AN ECONOMIC MODEL TO ASSESS THE EFFECTIVENESS OF ECONOMIC COOPERATION BETWEEN UKRAINE AND INTERNATIONAL NON-GOVERNMENT ORGANIZATION

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ABSTRACT

This study aims to develop an econometric model for assessing the effectiveness of economic international cooperation between Ukraine and international non-governmental organizations. Based on the cognitive modeling method, the key indicators of the model influencing the socio-economic development of Ukraine were determined. With the cognitive map's help, qualitative characteristics have been identified and argued regarding links between the socio-economic indicators of the country's development and the amount of funding attracted from foreign non-governmental organizations. The direction of influence between the indicators of socio-economic development and the volume of investment was determined using economic laws and expert assessments with the involvement of 35 professional experts. The scenario analysis made it possible to analyze the changes in the country's socio-economic development due to changes in the size and structure of investment funds received from international non-governmental organizations. It has been established that international non-governmental organizations' participation in ensuring the socio-economic development of Ukraine can have both positive and negative effects. The results obtained can be useful for local governments and business entities when developing an effective strategy for interaction with international organizations and constant monitoring of the effectiveness of the use of investment funds.

Keywords: Ukraine, international non-governmental organizations, investments, socio-economic development, economy, efficiency.

INTRODUCTION

The beginning of the new millennium has been marked by the active development of globalization processes and the strengthening of the role of civil society institutions in the world arena, a key place among which belongs to non-governmental organizations (NGO) (Latif & Williams, 2017; Rigolon & Gibson,

2021; Harangozó & Zilahy, 2015). NGOs' activation and influence on world politics has been facilitated by their participation in a series of international conferences in the first half of the last decade. They significantly squeezed out such traditional actors as states, international government organizations, and transnational corporations (Latif & Williams, 2017). Following the United Nations (UN) (United Nations, 1992), NGOs' primary goal was to protect the environment and ensure sustainable development of developed and developing countries. Today, NGOs are involved in all spheres of international relations. However, most often they focus their attention on the problems of protecting human rights (28.50%), education (12.69%), social (12.15%), and economic problems (6.13%) (International Monetary Fund, 2020a; The World Bank, 2021).

NGOs especially actively cooperate with developing countries in various areas to positively impact their socio-economic development (Osiobe, Osiobe & Olushol, 2019). Financial assistance in the form of investments from international NGOs in modern conditions often acts as a fundamental driver of developing countries' socio-economic development (Osiobe, Osiobe & Olushol, 2019; Dzhumashev & Hailemariam, 2021; Gnangnon & Brun, 2018; Onegina et al., 2020). In Ukraine, every year since 2014 there has been a rapid decline in all socio-economic indicators due to the deep crisis in the economy and the banking sector (International Monetary Fund, 2020a; The World Bank, 2021). The current situation has been significantly aggravated by the consequences of introducing forced active quarantine measures in connection with the spread of the COVID-19 pandemic (Megits, Neskorodieva & Schuster, 2020). As of the end of 2019, the country's unemployment rate rose to 9%, which in turn provoked an increase in the level of informal employment to 30%, with a low level of social protection of the population; in the third quarter of 2020, the unemployment rate increased to 9.4% (Organization for Economic Co-operation and Development, 2020). Inflation could be expected to exceed the level of 5% in 2021 (National Bank of Ukraine, 2020), and as a result, Ukraine's GDP decreased by 6% at the

end of 2020. According to preliminary IMF estimates, in the stratified condition for mitigating the effects of the crisis and economic recovery in the post-crisis period, the country must expand international economic cooperation, which is currently one of the fundamental factors in ensuring the sustainability of the national economy (International Monetary Fund, 2020b). In this regard, the expansion of economic cooperation with numerous national and international non-governmental organizations has become a logical reflection of the existing problems in Ukraine against the background of a lack of financial resources. During their operation, NGOs have offered a wide range of services and developed and implemented various development projects. The largest projects are related to the development of infrastructure and the development of reforms, decentralization, the social security system, the improvement of the work of local governments, etc. (Uryadov portal, 2021a)

At the end of 2017, 507 international technical assistance projects have been implemented in Ukraine, with a total value of 5.5 billion US dollars (Ministry of Economic Development and Trade of Ukraine, 2019). In 2018, 618 projects for 6.6 billion US dollars (Ministry of Economic Development and Trade of Ukraine, 2019). In 2019, 581 projects for 6.5 billion US dollars (Uryadov portal, 2021b). As of 01/06/2021, 259 active projects of international assistance to Ukraine were registered for a total of US $ 3.5 billion (Uryadov portal, 2021c). During 2021-2022, the priority must be to find funds to finance infrastructure facilities, such as airports, seaports, railways, and highways. A law on state support for investment projects to increase the efficiency of cooperation with non-governmental organizations and improve the investment climate is expected (President of Ukraine, 2020). However, due to the unpredictability of decisions of state authorities about objects of financing from funds of NGOs (Korotin et al., 2019), the disproportionate structure and volumes of distribution of investment funds (Korotin et al., 2019), the scale of the volumes of socio-economic challenges of the Ukrainian society (Reverchuk, Skomorovych & Sauers, 2016;

Korotin et al., 2019) and many other problems significantly reduce the effectiveness of cooperation and interaction between Ukraine and NGOs. Consequently, the image of Ukraine as a reliable international partner and the investment attractiveness of the country is deteriorating. In this regard, the question is raised of searching for optimal economic cooperation models and assessing the effectiveness of their interaction, based on a reliable assessment of the potential investment opportunities of NGOs and socio-economic needs of Ukraine at the present stage of its development. Our study was aimed at substantiating the indicators and the peculiarities of the use of investment funds by Ukraine in the framework of international cooperation with international non-governmental organizations, using the example of the Decentralization Offering Better Results and Efficiency (DOBRE) projects (DOBRE, 2021), U-LEAD (funded by the European Union) (U-LEAD, 2021), Konrad Adenauer Foundation (Germany) (Konrad Adenauer Foundation, 2020), International Technical Assistance (ITA) (Uryadovy Portal, 2021a).

LITERATURE REVIEW

The study of the evolution of views regarding the assessment of the effectiveness of cooperation between countries with an emerging market and NGOs regarding the qualitative and quantitative aspects of the impact on their socio-economic development in the scientific literature has a controversial basis for the views of scientists. The conceptual approaches that have been presented in modern literature have indicated several directions of scientific research.

The first group of scholars is supporters of the positive impact of aid on an emerging market country's economic development. (Dzhumashev & Hailemariam, 2021; Gnangnon & Brun, 2018; Maruta, Banerjee & Cavoli, 2020). The largest group of researchers, based on empirical studies, notes only a positive relationship between financial assistance from international non-governmental organizations and the country's economic growth. Evaluation of the

effectiveness of cooperation with NGOs and its impact on economic development was based primarily on the following indicators: GDP growth; increased investment; increased imports of capital goods or technology; no negative impact on investment and savings; increasing capital productivity and ensuring endogenous technical change (Edwards, 2014; Yiew & Lau, 2018; Ahmadov, 2020; Pomaza-Ponomarenko et al., 2020). Several researchers have studied the relationship between international NGO investment and country size (Pham & Pham, 2020) and the quality of political governance in a country (Maruta, Banerjee & Cavoli, 2020; Meyer, 2019). Taking the example of developing countries, it is concluded that especially high results from receiving assistance to NGOs are observed in countries with good political management (Maruta, Banerjee & Cavoli, 2020).

The second group consists of scientists who substantiated the inefficiency and destructive nature of the impact on the development of the national economy and the social system in the country during the process of active cooperation with NGOs due to the high level of the shadow sector of the economy and the corruption of the legal system (Isaksson & Kotsadam, 2018; Teichmann, Falker & Sergi, 2020). Asserting that NGOs' good intentions only contribute to the enrichment of the political elite in these countries and completely negates the possibility of using international investment funds for effective projects in the country, the second group of researchers considers the assistance of international non-governmental organizations from the standpoint of possible damage to the country's socio-economic development (Gnangnon, 2020; Edward & Karamuriro, 2020). For example, some authors (Economides, Kalyvitis & Philippopoulos, 2008), modeling the behavior of 75 recipient countries, obtain results that indicate that foreign grants suppress individual initiative for development, innovation, and the search for new cooperation. Especially, this is typical for emerging market countries (Economides, Kalyvitis & Philippopoulos, 2008). This is especially true for recipient countries with a large public sector. The negative impact of foreign aid on the growth of rent and

corruption was also evidenced by a study by Ishwor (2020). Gnangnon (2020) also empirically has proved the negative impact on gratuitous foreign investments' socio-economic development based on the analysis of data from 95 countries for the period 1969-2016 (Gnangnon, 2020). Factors explaining the negative relationship between economic growth and foreign aid include: the unstable nature of aid, hampering the government's spending ability, conditionality, capacity, investment directions, exchange rate, the export value of manufacturing products (Gnangnon, 2020). Moreover, it has been suggested that for developing countries, the danger of foreign aid may be that, sometimes, it makes a country dependent on aid rather than economically independent (Park, 2019).

The third group of scientists is characterized by an approach to assessing the economic efficiency of cooperation between the national economy and NGOs, which substantiates the duality of the effect of cooperation with NGOs on countries' socio-economic development (Pham & Pham, 2020). The positive and negative impacts are determined by the effectiveness of the strategy for using investment funds of international organizations, as well as the level of development of the political and legal system, innovativeness of the economy, and the quality of human capital in the country (Pham & Pham, 2020). Proponents of the third group (Pham & Pham, 2020; Gontar et al., 2020) have concluded that international aid under the same conditions in different countries can demonstrate different results, depending on the circumstances of development domestic investment and the efficiency of use. The influence of globalization processes can contribute to the growth of the country's economy thanks to foreign investments and lead to divergence.

Considering the specific features of the Ukrainian economy, such as a high level of corruption and the ongoing political and economic crisis, we tend to the third approach, and we believe that NGOs' external investments affect various spheres of the economy and the social system in two ways. This, in turn, requires an individual approach to assessing the effectiveness of countries'

cooperation with NGOs. Thus, within the framework of this study, formalization was carried out empirically, and the structure of the mutual influence of the components of the socio-economic development of Ukraine and investment funds received from external funding sources (NGOs) was determined. Potential scenarios of changes in the country's socio-economic development due to changes in the size of investment resources provided by international NGOs have been generated.

METHODS AND MATERIALS

To determine the effectiveness of Ukraine's international cooperation with NGOs, this study assessed the use of investment funds received within the provision of international technical assistance (ITA), implementation of educational projects DOBRE (United States Agency for International Development (USAID)), U-LEAD (European Union), the Konrad Adenauer Foundation, etc., all from the position of influence on the socio-economic development of the country. Cognitive modeling was used as the method for this. The resulting indicator of the cognitive model of the dependence of the socio-economic development of Ukraine on investment funds received within the ICP, advisory projects, and funds was GDP per capita (Garba & Bellingham, 2021; Akalpler & Hove, 2019).

The cognitive modeling method was based on the construction of a fuzzy cognitive map, a mathematical model, which is represented in the form of a directed graph, the vertices of which are many concepts. And the directed arcs of the graph were causal (cause-and-effect) relationships between concepts (Gorelova, Pankratova & Borisova, 2019). Causal relationships are visualized in the form of arcs that connect the vertices (concepts) of the graph - indicators of the country's socio-economic development and the volume of investment resources provided by international NGOs in the context of financing programs.

The fuzzy cognitive maps method was used to build a cognitive map for assessing the impact of investment funds received within the framework of international technical assistance, the implementation of educational

projects, project DOBRE, U-LEAD, and the Konrad Adenauer Foundation on the socio-economic development of the country (Gorelova, Pankratova & Borisova, 2019):

$$FCM = \langle C, F, W \rangle \qquad (1)$$

where

- FCM is the formalized analytical description of a fuzzy cognitive map;
- $C = \{C_i\}$ – indicators of the socio-economic development of Ukraine, the country, and the volume of investment resources provided by NGOs in the context of financing programs;
- $F = \{F_i\}$ – causal relationships between indicators of socio-economic development and funding volumes;
- $W = \{W_{ij}\}$ – weights of arcs reflecting the strength of mutual influence between socio-economic development indicators and the amount of funding

The theoretical generalization and correlation analysis of data for 2016-2020 (State Committee for Statistics of Ukraine, 2020) reflects the relationship between indicators of the country's socio-economic development and investment funds provided by the MGOs. A matrix of mutual influence between the concepts of a nonlinear cognitive map of the problem under study has been compiled. For investment funds provided by the NGOs, in this study we used data on the number of funds obtained within: the allocation of international technical assistance (ITA); programs to support the decentralization of Ukraine (U-LEAD, DOBRE) as one of the reasons for the transformation of approaches to support the country's socio-economic development; and the functioning of the Konrad Adenauer Foundation. Received funds within the framework of international technical assistance reflect the maximum impact of the influence of funds from external donors (European Union, United States of America, Germany, Organization for Security and Co-operation in Europe, European Banks for Reconstruction and Development, United Nations, Canada, Nordic Environment Finance

Corporation, Switzerland, Norway, Sweden, Chernobyl Shelter Fund, Great Britain, European Investment Bank, International Bank for Reconstruction and Development, Japan, Denmark, Council of Europe, Netherlands, Poland and Turkey) on various components of the socio-economic development of Ukraine (reforms of public administration, science, and education, the ship system, development of trade and export potential, etc.) (Uryadov portal, 2021a; Institute of Political Science, 2021).

Simultaneously, programs to support decentralization in Ukraine, which have been implemented actively since 2016, have acquired significant importance in socio-economic development. Among the programs to support decentralization, the programs U-LEAD and DOBRE are considered.

The implementation timeframes for U-LEAD with Europe Decentralization Reform Support Program in Ukraine: A Program for Ukraine with Local Empowerment, Accountability, and Development were divided into two periods: 1st from 01.01.2016 to 30.06.2020 and a budget of 102 million euros, and 2nd from 01.07.2020 to 31.12.2023 with a budget of 50.3 million euros (U-LEAD, 2021). The Decentralization Brings Better Results and Effectiveness (DOBRE) program costs US $ 50 million (DOBRE, 2021). The main goal is technical and financial assistance at the local level, namely assistance to the new United Territorial Communities.

Thus, the analysis of the use of investment funds from foreign donors in the framework of the NGOs allows one to assess the more global, large-scale effect of the influence of investment funds on the socio-economic development of the country at the national level, and at the local and territorial level within the DOBRE and U-LEAD programs. Investment funds allocated by the Konrad Adenauer Foundation were used to assess the impact of international investment on each person in the field of education, and in particular to improve the skills of the workforce. The Foundation, which has been operating in the territory of Ukraine since 1994, acts as a sponsor of students and a significant partner in Ukraine's political and economic transformation (Konrad Adenauer

Foundation, 2020).

The format of a set of indicators (reflecting the socio-economic development of the country) to build a cognitive model was based on the Resolution of the Cabinet of Ministers of Ukraine No. 671, dated 08.29.2020 (About the Forecast of the Economic and Social Development of Ukraine for 2021-2023, 2020) And, based on the previous set of indicators, descriptions of the country's socio-economic development (Soreg & Bermudez-Gonzalez,

2021; Ari & Koc, 2020; Boudreaux, Nikolaev & Klein, 2019; Qureshi et al., 2019; Chaudhry, Xu & Cao, 2018), taking into account the relevance of the scope ICC, DOBRE, U-LEAD programs, funds from the Konrad Adenauer Foundation. Thus, within the study, a pool of 21 indicators (Table 1) was formed which characterize the socio-economic development of the country, and indicators reflecting the impact on it of funds attracted from foreign NGOs (Table 1):

Table 1: Indicators of the socio-economic development

Symbols	Indicators
O1	GDP - GDP per capita, UAH
O2	Exports of goods, mln. USD
O3	Imports of goods, mln. USD
O4	Unemployment - rate of the population aged 15-70 year old (by ILO methodology), average per period, % of labor force
O5	Average monthly wage per employee / nominal, UAH
O6	Arrears in wage, thousand UAH
O7	Inflation - Consumer price index
O8	Retail trade turnover, mln. UAH
O9	Passenger turnover, mln. passenger/km
O10	Population, person
O11	Migration growth, reduction
O12	Number of enterprises / business entities
O13	Capital investment, UAH mln
O14	Foreign direct investment, million dollars USA
O15	Number of enterprises where product innovations were carried out at industrial enterprises
O16	Expenditures on innovations, UAH million
O17	Gross profit (loss) / financial result from ordinary taxation activities, UAH million
O18	Revenues (excluding intergovernmental transfers) UAH million
O19	Expenses UAH million
O20	Financing (deficit "+" / surplus "-"), UAH million
O21	Education - Higher education in Ukraine, the number of students at the level of education bachelor, master, graduate student
Y1	ITA - received investments within the provision of NGOs, million US dollars
Y2	Scholarship (KAF) – funds allocated by the Konrad Adenauer Foundation, scholarship of 80 euros per month per student
Y3	DOBRE – Amount of funding for the implementation of educational projects and DOBRE projects, USD million
Y4	U-LEAD - amount of funding under the U-LEAD program, million euros

Y1-Y4), and determined using a linguistic, numerical scale (Gorelova, Pankratova &

Borisova, 2019). According to this scale, there is a strong relationship between indicators if

the correlation coefficient is in the range (|0.6|; |0.85|]; a powerful relationship is (|0.85|; |1|]. The constructed map reflects strong and solid relationships between indicators' socio-economic development and the number of funds raised from foreign non-governmental organizations.

The direction and qualitative characteristics of the influence are determined based on economic laws using expert assessments. For this, a group of 35 experts was formed, including representatives of the Ministry and the Committee for Digital Transformation of Ukraine, the Ministry for Communities and Territories Development of Ukraine and the Ministry for Development of Economy, Trade and Agriculture of Ukraine. The experts were asked on a binary scale to assess in pairs the mutual influence between indicators of socio-economic development and investment volumes (O1-O21, Y1-Y4). The score "1" corresponded, according to the experts, to a significant impact of the i-th indicator on the j-th, and "0" corresponded to an insignificant impact. The representativeness of the expert assessment was confirmed by the competence of experts, expressed by experience in the field of assessment and the development of plans and strategies for the socio-economic development of the country and regions for at least 5 years.

The level of consistency of opinions of experts regarding the presence/absence of influence between the indicators was 86.7%.

To determine the effectiveness of the received investments within the framework of the provision of ITA, the implementation of educational projects and projects DOBRE, U-LEAD, the Konrad Adenauer Foundation, as well as an effective model for the participation of international NGOs in ensuring the socio-economic development of the country, the main system indicators of the cognitive map were calculated and consist of consonance (Outdegree), dissonance (Indegree) and the influence of concepts on the system (Centrality). The calculation of these indicators was based on comparing the contours formed from map concepts according to the criterion of compliance, balance, and degree of influence (Gorelova, Pankratova & Borisova, 2019).

The consonance function reflects the positive and negative influence of attracted investment resources from foreign non-governmental organizations on the components of the country's socio-economic development and its influence on each other. The higher the consonance index, the more significant is the influence of the index. Dissonance reflects the degree of mistrust in the results of influence; that is, it indicates an insignificant influence of the i-th indicator on the sample of socio-economic development indicators. The influence of concepts on the system implies and reflects the maximum positive or negative impact of investments received within ITA, the implementation of educational projects and projects DOBRE, U-LEAD, and the Konrad Adenauer Foundation, socio-economic development of the country.

Based on the calculated indicators using impulse modeling and using the Mental Modeler software, scenarios have been implemented for changing the socio-economic development of Ukraine as a result of changes in the size and structure of receiving investment funds from the NGOs.

RESULTS

Based on the correlation analysis results and expert assessment regarding the direction of cause-and-effect relationships between indicators, a fuzzy cognitive map was built (Fig. 1). The "+" designations near the graph arc reflect the positive influence of the indicator located at the base of the arc on the indicator located at the top of the arc; "-" - negative influence.

This map shows the impact of investments received within the provision of ICCs, the implementation of educational projects, and projects DOBRE, U-LEAD and the Konrad Adenauer Foundation on Ukraine's socio-economic development and reflects formalized and structured relationships between indicators of attracted investments and socio-economic development of the country.

According to Figure 1, a fuzzy cognitive judgment of the impact of received investments within the provision of ITA, the implementation of educational projects and projects DOBRE, U-LEAD and the Konrad

Adenauer Foundation on the country's socio-economic development contains 25 components (indicators) and 129 causal relationships between them. From the set of indicators based on the results of modeling, the following was selected:

- 5 concepts like "Driver" influence other indicators and are themselves not influenced by any of them. These include the main types of investments attracted from foreign NGOs, as well as the inflation rate;
- 20 concepts of the "Ordinary" type, which are intermediate indicators that influence and are influenced by other socio-economic development indicators. This type includes the components of socio-economic development, which reflect each indicator's impact on the other.

To formalize the relationship of the components of the influence of investments received within the provision of ITA, the strength of the influence of the components of the country's socio-economic development and the received investments was determined (Table 2 shows strong and powerful relationships between indicators). The table's values are interpreted as the power of influence of the i-th indicator indicated in the row of the table on the j-th indicator indicated in the column.

Figure 1: Cognitive map of the impact of investments received within the provision of ICA, implementation of educational projects and projects DOBRE, U-LEAD, Konrad Adenauer Foundation, on the socio-economic development of Ukraine

Table 2: Matrix of the mutual influence of received investments within the provision of MTP, the implementation of educational projects and projects DOBRE, U-LEAD, Konrad Adenauer Foundation, on the socio-economic development of the country of Ukraine

	O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12	O13	O14	O15	O16	O17	O18	O19	O20	O21	Y1	Y2	Y3	Y4
O1	1	0	0	0	0	0	0	0	1	0.997	0.999	0.969	0	0.998	0.997	0.996	0	0	0	0	0.988	0	0	0	0
O2	0.999	1	1	1	1	0	0	0.902	0	0	0	0.958	0	0	0	0.999	0.935	0.780	0.753	0	0	0	0	0	0
O3	0.999	1	1	0	0	0	0	0.900	0	0	0	0	0	0	0	0	0.939	0	0	0	0	0	0	0	0
O4	0.998	1	0.999	1	0	0	0	0	0	0	1	0	0.915	1	0	0	0	0.765	0.737	0.998	0.976	0	0	0	0
O5	0.998	1	1	1	1	0	0	0	0.999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O6	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O7	0.998	1	0.999	1	1	1	1	0.904	0.999	0	1	0.952	0.915	1	1	1	0.927	0.765	0.737	0.998	0.976	0	0	0	0
O8	0.900	0.902	0	0.904	0.903	0.904	0	1	0	0	0	0	0	0	0	0	0.823	0	0	0	0	0	0	0	0
O9	1	0	0	0.999	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O10	0.997	0	0	0.990	0	0	0	0	0.996	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O11	0.999	0	0	1	1	0	0	0	1	0.994	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O12	0.969	0.958	0.961	0.952	0.954	0	0	0.902	0.966	0.985	0.961	1	0	0	0	0	0	0	0	0	0	0	0	0	0
O13	0.941	0.925	0.930	0	0.918	0.916	0	0.825	0	0.960	0	0.987	1	0.916	0.915	0.907	0.982	0	0	0	0	0	0	0	0
O14	0.998	1	0	0	1	0	0	0	0	0.991	0	0.953	0	1	0	0	0.928	0	0	0	0	0	0	0	0
O15	0	0.999	0	0	1	0	0	0	0	0.990	0	0.953	0	1	1	0	0	0	0	0	0	0	0	0	0
O16	0	0	0	0	0	0	0	0	0	0.987	0	0.946	0	1	1	1	0	0	0	0	0	0	0	0	0
O17	0.949	0	0	0	0.930	0.927	0	0	0	0.966	0	0.980	0	0	0	0	1	0	0	0	0	0	0	0	0
O18	0	0	0	0	0.770	0.766	0	0.629	0	0.839	0	0.896	0	0	0	0	0.932	1	0	0.787	0	0	0	0	0
O19	0	0	0	0	0	0	0	0	0	0.817	0	0.883	0	0	0	0	0	0.999	1	0.762	0	0	0	0	0
O20	0.999	0	0	0	0.999	0	0	0	0	0.996	0.999	0.967	0	0	0	0	0	0.787	0	1	0.854	0	0	0	0
O21	0.988	0.981	0	0	0.978	0	0	0	0.986	0.997	0.982	0.995	0	0	0	0	0	0	0	0.986	1	0	0	0	0
Y1	0	0	0	1	1	0	0	0.904	0.999	0	0.999	0.952	0.915	0	0	1	0.927	0	0	0.998	0.976	1	0	0	0
Y2	0	0	0	1	1	0	0	0	0.999	0	1	0	0	0	0	0	0	0	0	0	0.976	0	1	0	0
Y3	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.976	0	0	1	0
Y4	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0.976	0	0	0	1

Structural analysis of the cognitive map of the impact of investments received within the provision of ITA, implementation of educational projects and projects DOBRE, U-LEAD and the Konrad Adenauer Foundation on the socio-economic development of the country, as well as the structural significance of the elements of the cognitive map, was carried out based on a matrix (Table 2) nonlinear cognitive map. As a result of the analysis, functional indices were obtained (Table 3), namely: consonance (Outdegree), dissonance (Indegree), and the influence of one factor on another (Centrality), the values of which were determined using the Mental Modeler software.

Table 3. Formalization of indicators of the socio-economic development of Ukraine of the country and investments received from foreign NGOs

Component	Indegree	Outdegree	Centrality	Type
GDP (O1)	14.43	5.86	20.29	ordinary
Export (O2)	8.76	9.25	18.01	ordinary
Import (O3)	3.87	2.9	6.77	ordinary
Unemployment (O4)	6.99	12.16	19.15	ordinary
Wage (O5)	13.69	3.73	17.42	ordinary
Arrears in wage (O6)	1	1.92	2.92	ordinary
Inflation (O7)	0	13.1	13.1	driver
Retail trade (O8)	4.47	4.22	8.69	ordinary
Passenger turnover (O9)	9.68	1	10.68	ordinary
Population (O10)	0.98	1.97	2.95	ordinary
Migration (O11)	8.92	1.99	10.91	ordinary
Business entities (O12)	3.82	7.67	11.49	ordinary
Capital investment (O13)	3.65	8.2	11.85	ordinary
Foreign direct investment (O14)	5.88	3.92	9.8	ordinary
Innovation-active enterprises (O15)	3.86	2	5.86	ordinary
Expenditures on innovations (O16)	5.83	2.98	8.81	ordinary
Enterprises financial result (O17)	6.44	2.79	9.23	ordinary
Budget revenues (O18)	4.63	1.76	6.39	ordinary
Budget expenses (O19)	3.22	1.64	4.86	ordinary
Budget deficit / surplus (O20)	4.42	2.97	7.39	ordinary
Education (O21)	7.72	3.9	11.62	ordinary
ITA (Y1)	0	10.54	10.54	driver
Scholarship (KAF) (Y2)	0	4.92	4.92	driver
DOBRE (Y3)	0	3.98	3.98	driver
U-LEAD (Y4)	0	6.89	6.89	driver

The analysis of the above indicators made it possible to determine the most significant indicators of the studied system - those that have the greatest impact on the country's socio-economic development. In the context of this study, these are investment resources and components of socio-economic development, which positively and negatively affect other

components of the country's socio-economic development. According to Table 3 these include: all the main types of attracted investment funds from foreign, non-governmental organizations (Konrad Adenauer Foundation Scholarships (Y2) for students, DOBRE (Y3), U-LEAD (Y4) programs, international technical assistance programs (Y1), which maximize positively effects on the socio-economic development of the country; key characteristics of the socio-economic development of the country - GDP per capita (O1), exports (O2), unemployment (O4), inflation (O7), retail trade turnover (O8), number of enterprises/economic entities (O12), capital investments (O13), which form and reflect the level of socio-economic development.

To analyze the change in the country's socio-economic development, indicators under the influence of investments received within ITA - the implementation of educational projects, and projects DOBRE, U-LEAD and the Konrad Adenauer Foundation - an impulse approach was used. Based on the results, the change in key indicators of socio-economic development was determined with an increase in investment volumes for the corresponding programs by 0.1%, which is reflected in Fig. 2. The diversity with the simultaneous centricity of foreign international organizations' donation programs forms a point effect on the components of the country's socio-economic development.

The U-LEAD program does not impact the main economic and social indicators by investing in a specific area. Still, it implies the cumulative effect of the knowledge gained and its application to improve socio-economic development at the local level, which is reflected in the country's socio-economic development (Fig. 2a).

Each euro used within the program (Fig. 2a) contributes to reducing population migration by involving the local population in the implementation of decentralization processes; many educational projects are being used to implement the processes of decentralization. U-LEAD's focus on providing local communities with IT tools contributes to an increase in innovation costs and an increase in the number of innovatively active enterprises. Creating an educational platform creates a new pool of investment opportunities, but with the simultaneous use of imported goods and services.

Unlike U-LEAD, in the DOBRE program, the implementation period ends in June 2021. The program's main objectives are to improve resource management, improve the quality of utilities, stimulate the local economy and increase citizen involvement in the processes of decentralization and local work. To assess the achievement of goals, at the final stages of the program implementation, and by applying the scenario and impulse approach, the components of the country's socio-economic development were identified, which are changed under the DOBRE program's influence (Fig. 2b).

The DOBRE program, like U-LEAD, forms an educational platform for the population. At the same time, the formation of territorial communities contributes to the disintegration of existing structures and temporary loss of jobs, and, consequently, the growth of wage arrears, which is reflected in Fig. 2b.

At the same time, it should be noted that a deeper dependence of the vision of the transformation of the foundation of Ukraine and its socio-economic development on the policies of the EU and its member countries - Denmark, Estonia, Germany, Poland, and Sweden - is being formed.

A similar relationship was found when assessing the impact of scholarships issued by the Konrad Adenauer Foundation on students (Fig. 2c). Receiving a scholarship (Fig. 2c) sets precedents for the international exchange of intelligence, with a simultaneous reduction in migration, passenger traffic, and the number of university students in Ukraine.
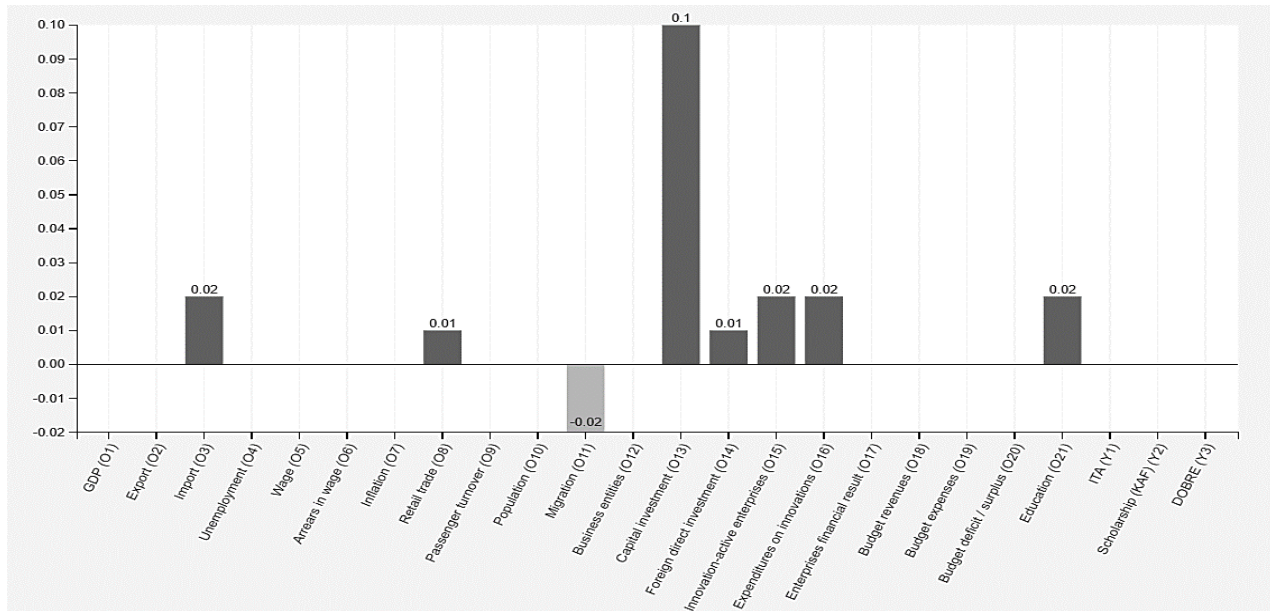
Figure 2a: A scenario of the change in the parameters of the socio-economic development of Ukraine, taking into account the increase in the amount of the budget and its development within the U-LEAD program
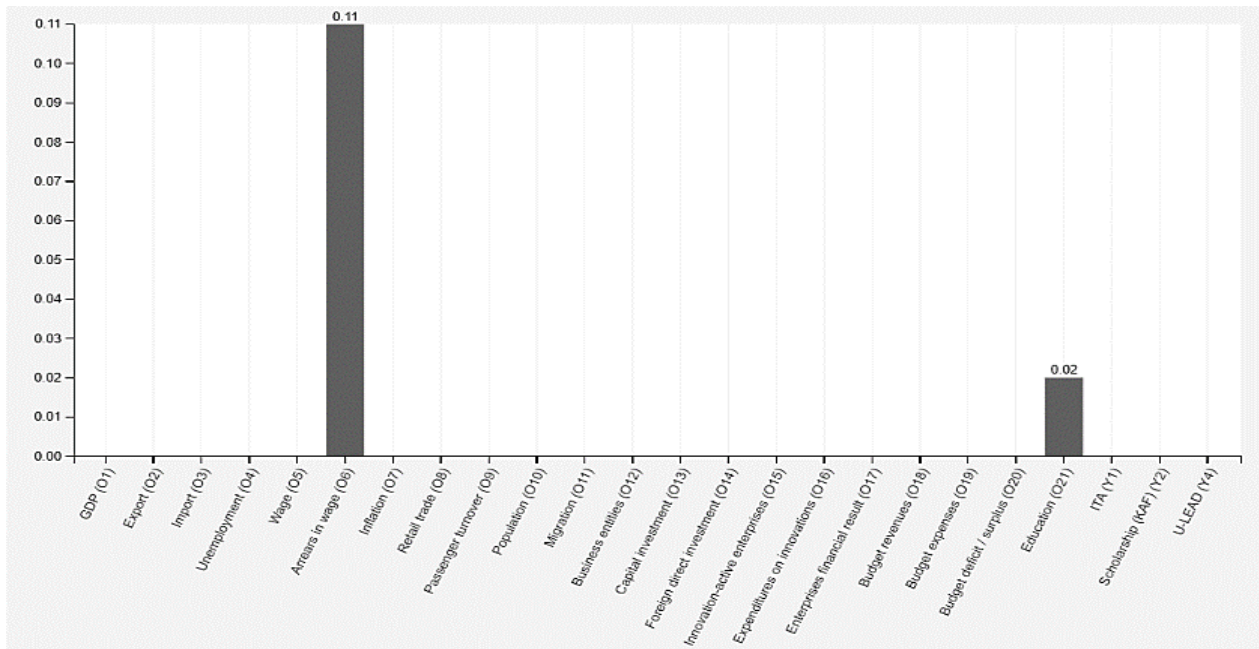

Figure 2b: A scenario of the change in the parameters of the socio-economic development of Ukraine, taking into account the increase in the amount of the budget and its implementation within the DOBRE program
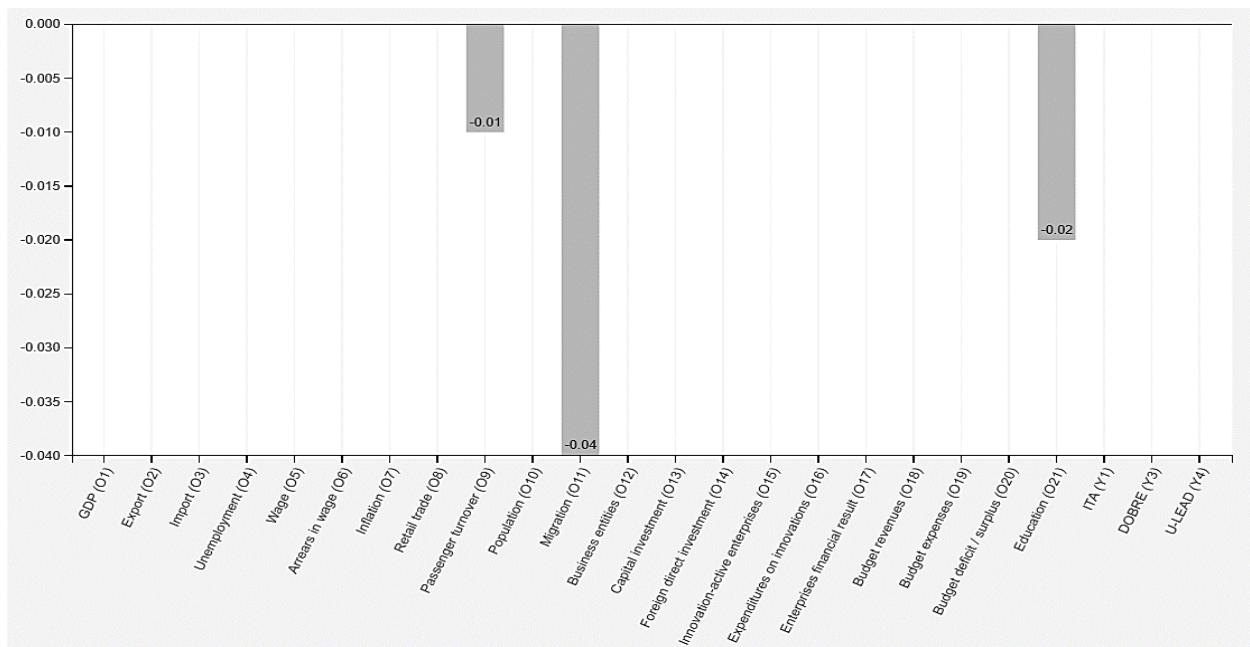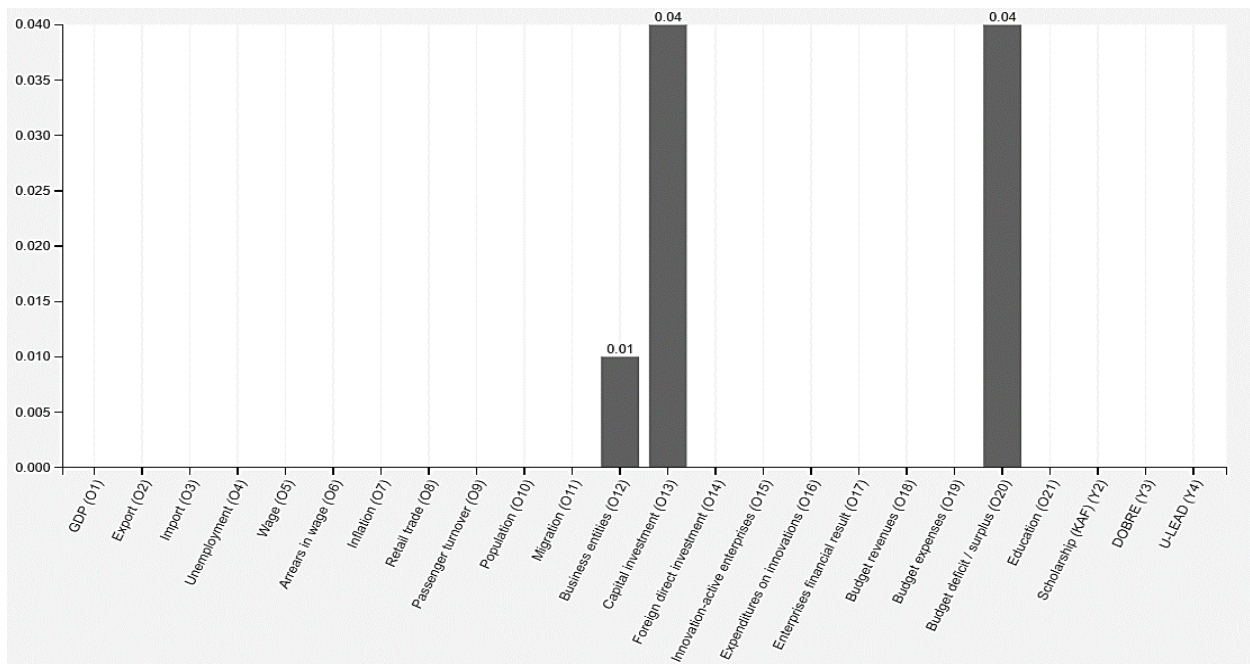
Figure 2c: A scenario of the change in the parameters of the socio-economic development of Ukraine, taking into account the increase in scholarships for students by the Konrad Adenauer Foundation

Figure 2d: A scenario of the change in the parameters of the socio-economic development of Ukraine, taking into account the increase in the amount of international technical assistance

Figure 2: Scenarios of the change in the parameters of the socio-economic development of Ukraine under the influence of investment resources provided by international non-governmental organizations

Receiving an ITA (Fig. 2d) has a wider spectrum of influence, which is confirmed by the rationality of using this type of assistance, N\namely support for small and medium-sized businesses, regulation of public debt.

Thus, according to the scenarios of changes in the parameters of the socio-economic development of Ukraine under the influence of attracted investments from foreign non-governmental organizations (Fig. 2), it is determined that:

An increase in the budget amount and its implementation within the U-LEAD (Y4) program by 0.1% contributes to a decrease in migration by 0.02%, an increase in imports, an increase in the number of students, an increase in spending on innovation, an increase in the number of innovative enterprises by 0.02%, real trade by 0.01%, and attracting capital investments by 0.1%;

An increase in the amount of the budget and its implementation within the DOBRE (Y3) program by 0.1% contributes to an increase in the number of students by 0.02%, but creates the likelihood of an increase in wage arrears by 0.11%;

An increase in the number of scholarships for students allocated by the Konrad Adenauer Foundation contributes to a decrease in passenger traffic by 0.01%, migration by 0.04%, and the number of students by 0.02%, which is a natural situation in the case of students leaving for Germany to study, with further employment.

An increase in the amount of international technical assistance by 0.1% contributes to an increase in the budget surplus and an inflow of capital investments by 0.04%, increasing the number of business entities by 0.01%.

The growth of investment funds attracted within the provision of ICCs, the implementation of educational projects and projects DOBRE, ULEAD and the Konrad Adenauer Foundation, contributes to GDP growth by 1.7%, without negative factors. Along with the growth of GDP per capita, the use of funds from the U-LEAD (Y4) program entails an increase in imports of goods and services, reducing GDP by 0.02%. Investment funds attracted from foreign donors in the educational sphere also have a contradictory effect, which, as a result, negatively affects the GDP as a resultant parameter of the country's socio-economic development.

DISCUSSION

This study has presented an assessment of the effectiveness of international non-governmental organizations' participation by financing many projects in ensuring the socio-economic development of Ukraine. The results obtained confirm our expectations about the presence of both positive and negative effects of international assistance on the country's socio-economic development. Considering the factor that most of the models presented in the literature rely on single point indicators (GDP, wages, etc.) (Edwards, 2014; Yiew & Lau, 2018; Gnangnon, 2020; Ahmadov, 2020), the key advantage and novelty of the proposed approach is a comprehensive analysis of a wide range of socio-economic indicators (21 in all). The analysis comprehensively assessed international organizations' participation in all spheres of the country's socio-economic development: internal and external trade, price level, employment and wages, population, migration, education system, entrepreneurship development, innovative development, and public finance. Based on the cognitive map, it was revealed that the greatest influence of international funding received from non-governmental organizations has on such socio-economic indicators of Ukraine's development as GDP per capita (O1), exports (O2), unemployment (O4), inflation (O7), retail trade turnover (O8), number of enterprises/business entities (O12), capital investments (O13), Expenditures on innovations (O16); Financing (deficit "+" / surplus "-"); Education (O21).

Also, a distinguishing characteristic from previous studies (Gnangnon & Brun, 2018; Korotin et al., 2019) is the fact that the assessment of the effectiveness of cooperation was carried out in the context of several non-governmental organizations (projects) (DOBRE, ULEAD, Konrad Adenauer Foundation), and not, in general, on the financial flows of foreign aid to the country. This makes it possible to highlight the individual risks and potential opportunities of each project and the degree of

its impact on the socio-economic development of the country.

Even though the four projects reviewed represent different forms of cooperation between NGOs and Ukraine, they cannot be considered a representative or a model of the most effective interaction. Nevertheless, they expand the possibilities of partnership between the state and civil society throughout the country, especially in social and economic relations, and are aimed at increasing the well-being of society, improving the quality of education and solving other pressing issues. It should also be noted that the proposed approach to assessing the effectiveness of Ukraine's cooperation with international non-governmental organizations is universal. Still, its application for other countries and assessing the effectiveness of other projects requires recalculation of the importance of cause-and-effect relationships between economic development indicators and the direction of these ties.

As noted, the effectiveness of international non-governmental organizations' participation in developing countries significantly depends on the country's level of political management (Maruta, Banerjee & Cavoli, 2020; Meyer, 2019). The level of corruption determines the effectiveness of governance (Isaksson & Kotsadam, 2018; Teichmann, Falker & Sergi, 2020). The presented approach did not consider the corruption factor, which is associated with the controversial aspect of its definition in the category of social indicators that are the purpose of the study. This controversial aspect formed the basis of our further scientific priorities.

CONCLUSION

Based on the conducted empirical research, the following scientific results were obtained. The growth of investment funds attracted within the provision of ITA, the implementation of educational projects and projects DOBRE, ULEAD, in general, has a positive effect on socio-economic indicators and contributes to an increase in spending on innovation and capital investment, an increase in real trade and budget surplus, an increase in the number of innovative

enterprises and students, thus, in aggregate, increasing the GDP of Ukraine by 1.7%.

At the same time, in the context of individual projects, there is a contradictory impact of investment funds attracted from foreign donors, which, as a result, negatively affects GDP as a resultant parameter of the country's socio-economic development. Thus, the use of funds from the U-LEAD (Y4) program entails an increase in imports of goods and services, reducing GDP by 0.02%. And the further increase in the size of the scholarship within the framework of the Konrad Adenauer Foundation programs contributes to a decrease in passenger traffic and the number of students, which is explained by students' departure to Germany for training, with further employment. In this connection, it can be concluded that the excessive involvement of investments attracted from non-governmental foreign, international organizations forms an excessive dependence on Ukraine's socio-economic development on donor countries' policy and financial capabilities.

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