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IMPACT EVALUATION OF EU FUNDS: EXAMPLES IN INFRASTRUCTURE PROJECTS

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Abstract. Being one of investment areas within EU Cohesion policy the sector of public infrastructure frequently faces the issue of efficiency. This issue largely arises from the lack of theoretical and practical concepts on how the evaluation techniques could achieve rigorous estimations of the investment impact on the current processes in the sector. The present paper seeks to contribute to these discussions by defining crucial problems in developing rigorous estimations relevant to public infrastructure projects and setting the assumptions. The research method is comparative and logical analysis of the theoretical concepts, methods and conclusions, published in scientific literature including policy analysis.

Keywords: cohesion fund, environment, public infrastructure, impact evaluation.

JEL Classification: H54.

ES FONDŲ POVEIKIO VERTINIMAS: INFRASTRUKTŪROS PROJEKTŲ PAVYZDŽIAI

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Santrauka. Viešosios infrastruktūros sektorius, būdamas vienas iš ES sanglaudos politikos investavimo sričių, dažnai susiduria su efektyvumo problema. Ši problema dažniausia kyla iš teorinių koncepcijų ir praktinio aprobavimo stokos – kokius vertinimo metodus taikyti, vertinant investicijų poveikį dabartiniams procesams viešosios infrastruktūros sektoriuje. Šiuo straipsniu siekiama prisidėti prie šių diskusijų, apibrėžiant svarbiausias problemas ir nustatant griežtas prielaidas viešosios infrastruktūros projektų efektyvumo vertinimo metodams taikyti. Tyrimo metodai yra teorinių koncepcijų, paskelbtų mokslinėje literatūroje, vertinimo metodų ir prielaidų lyginamoji ir loginė analizė, įskaitant sanglaudos politikos analizę viešosios infrastruktūros sektoriuje.

Reikšminiai žodžiai: sanglaudos fondas, aplinkos apsauga, viešoji infrastruktūra, poveikio įvertinimas.

1. Introduction

Paweł Samecki, European Commissioner in charge of Regional Policy defined Cohesion policy's goals as follows (2009): to enhance competitiveness and employment at the regional level; to facilitate growth in the lagging areas of the Union; to foster integration across borders. EU Cohesion Fund is one of the EU's regional policy and financial instruments, which aims to bridge between the existing national economic and social disparities. It is meant to fund large-scale infrastructure development activities (projects) in environmental protection and transport sectors.

Being defined as an investment priority the sector of transport infrastructures as well as sector of environmental infrastructure (as part of public infrastructure) frequently faces the issue of efficiency since there is not a single reliable concept of measuring possible impact of interventions in place. The issue of measuring the impact comprises itself in other possible components: impact of what, on what and for whom or in other words if policymakers must decide whether to expand, contract or maintain a program, or simply want to improve it, they need more than accountability information, they need to learn what works and what doesn't, and why. Thus, evaluating the impact of (cohesion) policy does involve a variety of cognitive tasks, with varying degrees of complexity (Martini 2009).

The present paper overlooks the issue of impact evaluation in the field of public investment projects and the goal is to complement ongoing debates on the efficiency of the policy.

2. Overlook of Cohesion Policy

According to Community strategic guidelines on economic, social and territorial cohesion, 2007–2013 the programmes supported by Cohesion policy should seek to target resources on the following three priorities (European Council 2006):

1) improving the attractiveness of Member States, regions and cities by improving accessibility, ensuring adequate quality and level of services, and preserving the environment;
2) encouraging innovation, entrepreneurship and the growth of the knowledge economy by research and innovation;
3) capacities including new information and communication technologies, and creating more and better jobs by attracting more people into employment or entrepreneurial activity, improving adaptability of workers and enterprises and increasing investment in human capital.

Present planning period follows previous programming periods, which are described as successful in making difference to standards of living across European Union (European Commission 2007), not very effective (de la Fuente 2003) and failed to deliver a satisfactory growth performance (Sapir *et al.* 2004). Some researchers note that no evidence is found that the policies adopted are the most appropriate (Boldrin, Canova 2001) and the Cohesion Funds should be terminated with the end of the previous spending cycle (2006) (Boldrin, Canova 2003).

Fig. 1 shows changes in amount of available EU financial resources for implementation of Cohesion policy.

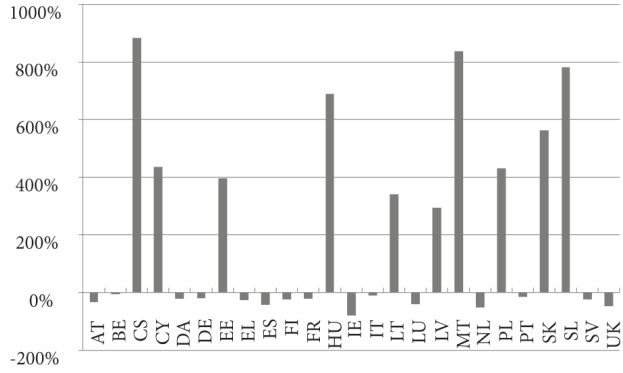

Fig. 1. Changes in amount of funding: 2000–2006 and 2007–2013 financial perspective for EU member states (Source: European Commission 2007)

Financial instruments and initiatives to address economics and social imbalances at Community level did exist since the beginning of European integration but only in 1986 legal foundations introduced by the Single European Act paved the way for an integrated cohesion policy. During the period 1957–1988, the European Social Fund (ESF, since 1958), the European Agricultural Guidance and Guarantee Fund (EAGGF, since 1962), and the European Regional Development Fund (ERDF, since 1975) co-financed projects which had been selected beforehand by Member States. EU Cohesion Fund is one of the EU's regional policy and financial instruments, which aims to bridge between the existing national economic and social disparities. It is meant to fund large-scale infrastructure development activities (projects) in environmental protection and transport sectors.

As summarised by F. Barca in the "An agenda for a reformed Cohesion Policy. A place-based approach to meeting European Union challenges and expectations" widely regarded as Barca Report (2009), the present framework of Cohesion policy for the period 2007–2013 is the result of several changes which have taken place since the far- reaching 1988 reform. One of the substantive changes proposed by Barca Report is the concentration of a significant proportion of cohesion policy funding on a limited number of core priorities (three or four). Although the definition of priority

is different from the definition of programme, it may be assumed that the number of programmes should be linked to the number of priorities. The problem of finding optimal number of priorities and then programmes (and further activities) is linked to the quantification of the targets. Some activities under the programmes will not produce any statistically significant outcome to the Cohesion policy and the results achieved will be hard to evaluate due to the limited scope of such interventions and the insignificant financial allocations to them.

Barca Report proposes six possible core priorities: Innovation and Climate change, with a predominantly efficiency objective; Migration and Children, with a predominantly social inclusion objective of efficiency and social exclusion; Skills and Ageing, where the two objectives are of similar relevance (Barca 2009).

3. Impact of a policy

Cohesion policy's instruments continuously raised the issue of effectiveness of the funding to achieve strategic goals of EU. F. Barca in his report for European Commission stresses that review of existing research, studies, and policy documents undertaken suggests that econometric studies based on macro–data on growth and transfers, while providing specific suggestions, do not offer any conclusive general answer on the effectiveness of the Policy (2009).

According to recent studies, various rounds of cohesion expenditure are not isolated from each other in practice, but represent an unfolding sequence of closely inter–related investment projects (Bradley *et al.* 2009). This is evident when we take into account eligibility rules set for each planning period. For 2000–2006 Cohesion fund projects the final eligibility date is 31 December 2010, but the initial date for eligibility of 2007–2013 planning period generally is 1 January 2007 (dates are set individually per each Member State, e.g. for Latvia 24 October 2006), apparently overlapping is unavoidable. According to de la Fuente the estimation of the impact of Cohesion policies on economic aggregates is not possible if we do not know at what point in time EU grants translate into productive capital (de la Fuente 2009).

As it was previously mentioned the issue of efficiency and apparently lack of rigorous estimations of the impact leads to discussions of policy's necessity and operational validity. While these opinions should be seriously considered the issue which also needs certain attention is finding the possibility to achieve rigorous estimates of policy's impact at least on theoretical level. We can start to solve the issue by assuming that policymakers (either elected or career officials) desire to have an impact on the problems facing their constituency or client base. They also tend to presume that all desirable changes are a consequence of their own policies (Martini 2009). Taking this into consideration we must underline the importance of assumptions used by impact evaluators.

Fig. 2 demonstrates some examples of how the actual result of the policy is being achieved. Since the interventions of EU funds (Cohesions policy's instruments) are meant to have an impact of variety of economic processes the number of actual situations is unlimited.

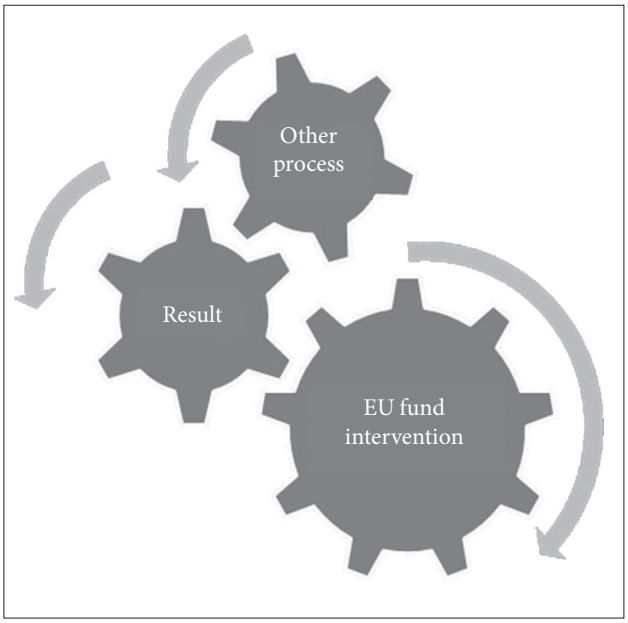

Fig. 2. Linkage between the intervention and the result

Situation A represents the typical view of a policy maker (as discussed above). Situation B highlights the fact that the actual result is co-achieved by some other process (e.g. natural dynamics in the sector). Situation C is different from situation B as the influence of "other process" is opposite for the desirable outcome (result) of the policy and thus the actual performance of the policy is more positive than the estimation of the result in situation A would have proposed. Other interpretation of the situation C could be a real nightmare for a policy maker, since we can assume that "the other process" actually gives the positive outcome, but the intervention of the EU fund slows down this process.

Accepting situation A is the first choice to make a statement in communication with general public (when it comes to investments in public infrastructure) since there is no use making investments if the result would be achieved anyway. This is strong assumption and it could be declined taking into consideration several other assumptions:

1. We could assume that intervention under a policy can be the only source of possible development of certain public infrastructure (the assumption may be tested by analysis of former and actual investment projects). In the survey done by the Commit-

tee of the Regions (2010) for the period January 2009 – November 2009 57% of respondents indicated high or relatively high difficulties in managing current expenses due to lack of local / regional 2009 budget resources compared with 2008, but 39% also indicated high or relatively high trend for delays in execution of ongoing infrastructure projects.

2. We could assume that there is no urgent need of financing the infrastructure; otherwise the project would have been implemented without the policy's financial interventions (if possible due to financial limitations). The assumption may be tested by surveys or by analysing territories or institutions which implemented (or not implemented) the projects in non-policy areas.
3. We could assume that the society generally accepts the second statement (there is no urgent need of financing the infrastructure) and there is no public initiative forcing the government or other public body to invest. The assumption may be tested by surveys.

By applying above mentioned assumptions the estimations of policy's impact may be more fact–based, but still not absolutely precise.

There is no rigorous way to estimate behaviour of the beneficiaries in absence of the policy. For example, in case of a small country the beneficiaries of certain policy may probably be all the companies represented in the sector (or largest part) and there is no possibility to establish a "control group" to estimate this behaviour.

The concept of "Compliers", "Always takers", "Never takers", "Defiers" is quite common in statistics (Cameron, Trivedy 2005) and can be extended to the behaviour of the beneficiaries implementing the projects under Cohesion policy.

Possible types of beneficiaries' behaviour are summarised in the Table 1.

Table 1. Types of behaviour

Type of beneficiary	Behaviour in case of financing availability	Behaviour in case of financing unavailability
Compliers	Implements a project	Does not implement a project
Always takers	Implements a project	Implements a project
Never takers	Does not implement a project	Does not implement a project
Defiers	Does not implement a project	Implements a project

These types of behaviour could be put in a simple binary model (Table 2). A statistical framework for causal inference that has received especially increasing attention is the one based on "potential outcomes", originally introduced by Neyman (1923) for randomized experiments and randomization–based inference, and generalized and extended by Rubin (1974; 1977; 1978) for nonrandomized studies and alternative forms of inference (Frankgakis, Rubin 2002). Practically Rubin causal model is being used: a unit is considered at a particular place and time; treatments are interventions each of which can be potentially applied to each unit; and potential outcomes are all the outcomes that would be observed when each of the treatments would be applied to each of the units. Then, a causal comparison between, say, two treatments is a comparison of the potential outcomes of the same group of units under the two treatment conditions (Frankgakis, Rubin 2002).

The principal strata approach to causal inference for assessing the relative effectiveness is being used widely, e. g. with respect to the employment status of their graduates (Grilli, Mealli 2008) or in a mediation context (Emsley, Dunn, White 2010).

Table 2. Binary model of beneficiaries' behaviour

Type of beneficiary	Behaviour in case of financing availability P_a	Behaviour in case of financing unavailability P_u	Effect of the policy (intervention or intervention series) $E = P_a - P_u$
Compliers	$P_a = 1$	$P_u = 0$	1
Always takers	$P_a = 1$	$P_u = 1$	0
Never takers	$P_a = 0$	$P_u = 0$	0
Defiers	$P_a = 0$	$P_u = 1$	–1

If we assume that the "defiers" do not exist (purely intuitive assumption) projects are implemented either by "compliers" or "always takers". There is no rigorous way to measure the proportion of each category among all beneficiaries.

These several observations mark the actual difficulty to define what worked and how worked when observing the interventions of EU funds in public sector.

4. Public infrastructure: examples in the sector of environment

Within this discussion we must take into consideration what actually public infrastructure is, and the answer is that it primarily depends on the country. For example, in Latvia utilities providing water services mainly belong to

municipalities (local governments) and we can consider investments in such infrastructure as the investments in public infrastructure, the assumption which would not be valid in many other countries. Still, for the purpose of illustration the policy's efficiency estimation problem, this example will be used in this paper.

Analysing investment flow in the sector (Fig. 3) and knowing that investments by using EU funds in the sector started after 2003 (except several EU PHARE projects), we are unable to agree on the assumptions above, so situation A may not be the only situation considered when estimating the efficiency of the policy.

We cannot assume that there is no urgent need of financing the infrastructure or there is no public initiative forcing the government to invest. This additional information raises the question of how the policy is actually achieving its results: by speeding up the natural process (people's expectations for qualitative drinking water and safe wastewater treatment force water utilities to invest) or by substituting the possible investments of water utilities. The answer could be any of these two and situation A still may be valid since due to the recent financial crisis investment possibilities of water utilities and public bodies are limited. It also should be noted that these public interventions are very important for the central government as the projects are targeted to achieve compliance with EU binding legislation (e.g. specific directives).

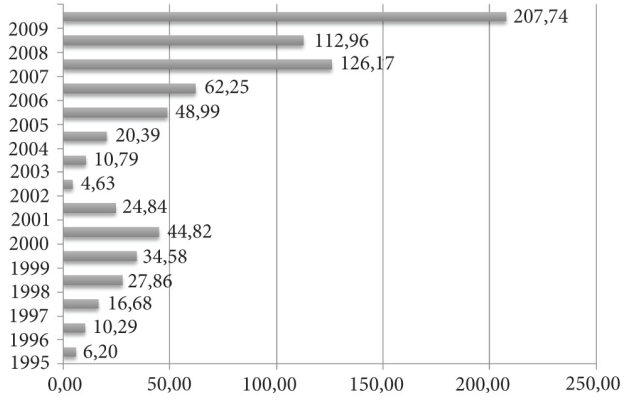

Fig. 3. Investments in development of infrastructure: water sector, Latvia (MEUR[1]) in 2009 (Source: LR Vides ministrija 2009)

In previous sections we discussed theoretical concepts of measuring the impact of the policy. Still we need to obtain information above the accountability data to understand the performance of the policy. Such understanding is crucial for planning further investment cycles and to make possible corrections of the funding programmes.

Accountability information for environmental projects includes length of pipelines, number of waste water treatment plants built, number of agglomerations treated, and number of protected areas included in the project. This information does not allow us to suggest improvements for the policy since there is no linkage between single indicators (e. g. length) and the goal of the policy. If the policy's goal is to change status or progress in any sector additional data should be collected, e.g. for the sector of environment:

1. Change of consumers' behaviour – resource saving measures.
2. Prevention of pollution – quantitative assessments.
3. Improvement of technological processes.
4. Coverage and accessibility of public services.

Indicators depend on the goal of policy – the fields where influence could be the maximum must be identified, i.e., substantial activity will not happen without intervention of EU funds and results are higher comparing with other fields.

Defining the right indicators cannot solve the problems discussed above but still can provide us with much more reliable information on the performance of the policy. That does not mean accountability information should not be collected, it still provides valuable information on the status of the project and may be used testing the cost estimates.

For the purposes of this paper illustration on how these "other" indicators may be applied the research on 88 projects has been performed.

All these projects are implemented under the Cohesion fund financed activity "Development of water management infrastructure in agglomerations with more than 2000 residents", the data on the individual projects has been provided by the Ministry of the Environment of the Republic of Latvia. The objective of the activity is to improve the quality of water distribution and waste water collection and treatment and make these services more accessible, ensuring a living environment of high quality, reducing environmental pollution and eutrophication of water reservoirs and promoting the rational use of water and energy (description in operational programme "Infrastructure and services", CCI: 2007LV161PO002).

Fig. 4 demonstrates the average tariff for water services (drinking water, wastewater treatment) as percentage of household income for these projects.

Analysis of this information may be quite extensive but this is not the purpose of present paper. We can just highlight several conclusions which could be done on the basis of the data:

1. Weighted mean is less than arithmetical mean which lead us to the conclusions that the tariff (as percentage of income) is higher in smaller agglomerations. It should be studied further are there

[1] Since the information is available in Latvian lats, for the purposes of this paper fixed rate has been used (0,702804 LVL/EUR)

any supportive measures in place for less protected categories (e.g. older people).

2. The tariff is growing after the project which is positive in respect of sustainability of water utilities. Still the re–investment possibilities should be further analysed.
3. The decrease of the tariff in year 2015 could be explained by macroeconomic ratios: the growth of income is planned to be higher than the inflation. This is a negative trend for the sustainability of water utilities and must be monitored.

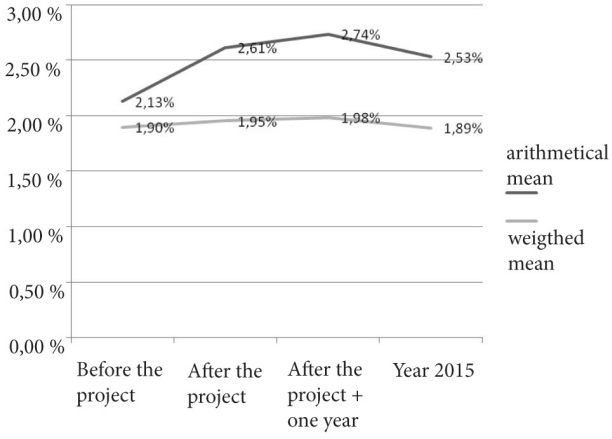

Fig. 4. Estimation of average tariff for water services (drinking water, wastewater treatment) as percentage of household income: Latvia, data on 88 projects

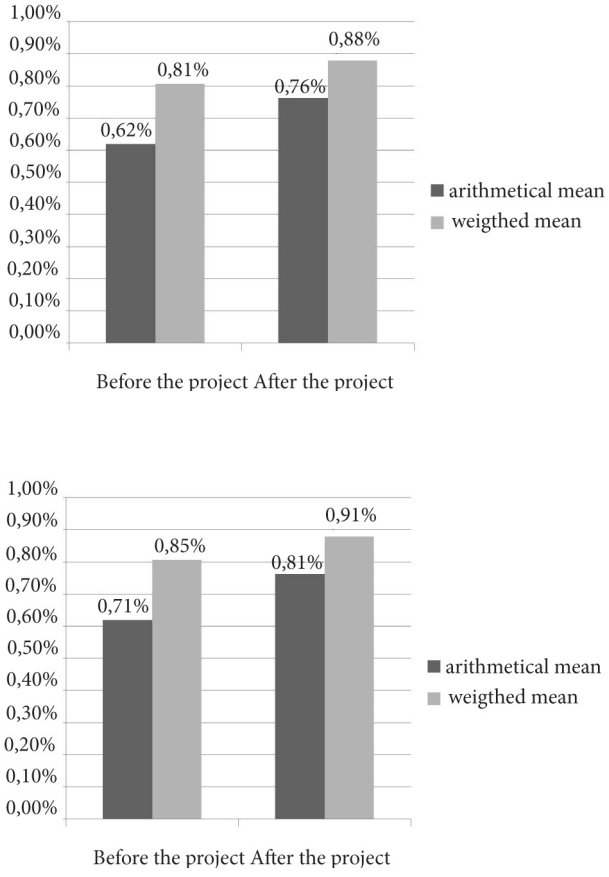

Fig. 5. Estimation of average service availability: Latvia, data on 88 projects (a) coverage of centralised waste water treatment system; (b) access to drinking water)

This example shows that with quite simple set of data the performance of the policy can be analysed in much more reliable way than just mentioning length of pipes. Although many limitations exist when dealing even with such amount of information: time of investment should be considered, initial financial status of utilities should be checked as well as previous investment cycles should be analysed.

Another type of data analysis is presented in Fig. 5. Service availability has been analysed: access to drinking water and coverage of centralised waste water treatment system.

Although the analysis has been performed and possible outcome has been evaluated it is not possible to judge on effectiveness, since there is no defined goal in regard to these indicators.

That also marks the crucial problem in investments into the public infrastructure: the outcome of the programme or policy is always treated like successful or not successful public communication, but in case of not defining the success in the programme documents all such disputes are largely inconsiderable for further planning.

6. Conclusions

Any financial programme linked to the public infrastructure should include the definition of success. The definition may be communicated publicly or not, but in case of its absence all possible evaluations of programme's impacts could not be compared with the targeted (or planned) impacts.

Justification for public financial interventions is not and cannot be a shortage of money – many industries and public initiatives are in a very difficult situation with the availability of financial resources. When proposing additional activities (requesting additional public financing) for any sector, development objectives, potential impact of policy implementation and the targets within achievable impact indicators have to be identified. I strongly believe that the examples shown in this paper may be extended to other types of public interventions, such as construction of municipal kindergartens, schools, cultural objects, etc.

The issue of efficiency is crucial in the area of public spending, e.g. public infrastructure development projects. Selection of indicators in the policy programming stage is crucial to achieve measurable estimates of the policy's planned and actual results.

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