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EVALUATION OF PUBLIC EXPENDITURE ON ECONOMIC GROWTH OF THE PERIPHERAL SLOVENIA WITH INPUT-OUTPUT MODEL

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ABSTRACT

Slovenia is witnessing a problem of divergence in economic performance of its regions despite the high importance of the balanced regional development on the policy agenda. After the EU accession the problem of regional disparities is addressed through a wide set of financial mechanisms that affect the regional development; i.e. certain elements of CAP, Structural and Cohesion funds and Community initiatives. The paper is evaluating impacts of public expenditure from these sources on the economic performance of the region Peripheral Slovenia by constructing a regional Input-Output model in the present (2004–06) and the following (2007–13) financial perspective. Results show that the analysed funds can stimulate a notable economic growth of the Peripheral Slovenia especially in the following financial perspective. However; comparisons of the output growth at the national level reveal likely lagging of the region. This means that the anticipated increase of regional development disparities in Slovenia would continue in the future.

Key words: economics / Slovenia / regional development / EU accession / regional input-output model

OVREDNOTENJE JAVNIH TRANSFEROV NA GOSPODARSKO RAST V PERIFERNI SLOVENIJI Z MODELOM INPUT-OUTPUT

IZVLEČEK

Slovenija se sooča z razlikami v gospodarski razvitosti med regijami, kljub deklarativno izraženem pomenu, ki ga uravnoteženemu regionalnemu razvoju posveča politika. Po pristopu k EU naj bi k zmanjševanju regionalnih razvojnih razlik pripomogli finančni mehanizmi Skupnosti, ki vplivajo na dinamiko gospodarske rasti regij. Te finančne mehanizme sestavljajo nekateri segmenti Skupne kmetijske politike, Strukturni in Kohezijski sklad ter iniciative Skupnosti. V članku so ovrednoteni gospodarski učinki teh finančnih instrumentov v »sintetični« regiji Periferna Slovenija z izgrajenim regionalnim modelom Input-Output za sedanje finančno obdobje (2004–06) in naslednjo finančno perspektivo (2007–13). Rezultati kažejo, da analizirani transferji lahko opazno spodbudijo ekonomsko rast Periferne Slovenije, še posebej v naslednji finančni perspektivi, primerjave z učinki na nacionalni ravni pa napovedujejo zaostajanje regije. To potrjuje pričakovanja o nadaljnjem povečevanju regionalnih razlik v Sloveniji.

Ključne besede: gospodarstvo / Slovenija / regionalni razvoj / vstop v EU / regionalni input-output model

INTRODUCTION

Despite the fact that balanced regional development has been highly ranked on the policy agenda, Slovenia is witnessing a problem of divergence in economic performance of its regions. Differences in economic development have been deepening between regions throughout the period of economic transition (IMAD, 2003). To a great extent driven by the EU-Accession, Slovenia has tackled this problem by putting in place the institutional set-up and by extending the range of policy instruments with a 'regional scope'.

As it stands at the moment, the territorial scope of EU policies dealing with cohesion, management of natural resources and rural development, which form the bulk of EU expenditure promoting regional development, Slovenia is treated as one single region.

Nevertheless, the paper attempts to unveil the regional impacts of the abovementioned EU policies to the region of *Peripheral Slovenia* (whole Slovenia except the capital with its surroundings), where effects at the national level are used as a comparative benchmark. The reason for choosing the region which occupies almost whole territory of the country lies in the fact that economic disparities are mainly exhibited in the core – periphery manner.

The central part of Slovenia around the capital city is developing much faster, while Peripheral Slovenia is lagging behind. GDP per capita in Peripheral Slovenia is about 13% below the national average (SORS, 2003) and increased competition following the EU accession may cause further negative effects on the regional disparities. Hence, Peripheral Slovenia is expected to receive the bulk of cohesion expenditure after the accession to the EU.*

The Peripheral region occupies 87.4% of Slovenian territory and provides residence for about 75% of its population. Over the last decade the number of inhabitants in the Peripheral Slovenia has been stagnating, which has resulted in correspondingly stagnant population density. In terms of settlement distribution, the region is characterised by villages and small towns, and only a few mid-size towns that are main generators of economic exchange and entrepreneurship. The share of people living in rural municipalities (62%) is higher than the national one (55%). In the year 2001 the region contributed around 67% of the national GDP. The region's GDP per capita was lagging behind the national average by 13% and amounted to 63% of the EU average. The taxable earnings per capita in the region have been weaker than national ones for a number of past years – they reached 92% of national average in 2001.

Despite region's relatively successful economic recovery after the transition shock, the divergence in the level of economic growth compared to the capital persist. This can be attributed to various reasons, e.g. less favourable sectoral structure (additionally impaired by harsh market conditions), uncompetitive firm structure, emigration and consecutive languishment of human capital (Strategija…, 2002). There can still be found highly agriculture-dependent or declining industrial areas with the lack of working potential and low educational level of population.

The paper is organised as follows. It starts with a brief theoretical discourse on the methodological approach used; namely regional Input-Output (I-O) model. This is followed by a presentation of the approach towards the analysis – the scenario formulation and composition of the vector of the final demand changes – the central step in the I-O simulation. The paper ends with commenting some of the most straightforward results and by discussing the implications for further research.

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* The process of regionalisation in Slovenia is under way at the moment and there are various concepts at stake. The concept used in our analysis is one of them and does not prejudice the likely regional division. As a matter of fact, according to the implications of the EU cohesion policy in the next programming period (2007–2013), Slovenia will most likely be treated as one region.

METODOLOGY AND DATA

A wide array of analytical tools has been developed for the purpose of quantitative economic evaluation of public expenditures. One of the well established classes of modelling approaches used is based on the input-output paradigm developed by Leontief and empirically applied for more than half of the century (Sadoulet and de Janvry, 1995).

With the development of more capable modelling tools (e.g. Computable General Equilibrium Model, econometric short-term forecasting macro-models) relevance of the linear deterministic models has certainly decreased, however, for the analysis at the regional level the interest for input-output technique is significantly increasing (Armstrong and Taylor, 2000). The main reason for popularity is robustness of the technique that can be implemented empirically despite data shortages (Thirlwall, 2003).

In the paper a regional I-O model was constructed to evaluate economic effects of the EU funds anticipated in the periods 2004–06 and 2007–13. Theoretical features of the methodology used are presented in the following sub-sections.

Input-Output modelling

Economic policies might cause structural changes that are facilitated by complex interactions among the economic sectors and agents (Intriligator, 1983), therefore, for evaluation of public expenditure an analytical approach is preferred that effectively estimate sectoral interdependence (Sadoulet and de Janvry, 1995). One of the widely applied theoretical paradigms for analysing structural change is I-O analysis (Thirlwall, 2003). The technique is also adequate for the evaluation of economic effects of public expenditures that are initiating changes of the final demand (Richardson, 1972).

I–O techniques numerically model the relationships among the productive sectors of an economic system. By showing details of the flow of goods and services among industries, they describe the process of production, the use of goods and services, and the income generated in production (O'Connor and Henry, 1975).

The starting point of an I-O model is the assumption that the quantity of the product used as an input of a sector (X_{ij}) is in proportion to the total output of this sector (X_j):

$$X_{ij} = a_{ij} X_j \quad [1]$$

The quantity of a product required by the sector for production of one unit of output (a_{ij}) is determined by the technical coefficient. They define the effect of production increase of a sector on the input demand.

Demand and supply in an I-O system are assumed to be in equilibrium hence applying the equation [1] can now be written:

$$X_i = \sum_{j=1}^{n} a_{ij} X_j + F_i . \quad [2]$$

Total supply of a product (X_i) is equal to the sum of intermediate demand ($\sum_{j=1}^{n} a_{ij} X_j$) and final demand ($F_i$) for this product.

From a series of equations like [2] representing all sectors of the analysed economy technical coefficients can be derived and with applying matrix algebra the effects of demand change for one product on the output of all other sectors of economy can be quantified.

This system of equation can be written in the matrix form as:

$$\mathbf{X} = \mathbf{AX} + \mathbf{F} \,. \qquad [3]$$

and the inverse of the equation [3] is:

$$\mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{F} \,, \qquad [4]$$

where $(\mathbf{I} - \mathbf{A})^{-1}$ represents the total multipliers matrix – known as *Leontief* inverse.

The basic technique of the I-O modelling is application of the total multipliers matrix for calculating total input requirements for a unit value of final demand. However, the change in final demand does not affect only the direct requirement in the production process of the analyzed sector itself, but also all indirect requirements resulting from intermediate product deliveries from other sectors. I-O method therefore includes both direct and indirect input necessary to satisfy change of final demand (Thirlwall, 2003; Miller and Blair, 1984).

From the times of its foundation the I–O technique had remained rather simple in comparisons with other contemporary models since it is subject to some restrictive assumptions:

- each sector's demand or intermediate inputs changes in direct proportion to output from that sector;
- the models are final demand driven;
- no technological change occurs;
- there is no substitution of intermediate inputs;
- different production activities can be grouped into homogeneous sectors, each producing one product (Rose and Miernyk, 1989).

Empirical limitations of the method arise from these assumptions; however; the technique is well capable to study elementary intersectoral relations and directions of potential effect from changed final demand in the economy (Sadoulet and de Janvry, 1995). Further, in recent years, computable general equilibrium (CGE) and social accounting matrices (SAM) represent newer paradigms based on the I–O logic that offer solutions to some of the inherent problems found in primary I–O analysis (Rose and Miernyk, 1989; Thirlwall, 2003).

Regional I-O models

Applications of the I-O methodology initially concerned national economies, however, soon after their affirmation, attempts to use it for the purposes of regional analysis evolved. First of them is the work of Isard and Kuene (1953). Miernyk (1982) provides detailed bibliographic presentation of the most important studies dealing with the construction and specification of regional input-output models.

The central task in the regionalisation procedure is adaptation of a national I-O model in order to reflect particular features of the regional economy. A regional I-O model can be constructed either by using primary data for the regional intersectoral transactions (survey method) or, more frequently, by applying various techniques of regionalizing the national I-O model (non-survey method). With the non-survey methods derivation is based on various secondary sources of statistical data applied on the national model (Richardson, 1972). Several approaches were proposed however, after the development of so called hybrid regionalisation, popularity of other approaches was reduced (Rose, 1982). Hybrid techniques combine the specific data and information from small scale surveys with the existing national table.

For the purpose of regionalisation of the national I-O table in the paper the GRIT technique was applied. The method was proposed by Jensen *et al.*, (1979). GRIT is a formalized non-survey regionalisation method with facility to insert survey data at any stage of the compilation

procedure. The main motivation for the methodology selection was lack of primary regional data. The regionalisation procedure is presented in the following subsection.

Derivation of the regional I-O table for Peripheral Slovenia

The basic source of data for regionalisation was the national 59 sector input-output table estimated by Slovenian Statistical Office for the year 2000 (SORS, 2003). Additionally some secondary data was used: employment at the national and regional level (SORS, 2004); structure of the national and regional value added (SORS, 2004); distribution of the income tax base (IMAD, 2004) and superior data on agricultural sector (SORS, 2004).

Decision about the appropriate sectoral disaggregation was adopted by taking into account the structure of economic activities in the analysed region. Due to relative size of the regional economy (it accounts for about two thirds of the national GDP), the region exhibits a great diversity of economic activities. Somewhat specific pattern of regional development in Slovenia before the transition*, together with the relative size of the region in national economy were the main arguments to analyse a relatively broad set of economic activities. Thus, the final regional input-output table comprises of 29 sectors.

A starting point for regionalisation was the adjustment to the national I-O table with total flows. The national flows matrix was converted to a technical coefficient matrix as follows:

$$A = Z\hat{X}^{-1} \qquad [5]$$

where A represents the matrix of technical coefficients, Z matrix of intersectoral transaction flows and X^{-1} the inverse of diagonal output matrix derived from output vector.

In the stage of the adjustment for regional technical coefficients, a non-survey method of Simple Location Quotients (SLQ) was used as follows.

$$A^R = \hat{q}\ A^N \qquad [6]$$

Regional technical coefficients are denoted by subscript R and national ones by N. The SLQ vector is denoted by q and they were derived from the relevant secondary statistical data (e.g. breakdown of employment data by sectors, E). Simple location quotient for sector *i* can therefore be calculated:

$$q_i = \frac{E_i^R / E^R}{E_i^N / E^N} \qquad [7]$$

The method used assumes that sectors whose relative importance at a regional level is equal or greater than at a national level ($q_i \geq 1$) are able to satisfy intermediate demand within the region and coefficients therefore remain the same as the national ones. Otherwise, the sector is supposed not to be self-sufficient and the corresponding national coefficient is multiplied by q_i.

In the next stage aggregation of the sectors has been conducted, hence first the regional matrix of technical coefficients was modified as follows:

$$A_{(1)}^R = A_{(0)}^R\ \hat{w} \qquad [8]$$

* This pattern of regional development is a consequence of the so called 'poli-centric' approach towards regional development policy. It is characterised by intensive (sometimes forced) public intervention in order to assure a spatially scattered and diversified industry mix (Nared, 2003).

The original technical coefficients were adjusted by the vector of employment weights *w*, by which approximation towards the regional structure of economic activities is made.

The next step is derivation of a prototype transactions table with an estimation of regional output. These estimates were determined by using employment ratios.

$$X_i^R = X_i^N \frac{E_i^R}{E_i^N} \qquad [9]$$

The next step in the prototype table derivation was the estimation of three components of final demand. The household consumption was calibrated by the share of regional income tax base in the total income tax base.

The remaining two components of the final demand, namely exports and other final demand categories (comprised of government expenditures, gross capital formation, expenditures by non-profit institutions and changes in inventories) were estimated simultaneously with balancing of intermediate consumption. The starting values were derived from the national tables and later adjusted downwards using employment and location quotient. All elements within the transaction matrix were treated equally and thus reduce the on or off-diagonal elements according to the value of output, final demand, share of imports in every cell of the national table and expert knowledge. Intermediate consumption rows of 12 sectors were reduced and 16 on-diagonal elements of primary and secondary sectors were reduced as well.

In the final checks and balancing stage some inconsistencies and errors were discovered and corrected. Finally, the balanced input-output table was composed which was believed to result in the realistic regional multipliers.

Policy scenario definition

The impact analysis using the constructed I-O model has been carried out in two sets of scenarios with respect of the financial programming period. The first set of scenarios includes the policy instruments available in the pre-accession period and in the first programming period after the EU accession (2004–06), whereas the second set of scenarios takes into account the proposed EU budgetary appropriations for the new financial perspective 2007–13.

Description of policy instruments and the corresponding financial breakdown for the period 2004–2006 was derived from various national and EU programming documents (Single programming document, Cohesion strategy, Rural development plan). In the case of CAP expenditure from the Guarantee section, where allocation of funds is not subject to programming, estimates proposed out by the Agricultural Institute of Slovenia were used.

For the financial perspective 2007–2013 budgetary appropriations were used as outlined in the Communication from the European Commission (COM/2004/487). The document only describes the overall financial framework by expenditure headings, while appropriations for commitments by Member States are not yet presented (December 2004). Qualified estimates of EU budgetary appropriations were obtained in consultation with the corresponding national working documents for the fields of cohesion (Mrak and Rant, 2004) and agricultural budget expenditure (MAFF, 2004).

In the New Financial Perspective 2007–2013 status of Slovenia in terms of its eligibility for EU cohesion expenditure is still not ultimately determined, therefore two options of expected budgetary appropriations were proposed. ”Conservative” estimates of EU budgetary inflows relate to the less favourable status of Slovenia. This entails full eligibility for the Cohesion fund support, whereas in the case of the Structural funds, Slovenia is assumed to be treated as a ‘phasing in’ region within the objective ‘Regional competitiveness and employment’. More optimistic estimates differ only in the eligibility status for structural funds. They derive from an

assumption that Slovenia will remain eligible for higher rates of structural fund support within the "Convergence objective", although this status will be only transitional due to expected statistical effects.

Once the national budgetary appropriations were consolidated the annuities needed to be regionalised. The funds attributed to *Peripheral Slovenia* have been estimated according to the selected regionalization weights: share of active population in the region, GDP contribution of the region, share of population in the region, ESU share of the region. These were applied according to the characteristics of each policy instrument.

Envisaged public expenditure for the *Peripheral Slovenia* for the two studied budgetary periods by the main policy instruments is presented in the table 1.

Table 1. National and EU funds available for the Peripheral Slovenia in the periods 2004–2006 and 2007–2013 (annuities, in million Slovenian Tolars – prices 2000)

Preglednica 1. Domača in EU proračunska sredstva namenjena regiji 'Periferna Slovenija' v programskih obdobjih 2004–2006 in 2007–2013 (vrednosti na letni ravni, v milijonih Slovenskih tolarjev, stalne cene za leto 2000)

Policy instrument	Period 2004–2006	Policy instrument	Period 2007–2013	
			"Phasing out"	*"Phasing in"*
SAPARD	2 200.2	Structural funds	36 857.8	13 425.2
ISPA	8 136.6	ERDF-type measures	23 363.0	8 509.8
Structural funds	14 811.1	ESF-type measures	13 494.8	4 915.4
ERDF	7 644.5	Cohesion fund	33 292.7	33 500.0
ESF	4 441.7	Territorial Integration	6 301.6	4 248.2
EAGGF	2 614.8	EAGGF – direct payments	22 687.1	22 687.1
FIFG	110.0	Agricultural Rural development fund	6 085.1	6 085.1
Cohesion fund	8 109.6	CAP RD-Guarantee type	25 967.3	25 967.3
Interreg	1 945.1	CAP RD-Guidance type	2 793.5	2 793.5
Equal	376.3	Fisheries	227.6	227.6
Schengen	6 496.6			
EAGGF – direct payments	17 829.2			
EAGGF Guarantee – rural development	17 339.8			

Source: Own compilation based on various national and EU sources

To evaluate the economic impacts of the formulated budgetary appropriations with the constructed I-O model the funds had to be distributed according to the expected effects they will have on the final demand for the economy's outputs. This external shock is aggregated within the vector of final demand changes. The structure of investment demand from the national I-O table (year 2000) was taken as a basis for the distribution of funds.

No additional weights or corrections were applied for assessing the structure of demand in the case of policies with general 'investment' patterns, whereas "objective-oriented policies" were treated specifically. Allocation of funds along the vector of final demand has been determined in accordance with the scope and "mechanism" of the policy as outlined in the programming documents. In the case of policies with an income support character (e.g. decoupled direct payments in agriculture), the effects were distributed according to the household final demand structure.

In the last stage of the vector definition the origin of demanded good has been taken into account. In the case of investment demand the share of domestic goods in investment from the

national I-O table was applied, whereas for the correction of the household final demand the proportions of the domestic supply in total market supply was used.

In total five scenarios were formulated for both programming periods:

Scenario 1: "pre-accession support":

In this scenario is assumed that only SAPARD and ISPA funds are available beside the existing national policies. In order to estimate the maximum potential of the pre-accession support, we have decided for a (rather unrealistic) assumption of a 100% absorption rate of these funds. This scenario was applied only for the first programming period.

Scenario 2: "partial integration":

This scenario attempts to give the "conservative" estimates of various EU financial mechanisms after the accession to the EU. In the first programming period after the accession, these relate to a lower absorption level of the funds.* For the CAP-related expenditure the proposed absorption is 85% in the case of direct payments and 70% absorption rate for rural development measures financed by EAGGF-Guarantee part. The assumed absorption of Structural funds and Cohesion fund is 50%, whereas the rate for Schengen facilities assistance is assumed to be somewhat higher (70%). Regarding the structural funds allocation in scenario 2 Slovenia is treated as the "phasing in" region.

In the attempt to model CAP direct payments as being fully decoupled the total amount is transferred to the final demand of households. This approach was used as a proxy illustrating the final structure of decoupled direct support in agriculture.

Scenario 2a: "partial integration DP coupled":

In this sub-version of the scenario 2 the attempt is made to evaluate the different treatment of the CAP direct payments. It is assumed that if the direct payments are fully coupled the entire sum is being spent according the vector of intermediate demand of the agricultural sector.

Scenario 3: "full integration":

In contrast to the scenario 2, this scenario attempts to provide the information about the maximum potential effect of the analysed funds. In this respect, we have taken an optimistic assumption that all available funds will be absorbed (100% absorption). This entails also favourable status within the Structural funds distribution, where Slovenia is assumed to be treated as the "phasing out" region. Direct payments are assumed to be fully decoupled.

Scenario 3a: "full integration DP coupled":

This sub-scenario rests on same assumptions as the scenario 3, with the only exception that CAP direct payments are, similarly as in scenario 2a, assumed to be fully coupled with production.

Four separate runs of each scenario were carried out. Firstly two runs were made for each programming period, except for the scenario 1 which is not relevant for the period 2007–13. In order to provide a benchmark for assessment of regional impacts, the policy scenarios were tested also at the national level with the national I-O model and appropriate budgetary outlays.

RESULTS

Change in the gross output

The most straightforward output of scenario analysis with the I-O model is the change in gross output by sectors. Main results presenting the percentage change of the gross output in

* Experience gained from previous enlargements (European Commission 2002, 2003, 2004) and recent experience with low absorption levels of the pre-accession funds in Slovenia (DAAC Consortium, 2004)), have led us to believe that in the initial period after accession part of the allocated funds may remain unused.

comparison to the base year (2000) for the main sectoral aggregates (agriculture, industry, services) are presented in Table 2.

Due to a relatively limited change of final demand caused by ISPA and SAPARD programmes in Slovenia, no considerable economic impacts were detected as a consequence of the pre-accession programmes (Scenario 1). This has happened even under the assumption of 100% absorption level. No conclusive evidence is given. As a matter of fact, only the construction sector exhibits noticeable (2%) increase of gross output mainly due to large-scale infrastructure investment projects supported by ISPA.

Taking into account more pessimistic estimates of EU budgetary inflows (Scenario 2), the projected increase of overall regional output is 1.1% in 2004–06 and 2.6% in 2007–13 period. Estimated effects under the Scenario 2 are higher at the regional level in comparison to the national figures for about one tenth in the period 2004–06 and 14% in the period 2007–13! Impacts on agriculture are projected to surpass the aggregate figure in 2004–06 in both territorial scopes. In contrast, it is expected to experience a slight lag behind the average levels of output increase in the period 2007–13. No significant implications are expected in the manufacturing sector, where only sectors of mining and quarrying, food manufacturing, supply of electricity, water and gas surpass the average levels of output increase in the period 2004–06. In 2007–13, favourable output increase prospects diminish in the sectors of food manufacturing and supply of electricity, water and gas, whereas significant improvements are projected for production of other non-metallic mineral products. The highest increases are again anticipated in the construction sector, whose output as a consequence of EU public expenditure is projected to grow by 2.3% in 2004–06 and by 10.0% in 2007–13. Most of this is due to infrastructural investments, and partly also due to investments in real estate (which form a significant part of Structural fund support) and transitional support for Schengen facilities in 2004–06.

Table 2. Simulation results: percentage changes in total output by analysed policy scenarios

Preglednica 2. Rezultati simulacijskih izračunov: odstotne spremembe v agregatnem outputu po obravnavanih scenarijih

	Scenario 1		Scenario 2		Scenario 2a		Scenario 3		Scenario 3a	
Peripheral Slovenia, 2004–2006										
Unit	mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%
Agriculture	227	0.11%	2 416	1.17%	3 121	1.52%	3 204	1.56%	4 077	1.98%
Industry	14 322	0.43%	25 749	0.77%	32 246	0.97%	42 912	1.29%	50 954	1.53%
- of which construction	10 953	1.99%	12 412	2.25%	20 078	3.64%	23 266	4.22%	32 753	5.94%
Services	2 545	0.10%	36 334	1.40%	25 760	1.00%	50 847	1.97%	37 760	1.46%
Total	**17 094**	**0.28%**	**64 498**	**1.05%**	**61 127**	**1.00%**	**96 963**	**1.58%**	**92 791**	**1.51%**
Slovenia, 2004–2006										
Unit	mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%
Agriculture	221	0.09%	2 877	1.22%	3 679	1.57%	3 809	1.62%	4 802	2.04%
Industry	14 490	0.33%	32 307	0.75%	39 343	0.91%	54 074	1.25%	62 782	1.45%
- of which construction	11 183	1.39%	15 853	1.97%	24 403	3.03%	29 861	3.71%	40 442	5.02%
Services	3 084	0.08%	47 262	1.16%	35 038	0.86%	66 667	1.64%	51 539	1.27%
Total	**17 796**	**0.21%**	**82 446**	**0.96%**	**78 060**	**0.91%**	**124 551**	**1.44%**	**119 123**	**1.38%**
Peripheral Slovenia, 2007–2013										
Unit			mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%
Agriculture		-	4 696	2.28%	5 807	2.82%	5 114	2.49%	6 225	3.03%
Industry		-	88 657	2.66%	98 889	2.97%	110 126	3.30%	120 359	3.61%
- of which construction		-	55 310	10.03%	67 382	12.21%	70 112	12.71%	82 185	14.90%
Services		-	67 521	2.61%	50 869	1.97%	86 556	3.35%	69 904	2.70%
Total		**-**	160 874	**2.63%**	155 565	**2.54%**	201 797	**3.29%**	196 488	**3.21%**
Slovenia, 2007–2013										
Unit			mio. SIT	%	mio. SIT	%	mio. SIT	%	mio. SIT	%
Agriculture		-	4 850	2.06%	5 985	2.55%	5 379	2.29%	6 513	2.77%
Industry		-	111 891	2.58%	121 841	2.81%	139 817	3.23%	149 767	3.46%
- of which construction		-	73 051	9.07%	85 142	10.57%	92 361	11.47%	104 452	12.97%
Services		-	81 248	2.00%	63 960	1.58%	108 693	2.68%	91 405	2.25%
Total		**-**	197 989	**2.30%**	191 786	**2.22%**	253 888	**2.94%**	247 686	**2.87%**

Model estimates for service sector in total reveal 1.4% increase in 2004–06 and 2.6% by 2007–13 which is above the average. The most positive prospects are projected for wholesaling, tourism and real estate, renting and business activities. The model results however suggest no substantial role of EU funds for improvements in activities dealing with human capital in the period 2004–06. The situation is likely to improve by 2007–13, where EU funds are likely to yield higher output increase (3.0%) in education.

Above described trends in projected output increase for individual sectors are not significantly changed if direct payments in agriculture are assumed to be fully coupled (Scenario 2a). In general, levels of output increase are somewhat lower (5%), apart from the sectors of agriculture and construction. The projected output increase in agriculture in the region would be higher by almost one third in 2004–06 and around one quarter in 2007–13 if direct payments are fully coupled. Implications of reinvestment of public transfers to agricultural production are therefore significant.

Scenarios 3 and 3a provide a benchmark for potential maximum impact of the analysed public funds. If this ”optimistic” scenario of EU budgetary inflows was realised, the gross regional output would increase by more than 1.5% for the period 2004–06, whereas the corresponding levels of aggregate output increase in period 2007–13 would be even higher, i.e. 3.3% for Scenario 3 and 3.2% for Scenario 3a. Rather comparable trends concerning output increase for sectors can be observed as in the previous two scenarios (2 and 2a).

Additional insight into the “nature” of modelled public transfers is obtained through the presentation of sectoral distribution of the total effects in Table 3. It is confirmed, that there are no major differences in the structure of the effects from the national-regional comparisons; however, impact on agriculture and industry tends to be somewhat higher in the Peripheral Slovenia, whereas results are more favourable for services. Taking into account the structure of economic activities in the region studied this result is not surprising.

Table 3. Sectoral contribution to the total effects of the public expenditure by analysed policy scenarios

Preglednica 3. Delež posameznih sektorjev v agregatnem učinku javnofinančne porabe po obravnavanih scenarijih

	Scenario 1	Scenario 2	Scenario 2a	Scenario 3	Scenario 3a
		Peripheral Slovenia, 2004–2006			
Agriculture	1.33%	3.75%	5.11%	3.30%	4.39%
Industry	83.79%	39.92%	52.75%	44.26%	54.91%
- of which construction	64.07%	19.24%	32.85%	23.99%	35.30%
Services	14.89%	56.33%	42.14%	52.44%	40.69%
Total	100.00%	100.00%	100.00%	100.00%	100.00%
		Slovenia, 2004–2006			
Agriculture	1.24%	3.49%	4.71%	3.06%	4.03%
Industry	81.43%	39.19%	50.40%	43.42%	52.70%
- of which construction	62.84%	19.23%	31.26%	23.97%	33.95%
Services	17.33%	57.32%	44.89%	53.53%	43.27%
Total	100.00%	100.00%	100.00%	100.00%	100.00%
		Scenario 2	**Scenario 2a**	**Scenario 3**	**Scenario 3a**
		Peripheral Slovenia, 2007–2013			
Agriculture		2.92%	3.73%	2.53%	3.17%
Industry		55.11%	63.57%	54.57%	61.26%
- of which construction		34.38%	43.31%	34.74%	41.83%
Services		41.97%	32.70%	42.89%	35.58%
Total		100.00%	100.00%	100.00%	100.00%
		Slovenia, 2007–2013			
Agricolture		2.45%	3.12%	2.12%	2.63%
Industry		56.51%	63.53%	55.07%	60.47%
- of which construction		36.90%	44.39%	36.38%	42.17%
Services		41.04%	33.35%	42.81%	36.90%
Total		100.00%	100.00%	100.00%	100.00%

Comparably, there are no major differences in the structure of the effects between the two analysed programming periods. The results suggest that in the programming period 2007–13 output increase will be slightly more on the side of industry sector, especially construction. This is due to projected proportional increase of funding in the fields of productive and infrastructural investments.

CONCLUDING REMARKS AND FURTHER RESEARCH

Paper tries to quantify the effects of EU funds on the region of Peripheral Slovenia using the Input–Output model. Analysis about the magnitude and effects distribution of various sources of EU public expenditure was made. Policy relevance of the research undertaken can be argued by provision of a valuable insight into the pattern of policy expenditure through various sectors of the regional economy. The following conclusions can be derived.

The results suggest that the analysed funds can bring a significant contribution to the overall output increase of the regional economy after the accession – especially in the 2007–13 period; whereas this can not be confirmed for the pre-accession funds. In this respect, the significance of pre-accession funds can be seen more in terms of institutional building and preparing of the implementation structures for successful absorption of funds after the accession.

Optimistic scenarios about the accession effects (Scenario 3) for 2004–06 and 2007–13 provide a benchmark or the potential maximum impact of the analysed public funds. If this "optimistic" scenario, assuming full absorption of available funds within the region was realised, the gross regional output would increase by 1.6% for the period 2004–06, whereas the corresponding aggregate increase in 2007–13 would be significantly higher, i.e. 3.3%.

However, the favourable post-accession effects should be regarded with some caution. There are various factors that can aggravate the optimistic view expressed with the "benchmark" results presented by the Scenario 3. These factors range from budgetary (status of Slovenian regions for EU cohesion expenditure in 2007–13, limited co-financing capacities of national budget) to organisational ones (implementation structures, availability of matching private capital, lower absorption level). The abovementioned factors could significantly deteriorate favourable results. Our results suggest that these effects could result in about one third lower growth in total output.

The question whether the analysed funds will reduce regional disparities was tackled by the comparison of the regional and national modelling results. As a general observation, there are no major differences in the structure of effects between Slovenia and Peripheral Slovenia region. In both cases, high public investments are channelled into labour intensive sectors (construction, agriculture) with low labour productivity. Our results also show that the impacts of analysed funds on output are slightly higher in the Peripheral Slovenia, although; the difference is rather moderate. For the actual financial perspective the projected growth in the region is about one tenth higher in comparison to the national average, whereas for the financial period 2007–13 the expected advantage of the region is somewhat higher (14%). Our results therefore suggest that the trend of increasing development disparities in Slovenia is will very likely to be stabilised. The question, however; remains whether the dynamic of convergence is sufficient.

Limitations of the research undertaken also have to be acknowledged. First of all, it has to be borne in mind that financial transfers from the EU budget represent only one dimension of the accession-related effects. The analysis does not deal with other important aspects of integration, such as trade effects and increased competition, division of labour, specialisation and change of relative prices. Limitations of the research arise also from the applied methodology – assumptions of the static I-O model are rather restrictive.

However, provided that both the national and regional I-O model is constructed accurately enough, theoretically implausible assumptions of the model are in some respects overshadowed

by its empirical realism and simplicity. With this in mind we can state that this approach towards modelling of policy expenditures gives at least approximate information about the expected changes in sectoral output.

Another warning goes to the fact that the I-O methodological framework is useful only for measuring "hard" tangible impacts, which therefore inevitably results in their over-valuation against the impacts of "soft" investments. With this methodological approach also no aspects is related to the flow of externalities (e.g. food safety, environmental management, rural development). Since these externalities seems to gaining importance on the policy agenda in the Community, they should not be neglected from the future analysis. Upgrading I-O based models with dynamics features is probably the first step after the exercise presented in this paper. But as for intangible effects, some steps in other dimension will be needed.

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