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INFLUENCE OF BUDGETARY INSTRUMENTS ON INDICATORS OF REGIONAL DEVELOPMENT

Abstract. One of the current problems of using budget instruments of support and stimulation of regional development is their low efficiency, which requires the improvement of existing ones and introduction of other, more rational ones. The purpose of the article is to determine the impact of current budget instrument on indicators of regional development, with the help of economic and mathematical modeling, in order to determine their effectiveness and to provide recommendations for introduction of more effective instruments of support and stimulation of regional development. The article shows the influence of budget instruments on such indicators of regional development as capital investment at the expense of own funds of enterprises and organizations, the unemployed population, the volume of industrial production (goods, services) that have been sold, the volume of construction works. The results of the modelling have shown that the main influence on the exemined indicators of regional development is made by capital investment using the state budget, in particular, on increasing the volume of construction works, the volume of industrial production sold and the volume of capital investments at the expense of enterprises and organizations' own funds, which is related to the direction of such state investments, namely infrastructure projects. Nevertheless, capital investment at the expense of local fundsbudgets have only a small effect on the growth of capital investment using their own funds of enterprises and organizations.The insignificant influence of the studied budget instruments on indicators of regional developmentis proved, which refers to their low efficiency, and highlights the need to improve the budget instruments of support for regional development and focus on the fiscal stimulation instruments for the effective use of the internal resource of the regions (using the grandees by communities and attracting investment in development of the territory). Recommendations for increasing the efficiency of the use of such a budget instrument as the State Fund for Regional Development are given.

Keywords: budget instruments, regional development, modeling, SFRD, capital investment, grants.

JEL Classification H54, H72, R11, R15

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ВПЛИВ БЮДЖЕТНИХ ІНСТРУМЕНТІВ
НА ПОКАЗНИКИ РЕГІОНАЛЬНОГО РОЗВИТКУ

Анотація. Однією із сучасних проблем застосування бюджетних інструментів підтримки та стимулювання регіонального розвитку є їхня низька ефективність, що зумовлює потребу в удосконаленні наявних і запровадженні інших, більш раціональних. Метою статті є визначення за допомогою економіко-математичного моделювання впливу нині застосованих бюджетних інструментів на показники регіонального розвитку для визначення їхньої ефективності та надання рекомендацій щодо запровадження більш ефективних інструментів підтримки і стимулювання регіонального розвитку. Визначено вплив бюджетних інструментів на такі показники регіонального розвитку, як капітальні інвестиції за рахунок власних коштів підприємств та організацій, безробітне населення, обсяг реалізованої промислової продукції (товарів, послуг), обсяг виконаних будівельних робіт. Результати моделювання продемонстрували, що основний вплив на досліджувані показники регіонального розвитку справляють саме капітальні інвестиції за рахунок коштів державного бюджету, зокрема на збільшення обсягу будівельних робіт, обсягу реалізованої промислової продукції та обсягу капітальних інвестицій за рахунок власних коштів підприємств та організацій, що пов'язано з напрямом спрямування таких державних інвестицій, а саме інфраструктурні проекти. Натомість капітальні інвестиції за рахунок коштів місцевих бюджетів мають лише незначний вплив на зростання обсягу капітальних інвестицій за рахунок власних коштів підприємств та організацій. Доведено незначний вплив досліджуваних бюджетних інструментів на показники регіонального розвитку, що вказує на їхню низьку ефективність і говорять про необхідність вдосконалення бюджетних інструментів підтримки регіонального розвитку та концентрації уваги на інструментах бюджетного стимулювання ефективного використання внутрішнього ресурсу регіонів (використання громадами грандів і залучення інвестицій до розвитку території). Надано рекомендації щодо підвищення ефективності застосування такого бюджетного інструменту, як державний фонд регіонального розвитку.

Ключові слова: бюджетні інструменти, регіональний розвиток, моделювання, ДФРР, капітальні інвестиції, гранти.

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ВЛИЯНИЕ БЮДЖЕТНЫХ ИНСТРУМЕНТОВ НА ПОКАЗАТЕЛИ РЕГИОНАЛЬНОГО РАЗВИТИЯ

Аннотация. Определено влияние бюджетных инструментов на такие показатели регионального развития, как капитальные инвестиции за счет собственных средств предприятий и организаций, безработное население, объём реализованной промышленной продукции (товаров, услуг), объём выполненных строительных работ, с целью определения их эффективности. Результаты исследования демонстрируют незначительное влияние исследуемых бюджетных инструментов на показатели регионального развития, что указывает на их низкую эффективность и говорит о необходимости совершенствования бюджетных инструментов поддержки регионального развития и концентрации внимания на инструментах бюджетного стимулирования эффективного использования внутреннего ресурса регионов (использование общинами грандов и привлечения инвестиций в развитие территории). Даны рекомендации по повышению эффективности применения такого бюджетного инструмента, как государственный фонд регионального развития.

Ключевые слова: бюджетные инструменты, региональное развитие, моделирование, ГФРР, капитальные инвестиции, гранты.

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Introduction. At the current stage of development of the Ukrainian economy, one of the main tasks of functioning of the state is to stimulate the development of the regions, since the general condition of the country`s economy depends on the degree of growth of their social and economic indicators. The state has a large number of instruments for supporting and stimulating regional development, including budget ones. These days, a significant amount of budget support instruments and incentives for regional development are used in Ukraine, of which budget allocation, subsidies subventions, loans, creation of funds in the budget for financing regional development program, investments projects and others. But the use of budgetary tools should be justified, taking into account the peculiarities of the stage of the development of the country, the peculiarities of the development of the regions, economic and social factors. Moreover, it has to be consistent with the economic development strategy and also agreed with each other and the priorities, which were adopted at the legislative and governmental levels that create an opportunity to intensify investment processes in all areas of the economy and counterbalance regional disparities.

One of the modern problems of using budget support instruments and stimulating regional development is their low efficiency, which necessitates the improvement of existing ones and introduction of other, more rational ones. In particular, the new requirements for the financial support of regional development, namely the rejection of paternalism and the transition if regions and communities to self-sufficiency through the search for resources on the ground, the disclosure and effective use of internal potential, which also lead to a change in approaches to the selection and formation of financial support instruments for regional development.

Analysis of researches and problem formulation. Problems of regional development, are considered in the writings of such national scholars as Z. S. Varnalius [1], S. A. Romanyuk [2], H. V. Vozniak [3], simulation of regional development in the works of S. M. Romashko, I. Z. Savras, R. G. Selivistrota, R.V. Yurintsa [4], the research of grant mechanisms of the distribution of funds devoted to the work B. M. Danylyshyn, V. V. Pilipiv [5]. Among the foreign scholars who paid attention to this problem, one can distinguish the works of R. J. Barro [6], D. J. Savoy, and B. H. Higgins [7], R. A. Musgrave [8]. However, despite a large number of studies in this area, the issue of the effective use of budget support instruments and stimulation of regional development, in particular, the effective use of investment transfers, the determination of the impact of these instruments on regional development indicators and the development of new mechanisms for funding local initiatives remain unresolved.

The purpose of the article is to determine the impact of existing budget tools on regional development indicators by means of economic and mathematical modeling, in order to determine their effectiveness and to provide recommendations for the implementation of more effective instruments for supporting and stimulating regional development.

Results of the research. In recent years, legislation on regional development has been substantially improved in Ukraine, a number of regulatory and legal acts on regional development strategies, medium-term budget planning, development and implementation of new budget support instruments and incentives for regional development (SFRD, subventions from the state budget to local budgets have been developed and adopted according to social and economic development of separate territories and on the formation of the infrastructure of the united communities). Decentralization and financial reform are carried out.

But, at the same time, there is currently no public investment program in Ukraine (a list of priority projects including the medium-term budgetary perspective) and a multi-year strategy for investments at the national and local levels. Today, funding for the strategic development of regions in Ukraine is absent or exists in a very fragmented form in selected cities (in the most financially self-sufficient regions).

The importance for optimization and proper use of public investment makes it necessary to improve coordination and synergy between investments that are made at the expense of different sources of funding by all participants in the development process, namely, by the state, regional and local authorities in a certain territory. This can be considered as a define form of planning or coordination of regional development [9, p. 31].

As practice shows, most of the public expenditures at the local level in Ukraine are current and often "extraordinary". As a rule, only "protected" items of expenses are funded on time or with a little delay. Capital projects are carried out only in the area of construction or repair of socially important objects, such as communal infrastructure, schools, hospitals and etc. Most measures under regional agreements of investment subventions are aimed at developing basic infrastructure and "locking holes" in financing current expenditures. Almost nothing is about projects aimed at the perspective, development measures that would have an impact on the changes in the structure of the economy, its productivity, labor intensity, as well as the structure of employment or income from active economic activity [9, p. 15].

Taking into account the above-mentioned, the question of determining the impact of budgetary instruments on regional development indicators, and in particular their effectiveness, is actualized.

Among the indicators of regional development, which mostly demonstrate the development of a specific region, the following can be distinguished: capital investments at the expense of own funds of enterprises and organizations, the unemployed population, the volume of sold industrial products (goods, services), the volume of construction work performed.

Unfortunately, it is impossible to determine the direct impact of such budget tools as subventions from the state budget to local budgets for the implementation of investment projects, implementation of measures for the social and economic development of certain territories and the formation of the infrastructure of the united communities and the funds of the SFRD for regional development due to the absence of continuous available data on budgetary tool over a significant

period of time, for at least 3 years. Therefore, data of capital investments from state and local budgets was used to determine the impact.

Econometric toolkit was used to determine the impact of the above instruments on regional development indicators.

As a result of the investigation of the impact of capital investment from the state and local budgets on the main indicators of regional development, 4 panel models with fixed effects were estimated:

$$y_{it} = \alpha_i + \beta_1 x_{1it} + \cdots + \beta_k x_{kit} + \varepsilon_{it},$$

where y_{it} – dependent variable;

x_{it} – k-measurable vector of independent variables;

ε_{it} – perturbations that are independent and equally distributed random variables in the model N of objects of observation ($i = \overline{1,N}$) and T ($t = \overline{1,T}$) of time periods;

β_k – model parameters.

Coefficients for x are the same for each observation unit during T periods, the average levels are different. Consequently, α_i reflects individual effects for the identical unit of observation and is constant over the time period [10].

При побудові моделей використано такі позначення:

Cap_inv_gov_budget – capital investment at the expense of the state budget, thousand. UAH;

Cap_inv_loc_budget – capital investment at the expense of local budgets, thousand UAH;

Private_enterpr_cap_inv – capital investment at the expense of own funds of enterprises and organizations, thousand. UAH;

Unemployment – unemployed population, thousand people;

Volume_of_ind_prod – volume of sold industrial products (goods and services), thousand. UAH;

Construction – volume of executed construction works, thousand. UAH

$\alpha_{1i}, \alpha_{2i}, \alpha_{3i}, \alpha_{4i}, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ – model parameters;

$\varepsilon_{1t}, \varepsilon_{2t}, \varepsilon_{3t}, \varepsilon_{4t}$ – perturbation in models.

The Eviews 9 software package was used to evaluate the models. The results of the models are presented in tables 1-4.

Capital investment at the expense of own funds of enterprises and organizations is influenced by capital investments at the expense of both state and local budgets, represented by the following interconnection (Model 1):

$$ln(Private\_enterpr\_cap\_inv_{it}) = \alpha_{1i} + \beta_1 \cdot ln(Cap\_inv\_gov\_budget_{it}(-4)) +$$
$$+ \beta_2 \cdot ln(Cap\_inv\_loc\_budget_{it}(-3)) + \varepsilon_{1t} \quad (1)$$

At the same time, it should be noted that the impact of capital investments at the expense of the state budget is carried out with the lag 4, capital investments at the expense of local budgets - with the lag. 3. The results of the assessment of model 1 are presented in Table 1.

Table 1.

Evaluation of model parameters 1

Variables	Coefficients	t-Statistic	Prob t-Statistic
Dependent variable *ln(Private_enterpr_cap_inv_{it})*			
Constant	526404,28	5,29	0,0000
ln(Cap_inv_gov_budget_{it}(-4))	3,07	2,03	0,0426
ln(Cap_inv_loc_budget_{it}(-3))	1,50	2,63	0,0088
R^2 = 0,19; F-statistic = 3,04 [0,0000]			

Source: calculated by the authors themselves.

Model 2 reflects the impact of capital investment at the expense of state and local budgets on unemployment and has the following form:

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$$ln(Unemployment_{it}) = \alpha_{2i}+\beta_3 \cdot ln(Cap\_inv\_gov\_budget_{it}(-4)) +$$
$$+\beta_4 \cdot ln(Cap\_inv\_loc\_budget_{it}(-4))+\varepsilon_{2t} \qquad (2)$$

In this case, the impact of capital investment at the expense of the state budget on unemployment is carried out with lag 4, capital investment at the expense of local budgets, also with the lag 4. The results of the assessment of model 2 are presented in Table 2.

Table 2.

Evaluation of model parameters 2

Variables	Coefficients	t-Statistic	Prob t-Statistic
Dependent variable $ln(Unemployment_{it})$			
Constant	-0,63	-0,22	0,8253
$ln(Cap\_inv\_gov\_budget_{it}(-4))$	-0,00004	-2,17	0,0304
$ln(Cap\_inv\_loc\_budget_{it}(-4))$	0,0001	3,02	0,0027
$R^2 = 0{,}28$; F-statistic = 5,22 [0,0000]			

Source: calculated by the authors themselves.

According to the results of the study, the volume of realized industrial products (goods and services) is influenced only by capital investments at the expense of the state budget (Model 3):

$$ln(Volume\_of\_ind\_prod_{it})=\alpha_{3i} + \beta_5 \cdot ln(Cap\_inv\_gov\_budget_{it}(-5))+\varepsilon_{3t} \qquad (3)$$

Moreover, capital investment at the expense of the state budget affects the volume of industrial products sold only with lag 5. The results of the evaluation of this model are reflected in Table 3.

Table 3

Evaluation of model parameters 3

Variables	Coefficients	t-Statistic	Prob t-Statistic
Dependent variable $ln(Volume\_of\_ind\_prod_{it})$			
Constant	5851708,33	18,81	0,0000
$ln(Cap\_inv\_gov\_budget_{it}(-5))$	2,39	27,32	0,0005
$R^2 = 0{,}21$; F-statistic = 3,36 [0,0000]			

Source: calculated by the authors themselves.

However, the volume of executed construction work is conditioned only by the impact of capital investments at the expense of the state budget with a lag of four quarters (the evaluation results are presented in Table 4). Capital investment at the expense of local budgets in the simulation process was insignificant. The final specification of the model is as follows:

$$ln(Construction_{it})= \alpha_{4i} + \beta_6 \cdot ln(Cap\_inv\_gov\_budget_{it}(-4))+\varepsilon_{4t} \qquad (4)$$

Table 4

Evaluation of model parameters 4

Variables	Coefficients	t-Statistic	Prob t-Statistic
Dependent variable $ln(Construction_{it})$			
Constant	198769,61	7,69	0,0000
$ln(Cap\_inv\_gov\_budget_{it}(-4))$	2,96	2,81	0,0052
$R^2 = 0{,}36$; F-statistic = 8,01 [0,0000]			

Source: calculated by the authors themselves..

We should note that the coefficients of models 1-4 are significant, and the models themselves are adequate. In order to take into account the possible heteroscedasticity of perturbations, the covariance matrix of White was used in the models.

The constructed models showed a small impact of capital investments from state and local budgets on the development of regions in Ukraine. This is indicated by the low values of the determination coefficients in the models. At the same time, capital investments from state and local

budgets are significant in all models (all independent variables in models are lagvariables). In most models, the impact of investments on the development of regions comes with a time lag 4.

Commenting on the results of the simulation, we note that as a result of the growth of state capital investment by 1%, the volume of construction works increases by 2.96% with a lag in 4 quarters.

As a result of the growth of state capital investment by 1%, the volume of industrial products sold is growing by 2.39% with a lag of 5 quarters.

It should be noted that only capital investment at the expense of the state budget with lag 5 and 4respectively, is influenced by the volume of industrial production sold and the volume of construction works performed.

Changing state capital investment and capital investment at the expense of local budgets almost does not affect the unemployment.

An increase of 1% in state capital investment leads to an increase in capital investment at the expense of enterprises and organizations' own funds by 3.1% with a lag in 4 quarters. At the same time, the growth of capital investments at the expense of local budgets by 1% leads to an increase in capital investment at the expense of enterprises and organizations' own funds by 1.5% with the lag. 3.

Summing up the results of the simulation, it can be noted that almost the main impact on the studied indicators of regional development is made by capital investments at the expense of the state budget, in particular, on increasing the volume of construction works, the volume of industrial production sold and the volume of capital investments at the expense of own funds of enterprises and organizations which is related to the objective of directing such public investments, namely, infrastructure projects.Instead, capital investments at the expense of local budgets have only a small effect on the growth of capital investment at the expense of their own funds from enterprises and organizations.

The disadvantage is that capital investments at the expense of both state and local budgets do not affect the level of unemployment, namely, the creation of new jobs.

Thus, today one can speak of the low efficiency of existing budget instruments supporting regional development in Ukraine, which is related both to the poor quality of planning and use of funds, to the "blurring" of the target priorities, and to the lack of complicity of the recipients of these funds in co-financing regional development projects. Nowadays, it is likely to develop the practice of co-financing regional development projects for specific purposes from the SFRD and regional budgets. However, this cooperation requires a clear and transparent process of resource allocation, and a competitive selection of financing projects without the use of corruption mechanisms. At the level of central authorities, more attention should be paid to increasing funding and reorganizing the SFRD in line with EU standards. Targeted development programs for certain areas of public services with the participation of the SFRD and local authorities allow the implementation of budget-oriented projects that are not able to finance local governments themselves. In particular, it would be better to monitor and evaluate existing regional development programs in order to coordinate their activities with the priorities set in the regional development strategies up to 2020, the State Strategy for Regional Development for the period up to 2020, the possibilities of attracting funds from the SFRD for their implementation. Moreover, to enhance a network of regional development agencies and integrate them into the preparation and implementation of regional development programs and projects.

In addition to that, considering the lengthy selection process for projects funded by the SFRD, there are problems with their timely implementation (funds arrive at the end of the year). Therefore, it is likely to reorient this budget instrument to finance medium-term projects with a significant amount of funding, and short-term measures with a small amount of funding to be placed on local budgets and other budget tools such as subventions from the state budget to local budgets for implementing investment projects, the economic development of certain territories and the formation of the infrastructure of the united communities. It should also be noted that the availability of such a number of budget instruments that aimed at supporting the social and economic development of the regions of the country requires clear criteria for selecting projects and

measures for financing through the appropriate instrument, their co-ordination, medium-term planning to prevent deconcentrating and ineffective use of budget funds.

Today, the transition from paternalistic budget financing to the development of regions on the principle of "macro-qualities" is considered relevant which is actively used in the EU countries, - the dependence of payments of structural funds on compliance with national governments of macroeconomic indicators guarantee the stability of the economy. In the regional development of Ukraine, this can be used to finance territorial development in terms of socioeconomic outcomes or adherence to objective targets. It is feasible to apply such financing principles while implementing measures or projects at the expense of the SFRD. In particular, the amount of funding distributed by the regions with the SFRR is tied to the effectiveness of the implementation of previous projects in the regions funded by the SFRD.

To stimulate and intensify the initiative of local authorities, it is expedient to gradually increase of the share of co-financing from local budgets of regional development projects, which are realized at the expense of the SFRD, from 10 to 20%, which corresponds to the model of co-financing of the EU countries.

It is also promising to stimulate the use of grants by communities and attract investments to the development of the territory.

Advantages of attracting grants are not only their target direction on certain projects of community development, but also their educational orientation, which provides skills for the basics of project management, strategic planning, financial reporting, etc. A project-based approach to financing can stimulate local authorities to create grant applications, as it is a long process of lobbying and decentralization. Foreign donor funds provide grants not to community activities in general, but to specific projects (for example, landscaping, insulation, etc.) with a specific time period for its implementation and the provision of relevant financial statements.

In addition, the benefits of grant projects are that they often require co-financing (that is 20-30% of the community's funds that should be financed on their own or attract additional investors), aimed at sustainable project results (which will continue in the future), aimed at bringing together the efforts of the inhabitants for the common development of the community, as well as the resource which is most often provided in the form of equipment purchases and construction of infrastructure objects, rather than monetary form. This causes a different look at the development of territories. The study of the "best practices" of neighbors, perspective and innovative ways of obtaining resources and skills minimizes the corruption component and promotes self-organization, raising the level of human and social capital of communities.

Thus, improving or introducing new budget support instruments and encouraging regional development under conditions of financial decentralization, the following principles should be taken into account: co-ownership of state and local authorities in financing regional development; stimulating the nature of the tools used; target direction; the effectiveness of the tools; and community responsibility for using the resources received.

Conclusions. The econometric simulation made it possible to determine the impact of certain budget tools on indicators of regional development. The results of the investigation show the insignificant influence of the studied budgetary tools on indicators of regional development, pointing to their low efficiency. There is a need to improve the budget support instruments for regional development and focus on the tools for fiscal stimulation of the effective use of the internal resource of the regions (using communities of grants and attracting investments to the development of the territory). These days, it is advisable to develop the practice of co-financing regional development projects for specific purposes from the SFRD and regional budgets. To stimulate and intensify the initiative of local authorities, it is expedient to gradually increase the share of co-financing from local budgets of regional development projects, which are realized at the expense of the SFRD, from 10 to 20%, which corresponds to the model of co-financing of the EU countries.

In subsequent studies, the authors plan to assess the impact of other budget instruments, in particular investment subventions, SFRD funds on regional development indicators, and consider the possibility of amending the regulatory framework to improve the functioning of the SFRD.

Література

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