

Table 1. Regional differences of development funds

Territorial level	Robin Hood Index	Hirschman-Herfindahl Index (normalized)
Regions	3.07%	-
Counties	14.70%	-
Micro-regions	22.50%	-
Settlements	-	0.062

Source: Own calculation

The other index can be interpreted if we suppose that the system of development funds allocation can be regarded a special market, sector or 'industry', where the actors are the settlements (self-governments). In this case the value of the Hirschman-Herfindahl Index informs us about the territorial concentration (TE, 2005:8) of this market or sector. However the level of this concentration proves to be low, as the normalized value of HHI (0.062) is small (Szakálné Kanó, 2011:85), i.e. the sector of development policy allocation is fragmented.

So these exploratory results imply that there seems to be a *regional difference* of development fund allocation and the market where the settlements compete for these resources (Vági, 1982) is not concentrated. In the further part of this paper we wish to present a *possible* explanation of this pattern of development fund distribution trying to shed some light on a *potential* structuring factor; *institutional regulation*. So our research question can be concretized whether *institutional regulation of the distribution* of the European Union development funds in Hungary is successful – taking into consideration its aim; i.e. to enable the less developed *regions* (settlements, micro-regions) of the country to absorb development funds. In order to reach this objective the government explores – using statistical data – the development level of every micro-region and according to these differences defines for every EU planning period the least developed micro-regions and settlements of the country listed in a *decree*. The importance of the content of this decree comes from the principle of the EU-funds allocation mechanisms, namely that (only) the underdeveloped areas listed by the decree (*preferred* or *favoured* micro-regions and settlements) can apply for development projects with smaller ratio of own sources, i.e. with higher support rate.

Methodological background

In this analysis we investigate empirically whether the *regulation* described above *facilitates the absorption of development funds*. To carry out the analysis we have built – and aggregated on micro-regional level – complex databases containing all the information needed to fill the variables in the general model:

$$\hat{Y} = b_0 + b_1 \times X_R + b_{2...n} \times X_{C1...n}$$

In the equation the dependent variable (Y) measured the amount of EU development funds allocated (source: downloaded from the webpage of National Development Agency, Hungary), the main explaining variable (regulation, X_R) contained the information – coded in a dummy format – if the micro-region is a preferred micro-region or not (source: recoded from and according to the decree

list). As we applied in the course of data analysis a specified impact analysis design (*'regression discontinuity design'*) to ensure statistical control (see Moksony, 2005) we furthermore introduced more relevant statistical data (as control variables; $X_{C1...n}$) on the actual regional level (source: downloaded and merged from the webpage of the Hungarian Statistical Office) in order to reach higher level of internal validity (Moksony, 1985), i. e. to control the estimation for as many alternative and potentially distorting explaining factors as possible and to measure the net effect of the regulation (Moksony, 2006).

Results of data analysis

Analyzing the development fund indicators of the micro-regions of the Great Hungarian Plain Region a *controversial* effect of being favoured micro-region can be identified in the case of the development-fund absorption rates of the preferred rural development micro-regions. The actual question here is whether being classified as a preferred, favoured *rural development* micro-region provides better options to gain development funds (ARDOP; Agrarian and Rural Development Operative Programme) which were directly designed to support rural- and agrarian investments. The results of Table 2. *do not* confirm this presumption: the difference between the preferred and not preferred rural development micro-regions can be most easily seen if we examine the last column of the table, the so-called '*rural-development multiplier*', which we calculated as a quotient: the value belonging to the favoured rural-development micro-regions was divided by the value belonging to the not preferred micro-regions. So this simple indicator reflects in one single number how "better" the preferred micro-regions were to acquire development funds.

Table 2. Differences of project absorption

Variable	T.M.R.	Mean	Standard deviation	R.D.M.
All OPARD projects (p.) (83,04; 40,38)	0	88.80	50.10	0.89
	1	79.20	33.79	
OPARD projects won (p.) (50,68; 23,74)	0	51.70	24.34	0.97
	1	50.00	24.18	
Total amount of OPARD funds applied (HUF) (1633149249,80; 1059447579,09)	0	2 017 305 663.30	1 335 799 644.64	0.68
	1	1 377 044 974.13	775 492 996.75	
Total amount of OPARD funds won (HUF) (982606361,72; 589555094,03)	0	1 178 452 305.30	559 099 678.77	0.72
	1	852 042 399.33	590 956 391.67	

Abbreviations: T.M.R. = Type of Micro Regions: 0 = not preferred rural development micro-regions, 1 = preferred rural development micro-regions; R.D.M. = Rural Development Multiplier: the quotient of the values of preferred rural development micro-regions and not favoured micro-regions.

Source: Own calculation

After surveying these numbers it can be seen that the highest difference between the micro-regions is in the case of the total amounts of the OPARD-funds: the preferred rural development micro-regions applied for only 68 percentage of the total amount of OPARD-fund applied by the non favoured micro-regions (!). That is, the

micro-regions preferred because of their agrarian and rural profile *applied for a smaller share* of agrarian- and rural development funds. However the value of the rural development multiplier in the case of all the variables is lower than 1, so it can be concluded that the *preferred rural development micro-regions perform regularly worse (!)* compared to the not preferred micro-regions in the case of rural development funds.

In order to refine the previous results we step down to micro-level data and examine directly the Regional Development Operative Program (RDOP) projects of the Hungarian Development Plan (HDP I.). However the effect of the decree-level institutional regulation of being preferred or favoured seems also to be problematic: in Table 3. we present the results of the linear regression models estimating the effects of being preferred micro-region and preferred settlement respectively on some absorption indicators.

Except for the variable of support rate, all of the 'b'-coefficients are negative, i.e. *the preferred micro-regions and preferred settlements perform worse* than their more developed partners. Only the support rate is influenced in the expected, i.e. the officially aimed positive direction: the projects of the favoured micro-regions have on average 2,2 percentage higher support rate, and the projects of preferred settlement have on average a 4,1 percentage advantage.

Table 3. The effects of preferred micro-region and settlement status on funds absorption and support rate

Dependent variable (millions HUF / %)	Explaining variables		Preferred micro-region or not	Preferred settlement or not
	Coefficients			
Total sum of funds won	Constant		215,601	213,060
	'b'		-19,492	-25,025
Amount of funds paid	Constant		210,937	206,883
	'b'		-24,857	-29,433
Support rate	Constant		84,398	84,280
	'b'		2,208	4,074

Source: Own calculation

We can unfold the connections explored above if we further analyze the effects of the regulations separately. For this we use the variable 'amount of funds paid' as this is an indicator representing a realized and already absorbed fund, and first take the preferred micro-regional status. The initial effect is again replicated by the results of the first model (Table 4: M1): a project from a favoured micro-region receives on average 25 million HUF smaller amount of fund compared to a project from a not disadvantaged micro-region. At the first step we calculated and included a new variable in the linear regression procedure (Table 4: M2) so as to control the impact of the factor arising from the obvious differences of the circumstances (Moksony 1985) (therefore we constructed a principal component containing several aspects of information – number of population, rate of unemployment, number of enterprises per capita, number of tax payers – about the actual micro-region all at once).

Table 4. The net effect of preferred micro-regional status on the amount of funds paid (HUF)

Constant, explaining variables	Models (M1–M4) constant and 'b' coefficients (million HUF)			
	M1	M2	M3	M4
Constant	210,937	201,977	214,300	200,983
$X_{\text{preferred micro-reg.}}$	-24,857	-8,605	-16,067	-10,733
$X_{\text{dev.level of micro-reg.}}$	–	24,108	–	24,393
$X_{\text{rate of preferred settl.}}$	–	–	-0,183	0,048

Source: Own calculation

After controlling for the features of the micro-region the effect of favoured status decreases to -8,6 million HUF, i.e. the disadvantage of the preferred – less developed – micro-regions may be explained partly by their disadvantaged circumstances itself. But it can not be said that the drawback is fully due to these factors, as there is still a remarkable negative impact related to the preferred micro-regional status. In the next model we applied another dimension of the development level of the micro-regions investigated: the rate of favoured settlement was treated as a new explaining factor. According to the results of this model estimation (Table 4: M3) with a higher level of preferred – underdeveloped – settlements in the micro-regions the amount of funds paid is smaller (i.e. the effect of this variable is negative; -0,18 on average with every 1 percent). But the more important outcome is that in this model also – now controlled for the share of underdeveloped settlements – the self-employed impact of being preferred micro-region is still negative: a project coming from a favoured micro-region – no matter how high or low the ratio of preferred settlements is – has smaller ('b' = -16,067) amount of funds paid on average.

Finally we included in the estimation both of the former control variables beside our main explaining factor, and again there seems to be an unfavourable effect (Table 4: M4). Separated from the – in this final model positive – effects of the features of micro-regions and the rate of underdeveloped settlements, *the impact of the institutional regulation of being preferred micro-region is negative*: a project from a favoured micro-region has on average nearly 11 million HUF *less amount of funds paid* compared to the more developed territorial units.

The other regulation concerning a lower territorial level (preferred status of *settlements lagging behind*) shows similar disparities. In this case also we need to start the exploration of the effects from the basic, two-variable model (Table 5: M5): it says that – as the corresponding part of Table 2. also shows – the project applications from a preferred / underdeveloped settlement have on average almost 30 million HUF less total amount of funds paid (Table 5: M5). Controlling for the previously introduced micro-regional development-level factor (principal component), the extent of the drawback of the favoured settlements decreases (Table 5: M6) from the initial -29,4 value to -18,6 million HUF. The next model takes into consideration the other alternative explaining variable; the overall rate of settlements in a disadvantaged position (Table 5: M7). The results show that if we control for the relative frequency of favoured settlements in the micro-region, a project coming from a preferred settlement has on average 22,8 million HUF less total amount of funds paid. And this dimension of disadvantage also seems to consist according to the results of the final model (Table 5: M8) containing all the two alternative factors previously examined separately and the main explaining variable. In this case the *average lack of funds paid for a project handed in from a lagging behind settlement* – aside from the (positive) effects coming from the development features of the

micro-regions and the level of underdeveloped settlement – is close to 28 million HUF.

Table 5. The net effect of preferred settlement status on the amount of funds paid (HUF)

Constant, explaining variables	Models (M5–M8)			
	constant and 'b' coefficients (million HUF)			
	M5	M6	M7	M8
Constant	206,883	203,335	210,945	196,981
X _{preferred settlement}	-29,433	-18,612	-22,773	-27,733
X _{dev.level of micro-reg.}	–	23,667	–	25,509
X _{rate of preferred settl.}	–	–	-0,139	0,208

Source: Own calculation

Staying at the project level and using the same database of the Regional Development Operative Program (RDOP) we also calculated the so-called *interaction effect* (Moksony, 2006) between the preferred settlement variable and support rate variable constructed by multiplying their values with each other as explicated below:

$$\hat{Y} = b_0 + b_1 \times X_{\text{preferred settlement}} + b_2 \times X_{\text{support rate}} + b_3 \times X_{\text{INTER}}, \text{ that is}$$

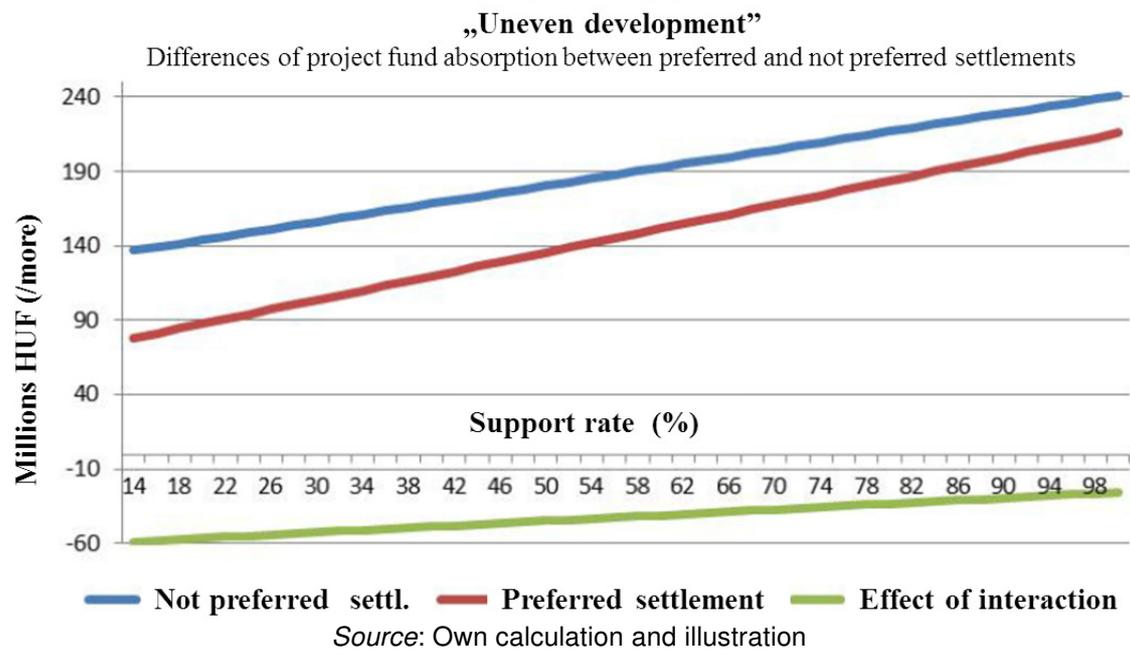
$$\hat{Y} = b_0 + b_1 \times X_{\text{preferred settlement}} + b_2 \times X_{\text{support rate}} + b_3 \times X_{\text{preferred settlement}} \times X_{\text{support rate}}$$

This special kind of indicator measures the effect of one variable from the interaction in the function of the value of the other variable from the interaction. Thus the – symmetric – indicator quantified this way informs us about the effect of one variable depending on the value of the other variable. In our analysis the main focus is on the effect of the favoured status of settlements, so we rearranged the regression equation in order to estimate the impact of being a preferred settlement in the light of the value of the support rate – as presented below:

$$\hat{Y} = b_0 + b_2 \times X_{\text{support rate}} + (b_1 + b_3 \times X_{\text{support rate}}) \times X_{\text{preferred settlement}}$$

Applying this $(b_1 + b_3 \times X_{\text{support rate}})$ formula we can calculate the actual value of the examined effect from the preferred status at every possible value of the support rate. The interaction effect itself is positive ($b_3 = 0,387$), which means that *with higher support rate a higher positive effect of the preferred status* (this is illustrated in Figure 1. using a green line with positive slope) can be expected. This relationship itself could be regarded as a fortunate result as it would imply that if the support rate is high enough, then the disadvantaged settlements can benefit more from the institutional regulation.

Figure 1. The inequalities of project fund absorption



However if we calculate not just the interaction effect but the actual effects separately for the not preferred and the preferred groups of settlements we can conclude that the positive effect is only a quasi positive effect. Actually the level of fund absorption is initially higher in the case of the more developed, i.e. not favoured settlements (illustrated with blue line in Figure 1), and these applicants preserve their better position: although in the case of the preferred settlements the (red) line representing the level of fund absorption is more steep – due to the original positive value of the interaction effect –, *this steepness is not high enough* for the lagging behind settlements with preferred status *to catch up with the more developed ones* – at least in the range of realistic values of the support rate with a natural maximum of 100 percent. So it can be stated that *although the effect of interaction is positive*; i.e. at higher value of support rate we witness a higher (positive) effect of the favoured status, *it is still insufficient to eliminate the drawback* of the underdeveloped settlements – not to mention to enable the latter ones to overtake the settlements in better positions.

Conclusion

According to the results of the empirical analysis we can conclude that (1) the regional distribution of development funds proves to be unequal, which might be explained by the fact that (2) both on micro-regional level and project level the *effect of the institutional regulation* of the absorption of European Union development funds – officially planned and expected to enable the regions in disadvantageous position to catch up with the less underdeveloped ones – *proved not to be successful*. The empirical results imply – in accordance with the related EU-level results (Bradley, 2006; Crescenzi, 2009; Martin & Tyler, 2006) – that *during the competition to gain development funds* (Vági 1982) *the less developed applicants* – no matter if micro-regions or directly projects – *are at a disadvantage*.

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