

TIME DISTANCE AS A NEW ADDITIONAL WAY TO MEASURE AND ASSESS THE OVERALL POSITION AMONG AND WITHIN COUNTRIES

The time distance concept and the statistical measure are valuable complementary tools for analysis and presentation of key indicators.

A broader concept to look at data and to compare situations

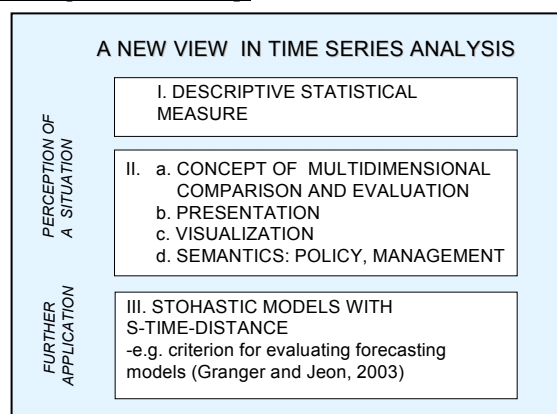
The first step is to describe and measure the situation better by *displaying more dimensions*. Time is one of the most universal units of measurement.

S-time-distance measure is a clear concept. It measures the difference in time when two compared units attain a given level of the indicator.

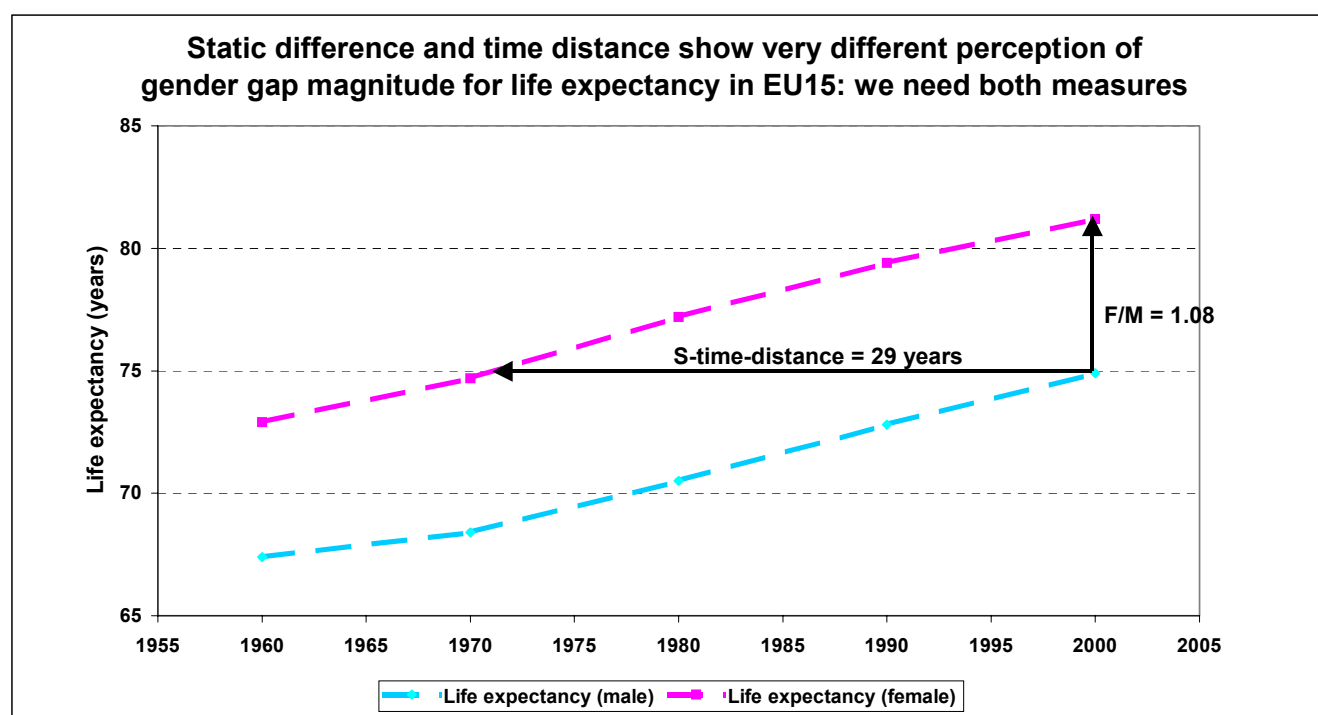
The example shows that the perception about the importance of the gender gap in life expectancy depends on the measure used: static gap is only 8% and looks small, the S-time-distance of 29 years gives a different message (women attained the 2000 value for men as early as 1971).

Empirically, the degree of disparity may be very different in static terms and in time distance. From existing data new insights are provided with new conclusions and semantics important for policy considerations.

A new generic measure with clear interpretability



As a special family of time distance measures the (S-time-distance) is a new generic measure using an additional perspective by comparing the time series in the horizontal dimension, i.e. for a given level of the variable (extracting additional information in time series left unexplored by the present state-of-the-art, see e.g. Sicherl, 1973, 2004a, 2004b).



Time-distance as a presentation and communication tool

Since S-time-distance is expressed in time units, it is intuitively understood by policymakers, professionals, managers, media and the general public, facilitating their subjective perception about their position in this additional dimension.

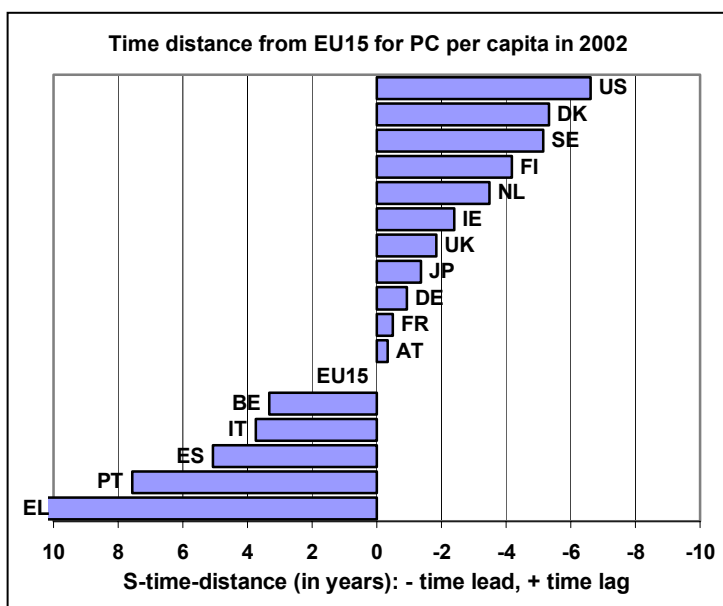
For policy analysis it offers:

- 1) a new expression and visualisation of facts and a broader dynamic evaluation of the outcomes for the past,
- 2) a new semantics for describing and comparing scenarios for the future.

The overall degree of disparity is assumed to be a weighted combination of static measure and time distance; both of them matter.

Simultaneous comparisons of time series data in the two specified dimensions: **vertically** (standard measures of static difference) as well as **horizontally** (Sicherl time distance) raises new important hypotheses about the interrelationship between efficiency, growth, disparity, convergence and in benchmarking.

The analytical conclusion that higher magnitudes of growth rates lead, *ceteris paribus*, to smaller time distances, and vice versa, provides new dynamic elements in explaining past developments and in preparing policy recommendations.



Two practical advantages of the time distance for wide use

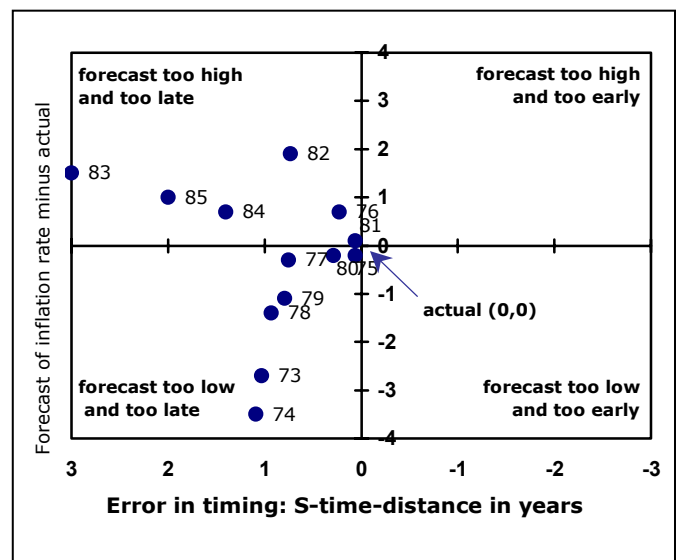
- Expressed in standardised time units it is comparable across variables, fields of concern and units of comparison (countries, regions, socio-economic groups, firms, etc.).
- When combined with other measures, the earlier results are left unchanged, but new conclusions may be reached due to an added dimension of analysis.

The new view of information, using levels of the variable(s) as identifiers and time as the focus of comparison, is theoretically universal, intuitively understandable and can be usefully applied to a wide variety of substantive fields at macro and micro levels.

The generic idea can be used for many additional applications

Example of use as a diagnostic tool:

Consensus forecast and actuals in two dimensions; growth rate of GNP deflator (USA, 1973-1985)



S-time-distance also adds a second dimension to comparing actual values with estimated values (forecast, budget, plan, target, etc.) and for monitoring.

For measuring deviations between estimated and actual values in regressions and models, forecasting, error in timing and causality, monitoring, business cycle analysis see Sicherl (1994, 1996, 1997), for variables other than time Sicherl (1999). Granger and Jeon (1997, 2003) further elaborated it for the use as a criterion for evaluating forecasting models.

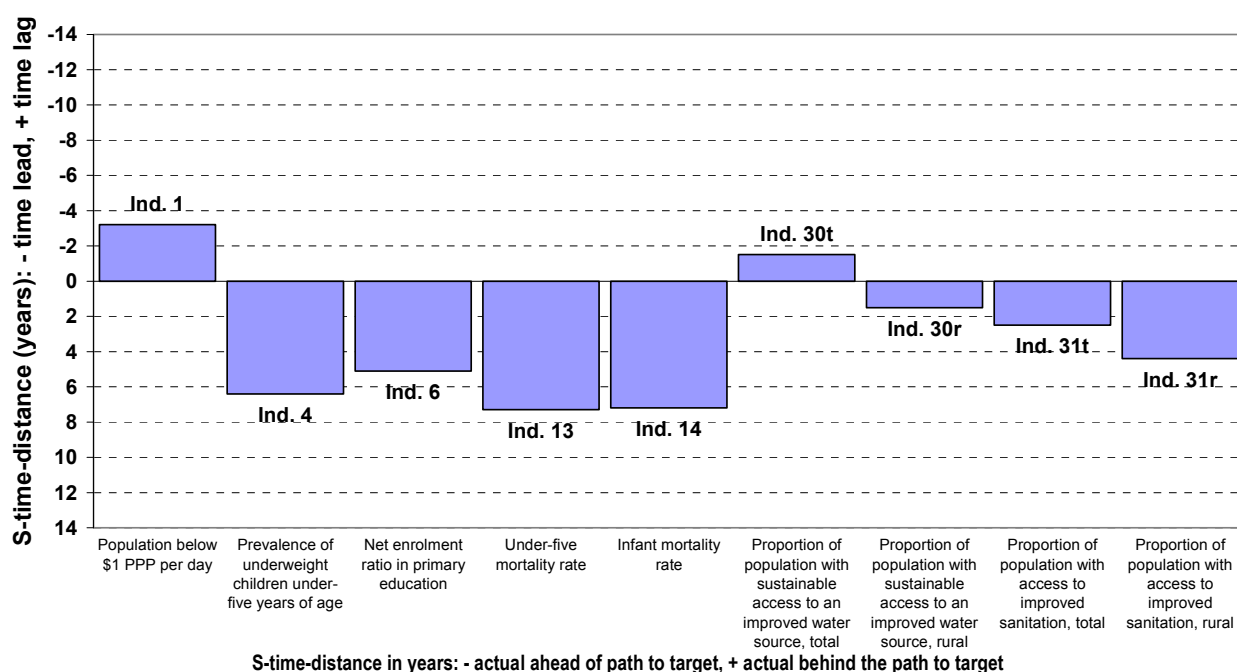
MONITORING IMPLEMENTATION OF THE MILLENNIUM DEVELOPMENT GOALS IN THE TIME DIMENSION **(A topical example of the excellent presentation tool)**

This example demonstrates the presentation capabilities of the novel methodology that can be used as one of the measures of the implementation of MDG across a number of relevant indicators by various users. The comparison across many indicators from different fields of concern is a very important topic at the national and sub-national analysis and reports of implementation of the MDG, in addition to the interest of international organisations and aid donors at the world and regional levels. A substantial effort by the international and national organisations has been and will be channelled into collecting the necessary data for the related system of indicators; time distance concept can be helpful for a better utilisation of data for policy debate.

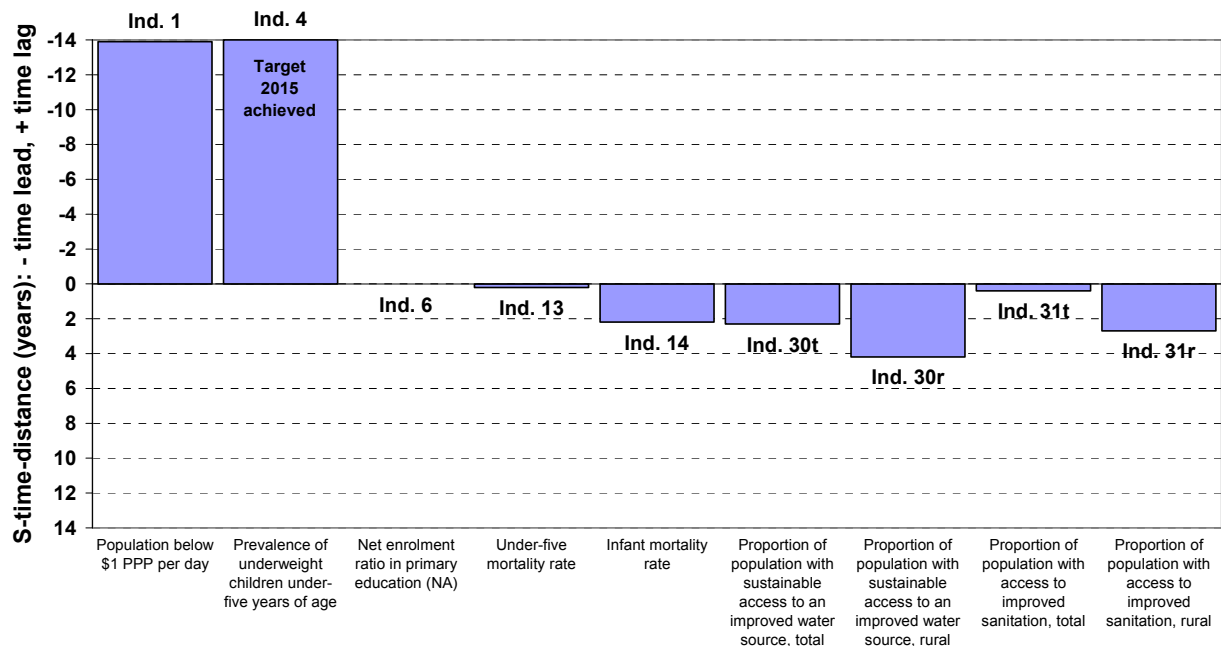
S-time-distance measures the time dimension of deviation between the actual implementation and the implied path to target in 2015 for a given target. It is very much like comparing actual arrivals with the train or bus time table; the difference being that the geographical space is here replaced with the indicator space. For instance, **the overview for Developing Regions**

shows that for the indicator ‘population below the \$1 PPP per day’ the actual value for 2004 was more than 3 years ahead of the line to target and should be an important indication of the progress in this direction. The next four indicators show a distinctly different and disturbing situation. **At the country level example China** shows an extraordinary progress in eradicating extreme poverty and hunger.

It should be reasonably easy to incorporate the S-time-distance methodology for monitoring implementation of the MDGs in the work of the UN, the World Bank and of some other agencies on these issues. This methodology can be used a standard procedure in numerous other activities of the UN and other international agencies and at the national and local levels, like monitoring and evaluation of implementation of development plans and policy targets, as well as for the relevant budgets. *The time distance information seems to be at least as helpful in providing a proper perception of the progress in implementation or the lack of it as is the percentage difference.*



**Monitoring implementation of the Millennium Development Goals in the time dimension for selected indicators:
DEVELOPING REGIONS, about 2004**



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

Monitoring implementation of the Millennium Development Goals in the time dimension for selected indicators: CHINA, situation around 2004

The perceptions of well-being and societal progress are subjective and the resulting decisions, behaviour and actions are influenced not only by the available statistical data and indicators but **also by the measures that are used in the measurement, analysis, presentation and semantics of discussing these issues as indispensable elements to form these perceptions.**

Here as an addition to the present state-of-the-art a new generic statistical measure S-time-distance is suggested to open a new view to many aspects of time series analysis with important technical and policy implications.

The novel time distance methodology provides a new insight to many problems, an additional generic statistical measure, and a presentation tool for policy analysis and debate expressed in time units, readily understood by policy makers, managers, media and general public.

The benefits of this new view in comparisons, competitiveness issues, benchmarking, target setting and monitoring for economic, employment, social, R&D and environment indicators at the world, OECD, EU, country, regional, city, sector, socio-economic groups, company, project, household and individual levels could be immediately applied to many indicators from many substantive fields using existing data and indicator systems from international, national, regional, business and local sources.

General conclusions on the new approach

Time distance concept and statistical measure S-time-distance is:

- theoretically universal
- intuitively understandable
- immanently practical

"The usual matrix for comparing two lines involves differences along the vertical axis. This can be a poor way of measuring how these trends vary in terms of time which is on the horizontal axis... Sicerl's several works have presented a non-technical discussion of the theory of time distance... As Sicerl (1973, 1993) proposes... observed time distance is a dynamic measure of temporal disparity between the two series, intuitively clear, readily measurable, and in transparent units....."

C.W.J. Granger and Y. Jeon, University of California at San Diego

"Time distance is a generic concept. That means that, as it has been the case e.g. with spreadsheet, one cannot in advance specify all the uses to which a generic framework can be put by imaginative users in numerous fields."

J. Backhouse, Information Science Dpt., London School of Economics