
Impact models and solutions for the management of the efficiency of European funds

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Abstract: *This article brings proposals and models to determine the impact of European funds on rural development. The results of the research allowed the conclusion that these models can constitute a considerable support for the economic development of the rural environment.*

Key Words: *agriculture, rural, strategies, reforms, funding, youth, matrix, models*

JEL Classification: *O00, O10, O13.*

Introduction

This research proposes a model for recording and evaluating the impact of European funds on the socio-economic development of rural areas, based on the social accounting matrix method, which, under certain assumptions, can be used as a general economic balance model, as well as a prerequisite for impact analysis financial intervention in the implementation of policies.

Research methodology

In recent years, several studies have been developed that analyze the impact of public intervention on economies using input-output techniques, where public intervention is considered exogenous within an input-output model and its impact on real variables and prices is verified.

The evaluation models of the impact of European funding on territories, in particular, rural areas, used up to now both in the ex-ante and ex-post evaluation phase have presented significant limitations due to either the excessive generality of the results or an excessive cost of the evaluation system, or the excessive use of evaluation methodologies based on quantitative models that are not very suitable to the counterfactual approach imposed by the recent European indications.

Using the matrix method as a model for determining the impact of public interventions does not differ from this fundamental and typical input-output analysis approach, although it sometimes allows for the "endogenization" of part of the financial intervention activity. The resulting advantages, compared to the traditional use of the simple cross-sectional table, are threefold: the first advantage emphasizes a greater internal consistency of the model than the traditional input-output scheme, the second and third highlight the greater complexity of the model in terms of instruments considered and evaluated effects [1]:

1) the model can be closed in the endogenous part with greater precision in terms of income distribution, which derives from the inclusion of relationships that allow the link functional distribution - sectoral distribution or primary distribution - final distribution, while a model based only on the intersectoral table has a single relationship between domestic consumption and GDP of the territory or some of its components, by which the transition from domestic income to national income can be achieved, distributed among the various institutional sectors that then use them to make consumption investments, real or financial ;

2) the model makes it possible to analyze the effects of rural policies by placing the transfer carrier on the output side, alongside the usual bearer of the public share both in the current account and in the capital account, and identifying the impact on the rural economy, on the public debt, so that vectors of current account and capital transfers "from" and "to" be the beneficiaries of funding (in particular, PA, NGO, SME), thus allowing the specific consideration of all interventions and benefits, which previously they were excluded from the input-output approach;

3) the type of results offered by the model are attributable to a vector composed of four blocks: the first refers to the activation of internal production, the second refers to the creation and distribution to the factors of GDP, the third to the sectoral distribution of total incomes transiting in the framework of the economic system in question, and the fourth - to the impulses "broadcast" in the rest.

The matrix is structured in such a way that it is divided into two parts, one defined as endogenous and the other exogenous, when the level of production and income depend, on the one hand, on the impulses induced by the exogenous part, and, on the other hand, on the characteristics "structural" of the endogenous part.

$$\text{Endogenous part } Xn = AnXn + Yn \rightarrow Xn = (I - An)^{-1} \cdot Yn$$

$$\text{Exogenous part } Xl = AlXn + Yn \rightarrow Xl = Al \cdot (I - An)^{-1} \cdot Yn$$

This construction of the matrix is based on the input-output (or resources-uses) technique, developed in the economic literature. The model allows the integration of economic indicators with demographic and social statistics, depending on the goals and the possibility of obtaining related information. The new approach from the theory of economic growth (New Growth Theory) believes that progress is generated endogenously through development activities, GDP being the most appropriate measure of economic development at county level (NUTS3 level), and investments from European funds

reflected in the indicator foreign direct investments as the best information available at the county level, representing the endogenous variables (Tab.1).

Table 1. Model variables

Variables Description	Variables Description
Regional GDP Gross Domestic Product at regional level, rural area (RON)	Regional GDP Gross Domestic Product at regional level, rural area (RON)
GDP Gross Domestic Product at county level, rural area (RON)	GDP Gross Domestic Product at county level, rural area (RON)
Capital - K Foreign direct investments at county level, rural area (RON)	Capital - K Foreign direct investments at county level, rural area (RON)
Work - L Population employed in the county economy, rural area (people)	Work - L Population employed in the county economy, rural area (people)
Research and development - R Research and development expenses of the county, rural area (RON)	Research and development - R Research and development expenses of the county, rural area (RON)

Source: [2]

Within the proposed model, two aspects can be noted:

- in the balance sheet of the outputs that pass through the economic circuit, the variables are classified, using the information from the Intersectoral Economic Table, according to their sectoral origin (fields, branches), as well as territorial (urban-rural, by localities), production distribution and of income is divided into 3 logical phases that make it up: from the functional distribution to the primary factors of production and typical of the input-output table, to the owned sectors of the factors, modified to take into account all the transfers that take place between sectors (Tab. 2 and 3);
- factor incomes, functional distribution and wage incomes are distinct because different policies operate on them.

Table 2. Model 1 input-output table at county level

Product	Domain (sector) of economic activity				Total production at basic prices per product	Total resources at basic prices	Output per product at purchase price
1							
2							
...							
m							
Total production per field at basic prices							

Table 3. Model 2 input-output table at county level

Domain (sector) of economic activity	Domain (sector) of economic activity				Total intermediate uses by branch	Final uses at basic prices			Total uses
1									
2	cross-sector transactions					end uses			
...									
m									
Value added to base prices per branch	Primary input								
Total output (production by domain at basic prices)	resources								

Source: Elaborated based on [3]

The assumptions of the model can be formulated as follows:

- all predicted relationships are linear: they are based on assumptions of fixed technical coefficients, idle production capacity and constant returns to scale, as well as average rather than marginal slopes;
- reports allow only comparative static analyses;
- prices are considered constant;
- there are problems of arbitrariness in the identification of exogenous versus endogenous elements and of the sensitivity of the results.

Thus, the high degree of disaggregation makes possible analyzes capable of improving the understanding of economic phenomena in the rural area and providing clear indications for rural policies, oriented towards endogenous growth approaches, the theory of endogenous growth being understood as a self-sustaining phenomenon through the accumulation of important factors: physical, technological, human and public capital, when investments represent the fundamental determinant of economic growth, identified in the neoclassical and endogenous growth models, with transitory impact or permanent effects respectively [2].

The standard model for assessing endogenous growth may take the form:

$$PIB_i = AK_i^\alpha L_i^\beta R_i^\delta$$

where: GDP represents output (Y), α and β are the elasticities of production with respect to capital K and labor L ($\alpha, \beta > 0$), A is constant, and R reflects endogenous progress.

The analysis of the data obtained using the given model, in the end, would allow the grouping of the rural localities in the county according to the index of the value of financing from European funds as the ratio between the value of the financing and the increase of the global product at the county (rural) level, determined by this funding. However, the application of the model requires transparency on the part of the Rural Project Management Authority in providing data on expenditure and resource use and maintaining a system of up-to-date and comprehensive cross-sectoral tables of the economy at the regional and local levels. Because currently these conditions are not ensured and the integral model is not applicable in practice, partial applications can be useful, even if they do not have predictive value providing an additional view on the studied phenomenon.

Human capital plays an important role in the local-rural economy. At the matrix level, human capital is an endogenous indicator and is used to determine the level of development or explain economic growth [4]. The increased interest in investing in human capital is also a concern of the OECD, for economic growth through projects specific to the educational field. In the end, those who benefit from the development of human capital are public and private society [4].

The technical infrastructure represents the support for the development of any activities undertaken by the inhabitants of the rural area. Due to the poor state of local roads, and because the measures focus

on collaboration - communication - information transfer, between raw and finished materials - between locations located at variable distances, local administrations must be interested in its improvement. Policies in the field must be correlated with: policies regarding the environment, poverty alleviation, infrastructure, education and health, defense, etc., with those regarding the provision of basic services of general interest.

Conclusions

The model for recording and evaluating the impact of European funds on the social-economic development of rural areas proposed, is based on the social accounting matrix method, which, under certain assumptions, can be used as a general economic balance model, as well as a prerequisite for impact analysis financial intervention in the implementation of policies.

The proposed models allow the selection, implementation, monitoring and evaluation of individual projects in accordance with the priorities and objectives agreed between the European Commission and the national or regional management authorities.

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