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DELAYS IN DELIVERING LISBON ANALYSED BY THE NOVEL TIME DISTANCE MONITORING METHOD

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Summary

At the EU and at the national level good governance implies good communication with many stakeholders. **The novel S-time-distance measure** ***expressed in time units is an excellent presentation and communication tool, intuitively understood by policymakers, professionals, managers, media and the general public***. It provides new insights from existing data and it serves the proclaimed need for greater transparency and communication with the public.

The actual attainment in a given year is compared with the time when such level was supposed to be achieved on the line to target. S-time-distance measure for each indicator and unit thus deals with lead or lag in time against their specific line to target (it is like tracking in time the actual arrivals in comparison with the train or bus timetable).

First we study the degree of implementation for two targets specified in the Report for EU27 and EU15. The total employment rate for EU15 was in 2007 still 1.6 years, for EU27 about 2.8 years behind the line to target. The situation with respect to the share of the R&D expenditures in GDP is much worse and totally unsatisfactory. S-time-distance indicates that the time delay was more than 6 years, the value in 2006 was even lower than the starting value in 2000. Detailed results by countries are shown in the text and in the Annex.

Next we extend the analysis of implementation to 12 selected structural and sustainable development indicators for EU15 across 7 SD themes. For four indicators no progress was shown: for road share of inland freight transport, total greenhouse gas emissions, share of electricity from renewable resources and for share of R&D in GDP. For three indicators the S-time-distance showed that EU15 was ahead of the line to the targets.

SICENTER developed a free web tool that allows a variety of interested users such as international and national organizations, NGOs, experts, managers, educators, students and media to monitor the implementation of Lisbon and NRP targets with S-time-distance.

New understanding from existing data for better communication and transparency

In the 'Strategic report on the renewed Lisbon strategy for growth and jobs: launching the new cycle (2008-2010)'[1] the Commission in the communication to the European Council indicates that by re-launching the Lisbon strategy in 2005, and refocusing it on growth and

[1] Commission of the European Communities (2007), Communication of the Commission to the European Council, COM(2007) XXX final – PART I, Brussels, December 11

jobs, Europe has come a long way. In the Statistical Annex the results of annual progress are provided for member countries for the shortlist of 14 structural indicators.

It is understandable that in such a summary strategic report there is not enough space to deal with a broader analysis of implementation over a greater number of indicators in several fields of concern. However, any good governance does not use setting of targets only to specify the vision and the desired direction but it uses the feedback from the implementation to adjust the future actions. In principle in the methodological framework for assessing progress with the implementation of the Growth and Jobs Strategy the qualitative assessment should be accompanied by quantifications drawing on available quantification techniques.

In the Statistical Annex the country fiches provide the raw statistical data for such evaluation against two sets of targets mentioned: 2010 EU target and 2010 national targets, for total employment rate and for the share of gross domestic expenditure on R&D in GDP, respectively. Yet the graphs presented in terms of difference from the EU27 average do not provide an operationally transparent measure of the evaluation of the degree of the implementation in the past that would bring a clear political message both to policy makers at the EU and the national levels as well as to the general public. 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 to utilise them in the next phases: knowledge building and policy use.

The S-time-distance[2] measure is a new quantification technique with clear interpretability that is now available to complement other techniques. Targets are usually expressed not only in terms of the indicator values but simultaneously also in time. Thus one can establish a line to target (like a train or bus timetable) and then compare the actual value in a given year with the line to target in two dimensions:
1. deviation in the absolute level or percentage at a given point in time, as well as
2. deviation in time of a given actual value from the envisaged time on the line to target.

The time distance information (of lead or lag against the line to target) 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 at a given point in time. Degree of disparities may be very different in static terms and in time; we need both perspectives for a more realistic perception of the situation.

Analysis of implementation of Lisbon 1 targets for employment rate and R&D in GDP

EU is performing better but there is no place for complacency[3]. We shall track the timetable for implementation of the Lisbon strategy for the two targets specified in the Report. For each of them the line to target is calculated between the actual for 2000 and the target in 2010 under the assumption of a required constant rate of growth of the indicator in this period. First we explore the results for the EU Lisbon 1 targets.

[2] 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, 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. For general methodology see Sicherl (2007b, 2007c, 2008) or consult e.g. the web page http://www.gaptimer.eu/content/view/3/22/

[3] EUROCHAMBRES (2007), Progress within EU but global comparisons underline need for vigilance, Brussels, March, http://www.sicenter.si/pub/2007/070305-TimeDistanceStudy2.pdf

Figure 1 shows the deviations of actual values from the line to the Lisbon 1 target in two dimensions (for more details on using S-time-distance for monitoring see Sicherl, 2006 and 2007a). For instance, the value of the total employment rate for 2007 of 65.4 is 3.2 percent below the line to target and 2.75 years behind the line to target. If the EU27 would be on the line to target this value for 2007 would be already achieved in 2004.25.

We have now two bits of information to build a perception of the degree of delay in implementation, which together give a better evaluation of the reality. On the first impression it may seem that a deviation of about 3 percent does not look as an important difference. A delay in time of nearly 3 years may bring a different perception of the degree of the problem. Both measures are easy to calculate and to understand, but the present state-of-the-art neglects this additional information and thus leads to an information loss that has no justification.

Figure 1.

Table 1. Tracking the timetable to Lisbon

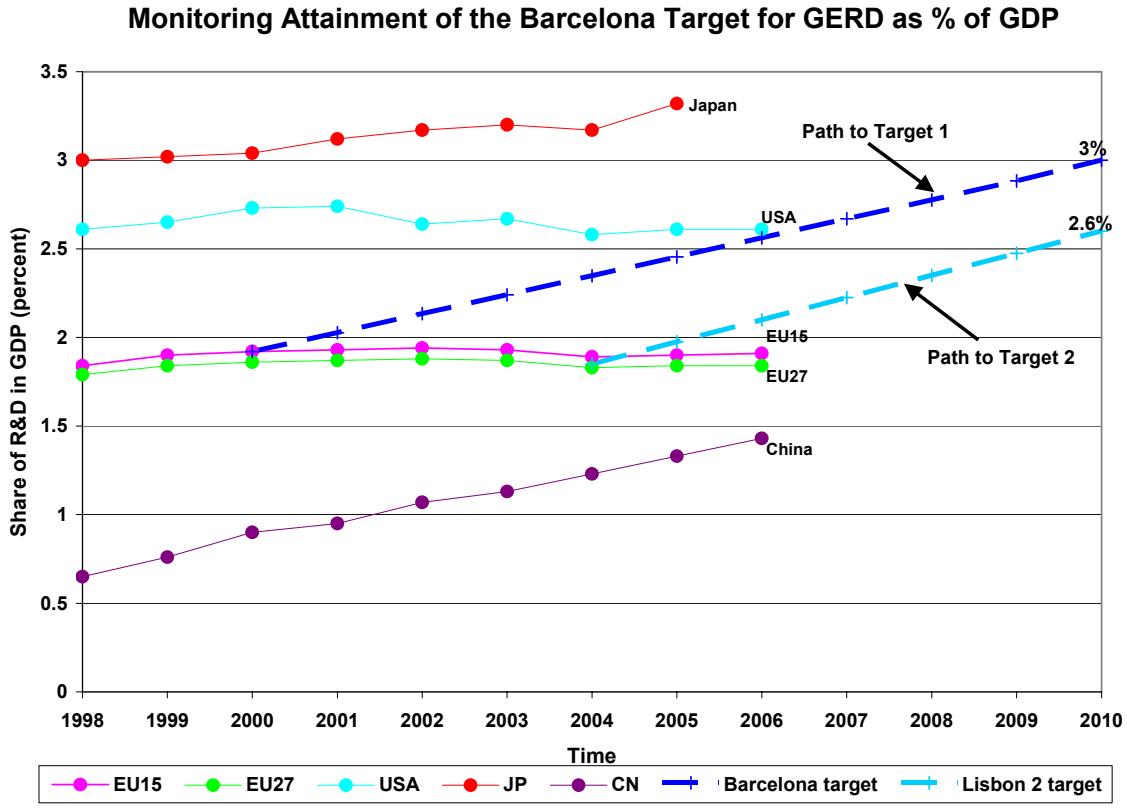
Monitoring implementation of the EU Lisbon 1 targets in the time dimension								
	S-time-distance (years)							
European Union	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Total employment rate								
EU (27 countries)	**0**	**0.6**	**1.9**	**2.5**	**3.1**	**3.3**	**2.9**	**2.8**
EU (15 countries)	**0**	**0.1**	**0.7**	**1.4**	**1.8**	**1.9**	**1.6**	**1.6**
Share of R&D in GDP								
EU (27 countries)	**0**	**0.9**	**1.8**	**2.9**	**> 4**	**> 5**	**> 6**	
EU (15 countries)	**0**	**0.9**	**1.8**	**2.9**	**> 4**	**> 5**	**> 6**	
Growth rate of GDP								
EU (27 countries)	**0**	**0.3**	**0.9**	**1.5**	**1.7**	**2.0**	**2.0**	**2.0**
EU (15 countries)	**0**	**0.4**	**1.0**	**1.6**	**1.8**	**2.2**	**2.2**	**2.3**
S-time-distance (years) = - time lead (ahead of path to target), + time lag (behind the path to target)								

Obviously, notwithstanding the progress in employment in the last years the total employment rate EU15 is still 1.6 years, for EU27 about 2.8 years behind the line to target. In other words, the actual values for 2007 were envisaged that much earlier. The good message is that the time lag behind the line to target did not increase further after 2004; in the next years further

acceleration might decrease the delay. Yet the time distance of about 2.8 years or percentage shortfall of 3.2 percent are far from negligible if we look at an illustration in absolute numbers. The shortfall from the line to target would be in the order of magnitude of 7 million employed.

The situation with respect to the share of the R&D expenditures in GDP is much worse and totally unsatisfactory. S-time-distance indicates that the time delay is more than 6 years, the value in 2006 was even lower than the starting value in 2000. In other words no progress was achieved in this indicator. With the initial target of 3 percent of GDP the actual value in 2006 was below the line to target for about 26 percent for EU27 and about 24 percent for EU15.

Figure 2.



Stagnation of the indicator over the last eight years is in sharp contrast with the ambitious target of 3% of GDP and convergence and overtaking with the USA. There is a question of how this target was set. However, even with less ambitious targets arising from the NRP targets amounting for EU27 to about 2.6 percent of GDP in 2010 the problem of implementation and stagnation of the share are continuing. At the same time China is increasing the share of R&D in GDP at higher rate than envisaged in the Barcelona target.

The delay of 6 years for EU27 and EU15 amounts to huge amounts. Using data from European Commission (2007) for GDP (in 1000 million purchasing power standard, current prices) R&D expenditures in 2006 amounted to below 215 billion. The exponential line to the 3 percent target would imply for 2006 the ratio 2.48 and the amount of 289 billion, for 2.6 percent target ratio of 2.27 and amount of 265 billion. In other words, only in 2006 the actual value was lower for about 75 billion for the 3 percent scenario and about 50 billion for the 2.6 percent scenario.

According to Eurostat (2008) R&D expenditures in 2006 increased to more than 210 billion euro from 170 billion euro in 2000. Thus the shortfall from the Lisbon 1 and NRP targets in a single year was larger than the increase between 2006 and 2000. When compared with the USA the actual R&D expenditures in EU27 were in 2006 about 69 billion euro or 24 percent lower. Figure 2 shows a large long-term gap between the share in the USA at about 2.6 percent and the share in the EU below 2 percent, a calculation of cumulative of differences in R&D expenditures over the last decade or more decades would come to very large sums.

This stagnation in the share of the R&D in GDP happened in a situation where the delay in the growth rate of GDP was not so large. With the line to target of growth of GDP under assumed 3 percent per year the S-time-distance delay was 2 years for EU27 and 2.3 years for EU15 (in percentage terms 5.8 and 6.5 percent, respectively). Again, as in case of total employment rate, the time distance lag for GDP growth did not increase after 2005. But the Eurostat projection of the GDP growth rates until 2009 show that the S-time-distances would increase to 2.8 years for EU27 and to 3.2 years for EU15, even before the current downgrading of projections.

In contrast with the total employment rate and growth of GDP where the delay expressed in S-time-distance was broadly varying in the range of 2-3 years, for the share of R&D in GDP the delay increased to more than 6 years and to about 25 percent. In simpler terms, tracking the timetable for this indicator the delay of more than 6 years in a 6-year period means that the train did not leave the departure station yet.

Comparing performance for total employment rate and growth of GDP against the Lisbon 1 Europe targets the two measures, percentage deviation and S-time-distance deviation from the line to target, can lead to different perceptions. In percentage terms, in the order of magnitude of 3 percent for the former and of about 6 percent for the latter, the deviation is greater for growth of GDP than for the total employment rate. Comparing in S-time-distance the ranking is still the same for EU15 (2.3 years and 1.6 years, respectively), but not for the EU27 where the time delay of 2.8 years for employment is higher than 2 years for GDP growth. The two perspectives together can provide better information for asking the right questions.

Analysis of implementation of Lisbon 1 targets by countries

For four indicators, total employment rate, female employment rate, employment rate for older workers (for 2000-2007) and for the share of R&G in GDP (2000-2006) details are provided for 27 countries in the Annex 1. Although the Lisbon 1 2010 targets are meant for the collective of the EU and not for individual Member States the distribution of countries against the collective target brings interesting information. This allows official institutions, experts, civil society and media to analyse in more detail the situation in particular countries or for a group of countries and compare it with the implementation of the NRP targets.

Table 2 provides for 2006 a summary overview of the tables for the four indicators in the upper part of the table. As shown before for the aggregate figures there are wide differences between the employment situation and that for R&D in GDP. For total employment rate 7 countries already achieved the 2010 target, 6 more are ahead of the line to target and 14 behind it. As distinct from the total employment rate the situation is much better for female employment rate and the employment rate for older workers; 15 countries and 12 countries respectively already attained the Lisbon 1 2010 targets by 2007 or earlier. For the share of R&D in GDP only Sweden and Finland were above the Barcelona target.

Table 2.

Number of countries with a given value of S-time-distance deviation from the line to target

Selected indicators	Exponential line to target							Number of countries
	Years ahead of the line to target			Years behind of the line to target				
	TA	-4 - -2	-2 - 0	0 - 2	2 - 4	4 - 6	WTS	
	Lisbon 1 targets							
Total employment rate	7	1	5	2	4	6	2	27
Female employment rate	15	0	2	1	3	5	1	27
Employment rate for older workers	12	0	2	3	6	2	2	27
R&D in GDP	2	0	0	2	6	8	9	27
Number of countries	36	1	9	8	19	21	14	108
Percentage distribution	33.3%	0.9%	8.3%	7.4%	17.6%	19.4%	13.0%	100.0%
	NRP targets							
Total employment rate	4	2	1	4	2	1	2	16
R&D in GDP	0	0	1	3	7	8	7	26
Number of countries	4	2	2	7	9	9	9	42
Percentage distribution	9.5%	4.8%	4.8%	16.7%	21.4%	21.4%	21.4%	100.0%

TA = target already achieved
WTS = actual value is worse then the starting value

Analysis of implementation of NRP targets for employment rate and R&D in GDP

In the re-launched Lisbon strategy Member States in their National Reform Programmes (NRP) specify their own national targets in line with their circumstances. This means that the more relevant comparison in the monitoring process for countries is between the degree of implementation and their particular NRP targets, rather than comparing it with the EU27 average as it was done in the Statistical Annex to the Commission Report.

In the NRP the targets have been specified by countries and the analysis of implementation is much more interesting also in political terms when it is made against the national targets. The targets in the NRP are in many cases lower than the EU targets for the two indicators analysed here. There are exceptions, e.g. for Sweden and Finland their NRP targets of 4 percent are higher than the EU target. For the R&D in GDP, for which practically all countries specified their NRP targets, it is possible to estimate the effect on the overall value for EU. If all NRP national targets would be attained the summary value for the EU in 2010 would come to around 2.6 percent as against the Lisbon 1 target of 3 percent.

Tables 3 and 4 show the results from monitoring the implementation of the NRP targets in the time dimension, i.e. showing whether the countries are ahead or behind the line to their national target. The conclusion is very different for employment rate than for R&D in GDP; though in both cases there are diminished overall values of the targets.

For the indicator R&D in GDP from 26 countries only one was ahead, 25 countries were behind their NRP targets, 19 of them more than 3 years and 7 of them more than 6 years. The only country ahead of the line to target is Malta with the low NRP target for 2010 of 0.75 percent of GDP.

Table 3.

Implementation of NRP targets for the share of R&D in GDP

S-time-distance (in years)

	2000	2001	2002	2003	2004	2005	2006	2007
EU27	0	0.8	1.7	2.8	> 4	> 5	> 6	
EU25	0	0.8	1.7	2.8	> 4	> 5	> 6	
EU15	0	0.8	1.7	2.8	> 4	> 5	> 6	
Malta			0.0	1.0	-3.5	-2.5	-1.5	
Austria	0	-0.5	-0.3	-0.4	0.7	-0.3	0.1	0.6
Estonia	0	-0.3	0.6	1.0	1.0	1.3	0.5	
Czech Republic	0	> 1	> 2	2.4	3.4	2.1	1.5	
Cyprus	0	0.7	0.5	0.4	1.0	1.4	2.1	
Latvia	0	> 1	> 2	> 3	> 4	3.0	2.2	
Spain	0	1.0	0.9	1.2	2.1	2.4	2.5	
Hungary	0	-1.0	-1.0	0.9	2.6	2.8	3.0	
Denmark	0	-1.2	-1.9	-1.8	0.5	1.9	3.2	
Ireland	0	> 1	> 2	2.3	2.4	3.1	3.4	4.0
Lithuania	0	0.0	1.1	2.0	1.9	2.9	3.5	
Finland	0	> 1	1.7	1.5	2.2	2.7	4.2	6.5
Germany	0	0.8	1.2	1.6	3.2	4.4	4.4	
Slovenia	0	0.0	1.3	> 3	3.9	4.6	4.4	
Italy	0	0.6	1.2	2.4	3.5	4.6		
Romania	0	0.7	1.8	2.7	3.7	4.4	4.8	
Portugal	0	0.4	2.0	> 3	3.9	4.3	5.0	
Sweden				0.0	> 1	> 2	> 3	
Greece		0.0		> 2	> 3	4.0	> 5	
United Kingdom	0	> 1	> 2	> 3	> 4	> 5	> 6	
France	0	0.3	0.9	2.7	4.0	> 5	> 6	
Belgium	0	-0.3	> 2	> 3	> 4	> 5	> 6	
Netherlands	0	> 1	> 2	> 3	> 4	> 5	> 6	
Slovakia	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7
Luxembourg	0			2.9	> 4	> 5	> 6	
Poland	0	> 1	> 2	> 3	> 4	> 5	> 6	

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

TA = target already achieved
> x = actual value is worse then the starting value, S-time-distance is more than x years

It is interesting to observe that also Finland and Sweden are behind their line to NRP target since they raised it to 4 percent but the progress has not been fast enough. The median value of delay measured by S-time-distance is 4.4 years. This means that the median country moved only for about one and a half year along the line to target in a 6 year period.

If we weight the time distance deviations by the population of the countries, for countries totaling about 95 percent of the EU27 population the time delay was more than 3 years, for about 55 percent more than 5 years. In Table 2 and Table 3 there is a group of 7 countries for which the share in GDP was in 2006 lower than in 2000 with the time delay of more than 6 years against their own NRP targets. They have shown decreasing rather than increasing

trends for this indicator. Their percentage deviation from the line to NRP targets varies from 15 to 57 percent. This is a significant group since it encompasses more than 39 percent of the EU27 population.

Table 4.

Implementation of NRP targets for total employment rate for 16 countries which NRP targets were presented in the Commission Report

	S-time-distance (in years)							
	2000	2001	2002	2003	2004	2005	2006	2007
Slovenia	0	-1.0	0.8	> 3	-0.8	-1.1	-1.3	TA
Cyprus	0	-3.1	-3.6	-3.7	-2.1	-0.4	-1.4	TA
Bulgaria	0	> 1	1.8	1.1	0.6	0.2	-1.1	TA
Latvia	0	-0.2	-1.2	-1.7	-1.2	-1.3	-3.3	TA
Spain	0	-0.7	-0.4	-0.8	-1.2	-2.4	-2.8	-2.6
Estonia	0	0.3	0.2	0.3	1.1	0.7	-2.1	-2.4
Ireland	0	-0.3	1.4	2.4	1.7	-0.1	-1.2	-1.2
Greece	0	> 1	0.6	0.0	0.0	0.1	-0.1	0.4
Czech Republic	0	1.0	-0.3	> 3	> 4	> 5	4.3	0.7
Lithuania	0	> 1	1.1	0.8	1.7	1.2	1.2	0.8
Malta	0	0.6	1.3	3.0	> 4	> 5	3.8	1.6
Finland	0	-0.3	0.7	2.3	3.4	3.2	2.9	2.5
Hungary	0	> 1	> 2	0.0	1.9	2.5	1.8	2.8
Belgium	0	> 1	> 2	> 3	> 4	4.3	5.4	5.3
Portugal	0	-2.8	-0.5	> 3	> 4	> 5	> 6	> 7
Romania	TA	> 1	> 2	> 3	> 4	> 5	> 6	> 7

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

TA = target already achieved
> x = actual value is worse then the starting value, S-time-distance is more than x years

Regrettably for about one third of the countries no NRP targets for total employment rate were reported in the Commission Report, among them were several large countries. The results available for 16 countries for employment rate show that in 2007 7 countries were ahead and 9 countries behind in reaching the envisaged values on their line to target. Four countries reached in 2007 their national targets for total employment rate.

It is unfortunate that for 11 countries their NRP targets for employment rate as one of the cornerstone of the Growth and Jobs strategy were not provided in the Commission Report. It is suggested that they be invited to specify or re-specify them to confirm the overall political commitment to the process.

Extending the analysis for EU15 to selected sustainable development indicators

Another application of time distance methodology for monitoring implementation deals with a selection of sustainable development indicators. In a single Table 5 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 for EU15. EU15 is chosen as it is easier to get data and other information and as these countries were actually members of the EU over the whole period. However, 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.

Table 5.

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

			S-time-distance in years							
Theme		**Proposed SDI**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Theme 1 - Economic development	1	Share of R&D in GDP	0	0.9	1.8	2.9	> 4	> 5	> 6	
Theme 1 - Economic development	2	Total employment rate, %	0	0.1	0.7	1.4	1.8	1.9	1.6	1.6
Theme 1 - Economic development	3	Employment rate, females, %	0	-0.6	-0.6	-0.7	-0.9	-1.4	-1.9	-2.5
Theme 2 - Sustain. consumption and production	4	Municipal waste landfilled, kg per capita	0	0.2	-0.6	-2.3	-4.2	TA	TA	
Theme 3 - Social inclusion	5	Life-long learning, %	0	1.0	1.7	-1.5	-2.5	-2.7	-1.5	-0.7
Theme 3 - Social inclusion	6	Early school-leavers, %	0	0.6	1.4	2.1	2.4	3.0	3.9	4.4
Theme 4 - Demographic changes	7	Employment rate of older workers, %	0	0.1	-0.2	-0.5	-0.2	-0.6	-0.5	-0.5
Theme 6 - Climate change and energy	8	Total greenhouse gas emissions	0	> 1	> 2	> 3	> 4	> 5		
Theme 6 - Climate change and energy	9	Share of electricity from renewable sources	0	0.0	> 2	> 3	3.8	> 5		
Theme 7 - Sustainable transport	10	People killed in road accidents	0	0.7	1.2	1.0	0.6	0.8		
Theme 7 - Sustainable transport	11	Road share of inland freight transport	0	> 1	> 2	> 3	> 4	> 5	> 6	
Theme 9 - Global partnership	12	Official development assistance, % of GNI	0	0.4	0.1	0.5	2.1	-1.8	-0.3	2.2

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

People will intuitively understand the lead or delay in time of actual implementation against the assumed time table to the proclaimed targets over many indicators from different fields of concern. It is a good example to show that S-time-distance measure is easy to understand and comparable across variables, fields of concern and units of comparison.

For indicators of sustainable development it is common that the desired direction over time is a decreasing tendency for some and increasing for others. Out of these 12 indicators there are 5 for which values the policy target is decreasing. Percentage differences between the line to target and actual values are very useful but their comparison over many indicators with different desired tendencies may be tricky. For positively oriented indicators it is desirable that the actual value is above the line to target, for negatively oriented indicators such situation is not desirable. S-time-distance is better in this respect; the time distance for a given level of the indicator can deal with indicators from both tendencies in the same easy understandable way. It can be used also as benchmarking in preparing targets after 2010.

Table 5 shows the lead and lags against the exponential lines to targets for all available years. In this way it is possible to follow not only individual S-time-distance values for a given year but also any consistent tendencies or variations over time. The purpose of this paper is to show methodological capabilities of the time distance methodology to complement existing statistical measures rather than entering into detailed analysis over the wide range of issues.

Figure 3.

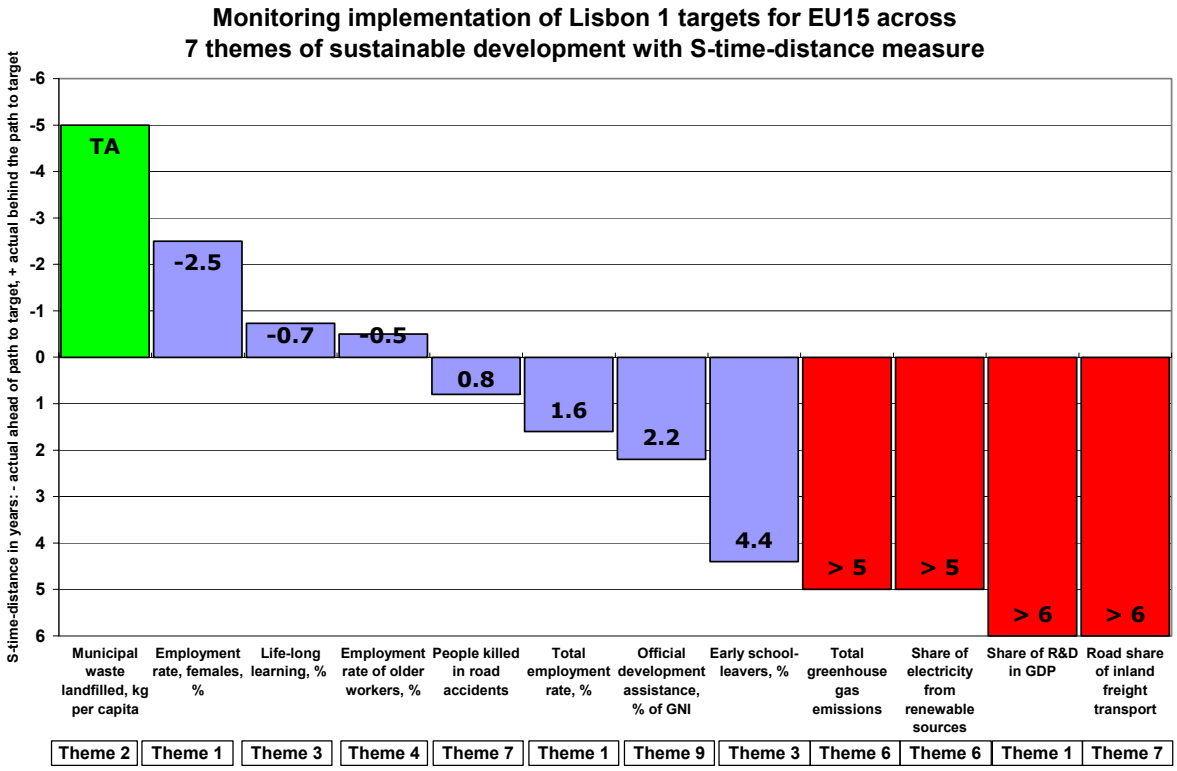


Figure 3 exhibits the S-time-distances for 12 indicators for the latest available years available for the indicators in Table 5 (2007, 2006 or 2005). The essence is to compare delays across indicators from various themes. The picture is clear: delays expressed by S-time-distance measure are the greatest for road share of inland freight transport, share of R&D in GDP, share of electricity from renewable resources and total greenhouse gas emissions. In all these four cases the indicators were worse at the end of the period than in the starting year.

Although this is just a small selection of the sustainable development indicators that can benefit from adding time distance analysis to other methods an interesting observation can follow. The four indicators with the greatest delays in time are related to **long-term issues**: sustainable transport (theme 7), share of R&D in GDP (theme 1), total greenhouse emissions and share of electricity from renewable resources (theme 6 climate change and energy).

SICENTER developed a FREE WEB TOOL for monitoring implementation of targets with the S-time-distance measure

The purpose of developing the free web tool is to empower a broad range of stakeholders in Europe and in the world with an excellent presentation and communication tool that is easily understood by policy makers, experts, managers, media and general public; it can support decision-making as well as influence public opinion.

Potential users could be all stakeholders who would like to take advantage of this complementary statistical measure for analysis and policy debate at various levels, e.g.: international and national organizations, NGOs, experts, businesses, managers, educators, students, interest groups, the general public and media. They can calculate the lead or lag in

time for tracking implementation of targets at the world, regional, national, sub-national or business levels, e.g. Lisbon, NRP and Sustainable Development targets in the case of EU, UN Millennium Development Goals or other planned, budgeted, or aid disbursement targets. Beside the application to official data and targets it can be used as a do-it-yourself tool to track the implementation by using their own choice of data and assumptions.

What are some benefits of using the S-time-distance tool for monitoring:

1. The time distance information is at least as helpful for a proper perception of the progress in implementation or the lack of it as is the percentage difference
2. It complements rather than replaces other methods
3. It is comparable across variables, fields of concern and units of comparison
4. This innovation provides simultaneous two-dimensional comparisons of time series data: vertically (standard measures of static difference) as well as horizontally (Sicherl time distance)
5. Empirically, the perceptions of the degree of disparity may be very different in static terms and in time distance
6. Thus the broader conceptual and analytical framework leads to new conclusions and richer semantics important for policy considerations

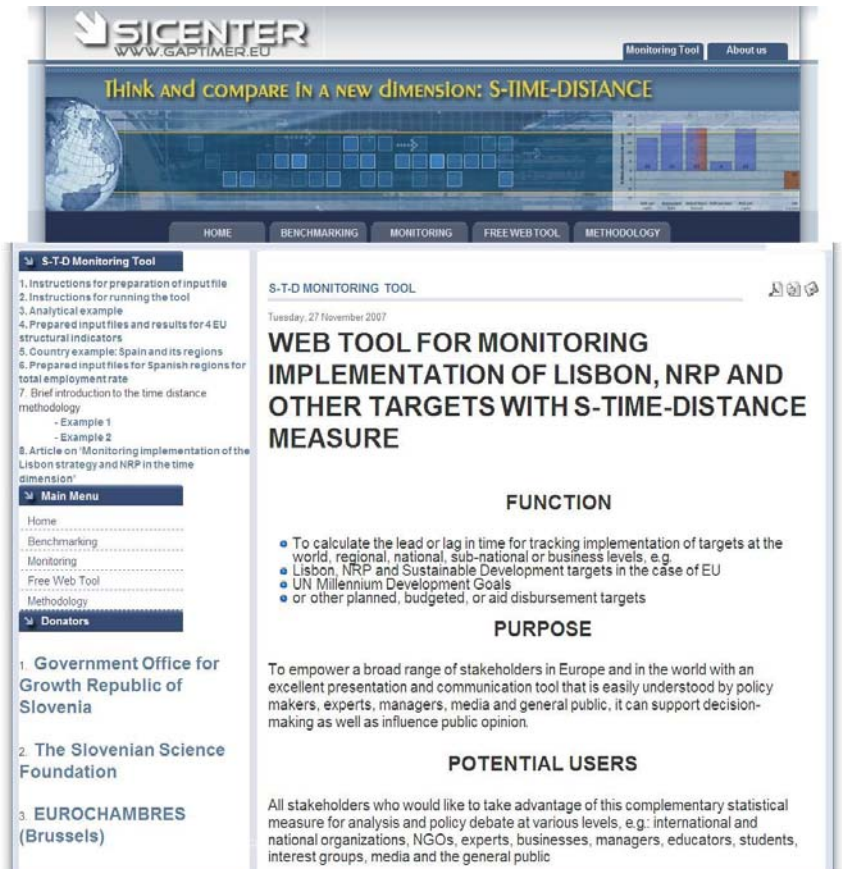
The free web tool for monitoring with S-time-distance measure is available at http://www.gaptimer.eu/s-t-d_monitoring_tool.html . The instructions for preparation of input files are prepared on the web page. Some input files for EU structural indicators and the results are also available there for easier initial browsing.

The web tool was prepared first for the application for monitoring implementation of Lisbon and NRP targets. SICENTER would like to thank for the donations that helped our own efforts for the preparation of the web tool: Government Office for Growth, Republic of Slovenia; The Slovenian Science Foundation; and EUROCHAMBRES (Brussels).

Another application under discussion is with the United Nations Statistical Division for application for monitoring implementation of the UN Millennium Development Goals. As mentioned above it can be used for tracking implementation of targets at the world, regional, national, sub-national or business levels.

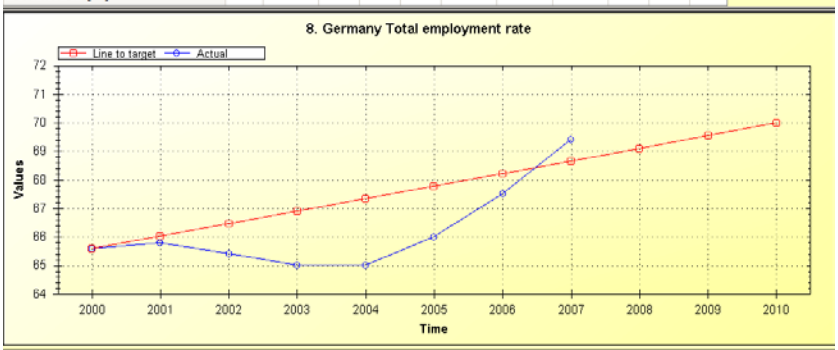
Below are two pictures showing the web tool entry page and an example of a portion of the results for a given country with two accompanying graphs. This example refers to the total employment rate for Germany. In the country table the first line shows the line to target from 2000 to 2010, assumed exponential line to the target 70. The second line contains the actual values of the total employment rate. In the third line are calculated values of S-time-distance between actual values and the line to target, accompanied in the forth line with the time on the line to target which correspond to the actual value in a given year. Fifth line shows the deviation between the actual values and the line to target in percentage terms. The two graphs for each country or group provide the visualisation of the monitoring results.

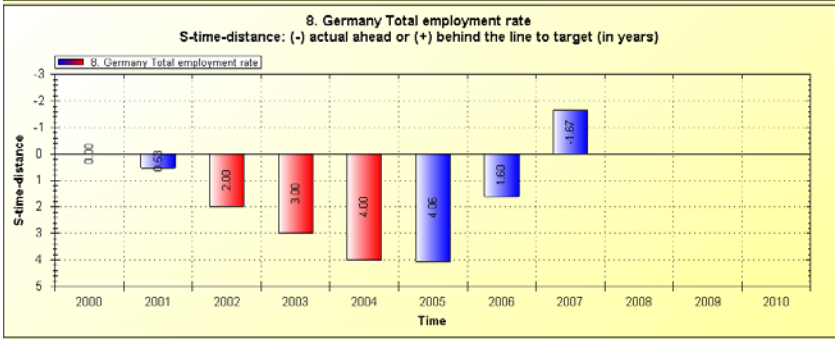
As indicated the input files provide the S-time-distance and percentage deviations from the line to target and two graphs for each of the countries and groups. Annex 1 shows examples of sorted S-time-distance tables for 30 units for a given indicator like the Table 3.



8. Germany Total employment rate

8. Germany Total employment rate	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Line to target	65.6	66.03	66.46	66.89	67.33	67.76	68.21	68.65	69.10	69.55	70
Actual value	65.6	65.8	65.4	65	65	66	67.5	69.4			
S-time-distance	0	0.53	2	3	4	4.06	1.60	-1.67			
Time on LT	2000	2000.47				2000.94	2004.40	2008.67			
Deviation in [%]	0	-0.34	-1.59	-2.83	-3.45	-2.60	-1.03	1.09			





The free web tool provides estimates of the S-time-distance and percentage deviations from the line to target and two graphs for each of the 27 EU countries and for EU27, EU25 and EU15 aggregates

Conclusions

If the relevant EU and national bodies would care to assess the S-time-distance measure 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 for monitoring implementation*** of the Lisbon EU and NRP strategies by structural and sustainable development indicators ***the S-time-distance measure would pass the test with flying colours.***

This paper offers an enhanced extension of the monitoring system that could be used across indicators as well as across and within countries. S-time-distance is simple, easy to understand by everybody and well placed to complement rather than replace existing methods for tracking the implementation.

These results present the situation in transparent terms with clear interpretability also to general public, which can as well facilitate understanding, commitment and broader participation in the Lisbon process. This means that the more relevant comparison in the monitoring process for countries is between the degree of implementation and their particular NRP targets, rather than comparing it in graphs with the EU27 average as it was done in the Statistical Annex to the Commission Report.

The degree of implementation for the two EU targets specified in the Commission Report showed that the total employment rate for EU27 was in 2007 about 2.8 years behind the line to target; for the share of the R&D expenditures in GDP S-time-distance indicates that the time delay was more than 6 years in a 6 year period, the value in 2006 was even lower than the starting value in 2000. Annex 1 brings additional information how are individual countries faring against the EU targets. The situation with R&D expenditures is a complete disappointment; the total employment rate is not close to the line to target. However, the targets for female employment rate and employment rate for older workers are for the EU total very close to the line to targets, for about half of the countries the 2010 targets were already reached by 2007 or before.

In the re-launched Lisbon strategy Member States in their National Reform Programmes (NRP) specify their own national targets in line with their circumstances. So the analysis of implementation is much more interesting also in political terms when it is made against the national targets. They are in most cases lower than the EU targets. For the share of R&D in GDP the summary of national targets would imply the EU target of 2.6 percent in 2010. For the total employment rate as one of the cornerstone of the Growth and Jobs strategy it is unfortunate that for 11 countries their NRP targets for employment rate were not provided in the Commission Report. This is not a good sign for the overall political commitment to the process.

The application of national targets for the share of R&D in GDP unfortunately did not change the conclusion that the implementation is equally disappointing as all countries (except Malta with a low target) are much behind the line to target. For countries totaling about 95 percent of the EU27 population the time delay was more than 3 years, for about 55 percent more than 5 years; for 7 countries with nearly 40 percent of the population the value in 2006 was lower than in 2000. This is not a good indication for the long-term position of EU in the world.

Next we tested the S-time-distance methodology for the analysis of implementation to 12 selected structural and sustainable development indicators for EU15 across 7 SD themes. It is a good example to show that S-time-distance measure is easy to understand and comparable across variables, fields of concern and units of comparison.

The four indicators with the greatest delays in time are related to **long-term issues**: sustainable transport (theme 7), share of R&D in GDP (theme 1), total greenhouse emissions and share of electricity from renewable resources (theme 6 climate change and energy); for all of them the indicators were worse at the end of the period than in the starting year. This brief analysis indicated that the implementation of SD targets is very disappointing in several cases with long-term consequences. This type of analysis can be repeated in the EU case for all 27 countries across a greater selected number of available indicators with established targets.

SICENTER developed a free web tool that allows a variety of interested users to monitor the implementation of Lisbon, NRP and other targets with S-time-distance. The purpose of developing the free web tool is to empower a broad range of stakeholders in Europe and in the world with an excellent presentation and communication tool that is easily understood by policy makers, experts, managers, media and general public; it can support decision-making as well as influence public opinion.

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Annex 1. S-time-distances for 4 indicators for EU targets

Based on the free web tool for monitoring implementation of Lisbon, NRP and other targets with S-time-distance measure available on http://www.gaptimer.eu/content/view/25/33/
Statistical data and targets from 'Commission of the European Communities (2007), Communication of the Commission to the European Council, COM(2007) XXX final – PART I and annex, Brussels, December 11'

Table 1. Implementation of Lisbon target for total employment rate (70%)

	S-time-distance (in years)							
	2000	2001	2002	2003	2004	2005	2006	2007
EU27	0	0.6	1.9	2.5	3.1	3.3	2.9	2.8
EU25	0	0.5	1.5	2.2	2.8	2.8	2.7	2.4
EU15	0	0.1	0.7	1.4	1.8	1.9	1.6	1.6
Denmark	TA	TA	TA	TA	TA	TA	TA	TA
Netherlands	TA	TA	TA	TA	TA	TA	TA	TA
Sweden	TA	TA	TA	TA	TA	TA	TA	TA
United Kingdom	TA	TA	TA	TA	TA	TA	TA	TA
Austria	0	1.0	0.7	0.3	> 4	4.3	TA	TA
Cyprus	0	-4.0	-4.8	-5.2	-3.5	-1.6	-3.1	TA
Finland	0	-2.3	-1.3	1.2	2.6	0.7	-1.5	TA
Estonia	0	0.3	0.2	0.3	1.1	0.7	-2.1	-2.4
Latvia	0	0.0	-0.5	-0.7	-0.1	0.1	-1.2	-1.8
Germany	0	0.5	> 2	> 3	> 4	4.1	1.6	-1.7
Ireland	0	-0.3	1.4	2.4	1.7	-0.1	-1.2	-1.2
Slovenia	0	-0.5	1.1	> 3	0.4	0.4	0.6	-0.1
Spain	0	-0.2	0.2	0.2	0.3	-0.4	-0.5	0.0
Bulgaria	0	> 1	1.9	1.8	1.8	1.9	1.4	0.8
Lithuania	0	> 1	1.2	1.0	1.9	1.6	1.7	1.5
Greece	0	> 1	1.2	1.2	1.7	2.1	2.4	3.1
Italy	0	0.2	0.8	1.4	1.4	2.4	2.8	3.6
France	0	0.1	0.8	0.5	1.9	2.6	3.8	3.7
Slovakia	0	1.0	2.0	2.3	3.8	4.3	3.9	3.8
Czech Republic	0	1.0	1.2	> 3	> 4	> 5	5.4	4.7
Luxembourg	0	0.4	1.0	> 3	> 4	3.7	4.7	4.9
Belgium	0	> 1	> 2	> 3	> 4	4.3	5.4	5.3
Poland	0	> 1	> 2	> 3	> 4	> 5	> 6	5.5
Malta	0	0.9	1.9	3.0	> 4	> 5	5.6	5.9
Hungary	0	> 1	> 2	2.4	3.6	4.5	5.2	6.2
Portugal	0	-2.8	-0.5	> 3	> 4	> 5	> 6	> 7
Romania	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7

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

TA = Target already achieved
> x = actual value is worse then the starting value, S-time-distance is more than x years

Table 2. Implementation of target for female employment rate (60%)

	S-time-distance (in years)							
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
EU27	0	0.0	0.8	1.0	1.0	0.7	0.2	-0.4
EU25	0	-0.2	0.2	0.4	0.4	0.2	-0.4	-0.9
EU15	0	-0.6	-0.6	-0.7	-0.9	-1.4	-1.9	-2.5
Denmark	TA	TA	TA	TA	TA	TA	TA	TA
Sweden	TA	TA	TA	TA	TA	TA	TA	TA
Netherlands	TA	TA	TA	TA	TA	TA	TA	TA
Finland	TA	TA	TA	TA	TA	TA	TA	TA
United Kingdom	TA	TA	TA	TA	TA	TA	TA	TA
Portugal	TA	TA	TA	TA	TA	TA	TA	TA
Austria	0	TA	TA	TA	TA	TA	TA	TA
Slovenia	0	-1.5	0.7	> 3	TA	TA	TA	TA
Estonia	0	-0.7	-1.3	-3.8	TA	TA	TA	TA
Germany	0	-2.2	-2.3	-1.3	-1.8	TA	TA	TA
Cyprus	0	-4.8	-6.7	TA	-4.1	-2.6	TA	TA
Latvia	0	-2.2	-3.0	-3.7	-3.7	-3.9	TA	TA
Lithuania	0	> 1	> 2	-0.1	3.6	-2.4	TA	TA
Ireland	0	-0.7	-0.6	-0.1	-0.4	-2.3	-2.9	TA
France	0	-0.7	-1.2	-3.4	-2.4	-2.0	-1.6	TA
Bulgaria	0	0.6	1.0	0.8	0.6	0.8	-0.4	-1.4
Spain	0	-0.1	0.1	-0.1	-0.2	-0.8	-0.8	-0.5
Luxembourg	0	0.1	0.4	2.1	2.0	1.2	1.2	0.7
Belgium	0	> 1	> 2	2.6	2.6	2.1	2.9	2.3
Italy	0	0.1	0.6	1.2	0.8	1.8	2.2	3.1
Greece	0	> 1	1.2	1.3	1.8	2.3	2.5	3.2
Slovakia	0	0.6	> 2	2.1	> 4	> 5	5.5	5.1
Malta	0	> 1	1.6	2.8	> 4	4.7	5.1	5.2
Poland	0	> 1	> 2	> 3	> 4	> 5	> 6	5.3
Czech Republic	0	1.0	1.7	> 3	> 4	> 5	> 6	5.7
Hungary	0	0.9	1.9	1.7	2.9	3.6	4.5	5.7
Romania	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7

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

TA = Target already achieved

> x = actual value is worse then the starting value, S-time-distance is more than x years

Table 3. Target implementation for older workers employment rate (50%)

	S-time-distance (in years)							
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
EU27	0	0.3	0.6	0.4	0.8	0.4	0.6	0.7
EU25	0	0.2	0.2	-0.1	0.4	0.1	0.3	0.5
EU15	0	0.1	-0.2	-0.5	-0.2	-0.6	-0.5	-0.5
Sweden	TA	TA	TA	TA	TA	TA	TA	TA
Denmark	TA	TA	TA	TA	TA	TA	TA	TA
United Kingdom	TA	TA	TA	TA	TA	TA	TA	TA
Portugal	TA	TA	TA	TA	TA	TA	TA	TA
Estonia	0	-5.0	TA	TA	TA	TA	TA	TA
Finland	0	-4.1	-5.6	-6.6	TA	TA	TA	TA
Cyprus	0	> 1	2.0	TA	-4.3	TA	TA	TA
Ireland	0	-2.3	-3.9	-5.0	-5.0	TA	TA	TA
Latvia	0	0.3	-2.5	-3.2	-4.7	-4.7	TA	TA
Lithuania	0	> 1	0.6	-1.7	-3.2	-4.2	-3.6	TA
Germany	0	0.7	0.8	0.9	0.3	-1.6	-2.9	TA
Netherlands	0	-0.3	-1.8	-2.5	-2.3	-2.0	-2.3	TA
Bulgaria	0	-0.6	-1.0	-1.2	-1.1	-0.8	-1.3	-1.2
Czech Republic	0	0.3	-1.7	-1.8	-1.1	-1.4	-0.9	-0.4
Spain	0	-0.9	-0.3	-0.2	0.4	-0.1	0.2	0.8
Slovakia	0	0.4	1.2	1.3	1.3	0.9	0.8	1.0
Austria	0	0.9	1.8	2.1	4.0	3.2	2.2	1.7
Slovenia	0	-0.5	1.0	2.6	0.9	1.2	1.4	2.1
Hungary	0	0.3	0.3	-0.2	-0.2	0.1	0.9	2.1
France	0	-0.3	-0.9	-1.1	-0.5	0.0	1.3	2.2
Belgium	0	> 1	1.8	2.0	2.0	2.1	3.0	2.8
Greece	0	> 1	1.8	0.7	3.6	2.4	2.7	3.6
Italy	0	0.8	1.3	1.5	2.4	2.9	3.3	3.6
Luxembourg	0	> 1	1.2	1.0	1.9	2.3	2.5	4.1
Poland	0	> 1	> 2	> 3	> 4	> 5	> 6	6.2
Romania	0	> 1	> 2	> 3	> 4	> 5	> 6	> 7
Malta	0	0.5	1.0	0.7	2.2	3.6	5.1	> 7

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

TA = Target already achieved
> x = actual value is worse then the starting value, S-time-distance is more than x years

Table 4. Implementation of Lisbon 1 targets for the share of R&D in GDP

	S-time-distance (in years)						
	2000	2001	2002	2003	2004	2005	2006
EU27	**0**	**0.9**	**1.8**	**2.9**	**> 4**	**> 5**	**> 6**
EU25	**0**	**0.9**	**1.8**	**2.9**	**> 4**	**> 5**	**> 6**
EU15	**0**	**0.9**	**1.8**	**2.9**	**> 4**	**> 5**	**> 6**
Finland	**TA**	**TA**	**TA**	**TA**	**TA**	**TA**	**TA**
Sweden		**TA**		**TA**	**TA**	**TA**	**TA**
Austria	**0**	**-0.5**	**-0.3**	**-0.4**	**0.7**	**-0.3**	**0.1**
Malta			**0.0**	**1.0**	**-0.4**	**0.7**	**1.7**
Estonia	**0**	**0.1**	**1.0**	**1.6**	**1.9**	**2.4**	**2.1**
Denmark	**0**	**-1.2**	**-1.9**	**-1.8**	**0.5**	**1.9**	**3.2**
Czech Republic	**0**	**> 1**	**> 2**	**2.7**	**3.7**	**3.3**	**3.4**
Latvia	**0**	**> 1**	**> 2**	**> 3**	**> 4**	**3.8**	**3.6**
Spain	**0**	**1.0**	**1.3**	**1.8**	**2.7**	**3.3**	**3.7**
Cyprus	**0**	**0.9**	**1.1**	**1.5**	**2.3**	**3.0**	**3.8**
Lithuania	**0**	**0.2**	**1.3**	**2.2**	**2.5**	**3.5**	**4.1**
Hungary	**0**	**-0.2**	**0.2**	**1.7**	**3.1**	**3.6**	**4.2**
Ireland	**0**	**> 1**	**> 2**	**2.6**	**3.0**	**3.8**	**4.3**
Germany	**0**	**0.8**	**1.2**	**1.6**	**3.2**	**4.4**	**4.4**
Slovenia	**0**	**0.0**	**1.3**	**> 3**	**3.9**	**4.6**	**4.4**
Romania	**0**	**0.8**	**1.9**	**2.8**	**3.8**	**4.5**	**5.1**
Portugal	**0**	**0.6**	**2.0**	**> 3**	**3.9**	**4.6**	**5.4**
Italy	**0**	**0.7**	**1.3**	**2.5**	**3.6**	**4.7**	
Greece		**0.0**		**> 2**	**> 3**	**4.0**	**> 5**
United Kingdom	**0**	**> 1**	**> 2**	**> 3**	**> 4**	**> 5**	**> 6**
France	**0**	**0.3**	**0.9**	**2.7**	**4.0**	**> 5**	**> 6**
Belgium	**0**	**-0.3**	**> 2**	**> 3**	**> 4**	**> 5**	**> 6**
Netherlands	**0**	**> 1**	**> 2**	**> 3**	**> 4**	**> 5**	**> 6**
Slovakia	**0**	**> 1**	**> 2**	**> 3**	**> 4**	**> 5**	**> 6**
Luxembourg	**0**			**2.9**	**> 4**	**> 5**	**> 6**
Poland	**0**	**> 1**	**> 2**	**> 3**	**> 4**	**> 5**	**> 6**

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

TA = Target already achieved
> x = actual value is worse then the starting value, S-time-distance is more than x years