

*The real voyage of discovery
consists not in seeking new lands
but in seeing with new eyes*

Marcel Proust

Innovative framework for dynamic indicator analysis of Beyond GDP initiatives

Professor Pavle Sicherl

SICENTER and University of Ljubljana

pavle.sicherl@gaptimer.eu, www.gaptimer.eu

1. Introduction

Progress and well-being are by their nature multi-dimensional and long-term phenomena; time is of essence in all domains, it is important both as operational and comparative metric. **Perceptions of well-being and progress are also inherently subjective; we need measures to build the perceptions about the degree of disparity in indicators in a dynamic context.**

Measuring well-being and societal progress entities is a complex undertaking and involves in its essence the search how to answer in an agreeable way two questions, which transcend fields of concern and technicalities: **PERCEPTION ABOUT WHAT (elements of well-being and societal progress) and WHICH MEASURES TO USE TO BUILD PERCEPTION ABOUT THEM (measures to present and to communicate the topics also for policy making)**. I shall deal with the second issue and explore possibilities how the time distance concept and two novel generic statistical measures can enhance knowledge building and policy implications in the context of Beyond GDP initiatives.

The high-level expert EU conference “Moving ‘beyond GDP’ in European economic governance”, Brussels (October 10, 2014) was intended to discuss recent technical advances in measuring well-being, their current policy implications and how to translate this into EU-level and national policy-making in the future. These issues are here discussed in three topical sections:

2. Broadened theoretical concept of measuring inequalities and in evaluating the magnitude of inequality; 3. Time matrix presentation format indicates at a glance that GDP underestimated the scale of damage of the financial crisis; 4. Time distance measurement for monitoring of implementation of targets and for goodness-of-fit; and summarized in 5. Conclusions.

It is very important how people understand data and indicators. We need new data and indicators but we also need innovative concepts of looking at data and new generic

statistical measures to better perceive and exploit the information available in existing data.

The starting theoretical point of my contribution is the fact that in empirical research and in decision-making the art of handling and understanding different views of data is crucial for the discovering of relevant patterns and **broader understanding of reality from several perspectives. The present state-of-the-art does not realise that**, in addition to static comparison, **there exists in principle a theoretically equally universal measure of difference (distance) in time when a given level of the variable is attained by the two compared time series**. On the scientific side, the fact that Nobel Prize Winner Clive Granger finds the concept of time distance for a given level of the variable a useful addition to the present state-of-the-art is an evidence of the generic capability of the methodology¹ beyond the benchmarking and monitoring examples here.

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 (Sicherl 1973, 1994, 2004a, 2007a, 2011b). For easy available description of methodology see Sicherl (2011a)², for extensive elaboration the book Sicherl (2012).

The range of applications of time distance methodology can be examined in two categories. **The first is application in statistics in a more narrow interpretation**, i.e. adding two generic statistical measures S-time-distance and S-time-step to the literature; **with the primary application in descriptive statistics but also in goodness-of-fit issues. The strength of the time distance concept lies in the fact that it enables additional exploitation of data and visualization for time related databases and indicator systems**.

The second category is the application of time distance methodology for better understanding of the information provided in statistical data; for building knowledge and for discussing policy and business issues in a new perspective. The two generic statistical measures S-time-distance and S-time-step have in addition to their use as descriptive statistical measures the potential to provide **new understanding** of a variety of situations in economics, management, research and statistics, **asking new questions, formulating new hypotheses, establishing new semantics and reaching new conclusions. This is a very important dimension for the conference.** The concept of time distance applies across variables, fields of concern, and units of comparison, making it an excellent analytical, presentation, and communication tool.

¹ 'As Sicherl (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 ... It is suggested that one should complement conventional vertical measures with horizontal measures. ... Sicherl's several works have presented a non-technical discussion of the theory of time-distance.' (Granger, Jeon, 1997).

² P. Sicherl, New Understanding and Insights from Time-Series Data Based on Two Generic Measures: S-time-distance and S-time-step; Working paper No. 44, Statistics Directorate, OECD Publishing, Paris, November 2011.

Download available on <http://dx.doi.org/10.1787/5kg1zpzzl1tg-en>.

2. Broadened theoretical concept of measuring inequalities and in evaluating the magnitude of inequality

Time, besides money, is one of the most important reference frameworks in a modern society. **People have memories of the past and expectations about the future; they compare over many dimensions and over time. This explicitly or implicitly introduces the concept of inter-temporal aspect of well-being.** It is elaborated also in Sicherl (2014c) in the Springer 'Encyclopedia of Quality of Life and Well-Being Research', edited by Alex Michalos.

The inter-temporal aspects of well-being relate both to individuals regarding their time preference and in our case even to a greater extent to comparing situation between countries, regions, gender, socioeconomic groups, individuals, etc., over time. Inter-temporal considerations might be of importance even over a very long term as e.g. parents might be considering the success of their children an important part of their wellbeing. Expectations and hope might be other elements in subjective considerations over time. As the perception of well-being is subjective, the concept of well-being and progress has to deal not only with the categories, measurement, and data availability but also with interpersonal and inter-temporal comparisons of the chosen constituent elements. **The time perspective, which no doubt exists in human perception when comparing different situations, has been with the S-time-distance method systematically introduced in a specific way both as a concept and as a quantifiable measure in statistical and comparative analysis.**

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. This innovation opens the possibility for simultaneous two-dimensional comparisons of time series data in two specified dimensions: vertically (standard measures of static difference) as well as horizontally (Sicherl time distance).

There are two aspects. One is descriptive, an additional statistical measure with clear interpretability. The second one is the evaluation of the degree of inequality in the broader two-dimensional framework. For instance, the perception whether the gender difference for the EU average in life expectancy is large or small depends on the measure used: large (time distance of 27 years, a quarter of century) or small (static percentage difference being less than 8%). We need both dimensions - static and time distance measures.

In the 2004 IARIW Conference there was a coincidence that two papers in the plenary sessions on **measuring and interpreting global inequality and poverty raised the same problem of the unsatisfactory situation that at the empirical level the one-sided reliance on relative measures is almost unconditional.** Both recommended that they should be complemented by other dimensions. Atkinson and Brandolini (2004) emphasised that they have never seen official publications reporting estimates of absolute inequality. In their paper 'Global world inequality: absolute, relative or intermediary?' - they put the emphasis on a broader choice of static measures. Sicherl (2004b), on the other hand, in the paper 'Time distance: a missing link in comparative analysis' - discussed the time distance concept and its role in measuring the temporal aspect of disparity.

In the dynamic world of today it is not satisfactory to rely only on static measures of disparity. The arguments for extension in several directions to a broader framework in theory and especially in empirical and policy work are well established; **it has to happen sooner or later.** If we have a **number of various measures of inequality** like static absolute or relative difference and time distance this raises the question of weights that people attach to each of them when reaching their **perception of the combined magnitude of the degree of inequality**³.

However, without going into complications of the weighting process to arrive at a composite measure of inequality, it should be **underlined that analyzing disparities in economic, social, environmental, technological and business indicators will show that the degree of disparities may be very different in static terms and in time. This means that new insights can be provided from existing data.** Different indicators may have very different growth rates. The greater the differences in the growth rates of the indicators, the greater is the probability that the degree of the disparity measured by time distance or measured by static measures will show different conclusions, especially in comparisons among indicators (Sicherl 1978, 1980).

The broader concept and measurement of dimensions of inequality leads to important policy consequences. The understanding of the situation may be very different than that based on static measures of inequality alone. The schematic presentation below presents a simple, but not simplistic case of comparing two countries or regions or social groups for a given indicator, assuming two scenarios. Scenario A assumes growth rate of 4%, and scenario B growth rate of 1%, for simplicity reasons both units are growing at the same rate of growth, respectively. Also assumption that the future trends to continue to grow at the same rate as earlier are used only for the purpose to make scheme as simply as possible. In the two compared units, the value of the indicator for region 1 is in static comparisons kept 50% higher than that of region 2 in both scenarios.

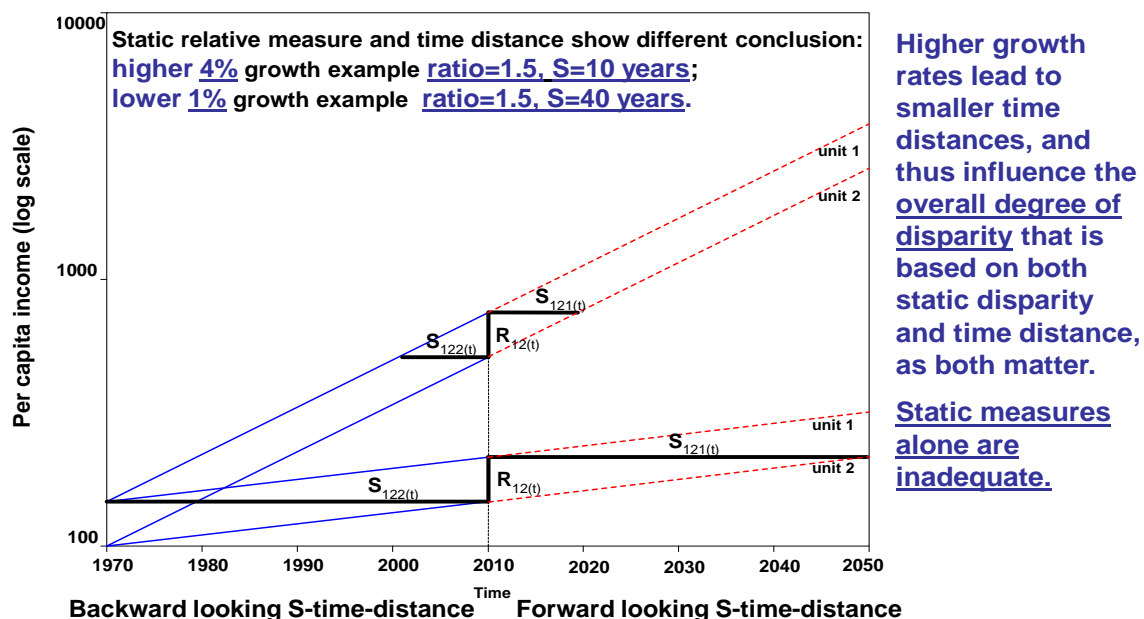
The value judgment that people attach to the time dimension of disparities and to the static dimension of disparity is an open question for interdisciplinary research. However, it may be safe to assume that a situation with 50 per cent static difference and time distance of 10 years is preferable to the situation with the same static difference and time distance of 40 years indicated in the example above. **The conventional analysis based only on static ratios or indexes, percentage differences, Gini coefficients or Theil indexes alone does not distinguish such situations (scenarios A and B) as different degrees of disparity.**

It is highly unlikely that people would perceive such situations as equal degrees of disparity. Conventional welfare theory would need to explain why it would not be possible to **incorporate such broader way of thinking, additional generic statistical measure(s) and the changed semantics into the present state-of-the-art.**

³ OECD has with the 'Better life index' initiative provided a tool to add the first and the most important subjective opinions among fields of concern and the respective indicators. Yet within each of these indicators there is again an open question of the weight people assign to the discussed two dimensions of disparity, at an instance of time and over time, static measure and time distance, to arrive at a subjective overall evaluation of their position in the society and in the world. Notionally we could look for the role of subjective weights in two rounds; first among indicators of the better life index followed by those among two dimensions of disparity.

In technical terms, the reduction of relative difference (expressed as a ratio of the values of the indicator for the two compared units) will depend only on the difference between the respective growth rates ($r_2 - r_1$), while the time distance will depend also on the absolute magnitude of the respective growth rates.

INEQUALITY within and between countries is a major challenge in the world and needs to be perceived and measured in both dimensions



The relations between growth, efficiency, convergence and perceptions are different in a dynamic concept of overall degree of disparity

An action program to reduce disparities and alleviate poverty must be concerned also with the absolute magnitudes of the growth rates of the indicator (r_2 and r_1), and not only with the difference in the growth rates ($r_2 - r_1$). Higher magnitude of the growth rates brings a net reduction in time distance in addition to whatever reduction in time distance has been achieved by the improvement in the relative difference. Factors that influence the magnitude of overall and sector growth rates also influence the overall degree of disparity via time distance, if at the same time appropriate distributional policies are being followed in the general strategic orientation for growth and equity (Sicherl, 1992).

If people take into account also time distance as one element of their subjective evaluation of the (overall) degree of disparity, **a new set of hypotheses with important economic, social and political consequences follows. An important hypothesis about the interrelationship between efficiency, growth and disparity can be formulated.**

In the conventional theory the trade-off between growth and inequality is sometimes emphasised. In the framework here, however, a high growth rate (with appropriate distribution policy) is not only a means for reaching higher levels of satisfaction of needs faster, but can be also a means of reducing disparities, at least in the time dimension. **Increased efficiency leads to higher growth from the same resources, this leads to smaller time distances that in turn could mean greater social cohesion, enabling a more**

conducive environment for timely adjustment to changes supporting increased efficiency and effectiveness, and the 'virtuous' circle can continue.

Higher growth can thus produce both positive and negative effects on social cohesion. The 'vicious' circle would work in the other direction; inefficiency has important negative economic and political consequences as far as disparities are concerned [Sicherl, 1992].

Lower growth rates should signal to politicians that an increase in the degree of disparity may be felt and that social tension may be increasing and cohesion decreasing. Unfortunately this relationship might be an important element of the understanding of the broad unrest and dissatisfaction with the consequences of the financial crisis of 2008.

On the one hand, many people see the fall or lower growth perspective for the future for indicators directly affect them. **On the other hand, their relative position in the society or in the world could be at the same time also worsened by two factors.** One is possible increasing static degree of inequality, the other the expected increase in the time distance lag behind others because of the lower growth rates. **Thus the time distance dimension of the overall degree of disparity provides an important component of understanding of the current economic and social circumstances beyond what is detected by static measures of inequality alone.**

3. Time matrix presentation format indicates at a glance that GDP underestimated the scale of damage of the financial crisis

First, any strategy has to start from a realistic evaluation of the initial position including the past performance. Second, ineffective co-ordination and problem of transparency are two factors that have to be remedied in the preparation and implementation of the new strategy.

Sicherl (2014e) **'European Union at a glance' presents an easily understandable overview of 30 selected indicators over 28 EU countries in time,** which is probably the most condensed current summary picture of disparities and dynamics in the EU countries over many domains over time. The [Gaptimer Report No. 3 European Union at a Glance](#) is timely publication **very useful for discussion of the situation in the EU in light of the forthcoming new European Commission and the new European Parliament** and at the occasion of the 10th Anniversary of the largest EU expansion in 2004.

It uses innovative time matrix presentation format that enables such condensed summary visual presentation over many countries and over time. These 30 selected indicators from many Eurostat indicators systems follow the orientation of Beyond GDP. The 30 time matrices give rich food for thought and imaginative readers can find numerous comparisons and stories in the material. One of them is that the damage done to countries by the world financial crisis is much greater when we look for 28 countries at employment, investment share, risk of poverty, income distribution, health, etc. and not at GDP alone.

This is a major policy conclusion confirming the multidimensional nature of development and well-being in the Beyond GDP initiatives. While media and also official organizations are frequently focusing on discussion of GDP growth rate (e.g. in extremes even discussing changes in this rate of e.g. 0.2 percent over quarters or years as the

sign that depression is over or such fall as indication that a country is again falling into recession), such orientation **GDP understated the severity of the crisis.**

Other domains show a more difficult situation:

- **employment rate** fell in 20 EU countries (71% of countries);
- **in all 28 EU countries without exception share of gross investment in GDP decreased** (100%);
- **risk of poverty as percent of total population increased** in 24 EU countries (86%);
- **income distribution worsened** as Gini coefficient and income quartile share ratio increased in 25 EU countries (89% of countries).

Time matrix is an innovative possibility of additional presentation of time series data. In the usual time series table data of the indicator (e.g. life expectancy) are organised in relation to the descriptors, like units (e.g. countries) and time (e.g. years). The time matrix presents the original data (or some approximations) in an alternative way: descriptors are units and levels of the indicator and the value in the field of the table are times when such levels were attained. Calculating these times by interpolations may pose a small problem of the degree of accuracy compared to the original data, but it **offers additional understanding about the time dimension of disparities and a good summary overview over many units and years and also a first-level visualisation tool.**

In short, time matrix organises the same data from Eurostat databases in a way that **data are arranged by selected levels of indicators showing in which year these levels of the indicators were achieved by given country. The result is a LEVEL-TIME MATRIX, which is easily understood by everybody.** This presents a first level visualisation that usefully complements the details in the original database by showing the easily understandable summary dynamic overview.⁴ This allows for a **quick level comparison for time matrices for all 30 indicators:**

- **comparing vertically** levels between countries show the situation and disparities across the EU countries over time
- **comparing horizontally in the row for each country** shows how many steps over levels of indicators were achieved (which is an additional indication of the dynamics in the country).

As an example out of 30 indicators the S-time-matrix for Gini coefficient is presented.

The year presented in **bold** show the latest presented year of the indicator for the given country. It can help to quickly observe whether there was a noticeable decrease in the observed period. It is observed at a glance that for majority of countries (25 countries or 89% of countries) the values in bold are not at the last position on the right, which means that there was a decrease for at least one step in the Gini coefficient during the period mentioned before.

⁴ It is defined for selected levels of a given variable and shows in which year various units (countries, regions, etc.) achieved these levels. The time matrix for indicator 1 life expectancy in the report condenses information for the period of more than 50 years (1960-2012), which in the Eurostat extended database amounts to more than 1000 entries; in this time matrix it is condensed to much smaller number of entries (228), i.e. nearly five times smaller.

Effects of the world financial crisis beyond GDP

Number of countries where indicator levels worsened	Employment rate (15 to 64 years), total	Gross Fixed Capital Formation in GDP	At-risk-of-poverty (% of total population)	GINI coefficient	Income quintile share ratio S80/S20
1	Bulgaria	Austria	Austria	Austria	Austria
2	Croatia	Belgium	Belgium	Bulgaria	Bulgaria
3	Cyprus	Bulgaria	Bulgaria	Croatia	Croatia
4	Czech Republic	Croatia	Croatia	Cyprus	Cyprus
5	Denmark	Cyprus	Czech Republic	Denmark	Denmark
6	Estonia	Czech Republic	Denmark	Estonia	Estonia
7	Finland	Denmark	Estonia	Finland	Finland
8	Greece	Estonia	Finland	France	France
9	Ireland	Finland	France	Germany	Germany
10	Italy	France	Germany	Greece	Greece
11	Latvia	Germany	Greece	Hungary	Hungary
12	Lithuania	Greece	Hungary	Ireland	Ireland
13	Netherlands	Hungary	Italy	Italy	Italy
14	Portugal	Ireland	Latvia	Latvia	Latvia
15	Romania	Italy	Lithuania	Lithuania	Lithuania
16	Slovakia	Latvia	Luxembourg	Luxembourg	Luxembourg
17	Slovenia	Lithuania	Netherlands	Malta	Poland
18	Spain	Luxembourg	Poland	Netherlands	Portugal
19	Sweden	Malta	Romania	Poland	Romania
20	United Kingdom	Netherlands	Slovakia	Romania	Slovakia
21		Poland	Slovenia	Slovakia	Slovenia
22		Portugal	Spain	Slovenia	Spain
23		Romania	Sweden	Spain	Sweden
24		Slovakia		Sweden	United Kingdom
25		Slovenia		United Kingdom	
26		Spain			
27		Sweden			
28		United Kingdom			
Percentage	71%	100%	82%	89%	86%

Comparing vertically the time matrix for Gini coefficient one can observe the range of the situation across EU countries, which is very large: from the lowest value of 0.23 in Slovenia to the highest values in the range of 0.33-0.36 from United Kingdom, Romania, Bulgaria, Greece, Portugal, Spain, and Latvia. **Comparing horizontally by rows**, one can see for each country the approximation for range of values over nearly two decades in the period 1995-2013 available in Eurostat. Slovenia, Czech Republic, Netherlands, Finland, Slovakia, and Sweden are in the range of 0.23-0.26 confirming the lowest income inequality by being observed also as the six best countries with income quintile ratio S80/S20 below 4.

Time matrix for GINI coefficient

S-time-matrix: time when specified level of the indicator was achieved (sorted by last available value)

LEVEL	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20
Slovenia																2009	2003		
Sweden															2008	2004	1999	1997	
Czech Republic													2005	2012					
Slovakia											2006	2006	2007	2009	2008				
Netherlands										2000	2001	2009	2010	1998					
Finland												2001	2009	2000	2000	1999	1998		
Belgium									2000	2001	2005	2008							
Malta									2000	2002	2010	2007							
Austria												2012	2010	2002	2001				
Hungary						2006	2006	2006	2006	2007	2013	2012	2011	2010	2002				
Luxembourg										2009	2012	2005	2000	1997					
Denmark											2012	2010	2009	2007	2006	2002	2001	1999	1997
Germany									2008	2011	2006	2006	2005	2001					
Ireland					1998	1999	1999	2007	2011	2009									
Croatia								2011	2010	2009	2009	2009							
France									2010	2008	2007	2007							
EU 28									2010										
EU 15								1995	2007	2001									
Poland				2005	2006	2006	2008	2012	2001										
Cyprus								2012	2011	2008	2004	2003							
Italy						2005	2007	2008	2002	2001									
Lithuania		2010	2010	2011	2011	2011	2012	2001											
Estonia		2004	2004	2005	2005	2007	2011	2008											
United Kingdom				2002	2005	2011	2000	1998	1997										
Romania		2007	2008	2009	2010	2006	2006	2005	2003	2000									
Bulgaria				2011	2012	2006	2006	2006	2006	2006	2005	2005	2005	2005	2003				
Greece				1998	2012	2010													
Portugal	2005	2007	2008	2009	2011														
Spain				2012	2010	2009	2008	2004											
Latvia	2006	2009	2010	2002	2000														

Source: Own calculation based on Eurostat data. Technically, if there are more intersections for a given level of the indicator the last year is shown

The voyage through 30 time matrices for 28 countries **compressed a very large amount of data, expressing multidimensional nature of development and well-being, indicating both visually and in numbers that very large differences exist between EU countries with respects to levels and dynamics**. Using the innovative approach of time distance methodology the **telling power of S-time-matrix** provided a good summary overview at-a-glance over many domains **with clear understanding to decision-makers as well as to the general public**. Seeing with new eyes creates new knowledge and better understanding.

4. Time distance measurement for monitoring of implementation of targets and for goodness-of-fit

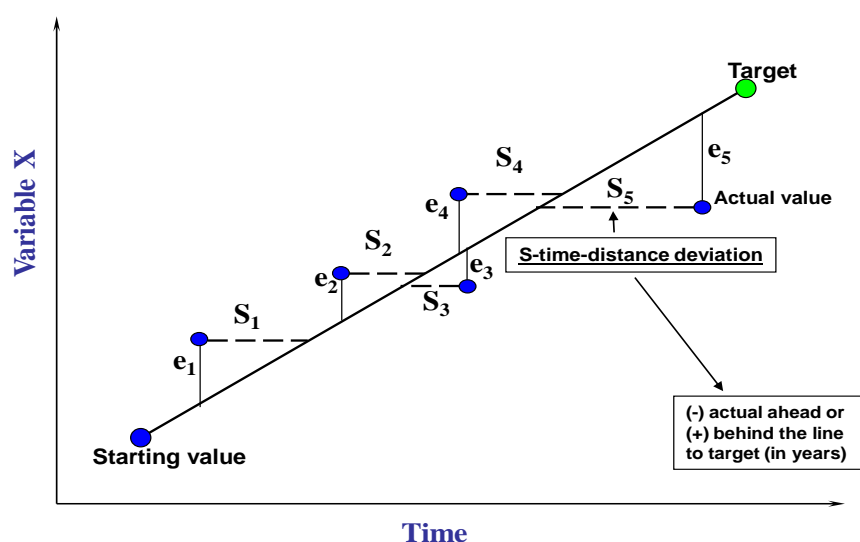
Monitoring implementation of targets is an integral part of policy making at many levels and in many domains. The innovation is that implementation of targets is described in two dimensions: static deviation from the line to target at a given point in time and S-time-deviation at a given level of the indicator.

Describing the implementation of targets as leading or lagging in time against the line to well-known targets is a very useful application in the policy debate that enhances knowledge, giving data a value beyond spreadsheets. **Expressed in time units, S-time-distance is easily understood by policy makers, managers, media and general public thus being an**

excellent presentation tool for policy analysis and debate. It can help us to form a new perception of the magnitude of the gap between the implementation and proclaimed targets for a given indicator as well as across more indicators.

MONITORING: time distance deviations from the line to target

S-time-distance adds a second dimension to comparing actual values with target values, forecast, budget, plan, etc.



and actual to estimated values thus evaluating goodness-of-fit in regressions, models, forecasting and monitoring

Source: Methodology P.Sicherl, Time Distance in Economics and Statistics, Echoraum, Vienna, www.gaptimer.eu

We measure deviations in two dimensions. Firstly, one can measure the difference in variables at a given point in time. And secondly, discrepancies in time (either time lead or time lag) are measured. Monitoring and evaluation of the degree of implementation of policy or business targets are very important. **Deviations from the line to target both at the public administration and at the enterprise levels, i.e. comparing actual values with target values, forecasts, budgets, plans, etc. can now be measured in two dimensions: static deviation and time distance deviation.**

People understand time and feel time. The story-telling and the interpretation of the deviation of actual development from the line to target with S-time-distance measure is straightforward and intuitively understandable; for each unit it deals with lead or lag of actual development against the line to their own target for the selected indicator. 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. The characteristics that it is expressed in time units means that it is comparable across variables, fields of concern and units of comparison, which makes S-time-distance an excellent complementary analytical and presentation tool for policy and business debate.

The Guardian published on their Global development web site my article on time distance method of measuring implementation of MDGs, where Gaptimer progress chart summarised the situation over 7 world regions and 10 selected MDG indicators around 2010. An updated study “System for Monitoring Implementation of Targets: Present MDGs and Post-2015 SDGs” Gaptimer Reports, Vol. 4, (Sicherl, 2015), link in the references.

The table below shows possible scheme and numerical values for **analysing time distance deviations for implementation of five selected headline indicators towards the EU2020 EU and national targets**. Such results would be available continuously for each year of actual development against the respective line to target, in this table only the latest available year is shown. In a single Gaptimer progress chart monitoring results are summarized for the EU aggregate as well as for individual countries for their national targets for 5 selected EU2020 targets. **The BrainPool report** was discussing also indicator factors – salience for broader audience and from the very broad discussion we would like to mention three elements: simplicity, understandability, and communication. The intersection between indicator factors from public perspective and policy perspective is described as including **two elements: 1. be attractive to the eye and accessible, 2. be easy to interpret. Time distance measures are clearly meeting these two objectives. The Gaptimer progress chart is a clear example of simplicity with the summary story of about 150 cases of EU2020 targets.**

For time distance monitoring of implementation of targets for examples of indicators for EU2020 and UN Millennium Development Goals, **SICENTER developed on www.gaptimer.eu a software tool to facilitate interested users to use the method for their own data.** The tool can be accessed on http://www.gaptimer.eu/s-t-d_monitoring_tool.html.

Without going into rich details the summary numbers show very large difference between headline indicators. The last three indicators showed that about 20 countries were ahead of schedule, for early leavers and tertiary education in 2014 in more than 10 countries their 2020 targets were already attained. For **employment rate** these results show another quantitative expression of the severe employment situation in the EU, 17 countries were behind the schedule. What is worse, in 2014 10 countries were below their 2010 starting values, in the language of S-time-distance deviation, they were more than 4 years behind the line to the 2020 targets. For 10 countries there was no progress in the 2010-2014 period for employment rate. The headline indicator **renewable energy** also more countries are ahead of schedule than behind it, but with fewer cases that already reached the 2020 targets. **R&D in GDP** indicates a different picture, with 9 countries ahead and 18 countries behind the schedule; overall it is closer with the employment rate situation than with the other three indicators. **The analysis of implementation is much more interesting also in political terms when it is made against the national targets.**

The time distance method brings the second dimension of deviations or disparities that the present state-of-the-art is neglecting. This semantics is clear and understandable to everybody and communicates the message in the narrative for policy debate that is beyond the message of the standard statistical tables. It can help us to form **a new perception of the magnitude of the gap between the actual implementation and proclaimed targets** for a given indicator as well as across more indicators.

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. Much effort has been over years put into developing indicator systems and data coverage but not enough attention has been paid to find new innovative ways and measures to utilise indicators in the next phases: knowledge building and policy use. **This is a much more transparent way of monitoring the implementation of targets for governments and the civil society that can help to bring about continuous policy debate and adjustments.**

Good governance does not use setting of targets only to specify the vision and the desired direction but it also uses the feedback from the implementation as an indispensable phase of the policy process to adjust the future actions. **This transparent innovative method for monitoring implementation at all levels is available but not utilised.**

EU28 time distance monitoring to the line to target EU2020
(S-time-distance: (-) actual ahead or (+) behind the line to target (in years))

	Employment rate - total (2014)	R&D in GDP (2013)	Renewable energy (2013)	Early leavers from education - total (2014)	Tertiary educational attainment - total (2014)
EU28	3.0	2.1	-0.9	-3.2	-2.8
EU27	2.9	N/A	N/A	-3.0	-2.9
Belgium	> 4	0.2	-1.0	-4.8	> 4
Bulgaria	> 4	2.0	TA	0.6	-0.2
Czech Republic	-2.8	TA	-5.5	> 4	-3.2
Denmark	3.8	TA	-3.8	TA	TA
Germany	TA	-1.8	-0.2	TA	2.5
Estonia	-4.3	1.5	TA	> 4	TA
Ireland	-1.5	> 2	-0.2	TA	1.7
Greece	> 4	-1.1	-4.0	TA	TA
Spain	> 4	> 3	0.0	-0.8	2.5
France	2.9	2.3	1.2	TA	2.9
Croatia	> 4	1.6	-3.9	TA	-3.7
Italy	> 4	1.6	-6.6	TA	-2.9
Cyprus	> 4	-3.1	-0.9	TA	TA
Latvia	-3.5	3.0	-4.3	TA	TA
Lithuania	-4.9	0.8	TA	TA	TA
Luxembourg	-2.1	> 3	1.4	TA	0.3
Hungary	-0.8	-1.5	0.6	> 4	TA
Malta	-2.4	0.5	-2.8	1.5	-0.6
Netherlands	> 4	-0.8	1.6	-3.0	TA
Austria	3.0	2.2	-2.8	TA	TA
Poland	0.6	0.8	-1.2	4.0	-3.4
Portugal	> 4	> 3	0.6	-2.0	-1.2
Romania	2.2	> 3	-5.4	2.5	-4.3
Slovenia	> 4	-3.1	-1.2	TA	TA
Slovakia	2.2	-1.4	1.1	> 4	0.7
Finland	3.8	> 3	-5.0	0.5	TA
Sweden	TA	1.9	TA	> 4	TA
United Kingdom	N/A	N/A	0.1	N/A	N/A
Target achieved	2	2	4	13	12
Time lead	8	7	16	4	8
Time lag	7	12	8	5	6
Lower than 2010	10	6	0	5	1
Ahead of schedule	10	9	20	17	20
Behind schedule	17	18	8	10	7

Source: Own calculations based on data from Eurostat,
http://ec.europa.eu/eurostat/c/portal/layout?p_l_id=4410618&p_v_l_s_g_id=0,
 accessed: 06. 08. 2015.

In the EU 2020 context the time distance methodology can be applied especially for benchmarking and for monitoring implementation **by complementing rather than replacing existing statistical measures**. It may be that some politicians, some organisations and some experts might not like **the additional information on the implementation of targets as it is giving a clear message understandable to everybody**. But for the media, NGOs,

independent experts and international organisations the improved transparency provides an additional instrument for strengthening the democratic debate.

If EU and national institutions would care to assess the S-time-distance measure by the same eight criteria applied for the selection of structural indicators by Eurostat like 1. Easy to understand, 2. Policy relevant, 3. Mutually consistent, ... 6. Comparable between countries, etc., **then for this application for monitoring implementation of EU and national strategies S-time-distance would pass the test with flying colours.**

This outline offers an improved extended monitoring system that could be used across countries as well as across indicators and in the operational work of Commission Services. The additional time distance monitoring supervision can be a standard procedure also in numerous other activities of the Commission and of the national and local levels in hundreds of cases like monitoring and evaluation implementation of budgets, plans, projects, structural funds, etc. It is difficult to understand why it is so difficult to persuade Commission services to test and use such innovative methodologies in their work.

5. Summary and conclusions

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

In its role as a **descriptive statistical measure, complementing existing approaches**, time distance can be applied literally to thousands of cases of time series comparisons **so that additional information content embodied in countless databases in different fields of concern for socio-economic research is not left unutilised.** In the information age this additional view of the existing data should be evaluated as an **important contribution to the more efficient utilisation of the information in many fields.** Measurement is costly and this novel generic statistical view should be evaluated as an **important contribution of how additional insights could be more efficiently derived from existing data in many fields without affecting the current mostly static measures.** There is **no need to collect new data:** one can start using existing data and indicator systems from international, national, regional, business, and local sources.

Time distance is an innovative approach for looking at time series data. Expressed in time units, the approach is easy to understand and provides a useful complement to existing methods. The strength of the time distance concept is that it enables additional exploitation of data and clear visualization of time series. **It is a generic concept, in the same way as static difference and growth rates; it provides an additional view to many problems and applications. Empirically, the degree of disparity may be very different in static terms and in time distance, which leads to new conclusions and semantics important for policy considerations.**

The time distance measure can present one of the measures that produce knowledge and policy messages in a very understandable way to build both objective and subjective perceptions of the situation. It can influence the perception and decisions of people when they are assessing their relative position in their surroundings, in the society and across countries over time. Understandable measures (Giovannini, 2008) enhance transparency and encourage participation in dialogue and democratic debate.

By providing an additional dimension of temporal disparity the time distance approach has two advantages: firstly, expressed in time units it is intuitively understood by policy-makers, professionals, managers, media, and the general public; secondly, time distance measure can be compared across variables, fields of concern, and units of comparison.

Especially in dealing with a wider set of fields of concern and a greater number of indicators (immanent in the Beyond GDP analysis) the additional view of the problem provided might be important for a more realistic evaluation of the situation, for improved semantics of discussing the policy issues, and for monitoring of progress. By analogy this methodology could be applied to numerous similar problems in business at the micro and corporate levels, for long-term, medium-term or short-term analysis.

The time perspective, which no doubt exists in human perception when comparing different situations, adds an element for intertemporal aspect of well-being and progress. It leaves the static measures of disparity unchanged but the notion of the overall degree of disparity might change the understanding of the situation and the overall conclusion. In the context of the conference three conclusions have been underlined.

1. Firstly, in addition to the use of S-distance as a descriptive statistical measure, the broader conceptual framework poses new interesting questions for growth and welfare theory, and the related policy issues. It relates performance and efficiency with inequality in a novel way. It was argued that increased efficiency by leading to higher growth from the same resources, may at the same time lead to smaller time distances that in turn could mean greater social cohesion, enabling a more conducive environment for timely adjustment to changes supporting increased efficiency and effectiveness, and the 'virtuous' circle can continue. Thus, for instance, in this framework the improvements through 'circular economy' initiative could have besides saving resources and fostering growth an additional indirect effect by decreasing the time distance of inequality.

Unfortunately, the 'vicious' circle works in the other direction; inefficiency has important negative economic and political consequences as far as disparities are concerned. The consequences of the financial crisis of 2008 analysed above across many domains put many EU countries in situation of double difficulty of diminished levels of indicators and slower growth rates or expectations resulting in perception of higher time distances between groups, regions and countries. The broader framework makes it easier to understand the wide unrest and dissatisfaction with the situation. Since immediate turnaround and sizeable substantial growth rates are not in sight the strategy at country and EU levels should in the medium term put policy emphasis also on direct improvements in the inequality domain to compensate for the detrimental effects of past inefficiencies that resulted in the deterioration of social cohesion. In the short run the efficiency improvements alone will not repair the damage done.

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 specific statistical measure (like static absolute and relative disparities or time distance) that will suit their particular interest. Obviously, for a better understanding of the reality one should take into account all these aspects simultaneously.

2. Secondly, the innovative time matrix presentation format enables compressed summary visual presentation over many countries and over time. This offers additional understanding about the time dimension of disparities and a good summary overview over many units and years and also a first-level visualisation tool. Time matrix calculator tool www.timedistance.net enables users to convert conventional time tables into time matrices.

The study ‘European Union at a glance’ presents an easily understandable overview of 30 selected indicators over 28 EU countries in time. It leads to a major policy conclusion confirming the multidimensional nature of development and well-being in the Beyond GDP initiatives. The time matrix presentation format indicates at a glance that GDP underestimated the scale of damage of the financial crisis, showing much greater effect in the deterioration of employment rates, investment share in the GDP, in the increasing risk of poverty and increasing income inequality (from 71% or 100% of the EU countries).

3. Thirdly, a transparent innovative method for monitoring implementation of targets at all levels is available but not utilised. Monitoring implementation of targets is an integral part of policy making at many levels and in many domains. The two-dimensional measurement of deviations bring a new perception of the magnitude of the gap between the actual implementation and proclaimed targets in a more transparent way, it can help governments and the civil society in a broader understanding for continuous policy debate and necessary adjustments.

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. The characteristics that it is expressed in time units means that it is comparable across variables, fields of concern and units of comparison, which makes S-time-distance an excellent complementary analytical and presentation tool for policy and business debate. The Gaptimer progress chart presented is a clear example of combining simplicity with the summary story of overview across about 150 cases of EU2020 targets (5 indicators x 28 countries and 2 EU aggregates). It is a joy or nightmare of the possible transparency for the Commission, member countries, media and interested public of citizens and entrepreneurs for the policy debate in the Beyond GDP framework. The framework can be used both for internal operations or publication.

Since S-time-distance is expressed in time units it is **easily understandable by managers, policymakers, professionals, media and general public.** Potential users of the methodology and results are very many at various levels: international and national organizations, NGOs, experts, businesses, managers, educators, students, interest groups, media, and the general public. The time distance concept **can influence the perception and decisions of people when they are assessing their relative position** in their surroundings, in the society and across countries over time.

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