reassign municipalities, however, but use the same ranking for country-wide as well as region-specific considerations[1].

We also test whether the region-specific mobility of municipalities – EU funds beneficiaries – is correlated with regional social capital. Since the number of observations is very low ($n = 16$), we calculate Spearman's rank correlation coefficients. We use the levels of bridging and bonding capital reported by Swianiewicz *et al.* (2008) and represent them with the use of four-level ordinal scale, where 1 – the lowest level of social capital, 4 – the highest level of social capital. Because of this, we supplement our correlation analysis with the Kendall rank correlation coefficient. Strictly speaking, we use tau-b, which makes adjustments for ties.

4. Results

We analyse the mobility of Polish municipalities – EU funds beneficiaries – within the distribution in the 2007–2010 period *versus* the 2011–2014 period. Table 1 presents the joint distribution of EU fund expenditures *per capita* in the 2007–2010 period (X_i) and EU fund expenditures in the

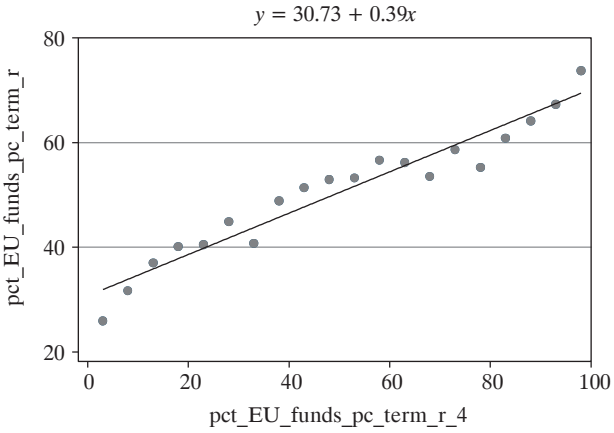
[1] An analogous approach is taken in, for instance, Chetty *et al.* (2014a).

2011–2014 period (Y_i). There is an indication of persistence at the ends of the distribution as 42.7% of the municipalities that received the lowest EU fund support in 2007–2010 also remained in the bottom quintile in the years 2011–2014. A similar percentage (41%) of municipalities most successful in attracting EU funds in the first term of office kept their top positions in the second four-year period. At the same time, dramatic movements within the distribution (from the bottom quintile to the top quintile and *vice versa*) were relatively rare. Their probability is lower than 10%.

Table 1. Transition Probability Matrix on EU Fund Expenditures *per capita* by Polish Municipalities over the Years 2007–2010 and 2011–2014

EU Fund Expenditures *per capita*		2011–2014 Term of Office				
		bottom quintile	second quintile	middle quintile	fourth quintile	top quintile
2007–2010 term of office	bottom quintile	42.7	22.4	14.2	12.4	8.3
	second quintile	23.8	25.0	23.6	16.3	11.4
	middle quintile	13.6	20.3	23.4	24.4	18.3
	fourth quintile	10.8	19.1	24.6	24.0	21.5
	top quintile	8.0	13.1	14.9	23.1	41.0

Source: author's own calculations based on Ministry of Finance data.



The diagram presents a binned scatter plot (20 bins in total) with a fitted line.
The equation of the fitted line is reported at the top of the diagram.

Fig. 3. Rank-rank Regression on Municipalities – EU Funds Beneficiaries – in the 2011–2014 Period *vs* the 2007–2010 Period in Poland

Source: author's own calculations based on Ministry of Finance data.

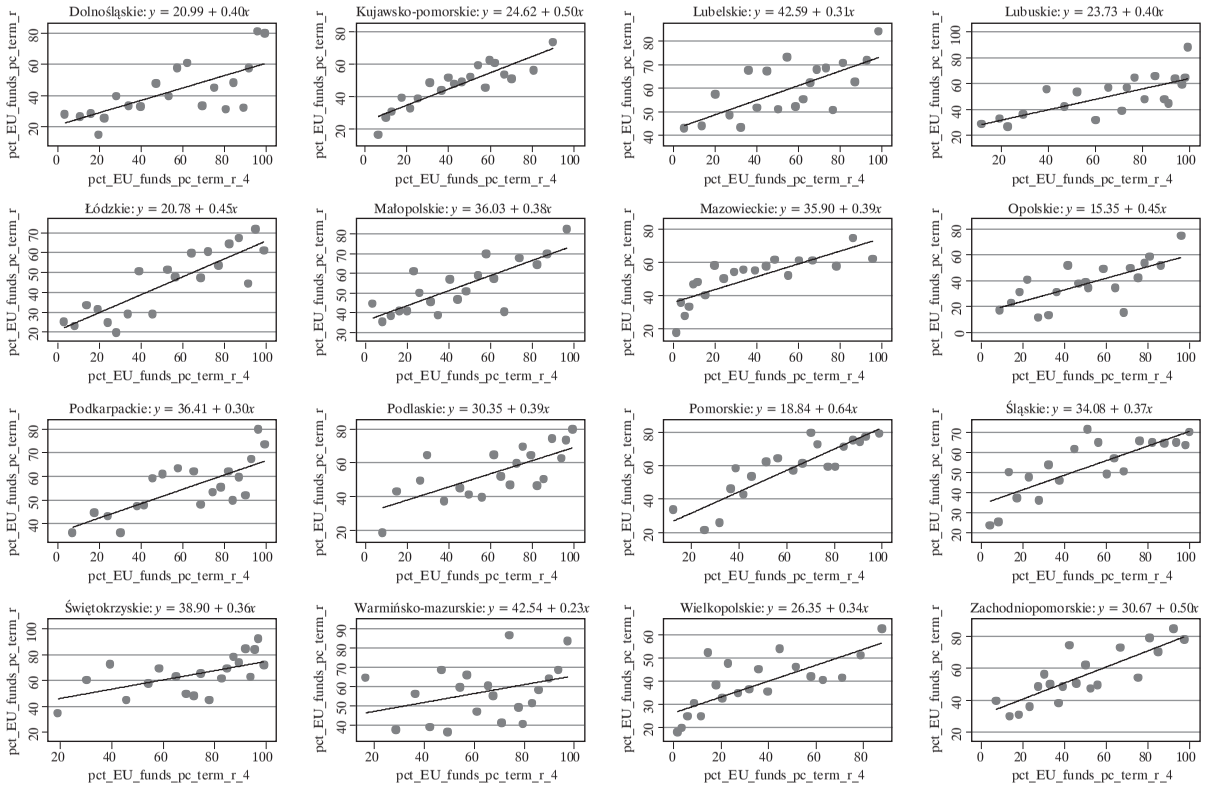
Figure 3 shows that the linear function accounts for a good approximation of rank-rank relationship in our sample. On average, municipalities initially most successful in EU fund acquisition (top percentile) end in a percentile that is higher by 39 positions than municipalities least successful in attracting EU funds. As for absolute mobility, municipalities located in the 25th percentile of the distribution in the 2007–2010 period are expected to move up to the 40th percentile in the second term of office.

In the next step we divide our sample into 16 administrative regions (voivodeships). The results are displayed in Figure 4 and Table 2. Relative upward mobility differs considerably across regions. It is highest for the Warmińsko-mazurskie region (slope equals 0.23) and lowest for Pomorskie (slope equals 0.64). We find that absolute mobility at the 25th percentile is highest for Lubelskie (mean end-period percentile is 50) and lowest for Opolskie (average end-period percentile is 27).

Table 2. Absolute Upward Mobility at the 25th Percentile of Municipalities – EU Funds Beneficiaries – in the 2011–2014 Period *vs* the 2007–2010 Period in Polish Regions

Region	Absolute Upward Mobility at the 25th Percentile
Dolnośląskie	30.99
Kujawsko-pomorskie	37.12
Lubelskie	50.34
Lubuskie	33.73
Łódzkie	32.03
Małopolskie	45.53
Mazowieckie	45.65
Opolskie	26.60
Podkarpackie	43.91
Podlaskie	40.10
Pomorskie	34.84
Śląskie	43.33
Świętokrzyskie	47.90
Warmińsko-mazurskie	48.29
Wielkopolskie	34.85
Zachodniopomorskie	43.17

Source: author's own calculations based on Ministry of Finance data.



The diagrams present binned scatter plots (20 bins in total) with fitted lines. The equations of fitted lines are reported at the top of each diagram.

Fig. 4. Rank-rank Regression on Municipalities – EU Funds Beneficiaries – in the 2011–2014 Period *vs* the 2007–2010 Period in Polish Regions

Source: author's own calculations based on Ministry of Finance data.

Table 3. Spearman's Rank Correlation Coefficients and Kendall's Rank Correlation Coefficients for Polish Regions in the 2007–2014 Period

Pair	Spearman's rho	Kendall's tau-b
Relative mobility of municipalities[a] – EU funds beneficiaries – and bridging social capital[b]	–0.433* (0.094)	–0.318 (0.130)
Absolute mobility of municipalities – EU funds beneficiaries – at the 25th percentile and bridging social capital	–0.595** (0.015)	–0.521** (0.011)
Relative mobility of municipalities – EU funds beneficiaries – and bonding social capital[b]	0.379 (0.148)	0.285 (0.186)
Absolute mobility of municipalities – EU funds beneficiaries – at the 25th percentile and bonding social capital	0.267 (0.317)	0.210 (0.329)

[a] Relative mobility is represented by the slope of rank-rank regression with a negative sign.
[b] Social capital indices are expressed with the use of a four-level scale, where 1 is the lowest level of social capital and 4 is the highest level of social capital.
$N = 16$; p-values in parentheses. Significance levels denoted as follows: * – significant at 10% level, ** – significant at 5% level.

Source: author's own calculations based on Ministry of Finance data.

Table 3 reports Spearman's rank correlation coefficients for relationships between mobility and social capital in Polish regions. Both Spearman's rho and Kendall's tau-b point to a negative and significant correlation between absolute mobility at the 25th percentile and bridging social capital. Similarly, the coefficient on the pair: relative mobility and bridging social capital is negative but loses significance once we use Kendall's rank correlation. Conversely, the correlations between bonding social capital and mobility are positive, However, they are not found to be significant at any conventional levels.

5. Conclusions

This paper offers an empirical analysis of movements within the ranking of *per capita* EU fund expenditures among Polish municipalities over two election cycles: 2007–2010 and 2011–2014. We find that the joint distribution of municipalities – EU funds beneficiaries – is characterized by "stockiness at the ends", i.e. municipalities most (least) successful in EU fund absorption rarely leave their top (bottom) positions. At the same time, using rank--rank regression, we document both the relative and absolute mobility of municipalities – EU beneficiaries, which varies considerably across regions.

We also find that within-region absolute mobility at the 25th percentile is negatively correlated with the level of bridging social capital. Comparing this result with the earlier study by Swianiewicz *et al.* (2008), we conclude that bridging social capital not only inhibits EU fund absorption but also preserves spatial patterns in EU expenditures. This result should be treated with caution as a correlation analysis does not allow any causal inferences to be made. In future studies it would be worth investigating which types of EU funds' regional administrative structures foster (hinder) mobility within the ranking of beneficiaries.

Bibliography

Bachtler, J., Martins, J. O., Wostner, P. and Zuber, P. (2017) *Towards Cohesion Policy 4.0: Structural Transformation and Inclusive Growth RSA Europe.* Regional Studies Association Brussels.

Baldwin, R. E. and Wyplosz, C. (2009) *The Economics of European Integration*. London: McGraw-Hill Education.

Banaszewska, M. and Bischoff, I. (2017) "The Political Economy of EU-funds: Evidence from Poland". *Jahrbücher für Nationalökonomie und Statistik* 237 (3), https://doi.org/10.1515/jbnst-2017-1105.

Becker, S. O., Egger, P. H. and von Ehrlich, M. (2012) "Too Much of a Good Thing? On the Growth Effects of the EU's Regional Policy". *European Economic Review* 56 (4), https://doi.org/10.1016/j.euroecorev.2012.03.001.

Bednarek-Szczepańska, M. (2013) "Zróżnicowanie przestrzenne kapitału społecznego w Polsce – ujęcie przeglądowe" [Spatial differentiation of social capital in Poland – a review]. *Przegląd Geograficzny* 85 (4), https://doi.org/10.7163/przg.2013.4.4.

Chetty, R., Hendren, N., Kline, P. and Saez, E. (2014a) "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States". *The Quarterly Journal of Economics* 129 (4), https://doi.org/10.1093/qje/qju022.

Chetty, R., Hendren, N., Kline, P., Saez, E. and Turner, N. (2014b) "Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility". *American Economic Review* 104 (5), https://doi.org/10.1257/aer.104.5.141.

Giannetti, M. (2002) "The Effects of Integration on Regional Disparities: Convergence, Divergence or Both?". *European Economic Review* 46(3), https://doi.org/10.1016/s0014-2921(01)00166-0.

Knack, S. and Keefer, P. (1997) "Does Social Capital Have an Economic Payoff? A Cross--country Investigation". *The Quarterly Journal of Economics* 112 (4), https://doi.org/10.1162/003355300555475.

Kyriacou, A. P. and Roca-Sagalés, O. (2012) "The Impact of EU Structural Funds on Regional Disparities within Member States". *Environment and Planning C: Government and Policy* 30 (2), https://doi.org/10.1068/c11140r.

Misiąg, J., Misiąg, W. and Tomalak, M. (2013) *Ocena efektywności wykorzystania pomocy finansowej Unii Europejskiej jako instrumentu polityki spójności społeczno-gospodarczej oraz poprawy warunków* życia [The assessment of European Union financial aid utilization efficiency as the instrument of socio-economic cohesion and the improvement in living conditions]. Rzeszów: Wyższa Szkoła Informatyki i Zarządzania.

Muraközy, B. and Telegdy, Á. (2016) "Political incentives and state subsidy allocation: Evidence from Hungarian municipalities". *European Economic Review* 89, https://doi.org/10.1016/j.euroecorev.2016.07.003.

Putnam, R. (1993) *Making Democracy Work.* Princeton: Princeton University Press.

Swianiewicz, P., Herbst, J., Lackowska, M. and Mielczarek, A. (2008) *Szafarze darów europejskich. Kapitał społeczny a realizacja polityki regionalnej w polskich województwach* [The dispensers of European donations. Social capital and the implementation of regional policy in Polish regions]. Warszawa: Scholar.

Veiga, L. G. (2012) "Determinants of the Assignment of EU Funds to Portuguese Municipalities". *Public Choice* 153 (1–2), https://doi.org/10.1007/s11127-011-9786-y.

Whiteley, P. F. (2000) "*Economic Growth and Social Capital". Political Studies* 48 (3), https://doi.org/10.1111/1467-9248.00269.

Woolcock, M. (1998) "Social Capital and Economic Development: Toward a Theoretical Synthesis and Policy Framework". *Theory and Society* 27 (2).