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Towards a composite index for assessing progress on the 2030 Agenda

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I. INTRODUCTION

1. The 2030 Agenda is a global strategy that requires high-quality indicators for its monitoring, in order to ensure an adequate follow-up of the goals and targets and to guide decision-making. Its monitoring is based on a set of 231 global indicators structured along 17 goals and 169 targets, which provides many disaggregated series. However, six years after its approval it is increasingly necessary to assess the progress on the Agenda as a whole.

2. In this sense, the National Statistics Institute of Spain (INE-Spain) is working in the development of a composite index to measure national progress towards 2030 Agenda.

II. METHODOLOGY

3. INE-Spain has been analysing different methodological approaches developed by international organizations, mainly United Nations and Eurostat, with the objective of building an index to assess the progress achieved and the compliance with SDGs.

United Nations – based on SDG progress chart methodology

4. The United Nations methodology for the trend assessment (UN, 2021) -also known as progress made since the baseline year- distinguishes between indicators without explicit numerical target and indicators with explicit numerical target.

5. If the indicators have an explicit numerical target established, it is used the ratio (CR) of the observed growth rate ($CAGRa$) to the required growth rate (CAGRr) to reach the numerical target.

6. If the indicators do not have an explicit numerical target, the Observed Compound Annual Growth Rate (CAGRa) is used to assess the progress. In these cases, depending on whether the indicator should increase/decrease over time, the progress made is categorized into different situations.

$$CAGRa = \left(\frac{x_t}{x_{t_0}}\right)^{\frac{1}{t-t_0}} - 1 \qquad (1)$$

7. Where x_t is the numerical value of the indicator in year t (last year available) and t_0 is the baseline year.

$$CAGRr = \left(\frac{x^*}{x_{t_0}}\right)^{\frac{1}{2030-t_0}} - 1 \qquad (2)$$

8. Where x* is the explicit numerical target and t0 is the baseline year.

9. In order to facilitate the evaluation of the Agenda as a whole, we assign a numerical value to each indicator with numerical target according to its state of progress:

Table 1
Score values according to the state of progress for indicators with an explicit numerical target

	State of progress	*Score*
If CR ≥0.95	Target will be met or almost met	10
If 0.8<CR< 0.95	It will be close to target	Between 8 and 10
If 0.6< CR≤ 0.8	It will be moderate distance to target	Between 6 and 8
If 0.4< CR≤ 0.6	It will far from target	Between 4 and 6
If 0< CR≤ 0.4	It will very far from target	Between 0 and 4
If CR≤ 0	It will very far from target	0

10. For indicators without an explicit numerical target, in case the indicator should increase over time, the progress made can be classified into one of five possible situations.

Table 2
Score values according to the state of progress for indicators without an explicit numerical target (increase over time)

	State of progress	*Score*
If CAGRa >0.01	Significant progress	10
If 0.005< CAGRa≤ 0.01	Fair progress but acceleration needed	Between 8 and 10
If 0 < CAGRa≤ 0,005	Limited progress	Between 4 and 8
If -0.01 < CAGRa≤ 0	No progress	Between 0 and 4
If $CAGR_a$≤ -0.01	Deterioration	0

11. If the indicator without an explicit numerical target should decrease over time, the progress made is categorized into one of five possible situations.

Table 3
Score values according to the state of progress for indicators without an explicit numerical target (decrease over time)

	State of progress	*Score*
If CAGRa <-0.01	Significant progress	10
If -0.01< CAGRa≤ -0.005	Fair progress but acceleration needed	Between 8 and 10
If -0.005< CAGRa≤ 0	Limited progress	Between 4 and 8
If 0< CAGRa≤ 0.01	No progress	Between 0 and 4
If CAGRa>0.01	Deterioration	0

12. Finally, the scores of indicators are aggregated linearly upwards (indicator, target, goal, Ps and global) to obtain a composite index.

Eurostat's methodology for SDG assessment

13. Eurostat also evaluates the trend of indicators through the compound annual growth rate and distinguishes between indicators with explicit numerical targets and without explicit numerical targets (Eurostat, 2021).

14. These values are inserted into a scoring function (which is different for indicators with and without quantitative target) in order to calculate a score ranging from + 5 (best score) to – 5 (worst score) for each indicator. These indicator scores are currently only calculated for the short-term (past 5 years) period. The average scores on the goal level are then calculated as the arithmetic mean of the individual scores of the indicators chosen for monitoring the respective goal.

AMPI methodology

15. In addition, INE-Spain has also been working with an approach based on the AMPI method (De Muro et al., 2011).

16. The AMPI method consists of the aggregation of indicators that are not substitutable for each other, have the same relevance in the phenomenon analysed and do not compensate each other (i.e. low value in one indicator is not compensated by a high value in another). Indicators with positive polarity are selected to measure progress towards compliance with the 2030 Agenda in Spain, it means indicators whose increasing variations mean improvements in the composite indicator.

17. The second step is to carry out the normalization process using the Mazziota-Pareto Adjusted procedure, which consists of rescaling the data for each indicator on a min-max scale between 85 and 115. Subsequently, the new scale adjusts 100 to the value chosen as reference. If the normalized value has increased, it should be interpreted that the indicator has improved. On the contrary if the value has decreased, the indicator has worsened.

18. Finally, we aggregate the rescaled indicators. The method is based on a linear aggregation but adding a penalty factor to take into account the variability of the results of the indicators within each unit of analysis (horizontal variability).

19. In this case, since the composite index measures a positive phenomenon, that is, increasing values of the index correspond to positive variations of the phenomenon, MPI- is used.

$$MPI_i^- = M_{zi}(1 - cv_i^2) = M_{zi} - \frac{S_{zi}^2}{M_{zi}} = M_{zi} - S_{zi}cv_i \qquad (3)$$

20. Where cv_i is the coefficient of variation of the normalized values of the indicators {j=1,..., m} in the statistical unit i, M_{zi} and S_{zi} are the mean and standard deviation of the normalized values of the indicators {j=1,..., m} in the statistical unit i.

III. RESULTS

21. United Nations and AMPI are the methods that we have been implemented to calculate composite indices of the progress towards 2030 Agenda.

22. For the construction of these composite indices, we have taken as basis the National Reporting Platform[1] that INE launched in 2018 and is maintained in collaboration with the ministerial departments to monitor progress 2030 Agenda. The analysis has been done with respect to the year 2019.

23. Currently, in the NRP there are available 151 indicators with more than 400 series, covering 61% of the global framework indicators. Most of these indicators come from annual statistics, but there are also sporadic modules, as well as ten-year, five-year or four-year statistics. In addition, some administrative registers have also been used.

24. The selection of the series for the index was made on the basis of their availability and their relevance. We have only considered targets with at least 75% of the available indicators. Wherever possible, global targets have been used but for some indicators they have been ruled out because some global targets do not make sense at the national level.

25. In the table below, you can find the preliminary results obtained after applying UN and AMPI methods:

[1] https://www.ine.es/dyngs/ODS/es/index.htm

Table 4
Composite Index on the progress towards 2030 Agenda. Preliminary results

	UN Method		*AMPI Method*	
	2016	*2019*	*2016*	*2019*
People (SDGs 1, 2, 3, 4 and 5)	6,27	6,87	100,02	101,25
Planet (SDGs 6, 12, 13, 14 and 15)	7,50	7,30	n.a	n.a
Prosperity (SDGs 7, 8, 9, 10 and 11)	4,11	6,92	99,94	100,14
Peace (SDG 16)	6,66	5,00	100,49	98,68
Partnership (SDG 17)	7,33	6,33	n.a	n.a
Global	5,90	6,76	100,06	100,56

26. The Global index on the progress towards 2030 Agenda in Spain show an improvement in 2019 compared to 2016 applying both methods. According to UN method, the index passes from 5,90 in 2019 to 6,76 in 2019; while the AMPI method shows an increase from 100,06 in 2016 to 100,56 in 2019.

27. Considering the five domains of the 2030 agenda, known as 5 P's (People (SDGs 1, 2, 3, 4 and 5), Planet (SDGs 6, 12, 13, 14 and 15), Prosperity (SDGs 7, 8, 9, 10 and 11), Peace (SDG 16) and Partnership (SDG 17)), the results evolve positively for People and Prosperity in 2019 compared to 2016 with both methods. However, for Peace both methods show worse results in Peace in 2019 compared to 2016.

28. Comparing the results of both methods at goal level, we observe an improvement in Goals 4, 5 and 9 and a deterioration in Goals 3 and 16, in 2019 compared against 2016.

IV. CONCLUSIONS

29. Taking into consideration the methodological work as well as the preliminary results, we can conclude the following:

- Different methodologies provide different results, although the sense of the trend is the same for both methods.
- The methods studied have not been applied to all the goals of the Agenda, due to data gaps.
- Our analysis using the AMPI method is based on goals instead of targets, mainly due to lack of data. Introducing headline indicators could facilitate analysis.
- Further work is necessary to improve this index before its release as experimental statistic, in particular as regards the comparison of results obtained by both methods and to choose the most suitable methodology. The soundness of the method should also be checked.
- Different data penalties could be studied.

- Composite indicators are useful since they summarise in a number a wide set of phenomena, however it is important to complement them with more detail data, at goal and target level, to have a complete overview of the situation.

V. REFERENCES

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