# Social and economic integration of Ukraine into the EU: Empirical assessments of divergence and strategic guidelines for cohesion policy

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| C H R O N I C L E | A B S T R A C T |
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| | The study identifies the growth of social and economic divergence between Ukraine and the EU. The purpose of this paper is to fill a gap in the literature on the scale and dynamics of an upward divergence between Ukraine and the EU by comparing integral indices of social and economic development of both areas. Reaching this goal is important for elaborating new guidelines for cohesion policy of the EU and recommendations on Ukraine's integration strategy. This research differs from the previously published ones by a new approach to measure social and economic integral indices used for estimating the rate of divergence between Ukraine and the EU. A distinctive feature of the author's methodology of the integral estimation of social and economic development of Ukraine and the EU-28 is the use of the innovative composition of indicators and the multiplicative form of the integral index, the simultaneous normalization and integral assessment indicators and justification of weights based on the principal component analysis (PCA). Priority areas of social and economic development of Ukraine as a prerequisite for the policy of rapprochement and integration with the EU are diversification of foreign economic relations, ensuring the stability and independence of the financial system, improving the parameters of the social security system, involving drivers of economic development, increasing the level of energy efficiency and energy saving. |
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## 1. Introduction

After the acquisition of independence in 1991, Ukraine started to lay the foundations of market economy and democratic principles of development that much better comply with the political and economic structure of the European Union, rather than with the former administrative command regime. In confirmation of the European identity of the Ukrainian people, the irreversibility of the European and Euro-Atlantic course of Ukraine has been stated in its Constitution. Despite the active European integration aspirations, the signing of the Association Agreement between Ukraine, on the one hand, and the European Union, the European Atomic Energy Community and their member states, on the other hand, as well as formation of a comprehensive free trade area and other significant measures on convergence, did not lead to full integration of Ukraine into the EU – nor in institutional nor in social and economic plane. One of the reasons for this is the presence of large divergence in the social and economic development of the countries. Identification of such critical gaps is quite important information and analytical basis for substantiating strategic priorities, and further tools and means of state policy of social and economic development aimed at the harmonization and improvement of prerequisites for Ukraine's integration into the EU.

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## 2. Literature Review

### 2.1. Transformation of the EU Cohesion Policy under the Convergence-Divergence Trends

The empirical literature suggests that European Union has significantly changed its priorities and strategic orientations since the Treaty of Lisbon setting new constitutional basis of the EU (Carayannis & Korres, 2013; Eissel, 2020). Prominent changes include the move from a mere economic union to the policy of social cohesion and well-being of the member states aimed at achievement of diverse, sustainable growth under current uncertainty and reformatting processes. The development of the EU before the 2008-2009 global economic recession showed that the most effective mechanism for enhancing the benefits from integration, as well as strengthening international competitive positions of the member countries is a social and economic convergence (Ridao-Cano & Bodewig, 2018). Supporters of this idea argue that convergence provides the levelling of key parameters of poorer and richer economies' development towards higher standards and cohesion. According to the recent research of Borsi & Metiu (2015), Forgó & Jevcák (2015), Piattoni & Polverari (2016), an upward convergence in the EU has been observed for the last decades. Many researchers have analyzed convergence processes in the Eastern and Western Europe in terms of per capita income and institutional development, and point out the importance of signing the Association Agreements between the EU and the Eastern European countries, which initiated more than a decade of cohesion of current and new member states. This stage lasted until the global recession in late 2008 and, according to some studies (Ferreiro et al., 2016; Kolev, 2012), even in the crisis years. There is also extensive literature on an intra-country divergence, which refers to differences in the national social and economic dimensions. Chuzhykov and Fedirko (2011), Gräbner et al. (2017), Palier et al. (2018) found that divergence trends in the EU have exacerbated in the post-crisis period due to its insurmountable negative effects, as well as under the influence of the EU's internal systemic crisis (including institutional, debt, migration, social and other components). These trends persist in forcing the EU to look for ways to redraw its cohesion strategies at the national and all-European levels. On the above basis, we hypothesize that:

H1: *There are significant and long-lasting disparities in social and economic development that do not contribute to the convergence of the EU and Ukraine.*

### 2.2. The Prospective of the EU-Ukraine Social and Economic Integration

The current state and prospects of Ukraine's European integration is the subject of a lot of studies and discussions in the specialized economic literature. Most recent studies (Connolly & Copsey, 2011; Ihnatenko et al., 2019; Pietnoczka, 2018) contain a comprehensive analysis of Ukraine's integration behaviour, examine the progress made towards integration and discuss the prospects for the EU-Ukraine rapprochement. For example, experts from IRF (2019) have concluded that there is a high potential specifically in the field of trade between Ukraine and the EU, and realization of this potential significantly depends on the progress of reforms in the Ukrainian economy. In this regard, Vasyltsiv & Lupak (2016) propose some possible ways of Ukraine's European social and economic integration, which lie in the intensification of domestic production, entrepreneurship and economic growth based on ICT and innovations with the following elaboration and implementation of import substitution programs.

Strengthening the efficiency in public administration, including areas of convergence and European integration, becomes an urgent task for Ukraine, which in September 2014 ratified the EU Association Agreement and in February 2019 constitutionally stated its strategic course for obtaining full membership in the Union. For more than a five-year period of various reforms and measures on implementation of the Association Agreement, Ukraine has not reached an expected convergence with member states. Moreover, according to some relevant studies and international rankings, it has become the European leader in poverty, corruption, and mass labour migration abroad, which is not inherent to any of the EU member countries (Åslund, 2014; Khomiak, 2014; Levytska et al., 2020). This indicates the existing disadvantages of domestic state regulation. Given the mentioned problem, it is underlined the idea by Dragneva and Wolczuk (2015) regarding the necessity of development of a multi-level system for managing the process of Ukraine's European integration with the involvement of representatives of government agencies, leading national and business associations, NGOs and various academic sectors.

Hence, there is a need to build a scientific basis for effective decision-making in the national public policy aimed at overcoming the existing divergence and the launch of the cohesion processes between Ukraine and the EU. In particular, it is important to understand key external and internal factors or indicators, which determine the social and economic divergence (convergence) between them. A number of scientists focus on the mentioned endogenous factors thoroughly discussing problems of Ukraine's possible integration into the European area, taking into account social dynamics, labour market imbalances, social security and quality (Eurofound, 2018; Levytska & Mulska, 2018; Novakova, 2017; Novikova, Sydorchuk, & Pankova, 2018). Much less attention is given to the problem of identifying relevant exogenous factors of the EU-Ukraine divergence (convergence), which provides the scope for further research.

A significant value has the experience of the Central and Eastern European countries, which have already passed their way to the EU integration, presented in a series of studies. Thus, for example, Nuroğlu and Kurtagic (2012) and Ilyash et al. (2020) substantiated the gains and losses from the integration for both Central and Eastern Europe and the EU, as well as for older

member states, modelling effects concerning trade, single market, capital movements, etc. In terms of the foreign direct investment flow, the authors have noted significant gains for Ireland, Spain and Portugal, and less obvious effect for Greece.

Recent data confirms the prospects of convergence between the Central and Eastern European countries and the EU. In the work by Grela et al. (2017), three concepts of distance between the mentioned countries are developed, namely the physical remoteness, an economic gap and a temporal distance. It turns out that economically richer countries of Central and Eastern Europe are like the poorest ones of the EU, and convergence to the level of the poorest EU countries is to be achieved by in average of 23-24 years. However, Wagner & Hlouskova (2005) consider prospects of economic growth and convergence of the Central and Eastern European countries to the level of the EU based on different scenarios and indirect methods, whereas using direct methods shows significant divergence in further economic development of these countries after joining the EU. The social and economic forecasts for Ukraine after accession to the EU have been performed in a few studies only (Burlay, 2019; Sidenko, 2018). In the works on economic relations between Ukraine and the EU, Fertig & Kahanec (2015) analyse short-term and long-term results of EU's enlargement coming to the conclusion that it is premature to talk about Ukraine's accession to the Union in the next years. The authors emphasize on the need for the mechanism of a target financing of the adaptation to international standards, as well as formation of a competitive national economy for Ukraine. New priorities of the public policy development in focus of the EU-Ukraine integration should involve enhancing technological competitiveness of Ukrainian economy as an important factor for its sustainable growth (Vasyltsiv et al., 2020). Summarizing the above considerations, the hypothesis 2 is put forward:

H$_2$: *There are several aspects of social and economic development, in terms of which the disparities between Ukraine and EU countries are significant and growing.*

The *purpose* of this paper is to evaluate the scale and dynamics of an upward divergence between Ukraine and the EU by comparing integral indices of social and economic development of both areas. Reaching this goal is important for elaborating new guidelines for cohesion policy of the EU and recommendations on Ukraine's integration strategy.

The *novelty* of this paper lies in the substantiation of a prospective of the EU-Ukraine social and economic integration as a pre-condition for Ukraine's full membership in the Union. This work is distinguished by a new approach to measuring social and economic integral indices used for estimating the rate of divergence between Ukraine and the EU.

## 3. Methodology

This paper uses macro data from the European Statistical Office and national statistics to assess social and economic development of Ukraine and the EU-28 to reveal 'divergence zones' between Ukraine and the EU. The methodological approach to the integral assessment of the level of social and economic development is based on the *principles* of systemic character, complexity, adequacy, ambiguity, and accessibility. The principle of 'systemic character' means that the change in the value of an indicator of the components of social and economic development affects the change in the integral assessment of the level of social and economic development in general. The principle of 'complexity' involves the coverage of important components and indicators of development, where each indicator has a significant impact on the system, and 'adequacy' means the optimal support of the information base of indicators, which fully reflects the real state of the study's object. The principle of 'ambiguity' allows a division of indicators into stimulators and de-stimulators of social and economic development. A *distinctive feature* of the author's methodology of the integral estimation of social and economic development of Ukraine and the EU-28 is the use of an innovative composition of indicators and the multiplicative form of the integral index, the simultaneous normalization and integral assessment indicators, justification of weights based on *the principal component analysis (PCA)*. This approach makes it possible to compare in one scale the dynamics of integral indices of Ukraine and the EU-28 with the threshold values, to identify gaps and potential *'divergence zones'* on each indicator and groups of indicators, as well as to determine and objectively substantiate the conditions that are necessary for Ukraine's economic convergence with EU countries. To create an integral index of social and economic development, it is necessary to implement three *tasks*, such as (1) normalization of indicators, (2) determination and substantiation of weight coefficients, (3) construction of group indices and integral index. Normalization of indicators is an initial and priority stage of the study. All indicators have different dimensions and direction, and therefore, the correct rationing will reduce the indicators to the range [0, 1], and thus lead them to a comparable row. Normalization of indicators (formulas (3)-(4)) is based on a comparison of empirical indicators ($x_i$) with threshold values ($x_{lim}$). For stimulators ($a_i^s$), threshold values are the maximum indicator values in a dynamic series, and the minimum indicator value is used for de-stimulators ($a_i^d$).

$$a_i^s = {x_i}/{x_{lim}} \tag{1}$$

$$a_i^d = {x_{lim}}/{x_i} \tag{2}$$

To determine the weight coefficients of indicators of economic ($w_i^e$) and social ($w_i^s$) components of an integral index by the *principal component analysis*, it is possible to use the formulas (3) - (4):

$$w_i^s = \frac{|Component_i^s|}{\Sigma_i^n |Component_i^s|}, \; w_i^s > 0, \; \sum_i^n w_i^s = 1 \tag{3}$$

$$w_i^e = \frac{|Component_i^e|}{\Sigma_i^n |Component_i^e|}, \; w_i^e > 0, \; \sum_i^n w_i^e = 1 \tag{4}$$

in which:

$w_i^s$ is the weight of the $i$-indicator in the group of 'Development of the social sphere';
$w_i^e$ is the weight of the $i$-indicator in the group of 'Economic development';
$Component_i^s$ is the value of the principal component of the $i$-indicator in the group of 'Development of the social sphere';
$Component_i^e$ is the value of the principal component of the $i$-indicator in the group of 'Economic Development';
$n$ is the number of indicators within the group.

A multiplicative form of index construction is used instead of a classical approach (weight sum method) to avoid the zero value of indicators within the group, as well as the situation when the value of the integral index is levelled by some indicators at the expense of other ones. This method for calculating the integral index (formula 5) of social and economic development considers the nonlinearity of social and economic processes using the logarithmic function.

$$Index_t^{SEintgr} = \prod_i^n a_{it}^{w_i} \tag{5}$$

in which:
$Index_t^{SEintgr}$ is an integral index of social and economic development in the $t$-time interval. In general, the methodology of integral assessment of the level of social and economic development of Ukraine and the EU-28 allows:

1. To assess the level of economic and social development of Ukraine and make a cross-section of the state of the social and economic sphere, which is a prerequisite for the development of a purposeful integration strategy of Ukraine.

2. To develop a system of components and indicators of social and economic development with coefficients of significance to determine the '*divergence zones*' and the causes of increasing differentiation between Ukraine and the EU.

## 4. Results

Equalization of the state and trends of social and economic development of countries is an important and necessary prerequisite for their integration, the joint realization of potential including the formation of economic and political unions. In contrast, the high divergence leads to economic and social inequalities, the dependence of under-developed countries on more economically developed ones, increases the 'burden' of responsibility for assistance, protection, and support, and thus a good reason to restrain the integration aspirations of countries.

The assessment of the level and structural characteristics of divergence involves identifying key indicators of social and economic development of countries, analysing their status and contribution to integrated characteristics and comparing them both in terms of partial indicators and integrated levels of quality of social sphere, economy and social and economic development in general.

To the integral assessment of the social and economic development of Ukraine and the EU-28, the indicators characterizing the state of functioning the social sphere and indicators of economic growth of the country have been formed (Table 1). All indicators of social development are stimulants. They characterize the average level of payments and expenditures of the state on various aspects of social protection, support, and assistance. Accordingly, the increase in their values affects the growth of the social sphere of the country.

Indicators of economic development include key macroeconomic characteristics that are stimulators, respectively, increasing the values of which provides economic growth (adjusted gross disposable income of households and real gross domestic product, share of high technology exports, the number of small businesses, share of renewable energy in gross final energy consumption) and de-stimulators which have reversed relationship between increasing values and economic development (general government gross debt, the energy intensity of gross domestic product, harmonised index of consumer prices).

At the first stage of the analysis, the weights of indicators were determined (Table 2), as a result, different contributions of indicators to the social and economic development of Ukraine and the EU-28 were identified, which is an evidence of significant uneven internal environments when the same factors affect differently for further growth. This aspect also needs to be taken into account for creating the state cohesion policy.

**Table 1**
Components and indicators of social and economic development

| Development of the social sphere | Economic development |
|---|---|
| Social benefits for children/family, *per a* person, euro (S) | Adjusted gross income per household, euro (S) |
| Social unemployment benefits, *per capita, euro* (S) | Real gross domestic product *per capita, euro* (S) |
| *Total expenditure on pensions per a pensioner* (at constant 2010 prices), euro *(S)* | General public gross debt, *percentage of gross domestic product (D)* |
| Social protection benefits per capita, euro (S) | Share of renewable energy in gross final energy consumption, *share of renewables* (S) |
| *Health care expenditure,* percentage of gross domestic product (S) | High-tech exports, *percentage of total export* (S) |
| Expenditure on education, percentage of gross domestic product (S) | Harmonised index of consumer prices (2012 year =100) (D) |
| Expenditure on social protection, Percentage of gross domestic product (S) | Small-sized enterprises (number of units per 10,000 population (S) |
| | Energy intensity of gross domestic product, *kilograms of oil equivalent per thousand euro* (D) |

*Source:* compiled by the author
*Note:* S is stimulator; D is de-stimulator

**Table 2**
Weight coefficients of indicators in the integral index of social and economic development, per cent

| Indicators | Ukraine | EU-28 |
|---|---|---|
| ***Development of the social sphere*** | | |
| Social benefits for children/family | 20.06 | 13.33 |
| Social benefits for unemployment | 19.23 | 18.60 |
| Total expenditure on pensions | 21.78 | 5.57 |
| Social protection benefits | 16.78 | 16.15 |
| Health care expenditure | 4.45 | 20.62 |
| Expenditure on education | 2.58 | 5.38 |
| Expenditure on social protection | 15.12 | 20.35 |
| ***Economic development*** | | |
| Adjusted real gross income of households | 9.15 | 14.47 |
| Real gross domestic product | 10.14 | 12.69 |
| General gross government debt | 13.63 | 11.16 |
| Share of renewable energy in total energy consumption | 16.18 | 14.39 |
| High-tech exports | 14.74 | 9.19 |
| Index of consumer prices | 11.29 | 11.15 |
| Small-sized enterprises | 6.49 | 12.27 |
| Energy intensity of gross domestic product | 18.39 | 14.67 |

*Source:* based on the author's calculations using the formulas (3)-(4)

Thus, if in the EU-28 the development of the social sphere is largely determined by the level of funding for health care (20.62 %) and social protection (20.35 %), in Ukraine there are pension benefits (21.78 %), social benefits for children or family (20.06 %) and benefits for unemployment (19.23%). In other words, the social sphere of Ukraine is characterized by a situation with a higher level of satisfaction of primary social needs, while in the EU-28 there is a slightly higher order need. Disparities of similar nature are observed among the weight coefficients of economic development indicators. For example, if Ukraine's economic growth significantly depends on high-tech exports (14.74 %), then for the EU-28 (where high-tech exports are much more developed) the value of this indicator is objectively significantly lower (9.19 %). The same is for gross income, the share of renewable energy, some small-sized enterprises, etc. That is, for the convergence of Ukraine's economy to the European Union, first of all, the basic parameters of 'healthy' economic development should be approved, as well as strengthening the role of the small business sector, increasing investment in high technology, critical energy intensity in the real sector of the economy. In Table 3, it is shown the results of the calculation of indices of indicators for development of the social sphere of Ukraine and the EU-28. In general, every year of the period 2005-2018, the values of indices for the EU-28 were higher than for Ukraine (with the exception of a share of government spending on education and social protection), which is an evidence of a significant predominance of social development in the EU in comparison with Ukraine.

It should be noted that in 2005-2018 the values of all indicators (except the share of expenditures on education) of the development of social sphere in the EU-28 increased, which is an evidence of further qualitative progressive changes. Concerning Ukraine, similar trends cannot be pointed, as the values of indicators deteriorated, especially social protection payments (by 3.96 %), as well as health care expenditure (2.8 %) and expenditure on education (1.41 %). In fact, during the analysed time lag (2005-2018) the divergence of the values of indicators of the development of the social sphere in Ukraine in comparison with the EU-28 was significant (from 21 % to 36 %) in such aspects as social benefits for children, unemployment and social protection, the amount of pension support (Fig. 1).

**Table 3**

Indices of indicators of the social sphere development in Ukraine and the EU-28, 2005-2018

| Years | Countries | Social benefits for children/family | Social benefits for unemployment | Total expenditure on pensions | Social protection benefits | Health care expenditure | Expenditure on education | Expenditure on social protection |
|---|---|---|---|---|---|---|---|---|
| 2005 | Ukraine | 0.7126 | 0.6017 | 0.6765 | 0.6250 | 0.9926 | 1.0000 | 0.9630 |
| | EU-28 | 0.9558 | 0.9486 | 0.9983 | 0.9497 | 0.9764 | 0.9622 | 0.9281 |
| 2006 | Ukraine | 0.7175 | 0.6351 | 0.7171 | 0.6385 | 0.9825 | 0.9941 | 0.9652 |
| | EU-28 | 0.9580 | 0.9535 | 0.9988 | 0.9544 | 0.9794 | 0.9611 | 0.9248 |
| 2007 | Ukraine | 0.7090 | 0.6611 | 0.7283 | 0.6145 | 0.9703 | 0.9869 | 0.9660 |
| | EU-28 | 0.9561 | 0.9516 | 0.9997 | 0.9591 | 0.9764 | 0.9601 | 0.9215 |
| 2008 | Ukraine | 0.7368 | 0.7153 | 0.7900 | 0.6399 | 0.9683 | 0.9880 | 0.9758 |
| | EU-28 | 0.9596 | 0.9539 | 0.9910 | 0.9635 | 0.9825 | 0.9611 | 0.9270 |
| 2009 | Ukraine | 0.7271 | 0.6876 | 0.7632 | 0.6163 | 0.9736 | 0.9913 | 1.0000 |
| | EU-28 | 0.9638 | 0.9989 | 0.9936 | 0.9695 | 1.0000 | 0.9642 | 0.9466 |
| 2010 | Ukraine | 0.7814 | 0.7152 | 0.7854 | 0.6374 | 0.9750 | 0.9915 | 0.9970 |
| | EU-28 | 0.9691 | 1.0000 | 0.9941 | 0.9751 | 1.0000 | 0.9642 | 0.9456 |
| 2011 | Ukraine | 0.8062 | 0.7248 | 0.7953 | 0.6427 | 0.9705 | 0.9885 | 0.9864 |
| | EU-28 | 0.9706 | 0.9945 | 0.9946 | 0.9781 | 0.9943 | 0.9632 | 0.9426 |
| 2012 | Ukraine | 0.8510 | 0.7579 | 0.8238 | 0.6640 | 0.9752 | 0.9910 | 0.9915 |
| | EU-28 | 0.9733 | 0.9933 | 0.9951 | 0.9830 | 0.9943 | 0.9622 | 0.9456 |
| 2013 | Ukraine | 0.8763 | 0.7698 | 0.8469 | 0.6640 | 0.9760 | 0.9911 | 0.9896 |
| | EU-28 | 0.9737 | 0.9963 | 0.9959 | 0.9850 | 0.9972 | 0.9622 | 0.9476 |
| 2014 | Ukraine | 0.8131 | 0.7231 | 0.7838 | 0.6193 | 0.9696 | 0.9879 | 0.9798 |
| | EU-28 | 0.9792 | 0.9870 | 0.9966 | 0.9885 | 0.9972 | 0.9611 | 0.9456 |
| 2015 | Ukraine | 0.7537 | 0.6860 | 0.7188 | 0.5960 | 0.9689 | 0.9853 | 0.9681 |
| | EU-28 | 0.9860 | 0.9805 | 0.9975 | 0.9949 | 0.9972 | 0.9611 | 0.9426 |
| 2016 | Ukraine | 0.7475 | 0.7087 | 0.7059 | 0.5869 | 0.9636 | 0.9838 | 0.9508 |
| | EU-28 | 0.9869 | 0.9753 | 0.9981 | 0.9942 | 0.9943 | 0.9601 | 0.9426 |
| 2017 | Ukraine | 0.7511 | 0.7218 | 0.7081 | 0.6008 | 0.9670 | 0.9861 | 0.9444 |
| | EU-28 | 0.9889 | 0.9687 | 0.9991 | 0.9971 | 0.9943 | 0.9590 | 0.9406 |
| 2018 | Ukraine | 0.7336 | 0.7417 | 0.7454 | 0.6002 | 0.9647 | 0.9859 | 0.9958 |
| | EU-28 | 1.0000 | 0.9712 | 1.0000 | 1.0000 | 0.9943 | 0.9590 | 0.9385 |
| Average annual growth, *per cent* | Ukraine | 100.31 | 101.71 | 100.86 | 99.74 | 99.78 | 99.89 | 100.27 |
| | EU-28 | 100.35 | 100.19 | 100.01 | 100.40 | 100.14 | 99.97 | 100.09 |
| 2018/2005, *per cent* | Ukraine | 102.95 | 123.28 | 110.19 | 96.04 | 97.20 | 98.59 | 103.40 |
| | EU-28 | 104.62 | 102.38 | 100.18 | 105.30 | 101.84 | 99.67 | 101.13 |

*Source:* the author's calculations based on Table 2
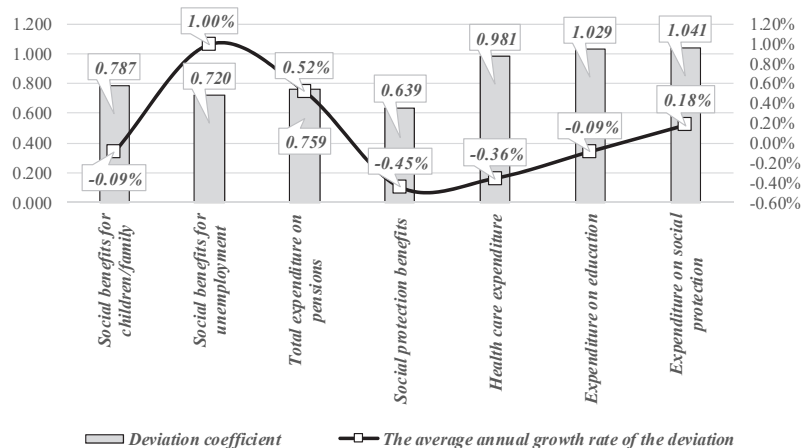


**Fig. 1.** The average annual rate of Ukraine's deviations of indicators of development of the social sphere from the EU-28 for 2005-2018

*Source:* the author's calculations based on Table 3

It should be noticed that against the background of a significant lag for some indicators of the development of the social sphere of Ukraine in 2005-2018, there are persistent trends to further deterioration of the situation. These are, social benefits for unemployment (the average annual growth rate of differentiation between Ukraine and the EU was 1.0 %), the amount of pension support (0.52 %) and the share of expenditures on social protection (0.18 %). Therefore, it is extremely important to correct the situation and change trends in these aspects of the development of the social sphere of Ukraine. It is also appropriate to emphasize the tendency to gradually reduce the gaps between Ukraine and the EU in social protection payments (average

annually 0.45 %), the share of health care expenditures (0.36 %) and social benefits for children (0.09 %). The situation with higher values of indicators of shares of expenditures on education and social protection in Ukraine in comparison with the EU-28 is a little paradoxical. According to the author, the reason for this situation was not better financing on education and social protection, but rather small amounts of budget opportunities against the background of high demand for financing in these areas in Ukraine. Therefore, the further improvement of the situation is closely correlated with the development of the economy, the increase of budget revenues with their further rational use to financially support health care sphere, education, science, and social protection of the population. The calculated indices of economic development in Ukraine and the EU-28 are given in the Table 4. The values of most indicators in Ukraine are also lower than the corresponding indicators in the EU-28, which does not contribute to the convergence of countries. However, it should be noted some positive changes that are observed in the dynamics. Thus, the average annual growth rate of indicators of economic development in Ukraine during 2005-2018 was higher than in the EU-28. The only exception was the excessive energy intensity of GDP.

**Table 4**
Indices of economic development indicators in Ukraine and the EU-28, 2005-2018

| Years | Countries | Adjusted gross income of households | Real gross domestic product | General government gross debt | Share of renewable energy in gross final energy consumption | High-tech exports | Harmonised index of consumer prices | Small-sized enterprises | Energy intensity of gross domestic product |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | Ukraine | 0.7506 | 0.7406 | 1.0000 | 0.6761 | 0.7926 | 0.9679 | 0.9114 | 0.7410 |
| | EU-28 | 0.9723 | 0.9836 | 0.6691 | 0.9068 | 0.9931 | 1.0000 | 0.9957 | 0.9577 |
| 2006 | Ukraine | 0.7653 | 0.7582 | 0.7446 | 0.6828 | 0.7988 | 0.9691 | 0.9121 | 0.7548 |
| | EU-28 | 0.9781 | 0.9872 | 0.6709 | 0.9148 | 0.9863 | 0.9975 | 0.9974 | 0.9620 |
| 2007 | Ukraine | 0.7778 | 0.7734 | 0.7636 | 0.6828 | 0.7988 | 0.9655 | 0.9165 | 0.7643 |
| | EU-28 | 0.9762 | 0.9904 | 0.6742 | 0.9270 | 0.9903 | 0.9949 | 1.0000 | 0.9693 |
| 2008 | Ukraine | 0.7919 | 0.7868 | 0.7152 | 0.6952 | 0.8047 | 0.9542 | 0.9129 | 0.7709 |
| | EU-28 | 0.9781 | 0.9905 | 0.6702 | 0.9362 | 0.9863 | 0.9909 | 0.9986 | 0.9708 |
| 2009 | Ukraine | 0.7706 | 0.7573 | 0.6630 | 0.7119 | 0.8076 | 0.9625 | 0.9151 | 0.7713 |
| | EU-28 | 0.9750 | 0.9846 | 0.6562 | 0.9504 | 0.9958 | 0.9898 | 0.9955 | 0.9724 |
| 2010 | Ukraine | 0.7909 | 0.7771 | 0.6505 | 0.7010 | 0.8104 | 0.9691 | 0.9121 | 0.7568 |
| | EU-28 | 0.9786 | 0.9870 | 0.6509 | 0.9561 | 0.9903 | 0.9875 | 0.9986 | 0.9708 |
| 2011 | Ukraine | 0.7985 | 0.7881 | 0.6599 | 0.7010 | 0.8131 | 0.9702 | 0.9114 | 0.7704 |
| | EU-28 | 0.9810 | 0.9889 | 0.6487 | 0.9587 | 0.9863 | 0.9842 | 0.9516 | 0.9787 |
| 2012 | Ukraine | 0.8155 | 0.8008 | 0.6582 | 0.7010 | 0.8573 | 0.9780 | 0.9106 | 0.7755 |
| | EU-28 | 0.9835 | 0.9881 | 0.6467 | 0.9714 | 0.9880 | 0.9813 | 0.9514 | 0.9787 |
| 2013 | Ukraine | 0.8174 | 0.8017 | 0.6500 | 0.7358 | 0.8491 | 0.9781 | 0.9151 | 0.7832 |
| | EU-28 | 0.9838 | 0.9882 | 0.6450 | 0.9778 | 0.9857 | 0.9797 | 0.9507 | 0.9804 |
| 2014 | Ukraine | 0.7887 | 0.7769 | 0.6023 | 0.7314 | 0.8613 | 0.9544 | 0.9106 | 0.7868 |
| | EU-28 | 0.9871 | 0.9901 | 0.6445 | 0.9853 | 0.9874 | 0.9791 | 0.9529 | 0.9889 |
| 2015 | Ukraine | 0.7701 | 0.7611 | 0.5922 | 0.7485 | 0.8761 | 0.9397 | 0.9114 | 0.7905 |
| | EU-28 | 0.9934 | 0.9926 | 0.6462 | 0.9897 | 0.9953 | 0.9789 | 0.9514 | 0.9907 |
| 2016 | Ukraine | 0.7700 | 0.7635 | 0.5907 | 0.7777 | 0.8469 | 0.7447 | 0.9041 | 0.7916 |
| | EU-28 | 0.9934 | 0.9948 | 0.6472 | 0.9919 | 0.9995 | 0.9787 | 0.9539 | 0.9925 |
| 2017 | Ukraine | 0.7831 | 0.7767 | 0.6004 | 0.7963 | 0.8286 | 0.9646 | 0.9106 | 0.8034 |
| | EU-28 | 0.9957 | 0.9977 | 0.6487 | 0.9959 | 0.9995 | 0.9768 | 0.9522 | 0.9943 |
| 2018 | Ukraine | 0.7927 | 0.7856 | 0.6140 | 0.8021 | 0.8381 | 0.7690 | 0.9136 | 0.8107 |
| | EU-28 | 1.0000 | 1.0000 | 0.6502 | 1.0000 | 1.0000 | 0.9748 | 0.9544 | 1.0000 |
| Average annual growth, *per cent* | Ukraine | 100.44 | 100.48 | 96.62 | 101.34 | 100.45 | 98.89 | 100.02 | 100.70 |
| | EU-28 | 100.22 | 100.13 | 99.78 | 100.76 | 100.05 | 99.80 | 99.68 | 100.33 |
| 2018/2005, *per cent* | Ukraine | 105.62 | 106.08 | 61.40 | 118.63 | 105.73 | 79.45 | 100.25 | 109.40 |
| | EU-28 | 102.85 | 101.67 | 97.18 | 110.28 | 100.70 | 97.48 | 95.86 | 104.41 |

*Source:* the author's calculations based on Table 2

In general, in 2005-2018, significant differences in the values of indicators of economic development of countries were observed in the share of renewable energy in total energy consumption (by 24.7 %), real GDP (21.8 %), energy intensity of GDP (20.7 %) and adjusted gross income (20.3 %) (Fig. 2). Therefore, to ensure the fastest convergence of economic environments between Ukraine and the EU, public policy should primarily focus on increasing production, sales and exports of high value-added products, depth of processing and innovation, as well as the implementation of energy saving programs.

These conclusions are confirmed by the fact that these indicators were perhaps the highest average annual growth rates in 2005-2018 disparities of the values of indices in Ukraine and the EU-28, namely the share of renewable energy in total energy consumption (annually on average) by 0.43 %, energy intensity of GDP (0.28 %), real GDP (0.25 %), adjusted gross income (0.16 %). However, it should be added the rapid growth of differentiations between Ukraine and the EU in terms of indicators as the number of small units (0.32 %) and high-tech exports (0.31 %).
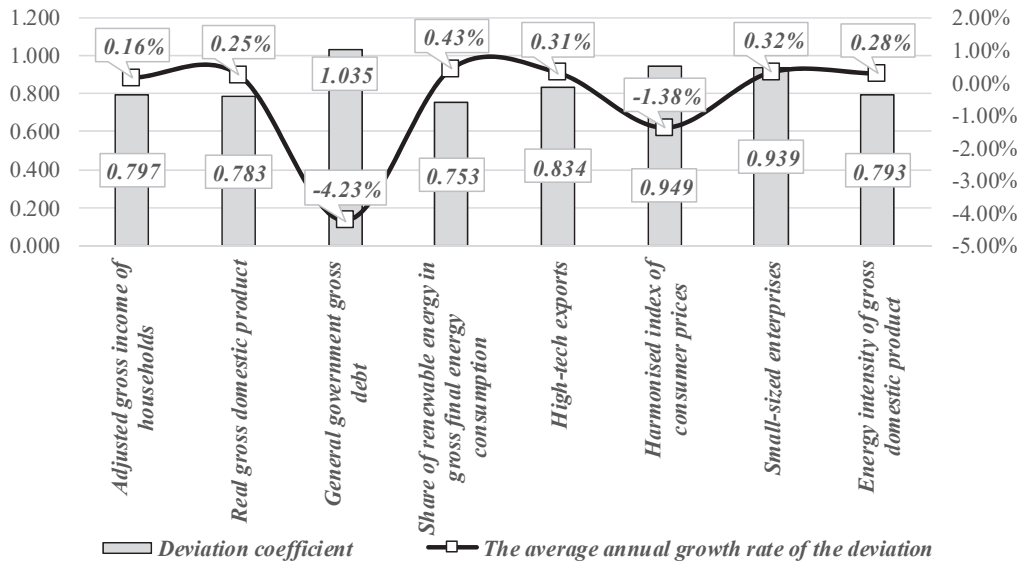
**Fig. 2**. The average annual rate of Ukraine's deviations of economic development indicators from the EU-28 for 2005-2018

*Source:* the author's calculations based on Table 4

The high level of gross public debt, which continues to grow, is a critically acute problem that prevents Ukraine's integration into the EU. When before 2008, this indicator did not exceed 20 %, and in 2009-2013 ranged from 30 %, in 2016, the gross public debt of Ukraine increased to 80.9 %, the highest rate at the modern stage of social and economic development of the country. In 2018, this indicator decreased to 60.9 %, however, remained critically high. The results of estimating the integral values of social development of Ukraine and the EU-28 are shown in Fig. 3a. The obtained data strengthen the argument about the presence of significant disproportions in social and economic development of Ukraine and the EU, which do not contribute to the further convergence and integration of Ukraine into the EU. This is confirmed by the following facts. Firstly, throughout the period 2005-2018, there was a significant gap in index values between Ukraine and the EU, which was 0.638 in 2018. Secondly, the differentiation during 2005-2018 increased by 0.062 (from 0.576 in 2005). Thirdly, while the indices of social development in the EU-28 were characterized as stable (for the period 2005-2018, the integral indicators were showing an upward trend, except year 2017), in Ukraine the oscillations and instability were observed (from 2005 to 2013, the value of the index of social development improved; in 2014-2016 there was a decay; in 2017-2018 some minor recovery started, and in 2018 the indicator was 0.231 that was less than in 2013 by 0.132).
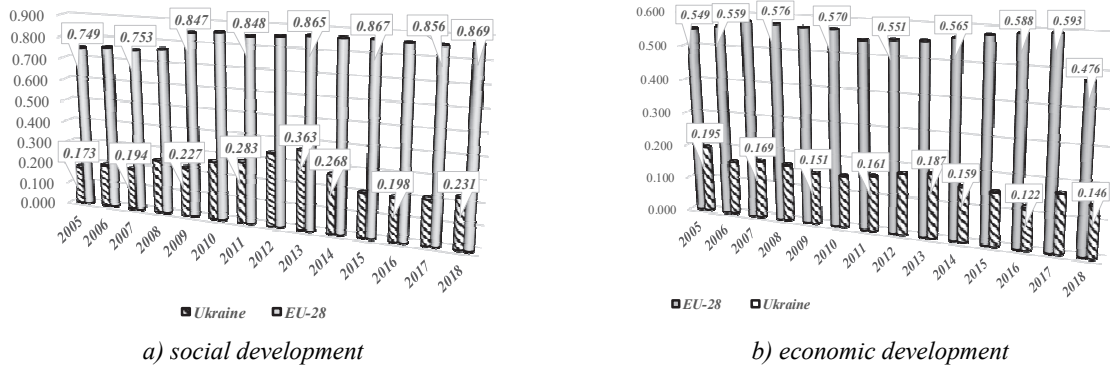


*a) social development*



*b) economic development*

**Fig. 3.** Social and economic development indices in Ukraine and the EU-28, 2005-2018

*Source:* the author's calculations based on Tables 3-4

However, the economic development of the EU-28 is not as stable as social one (Fig. 3b), and values of the corresponding integral indices in 2018 and 2017 were decreased from 0.593 to 0.476. Even at this level, the value was significantly higher than in Ukraine (0.146), which did not provide for the convergence of economies. Moreover, for Ukraine, the period 2005-2018 was characterized by a decline in the index of economic development, which had a negative affect. The above mentioned changes in the values of partial and integral indices of social and economic development affected the rate and dynamics of integral indices of social and economic development of Ukraine and the EU-28 (Fig. 4). The disparity of 2018 was 0.459, when the integral value for the EU-28 was 0.643, and for Ukraine – 0.184. In 2016-2018 differentiation in levels of social and economic development of Ukraine and the EU-28 decreased. However, it was not a cause of the success of economic reforms in Ukraine but as a result of a certain reduction of the integral index in the EU-28. It is noteworthy that in 2018 the gap in the

values of the integral index of social and economic development corresponded to the level of 2005, and the slightest deviation (0.431) was observed in 2013, when the value for the EU-28 was 0.691, and for Ukraine – 0.260.
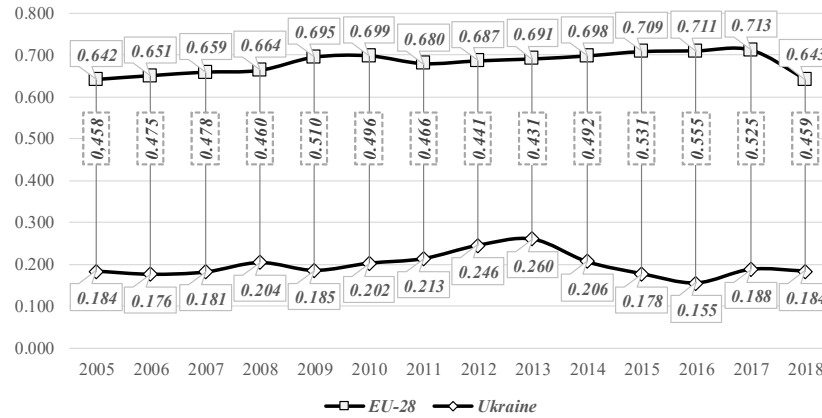


**Fig. 4.** Integral indices and gaps of fluctuations of social and economic development of Ukraine and the EU-28, 2005-2018
*Source:* the author's calculations



| **Strategic priorities** of the state policy | | | | |
|---|---|---|---|---|
| Diversification of international economic relations and foreign trade | Support of stability and independence of the state financial system | Convergence of social security with the leading international practices | Realization of the potential of 'drivers' of economic sovereignty and development | Strengthening of energy independence, increasing of energy efficiency |

**Policy objectives**:

➢ formation of stable and equitable long-term foreign trade relationships with reliable partners, diversification of supply markets and sales;
➢ contraction of import dependence of the national economy and domestic market;
➢ decrease in the level of public debt and reduction of dependence on international financial institutions;
➢ reduction of the poverty rate and increase in quality of life, social cohesion of the nation, containment of emigration and labour migration, weakening of economic dependence on the human resource shortage;
➢ decline in the influence of energy costs on political and economic decisions

**Tools for policy implementation**

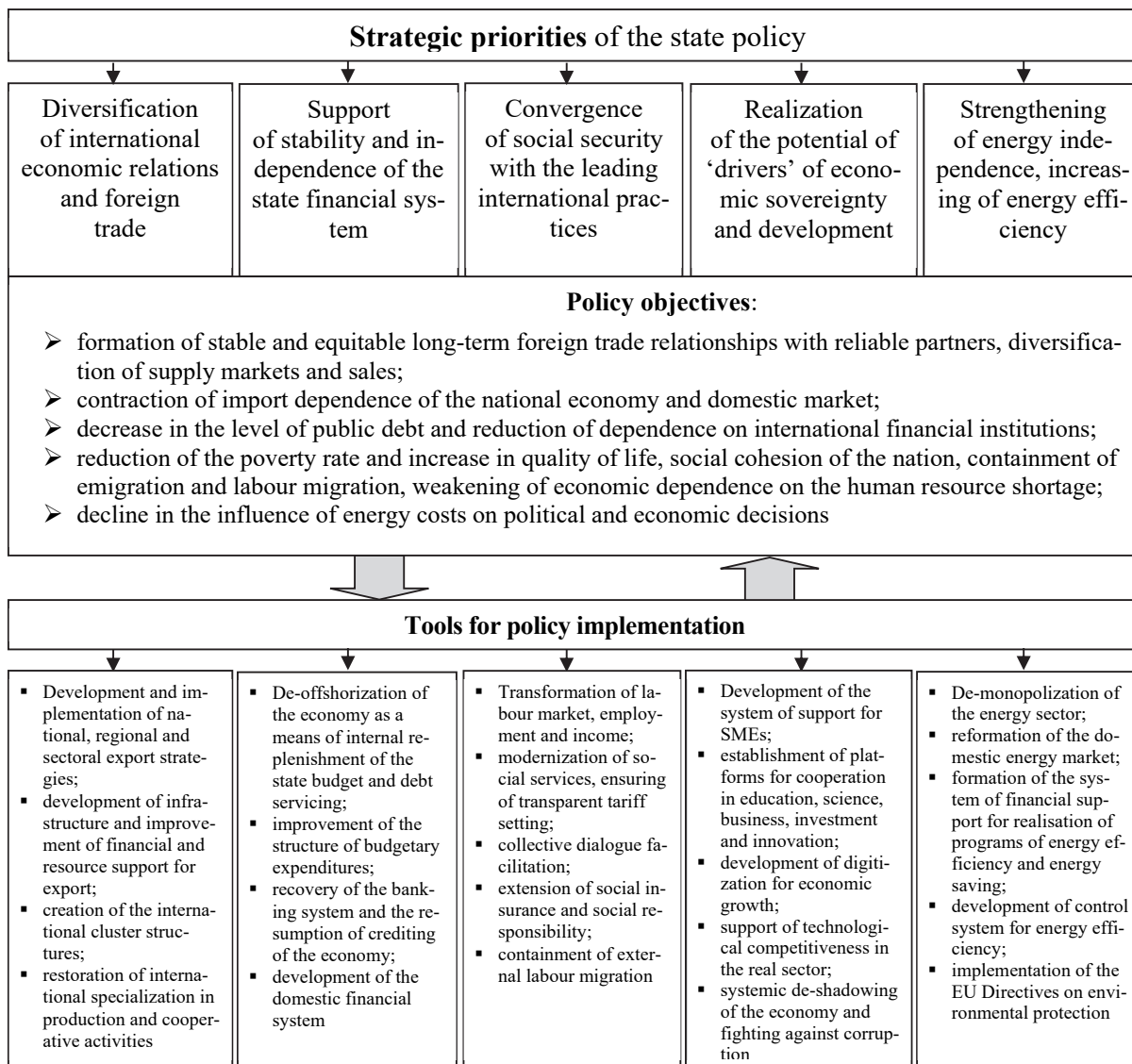| | | | | |
|---|---|---|---|---|
| ▪ Development and implementation of national, regional and sectoral export strategies;<br>▪ development of infrastructure and improvement of financial and resource support for export;<br>▪ creation of the international cluster structures;<br>▪ restoration of international specialization in production and cooperative activities | ▪ De-offshorization of the economy as a means of internal replenishment of the state budget and debt servicing;<br>▪ improvement of the structure of budgetary expenditures;<br>▪ recovery of the banking system and the resumption of crediting of the economy;<br>▪ development of the domestic financial system | ▪ Transformation of labour market, employment and income;<br>▪ modernization of social services, ensuring of transparent tariff setting;<br>▪ collective dialogue facilitation;<br>▪ extension of social insurance and social responsibility;<br>▪ containment of external labour migration | ▪ Development of the system of support for SMEs;<br>▪ establishment of platforms for cooperation in education, science, business, investment and innovation;<br>▪ development of digitization for economic growth;<br>▪ support of technological competitiveness in the real sector;<br>▪ systemic de-shadowing of the economy and fighting against corruption | ▪ De-monopolization of the energy sector;<br>▪ reformation of the domestic energy market;<br>▪ formation of the system of financial support for realisation of programs of energy efficiency and energy saving;<br>▪ development of control system for energy efficiency;<br>▪ implementation of the EU Directives on environmental protection |

**Fig. 5.** Strategic priorities, objectives, and tools of the state policy of social and economic development of Ukraine with a focus on convergence and formation of pre-conditions for EU integration

Thus, the presence of a substantial gap between the social and economic development of Ukraine and the EU-28 is empirically confirmed for the entire period of 2005-2018. During this time, the significant positive shifts in Ukraine were not observed, except some permanent higher values of indicators of social development of the country. This is a major institutional, economic, social, and psychological barrier for social and economic integration of Ukraine into the EU. The solution to this problem requires identification of strategic priorities of the state policy for enhancing social and economic development and eliminating the backlog of Ukraine's economy and development of its social sphere from EU countries. Furthermore, the appropriate tools and means of state regulation should be focused on achieving certain policy objectives. The vision of strategic priorities of the state policy for ensuring social and economic development of Ukraine, as well as a set of tasks and tools of regulation, in fact, serve as guidelines in forming effective and efficient policy of social and economic integration of Ukraine into the EU at this stage (Fig. 5).

It is important to point out the functional structural and organizational approaches to the policy of planning the social and economic development of Ukraine in the most vulnerable sectors (in terms of the functioning and proper reproduction of the economy, as well as the functioning of the country's social sphere), namely in the macroeconomic, financial, social, investment and innovation, energy sectors. In addition, for implementing the policy of convergence and integration with the EU, it is reasonable to develop the priority areas of social and economic development of Ukraine, such as diversification of foreign economic ties and relations, providing with stability of the financial system performance and independence, improvement of the parameters of the social security system, involvement of the 'drivers' of economic development, strengthening of energy independence and improvement of energy efficiency and energy saving. The implementation of tools for state regulation in these areas is the path to the creation of an effective system of social and economic development, as well as construction of a 'fuse' of the potential gain of divergence between the EU and Ukraine in key areas.

## 5. Discussion and Conclusions

The existence of substantial lag in social and economic development of Ukraine and the EU-28 is empirically confirmed. In addition to the higher permanent values of the most individual indicators of social development and economic growth during 2005-2018, Ukraine is characterized by much worst values, which is a significant institutional, economic, social, psychological barrier in the process of further integration of Ukraine into the EU. In 2018, the value of the integral index of social and economic development of Ukraine (0.184 in a scale from zero to one) was 3.5 times lower in comparison with the same indicator in the EU-28 (0.643). Despite some convergence, observed in 2010-2013, by 2018, the disparities fell back to the level of the year 2005. Causes of Ukraine-EU divergence have both social and economic nature. The first one is more significant and the integral index of social development of Ukraine (0.231) in 2018 was lower in 3.8 times than in the EU-28 (0.869). The difference in the values of the integral index of economic development (0.146 and 0.476, respectively) was in 3.3 times. The results of the indicator analysis of the state and dynamics of the respective differentiations allowed us to distinguish the areas that led to the greatest increase in the divergence of social and economic development of Ukraine and the EU-28 in 2005-2018. Regarding the development of the social sphere, there are social unemployment benefits (the average deviation was 28 %, and the average annual growth rate was 1.0 %), the amount of pension benefits (24.1 % and 0.52 %, respectively), social protection payments (36.1 % deviation with a 0.45 % gradual decrease annually), social benefits for children (21.3 % with a reduction by 0.09 % per year). Regarding economic development, these areas are the gross public debt (which increased to 60.9 % of GDP in 2018), the share of renewable energy sources in total energy consumption (the average deviation was 24.7 %, and the average annual growth rate was 0.43 %), real GDP (21.8 % and 0.25 %, respectively), real adjusted gross income (20.3 % and 0.16 %, respectively), energy intensity of GDP (20.7 % and 0.28 %, respectively), the share of high technology exports (16.6 % and 0.31 %, respectively) and the number of small businesses (6.1 % and 0.32 %, respectively). This highlights the need to determine strategic guidelines of the state policy to enhance social and economic development, the achievement of which will eliminate the lag of Ukraine's economy and the development of its social sphere in comparison with the EU. The tools and means of the state regulation should be directed to the following priorities for improving the preconditions of cohesion and European integration policy in the field of social and economic development of Ukraine that are (1) diversification of foreign economic relations, (2) ensuring of stability and independence of the financial system, 3) improvement of the parameters of the social security system, (4) involvement of the 'drivers' of economic development, (5) strengthening of energy independence and increase of the level of energy efficiency and energy saving.

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