The effectiveness of voivodship contracts in Poland in 2001-2003 in the light of PARADISE method evaluation

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This paper addresses the issues of evaluation of regional development policy effectiveness in Poland. It consists of three parts. In the first section contemporary regional policy in Poland is described and the operational definition of regional policy is given (voivodship1 contracts). The second fraction focuses on the key issues of the evaluation of regional policy, inter alia the concept of its effectiveness. In the last section the detailed description of the PARADISE model is given and an attempt to introduce this method in Polish conditions is made.

1. Contemporary regional development policy in Poland

Regional policy2 in its present shape has its roots in the administrative reform in 1999. The reform created 16 self-governing voivodships and made regional self-government authorities a true partner for the decision centre (the government) as far as decisions concerning regional development are concerned. The change of approach to regional policy was aimed at more effective and successful realization of tasks facing the regional development policy. The status and importance of regional policy was increased by the perspective of Polish access to the European Union structures (EU). The great importance of regional policy in the EU can be reflected in the share of EU budget allocated for this purpose. This share amounts to ca. 37% of the whole EU budget. Poland, as a beneficiary of EU regional policy, took action to create proper conditions to absorb the support funds (European Commission 1999a). One of the elements of these adjustments was the creation of a new model of regional policy in Poland.

One of the basic problems of analyzing the regional development in Poland is its operational definition. Generally speaking, the term regional policy is defined as conscious and deliberate activity of public authority representatives aiming at regional development, namely having as its objective the optimal utilization of regions’ resources to provide steady development of these regions (review of definitions, see: Vanhove N. 1999, pp. 57-63). The administrative division of the country allows us to differentiate two complementary subsystems of regional policy (Kudłacz T. 1999, pp. 80-121; G. Gorzelak 2001, pp. 177-189):

- inter-regional policy - led by central institutions of public authorities, where the decision making criterion is the region or a system of regions
- intra-regional policy – led by regional institutions of authority (regional self-government), to realize its own aims, on the basis of its own means and at its own responsibility (16 voivodship).

The above definition of regional development policy (let’s call it a “broad” definition) will be specified to enable its evaluation. In order to do so, shortly characteristic of regional policy in the analyzed period will be given.

The legal foundations for regional development policy were introduced in 2000 by the act on regional development support rules, defining the rules and forms of regional development support and principles of cooperation of the Council of Ministers and government administration representatives with self-government (Act of May 12, 2000 on the regional development support rules)3.

The vision of contemporary regional policy in Poland was presented in the National Strategy of the Regional Development 2001-2006 – NSRD (Resolution of the Council of Minister on National Strategy of the Regional Development 2001-2006). NSRD constitutes part of social and economic strategy of Poland, and is responsible for accomplishing the development aims concerning the area of Poland. The NSRD records make a foundation for programming regional development on the operational level and for launching enterprises and projects supporting regional development. NSRD strategic aim is to create conditions increasing regions’ competitiveness and counteracting the marginalization of certain regions in a way that favors the long-term economic development of the country, its economic, social and territorial integrity and the integration with the EU. This strategic aim will be accomplished through state activities focused on the following priorities:

A. Extension and modernization of infrastructure helping to increase the competitiveness of regions,
B. Restructuring of the economic basis of regions and creating conditions for its diversification,

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1 Voivodship is a level of territorial division of Poland with self-government authority. It answers the NUTS II region in the EU nomenclature. There is 16 voivodships in Poland.
2 In this paper the term is used interchangeably with the term regional development policy.
3 After Poland access to the EU, the act was replaced by the act of April 20, 2004 on National Development Plan, Dz. U., 2004, No 116, position. 1206.
C. Development of human resources,
D. Supporting the areas needing activation and threatened by marginalization,
E. Development of cooperation among regions.

The embodiment of NSRD was the introduction of the Support Program for years 2001-2003 (Directive of the Council of Minister of 28.12.2000 on the adoption of the Support Program 2001-2003). The support program for years 2001-2003 defined the scope, procedure and conditions of state support of voivodship programs (see e.g.: Małopolska Region Parliament 2000). In accordance with NSRD it defined its general aim as supporting social and economic development of the country and its particular areas in order to increase their competitiveness, improve living standards, and increase social, economic and spatial integrity in internal relations as well as in relations with countries and regions of the European Community. The actions resulting from voivodship programs focused on accomplishment of aims specifying the NSRD priorities. The proposed division of means according to priorities A-E presented above was as follows: 50%, 15%, 12%, 18%, 5%. In spite of the fact that the support program allowed the regions to allocate the means differently, the above proportions were preserved (Ministry of Economy and Labour 2004a, p. 10). This can be seen as a sign of general agreement between the government and self-governments as to regional policy priorities in Poland.

Voiwodship contracts were signed on 19.06.2001 for years 2001-2002. In 2002, the realization period was prolonged until 2003. The contracts define the scope, procedure and conditions of task implementation resulting from the voivodship programs, assisted by governments and tasks supervised by proper ministers, assisted by self-governments and other entitled subjects (see: Support Program for years 2001-2003). The voivodship contract is an agreement signed by the Council of Ministers (represented by the Minister responsible for regional development) and the region self-government represented by the Region’s President. Voiwodship contracts absorbed ca. 6 billions zloty in the analyzed period (2.6 in 2001, 1.8 in 2002 and 1.4 in 2003; in 2002 prices).

In this paper the definition of regional policy was limited to the public expenditure related to contracts. There are many other instruments, which can be considered as regional policy instrument: the regional part of state aid in the country, special economic zones, means allocated in infrastructure, advisory, information and pilot programs or preventing natural disasters (about regional policy in Poland see World Bank 2003, Ministry of Economy and Labour 2004b).

2. Evaluation of regional development policy

The foundations for evaluation of the activities of a country should be searched in praxeology – a general theory of efficient activity. The evaluation of activities will be seen on the grounds of praxeology as some practical features of activities ascribed to them from the point of view of their efficiency (Kotarbiński T. 2000, p.74). Efficiency may have three different meanings:

- Universality, general term of each practical (praxeological) features of activity, for example thoroughness, effectiveness, usefulness.
- Synthetic, all the features, the more effective you are, the more you fulfill particular feature.
- Manipulative, defined by term skillfulness (even for non-physical activities).

The main area of interest of this article is the efficiency of public authorities activities directed at regional development in its universal meaning. The features of efficient activities can be grouped according to the object of activities as well as to the activities themselves (Kotarbiński T. 2000, pp. 74-93). Among features of the activity effectiveness and efficiency seems to be most important. The action of public authorities can be called effective when it leads to the desire aim. The action may be effective or ineffective, that is counter-effective or neutral to a given aim. The efficiency is defined as productiveness or economy. The action is more productive if we produce the bigger total product (its value, to be precise) with given investment. Economy is understood as minimizing the investment with the same product. Both features are gradable, which means that the action can be more or less effective and more or less efficient.

The European Commission made special contribution into the development of evaluation. The evaluation of policy in the European Commission methodology equals the praxeological definition: by evaluation of the policy, program or project we understand the value of policy, program or project with reference to criteria defined earlier and on the basis of particular information. The key issues of policy evaluation should answer the following questions:

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4 Initially the support program was provided for years 2001-2002, then it was prolonged for 2003, consequently the means in the preliminary for 2002 had to be divided into two years. In 2004 a new program was adopted by the Directive of the Council of Minister of 16.03.2004 on adopting a support program for 2004, Dz. U. 2004, No 56, position 542.

5 By such delimitation efficiency is understood narrower then the efficiency of public authorities in universal meaning. That „imprecision” results from weaknesses in translation of polish terms: “sprawność” (efficiency in universal meaning) and “efektywność” (efficiency in narrower sense).

6 Pay special attention to the Commission program MEANS (Méthodes d’Évaluation des Actions de Nature Structurale), see also special guide accessible on site: http://www.evalsed.info.
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- Relevance: To what extent are the programme’s objectives relevant in relation to the evolving needs and priorities at national and EU level?
- Efficiency: How were the resources (inputs) turned into outputs (direct effects), results or impacts (wider effects on direct and indirect beneficiary)?
- Effectiveness: How far has the programme contributed to achieving its specific and global objectives?
- Utility: Did the programme have an impact on the target groups or populations in relation to their needs?
- Sustainability: To what extent can the changes (or benefits) be expected to last after the programme has been completed?

As the concept of effectiveness shows, it is required to define clear objectives for regional policy. Regional competitiveness is presently considered as a main priority for modern regional development policy (see e.g. Bachtler J., Yuill D. 2001). In present paper regional competitiveness is understood as a region’s ability to create relatively high income and employment (European Commission 1999b, p. 75). There is a wide range of measures of regional competitiveness (see e.g. European Commission 2003). In the paper it is assumed that private investment is a good indicator for regional competitiveness (see section about PARADISE model).

3. The PARADISE model. An attempt to assess regional policy impact in Poland

The PARADISE model (Policy Assessment of Regional Achievements and Development Induced by Stimuli of ERDF) was used in 1990s to estimate the impact of the European Regional Development Fund (Blaas E. and Nijkamp P. 1995). The aim was to generate an evaluation method, which can be applied in a consistent manner across regions in all the EU countries. PARADISE approach is one of so-called top down techniques of evaluating the regional policy (for characteristics of other techniques see: MEANS 1999, p. 24; Bachtler J. 2000, pp. 107-130).

The evaluation of the policy effectiveness consists of two steps:
- frequency analysis,
- simple explanatory model, which uses multiple regression approach.

Frequency analysis is based on a cross-sectional comparison of the relative performance of various region in a country in terms of two or more strategic policy-relevant variables in a given year. Imagine that the relevant impact variable is A, and the policy (or control) variable is B and that we have observations on these variables across all regions. These variables are standardized for regional size (for example, per head of population). The average values of A and B across the whole population under consideration are A* and B*. Each region is then classified as having an above or below average value for A and B. This places the region in one of the four categories identified in the table below. If a positive relationship between the policy and impact variable is expected, we expect the bulk of the observations across regions to lie in the quadrants I and IV. However, the direction of causality cannot be derived directly from that table in a static setting. Moreover, no conclusion about the strength of the correlation between the variables can be drawn.

Table 1: A cross-classified Frequency Table for Regional Policy Evaluation

| A, > A* | B, > B* | I | II |
| A, < A* | B, < B* | III | IV |


This impact method is easy to handle and presents directly interpretable picture of a possible influence of one or more explanatory (or control) variables on a dependent regional response variable.

The main barrier to implementing top-down approach for regional policy effectiveness evaluation in Poland is the lack of appropriate data at the regional level. Regarding the new administrative division they are available since the year 1995. Problems concern also the update of data (for example two years lag in aggregate production and income measures). Despite obstacles mentioned above, an attempt to use this method for the assessment of regional policy (in its narrow sense) effectiveness is made.

It is assumed that private investments can be taken as a measure of regional competitiveness, because the objective of regional competitiveness is regional development (regarded as creating relatively high income and employment). Private investments increase the capital stock and employment in the region (consequently potential output of a region). The significant correlation between GVA per capita (commonly used measure of regional competitiveness, see: European Commission 2003, pp. 2-36) and private investments per capita

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1 Net investments should be taken into calculation but the lack of appropriate data force the author to use gross investment data.
confirms that private investments are appropriate regional competitiveness indicator (see table 2). The p value in table 2 is interpreted as a probability of error that is involved in accepting our observed results as valid (in many areas of research the p value of 0.05 is customarily treated as a “borderline acceptable error level”). Regional competitiveness is also connected with employment level hence using the labour-investment ratio is appropriate.

**Table 2: Correlation coefficient between private investments per capita and GVA per capita (1999-2003)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Coefficient</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>0.9130</td>
<td>0.000</td>
</tr>
<tr>
<td>2000</td>
<td>0.9092</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>0.9207</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>0.9237</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: own analysis

The value of the private investments in a region (Ipr) is the dependent variable in the simply explanatory model. Public investments minus voivodship contracts in a region ((Ibr), voivodship contracts measures (Ikr)** and the changes in gross value added in a region (ΔGVAr) are considered as explanatory variables. All variables are weighted by population of a region. If the significance of the value of the reaction coefficient of the voivodship contracts commitments exists it would be concluded that the regional policy in the narrow sense in Poland is effective. In the reverse situation (on the contrary) conclusions about the effectiveness of the regional policy would not be justified. Additionally, if there is a significant (positive) influence of private investments on the employment the conclusions are strengthened.

The following model is used as a frame of reference:

\[ I_{pr} = \alpha_0 + \alpha_1 I_{br} + \alpha_2 I_{kr} + \alpha_3 \Delta GVA_r \]

where:
- \( \alpha_i \) reaction coefficient (i= 1, 2, 3);
- \( \alpha_0 \) intercept;
- \( I_{pr} \) private investments in region r;
- \( I_{br} \) public investments minus voivodship contract in region r;
- \( I_{kr} \) voivodship contract expenditures in region r;
- \( \Delta GVA_r \) change in gross value added in region r.

The analysis is broadened by using two complementary models, which describe the possible behaviour of entrepreneurs in the case of explanatory variables:

- Conventional investment model, which analysis the influence of the public investments minus voivodship contract expenditures and voivodship contract expenditures on the private investments. The time lags are taken into consideration.

\[ I_{pr} = \alpha_0 + \alpha_1 I_{br}^{-\delta} + \alpha_2 I_{kr}^{-\delta} \]

where:
- \( \delta \) time lag (\( \delta = 0,1,2 \))

- Passive response model, where private investments in time t depend on the public investments (total minus contracts and contracts) in the same time t and on the economic situation in the past (the change in the gross value added in region r).

\[ I_{pr} = \alpha_0 + \alpha_1 I_{br} + \alpha_2 I_{kr} + \alpha_3 \Delta GVA_r^{-\delta} \]

The limited data makes it impossible to analyze policy impact with more than two years time lag. The same kind of problem appeared when the attempt of active response model construction was made. Gathering data for greater number of years would enable to use not only the absolute data but also moving averages in the analysis.

Additionally, the dependence between employment (this variable is not weighted by population) and private investments can strengthen the results of analysis. That dependence is represented by following model:

\[ L_r = \alpha_0 + \alpha_1 I_{pr}^{-\delta} \]

where:
- \( L_r \) total employment in region r,

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4 Due to limited data it was assumed that all voivodship contracts commitments are investment kind.
Table 3: Frequency table for the years 2001 - 2003

<table>
<thead>
<tr>
<th>Time lag</th>
<th>I_{pr} &gt; I_{pr}</th>
<th>I_{pr} &lt; I_{pr}</th>
<th>I_{pr} &gt; I_{pr}</th>
<th>I_{pr} &lt; I_{pr}</th>
<th>ΔGVA_{r} &gt; ΔGVA_{r}^*</th>
<th>ΔGVA_{r} &lt; ΔGVA_{r}^*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>9</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
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<td>3</td>
<td>8</td>
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<tr>
<td>2</td>
<td>3</td>
<td>9</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>11</td>
<td>6</td>
<td>8</td>
<td>-</td>
<td>-</td>
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<tr>
<td>2</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td>9</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>20</td>
<td>7</td>
<td>9</td>
<td>8</td>
<td>18</td>
<td>7</td>
</tr>
</tbody>
</table>

I_{pr} - private investments in region r; I_{pu} - public investments minus voivodship contract in region r; I_{vp} - voivodship contract expenditures in region r; ΔGVA_{r} - change in gross value added in region r; * describes the national average of a given value, dots mean the lack of data from given period.

Source: own analysis.

Frequency analysis suggests the existence of positive correlation between the private investments and explanatory variables (see table 3). Table 3 should be read in the following way. The dependence between the private investments (I_{pr}) and public investments with voivodship contracts subtracted (I_{pu}) in year 2001 (time lag 0) is considered. Three voivodships had the higher value of both I_{pr} and I_{pu} than the national average (that cell is called quadrant I, compare: table 3). None of voivodships showed the I_{pu} higher than national average and I_{pu} below the national average simultaneously (quadrant II). Three voivodships were characterized by the value of I_{pr} below the national average and I_{pr} above (quadrant III). The rest of voivodships (10) were put in quadrant IV. The other dependences should be interpreted in the analogous way. If the number of voivodships in quadrants I and IV is higher than the half of all voivodships, the positive correlation between the variables can be concluded. Regarding I_{pr}, 75% of the results is placed in these quadrants, for I_{pu} and ΔGVA, the numbers are accordingly 72% i 54%.

The results of regressions analysis are presented in table 4. Investments and employment models are well fitted (adjusted R² above 0,5 in most cases). In order to facilitate the understanding of the results, the conventional model, explaining the influence of the public investments minus voivodship contract expenditures (I_{pu}) and voivodship contract expenditures (I_{vp}) on private investments (I_{pr}) in year 2001, would be analyzed. I_{pr} has significant influence on the private investments in each possible time lag (in each field +). I_{vp} had significant influence on I_{pr} with time lag 0 (i.e. from the same year). Sign “Δ” in the other fields means that contracts in years 2000 and 1999 (time lag 1 and 2) did not exist.

A look at the separate variables shows that public investments give the best results (almost all parameters are significant). The changes of GVA have no significant influence on dependent value (the significant influence is observed only in one case).

Voivodship contract investments in 6 cases out of 14 have significant influence on the private investments. It can be noticed that the contracts from 2001 year have always significant influence on investments (in 6 cases out of 6). So it suggests that regional policy in this year had effective influence on the regional competitiveness (measured by private investments). The contracts from other years did not show significant influence on the private investments (the effectiveness of regional policy is doubtful).
I present Final

\[ I_{pr} = \alpha_0 + \alpha_1 I_{br}^\sigma + \alpha_2 I_{\Delta r}^\sigma \]

\[ I_{pr} = \alpha_0 + \alpha_1 I_{br} + \alpha_2 I_{\Delta r} + \alpha_3 \Delta GVA_r^\sigma \]

\[ L_r = \alpha_0 + \alpha_1 I_{pr}^\sigma \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>( I_{br} )</th>
<th>( I_{\Delta r} )</th>
<th>( \Delta GVA_r )</th>
<th>( L_r )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time lag</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>Δ</td>
</tr>
<tr>
<td>2002</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>Δ</td>
</tr>
<tr>
<td>2003</td>
<td>+</td>
<td>0</td>
<td>0</td>
<td>+</td>
</tr>
</tbody>
</table>

+ = significant explanation with: 0.5 < adjusted \( R^2 < 1 \); * = significant explanation with: 0.4 < adjusted \( R^2 < 0.5 \); Δ = absence of variable in given period; 0 = coefficient not significant. A dot means that there is lack of data necessary for regression from given period. The significance of all coefficients is based on confidence level > 95%.

Source: own analysis.

Conclusions

The effectiveness of regional policy (limited to voivodship contracts) in year 2001 and lack of effectiveness in years 2002-2003 are the results of analysis. The main advantage of PARADISE model is the fact that the statistical testing of the relationship between an independent policy variable and a dependent impact variable is in principle a powerful tool and this is a general methodological approach most strongly favoured in economics. This method is relatively less time consuming and less expensive in comparison to other models. The quality of the model would be probably higher if data with greater time period could be obtained and when net investments data instead of gross investment used. In order to improve the quality of regional policy effectiveness evaluation complementary techniques should be used. Revealing the effectiveness of regional policy in Poland could be the starting point for the analysis of other issues of policy evaluation, e.g. regional policy efficiency.

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