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JOBLESS-GROWTH OR EMPLOYMENT-ORIENTED DEVELOPMENT – DILEMMA OF THE NEW EU FINANCIAL PERSPECTIVE*

Abstract: Poland as the main beneficiary of EU Cohesion Policy is an interesting target of analyses regarding the impact of financial interventions on regional economies. Obviously, especially important for regional communities is the influence of EU funds on the labour market. Greater employment in a given area – apart from counteracting social exclusion – is expected to increase disposable incomes of households and consumption expenditures. This, in turn, is likely to improve the well-being of the respective inhabitants. Hence, impacts of EU Cohesion Policy on regional labour markets are considered to be the most tangible contribution of the EU financial assistance to higher standards of living for ordinary citizens. The main objective of this paper is to present and confront the effects of Cohesion Policy on employment with the EU financial support in the Polish NUTS-2 regions over the period 2004-2020. Making use of available counterfactual analyses, attempt is made to evaluate the cost-effectiveness of the job creation due to the EU funds. Consequently, analysis is carried out to examine effectiveness of cohesion policy in stimulating the labour market in relation to effectiveness of EU funds in terms of GDP growth. This allows us to answer the question whether the effects of EU Cohesion Policy stimulate the so-called *jobless growth* – an economic growth with a relatively low demand for labour – or employment-oriented model is the case. This research in the field of evaluation – being an important component in the process of programming regional development – can be a contribution to the debate on the shape of Cohesion Policy in the new EU financial perspective 2014-2020.
Key words: Cohesion policy, labour market, cost-effectiveness, macroeconomic modeling, jobless-growth.

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Introduction

As a result of the crisis in the global economy, which erupted in the second half of 2008, a considerable number of people not related to strictly economic professions started to demonstrate a growing interest in information showing the real condition of the economy of their country or region and even of the global economy. Any positive GDP data began to give hope for a reversal of the crisis situation and a return of prosperity. However, it soon turned out that even if there was a certain positive increase in output in the economies of many states and regions after the perturbations of the 2008-2009 period, this was rarely reflected in labour market statistics. The above-mentioned fact caused consternation not only among ordinary people, but also among representatives of renowned economic institutions. The situation on the labour market is a kind of touchstone for the extent to which the potential of a given economy is used and for its sustainable development. Secondly, favourable trends in the labour market reduce the risk of long-term unemployment, hysteresis, economic inactivity, and thereby apathy and different kinds of social pathology. Thirdly, positive trends in labour demand create an opportunity for an increase in affluence, living standards, knowledge and experience of the population, a chance to pursue aspirations and higher-order needs, thereby making the social development itself more dynamic. An increase in the number of people employed and greater economic activity, thus the involvement in the economic life of a country/region, contribute to greater identification with a particular area and thereby to its increased social capital and investment attractiveness.

Given the above, we are not surprised by the fact that the EU sets high levels of employment as one of the priorities defined in its most important strategic document – *Europe 2020*. On account of the fact that the EU's cohesion policy is one of the most important tools stimulating development in regions which are relatively weaker economically, including all the NUTS-2 regions in Poland, one should consider the cost per job created or retained as a result of the implementation of cohesion policy resources[1] in the financial perspectives 2004-2006 (through the *National Development Plan (NDP*) and 2007-2013 (*National Strategic Reference Framework (NSRF*). One should be aware that the operational programmes implemented over this period are not oriented directly towards an increase in the number of jobs, but primarily towards the development of infrastructure, an increase in innovation and human capital, thereby an increase in factor productivity and GDP. In this sense, speaking of the cost of job creation/retention does not seem to be fully justified. However, it is worth

[1] In this article, the cost per job created/retained is understood as cohesion policy resources per job created due to the implementation of this policy or per job retained due to this policy (*e.g.* a job that was not created due to cohesion policy, or was created due to it in the previous years, but still existed in a particular year only thanks to EU funds from such year). The job in this paper means full- time job. Part-time jobs were translated into full-time equivalents. Durability of created jobs is not the question to be analyzed in this paper.

noting that the estimation of the above-mentioned cost allows one to compare the effectiveness[2] of EU funds between particular regions in the context of labour market.

The main objective of this paper is to present and confront the effects of cohesion policy on employment with the costs of EU financial support in the Polish NUTS-2 regions over the period 2004-2020. Making use of available counterfactual analyses, an attempt is made to evaluate the cost-effectiveness of job creation due to EU funds. Then, analysis is carried out to examine effectiveness of cohesion policy in stimulating the labour market in relation to effectiveness of EU funds in terms of GDP growth. This allows us to answer the question whether the effects of EU cohesion policy stimulate the so-called *jobless growth* – an economic growth with a relatively low demand for labour- or employment-oriented model is the case. When realizing that the current EU financial perspective (2007-2013) does not handle this dilemma in a direct and distinct manner this part of research seems to be especially interesting for the new programming period.

The gathered results may be treated as a useful supplement to the evaluation of cohesion policy in Poland – especially when one realizes that much emphasis of researchers is very often put upon the effects of the EU funds rather than their cost-effectiveness. This experience in the field of evaluation process – being an important part of programming regional development – will be a vital contribution to the debate on the design of cohesion policy in the new EU financial perspective 2014-2020.

The regional HERMIN models for the economies of the Polish NUTS-2 regions were the main research tools used to obtain the results that formed the basis for this article. The HERMIN methodology is used to determine the impacts of EU funds on the socio-economic development of the EU member states and regions covered by cohesion policy support, as well as to make economic forecasts. It meets the requirements of the European Commission with respect to tools that should be used for this type of research[3]. Results of the HERMIN simulations were presented, among others, in the Fifth Cohesion Report published by the European Commission in November 2010[4,5].

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[2] In this paper effectiveness of the EU funds with respect to the labour market is understood as the average cost per job created/retained due to the cohesion policy.

[3] The New Programming Period 2007-2013. Indicative guidelines on evaluation methods: ex ante evaluation. Working document no. 1.", European Commission, Directorate-General Regional Policy, August 2006.

[4] "Investing in Europe's future. Fifth report on economic, social and territorial cohesion". Brussels, European Commission, November, 2010.

[5] In Poland the HERMIN methodology was implemented both at the national level (2002, a study commissioned by the Ministry of Economy) and at the regional level (2005, a study commissioned by the Ministry of Regional Development); these were the first regional models dedicated to analysis of economic development of all Polish regions (voivodeships) which were of a prototype and experimental nature. Currently, the research team of the Wroclaw Regional Development Agency (WARR) led by Prof. Janusz Zaleski, in collaboration with Dr J. Bradley (the author of the original HERMIN methodology) of the Economic and Social Research Institute in Dublin, uses the 2nd generation regional models which are harmonised with the system of models used by DG REGIO (CSHM),

This article has the following structure: after an introduction, the results of some studies on the effects of cohesion policy on the labour market are presented. The next sections are devoted to a synthetic analysis of the Polish NUTS-2 regions as well as to *NDP* and *NSRF* payments in Poland. Then, the results of the study on the cost per job created/retained due to cohesion policy in Poland are presented, followed by the conclusions.

1. Presentation of selected previous studies

Analysing information concerning the cost per job created in the previous and present financial perspective of the European Union and EU standards in this respect should be one of the elements of estimating the impact of the Structural Funds on employment. The calculation of the cost per job created under programmes co-financed by EU funds forms the basis for evaluation of the effectiveness of this type of intervention. Nevertheless, one should take account of the fact that all obtained results must be treated with great caution, since two similar interventions or the circumstances under which they are carried out are not identical. Therefore, they will produce different effects due to the conditions prevailing in the environment in which they are carried out.

In Poland the operational programmes are now implemented under the second EU financial perspective that includes Poland following its accession to the European Community. The authors of this article did not have access to any studies that would deal in a comprehensive manner with the cost of job creation for the whole *National Development Plan (NDP)* and *National Strategic Reference Framework (NSRF)* (*i.e.* the instruments of cohesion policy implementation in Poland during the periods 2004-2006 and 2007-2013), but only to some partial studies, that is, studies devoted to analysis of the cost per job created under individual programmes or under the priorities of the operational programmes – primarily devoted to the *Integrated Regional Operational Programme (IROP*) and the *Sectoral Operational Programmes* being a component of the *NDP 2004-2006*. Below, we present some (due to the volume constraints on this article) reports relating to the cost per job created due to financial intervention.

Analysing information concerning the cost per job created in the previous financial perspective of the European Union, we notice that lower cost per job created is observed in the area of SMEs, especially with regards to subsidies granted to

among others by the disaggregation of the fifth sector – building and construction. The constructed models – for the whole Polish economy and for 16 regional economies of the particular regions – have been used to prepare a number of reports on the evaluation of the impacts of EU funds on key macroeconomic indicators both at the ex ante stage and for ongoing evaluation. WARR's reports are available at the website www.hermin.pl.

Table 1

Presentation of selected studies on cost per job created under programmes co-financed by EU funds (basic information)

Study No.	Scope of the study	Authors/Name of the report	Synthetic description of the study
1	NDP 2004-2006; Integrated Regional Operational Programme (IROP), Priority I and Priority III	PSDB; *Analysis of the impact of projects co-financed by the European Regional Development Fund (ERDF) and implemented under Priority I and III of the IROP on job creation*; April 2008	This study involved the estimation of jobs created due to the implementation of Priority I and III of the IROP. The estimates were based on, among others, questionnaire surveys of employers, the European Commission's methodology using questionnaire surveys of beneficiaries as well as on an econometric investigation. One of the effects of this study was the estimation of the average cost per job created as a direct effect of individual submeasures (without road projects)
2	NDP 2004-2006; Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises" (SOP ICE) (excluding specific objectives 1.1, 1.4.5, 1.5)	Consortium: InfoAudit; *The impact of the implementation of the Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises" 2004-2006 on the level of employment in the enterprise sector*	This study involved, among others, the estimation of the number of newly created jobs on the basis of CATI surveys
3	NDP 2004-2006; IROP, SOP ICE, Sectoral Operational Programme "Human Resources Development" (SOP HRD)	PAG Uniconsult; a study commissioned by the Ministry of Regional Development; *The effect of cohesion policy on the level and quality of employment in Poland*; July 2010	This study involved, among others, the estimation of the cost per job created under Measures 2.1 and 2.3 of SOP ICE on the basis of CATI and CAWI surveys
4	Two programmes implemented in Italy, with national and regional coverage, dedicated to manufacturing enterprises and SMEs	Bondonio D., Martini A. *Lessons from the evaluation of two Italian enterprise support programmes*	This study involved the estimation of the real impact of the implementation of two enterprise support programmes in Italy and a more realistic calculation of the cost per job created

Source: Author's research.

companies for investment activity. Obviously, the lowest cost is observed in the area of consulting services for companies, but that type of jobs is not stable. The highest

Table 2

Comparison of the results for the estimated cost per job created as presented in the above – mentioned studies and reports

Study No.	Thematic name of the programme/priority and assistance areas/specific objective	Average cost per job created (in euros)*
(1)	Environmental protection infrastructure (1.2 IROP)	818,284
	Regional education infrastructure (1.3.1 IROP)	351,722
	Regional health care infrastructure (1.3.2 IROP)	624,345
	Development of tourism and culture (1.4 IROP)	304,842
	Information society infrastructure (1.5 IROP)	264,848
	Rural areas (3.1 IROP)	1,794,527
	Areas subject to restructuring (3.2 IROP)	561,711
	Revitalisation of urban areas (3.3.1 IROP)	235,195
	Revitalisation of post-industrial and post-military areas (3.3.2 IROP)	83,480
	Microenterprises (3.4 IROP)	20,940
	Local education and sports infrastructure (3.5.1 IROP)	360,464
	Local health care infrastructure (3.5.2 IROP)	115,149
	Priority I, III under IROP – average cost	161,442
(2)	Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises" (SOP ICE) (excluding Measures 1.1, 1.5 and Sub-measure 1.4.5)	21,102
(3)	Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises", including:	
	Improvement of the competitiveness of enterprises through investment (2.3 SOP ICE) – gross cost per job created	22,500
	Improvement of the competitiveness of enterprises through investment (2.3 SOP ICE) – net cost per job created	9,000-17,750
	Improvement of the competitiveness of enterprises through advice (2.1 SOP ICE) – gross cost per job created	914
	Improvement of the competitiveness of enterprises through advice (2.1 SOP ICE) – net cost per job created	1,250-2,750
(4)	Two enterprise support programmes implemented in Italy, including (a) a national programme dedicated to manufacturing enterprises; and (b) a regional programme dedicated to small and medium-sized enterprises in Piedmont	231,237

SOP ICE – Sectoral Operational Programme „Improvement of the Competitiveness of Enterprises" 2004-2006; IROP – The Integrated Regional Operational Programme 2004-2006

* In the case of the Polish reports, we presented the results in euros using the average exchange rates from the Polish National Bank.

Source: Authors research based on studies described in Table 1.

estimated cost per job created was observed in programmes for rural areas. It is also worth mentioning that higher costs per job created are typical of the projects managed by public sector.

2. Synthetic analysis of the Polish NUTS-2 regions

Poland is characterised by regional differences in socio-economic development. The western voivodeships (regions) of the country, including Wielkopolskie and Dolnośląskie, as well as the centrally located regions, primarily Mazowieckie, Śląskie, and Pomorskie, are marked by a relatively better economic situation compared to the whole country. The relatively weaker voivodeships are concentrated in the eastern part of Poland – in the areas located peripherally in Europe, along the border with Ukraine, Belarus and Lithuania. Those NUTS-2 regions – Lubelskie, Podlaskie, Podkarpackie, Warmińsko-Mazurskie, and Świętokrzyskie – should be included in the regions with a relatively lower level of socio-economic development. The above is reflected in the level of GDP *per capita*.

The convergence with the more affluent regions of Western Europe is ongoing in Poland. This process is the most efficient in Mazowieckie Voivodeship (primarily in the agglomeration of Warsaw, which is the capital of the country). The situation of Dolnośląskie (66%), Wielkopolskie (65%) and Śląskie (65%) also looks quite well when compared to the whole country. However, this process is progressing noticeably more slowly in the eastern part of Poland where the regions are characterised by one of the lowest rates of GDP *per capita* relative to the EU average. The low levels of

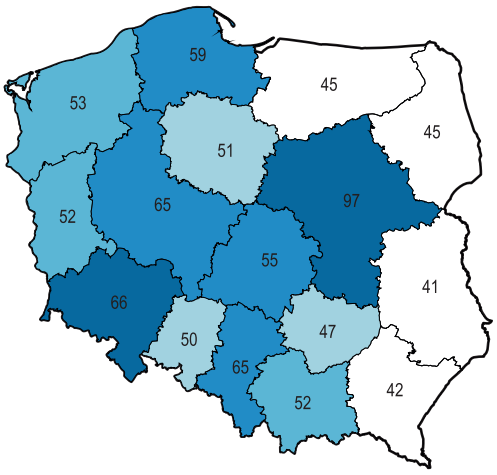

Fig. 1. GDP *p.c.* in PPS (EU = 100) in Polish regions in 2009

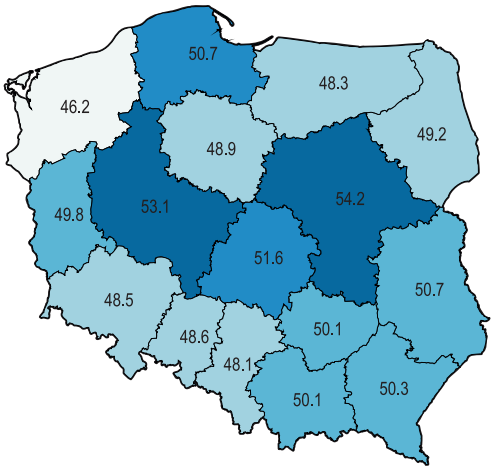

Fig. 2. The employment rate in Polish regions in 2010

Source: stat.gov.pl (Figs. 1, 2).

this indicator are most frequently accompanied by a relatively high unemployment rate. This applies chiefly to Świętokrzyskie and Podkarpackie, but also to Zachodniopomorskie, which is situated in the west of Poland. The spatial distribution of the employment rate is slightly different. Even though it is the highest in the economically strong regions of Mazowieckie (54.2) and Wielkopolskie (53.1), relatively high values of the employment rate are found in the less affluent south-eastern regions of the country (Lubelskie, Podkarpackie, Świętokrzyskie) compared to the western regions, including, among others, the relatively wealthy regions of Śląskie (48.1%) and Dolnośląskie (48.5). This situation is probably associated with the fact that the eastern regions, Świętokrzyskie, Lubelskie, and Podkarpackie, are highly oriented towards agriculture and there are EU direct payments that generate large-scale hidden unemployment in these areas.

3. Synthetic analysis of cohesion policy (*NDP/NSRF*) payments

When Poland entered the European Union in 2004, it joined the implementation of cohesion policy designed to support a harmonious development of the whole Community through measures eliminating the disproportions in regional development. The proper orientation of measures implemented under cohesion policy, with financial support of the Structural Funds, was a development opportunity for Poland to accelerate the processes of convergence with the better developed countries and regions of the EU. In accordance with the European Union's guidelines, the *National Development Plan (NDP 2004-2006*) and the *National Strategic Reference Framework (NSRF 2007-2013*) became the instrument of cohesion policy implementation, taking into account Poland's socio-economic conditions. In the successive programming periods, these documents defined the direction of financial support available from the European Union budget under the European Regional Development Funds, the European Social Fund, and the Cohesion Fund. Both the NDP and NSRF were reference instruments for the preparation of the operational programmes, at the same time incorporating the strategic objectives of the national and Community documents and responding to, among others, the challenges of the Lisbon Strategy.

According to MRD[6] data, € 19,067.5 million and € 13,429.9 million, respectively, *i.e.* a total amount of 32,497.3 million euro, were allocated in Poland under the NDP and NSRF (including domestic public co-finance) over the period 2004-2010. In accordance with the plan, a total amount of € 65,531.3 million will be implemented in the following years (*i.e.* 2011-2015). This means that the largest scale of allocations is foreseen at the end of the current financial perspective. Under the NSRF, in

[6] Ministry of Regional Development.

Table 3

Payments under the *National Development Plan 2004-2006 (NDP 2004-2006)* and the *National Strategic Reference Framework (NSRF 2007-2013)* in 2004-2015 (including domestic public co-finance) in mln euro

		Payments under NDP 2004-2006						Payments under NSRF 2007-2013							
Years:		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2004-2015
NSRF 2007-2013	**Total**					366.5	4,509.2	8,554.2	10,450.6	12,759.9	15,646.5	14,491.8	12,182.5	78,961.2
	EU funds					311.5	3,832.8	7,271.0	8,883.0	10,845.9	13,299.5	12,318.1	10,355.2	67,117.0
NDP 2004-2006		390.5	1,294.9	3,835.1	5,416.0	4,014.9	2,802.2	1,313.9	**Total**					19,067.5
		274.1	912.1	2,703.3	3,784.2	2,675.8	2,042.4	943.7	**EU funds**					13,335.6
Total NDP and NSRF payments		**390.5**	**1,294.9**	**3,835.1**	**5,416.0**	**4,381.4**	**7,311.5**	**9,868.1**	**10,450.6**	**12,759.9**	**15,646.5**	**14,491.8**	**12,182.5**	**98,028.7**

Source: Authors' calculations based on the data of the Ministry of Regional Development (MRD).

the period 2007-2013 (in accordance with the n+2 rule) a total amount of € 78,961.2 million (including domestic public co-finance) is provided, which is a nearly fourfold higher amount than the allocation earmarked in the first programming period that also included Poland, *i.e.* 2004-2006. The total amount of NDP and *NSRF* payments is € 98,028.7 million.

The data presented in the above table are historical (in the case of the NDP data); as far as the data relating to *NSRF* payments are concerned, a part of them is historical (for the period 2008[7]-2010), while the other part is forecast (for the period 2011-2015). As regards the *NSRF,* an assumption is made that the domestic public co-finance contribution is at the level of 15%.

The highest amount of payments under *NDP 2004-2006* was in 2007 and 2008, which is justified taking into consideration the duration of investment projects and project accounting. For the same reason, under the *NSRF* the highest transfers of funds from the EU budget are expected in the years 2013 and 2014. In both financial perspectives, the utilisation of financial resources under cohesion policy gradually became more dynamic and then slowed down.

A major part of *NDP* and *NSRF* resources were funds from the EU budget. Under the *NDP*, which was an instrument of cohesion policy implementation during the adjustment period, right after Poland's accession to the EU, the Community contribu-

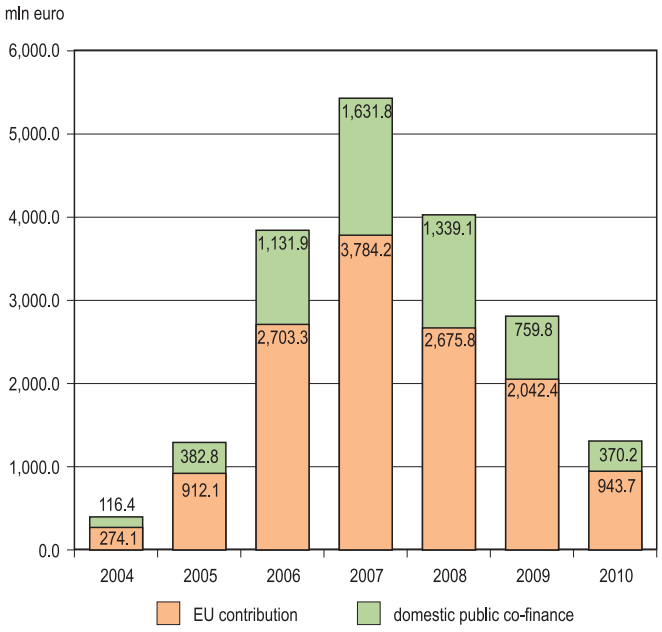

Figure 3. *NDP* – funding structure by source

Source: Author's calculations based on the data of the Ministry Regional Development (MRD) (Figs. 3-6).

[7] There were no payments in the first year of NSRF implementation.

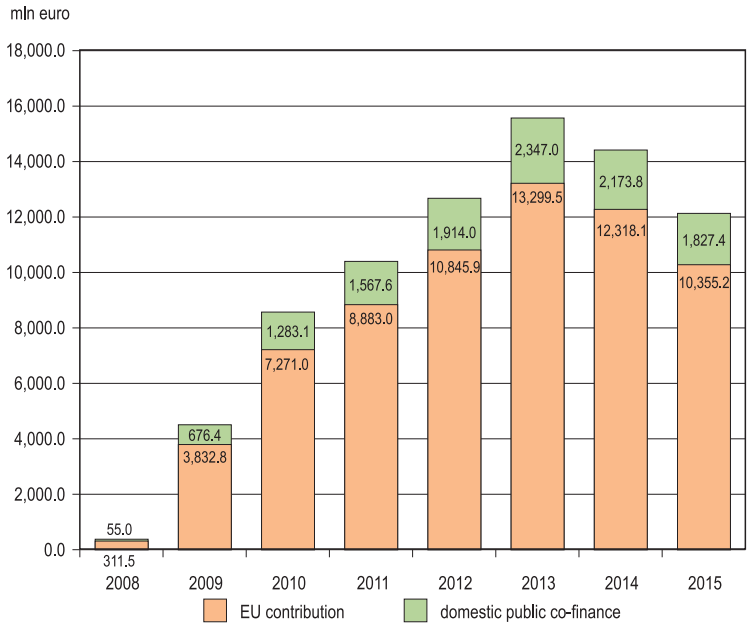

Figure 4. *NSRF* – funding structure by source

tion was 69.9% of the total amount of payments, *i.e.*, € 13,335.6 million. Under the *NSRF*, the amount of the EU contribution was higher, that is 85% of the total amount of payments, *i.e.*, € 67,117 million, The percentage of EU contribution in each of the years of *NDP* implementation in question was not constant (ranging between 66-73% of payments in a particular year), which results from the rules and procedures for accounting for projects financed from the European Union budget.

More than 50% of payments transferred to *NDP/NSRF* beneficiaries are funds allocated to physical infrastructure. Funding allocated to direct aid to enterprises is the second group in terms of value. The so-called soft projects involving human resources development have the relatively lowest share in EU payments.

In nominal terms, the country's largest regions (with the highest population), notably Mazowieckie, Śląskie, Wielkopolskie, and Dolnośląskie, are the largest beneficiaries of NDP and NSRF implementation. The lowest values of transfers are recorded for the less inhabited regions of Poland – Warmińsko-Mazurskie, Świętokrzyskie, Lubuskie, Opolskie.

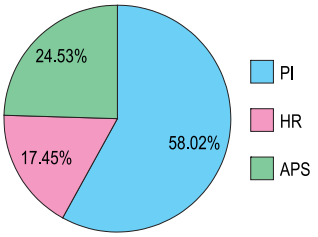

Figure 5. Percentage shares of payments under the categories of direct aid to the productive sectors (APS), human resources (HR), and physical ifrastructure (PI) in total *NDP* and *NSRF* funding in 2004-2015

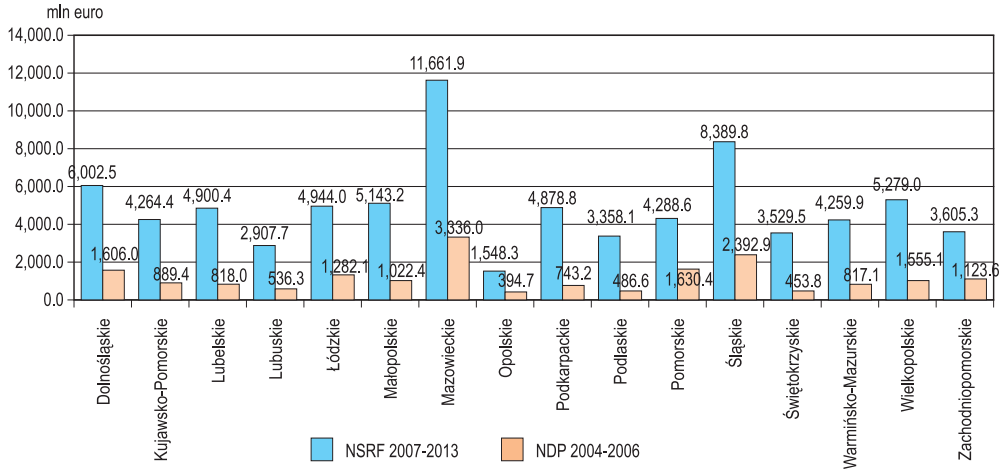

Figure 6. *NDP* and *NSRF* payments by Polish regions

In terms of *NDP* and *NSRF* payments *per capita* (according to 2004 population data[8]), the list of the largest beneficiaries changes, since the highest payments *per capita* are in the relatively less developed regions of Poland, primarily the regions of Eastern Poland.

Another element of the analysis of *NDP* and *NSRF* payments is to analyse them in relation to GDP – such an approach indicates the real weight of transfers in the economy of the studied country. This relation was calculated based on historical GDP data for 2004-2009 and on the data projected by the HERMIN model (for 2010-2015).

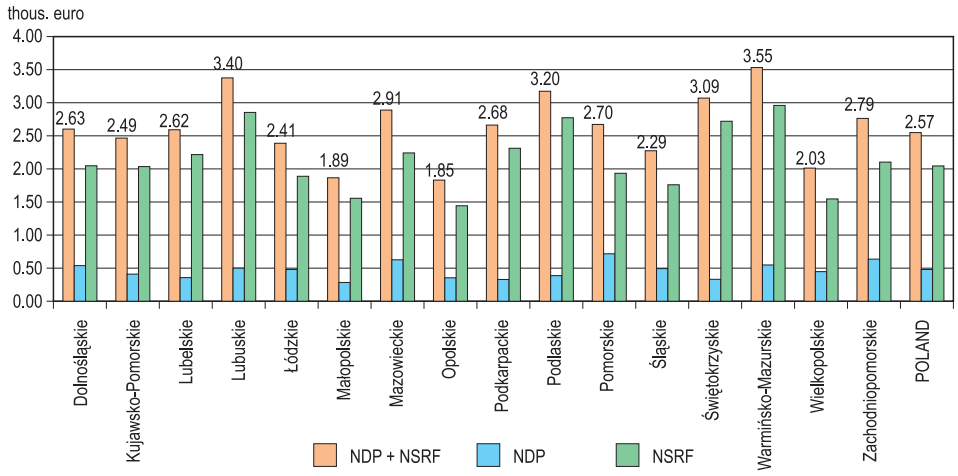

Figure 7. *NDP* and *NSRF* payments *per capita*
(2004 population data according to GUS – Polish Statistical Office)
Source: As in Figure 1, and stat.gov.pl (Figs. 7, 8).

[8] The first year of cohesion policy implementation.

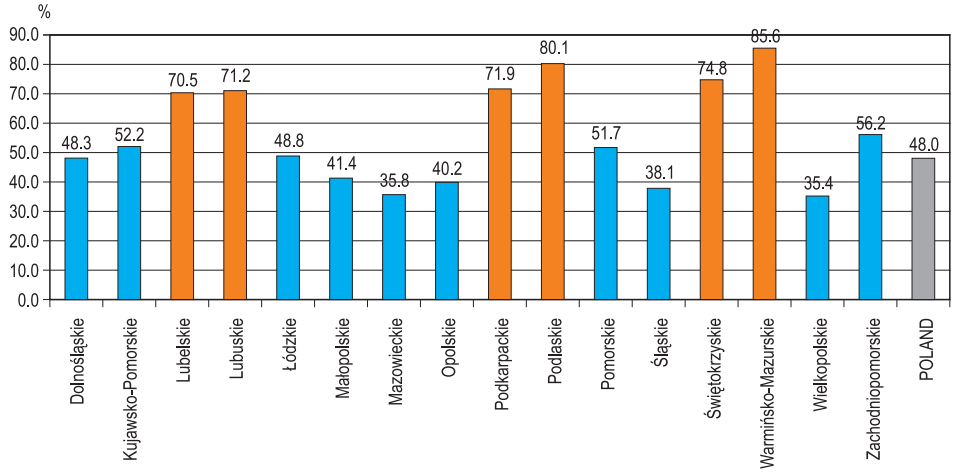

Figure 8. *NDP* and *NSRF* payments in relation to GDP by Polish regions (GDP for 2004)

This ratio reaches the highest values in the regions of Eastern Poland, Warmińsko-Mazurskie, Świętokrzyskie, Lubelskie, Podlaskie, and Podkarpackie, as well as in a relatively small and less developed region of Western Poland – Lubuskie. In the case of Podlaskie and Warmińsko-Mazurskie Voivodeships (regions), this ratio exceeded 80% of GDP, which proves that EU payments play a huge role primarily in the less affluent regions of Poland.

4. Analysis of the results based on the macroeconomic HERMIN simulations

The analysis of the average cost per job created as a result of a specific financial intervention (*e.g.* under the EU's cohesion policy) is a task consisting of two basic parts. The first, easier part requires the determination of the value of funding that has been implemented into the economic system of a region or country. This analysis is based on historical data and forecasts of payments under the *National Development Plan* (*NDP*) 2004-2006 and the *National Strategic Reference Framework* (*NSRF*) 2007-2013 which were made available by the Polish Ministry of Regional Development – the institution responsible for collecting information on the spending of cohesion policy funds and for making projections of such spending in the future, *e.g.* with a breakdown by NUTS-2 regions. The second part of the investigation consists in estimating the number of jobs that have been created due to EU financial support. It should be mentioned that *NDP/NSRF* payments affect the economy both directly and indirectly. By jobs which are directly associated with EU funds one means in this paper the jobs created by a beneficiary or in the unit which implemented the project.

However, these are not the only effects generated by the EU funds. Cohesion policy also affects this part of the economy which is not directly involved in the EU projects (in this article indirect labour market effects are referred to as jobs generated by EU funds elsewhere than at the beneficiary's). This is the case, among others, due to demand-side effects. In other words, the inflow of funds into an economic system contributes to an increase in income and global demand which simulates growth in GDP through the Keynesian multiplier mechanism, and this in turn has a positive effect on the labour market. We also have to do with supply-side effects of cohesion policy associated with the development and modernisation of transport and telecommunications infrastructure, upgrade of machinery and equipment of enterprises as well as increased human capital resources and quality. In the long-term perspective, effects stimulating the supply side of the economy support the development of business initiative reflected in increased entrepreneurship and investment, as well as increased employment. It is much more difficult to capture the indirect impact of resources allocated under the *NDP/NSRF* than to extract the direct effects of cohesion policy on the labour market of a region/country. One of the methods that enable the estimation of total direct and indirect effects of EU financial support on the labour market is macroeconomic modelling which, by using counterfactual analysis, allows one to determine what part of changes in the indicators such as the unemployment rate or the employment rate is a result of cohesion policy payments. The earlier mentioned regional HERMIN models of the economies of the Polish NUTS-2 regions (voivodeships) were used in the study whose results formed the basis of this article.

To calculate the average cost per job created/retained as a result of the implementation of cohesion policy at the level of the Polish NUTS-2 regions, the following formula was used:

$$C_n = \frac{P_n}{\mathrm{Im}_n}$$

where:

C_n *the average cost per job created/retained in the year;*

P_n *NDP/NSRF* payments in the year n;

Im_n the impact of *NDP/NSRF* (based on HERMIN simulations) funding on employment numbers (in terms of full time equivalents)[9] in the year *n* in the NUTS-2 region analysed.

One noteworthy fact is that both the economically weaker regions that are covered by a special operational programme under cohesion policy (Lubelskie, Podlaskie, Podkarpackie and Warmińsko-Mazurskie) and the economically stronger regions (Pomorskie, Wielkopolskie), as well as those ranking somewhere between these two groups (Opolskie, Kujawsko-Pomorskie, Zachodniopomorskie), are the regions

[9] In the whole analysis, the impacts of cohesion policy on the number of employed persons were translated into full time equivalents.

Table 4

The cost per job created due to the implementation of *NDP* and *NSRF* in 2004-2015 (in euros per person employed)*

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	aver-age	average (PL= 100)
DL**	24,554	27,677	34,449	35,516	31,425	28,200	29,928	30,718	31,850	33,102	32,935	32,306	**31,055**	**100.3**
KP	21,842	27,585	29,548	34,199	36,998	31,931	36,574	39,745	42,498	45,458	46,922	47,329	**36,719**	**118.6**
LL	22,450	26,421	28,442	31,582	33,587	29,582	32,430	34,036	35,573	37,272	38,298	38,903	**32,381**	**104.6**
LB	23,136	26,868	27,524	30,655	31,653	26,666	25,779	28,370	29,825	31,193	31,069	30,210	**28,579**	**92.3**
LD	21,820	26,448	28,235	32,815	29,510	26,769	27,261	29,921	31,404	32,957	33,024	32,364	**29,377**	**94.9**
ML	20,073	22,962	28,520	30,748	29,858	25,106	27,500	28,690	30,672	32,841	33,998	34,811	**28,815**	**93.1**
MZ	28,324	29,302	31,778	33,910	36,120	28,868	27,903	26,227	27,600	28,482	27,534	26,516	**29,380**	**94.9**
OP	22,582	27,876	29,137	32,386	34,868	30,063	32,858	33,717	35,978	38,533	39,754	40,026	**33,148**	**107.1**
PK	25,916	28,863	31,235	35,178	34,818	30,335	33,130	33,878	35,474	37,314	37,604	36,990	**33,395**	**107.8**
PD	28,182	34,312	37,674	40,932	41,735	36,377	40,617	43,780	46,346	48,925	50,442	50,939	**41,688**	**134.6**
PM	22,136	25,278	28,355	34,945	34,165	30,311	32,266	32,467	35,323	38,233	39,116	39,127	**32,643**	**105.4**
SL	25,016	27,100	29,845	31,206	29,032	22,960	24,241	23,311	24,811	26,317	25,902	24,886	**26,219**	**84.7**
SW	***	24,963	25,972	29,985	30,430	28,704	30,677	31,426	32,685	34,222	34,427	33,844	**30,667**	**99.0**
WM	23,423	29,440	31,802	33,546	32,764	29,091	31,874	33,514	35,598	37,912	38,948	39,176	**33,091**	**106.9**
WL	25,216	29,290	31,556	32,366	31,629	30,960	31,612	34,572	36,781	39,046	39,341	38,644	**33,418**	**107.9**
ZP	23,324	25,668	30,794	32,602	36,706	33,956	35,086	38,543	42,624	46,719	49,571	51,823	**37,285**	**120.4**
16 regions	**24,471**	**27,198**	**30,349**	**33,104**	**33,191**	**28,405**	**29,511**	**30,638**	**32,421**	**34,181**	**34,300**	**33,807**	**30,965**	**100.0**

* The results of the simulations carried out using the regional HERMIN models show that the supply-side effects play a small role in the stimulation of the labour market during the implementation of *NDP*/ *NSRF* funding. The short-term (one-year in the HERMIN methodology) demand-side effects are of major importance here. The scale of permanent jobs resulting from an improvement in economic conditions (physical infrastructure, human capital, machinery and equipment) is relatively small during this period (at the maximum about 10% of the total number of jobs existing due to the implementation of cohesion policy in a given year). Therefore, the values shown in the table can be treated as a relatively good approximation of the cost per job created thanks to the EU. The scale of the supply-side effects for the labour market seems to confirm an intuitive conjecture that many projects implemented under the NDP and NSRF have a short-term effect on the labour market and on the whole economy.

** DL – Dolnośląskie; KP - Kujawsko-pomorskie; LL – Lubelskie; LB- Lubuskie; LD- Łódzkie; MP – Małopolskie; MZ – Mazowieckie; OP – Opolskie; PK – Podkarpackie; PD – Podlaskie; PM – Pomorskie; SL – Śląskie; SW –Świętokrzyskie; WM - Warmińsko-Mazurskie; WP – Wielkopolskie; ZP – Zachodniopomorskie.

*** In Świętokrzyskie the impact of cohesion policy on the number of employment in this year was close to zero.

Source: Author's calculations based on HERMIN simulations (Tables 4-8).

characterised by the relatively highest average cost per job created due to cohesion policy (higher than for Poland as a whole: €30,965). Thus, it cannot be concluded that the cost of job generation is strictly dependent on the level of economic development of a particular region. Furthermore, a conclusion can be drawn that there is no significant correlation between the cost of job creation and the real scale of EU

payments measured in relation to regional GDP. It is visible when comparing two regions: Warmińsko-Mazurskie (the largest beneficiary of EU payments relative to its GDP and, at the same time, a region that is characterised by a relatively high cost per job) and Lubuskie (ranking relatively high in terms of EU payments relative to its GDP and, at the same time, characterised by a relatively low cost per job). Taking into account the above, it should be stated that the regional differences in the cost per job created as a result of EU financial intervention are the resultant of a number of factors determining the effectiveness of funds implemented into the economy, such as, among others: the strength of the Keynesian multiplier mechanism[10] (determined by the marginal propensity to consume and to import from regional income) affecting the scale of demand-side effects, the employment multiplier[11], the rate of technological progress impacting labour productivity[12].

Table 5

A correlation table - the main determinants of the cost per job created due to *NDP* and *NSRF* implementation in 2004-2015

Feature	Cost per job created due to *NDP/NSRF* in euros (average for 2004-2015)	Value of the Keynesian investment multiplier (average for 2010-2015)	Value of the employment multiplier (average for 2010-2015)	Impact of *NDP/NSRF* on labour productivity (average for 2004-2015)	Total *NDP/NSRF* payments in relations to GDP
Cost per job created due to *NDP/NSRF* in euros (average for 2004-2015)	1.00				
Value of the Keynesian investment multiplier (average for 2010-2015)	-0.44*	1.00			
Value of the employment multiplier (average for 2010-2015)	-0.48*	0.96	1.00		
Impact of *NDP/NSRF* on labour productivity (average for 2004-2015)	0.27*	0.11	-0.02	1.00	
Total *NDP/NSRF* payments in relations to GDP	0.40	-0.61	-0.58	0.47	1.00

* Statistically significant at 10%.

[10] The Keynesian multiplier indicates how much total real income rises in equilibrium if autonomous expenditures rise.

[11] The employment multiplier is calculated by dividing total employment(direct, indirect and induced) by direct employment due to the EU funds.

[12] Those determinants were selected for the correlation analysis on the basis of numerous HERMIN simulations.

The analysis of the data in Table 5 shows that none of the main factors which can determine the strength of cohesion policy effects is of decisive importance for the value of the average cost per job at the regional level in Poland. It is worth noticing that the multiplier mechanisms, which multiply the impacts of EU resources on the labour market and thereby reduce the average cost per job created due to the implementation of cohesion policy, play a relatively important role here.

Another interesting convention of presentation of the average cost per job created due to EU financial intervention can be the calculation of the cumulative cost that has been incurred up to a given year, in accordance with the following formula:

$$Cs_n = \frac{\sum_{k=2004}^{n} P_k}{\mathrm{Im}_n}$$

where:

Cs_n the cumulative cost per job created/retained in the year *n*;

P_n *NDP/NSRF* payments in the year *n*;

Im_n the impact of *NDP/NSRF* (based on HERMIN simulations) funding on employment numbers (in terms of full time equivalents) in the year *n* in the NUTS-2 region analysed.

Such a method of calculation of the cost in question allows one to determine the effectiveness of funding implemented into the economic system from the beginning of the implementation period (2004) until a specific year. The above convention enables us to answer the question: What is the final cost of *NDP/NSRF* impact, measured in a particular year, on the labour market? – with the final cost understood as all funding that was spent up to a given year, inclusive, to create a job existing in that year. In other words, this method does not take into account jobs that were created/retained due to EU interventions in the previous years, but they do not exist any more in the year examined. Given the above, it can be stated that, on the one hand, the cost under consideration is overestimated, since even short-term jobs generated positive effects for a particular region, *e.g.* in the form of additional professional experience for a part of its population, protection from long-term unemployment as well as reduced economic inactivity and social exclusion. On the other hand, this method of calculation of the average cost per job allows one to present explicitly and to compare at the regional scale the final long-term effectiveness of cohesion policy with respect to the labour market several years after the termination of the inflow of funds into the economy.

As shown in Table 6, Zachodniopomorskie, which is a relatively economically weaker region of Poland, though marked by high development potential, is the Polish NUTS-2 region characterised by the highest cost per job created/retained due to EU cohesion policy according to the simulations performed. In 2020, thus five years after the assumed termination of *NDP/NSRF* payments, the average cost per job created/retained and still existing in this region in 2020 due to the EU programmes is estimated at about

€6.1 million, which is 333% of the national average. The Silesian region (Śląskie) is at the opposite extreme with the average cost about 1 million (57% of the national average in 2020), which indicates relatively high supply and demand-side effects of the EU funds (see the year 2013) in the labour market as well as higher durability of jobs created due to cohesion policy in this region. A decline in the cost in question was recorded in half of the regions (primarily in Śląskie, Wielkopolskie, and Lubuskie) in relation to the national average between 2013 and 2020. This suggests relatively high supply and demand-side effects in the labour market in these regions and/or a high level of durability of jobs created. It must be stressed that an enormous increase in the nominal cumulative cost per job created due to EU financial intervention which is noticed between 2015 and 2020 results from the fact that after the assumed termination of EU funds the demand-side effects disappear and the only impact of cohesion policy on the labour market is through the long-term supply-side effects that are lower than total (supply and demand- side) effects of EU financial assistance in the implementation phase (2004-2015).

Table 6

The cumulative cost per job created due to *NDP* and *NSRF* implementation in some* years of the analysed period 2004-2020 (in euros per person employed, Poland=100)

Year / Voivodeship	2013	2013 Poland=100	2015	2015 Poland=100	2020	2020 Poland=100
DL	141,991	91	248,714	91	1,922,197	**105**
KP	187,061	120	353,763	130	2,329,705	**127**
LL	148,320	95	284,008	104	3,210,556	**175**
LB	137,949	88	237,733	87	1,205,010	**66**
LD	143,575	92	251,945	93	1,424,712	**78**
ML	142,755	92	270,561	99	3,373,393	**184**
MZ	143,147	92	229,214	84	2,037,419	**111**
OP	196,696	126	350,050	129	2,222,125	**121**
PK	157,866	101	281,979	104	1,554,418	**85**
PD	187,564	120	362,349	133	2,547,881	**139**
PM	204,231	131	354,107	130	2,150,855	**117**
SL	129,134	83	211,322	78	1,036,765	**57**
SW	138,035	89	249,428	92	1,451,147	**79**
WM	163,254	105	302,442	111	2,142,528	**117**
WL	189,621	122	325,643	120	1,697,266	**92**
ZP	247,831	159	466,537	171	6,110,409	**333**
16 regions	**155,879**	**100**	**272,036**	**100**	**1,834,895**	**100**

* 2013 – the peak year of EU payments; 2015 – the last year of EU payments in the 2007-2013 perspective (the year after which EU transfers are assumed to terminate, which is designed to determine long-term supply-side effects of *NDP/NSRF* funding); 2020 – the last year of the analysis, five years after the assumed termination of Community financial support under cohesion policy.

Table 7

The cost per job created due to *NDP* and *NSRF* implementation in 2004-2015 (in euros per person employed), taking into account the *deadweigh*t effect and *displacement* effect, and the cumulative cost in 2020 (in euros per person employed)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2004 - 2020
DL	46,085	51,946	64,657	66,659	58,981	52,928	56,171	57,653	59,779	62,128	61,815	60,634	**3,607,728**
KP	40,994	51,773	55,457	64,188	69,440	59,930	68,645	74,596	79,764	85,320	88,067	88,831	**4,372,569**
LL	42,135	49,590	53,383	59,276	63,038	55,522	60,867	63,881	66,767	69,955	71,880	73,016	**6,025,818**
LB	43,424	50,429	51,659	57,536	59,408	50,049	48,385	53,246	55,978	58,545	58,312	56,700	**2,261,656**
LD	40,954	49,640	52,994	61,590	55,386	50,242	51,166	56,158	58,942	61,855	61,982	60,743	**2,674,010**
ML	37,675	43,097	53,529	57,711	56,041	47,122	51,614	53,847	57,568	61,639	63,811	65,336	**6,331,444**
MZ	53,161	54,997	59,644	63,645	67,793	54,181	52,370	49,224	51,801	53,457	51,678	49,767	**3,823,984**
OP	42,384	52,321	54,686	60,784	65,443	56,425	61,671	63,283	67,525	72,322	74,612	75,124	**4,170,656**
PK	48,641	54,172	58,625	66,025	65,350	56,935	62,180	63,584	66,580	70,035	70,579	69,425	**2,917,450**
PD	52,895	64,399	70,710	76,824	78,332	68,276	76,233	82,169	86,986	91,826	94,674	95,607	**4,782,060**
PM	41,547	47,443	53,219	65,587	64,123	56,891	60,560	60,937	66,298	71,758	73,416	73,436	**4,036,889**
SL	46,952	50,864	56,015	58,570	54,489	43,093	45,497	43,751	46,567	49,395	48,616	46,708	**1,945,881**
SW	*	46,852	48,747	56,279	57,113	53,875	57,576	58,982	61,346	64,231	64,616	63,522	**2,723,624**
WM	43,961	55,256	59,689	62,962	61,493	54,600	59,824	62,901	66,813	71,155	73,101	73,528	**4,021,261**
WL	47,326	54,973	59,227	60,748	59,363	58,109	59,333	64,887	69,034	73,285	73,838	72,531	**3,185,560**
ZP	43,777	48,176	57,796	61,190	68,893	63,732	65,852	72,341	80,001	87,687	93,039	97,265	**11,468,486**
16 regions	**45,929**	**51,047**	**56,961**	**62,132**	**62,295**	**53,313**	**55,388**	**57,503**	**60,851**	**64,154**	**64,377**	**63,452**	3,443,872

* In Świętokrzyskie the impact of cohesion policy on the number of employment in this year was close to zero.

In the context of the analysis of the average cost per job created/retained due to the implementation of cohesion policy, one should also mention a very important aspect of the investigation of the effects of financial interventions, which is the *deadweight* effect[13]. Due to the fact that *NDP* payments terminated relatively recently, while the *NSRF* programme still continues, there are no reliable research results that would present the estimated scale of this phenomenon over the period 2004-2015. Therefore, full additionality of the effects generated by EU funds was assumed in the HERMIN methodology – including the impacts of *NDP/NSRF* on the labour market. In order to make an initial tentative estimate of the cost of job creation, taking into account the *deadweight* effect, the authors used the results of a questionnaire survey conducted by the Polish Agency for Enterprise Development (2005) relating to the scale of the above-mentioned effect during the implementation of the Phare programme (specifically, a component of this

[13] A situation where a part (or all) of employment effects associated with Structural Fund interventions would have occurred anyway.

Table 8

Cumulative cost per job created due to Cohesion Policy (2020)

Voivodeship	Cumulative multiplier (2020)	Cumulative cost per job created due to Cohesion Policy (2020)
DL	1.5	1,922,197
KP	1.3	2,329,705
LL	1.1	3,210,556
LB	1.5	1,205,010
LD	1.3	1,424,712
ML	1.4	3,373,393
MZ	2.0	2,037,419
OP	1.4	2,222,125
PD	1.0	1,554,418
PK	1.3	2,547,881
PM	1.4	2,150,855
SL	1.9	1,036,765
SW	1.5	1,451,147
WM	1.1	2,142,528
WL	1.7	1,697,266
ZP	1.3	6,110,409

programme oriented towards assistance to SMEs)[14],[15]. Furthermore, the estimated *displacement* effect[16] was also taken into account[17].

As can be easily seen, when the *deadweight* and *displacement* effects are taken into account there is an increase in the average cost per job created/retained due to the implementation of cohesion policy in 2004-2015. It should be stressed here once again that the

[14] This programme was implemented across Poland from September 2003 until December 2004. It offered grants for advisory services and investment to small and medium-sized enterprises.

[15] On the basis of the survey referred to above, the authors of this article made an assumption that positive answers to the below questions given by the enterprises surveyed were evidence of the deadweight effect: 1) If your business had not received the grant, would the measures have been implemented to the same extent and in the same period of time?; and 2) If your business had not received the grant, would the measures have been implemented to the same extent, but at a later time. Under the implemented programmes, the average number of positive answers to the above questions was 33.4%.

[16] The extent to which positive employment outcomes that can be attributed to Structural Fund intervention are offset by negative side effects.

[17] The estimation is not an outcome of the research conducted for the Polish regions. It is based on the document of the European Commission ("Measuring structural funds employment effects" 2006) where it is indicated that the displacement effect should fluctuate between 10% and 30%. In this paper we assumed the average value (20%).

above estimates are based on the results of the investigation of the *deadweight* effect in the pre-accession period and guidelines of the European Commission regarding the *displacement* effect. Therefore, the values presented in Table 7 should be treated with caution.

To conclude the analysis of the cost of job creation/retention as a result of EU financial intervention, it is worth investigating the correlation between the cumulative costs approximating the effectiveness of cohesion policy in stimulating the labour market and the cumulative multiplier[18] [Bradley, Untiedt 2010] reflecting the effectiveness of EU funds in terms of GDP growth. This will allow us to answer the question whether the effects of EU cohesion policy stimulate the so-called *jobless growth* – an economic growth with a relatively low demand for labour.

The analysis of the data in Table 8 shows a lack of correlation between the cumulative cost at the end of the period in question and the cumulative multiplier in 2020 (R=-0.29)[19]. Hence, this induces us to conclude that the effectiveness of *NDP*/*NSRF* in terms of economic growth is not fully translated into the labour market.

Conclusions

One of the important aspects of programming regional development is evaluation. It enables us to draw the most significant conclusions from pursuing regional policy and make some necessary corrections and modifications. An inherent part of regional development being also an indicator for the programming process is employment. An improvement in the labour market is an extremely important aspect of socio-economic development that allows a measurable improvement in living conditions of EU residents and an increase in their real participation in the development processes. This is reflected in the main strategic document of the European Union, *"Europe 2020",* in which increased employment and social inclusion are one of the key priorities. The counterfactual analyses carried out using the macroeconomic models clearly show the positive effect of cohesion policy funding (*NDP/NSRF*) on the regional labour markets in Poland. Such effects of EU financial interventions should be considered to be desirable and beneficial for particular territorial areas of support. Nevertheless, attention is rarely paid to the average cost per job created or retained due to the implementation of cohesion policy in the context of the analysis of the impact of this policy on the labour market. Obviously, the operational programmes implemented under the *NDP* and *NSRF* were not directly oriented towards an increase in jobs but, among others, towards the development of infrastructure, an increase

[18] Cumulative multiplier is calculated by dividing the cumulative percentage increase in the level of GDP due to Cohesion Policy by the cumulative injection of Cohesion Policy funds (the latter expressed as a share of GDP). Regions with high cumulative multipliers are the ones who are likely to make best use of cohesion policy funds.

[19] No correlation was observed for all years of the period in question, either.

in innovation and human capital, and thereby an increase in factor productivity and GDP. In this sense, speaking of the cost of job creation/retention appears not to be fully justified. However, it is worth noting that the estimation of the above-mentioned cost allows the effectiveness of EU funds in terms of labour market[20] to be compared between individual regions. When we compare the average cost of job creation and the effectiveness of the impact of cohesion policy on GDP, this allows us to assess whether the effects of EU resources on the economy fit more the Europe 2020 priority, which is increased employment, or they stimulate more the so-called *jobless growth*[21].

The analysis of the average cost of job created/retained due to *NDP* (2004-2010) and *NSRF* (2007-2015) funding made in this paper allows us to make the following conclusions:

- The average cost of job creation/retention is not dependent on the level of economic development of a region. Both the economically weaker regions which are covered by a special operational programme under cohesion policy (Lubelskie, Podlaskie, Podkarpackie, and Warmińsko-Mazurskie) and the economically stronger regions (Pomorskie, Wielkopolskie), as well as those ranking somewhere between the above two groups (Opolskie, Kujawsko-Pomorskie, Zachodniopomorskie), are the regions characterised by the relatively highest average cost per job created due to cohesion policy (higher than for Poland as a whole: € 30,965).
- The regional differences in the average cost per job created as a result of EU financial intervention are the resultant of a number of factors determining the effectiveness of funds implemented into the economy such as: the strength of the Keynesian multiplier mechanism (determined by the marginal propensity to consume and to import from regional income) affecting the scale of demand-side effects, the employment multiplier, the rate of technological progress impacting labour productivity, labour force participation affecting labour costs.
- Zachodniopomorskie, a relatively economically weaker region of Poland, though marked by high development potential, is characterised by the highest cumulative cost per job created/retained due to EU cohesion policy. In 2020, thus five years after the assumed termination of *NDP/NSRF* payments, the average cost per job created/retained in this region and still existing in that year due to the EU programmes is estimated at about € 6.1 million, which is 333% of the national average. The Silesian region (Śląskie) is at the opposite extreme with the average cumulative cost amounting to approximately € 1million (57% of the national average in 2020).
- In the optimistic scenario, resources implemented into a regional economy should stimulate economic activities (*e.g.* investment) which would not be undertaken in the absence of EU funds (in keeping with the principle of full additionality).

[20] In this paper effectiveness of the EU funds with respect to the labour market is understood as the average cost per job created/retained due to the cohesion policy.

[21] More information about jobless growth can be found – among others – in: [Caballero, Hammour 1997; Khemraj *et al.* 2006].

Nevertheless, we should expect with high probability the occurrence of *the dead-weight* and *displacement* effect, the consequence of which will be an increase in the average cost per job analysed.

- Due to the lack of studies on the supply-side effects of EU resources in Poland and its NUTS-2 regions, the authors of the present article used in their simulations the same parameters of *spillover elasticities* determining the scale of supply-side effects (adopted on the basis of available empirical analyses carried out for other countries with the economic characteristics similar to that of Poland [Bradley, Untiedt 2010].
- In the Polish NUTS-2 regions, the effectiveness of cohesion policy in terms of its impact on regional GDP is not necessary related to the effectiveness of EU funds with respect to the labour market. In connection with the above, it is conceivable that cohesion policy in Poland is closer to a *jobless growth* model rather than employment-oriented one. The above conclusion relates to the medium-term period in question (until 2020). In the long-term, the stimulation of labour productivity must result in increased employment. Thus, it is recommended not to replace the total factor productivity-oriented policies with those being not economically-efficient in the long-run but entailing a significant in employment in the mid-term. The drawn conclusion and calculated costs can form an important contribution to the discussion on the priorities of projects to be implemented in the new EU financial perspective (2014-2020) and on their expected effectiveness for the labour market.
- Bearing in mind that much emphasis of researchers is very often put upon the effects of the EU funds rather than their cost-effectiveness and its various aspects, the results presented in this paper point to a greater need to account for the long-term efficiency of cohesion policy in the process of *ex ante*, on-going and *ex post* evaluation. This will help answer the question – especially in the context of a comparative regional analysis- if financial resources allocated in an economy generate satisfactory and expected effects *e.g.* for the labour market. It in turn will contribute to the higher quality of programming regional development the significant part of which is evaluation.

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