EU VECTOR OF UKRAINE DEVELOPMENT: LINKING BETWEEN MACROECONOMIC STABILITY AND SOCIAL PROGRESS

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ABSTRACT

The paper deals with analysis of the linking between level of social progress and macroeconomic stability as the basis for the foresight of the country's development strategy. For that purpose, the authors analysed the main indicators which influenced on country's level of macroeconomic stability. On the findings, we allocate the main social determinants which should be taken to account during the developing the country's development strategy. In the paper, the authors tried to prove the hypothesis: the linking between levels of macroeconomics stability and social progress. Thus, the authors used the economics and mathematical approaches as follows: TOPSIS, σ and β-convergences, cross-sectional regression analysis, principle component analysis, least square method, moment method of Arellano-Bond. The focus of investigation was: five latest members of EU (Latvia, Lithuania, Croatia, Romania and Poland) and Ukraine. The dataset for analysing were taken from nine data bases: World Data Bank, United Nations, World Intellectual Property Organization, The Heritage Foundation, Freedom House and etc. On the statistical dataset the authors developed the massive of statistics information on 19 parameters which have been structural consolidated under three main sub-indexes: "Life, Health, Welfare", "Science, Education, Cultural", "Freedom, Equal, Safety". On the obtained results of the convergence between social progress and macroeconomic stability, the authors developed the model which allowed described the character of the linking between macroeconomic stability and level of the social progress. Using the proposed model and findings (on EU experience) the authors allocated three based development strategies for Ukraine: quasi-integration growth, convergent diversification, progressive growth. The findings showed that for Ukraine the most applicable and attractive strategy is convergent diversification which will be allowed harmonizing the macroeconomic stability and level of social progress.

Keywords: Stability; Progress; Factors; Social; Freedom; Welfare growth

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1.   INTRODUCTION

The modern tendency in the world among the countries to achieve the leader position on the economic developments, in the informational technologies and etc. justifies the exhausting and intensification of the all types of the resources (human, natural, financial ant etc.). The main issue in that running is the appearing of the disparities in the all others sectors (social, financial, environmental and etc.) Therefore, striving to achieve the economic goals provokes the neglecting of the social, the financial and the environmental aims. Such exhausting of natural recourses provokes the whole range of the environmental problems and increases the production costs. The overtime working of the staff have negative impact on human resources which is accompanied by the numbers of the social strikes. Besides, the economic development couldn't be without technological progress contributing the huge financial resources.

At the same time, new technologies lead to decreasing the consumptions of the resources and production costs, improving the life quality of society and etc. From the other side, the economic development guarantees the increasing of the life qualities, creating new workplaces and decreasing of the unemployment rate, providing the increasing of the social progress. Thus, we received the vicious circle: macroeconomic stability – social progress – ecological stability – technological progress. In that case, the government during the implementation of the corresponding reforms and the formulating the country's development strategy should take to account all aims economic, social, technological, and ecological, and etc. in the parity and on the equal base.

Noticed, that Ukraine has already started the EU integration process which accompanied by the corresponding reforms and transformations in all sectors and spheres. The first stage (the political part of EU Ukraine) had been signed on 21 March 2014; the second stage was the economic part of agreement which had been signed on 7 June 2014. Thus, starting from the 1st of January 2016 the economic part of Associated Agreement is in operation (Countries, 2017; EU-Ukraine, 2012). According to the obtained results of analysis of cooperation between EU and Ukraine (Zhylinska, et al., 2017; Pilia, 2017; Pimonenko et al., 2018a), EU has the huge share in international cooperation with Ukraine. And every year this cooperation improves and progress. And it is necessary to underline, that it is only the first visible results of European integration.

Moreover, the previous experience of the latest member of EU (Latvia, Lithuania, Croatia, Romania and Poland) is shown the positive economic effect. The results of the GDP dynamics of the above-mentioned countries are indicated that GDP of these countries is continuing to increase. The snowballing results have Poland (figure 1). Besides, in 2017 the GDP growth was the highest in Romania 178% compare to 2004 (year of EU integration).

Figure 1: The GDP dynamics of Latvia, Lithuania, Croatia, Romania, Poland and Ukraine 2000–2017 years, billions of USA
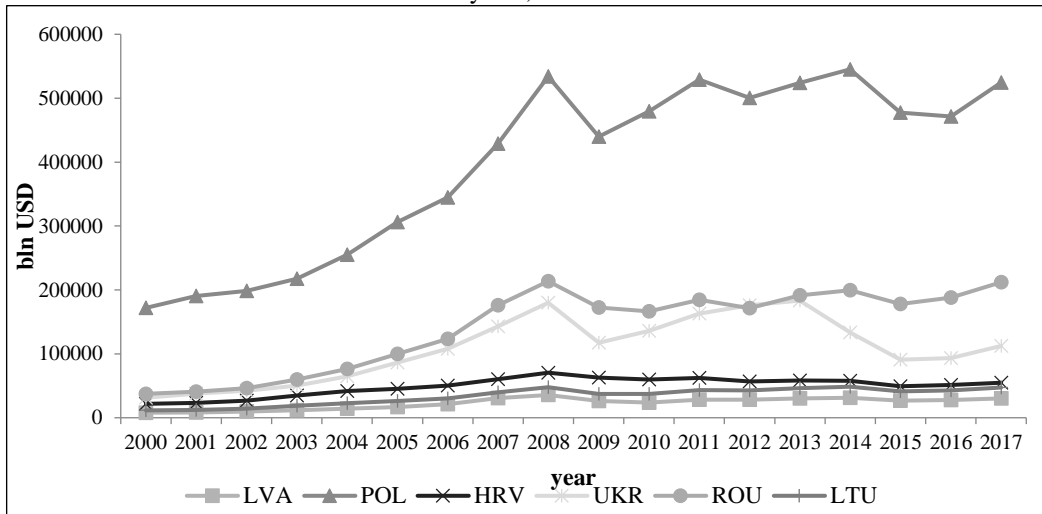
It should be highlighted, that among the analysed countries, during 2009-2017 in Latvia and Romania the Global Competitive Index was declining compare to 2007 (figure 2), but other countries Ukraine, Croatia, Lithuania and Poland had the positive tendency.

Figure 2: Tendency of Global Competitive Index
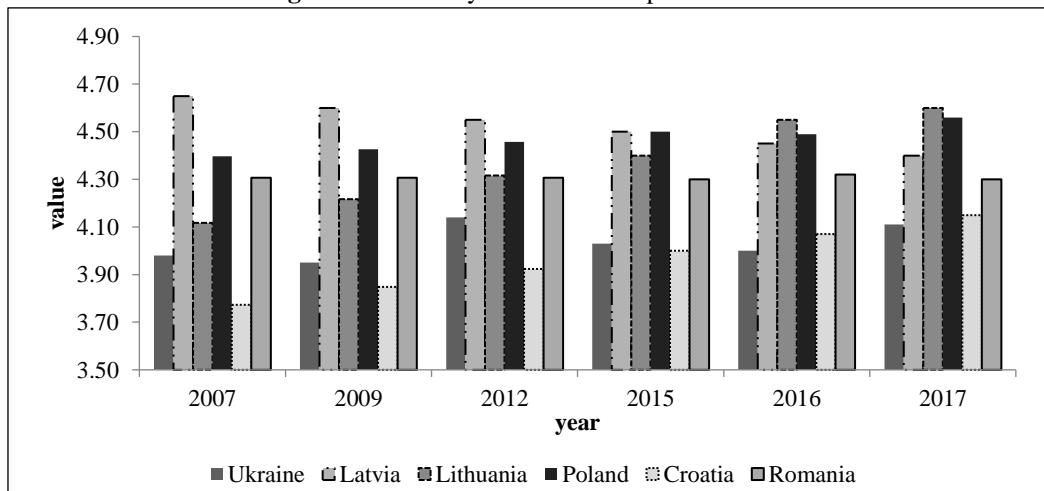
All above-mentioned members are countries with a high Human Development Index. On this Index the worse position had Ukraine, but with positive tendency. In 2018 Croatia's value was decreasing

as in Latvia. In 2018 Poland had the higher value of Human Development Index, Romania and Lithuania had the positive tendency.

Figure 3: The dynamic of Human Development Index
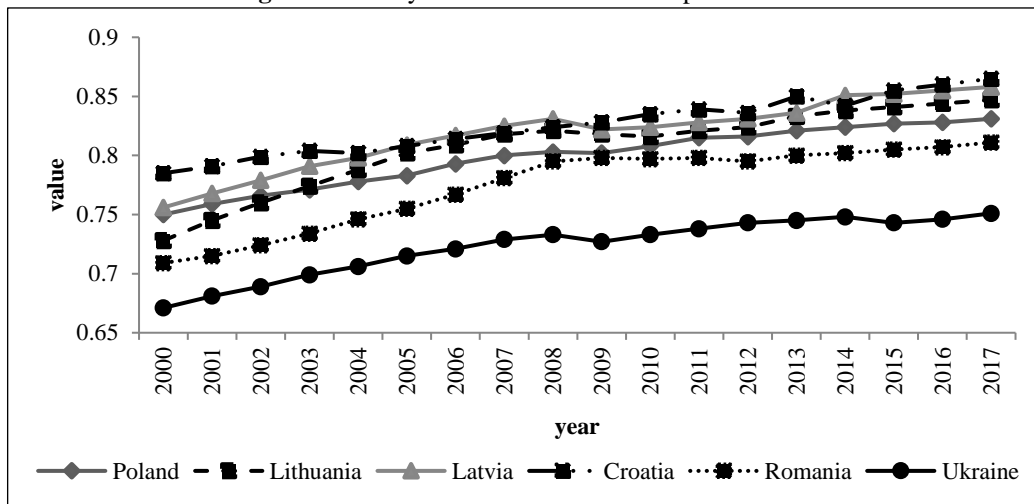
In that case, it should be highlighted that all-abovementioned countries according to the macroeconomic imbalance procedure (MIP) didn't have the positive results (which more than thresholds) on the indicator Net international investment position as share of GDP (NIIP). At the same time, Latvia had value higher than thresholds on indicator – 3-year percentage change of the real effective exchange rates based on HICP/CPI deflators, relative to 41 other industrial countries (REER) and Croatia on General government sector debt in % of GDP (GGS); Latvia and Lithuania on indicators – 3-year percentage change in nominal unit labour cost (NULC); Latvia and Romania – Year-on-year changes in house prices relative to a Eurostat consumption deflator (HP); Croatia and Latvia on indicators – 3-year backward moving average of unemployment rate (UR). Noticed that all employment indicators (3-year change in p.p. of the activity rate (AR); 3-year change in p.p. of the long-term unemployment rate (LUR); 3-year change in p.p. of the youth unemployment rate (YUR)), two external imbalances indicators (3-year backward moving average of the current account balance as share of GDP (CAB), 5-year percentage change of export market shares measured in values (EMS) and three indicators from the group of internal imbalances (Private sector credit flow in % of GDP (PSC), Private sector debt (consolidated) in % of GDP (PSD), Year-on-year changes in total financial sector liabilities (FL)) were in the normalised value and correspond to the thresholds.

Table 1: Macroeconomic Imbalanced Procedure: Scoreboard 2016

Countries	External imbalances					Internal imbalances						Employment indicators		
	CAB	NIIP	REER	EMS	NULC	HP	PSC	PSD	GGS	UR	FL	AR	LUR	YUR
Croatia	2,9	-70,1	0,1	8,12	-5,90	2,1	-0,10	106,10	82,9	15,6	2,5	1,9	-4,4	-18,1
Latvia	-0,3	-58,9	4,9	9,25	16,5	7,4	0,3	88,3	40,6	10,1	5,8	2,3	-1,7	-5,9
Lithuania	-0,3	-43,2	5,4	5,38	14,7	4,5	4,3	56,2	40,1	9,2	16,3	3,1	-2,1	-7,4
Poland	-1	-60,7	-5	18,13	2,10	2,5	4,7	81,6	54,1	7,6	8,9	1,8	-2,2	-9,6
Romania	-1,3	-49,9	-2,5	23,58	6,00	6,5	0,60	55,80	37,6	6,5	7,6	0,7	-0,2	-3,1

Resources: Compiled by authors based on Commission, 2017; The indicators, 2017, Pimonenko et al., 2018a

The results of statistical analysis showed that abovementioned countries after EU integration had as the positive results so as some issues. In that case, for Ukraine the transformation process could provoke not only positive changes, but also a range of the barriers. That is why Ukraine should take to account the best experience of each country, adopt to own conditions and features and only after that try to implement the corresponding reforms which require the EU integration process. In addition, Ukraine should consider the main principles of sustainable development and try to achieve equilibrium between economic, social and ecological goals.

2. LITERATURE REVIEW

Noticed, that issues of the parity between economic, social and ecological goals have been investigating by the wide range of scientists. In addition, all world community try to achieve equilibrium through the implementation and achieving of the Sustainable Development Goals 2030. It should be underlined, that SDGs 2030 tried to implement the parity and sustainable development around the world through the inclusive development strategy of all sectors (Prince, 2017; Chygryn, 2016; Tambovceva et al., 2017; Vasilyeva et al., 2016).

Thus, in the official report "Ukraine 2030: Sustainable Development" (Zhylinska, et al., 2017) the experts analysed the horizon of social and economic development in Ukraine on the basis of Declaration G20 on Sustainability. The experts indicated 19 indicators' which allows making the estimation of the social development level. It should be noticed, that these indicators allow allocating only the direction and vector of social development. In this direction, it is necessary to investigate and allocate parameters which could be compiled in one integrated indicator and allowed to give the quantitative analysis of social progress.

Thus, all investigations on that issue could be divided by on the several groups according to the key (bullet points) aims and to the accents as follows: the linking between economic and environmental indicators (Dimante et al., 2016; Pimonenko et al., 2018b; Lyulyov et al., 2015; Cebula et al., 2015; Chortok & Rodymchenko, 2014); inclusive growth (Louis, 2018; Tambovceva et al., 2018); access to the resources (financial, educational, natural and etc.) in the papers (Prokopenko et al., 2017; Pimonenko et al., 2017; Tambovceva, 2016; Vasylieva et al., 2013); affordable conditions for living (Kubatko and Kubatko, 2017), macroeconomic imbalance and country's welfare (Vasylieva et al., 2018; Lauzadyte-Tutliene et al., 2018); macroeconomic stability and democracy level (Yevdokimov et al., 2018); countries welfare and quality of the social

institutions (Cohen, 2017; Vasylieva et al., 2014; Bhowmik, 2018; Harold, 2018; Vasilyeva et al., 2018; Jovovic et al., 2017; Draskovic et al., 2017) and etc.

It should be highlighted, that most of the scientists proved that macroeconomic stability is one of the key factors to the country's welfare. In that case, the latest scientific economic papers devoted to the analysis of the main indicators which influence on macroeconomic stability from the different point of view: financial, ecological, technical, political, social and etc.
Besides, the scientists in the paper (Tunay and Yüksel, 2016; Nguedie, 2018; Lyeonov et al. 2018; Pilia, 2017; Krasnyak & Chygryn, 2015) the macroeconomic stability has the huge impact on the emergency economy and low-income economies.

Thus, the authors in the paper (Yevdokimov et al., 2018) proved the linking between level of freedom and democracy were the key indicators for increasing of macroeconomic stability. Thus, in that paper their findings showed the statistically significant impact of economic freedom and democracy on macroeconomic stability. The authors (Melnyk et al., 2018; Chygryn et al., 2018; Tung, 2018; Lyulyov et al., 2018) analysed the correlation between macroeconomic stability, social development and fiscal decentralization.

In the paper (Abaas et al., 2018) the authors analysed of OPEC countries and on the basis of the obtained result made conclusions that the social factors had the statistically significant impact on economic growth and were the drivers of economic development.

The main aim of this paper is analysing of the linking between macroeconomic stability and social progress with purpose to build the foresight model of the development strategy for the country. In that case, the authors analysed and consolidated the main factors among the social determinants which influenced on the macroeconomic stability.

Thus, the authors (Gnade et al, 2017) analysed South African and proved that basic and social infrastructure had the positive impact on economic growth and social development in that countries. The other scientists in the paper (Castells-Quintana et al., 2012) analysed the linking between the unemployment rate and level of economic development. They proved that the huge level of unemployment had the significant and negative impact on long-term economic development.
The group of scientists in the paper «Economic Growth and the Demographic Transition» (David et al, 2001) on the findings made conclusions the necessity of implementing the demographic reforms in the countries. They investigated three main hypotheses:

- population growth restricts economic development (the «pessimistic» theory);
- population change can fuel economic growth (the «optimistic» theory);
- population change has no significant effect on economic growth (the «neutralist» theory) (David et al, 2001).

In the paper (Lutz et al, 2008) the scientists analysed the level of education as a key factor of economic growth. Using the Koba-Duglas functioning in the paper's findings (Odit, 2010) showed that GDP growth relate from the level of education among society which influenced on the labour productivity.

3.   METHODOLOGY

The main aim of the paper is cheeking of two hypotheses:

H0: the convergence of the indicators of social progress index under the reforming process in new members of EU
H1: the linking between levels of macroeconomics stability and social progress.

Under the investigation five latest members of EU (Latvia, Lithuania, Croatia, Romania and Poland) and Ukraine which has already started the EU integration process were analysed.

As in 2010 EU countries implemented the strategy "Europe 2020" (Communication, 2010) with key aim to invest the social development. The results of analysis showed that the reorientation of finance flow to the social sector had the significant impact on the macroeconomic stability in EU countries. In this case, the period of analysing was 2000-2007 years (time before and after social reforms in EU). These countries were chosen because all of above-mentioned countries had the same fluctuation of GDP per capita and spending on social development. It should be underlined, that focus of researching was concentrated on Ukraine in the context of implementing the development strategy under the EU integration.

The dataset for analysing were taken from nine data bases: World Data Bank, United Nations, World Intellectual Property Organization (2018), The Heritage Foundation (2018), Freedom House (2018) and etc. On the basis of "Ukraine 2030: Sustainable Development" (Zhylinska, et al., 2017) the authors developed the massive of statistics information on 19 parameters which have been structural consolidated under three main sub-indexes: "Life, Health, Welfare" (I_{lhi}), "Science, Education, Cultural" (I_{sec}), "Freedom, Equal, Safety" (I_{fes}) (table 2).

Table 2: The main indicators of three sub-indexes I_{lhi}, I_{sec}, I_{fes}

Indicators	Symbol
Life, Health, Welfare	**I_{lhi}**
– Human Development Index	k_{hdi}
– Global Hunger Index	k_{ghi}
– Legatum Prosperity Index	k_{pi}
– Health Care Costs	k_{he}
– The share of the population aged 15-64 in% of the total	k_{pop}
– The share of population aged 0-14 in% of the total number	k_{pa}
– Gini Coefficient	k_{gni}
– The share of the population living in poverty in% of the total	k_{phr}
– Expected life Expectancy	k_{leb}
Science, Education, Cultural	**I_{sec}**
– The number of patent applications	k_{pap}
– Global Innovation Index	k_{gii}
– The share of government spending on education in GDP	k_{ge}
– The coefficient of education	k_{ger}
– The share of government spending on research and development in GDP	k_{rde}

Indicators	Symbol
Freedom, Equal, Safety	**I$_{fes}$**
– Economic Freedom Index	k$_{ief}$
– World Press Freedom Index	k$_{pfi}$
– Human Freedom Index	k$_{cli}$
– International Property Rights Index	k$_{ipr}$
– Network Readiness Index	k$_{nri}$

Source: Consolidated by the authors

Using the TOPSIS method three sub-indexes I_{lhi}, I_{sec}, I_{fes} were calculated. All above-mentioned three sub-indexes were consolidated in one integral index of social progress (I_{sp}) by the method of geometric mean.

After that, with purpose to estimate the efficiency, directions of social reforms and convergence (the countries develop in one directions) or divergence (each country has own tendency) of the social development in each countries the authors used the (1) and 2).

$$\sigma - \text{convergence } \sigma_t = (\sqrt{\sum_{i=1}^{N}(\ln(k_{jt}) - \ln(\overline{k_t}))/N} \qquad (1)$$
$$\beta - \text{convergence } ((1/T)ln(k_{jt} - k_{0t}) = \alpha + \theta \ln(k_{0i}) + \varepsilon, \beta = -(1/T)ln(1 + \theta T \qquad (2)$$

where N – numbers of countries (6); k_{it} – value of j parameters in t period; T – period of investigation (17 years); α, θ –constant; ε – errors; k_{oi} – value of j parameters in i countries in the target year (2010); $\overline{k_t}$ – average of j-parameters in t period in the whole among the dataset of countries.

For checking the above-mentioned H1 the authors developed the dynamic model which based on the moment method of Arellano-Bond. The explanation of the endogenous and exogenous parameters is showed in the table 3.

Table 3: The Exogenous and Endogenous Parameters

Type of parameters	Indicators/explanations	Symbol
Endogenous	The integration index of the country into globalization processes in the global economy. Globalization not only increases the mobility of labour resources, which causes hyper dynamic transformations of the social sector, but also forms new megatrends of the money flow and capital.	**KOF**
	The aggregate indicator of the of public administration efficiency. The role of institutions is to create protective buffers for the economy and the social sector from external shocks, therefore, countries with inefficient judicial system, political instability, in which the mechanisms of limiting access of political elites to resources and struggle are not regulated with corruption are not able to level the influence of the volatility of exogenous shocks on the achievement of the macroeconomic stability and social progress.	**GOV**

Type of parameters	Indicators/explanations	Symbol
Exogenous	Population was entered in the model to ensure an adequate comparison of countries	**Pop**
	The type of the government (introduced into the model as a fictitious variable (0 is a presidential republic, 1 is a mixed republic, 2 is a parliamentary republic).	**Reg**

Source: Consolidated by the authors

The general model of functional linking between level of social progress (I_{sp}) and macroeconomic stability was shown in the formula (3, 4). Formula 3 described the impact of I_{sp} on macroeconomic stability; the second equitation described the impact of macroeconomic stability on I_{sp}.

$$MS_{it} = \alpha_1 \Delta MS_{it-1} + \alpha_2 \Delta Isp_{it} + \alpha_3 \Delta KOF_{it} + \alpha_4 \Delta GOV_{it} + \alpha_5 \Delta Pop_{it} + \alpha_6 Reg_{it} + \varepsilon_{it} \quad (3)$$
$$Isp_{it} = \beta_1 \Delta Isp_{it-1} + \beta_2 \Delta MS_{it} + \beta_3 \Delta KOF_{it} + \beta_4 \Delta GOV_{it} + \beta_5 \Delta Pop_{it} + \beta_6 Reg_{it} + \varepsilon_{it} \quad (4)$$

where $\alpha_1 \ldots \alpha_6$, $\beta_1 \ldots \beta_6$ – constants, ε_{it} – errors.

With purpose to allocate the priority directions for Ukraine to implement the important reforms in the social sectors the authors used the cluster analyses which based on the Ward's agglomerative hierarchical clustering procedure (which based on the principle component analysis).

4. RESULTS AND DISCUSSION

The empirical results on indicators (which presented in the table 2) showed that during the 2000-2017 years the average value of I_{sp} was the lowest in Romania (0.449) and Ukraine (0.435). The fragment of finding was presented in the figure 4.

Figure 4: The results of scaling the new members of EU on the level of social progress index
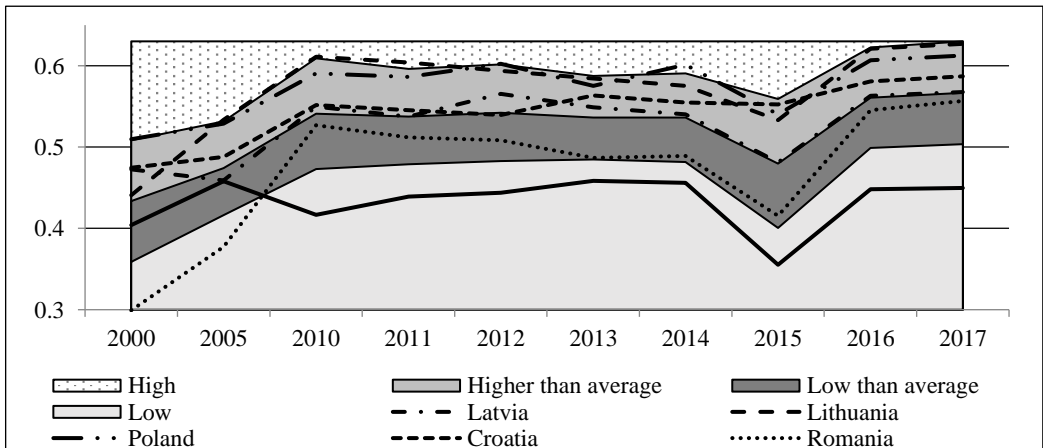
Source: Developed by the authors

All countries were divided by four levels: high level, higher than average, low than average, low level (table 4).

Table 4: The Scaling Of The Countries *Isp$_{it}$*

Measures	Levels
$I_{sp_i} \geq \bar{I}_{sp_t} + \sigma$	High level
$\bar{I}_{sp_t} \leq I_{sp_i} < \bar{I}_{sp_t} + \sigma$	Higher than average
$\bar{I}_{sp_t} - \sigma \leq I_{sp_i} < \bar{I}_{sp_t}$	Low than average
$I_{sp_i} < \bar{I}_{sp_t} - \sigma$	Low level

Isp$_{it}$ – the actual value of the of social progress index in the *i*-country in the t-th period; $\bar{I}_{sp_t}$ – the average value of the integral social progress index in the t-th period throughout the sample of countries, σ – the standard deviation

Source: Developed by the authors

Besides, the findings showed that coefficient of variation of *Isp$_{it}$* for Romania was 17% which proved the positive fluctuation in the dynamic time series. In addition, in Romania from the 2004 to 2017 (period as EU member) this value was increase to 12.86%. At the same time, in Ukraine the fluctuation of that indicator was insignificant. Moreover, the obtained results showed the convergence of the social reforms vectors in the analysing countries.

Using the σ-convergence (formula 1) and β-convergence (formula 2) gave opportunity to check the H0. Thus, the trajectory of the social reforms in each country (which were presented through 19 parameters from table 2) was estimated allocating the common directions (convergence) and each country on its own trajectory (divergence).

Table 5: The Results of σ-convergence and β-convergence

σ-convergence (with Ukraine)

Year	k_{hdi}	k_{ghi}	k_{pi}	k_{he}	k_{pop}	k_{pa}	k_{gni}	k_{phr}	k_{leb}	k_{pap}	k_{gii}	k_{ge}	k_{ger}	k_{rde}	k_{ief}	k_{pfi}	k_{cli}	k_{ipr}	k_{nri}
2010	0.04	0.13	0.36	0.11	0.02	0.04	0.55	0.32	0.03	1.52	0.03	0.21	0.15	0.23	0.13	0.96	0.41	0.13	0.05
2017	0.07	**0.37**	**0.41**	0.12	0.02	0.02	**0.56**	**0.75**	0.03	**1.65**	0.05	**0.37**	0.13	0.29	0.16	0.19	**0.42**	0.20	0.09

σ-convergence (without Ukraine)

Year	k_{hdi}	k_{ghi}	k_{pi}	k_{he}	k_{pop}	k_{pa}	k_{gni}	k_{phr}	k_{leb}	k_{pap}	k_{gii}	k_{ge}	k_{ger}	k_{rde}	k_{ief}	k_{pfi}	k_{cli}	k_{ipr}	k_{nri}
2010	0.01	0.01	0.25	0.11	0.02	0.04	0.17	0.08	0.02	1.51	0.02	0.16	0.15	0.23	0.06	0.72	0.34	0.08	0.02
2017	0.02	0.06	0.23	0.12	0.02	0.02	0.15	0.12	0.02	**1.72**	0.05	0.34	0.11	0.31	0.09	0.16	**0.37**	0.10	0.10

β-convergence (with Ukraine)

	k_{hd}	...	k_{pop}	k_{pa}	...	k_{phr}	...	k_{ge}	k_{ger}	...	k_{ief}	k_{pfi}	...
$ln\,k_{ot}$	-0.021	...	-0.119	-0.117	...	0.059	...	0.087	-0.043	...	-0.021	-0.118	...
R^2	0.322	...	0.065	0.848	...	0.775	...	0.339	0.667	...	0.563	0.873	...
β	0.023	...	0.379	0.345	...	-0.048	...	-0.066	0.0521	...	0.023	0.374	...

β-convergence (without Ukraine)

	k_{hdi}	...	k_{pi}	k_{he}	k_{pop}	k_{pa}	k_{gni}	...	k_{leb}	...	k_{ger}	k_{rde}	...	k_{pfi}	k_{ipr}	k_{nri}
$ln\,k_{ot}$	-0.104	...	-0.042	-0.005	-0.022	-0.116	-0.027	...	-0.005	...	-0.07	-0.005	...	-0.14	-0.04	-0.69
R^2	0.546	...	0.226	0.018	0.143	0.788	0.076	...	0.008	...	0.193	0.018	...	0.862	0.156	0.444
β	0.223		0.051	0.024	0.329	0.0304	0.005	...	0.005	...	0.119	0.005	...	0.402	0.041	0.1

Source: Authors' calculations

The results of σ-convergence (table 5) proved that the social reforms were coming together in analysed countries by the all indicators excluding k_{pap}. At the same time, the social transformation in Ukraine on the parameters k_{ghi}, k_{pi}, k_{gni}, k_{phr}, k_{pap}, k_{ge}, k_{cli} were opposite to the indicators of five EU countries. It should be highlighted that in long-term perspectives all countries try to achieve the stable equilibrium and decrease the distance to it.

The calculation results of the absolute β-convergence with using of cross-section regression analysis **of** least square method allowed indicating the main directions of the social reforms which had the statistical significant linking between temp of growth and the beginning level. Therefore, the findings in table 6 proved that the most indicators of social progress index had the significant temp of convergence from 10% to 40%. However, Ukraine should overcome the longer way to achieve the convergent long-term equilibrium, than developed EU countries.

Table 6: The results of calculation

Parameters	k_{hdi}	k_{pi}	k_{pop}	k_{pa}	k_{gni}	k_{gii}	k_{iez}	k_{pfi}	k_{ipr}
1-st component	0.3625	-0.3209	0.3413		0.3273		0.3273		0.3382
2-d component				-0.4162		0.4158		0.3814	

Source: Authors' calculations

As Ukraine has already started the EU integration process, it necessary to allocate the priority directions of social reforms taking to account the EU strategy. The cluster analysing allowed allocating the priority reforms for Ukraine as follows: k_{hdi}; k_{pi}; k_{pop}; k_{pa}; k_{gni}; k_{gii}; k_{ief}; k_{pfi}; k_{ipr} (table 5). These indicators were chosen because the findings showed that indicators were the key drivers of social progress under the transformation from one cluster to other (figure 5).

Figure 5: The Results of Cluster Analysis of The Countries
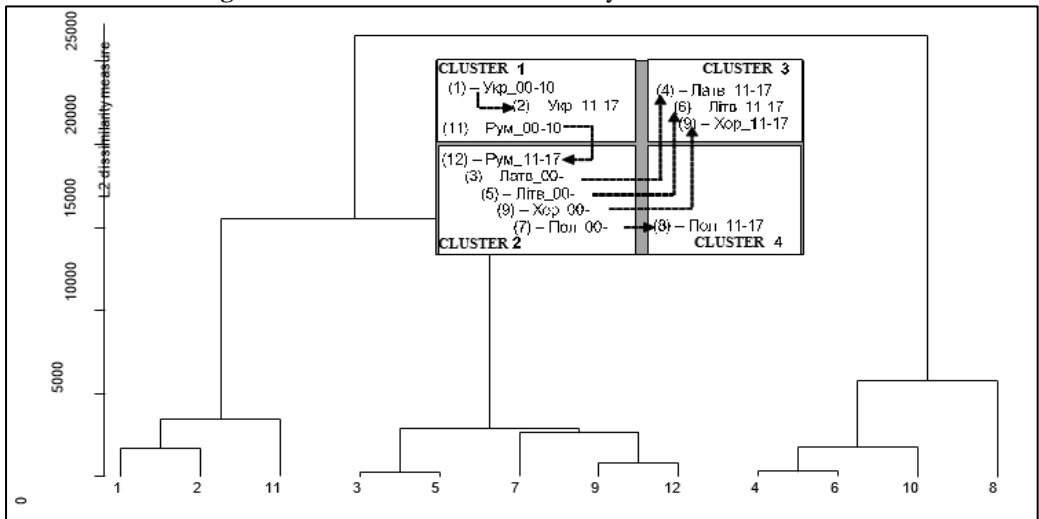
Source: Developed by the authors

For checking the above-mentioned H1 the formulas 3 and 4 was used. The fragment of the empirical results of analysis of linking between the levels of social progress (I_{sp}) and macroeconomic stability was showed in table 7.

Table 7: The Results of Linking Between Levels of Social Progress and Macroeconomic Stability (fragment)

Variables	Analysed EU members			Ukraine		
	(a)	**(b)**	**(c)**	**(a)**	**(b)**	**(c)**
	Values of constant α corresponding to the variables in the 1st equitation in model (3)					
ΔMS	0.4228	0.4290	0.4219	0.3017	0.2759	0.3791
	(0.007)	(0.004)	(0.007)	(0.05)	(0.007)	(0.198)
Isp	-3.117	-2.3445	-3.154	-3.574	-1.705	-1.033
	(0.002)	(0.024)	(0.018)	(0.043)	(0.236)	(0.715)
Pop	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.012)	(0.004)	(0.014)	(0.195)	(0.009)	(0.009)
KOF	0.0932	0.1648	–	-2.673	-2.508	–
	(0.046)	(0.08)		(0.008)	(0.000	
Gov	2.5943	–	4.2626	-8.674	–	-2.067
	(0.047)		(0.135)	(0.103)		(0.744)
Reg	-3.156	-2.809	-3.538	–	–	–
	(0.001)	(0.000)	(0.000)			
R^2	0.96	0.96	0.90	0.96	0.96	091
Values of constant β corresponding to the variables in the second equitation in dynamic model (4)						
ΔIsp	0.0589	0.092	0.0515	0.5735	0.7724	0.6735
	(0.503)	(0.369)	(0.548)	(0.003)	(0.005)	(0.005)
MS	-0.003	-0.004	-0.003	-0.006	-0.005	-0.004
	(0.004)	(0.003)	(0.004)	(0.02)	(0.07)	(0.028)
Pop	0.0001	0.00001	0.0001	0.0001	0.0001	0.0001
	(0.388)	(0.096)	(0.417)	(0.23)	(0.486)	(0.635)
KOF	0.0005	0.005	–	-0.013	-0.008	–
	(0.681)	(0.000)		(0.174)	(0.269)	
Gov	0.1334	–	0.1418	-0.145	–	-0.133
	(0.001)		(0.000)	(0.006)		(0.016)
Reg	-0.010	0.292	-0.012	–	–	–
	(0.233)	(0.000)	(0.104)			
R^2	0.88	0.32	0.91	0.88	0.71	0.85

Notes: (a) - calculations taking into account all endogenous and exogenous parameters of the model; (b) - calculations without taking into account the endogenous Gov parameter; (c) - calculations without the endogenous parameter KOF; R^2 - determination coefficient of the model; in brackets the statistical significance of the corresponding constants α and β was shown

Source: Authors' calculations

The negative impact of $α_2$, $β_2$ parameters and its statistical significant impact will be allowed making conclusion about the divergence of the vectors which characterised the changing dynamic

of macroeconomic stability and the social progress. Thus, the increasing of the social progress was accompanied by the decreasing of macroeconomic stability. It relates with the increasing of the government spending on social guarantees, decreasing the unemployment rate, eliminating the social contradictions and vice versa.

Moreover, the additional financial transactions to increase the social progress by 1 point as a consequence lead to the decreasing of macroeconomic stability by 3 points for EU countries and for 3.5 points for Ukraine. Furthermore, the political imbalance and no efficiency of in Ukraine lead to the decreasing of macroeconomic stability by 8 points and the level of social progress by 0.14 points.

At the same time, the findings of convergence analysis (without Ukraine) showed that the effective Public Governance and synchronised actions during the integration process gave opportunity to reorient and overcome the divergence of the tendency, and Lithuania had traversed from divergence to convergence.

It should be underlined, that Ukraine should take to account the EU experience during the developing and implementation of the corresponding reforms under EU integration process. Thus, on the findings and what experience will be adopted as a benchmark:

1) quasi-integration growth – benchmark is countries' policies from the cluster 2; Romania (2011-2017); Latvia, Lithuania, Croatia, Poland (2000-2010);
2) convergent diversification – benchmark is countries' policies from the cluster 3; Latvia, Lithuania, Croatia, Poland (2011-2017);
3) progressive growth – benchmark is Poland's policy (2011-2017) from the cluster 4

Table 8: The results of modelling the development strategy on reforming in Ukraine taking to account linking between macroeconomic stability and level of social progress

The achieving results of reforms accordance to the chosen strategy		Necessary conditions for achievement of results	The type of functional relations (formula (3))	Statistical significance of the parameters				
Expected values of parameters	Achieving year			ΔMS	I_{sp}	KOF	GOF	Pop
Quasi-Integration Growth»								
↑ΔMS=12.68 ↑ΔI_{sp}=0.08	2030	↑ΔKOF=const ↑ΔGOF=1.33	ΔMS_{it} $= 0.7\Delta MS_{it-1}$ $+ 3.7\Delta Isp_{it}$ $+ 2.46\Delta KOF_{it}$ $+ 3.2\Delta GOV_{it}$ $+ 0.0001\Delta Pop_{it}$	0.116	0.147	0.013	0.030	0.271

The achieving results of reforms accordance to the chosen strategy		Necessary conditions for achievement of results	The type of functional relations (formula (3))	Statistical significance of the parameters				
Expected values of parameters	Achieving year			ΔMS	I_{sp}	KOF	GOF	Pop
Convergent Diversification								
↑ΔMS=10.92 ↑ΔI_{sp}=0.25	2047	↑ΔKOF=3.6 ↑ΔGOF=1.63	$\Delta MS_{it} = 0.29\Delta MS_{it-1} - 7.3\Delta Isp_{it} + 1.08\Delta KOF_{it} + 2.99\Delta GOV_{it} + 0.0001\Delta Pop_{it}$	0.305	0.022	0.025	0.033	0.272
Progressive Growth»								
↑ΔMS=11.44 ↑ΔI_{sp}=0.12	2038	↑ΔKOF=const ↑ΔGOF=1.33	$\Delta MS_{it} = 0.43\Delta MS_{it-1} - 2.6\Delta Isp_{it} + 1.77\Delta KOF_{it} + 2.24\Delta GOV_{it} + 0.0001\Delta Pop_{it}$	0.021	0.028	0.000	0.011	0.17

Source: Authors' calculations

The findings in table 8 showed that strategy of Convergent Diversification will give opportunity to increase the level of macroeconomic stability by 10.92 points and the social progress by 0.25 points. For that purpose, Ukraine should increase the level of the global integrity into the globalization process (increasing KOF by 3.6) and efficiency of Public Governance GOF by 1.63).

5.   CONCLUSION

The findings in the paper showed that the social progress is one of the important drivers of macroeconomic stability. Besides, the findings proved two hypotheses: the convergence of the indicators of social progress index under the reforming process in new members of EU; the linking between levels of macroeconomics stability and social progress. The results of σ, β-convergences analysis proved that the social reforms were coming together in analysed countries by the all indicators excluding k_{pap}.

The empirical results of linking between the macroeconomic stability and social progress in the EU for the years 2000-2017 indicated the negative and statistically significant (5%) impact: investments in increasing social progress by 1-point lead to reduce the level of macroeconomic stability by 3 points for EU countries and 3.5 points for Ukraine. Political instability and inefficiency of public administration in Ukraine reduce the level of macroeconomic stability by 8 points and the level of social progress by 0.14 points.

Depending on which experience Ukraine will adopt as a benchmark for reform in order to ensure both an increase in macroeconomic stability and social progress, three strategies could be identified: quasi-integration growth, convergent diversification and progressive growth. The simulation

showed that the best results could be achieved in the implementation of the second strategy, but for this, by 2047, it would be necessary to ensure a significant increase the level of Ukraine's integration into globalization processes in the world economy (by 3.6) and the efficiency of public governance (by 1.63 points).

6.   ACKNOWLEDGEMENT

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