

## Contribution to Beyond GDP „Virtual Indicator Expo“

<http://www.beyond-gdp.eu>

Name of the indicator/method: **Time Distance Method for Analysing and Presenting Indicators**

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### ***Why we need the time distance method for analysing and presenting indicators***

The time distance methodology offers a very interesting new way of analyzing and presenting indicators and time series data in general. Well-being and development are multidimensional and long-term phenomena, people compare and assess over many dimensions and over time. Time, besides money, is one of the most important reference frameworks in a modern society. The time perspective, which no doubt exists in human perception when comparing different situations, has been with the S-time-distance method systematically introduced both as a concept and as a quantifiable generic statistical measure.

- *The new generic time distance approach offers a new view of existing data that is exceptionally easy to understand and communicate, and it allows for developing and exploring new hypotheses and perspectives.*
- *It can also make important contribution to better exploitation of information resources in new ways and to the visualization of findings; it is also well placed to be used jointly with other methods.*
- *Expressed in time units it is an excellent presentation tool easily understood by policy makers, experts, managers, media and general public, it can support decision-making as well as influence public opinion.*

### **Definition of S-time-distance and policy implications: different statistical measures may lead to different perceptions about the situation**

Statistical measure S-time-distance measures the distance (proximity) in time between the points in time when the two series compared reach a specified level of the indicator X. The observed distance in time (the number of years, quarters, months, etc.) for given levels of the indicator is used as a temporal measure of disparity between the two series, in the same way that the observed difference (absolute or relative) at a given point in time is used as a static measure of disparity.

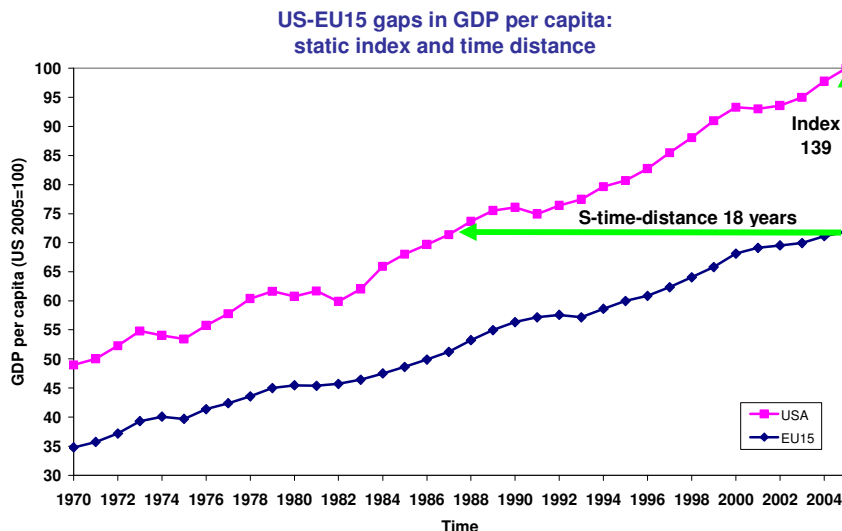
S-time-distance measure is a measure with clear interpretability that delivers a broader concept to look at data and to compare situations, including benchmarking and monitoring. This innovation opens the possibility for simultaneous two-dimensional comparisons of time series data: vertically (standard measures of static difference) as well as horizontally (Sicherl

time distance). In graphical terms, the usual way is to compare the time series in the **vertical dimension**, i.e. for a given point in time. The time distance approach uses an additional perspective; it compares the respective time series in the **horizontal dimension**, i.e. for a given level of the variable. Empirically, the degree of disparity may be very different in static terms and in time distance, which leads to important technical and policy consequences.

### Benchmarking and gap analysis

Two time series can and should be compared in two dimensions:

1. static gap for a given point in time
2. gap in time for a given level of the variable



Comparing the EU15 for male-female differences in life expectancy in 2000 the female life expectancy was 6.3 years higher (absolute static difference), which amounted to about 8 percent difference (relative static difference) in relation to that of men. However, the S-time-distance was an astonishing 29 years. This means that women attained the value of male life expectancy for 2000 already in 1971, about three decades ago. The perception whether the gender difference in life expectancy in the EU15 is large or small depends on the measure used: static percentage difference is only 8 percent, while S-time-distance amounts to 29 years. For a more realistic conclusion all measures should be presented simultaneously.

This is important for analysis and policy debate for a single indicator and especially for comparisons across indicators with different growth rates in different fields of concern as needed for the Beyond GDP approach. The better the analytical framework the greater the information content provided to decision makers, experts, media and general public. If one does not use explicitly the broader framework outlined here, there is a possibility that in political debate and policy formulation various interest groups would intentionally look only at the measure which will suit their particular interest.

### Monitoring and evaluation – how to present it better for public debate

A substantial effort of the international and national organizations as well as research organizations has been and will be channeled into collecting and analyzing the necessary data for the systems of indicators under discussion. However, the benefit for better decision making and wide participation of broad range of stakeholders will depend critically on the *human interface: understanding of the information and communication of that understanding* (Sicherl, 2006b). Monitoring and evaluation of the degree of implementation of policy targets are indispensable phases of the policy circle. The interpretation of the deviation of actual development from the line to target with S-time-distance measure is straightforward and intuitively understandable; it deals with lead or lag against their own target. It is like tracking the actual arrivals in comparison with the train or bus timetable, the difference being that the concept of geographical space is in our application replaced with the indicator space.

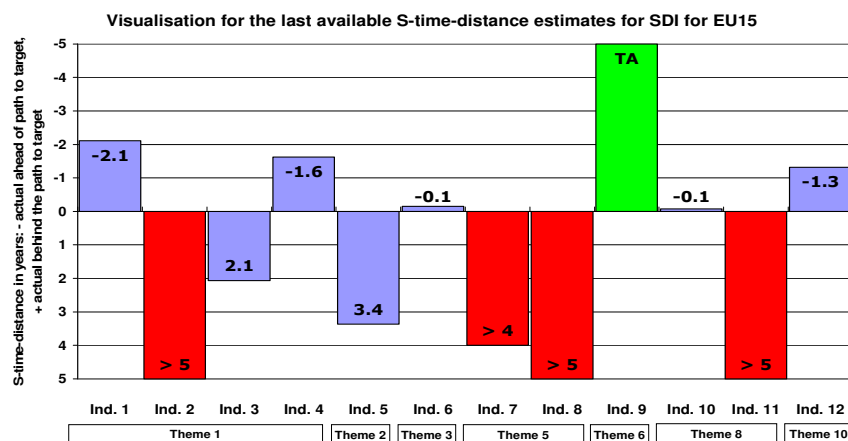
**Monitoring implementation of Lisbon 1 targets for EU15 across 7 themes of SDI**  
(S-time-distance deviation from the linear hypothetical path to target)

Theme		Proposed SDI	S-time-distance in years						
			2000	2001	2002	2003	2004	2005	2006
Theme 1 - Economic development	1	Life-long learning, %	0	1.0	1.8	-1.0	-2.0	-2.1	
Theme 1 - Economic development	2	Share of R&D in GDP	0	0.8	1.7	2.9	> 4	> 5	
Theme 1 - Economic development	3	Total employment rate, %	0	0.1	0.8	1.6	2.0	2.1	2.1
Theme 1 - Economic development	4	Employment rate, females, %	0	-0.5	-0.5	-0.2	-0.6	-1.1	-1.6
Theme 2 - Poverty and social exclusion	5	Early school-leavers, %	0	0.5	1.2	1.5	2.0	2.7	3.4
Theme 3 - Ageing society	6	Employment rate of older workers, %	0	0.2	0.0	-0.2	0.1	-0.2	-0.1
Theme 5 - Climate change and energy	7	Total greenhouse gas emissions	0	> 1	> 2	> 3	> 4		
Theme 5 - Climate change and energy	8	Share of electricity from renewable sources	0	0.2	> 2	> 3	3.9	> 5	
Theme 6 - Production and consumption pattern	9	Municipal waste landfilled, kg per capita	0	0.1	-0.9	-2.5	-4.2	TA	
Theme 8 - Transport	10	People killed in road accidents	0	0.5	0.9	0.4	-0.2	-0.1	
Theme 8 - Transport	11	Road share of inland freight transport	0	> 1	> 2	> 3	> 4	> 5	
Theme 10 - Global partnership	12	Official development assistance, % of GNI	0	-0.1	0.4	0.9	2.4	-1.3	

S-time-distance in years: - actual ahead of path to target, + actual behind the path to target

TA - Target already achieved

> x - Actual value is worse than the starting value, therefore S-time-distance is more than x



With EUROSTAT we agreed on a selection of sustainable development indicators to be tested using the time distance methodology. In a single table there is a wealth of clear information about being on or off the track to targets for 12 selected indicators from 7 themes of SDI for all years.

People will intuitively understand the lead or delay in time of actual implementation against the assumed time table to the proclaimed targets.

This type of analysis can be repeated in the EU case for all 27 countries across a selected number of available indicators with established targets. In the case shown it is easy to observe the large delays in the theme 5 Climate change and energy; as well as in the road share of inland freight transport and share of R&D in GDP.

**Lisbon 1 target of 70% employment rate in 2010 for all countries**  
(S-time-distance deviation from the linear hypothetical path to target)

	S-time-distance in years						
	2000	2001	2002	2003	2004	2005	2006
EU (25 countries)	0	0.5	1.5	2.3	2.8	3.2	3.0
EU (15 countries)	0	0.1	0.8	1.6	2.0	2.3	2.1
Denmark	TA	TA	TA	TA	TA	TA	TA
Netherlands	TA	TA	TA	TA	TA	TA	TA
Sweden	TA	TA	TA	TA	TA	TA	TA
United Kingdom	TA	TA	TA	TA	TA	TA	TA
Austria	0	1.0	0.7	0.3	0.0	4.3	TA
Cyprus	0	-3.9	-4.7	-5.1	-3.4	-1.5	-3.8
Estonia	0	0.4	0.3	0.4	1.3	0.8	-2.0
Finland	0	-2.2	-1.2	1.2	2.6	0.7	-1.5
Ireland	0	-0.2	1.4	2.4	1.7	0.0	-1.1
Latvia	0	0.1	-0.3	-0.4	0.2	0.4	-1.0
Spain	0	-0.1	0.4	0.4	0.5	-0.1	-0.2
Slovenia	0	-0.4	1.2	> 3	0.5	0.6	0.7
Lithuania	0	> 1	1.3	1.2	2.1	1.8	1.9
Germany	0	0.5	> 2	> 3	> 4	> 5	2.4
Greece	0	1.1	1.3	1.4	1.9	2.3	2.7
Italy	0	0.3	0.9	1.5	1.6	2.6	3.1
Slovakia	0	1.0	2.0	2.3	3.8	4.3	4.0
Luxembourg	0	0.5	1.0	> 3	> 4	3.8	4.8
France	0	0.1	0.9	1.5	2.7	3.7	4.9
Hungary	0	> 1	> 2	2.5	3.6	4.6	5.3
Czech Republic	0	1.0	1.2	> 3	> 4	> 5	5.4
Belgium	0	> 1	> 2	> 3	> 4	4.4	5.5
Malta	0	0.9	1.9	3.0	> 4	> 5	5.6
Portugal	0	-2.7	-0.5	> 3	> 4	> 5	> 6
Poland	0	> 1	> 2	> 3	> 4	> 5	> 6

S-time-distance in years: - actual ahead of path to target, + actual behind the path to target

by the same eight criteria applied to the selection of structural indicators like 1. Easy to

understand, 2. Policy relevant, 3. Mutually consistent,... 6. Comparable between countries, etc. (Munoz 2004), *then for this application in monitoring implementation of the Lisbon EU and NRP strategies by structural indicators as well as for sustainable development strategies the S-time-distance measure would pass the test with flying colours.*

### **Wide range of possible applications**

In empirical research and in decision-making the art of handling and understanding different views of data is crucial. We need innovative perspectives also in statistical concepts and measures, not only in qualitative and other dimensions. The possibilities for S-time-distance analysis range from a simple analysis of monitoring implementation of targets to more complex benchmarking and to a very complex econometric analysis (Granger and Jeon used time distance as a criterion for evaluating forecasting models). The time distance approach can thus contribute a useful piece of the mosaic in building up an internationally supported methodology to measure and assess the overall “position” and “progress” among and within countries. Examples are available on [www.sicenter.si](http://www.sicenter.si) and [www.gaptimer.eu](http://www.gaptimer.eu)

## **Benefits of immediate operational uses of time distance**

- **A new view in competitiveness issues, benchmarking, target-setting and monitoring** for economic, employment, social, R&D and environment indicators at the world, OECD, EU, country, regional, city, project, socio-economic groups, company, household and individual levels
- **A broader dynamic framework for interrelating strategy issues of growth, efficiency, inequality and convergence**
- **Enhanced semantics for policy analysis and public debate**
- **Additional exploitation of databases and indicator systems**
- **An excellent presentation and communication tool:**
  - among different levels of decision makers and interest groups
  - for describing of the situations, challenges and scenarios
  - for proactive discussion and presentation of policy alternatives to policy makers, media, the general public and mobilizing those participating in or being affected by the programs
  - for communicating the urgent need for change and reforms

UN Statistical Division decided to put the software to calculate the S-time-distance measure for monitoring the implementation of the Millennium Development Goals on its official MDG web site to enable countries and other stakeholders to take advantage of this complementary statistical measure for policy debate at various levels.

SICENTER is in the process of developing a web application which would allow a variety of interested users such as international and national organizations, NGOs, experts, managers, educators, students and media to monitor with S-time-distance the lead or lag in time from the Lisbon and NRP targets in the case of EU and for the UN Millennium Development Goals or other planned, budget, or aid disbursement targets at world, regional, national, sub-national and business levels.