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ANALYSIS OF THE ONGOING EVALUATION FOR THE EFFECTIVENESS IMPLEMENTATION OF THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT MANAGEMENT

Summary

The present paper deals with the issue of sustainable development and the adopted Agenda 2030. Its aim was to assess and clarify, based on available databases from the Statistical Office of the European Communities (Eurostat), the intermediate status of the implementation of selected objectives and indicators of the 2030 Agenda at the level of the European Union countries.

Key words: sustainable development, Agenda 2030, environmental management.

ANALIZA BIEŻĄCEJ OCENY SKUTECZNOŚCI REALIZACJI AGENDY 2030 DLA ZARZĄDZANIA ZRÓWNOWAŻONYM ROZWOJEM

Streszczenie

W artykule przedstawiono problematykę zrównoważonego rozwoju i przyjętej Agendy 2030. Jego celem była ocena i wyjaśnienie, na podstawie dostępnych baz danych Urzędu Statystycznego Wspólnot Europejskich (Eurostat), stanu pośredniego realizacji wybranych celów i wskaźników Agendy 2030 na poziomie krajów Unii Europejskiej.

Słowa kluczowe: zrównoważony rozwój, Agenda 2030, zarządzanie środowiskiem.

Introduction

Goal orientation and progress have always been natural characteristics of humanity. People care about a better life or a better future not only for themselves but also for their children and the generations that come after them. Today, the concept of sustainability is a highly topical issue and is also a universally accepted and comprehensive principle for the development of human civilization The main reason for its emergence was not only the vision of a more ideal world but also the awareness of the growing threat of global environmental problems. With a vision of preserving the right values while gradually eliminating the shortcomings or negative consequences of anthropogenic activities, the world's superpowers have committed themselves to changing the world by 2030 through the Agenda 2030. The concept of sustainable development aims to create governance systems that can be integrated at local, national, and global levels. However, its solution is not easy, cheap, or quick; it is often a complicated and lengthy process. Nevertheless, it is conscious and right to strive to live up to the idea of sustainable development, including all three pillars: economic, environmental, and social.

The European Union is the undisputed leader in the field of sustainable development. It has been involved in drawing up extremely ambitious plans for sustainable development and the related protection of the environment. The adoption of various documents and strategies, which have gradually been incorporated into the national policies and legislation of the countries

of the European Union, has confirmed the interdependence between the social, economic, environmental, and economic agendas. National leaders have committed themselves to the implementation of sustainable development strategies with the vision of improving social welfare, progressing towards a more stable economy, and ensuring economic growth and more rational use of available natural resources and finances (Vilinovic, 2011).

The states of the European Union have explicitly addressed the idea of sustainable development, tried to integrate it as a norm in decision-making, and attempted to adopt policies "in line with its orientation" (Lafferty, Meadowcroft, 2000, p. 20). The fact that the concept "ties together normative ideas such as equality, participation, prudence, well-being, and environmental concern" (Ibidem, p. 16) contributes to its normative nature.

The concept of sustainable development is often considered broad, relative, or too general. Therefore, society decided that a roadmap was needed to better understand and apply it more comprehensively. A watershed moment was the adoption of the roadmap in 2015 by all UN Member States on the 70th anniversary of the UN General Assembly, under the title "Transforming our world: the 2030 Agenda for Sustainable Development" (UN 2015). The UN 2030 Agenda for Sustainable Development (hereafter referred to as the 2030 Agenda) envisages ending poverty, protecting the planet, and ensuring prosperity and peace for all human beings (Capua, Giovannini, 2019). Although this document was not legally binding, it became a concept of sustainable development that 193 countries decided to accept and comply with. Starting with this new challenge, all 193 signatory countries reaffirmed their commitment to the ideal scenario of fulfilling the 17 goals and attempted to incorporate the goals into their strategic and policy documents. The new commitment somehow formed a common template enriched with new cultural and social expectations related to sustainability (Clemens, Cook, 1999). Measuring sustainability is a topic of heated debate among researchers, policymakers, and other stakeholders (Holden et al., 2014; Costanza et al., 2016). The adoption of the 2030 Agenda and its Sustainable Development Goals (SDGs), targets, and related indicators have further enriched this debate (Liu et al., 2018).

The general respect and recognition of the 2030 Agenda and the SDGs in question has been a strong indication of the global interest in integrating economic, social, and environmental considerations into the development aspirations of UN member states. The ambitious outcome of such an integrated perspective is a substantial improvement in public health and social well-being while preserving the natural and economic systems that underpin them (Pradyumna, 2018). It was intended to address the major challenges we face, recognizing that poverty eradication requires strategies that can act on economic growth by ensuring environmental protection and managing a range of social needs, including health, education, and gender equality (Miola, Schiltz, 2019). To implement the 2030 Agenda for Sustainable Development along with the 17 SDGs, a fully integrated approach across sectors, disciplines and countries is needed, which requires new strategies targeting a wide range of actors such as civil society, business, academia, and regional and international bodies (Bruntland, 1987).

The 2030 Agenda consists of 17 goals, additional sub-goals, and indicators that are aligned with the social, environmental, and economic dimensions of sustainable development. The Addis Ababa Action Agenda on Financing for Development and the Paris Agreement to the UN Framework Convention on Climate Change were the starting points for the 2030 Agenda. Universality is the first defining characteristic of the Agenda; integration is the second (Drinková, 2020).

Methodology of study

The paper aims to assess the intermediate status of selected EU countries in meeting the specific objectives of the 2030 Agenda. The paper aims to assess whether EU countries are on track to achieve the SDGs.

The data sources for the analysis were obtained from available databases from the Statistical Office of the European Communities (Eurostat). Based on the analyses carried out and the 5 goals and 9 indicators selected by us, the sustainable development status of the selected countries was assessed. The countries that were assessed include the Slovak Republic, the Czech Republic, Hungary, and Poland – i.e., the V-4 countries.

Through regression analysis, we were able to project the future in meeting the 2030 Agenda goals of the selected countries, considering past, present, and possible future trajectories of sustainable development. In producing the data, we ensured that it came from an objective source of information to maintain the credibility of the work. If (for various reasons) the relevant data for a given country was not available in the Eurostat database, we had several options for obtaining the data in question. The first option was to substitute and search for it in other databases. However, in this case the accuracy of the data could be questioned and there could also be a risk of losing comparability on the same methodological basis, in other words, comparability over time or between countries could be lost. Another possibility was to use a statistical method that could replace the missing value of a trait. The substituted value would not necessarily be exact, it would only represent an estimate in which various assumptions could be made, which we as authors wanted to avoid. For the above-mentioned reason, the results of the practical part were limited only to data from Eurostat, which we believe to be a sufficiently reliable source of information on which we can rely since the data presented for each country are presented using an identical methodology and their correctness is verified by a verification body.

The selection of targets was focused primarily on those that have meaningful value to us. On deeper examination, limiting difficulties were discovered, stemming from the fact that not every member country reports data to Eurostat in every indicator. Missing data may reflect a country's approach or willingness to cooperate in completing the data. On the other hand, we can ask ourselves whether the lack of data for 2020 and 2021 was caused by the COVID-19 pandemic, when the priorities of all countries were changed to reduce the impact of the pandemic on different aspects of the country's functioning. Therefore, the original intention to include the most up-to-date years was reversed to the intention to find as many appropriate targets as possible that include data for at least 2020. Thus, there were limiting factors in the selection process due to which we prioritized targets that included data in individual indicators and in selected countries. After rational consideration, 5 targets were selected along with 9 indicators for the 2015-2020 timeframe.

While it was our wish to produce the most comprehensive research containing as many countries and 2030 Agenda targets as possible, a path of careful reduction was chosen for this paper. As the scope of the paper did not allow us to comprehensively assess the entire 2030 Agenda, either in terms of the breadth of the topic or in terms of capacity, we opted for a selection of indicators to cover all the pillars of sustainable development (economic, environmental, social, institutional). Of course, this is the predominant relationship to the sustainable development pillar, as these are often cross-cutting indicators. A summary of the selected indicators, their relationship to the relevant 2030 Agenda targets, and also their relationship to the dominant sustainable development pillar is presented in Table 1.

Table 1
Overview of the selected indicators, their relevance to the SDGs and the pillar

Goal	Indicator	Unit	Relevance to sustainable development pillar
Goal 2 – Zero hunger	Area under organic farming (OF)	% of utilised agricultural area	En
Goal 5 – Gender equality	Tertiary educational attainment (TE)	% of the population aged 25-34 who have successfully completed tertiary studies	S
Goal 7 – Affordable and clean energy	Final energy consumption (EC)	Index, 2005 = 100	Ec
	Share of renewable energy in gross final energy consumption (RE)	% of gross final energy consumption	En
	Energy import dependency (EI)	% of imports in total gross available energy	Ec
Goal 8 – Decent work and economic growth	Real GDP per capita (GDP)	€ per capita	Ec
	Employment rate (ER)	% of population 20-64	S
	In work at-risk-of-poverty rate (RP)	% of population 18+	S
Goal 16 – Peace, justice and strong institutions	Corruption Perceptions Index (CP)	Scale. 0 (highly corrupt) – 100 (very clean)	I

Source: own elaboration.
Note: Ec – economic pillar, En – environmental pillar, S – social pillar, I – institutional pillar

Time series analyses based on regression analysis were performed using Statistica statistical software. Data visualization was performed in the environment of statistical software Systat.

For the time series analysis, we limited ourselves to the application of linear regression models. These were mostly statistically significant models, which allowed us to make the results more interpretable.

Simple linear regression is a statistical method that is used to obtain a prescription by which we are able to predict the value of one variable from knowing the value of another variable if there is a causal relationship between the two variables.

The basis of a simple linear regression is the equation of a straight line, which is most often represented by the prescription:

$$y = \beta_0 + \beta_1 x,$$

where:
y – the dependent variable (in our case, the values of each selected indicator of the 2030 Agenda Goals)
x – independent variable (in our case years)

Results and discussion

The first objective pursued was Goal 2: "Zero Hunger" with the indicator "Area under organic farming" (OF), where it is desirable that the proportion of the total utilised agricultural area is as much as possible implemented by organic farming.

Table 2
Results of the time series analysis for the indicator "Area under organic farming" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,97953152 R2= ,95948200 Adjusted R2= ,94935250 F(1,4)=94,722 p<,00062 Std.Error of estimate: ,15339					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			13,25933	0,142796	92,85529	0,000000
Year	0,979532	0,100645	0,35686	0,036667	9,73250	0,000624
HU	Regression Summary for Dependent Variable: **HU**. R= ,96087181 R2= ,92327463 Adjusted R2= ,90409329 F(1,4)=48,134 p<,00227 Std.Error of estimate: ,42862					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			1,728667	0,399026	4,332213	0,012328
Year	0,960872	0,138497	0,710857	0,102460	6,937867	0,002267
PL	Regression Summary for Dependent Variable: **PL**. R= ,69591839 R2= ,48430241 Adjusted R2= ,35537801 F(1,4)=3,7565 p<,12464 Std.Error of estimate: ,20474					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			3,915333	0,190601	20,54208	0,000033
Year	-0,695918	0,359060	-0,094857	0,048942	-1,93817	0,124640
SK	Regression Summary for Dependent Variable: **SK**. R= ,85593422 R2= ,73262339 Adjusted R2= ,66577924 F(1,4)=10,960 p<,02964 Std.Error of estimate: ,45598					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			8,895333	0,424494	20,95514	0,000031
Year	0,855934	0,258542	0,360857	0,109000	3,31062	0,029637

Source: own calculations.

In all countries (except Poland), we found statistically significant results for changes in the indicator over time. In the countries in question, the parameter b1 of the regression models is positive, i.e., the observed parameter over time smoothed by the regression model shows a continuous increase in the value of the parameter, which, of course, can be viewed positively. The highest value of the parameter b1 in the regression models was in Hungary, but it should be noted that the share of the area used for organic farming is the lowest among the countries analyzed.

The second objective considered was Objective 5: "Gender equality" with the indicator "Tertiary education attainment by sex" (TE). For this indicator, it is positive if the proportion of the population that has successfully completed tertiary education is higher.

Table 3
Results of the time series analysis for the indicator "Tertiary education attainment by sex" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,53124602 R2= ,28222234 Adjusted R2= ,10277792 F(1,4)=1,5728 p<,27810 Std.Error of estimate: ,90541					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			31,76667	0,842888	37,68788	0,000003
Year	0,531246	0,423609	0,27143	0,216434	1,25410	0,278096
HU	Regression Summary for Dependent Variable: **HU**. R= ,47355305 R2= ,22425249 Adjusted R2= ,03031561 F(1,4)=1,1563 p<,34277 Std.Error of estimate: ,66690					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			31,36667	0,620855	50,52177	0,000001
Year	-0,473553	0,440383	-0,17143	0,159421	-1,07532	0,342768
PL	Regression Summary for Dependent Variable: **PL**. R= ,48324557 R2= ,23352628 Adjusted R2= ,04190785 F(1,4)=1,2187 p<,33156 Std.Error of estimate: ,44390					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			43,69333	0,413249	105,7313	0,000000
Year	-0,483246	0,437742	-0,11714	0,106113	-1,1039	0,331557
SK	Regression Summary for Dependent Variable: **SK**. R= ,97809936 R2= ,95667836 Adjusted R2= ,94584795 F(1,4)=88,333 p<,00071 Std.Error of estimate: ,73760					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			30,06667	0,686664	43,78656	0,000002
Year	0,978099	0,104069	1,65714	0,176319	9,39854	0,000714

Source: own calculations.

The quality of the regression models obtained as a basis for time series analysis was unsatisfactory in this indicator. Except for the Slovak Republic, the other regression models were not statistically significant and thus it was not possible to generalise the conclusions reached. Trends in the Slovak Republic, since in this case it is possible to take a position considering the parameters of the model quality, point to a positive direction – associated with the modelled increase in the share of the population with higher education.

The third objective assessed was Objective 7 "Affordable and clean energy", with three selected indicators. The first indicator analysed in this objective was "Final energy consumption in households per capita" (EC).

Table 4
Results of the time series analysis for the indicator "Final energy consumption in households per capita" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,21838819 R2= ,04769340 Adjusted R2= ----- F(1,4)=,20033 p<,67763 Std.Error of estimate: 14,954					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			657,0667	13,92177	47,19708	0,000001
Year	0,218388	0,487931	1,6000	3,57478	0,44758	0,677626
HU	Regression Summary for Dependent Variable: **HU**. R= ,39755332 R2= ,15804864 Adjusted R2= ----- F(1,4)=,75087 p<,43509 Std.Error of estimate: 23,035					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			627,8667	21,44429	29,27897	0,000008
Year	-0,397553	0,458790	-4,7714	5,50638	-0,86653	0,435086
PL	Regression Summary for Dependent Variable: **PL**. R= ,71448027 R2= ,51048206 Adjusted R2= ,38810257 F(1,4)=4,1713 p<,11064 Std.Error of estimate: 25,340					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			499,5333	23,59006	21,17559	0,000029
Year	0,714480	0,349828	12,3714	6,05737	2,04238	0,110644
SK	Regression Summary for Dependent Variable: **SK**. R= ,87818562 R2= ,77120997 Adjusted R2= ,71401247 F(1,4)=13,483 p<,02135 Std.Error of estimate: 32,811					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			314,8667	30,54498	10,30830	0,000500
Year	0,878186	0,239160	28,8000	7,84323	3,67196	0,021354

Source: own calculations.

As in the previous model, we did not obtain statistically significant regression models for each country analyzed. A statistically significant model was confirmed only for the Slovak Republic. The value of the parameter b1 of the regression model is positive, which justifies us to conclude that the trend in the Slovak Republic is positive in the parameter under study. On the other hand, the non-significance of linear regression models in other countries does not automatically mean that these countries do not achieve a positive trend. We would like to remind that the analysis used in this paper is primarily based on the analysis of linear regression models, which allow for a simple and clear interpretation of the results obtained. In the case of other countries, it would be desirable to choose a different regression model, which could be a sufficiently reliable model, but does not allow to take a clear position by evaluating the achieved values of the parameter b1 or other parameters.

The second indicator analyzed for target 7 was the "Share of renewable energy sources" (RE).

Table 5
Results of the time series analysis for the indicator "Share of renewable energy sources" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,83085208 R2= ,69031517 Adjusted R2= ,61289397 F(1,4)=8,9164 p<,04050 Std.Error of estimate: ,72870					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			5,417667	0,678381	7,986166	0,001333
Year	0,830852	0,278247	0,520143	0,174192	2,986027	0,040497
HU	Regression Summary for Dependent Variable: **HU**. R= ,76057295 R2= ,57847121 Adjusted R2= ,47308902 F(1,4)=5,4893 p<,07913 Std.Error of estimate: 1,1678					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			6,051133	1,087185	5,565872	0,005104
Year	0,760573	0,324626	0,654057	0,279163	2,342919	0,079125
PL	Regression Summary for Dependent Variable: **PL**. R= ,63680997 R2= ,40552693 Adjusted R2= ,25690866 F(1,4)=2,7286 p<,17391 Std.Error of estimate: ,91249					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			4,136733	0,849479	4,869728	0,008221
Year	0,636810	0,385510	0,360314	0,218126	1,651862	0,173907
SK	Regression Summary for Dependent Variable: **SK**. R= ,27842284 R2= ,07751928 Adjusted R2= ----- F(1,4)=,33613 p<,59316 Std.Error of estimate: ,99099					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			7,502800	0,922561	8,132582	0,001244
Year	0,278423	0,480229	0,137343	0,236892	0,579771	0,593157

Source: own calculations.

Only the Czech Republic achieved demonstrable results in the renewable energy share indicator. The other linear regression models were not reliable. Despite the above, in all cases the values of the regression coefficients b1 were positive. Thus, we can conclude that the time series of data smoothed by the linear regression model shows a continuous increase in the share of renewable energy sources in total energy resources.

We also tracked a third indicator in the target, which tracks the dependence of countries on total energy imports.

Table 6
Results of the time series analysis for the indicator "Energy import dependency" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,90647812 R2= ,82170258 Adjusted R2= ,77712823 F(1,4)=18,434 p<,01271 Std.Error of estimate: 1,6098					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			30,65887	1,498651	20,45765	0,000034
Year	0,906478	0,211126	1,65223	0,384818	4,29353	0,012711
HU	Regression Summary for Dependent Variable: **HU**. R= ,46741328 R2= ,21847517 Adjusted R2= ,02309397 F(1,4)=1,1182 p<,34994 Std.Error of estimate: 5,7543					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			54,37667	5,356986	10,15061	0,000530
Year	0,467413	0,442019	1,45457	1,375547	1,05745	0,349939
PL	Regression Summary for Dependent Variable: **PL**. R= = ,90556390 R2= ,82004597 Adjusted R2= ,77505747 F(1,4)=18,228 p<,01296 Std.Error of estimate: 3,1698					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			27,07380	2,950929	9,174671	0,000784
Year	0,905564	0,212105	3,23506	0,757729	4,269414	0,012956
SK	Regression Summary for Dependent Variable: **SK**. R= ,08598343 R2= ,00739315 Adjusted R2= ----- F(1,4)=,02979 p<,87134 Std.Error of estimate: 5,1671					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			61,79380	4,810344	12,84603	0,000212
Year	0,085983	0,498148	0,21320	1,235182	0,17261	0,871343

Source: own calculations.

The achieved models as results of the regression analysis were statistically reliable in most of the analyzed countries. Despite the above, the results obtained cannot be assessed as satisfactory. In all countries, the values of the parameter b1 were positive. This means that there was an increase in the countries' dependence on energy imports during the period under review. In this context, we cannot assess the results achieved as satisfactory, especially considering the current geopolitical processes.

In Goal 8 "Decent work and economic growth", we focused on 3 indicators. The first indicator considered was "Real GDP per capita".

Table 7
Results of the time series analysis for the indicator "Real GDP per capita" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,73791514 R2= ,54451875 Adjusted R2= ,43064844 F(1,4)=4,7819 p<,09403 Std.Error of estimate: 607,79					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			16261,33	565,8231	28,73925	0,000009
Year	0,737915	0,337447	317,71	145,2900	2,18676	0,094032
HU	Regression Summary for Dependent Variable: **HU**. R= ,90861843 R2= ,82558746 Adjusted R2= ,78198432 F(1,4)=18,934 p<,01214 Std.Error of estimate: 368,62					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			10894,67	343,1681	31,74732	0,000006
Year	0,908618	0,208814	383,43	88,1174	4,35134	0,012144
PL	Regression Summary for Dependent Variable: **PL**. R= ,95779355 R2= ,91736849 Adjusted R2= ,89671061 F(1,4)=44,408 p<,00263 Std.Error of estimate: 273,88					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			10491,33	254,9688	41,14752	0,000002
Year	0,957794	0,143728	436,29	65,4699	6,66391	0,002634
SK	Regression Summary for Dependent Variable: **SK** R= ,80967199 R2= ,65556873 Adjusted R2= ,56946091 F(1,4)=7,6133 p<,05089 Std.Error of estimate: 388,56					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			14168,00	361,7276	39,16759	0,000003
Year	0,809672	0,293441	256,29	92,8831	2,75923	0,050890

Source: own calculations.

The gross domestic product per capita is increasing in all countries analysed. The linear parameter of the regression models is positive in each country, even for countries where the linear regression models were not significant enough.

Another indicator monitored for Goal 8 was the employment rate indicator.

Table 8
Results of the time series analysis for the indicator "Employment rate" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ.** R= ,90740919 R2= ,82339144 Adjusted R2= ,77923930 F(1,4)=18,649 p<,01246 Std.Error of estimate: 1,0158					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			74,64667	0,945618	78,93955	0,000000
Year	0,907409	0,210124	1,04857	0,242812	4,31844	0,012463
HU	Regression Summary for Dependent Variable: **HU**. R= ,94263087 R2= ,88855295 Adjusted R2= ,86069119 F(1,4)=31,891 p<,00484 Std.Error of estimate: ,97358					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			70,70000	0,906353	78,00491	0,000000
Year	0,942631	0,166918	1,31429	0,232730	5,64725	0,004842
PL	Regression Summary for Dependent Variable: **PL**. R= ,97578094 R2= ,95214844 Adjusted R2= ,94018555 F(1,4)=79,592 p<,00087 Std.Error of estimate: ,61226					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			65,58000	0,569979	115,0568	0,000000
Year	0,975781	0,109375	1,30571	0,146357	8,9214	0,000873
SK	Regression Summary for Dependent Variable: **SK**. R= ,91355806 R2= ,83458832 Adjusted R2= ,79323540 F(1,4)=20,182 p<,01089 Std.Error of estimate: 1,0030					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			69,44667	0,933760	74,37314	0,000000
Year	0,913558	0,203354	1,07714	0,239767	4,49245	0,010885

Source: own calculations.

In this case, statistically significant linear regression models were obtained in each of the countries analyzed. The smoothed linear regression models show a continuous increase in employment, which in this context can be seen as a positive indicator of both the economic and social sustainability of the country concerned.

The last of the indicators analyzed in Objective 8 was the rate of work at risk of poverty.

Table 9
Results of the time series analysis for the indicator "In work at-risk-of-poverty rate" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R= ,59172634 R2= ,35014006 Adjusted R2= ,18767507 F(1,4)=2,1552 p<,21600 Std.Error of estimate: ,20354					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			3,900000	0,189486	20,58205	0,000033
Year	-0,591726	0,403069	-0,071429	0,048655	-1,46805	0,216004
HU	Regression Summary for Dependent Variable: **HU**. R= ,76757164 R2= ,58916622 Adjusted R2= ,48645778 F(1,4)=5,7363 p<,07476 Std.Error of estimate: ,64376					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			10,24000	0,599309	17,08634	0,000069
Year	-0,767572	0,320482	-0,36857	0,153888	-2,39506	0,074756
PL	Regression Summary for Dependent Variable: **PL**. R= ,90731371 R2= ,82321818 Adjusted R2= ,77902272 F(1,4)=18,627 p<,01249 Std.Error of estimate: ,31848					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			11,30000	0,296487	38,11292	0,000003
Year	-0,907314	0,210227	-0,32857	0,076131	-4,31587	0,012488
SK	Regression Summary for Dependent Variable: **SK**. R= ,71803239 R2= ,51557051 Adjusted R2= ,39446314 F(1,4)=4,2571 p<,10805 Std.Error of estimate: ,61404					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			6,793333	0,571642	11,88389	0,000287
Year	-0,718032	0,348005	-0,302857	0,146784	-2,06328	0,108050

Source: own calculations.

In this case, statistically reliable regression model results were obtained for only one country – Poland. The values of the regression coefficients of the linear models in all countries, including the countries where the real regression models achieved were not statistically reliable, have a negative value. In the context of the construction of the given indicator, this can be seen as a positive trend towards a reduction in the rate of work at risk of poverty.

Taking this into account, we can conclude that in the economic parameters of Goal 8, countries declare economic sustainability.

The last goal selected was Goal 16 "Peace, Justice and Strong Institutions", from which we assessed the indicator related to the "Corruption Perception Index". The indicator in question deals with public sector corruption, ranking countries according to their scores. A country with a score of 0 represents a very high level of corruption, while a country with a score of 100 represents a very clean country with no corruption.

Table 10
Results of the time series analysis for the indicator "Corruption Perceptions Index" using linear regression analysis in the V-4 countries

CZ	Regression Summary for Dependent Variable: **CZ**. R = ,15516780 R2= ,02407705 Adjusted R2= ----- F(1,4)=,09868 p<,76912 Std.Error of estimate: 1,9024					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			56,66667	1,771019	31,99665	0,000006
Year	-0,155168	0,493944	-0,14286	0,454756	-0,31414	0,769116
HU	Regression Summary for Dependent Variable: **HU**. R= ,89982992 R2= ,80969388 Adjusted R2= ,76211735 F(1,4)=17,019 p<,01455 Std.Error of estimate: 1,3327					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			50,93333	1,240712	41,05171	0,000002
Year	-0,899830	0,218120	-1,31429	0,318585	-4,12538	0,014549
PL	Regression Summary for Dependent Variable: **PL**. R= ,98037302 R2= ,96113125 Adjusted R2= ,95141407 F(1,4)=98,910 p<,00057 Std.Error of estimate: ,56484					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			64,53333	0,525840	122,7242	0,000000
Year	-0,980373	0,098576	-1,34286	0,135023	-9,9454	0,000574
SK	Regression Summary for Dependent Variable: **SK**. R= ,92309308 R2= ,85210084 Adjusted R2= ,81512605 F(1,4)=23,045 p<,00864 Std.Error of estimate: ,32367					
	b*	Std.Err. of b*	b	Std.Err. of b	t(4)	p-value
Intercept			51,46667	0,301320	170,8041	0,000000
Year	-0,923093	0,192288	-0,37143	0,077372	-4,8006	0,008645

Source: own calculations.

The linear regression modelling results achieved showed overwhelmingly statistically significant patterns. Unfortunately, the results are unsatisfactory. There was a decrease in the value of the indicator over the period under review. This can be seen in the negative values of the regression coefficient b1 in all countries analyzed. Of course, it is the respondents' perception of corruption which may also be the result of a higher degree of critical view of the respondents on the state of corruption in the respective country. However, countries should not settle for this alternative of a higher level of criticality among their own citizens. Rather, they should look for internal reserves aimed at reducing the level of corruption per se, as an objective indicator.

Summarizing the partial analyses of the evolution of changes in indicator values over time, we can model the indicator values in the target year 2030. The results are summarized in the table.

Table 11
Expected value of selected sustainable development indicators in the target year 2030

Indicator	Country			
	CZ	HU	PL	SK
Area under organic farming	19,0	13,1	2,4	14,7
Tertiary educational attainment	36,1	28,6	41,8	56,6
Final energy consumption	682,7	551,5	697,5	775,7
Share of renewable energy in gross final energy	13,7	16,5	9,9	9,7
Energy import dependency	57,1	77,6	78,8	65,2
Real GDP per capita	21 344,7	17 029,6	17 472,0	18 268,6
Employment rate	91,4	91,7	86,5	86,7
In work at-risk-of-poverty rate	3,9	10,2	11,3	6,8
Corruption Perceptions Index	54,4	29,9	43,0	45,5

Source: own calculations.

It is important to note that in this case it is only a simple extrapolation of indicator values from previous years to the target year 2030. In several cases, the linear regression models were not statistically significant, so the modelled value for 2030 is also not statistically reliable (statistically significant values are highlighted). Despite the above, this is a useful contribution to the debate on the extent to which the V-4 countries are sufficiently effective in achieving the 2030 Agenda targets.

Conclusion

In the present paper, we have tried to model the evolution of selected indicators of some of the goals of the Agenda 2030 strategy of the V-4 countries using regression models.

For better interpretability of the results, we applied linear regression models to the forecasts. If these models were statistically significant, we extrapolated the values of the parameters under study for the year 2030, the target year of the 2030 Agenda.

We can see that the 2030 Agenda goals are very ambitious. On the other hand, in several cases, it is very difficult to clearly quantify the success or failure to meet the respective target listed in each indicator, as several of the defined indicators are difficult to quantify. Considering the analyzed indicators, the V-4 countries can be seen as a relatively homogeneous group of countries with similar economic, social, societal, environmental, and other backgrounds. The trends of changes in the individual indicators in the countries concerned are very similar, although of course they vary in intensity. The rate of change is largely determined by the baseline value of the indicator in question – a country that has a lower baseline value at the beginning of the period under analysis makes more significant year-on-year progress and thus catches up with other countries in the process of improving indicator values, which also means better stabilisation of the level of long-term sustainability of the country concerned.

In our analysis, we came to some surprising conclusions. The analyzed V-4 countries have similar trends of development in all the indicators studied, even if the results of the time series analysis were statistically insignificant in the respective indicator. The V-4 countries overwhelmingly show positive trends in the indicators analyzed. Sustainability in some cases, especially in those that are not significantly linked to economic decisions only but are mainly linked to political decisions. Countries such as energy dependence or perceptions of corruption are examples. These are negative trends. It would therefore be desirable for better decisions to be taken at country level to reverse the negative trends, which can have a positive impact on sustainability at all levels.

The analysis at the level of selected indicators is of course not a comprehensive analysis based on which it would be possible to draw clear conclusions on the success of the implementation of national policies in meeting the 2030 Agenda objectives. It should also be pointed out that in many cases the target for the relevant indicator for 2030 is not clearly defined, and in several cases, there are no country-specific data. Therefore, it is not possible to take an unequivocal position on the fulfillment of the conclusions of the 2030 Agenda at a given level of existence of relevant data. The paper presented here is an idea for a discussion on this complex issue, a suggestion to look for deeper connections between countries and each other, to look for key determinants of change over time, all with the aim of implementing good solutions at the national level to achieve long-term sustainability.

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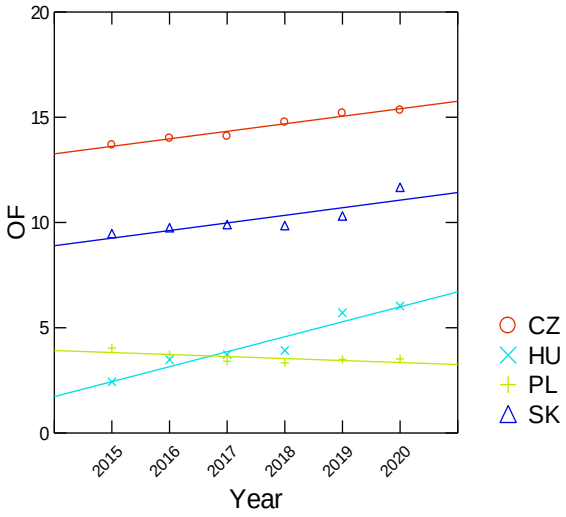
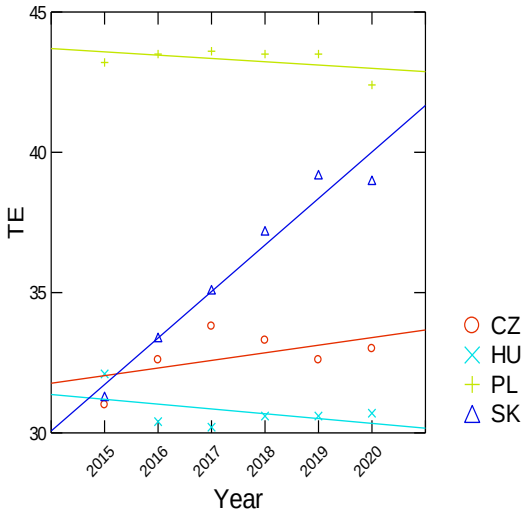
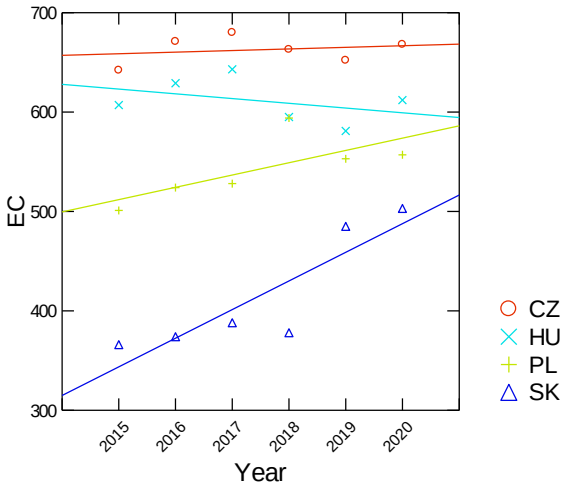
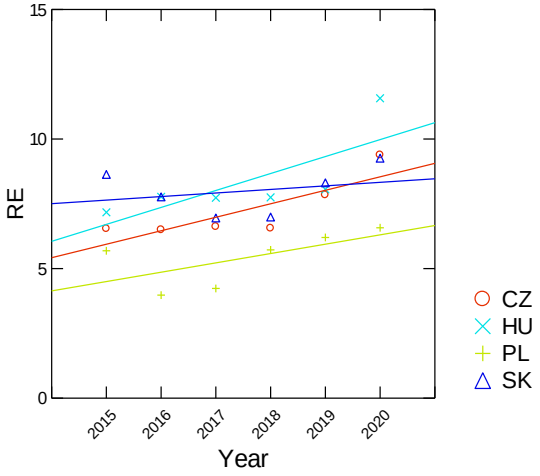
Annex

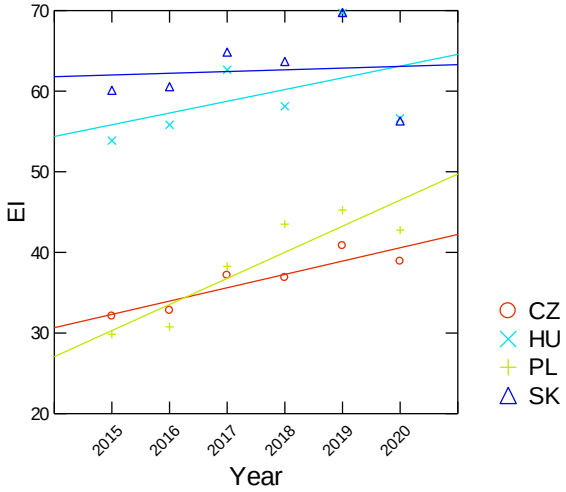
Values of the indicators analysed for each country in the period under review.

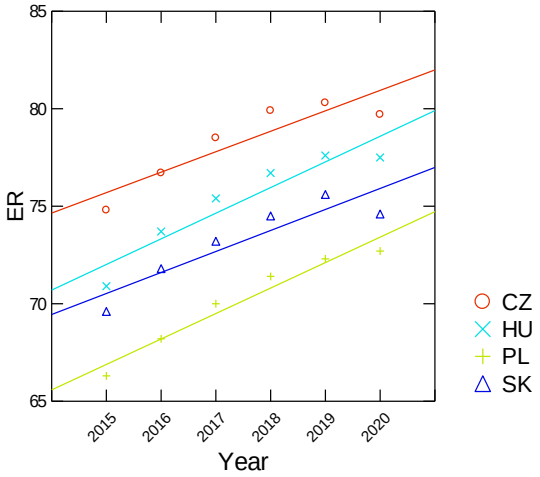


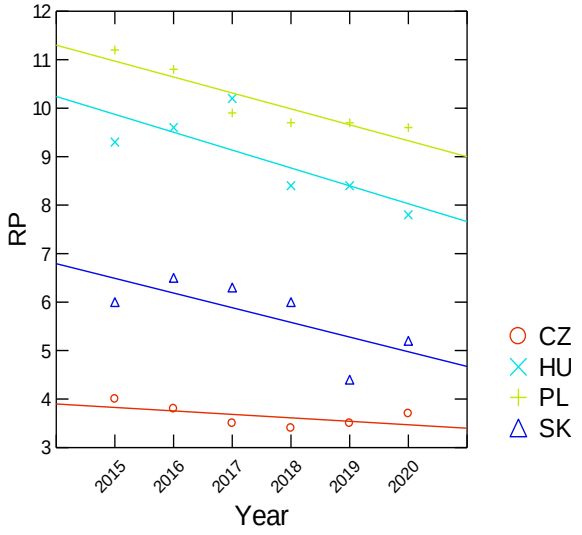








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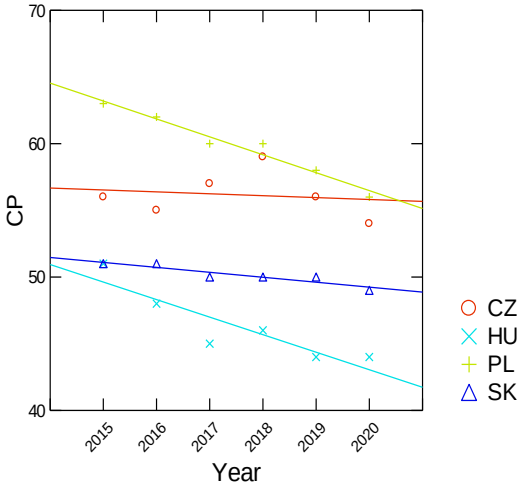
Year
CZ
HU
PL
SK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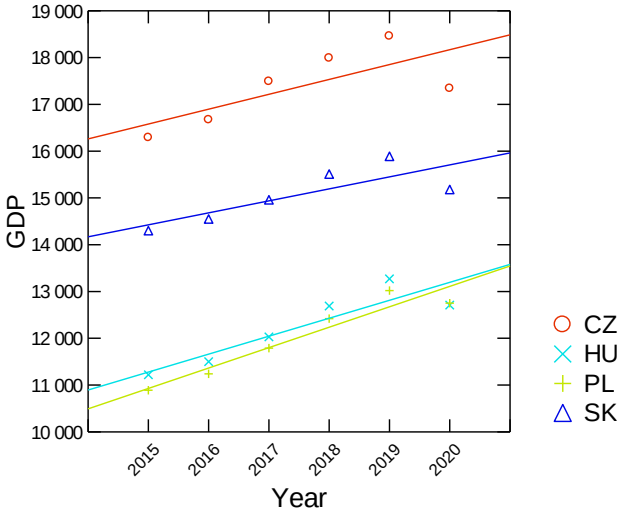
GDP
Year
CZ
HU
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