TrendChart
Innovation Policy in Europe

European Trend Chart on Innovation

EUROPEAN INNOVATION SCOREBOARD 2005

COMPARATIVE ANALYSIS OF INNOVATION PERFORMANCE

2005 EUROPEAN INNOVATION SCOREBOARD

1. INTRODUCTION

1.1. Executive summary

This is the fifth edition of the *European Innovation Scoreboard* (EIS). The EIS is the instrument developed by the European Commission, under the Lisbon Strategy, to evaluate and compare the innovation performance of the Member States. The EIS 2005 includes innovation indicators and trend analyses for all 25 EU Member States, as well as for Bulgaria, Romania, Turkey, Iceland, Norway, Switzerland, the US and Japan. The list of indicators and the methodology for calculating the Summary Innovation Index (SII) have been revised in close co-operation with the Joint Research Centre (JRC) (cf. section 1.2). The revised methodology now captures more dimensions of a country's innovation performance, although ensuring continuity with results of the former EIS editions. The Annex includes tables with definitions as well as comprehensive data sheets for every country. This report and its annexes, accompanying thematic papers and the indicators database are available at www.trendchart.org.

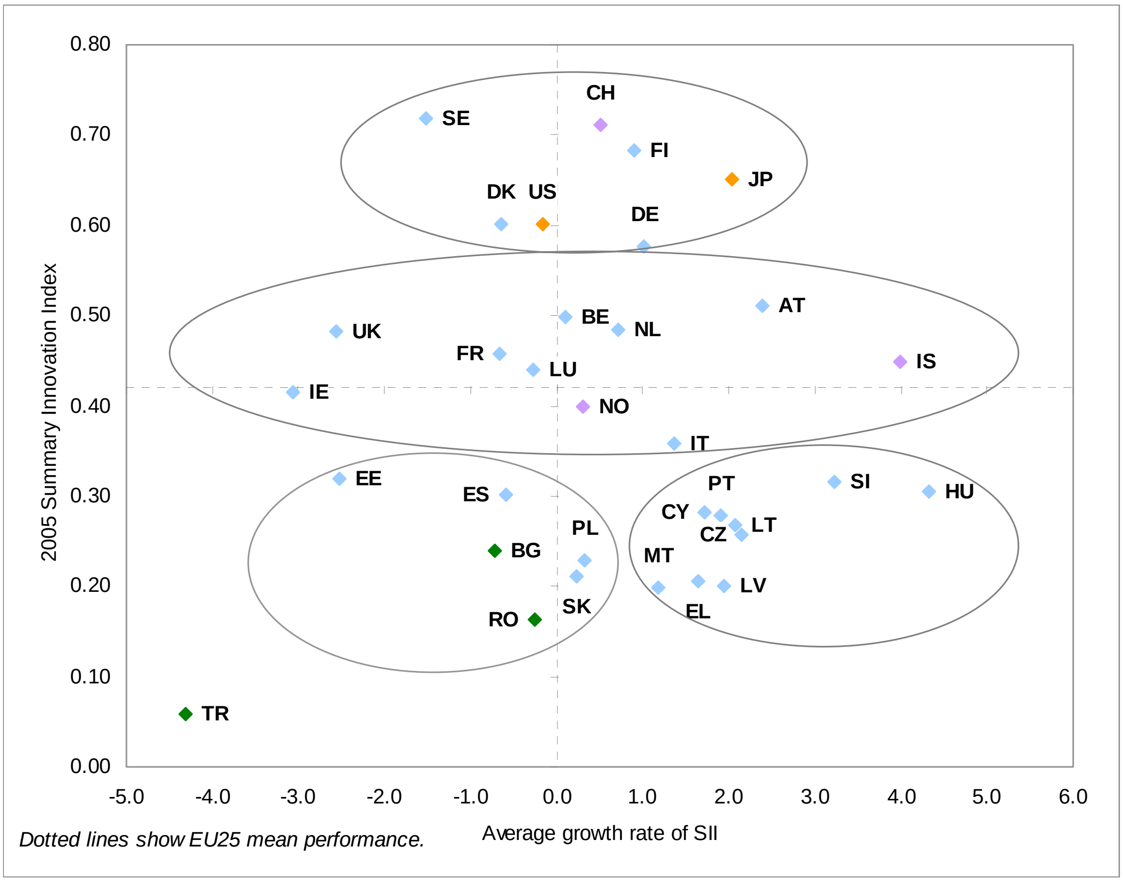
Development of national innovation performances

With respect to the situation in Europe, significant national differences are still observed (cf. section 2.1). Figure I shows the Summary Innovation Index (SII) on the vertical axis and the average growth rate of the SII on the horizontal axis. Countries above the horizontal dotted line currently have an innovation performance above the EU25. Countries to the right of the vertical dotted line had a faster average increase in the SII than the EU25.

Based on their SII score and the growth rate of the SII, the European countries can be divided in four groups:

- Switzerland, Finland, Sweden, Denmark and Germany make up the group of "*Leading countries*".
- France, Luxembourg, Ireland, United Kingdom, Netherlands, Belgium, Austria, Norway, Italy and Iceland all belong to the group of countries showing "*Average performance*".
- Countries "*Catching up*" are Slovenia, Hungary, Portugal, Czech Republic, Lithuania, Latvia, Greece, Cyprus and Malta.
- Countries "*Losing ground*" are Estonia, Spain, Bulgaria, Poland, Slovakia, Romania and Turkey.

FIGURE I. SII AND TRENDS



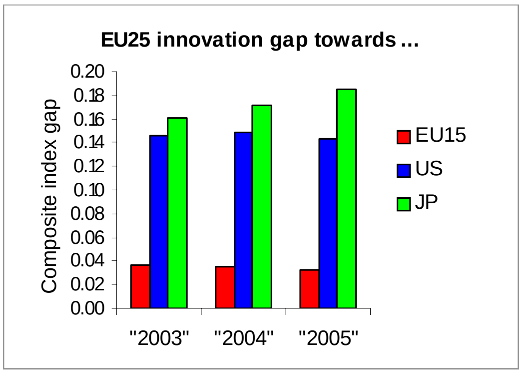
Notes: The circles in Figure I identify the four main country groupings: top = leading countries, middle = average performers, bottom right = catching up, and bottom left = losing ground.

No short-term convergence is expected

Although many countries show signs of catching-up, none of these countries is expected to complete this process by 2010. Using a simple linear extrapolation of current performances and growth rates, only Hungary, Slovenia and Italy are expected to reach the EU25 average within 20 years. For the other countries this process will take even longer, for some even more than 50 years (cf. section 2.2). This also means that it would take more than 50 years for the EU25 to catch up to the US level of innovation performance.

The gap between the US and the EU still exists

FIGURE II. EU25 INNOVATION GAP TOWARDS US, JAPAN AND EU15



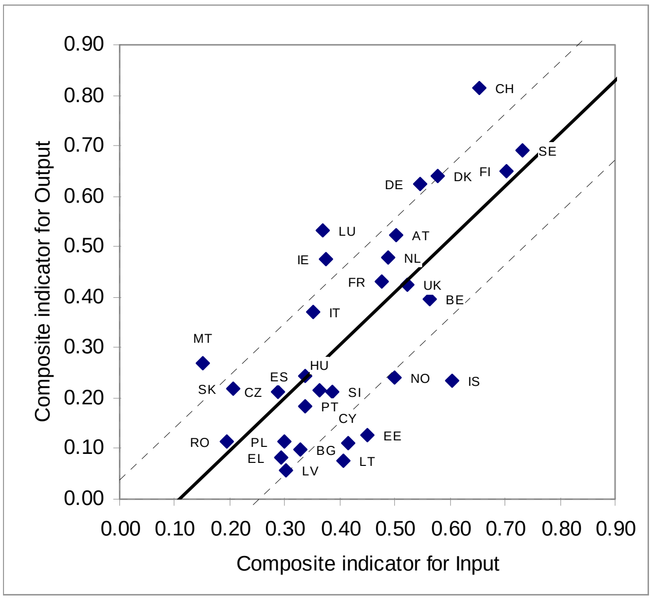
EU25 equal to 0.00

The US and Japan are still far ahead of the EU25 as shown in Figure II (cf. section 3.3). The innovation gap between the EU25 and Japan is increasing and the one between EU and US is close to stable. About 70% of the EU-US innovation gap is explained by lagging EU performance in three indicators: USPTO patents, population with tertiary education and ICT expenditures. The EU-Japan innovation gap is largely explained by lagging EU performance in three indicators: USPTO patents, Triad patents and population with tertiary education. However the economic interpretation of these statistical differences is to be conducted with care, where for example, the patenting performance does not only reflect a difference in term of innovation performance, but also in term of business usages and sector coverage.

Inputs and Outputs: transforming innovation assets into results

For the first time, the EIS has developed an input/output approach. This analysis allows for a better understanding of transformation of innovation assets (education, investment in innovation, etc) into innovation return (firm turnover coming from new products, employment in high tech sectors, patents, etc) (cf. section 2.4).

FIGURE III. INPUT AND OUTPUT



The solid line shows the trend line between both indices.

Although for many countries relative input performance is close to relative output performance, for several countries large differences in relative performance is observed. Switzerland, Germany, Luxembourg, Ireland and Malta are examples of countries showing much better performance on outputs, therefore suggesting a better transformation of their assets into innovation success. Iceland, Estonia, Lithuania, Cyprus and Norway are examples of countries showing much lower performance on outputs than on inputs.

One possible explanation for these observed differences might be the receptiveness of a country's population to new products and services, as it has been measured by the Innobarometer 2005 (cf. section 3.4). Among the 10 European countries which have the highest share of population attracted by innovative products or services, 9 have an above average output/input rate. Conversely, 7 countries among the 10 where population readiness for innovation is the lowest are below average output/input rate.

Key dimensions of innovations

Innovation is a non-linear process and the EIS indicators are distributed among five categories that cover different key dimensions of innovation performance. *Innovation drivers* measure the structural conditions required for innovation potential, *Knowledge creation* measures the investments in R&D activities, *Innovation & entrepreneurship* measures the efforts towards innovation at the firm level, *Application* measures the performance expressed in terms of labour and business activities and their value added in innovative sectors, and *Intellectual property* measures the achieved results in terms of successful know-how.

Not all countries perform on the same level in each of these dimensions and some countries may even prove to be especially weak in one or several dimensions of innovation (cf. section 2.3). As there is evidence (cf. section 3.5) that an even performance on these five dimensions fosters innovative performance, countries which show a below average performance on one of these dimensions as compared to the country's overall performance, might be in danger of hampered future innovative performance.

Innovation drives economic performance at sectoral level

There is weak statistical evidence at the country level that innovative performance drives economic performance (cf. section 3.1). Apparently GDP growth is influenced by so many parameters that the impact of innovation is hardly measurable. Some forms of innovation may also only be partially captured by the EIS. Furthermore, the impact of innovation can only be measured in the long term. This may explain why some of the European innovation leaders, like Sweden and Finland have not yet been sufficiently successful in transforming their innovation excellence into higher GDP per capita.

Conversely, at sectoral level, such positive evidence exists. More innovative sectors tend to have higher growth rates of labour productivity as measured by turnover per employed persons.

1.2. Revised indicators and methodology

The European Innovation Scoreboard (EIS) covers the 25 EU Member States, Bulgaria, Romania and Turkey, the associate countries Iceland, Norway and Switzerland, as well as the US and Japan. The indicators of the EIS summarise the main elements of innovation performance.

The 2005 EIS has been revised in collaboration with the Joint Research Centre (JRC)[1]. The number of categories of indicators has been revised and increased from four to five and the set of innovation indicators has been modified and increased to 26. The correlation between indicators was evaluated which allowed to abandon several of them and add new ones allowing to capture information on new dimensions of the innovation performance. The methodology for the composite innovation index has been reviewed. The 2005 EIS Methodology Report (MR) describes and explains all changes in full detail. The report is available on the Trend Chart website[2].

The innovation indicators are assigned to five categories and grouped in two main themes: Inputs and Outputs.

Innovation Inputs:

- *Innovation drivers* (5 indicators), which measure the structural conditions required for innovation potential;
- *Knowledge creation* (5 indicators), which measure the investments in R&D activities, considered as key elements for a successful knowledge-based economy;
- *Innovation & entrepreneurship* (6 indicators), which measure the efforts towards innovation at the level of firms.

Innovation Outputs:

- *Application* (5 indicators), which measure the performance, expressed in terms of labour and business activities, and their value added in innovative sectors;
- *Intellectual property* (5 indicators), which measure the achieved results in terms of successful know-how.

Table 1[3] shows the 5 main categories, the 26 indicators, and the primary data sources for each indicator. In total, nine indicators are new compared to the EIS 2004. These are identified in Table 1.

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[1] Joint Research Centre (JRC), Unit of Econometrics and Statistical Support to Antifraud (ESAF) of the Institute for the Protection and Security of the Citizen (IPSC).

[2] http://www.trendchart.org/scoreboards/scoreboard2005/scoreboard_papers.cfm

[3] Annex Table D gives full definitions for all indicators and also provides brief explanations why each new indicator was included.

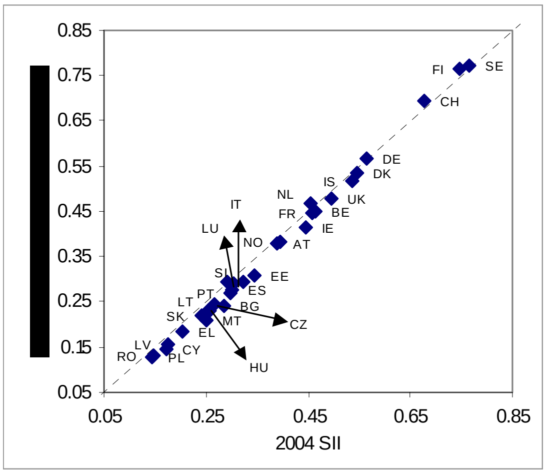
TABLE 1. EIS 2005 INDICATORS

	INPUT - Innovation drivers	
1.1	S&E graduates per 1000 population aged 20-29	EUROSTAT
1.2	Population with tertiary education per 100 population aged 25-64	EUROSTAT, OECD
1.3 NEW	Broadband penetration rate (number of broadband lines per 100 population)	EUROSTAT
1.4	Participation in life-long learning per 100 population aged 25-64	EUROSTAT
1.5 NEW	Youth education attainment level (% of population aged 20-24 having completed at least upper secondary education)	EUROSTAT
	INPUT – Knowledge creation	
2.1	Public R&D expenditures (% of GDP)	EUROSTAT, OECD
2.2	Business R&D expenditures (% of GDP)	EUROSTAT, OECD
2.3 NEW	Share of medium-high-tech and high-tech R&D (% of manufacturing R&D expenditures)	EUROSTAT, OECD
2.4 NEW	Share of enterprises receiving public funding for innovation	EUROSTAT (CIS)
2.5 NEW	Share of university R&D expenditures financed by business sector	EUROSTAT, OECD
	INPUT - Innovation & entrepreneurship	
3.1	SMEs innovating in-house (% of all SMEs)	EUROSTAT (CIS)
3.2	Innovative SMEs co-operating with others (% of all SMEs)	EUROSTAT (CIS)
3.3	Innovation expenditures (% of total turnover)	EUROSTAT (CIS)
3.4	Early-stage venture capital (% of GDP)	EUROSTAT
3.5	ICT expenditures (% of GDP)	EUROSTAT
3.6	SMEs using non-technological change (% of all SMEs)	EUROSTAT (CIS)
	OUTPUT – Application	
4.1	Employment in high-tech services (% of total workforce)	EUROSTAT
4.2 NEW	Exports of high technology products as a share of total exports	EUROSTAT
4.3	Sales of new-to-market products (% of total turnover)	EUROSTAT (CIS)
4.4	Sales of new-to-firm not new-to-market products (% of total turnover)	EUROSTAT (CIS)
4.5	Employment in medium-high and high-tech manufacturing (% of total workforce)	EUROSTAT
	OUTPUT - Intellectual property	
5.1	EPO patents per million population	EUROSTAT
5.2	USPTO patents per million population	EUROSTAT
5.3 NEW	Triadic patent families per million population	EUROSTAT, OECD
5.4 NEW	New community trademarks per million population	OHIM[4]
5.5 NEW	New community designs per million population	OHIM[4]

The Methodology Report researches in detail how to improve the methodology of calculating summary innovation indices using two different normalisation techniques (standardisation (z-scores) and re-scaling) and four different weighting schemes (budget allocation, factor analysis, benefit of the doubt and equal weighting). The Methodology Report provides a Robustness Analysis using a Monte Carlo experiment, which consists of a set of 300 simulations of evaluation of the composite indices based on a random selection of the normalisation and weighting scheme applied. The Robustness Analysis shows that country groupings and rankings are relatively stable and insensitive to the different weighting and normalisation schemes. For the computation of the 2005 Summary Innovation Index (SII) it was thus concluded to keep the methodology as simple as possible, with equal weighting applied to all indicators.

[4] Office for Harmonization in the Internal Market (Trade Marks and Designs): http://oami.eu.int/

FIGURE 1. NEW SII METHODOLOGY ENSURES CONTINUITY



The new methodology led to the removal of 5 redundant indicators, which were replaced with 9 new indicators that capture new dimensions of innovation performance and allow for further analysis. Considering the high political visibility of the Summary Innovation Index and the European Innovation Scoreboard, a requirement for any changes to the EIS was to ensure continuity with previous years. Figure 1 correlates the original 2004 SII scores and a recalculation of the 2004 SII using the 2005 methodology. The high correlation coefficient of 0.998 illustrates that the new methodology does not significantly change the relative innovation performance of countries as measured by the SII. Furthermore, the rank order of 19 countries does not change and for nine countries the change is limited to a gain or loss of only one rank position.

2. EUROPEAN INNOVATION SCOREBOARD: BASE FINDINGS

2.1. Overall innovation performance in Europe

The Summary Innovation Index gives an "at a glance" overview of aggregate national innovation performance. The EIS report on Strengths and Weaknesses gives more detailed information on the strengths and challenges of each country[5].

Figure 2 shows the results for the 2005 SII. As measured by the EIS indicators, Sweden, Switzerland, Finland, Germany and Denmark are the European innovation leaders. Estonia and Slovenia lead the group of new Member States. For Turkey, the US and Japan the SII value is an estimate based on a more limited set of indicators. The relative position of these countries in Figure 2 should thus be interpreted with care.[6]

FIGURE 2. THE 2005 SUMMARY INNOVATION INDEX (SII)

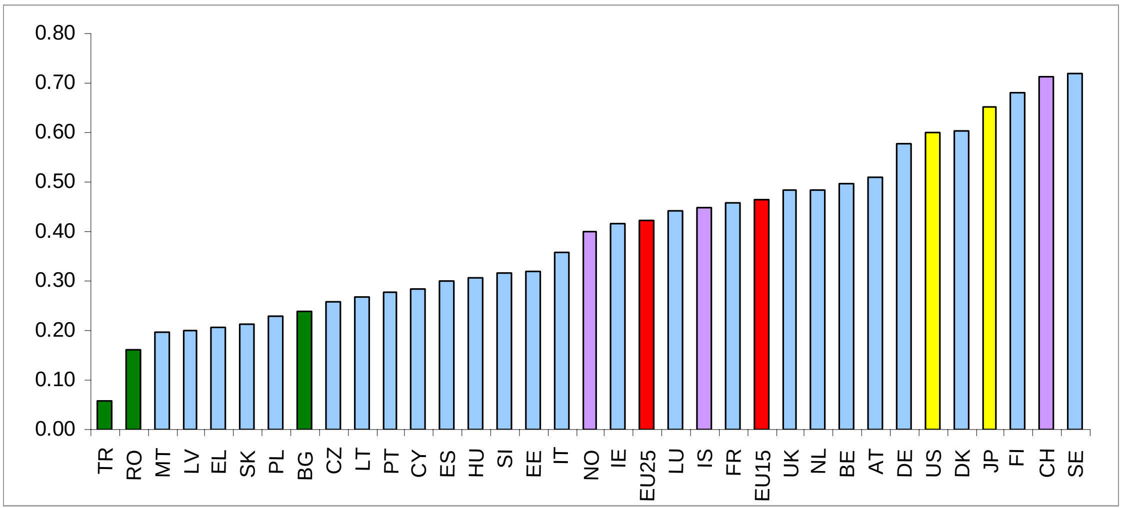


Figure 3 shows the current performance as measured by the SII on the vertical axis against the short-run trend performance of the SII on the horizontal axis. This creates four quadrants: countries above both the average EU-25 trend and the average EU-25 SII are *moving ahead*, countries below the average SII but with an above average trend performance are *catching up*, countries with a below average SII and a below average trend are *falling further behind*, and countries with an above average SII and a below average trend are *losing momentum*.

It should be noted that Figure 3 is not comparable to any of the four-quadrant graphs in previous EIS reports as the horizontal axis shows the average annual growth rate of the SII[7] whereas previous reports showed the average trend increase for the various

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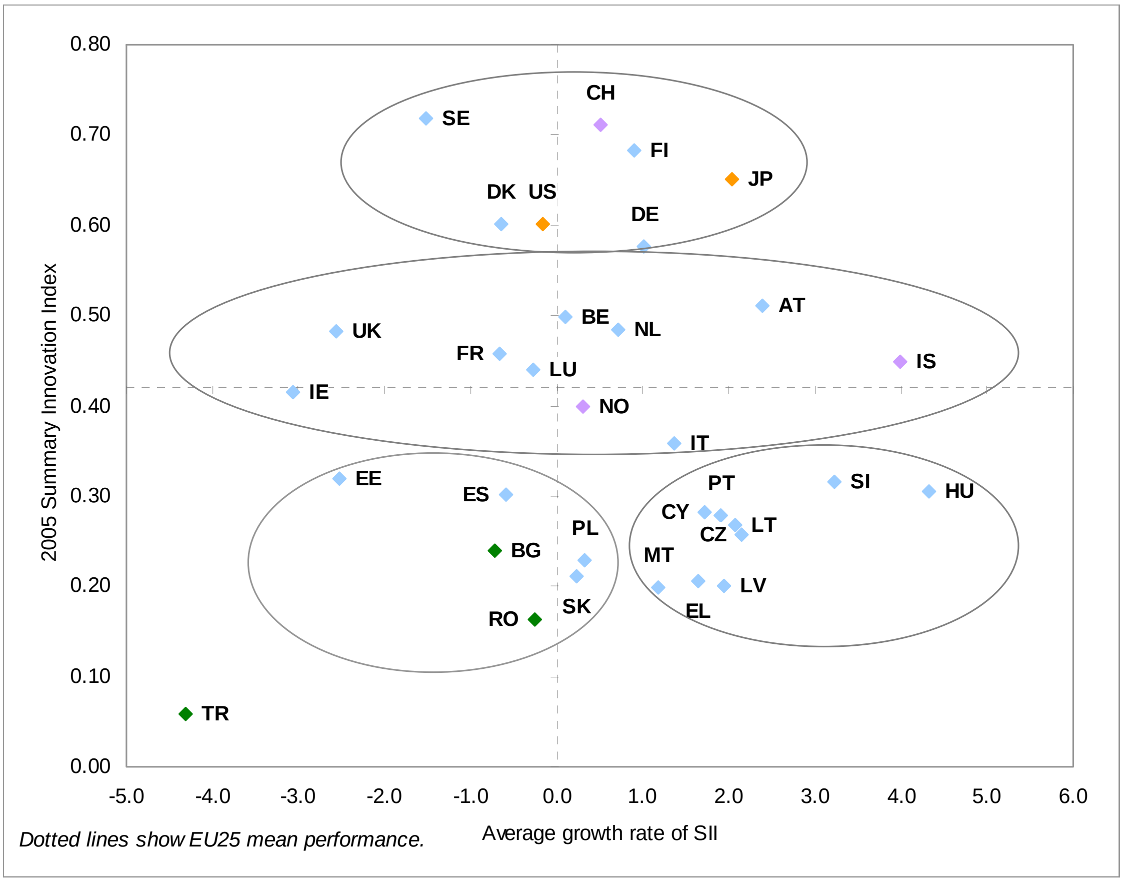
[5] The EIS 2005 Strengths & Weaknesses report is available for download at http://www.trendchart.org/scoreboards/scoreboard2005/scoreboard_papers.cfm

[6] The Technical Annex provides more details.

[7] The SII scores for 3 years – using the 2005 methodology for all 3 years –, the growth rate and the ranks for these 3 years are shown in Annex Table E. Although several countries show large changes in

innovation indicators. The new methodology therefore better characterizes the SII evolution.

FIGURE 3. SII AND TRENDS



Notes: The circles in Figure 3 identify the four main country groupings: top = leading countries, middle = average performers, bottom right = catching up, and bottom left = losing ground.

Based on their SII score and the growth rate of the SII the countries can be divided into four groups: Switzerland, Finland, Sweden, Denmark and Germany make up the group of "*Leading countries*". Of the leading countries, Sweden and Denmark show a below EU average SII growth rate. France, Luxembourg, Ireland, United Kingdom, Netherlands, Belgium, Austria, Norway, Italy and Iceland all belong to the group of countries showing "*Average performance*". Countries "*Catching up*" include Slovenia, Hungary, Portugal, Czech Republic, Lithuania, Latvia, Greece, Cyprus and Malta. Countries "*Losing ground*" include Estonia, Spain, Bulgaria, Poland, Slovakia, Romania and Turkey. Each of these four groups are circled in Figure 3 and mapped in Figure 4.

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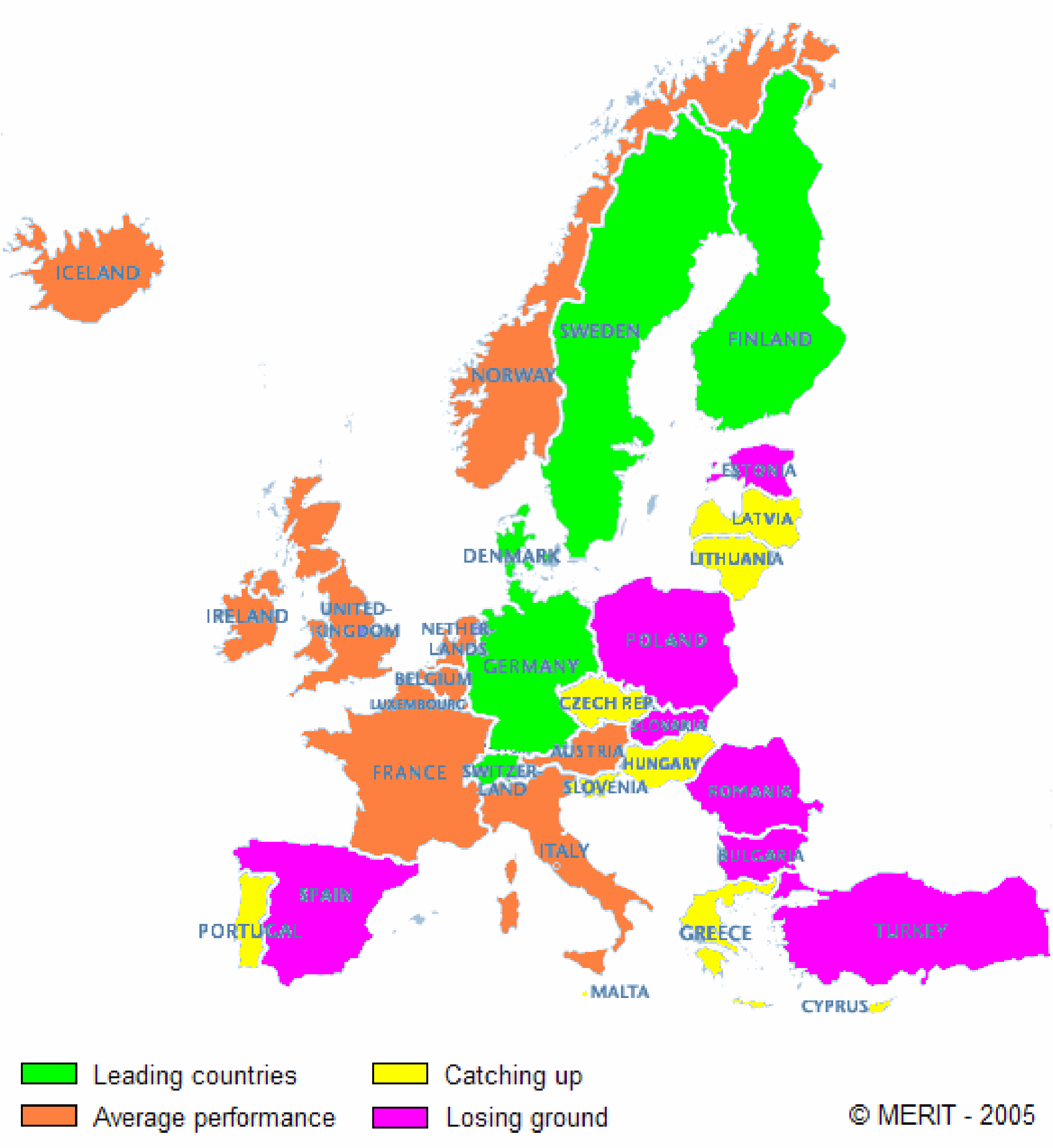
their SII score, the country ranking is very stable and shows almost no changes in rank with the exception of Ireland.

FIGURE 4. EIS COUNTRY GROUPINGS

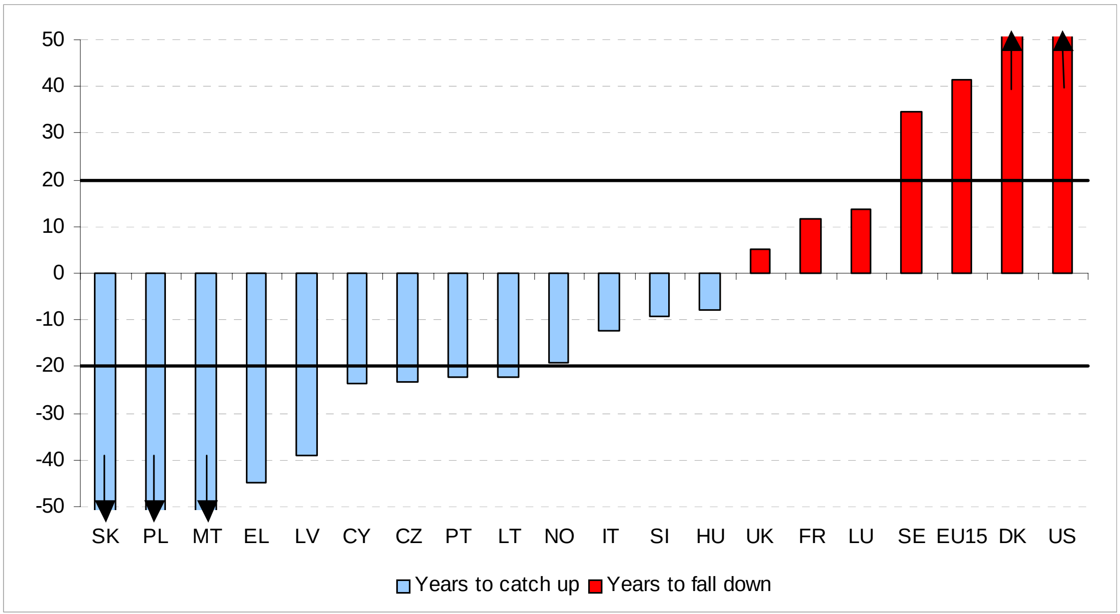


2.2. No short-term convergence is expected

Using a simple linear extrapolation of current performances and growth rates, an estimate can be made for those countries either catching up or losing momentum on how many years it would take to either catch up or decline to the EU25 average level of performance. The estimates based on a linear extrapolation will become less reliable the longer the time period the estimate is based on. Figure 5 shows the estimated years to catch up to or decline to the EU25 average.

None of the catching up countries is expected to be at the EU25 average by 2010. At best, Hungary, Slovenia, and Italy will reach the EU25 average under the current conditions by 2015. Under this scenario, for Malta, Slovakia and Poland the catching up process would take more than 50 years. This enormous time lag should raise questions on which dimensions of the innovation policy have to be better addressed in these countries. Similar questions need to be addressed in countries like France or the United Kingdom: They still show an average value of the summary index above the EU average, but might regress to the EU average, possibly within the next 5 to 10 years. Based on the current trends, it would also take more than 50 years for the EU25 to reach the US level of innovation performance.

FIGURE 5. YEARS TO CATCH UP OR DECLINE TO EU25 AVERAGE PERFORMANCE

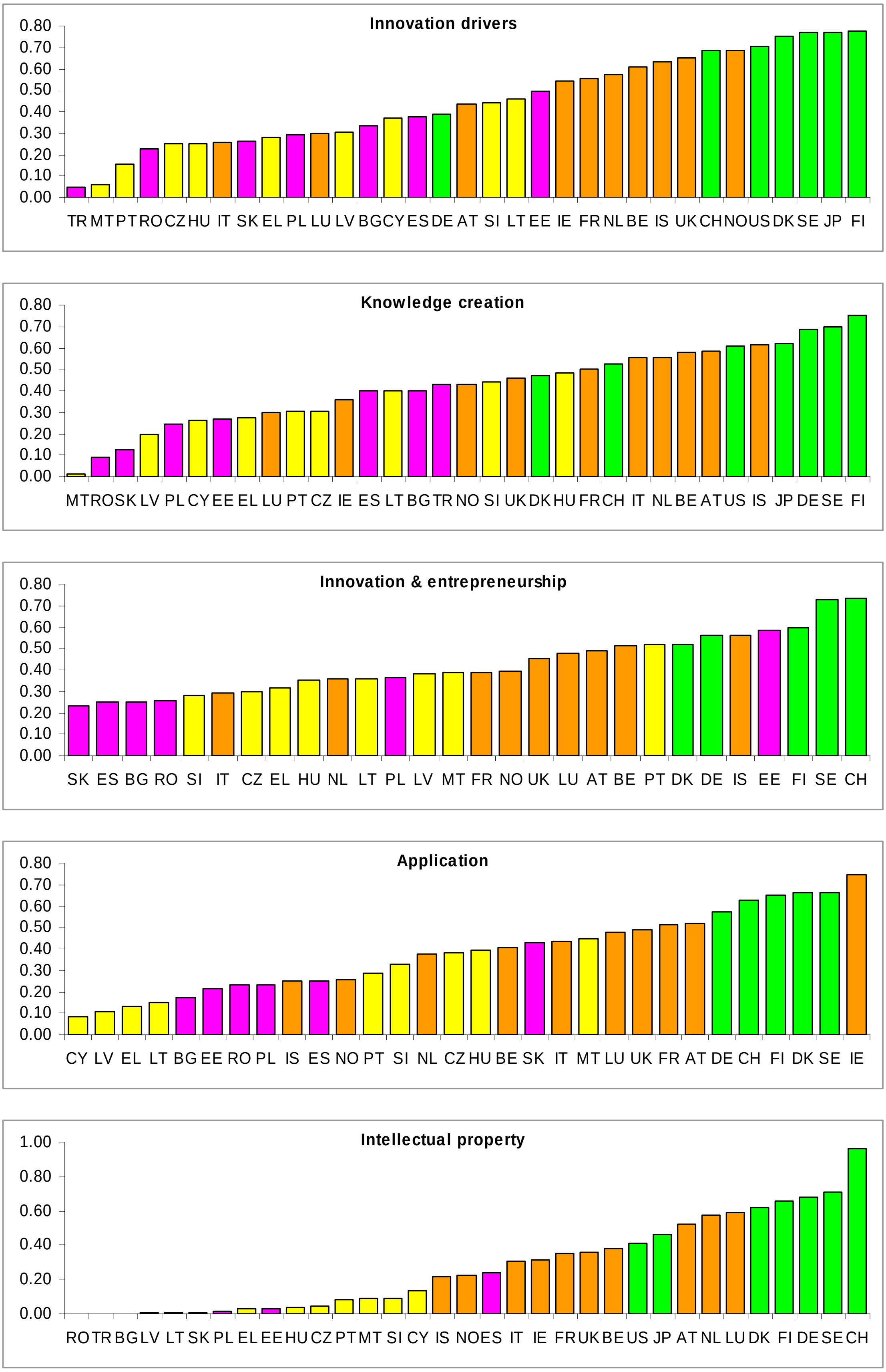


Bold lines reflect 20 years to catch up or decline to the EU average. For countries having either both above average SII and growth rates or both below average SII and growth rates, years to catch up could not be computed as these countries are either expected to increase their lead, respectively gap, towards the EU25.

2.3. Five key dimensions of innovation performance

Innovation is a non-linear process. The 26 EIS innovation indicators have been classified into five categories to better capture the various aspects of the innovation process. These five categories cover different dimensions of innovation performance with a limited set of indicators. *Innovation drivers* measure the structural conditions required for innovation potential, *Knowledge creation* measures the investments in R&D activities, *Innovation & entrepreneurship* measures the efforts towards innovation at the firm level, *Application* measures the performance expressed in terms of labour and business activities and their value added in innovative sectors, and *Intellectual property* measures the achieved results in terms of successful know-how. Figure 6 shows the ranking of countries for each of these groups from the worst to best performer. Country colour codes correspond with those in Figure 4.

FIGURE 6. INNOVATION PERFORMANCE PER GROUP OF INDICATORS



Countries generally perform at a comparable level in each of these groups. However, there are some noteworthy exceptions. Germany, Italy and Luxembourg are performing worse in Innovation drivers, Switzerland in Knowledge creation and Iceland in Applications than in the other groups. Estonia, Latvia and Portugal are performing much better in Innovation & entrepreneurship and the Czech Republic and Ireland in Applications than in the other groups. The EIS report on Strengths and Weaknesses gives more detailed information on the strengths and challenges of each country[8].

There is some evidence that countries with an even performance on each of the key dimensions perform better overall than countries with an uneven distribution (see Section 3.5). Germany's weak performance on Innovation drivers might thus hamper the effect of increased efforts in other key dimensions on the overall innovative performance of the country. A similar statement can be made for Knowledge creation in Denmark, the UK and Switzerland, and Innovation drivers in Austria and Portugal. The opposite might also hold true: a country can also over perform in one of the key dimensions without fully benefiting of an improved overall innovative performance. This might be the case for Innovation & entrepreneurship in Estonia and Portugal, and Applications in Ireland.

The information delivered by these 5 categories allows for a rapid identification of areas of weakness to be explored. However, further analysis and identification of strengths and weaknesses will have to be conducted through an in-depth study of the component indicators and external sources.

2.4. Innovation input and innovation output

The concept of innovation efficiency is a key dimension of innovation policy. Innovation efficiency can be measured as the ability of firms to translate innovation inputs into innovation outputs. The ratio between the EIS composite index for inputs (education, investment in innovation, etc) and outputs (firm turnover coming from new products, employment in high tech sectors, patents, etc) provides a measure of this relationship for national innovation systems. The composite indicator for Inputs is computed as the average of the 16 indicators covered in Innovation drivers, Knowledge creation and Innovation & entrepreneurship; the composite indicator for Outputs is computed as the average of the 10 indicators covered in Applications and Intellectual Property. Table 2 shows the ranking of countries based on their SII scores and the composite indicators for Inputs and Outputs. Finland, Sweden and Switzerland are leading in both Inputs and Outputs.

Table 2. Input, output and SII ranks

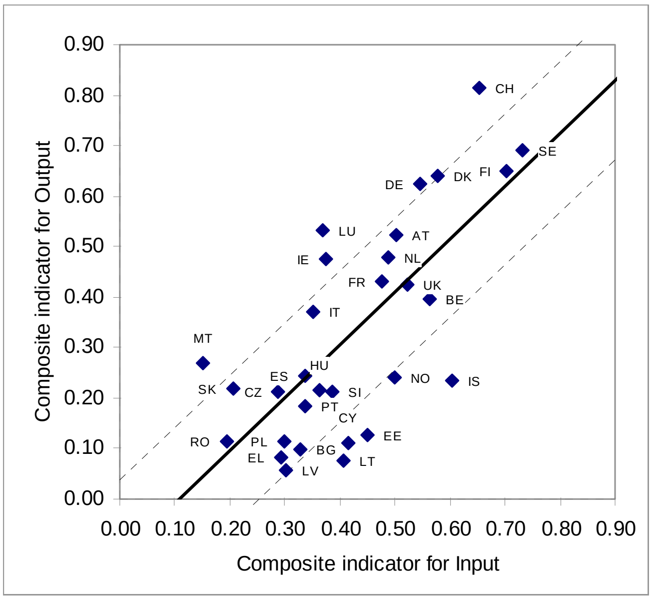
	SE	CH	FI	DK	DE	AT	BE	UK	NL	FR	IS	LU	IE	NO	IT	EE	SI	HU	ES	CY	PT	LT	CZ	BG	PL	SK	EL	LV	RO
INPUT	1	3	2	5	7	9	6	8	11	12	4	18	17	10	20	13	16	19	22	14	21	15	27	23	25	28	26	24	29
OUTPUT	2	1	3	4	5	7	12	11	8	10	16	6	9	15	13	22	20	18	14	25	21	28	19	26	24	17	27	29	23
SII	1	2	3	4	5	6	7	9	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

[8] The EIS 2005 Strengths & Weaknesses report is available for download at http://www.trendchart.org/scoreboards/scoreboard2005/scoreboard_papers.cfm

Many countries have similar rankings on both Input and Output performance. The most noteworthy exceptions are Belgium, Iceland, Norway, Estonia, Cyprus, Lithuania and Latvia, which all rank much better on Inputs than on Outputs. Luxembourg, Ireland, Italy, Spain, Czech Republic, Slovakia and Romania all score much better on Outputs. These results should, however, be interpreted with caution as many of the Output indicators measure intellectual property where there is an enormous range in performance (see Figure 6).

Figure 7 graphs the composite index scores for Inputs against the scores for Outputs. The results give an indication of the efficiency with which a country transforms its innovation inputs (education, investment in innovation) into innovation outputs (turnover coming from new products, employment in high-tech sectors, and patents). Despite the fact there is no theoretical basis for assuming a linear relationship, and several aspects of innovation may only be partially covered by the EIS, this analysis is a first contribution to the discussions on the efficiency of innovation systems in Europe.

FIGURE 7. INPUT AND OUTPUT



The solid line shows the trend line between both indices.

Countries above the diagonal line perform better on outputs than on inputs, suggesting that they are more efficient at transforming inputs into outputs than countries below the diagonal line. The picture is very diverse, with both highly innovative countries according to the SII, such as Germany and Finland, and mid performing countries such as Italy, falling above the diagonal line. On the other side fall most of the new Member States, with relatively large investments but poor performance on outputs. However, innovation is a long-term process and the evolution of the output performance of these countries will likely improve in the years to come, based on current investment in inputs. Among the more advanced countries, Iceland is an example of a country that is a poor performer on applications, despite a favourable general business environment with high investments in R&D and a good education level. This is partly explained by the emphasis in Iceland on long-term innovation strategies, based on biotechnology and the hydrogen economy, that have yet to pay off.

The receptiveness of a country's population might be one explanation for the fact that some countries perform relatively better on outputs and other countries on inputs. Section 3.4 shows that most countries with above average shares of citizens attracted by new products and services also have output/input rates above the European trend.

Similarly, countries with below average shares of citizens attracted by new products and services have below average output/input rates.

2.5. Innovation performances and trends by country – Challenges

Table 3 identifies for each indicator the three European countries with the highest scores[9] and the results for the EU25, EU15, US and Japan. The innovation leaders Sweden, Finland, Denmark, Germany and Switzerland take up 60% of the leading slots.

TABLE 3. INNOVATION PERFORMANCE LEADERS

	EU25	EU15	European leaders			US	JP
1.1 S&E graduates	12.2	13.1	IE (24.2)	FR (22.2)	UK (21.0)	10.9	13.2
1.2 Tertiary education	21.2	23.1	FI (34.2)	DK (32.9)	NO (32.3)	38.4	37.4
1.3 Broadband penetration rate	6.5	7.6	DK (15.6)	IS (15.5)	NL (14.7)	11.2	12.7
1.4 Life-long learning	9.9	10.7	SE (35.8)	IS (31.7)	CH (28.6)	--	--
1.5 Youth education	76.7	73.8	NO (95.3)	SK (91.3)	CZ (90.9)	--	--
2.1 Public R&D expenditures	0.69	0.70	IS (1.37)	FI (1.03)	SE (1.02)	0.86	0.89
2.2 Business R&D expenditures	1.26	1.30	SE (2.93)	FI (2.45)	CH (1.90)	1.91	2.65
2.3 Share of medium-high/high-tech R&D	--	89.2	SE (93.7)	DE (93.5)	IT (91.1)	90.6	86.8
2.4 Share of firms receiving public funding	N/a	N/a	AT (19.2)	FI (18.7)	IT (14.8)	--	--
2.5 University R&D expenditures financed by business sector	6.6	6.6	LV (23.9)	BE (12.7)	DE (12.5)	4.5	2.7
3.1 SMEs innovating in-house	N/a	N/a	CH (54.8)	IS (46.5)	AT (44.7)	--	--
3.2 Innovative SMEs co-operating with others	N/a	N/a	HU (32.9)	CY (22.6)	FI (18.6)	--	--
3.3 Innovation expenditures	N/a	N/a	CH (3.48)	UK (3.35)	MT (3.29)	--	--
3.4 Early-stage venture capital	--	0.025	SE (0.081)	FI (0.065)	DK (0.063)	0.072	--
3.5 ICT expenditures	6.4	6.3	SE (8.7)	EE (8.6)	MT (8.5)	7.8	8.0
3.6 SMEs using non-technological change	N/a	N/a	LU (74)	DE (65)	CH (63)	--	--
4.1 Employment in high-tech services	3.19	3.49	SE (4.85)	IS (4.81)	FI (4.68)	--	--
4.2 High-tech exports	17.8	17.2	MT (55.5)	IE (29.9)	LU (29.3)	26.9	22.7
4.3 Sales share of new-to-market products	N/a	N/a	SK (10.9)	PT (10.8)	LU (9.1)	--	--
4.4 Sales share of new-to-firm not new-to-market products	N/a	N/a	DK (25.6)	DE (23.4)	CH (20.5)	--	--
4.5 Employment in medium-high/high-tech manufacturing	6.60	7.10	DE (11.04)	SI (8.94)	CZ (8.71)	4.89	7.40
5.1 EPO patents	133.6	158.5	CH (460.1)	SE (311.5)	FI (310.9)	154.5	166.7
5.2 USPTO patents	59.9	71.3	CH (188.3)	SE (187.4)	FI (158.6)	301.4	273.9
5.3 Triad patents	22.3	36.3	CH (110.8)	FI (94.5)	SE (91.4)	53.6	92.6
5.4 Community trademarks	87.2	100.9	LU (571.2)	CH (180.0)	AT (158.8)	32.0	11.1
5.5 Community designs	84.0	98.9	DK (199.1)	CH (161.2)	DE (147.1)	12.4	15.1

[9] European countries in Tables 3 and 4 are defined as the group of EU25 countries, Iceland, Norway and Switzerland.

Having the highest score does not necessarily qualify a country as an innovation leader in that particular indicator. In particular for (very) small countries a high score can be achieved due to their specialization in certain sectors or products without achieving innovation leadership. In particular for high-tech exports the high scores for Malta and Luxembourg are most likely due to their industrial specialization.

The US does better than the EU in 11 indicators, while the EU only scores above the US in 5 indicators (S&E graduates, university R&D financed by business sector, employment in medium-high and high-tech manufacturing, community trademarks and community designs). Japan also does better than the EU in 11 indicators, while the EU only scores above Japan in 4 indicators (share of medium-high and high-tech R&D, university R&D financed by the business sector, community trademarks and community designs). Performance in intellectual property is biased due to the home advantage that local companies have in their local market. This home advantage explains the very high patent score for the US on USPTO patents and the poor performance for the US and Japan on both *community* trademarks and *community* designs within the EU. However, despite its home advantage, the EU is not outperforming the US and Japan in EPO patents.

TABLE 4. INNOVATION TREND LEADERS

	EU25	EU15	European leaders			US	JP
1.1 S&E graduates	9.4	9.0	SK (17.9)	IT (16.7)	PL (16.5)	6.4	2.1
1.2 Tertiary education	4.3	3.8	MT (18.5)	PT (16.9)	PL (14.4)	2.6	6.2
1.3 Broadband penetration rate	--	49.5	IE (312.3)	LU (122.6)	IT (79.2)	--	--
1.5 Youth education	0.2	1.5	MT (9.4)	PT (6.1)	LT (4.2)	--	--
2.1 Public R&D expenditures	2.2	2.0	LU (24.0)	CY (16.2)	HU (14.0)	11.9	2.3
2.2 Business R&D expenditures	1.3	1.4	CY (26.5)	EE (22.5)	AT (12.1)	-2.1	10.8
2.5 University R&D expenditures financed by business sector	0.6	0.9	HU (41.5)	PT (23.5)	CY (23.3)	-12.9	6.8
3.5 ICT expenditures	6.9	-1.3	PL (6.9)	NO (4.0)	CH (2.3)	0.0	8.2
4.1 Employment in high-tech services	0.1	1.3	CY (9.9)	IS (8.3)	AT (8.3)	--	--
4.2 High-tech exports	-6.3	-6.2	CZ (22.5)	LU (17.6)	SI (16.1)	-4.5	-5.8
4.5 Employment in medium-high/high-tech manufacturing	-2.8	-3.4	IS (9.9)	SK (8.9)	CY (6.7)	-4.3	-2.4
5.1 EPO patents	5.3	5.2	SI (20.2)	MT (20.0)	NL (17.7)	3.3	9.9
5.2 USPTO patents	--	5.9	CY (37.9)	IS (20.4)	EE (19.9)	-0.1	5.5
5.3 Triad patents	1.2	1.0	CY (166.7)	LT (62.0)	LV (28.4)	-1.4	2.9
5.4 Community trademarks	15.6	13.9	PL (525.4)	EE (449.9)	CZ (240.2)	-1.9	13.9

Annual percentage change

Table 4 identifies for each indicator, for which time series data are available, the three European countries with the highest growth rates and the results for the EU25, EU15, the US and Japan. The catching-up countries take up almost 50% of the leading slots. In particular Cyprus, has the highest growth rates in 7 indicators.

The EU shows a higher trend than the US in 10 indicators, the US scores above the EU in 2 indicators (public R&D and high-tech exports). Japan shows a higher trend than the EU in 9 indicators while the EU only scores above Japan in 3 indicators (S&E graduates, USPTO patents and community trademarks).

The role of intellectual property

The new member states show below average innovation performance, partly because almost all of them have extremely low rates of patenting. The analysis of the main challenges for these countries does not view this as an issue because low patenting rates are caused by very low investments in R&D. The challenge, over the short and medium term, is often to first focus on improving both public and private R&D expenditures. Once this is achieved, patent rates will probably increase, given appropriate infrastructural support, such as programmes to assist firms with filing patent applications. If patent rates do not increase after a sustained period of higher R&D expenditures, then low patent rates could develop into a main challenge, but this is not the case at present.

A long-term return for investing in innovation

Although Finland and Sweden are EU innovation leaders, both countries present below average static economic performance. For example, Finland’s per capita GDP is below that of the majority of countries in the intermediate innovator group. More discouragingly, its labour productivity per hour worked in 2003 was only 92.6% of the average for the EU-15. The same problems with per capita income and labour productivity apply to Sweden. However, the GDP growth rate of both countries is significantly higher than EU average (65% above EU-15 average for Finland and 20% for Sweden on average between 1996 and 2004). It can therefore be expected that the return on investment in innovation will be a long term one. Taking full advantage of this long term investment will be the key challenge for the innovation leaders.

When more is not better

Innovation scoreboards assume that more of each indicator is always better. This is not, however, the case for some indicators, where the optimum level will depend on national circumstances. For example, more university R&D financed by business is usually better within the intermediate and leading countries, but this indicator can have a different interpretation in the lagging countries. Some of these countries have results for this indicator that are three or four times the EU average. This is possibly excessive and is linked to extremely low levels of business R&D. This forces firms with limited capabilities to perform creative innovation activities in-house to contract out R&D to other organisations. In a few countries, the level of university R&D funded by business has decreased over time as business R&D levels increased, creating more in-house capabilities.

Trademarks is another indicator that must be interpreted cautiously, because ‘more’ does not refer to the same conditions across countries. Within many of the new member states high community trademark registration reflects the activities of local affiliates registering the trademarks of their parent corporation. These trademarks have already been registered, often for years, in other more developed countries.

The share of R&D performed in the medium-high and high technology sectors is also open to different interpretations. In Finland, this share is low because of high levels of R&D in low technology and medium-technology manufacturing. Since Finland already excels in high technology manufacturing R&D, this result is a sign of strength and shows the acquisition of an R&D based strategy by firms across the manufacturing sector.

Business R&D

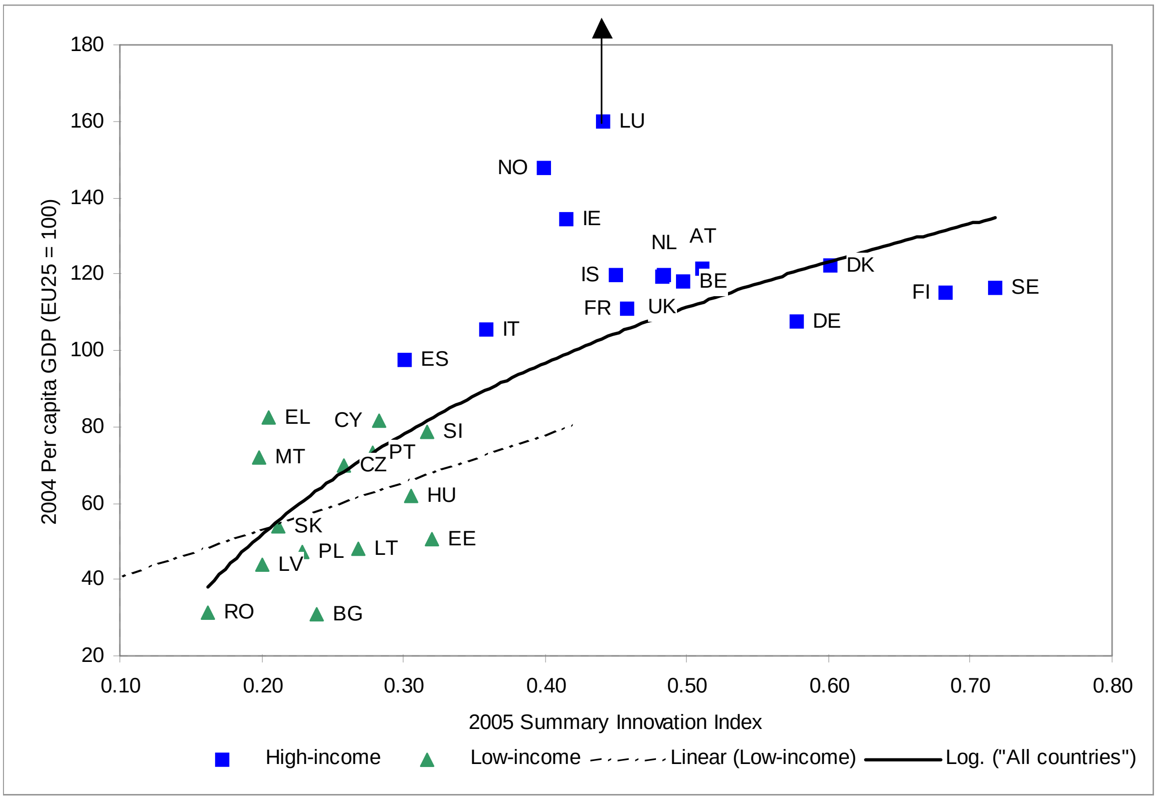
In many of the more innovative EU countries, business R&D has been declining instead of increasing, as required to meet the Barcelona objective of an average business R&D intensity of 2%. Notable declines in business R&D have occurred in Belgium, France, Germany, Ireland, the Netherlands and Sweden, while remaining stable in Finland, Italy and Luxembourg and only increasing in Austria, Denmark, and the UK. For those countries with a decline, the peak year for best performance in business R&D ranges between 1998 and 2003. The decline in business R&D could therefore be linked to the collapse of the dotcom bubble and high technology stocks. However, the decline in business R&D could also be due to other trends, such as a shift in R&D abroad combined with a decline in national competitiveness for research, that are worth following closely over the next few years.

3. THEMATICS

3.1. Innovation performance versus economic performance

The justification for policy actions in support of innovation is to combat market failures that prevent innovation to contribute fully to improvements in the quality of life and in quantitative measures of well-being such as higher GDP per capita, productivity, and economic growth. The link between innovation and growth has been extensively explored from both a theoretical and an empirical perspective. Although several different measures of innovation have been used in empirical research, including R&D spending, patenting, and the technological balance of payments, most empirical research has focused on the effect of innovation on productivity, either at the firm, industry or country level. The literature[10] on this issue finds that innovation, whether measured by R&D spending or patenting, has a significant effect on productivity.

FIGURE 8. INNOVATION PERFORMANCE AND PER CAPITA GDP



Relative per capita GDP for Luxembourg is at 217. The log-linear trend line for all countries does not include Luxembourg and Norway.

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[10] For a review of this literature, see Mairesse, J. and Mohnen, P. (1995). R&D and productivity: a survey of the econometric literature, Université du Québec: mimeo; or Cameron, G. (1998) Innovation and Growth: a survey of the empirical literature (manuscript).

The trend lines in Figure 8 suggest that per capita GDP levels are correlated with innovation performance, in particular for the "low-income" countries[11]. The richest countries prove to have close GDP levels for significantly different innovation performance. More generally the link between innovation and GDP remains difficult to establish at national level, considering the innovation is only one factor among other structural ones.

Table 5 gives regression results between the SII and five macro-economic variables for two groups of countries. The results in the first row show a positive link for all countries between the SII and the 2004 level of per capita GDP and the 2003 level of labour productivity per hour worked. However, the link between the SII and the growth rates of both per capita GDP and two measures of labour productivity is negative. This means that in the most innovative countries, the incremental augmentation of economic indicators is lower than what is observed in less performing countries. This is closely linked to the overall economic situation, where it is much easier to progress fast when coming from lower levels.

Conversely, analysis of the CIS-3[12] data for the 15 countries covered by the Sectoral Scoreboard (see section 3.2 for a summary of the report on sector scoreboards) shows a significant positive correlation between innovative and economic performance at the sector level, after controlling for country-specific and sector-specific effects. Innovative performance at sectoral level and labour productivity growth as measured by the 1998-2000 growth rate of turnover per employee are positively correlated. More innovative sectors on average tend to have higher growth rates of labour productivity.

TABLE 5. REGRESSIONS RESULTS FOR SIMPLE CORRELATIONS BETWEEN COMPOSITE INNOVATION INDICATORS AND ECONOMIC PERFORMANCE INDICATORS

	2004 GDP per capita	2000-2004 GDP per capita growth rate	Labour productivity per hour worked 2003[a]	2000-2003 Labour productivity per hour worked growth rate	2000-2003 Labour productivity per person employed growth rate
SII – all countries	181.627 ***	-5.584 **	111.989 ***	-7.655 ***	-5.891 **
SII - Subset of 15 countries†	55.591	-3.477	44.720	-3.184	-3.762
			1998-2000 Labour productivity per person (turnover per employee) growth rate		
ISI – 25 sectors, 15 countries† (country and sector dummies)			23.488 *		

***/**/* Correlation is significant at the 1%-level/5%-level/ 10%-level. ISI = Innovation Sector Index.

† Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain and Sweden.

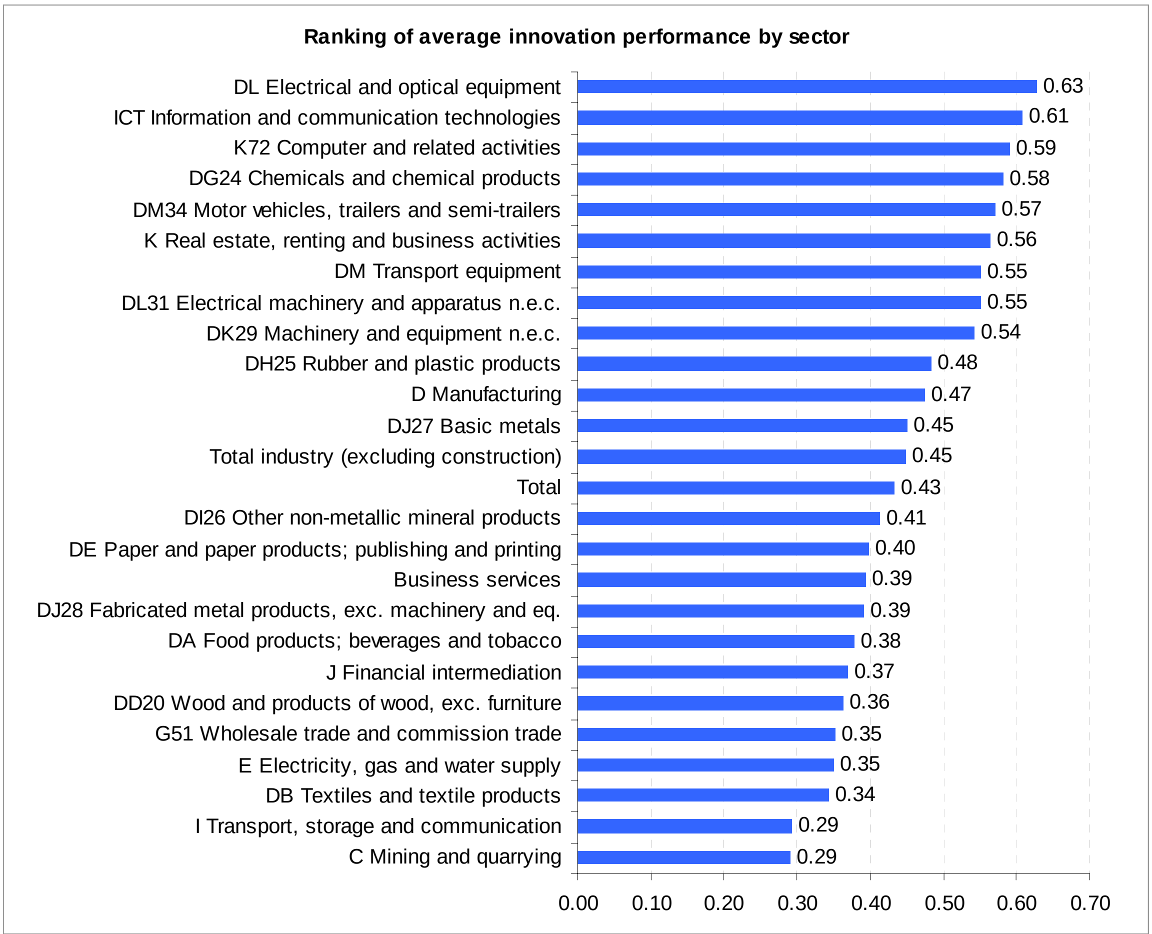
[11] Low-income countries are defined as those countries with a per capita GDP less than 90% of that of the EU25: TR, BG, RO, LV, LT, PL, EE, SK, HU, CZ, MT, PT, SI, EL, CY. High-income countries are defined as those countries with a per capita GDP of close to or above that of the EU25: ES, IT, DE, FI, FR, SE, BE, IS, JP, UK, NL, AT, DK, CH, IE, NO, US.

[12] Community Innovation Survey. http://www.cordis.lu/innovation-smes/src/cis.htm

3.2. Sector Innovation Scoreboards

As shown in the previous section, innovation performances per sector are positively correlated with economic performance. Therefore larger differences in the innovative performance of different sectors are expected to directly impact their economic performance. The 2005 EIS report on Sectoral Innovation Scoreboards has developed composite indicators measuring innovative performance at the sector level[13].

Figure 9. Average sector innovation performance



The 2004 EIS included, for the first time, an analysis of innovation performance by sector for 14 sectors. The sector analysis for 2005 has been expanded to a total of 25 sectors for 15 European countries[14] and uses data for 12 indicators, of which 11 are

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[13] For more details the reader is referred to the 2005 EIS report on Sectoral Innovation Scoreboards on the Trend Chart website http://www.trendchart.org/scoreboards/scoreboard2005/scoreboard_papers.cfm

[14] Unpublished sector data were available for analysis for 15 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain and Sweden. Data for Ireland, the United Kingdom and all new member states are not available.

taken from the CIS-3 survey (share of employees with higher education; share of firms using training for personnel directly aimed at the development and/or introduction of innovations; share of firms that receive public subsidies to innovate; share of firms innovating in-house; share of SMEs co-operating with others; innovation expenditures as a percentage of total turnover; share of total sector sales from new-to-market products; share of total sector sales from new-to-firm but not new-to-market products; share of firms that patent; share of firms that use trademarks and share of firms that use registration of design patterns). One indicator is taken from the ANBERD database from the OECD (R&D expenditures as a percentage of value-added). All indicators are identical to or very similar to those used in the 2005 EIS.

The *Innovation Sector Index (ISI)* measures average innovation performance for each of the sectors. The ISI is a composite indicator that is calculated for each sector using 12 innovation indicators. For all 15 countries most innovative sectors are Electrical and optical equipment (NACE DL), Information and communications technologies (ICT), Computer and related activities (NACE K72), Chemicals and chemical products (NACE DG24) and Motor vehicles, trailers and semi-trailers (NACE DM34). Least innovative sectors are Transport, storage and communication (NACE I) and Mining and quarrying (NACE C) (see Figure 9).

TABLE 6. SECTOR INNOVATION LEADERS

NACE	Sector		Leaders	
C_D_E	Total industry	Finland	Germany	Belgium
C	Mining and quarrying	Finland	Norway	Netherlands
D	Manufacturing	Finland	Germany	Belgium
DA	Food products, beverages and tobacco	Belgium	Sweden	France
DB	Textiles and textile products	Finland	Germany	Belgium
DD20	Wood and wood products	Germany	Finland	Austria
DE	Pulp, paper and paper products, publishing and printing	Finland	Germany	Luxembourg
DG24	Chemicals and chemical products	Austria	Finland	Belgium
DH25	Rubber and plastic products	Sweden	Austria	France
DI26	Other non-metallic mineral products	Germany	Finland	Sweden
DJ27	Basic metals	Finland	Austria	Sweden
DJ28	Fabricated metal products, except machinery and equipment	Finland	Belgium	Germany
DK29	Machinery and equipment n.e.c.	Finland	Germany	Netherlands
DL	Electrical and optical equipment	Finland	Belgium	Sweden
DL31	Electrical machinery and apparatus n.e.c.	Germany	Finland	France
DM	Transport equipment	Germany	France	Austria
DM34	Motor vehicles, trailers and semi-trailers	Germany	France	Austria
E	Electricity, gas and water supply	Portugal	Netherlands	Germany
G_TO_K	Services	Sweden	Finland	Germany
G51	Wholesale trade and commission trade	Sweden	Finland	Germany
I	Transport, storage and communication	Finland	Luxembourg	Belgium
J	Financial intermediation	Portugal	Luxembourg	Germany
K*	Business services	Belgium	Sweden	Greece
K72	Computer and related activities	Greece	Germany	Belgium
DL30, DL32, DL33, I64, K72	Information & communication technologies (ICT)	Finland	Belgium	Germany

* Includes NACE K72, K73, K74.2 and K74.3.

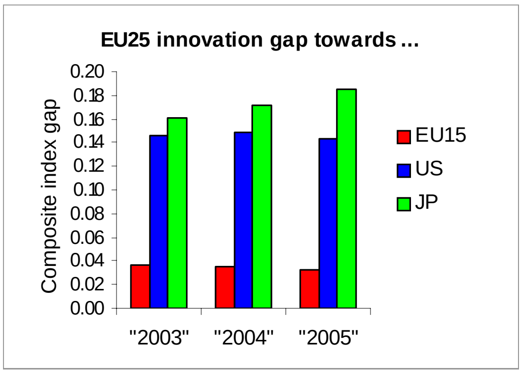
Table 6 gives the sector innovation leaders in Europe. Innovation leaders are here simply defined as the best 3 ranking countries. For several sectors differences with other countries are only marginal. Finland and Germany are leading in about 15 sectors each. Small economies such as Finland, Austria and Belgium are highly innovative in several manufacturing sectors[15]. Finland, Germany and Belgium are overall leaders in the manufacturing sector.

Sweden, Finland and Germany are overall leaders in services. Portugal is leading in Financial intermediation, a result due to high scores on the three indicators measuring the protection of inventions and innovations. Greece is leading in Computer and related activities, a result due to remarkably high R&D expenditures, four times as high as the weighted average for these countries and more than twice as high as those of the next best country.

Despite their above average EIS 2005 innovation performance, Denmark and the Netherlands show a below average representation in sector leadership, with the Netherlands only leading in 3 sectors and Denmark in no sector at all. This suggests that these two countries perform relatively well in all dimensions of their economy, without showing a particular strong innovation leadership in many sectors.

3.3. EU innovation gap with US and Japan

FIGURE 10. EU25 INNOVATION GAP TOWARDS US, JAPAN AND EU15



EU25 equal to 0.00

Based on a set of comparable data for 16 indicators[16], the US and Japan are still far ahead of the EU25. The innovation gap between the EU25 and the US is close to stable (Figure 10). About 70% of the innovation gap is, in statistical term, explained by lagging EU performance in three indicators (Figure 11): USPTO patents, population with tertiary education and ICT expenditures. Looking at individual indicators[17], we see a significant increase in the EU gap for public R&D expenditures and exports of high-tech products and an increase in the EU lead for university R&D expenditures financed by the business sector and community trademarks.

[15] The diversity of Finland's innovative strengths shows that Finland's innovative capacity is not limited to Nokia, as often suggested.

[16] For Japan data are available for 15 indicators as data for early-stage venture capital is missing.

[17] Table 3 & 4 contains the real data per indicator for the EU25, US and Japan.

FIGURE 11. EU25-US INNOVATION GAP EXPLAINED

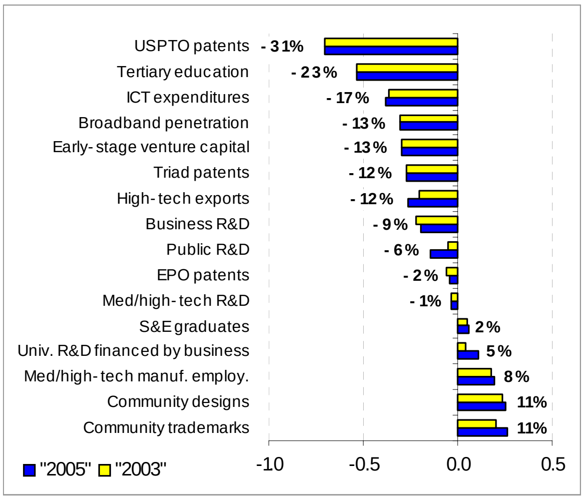
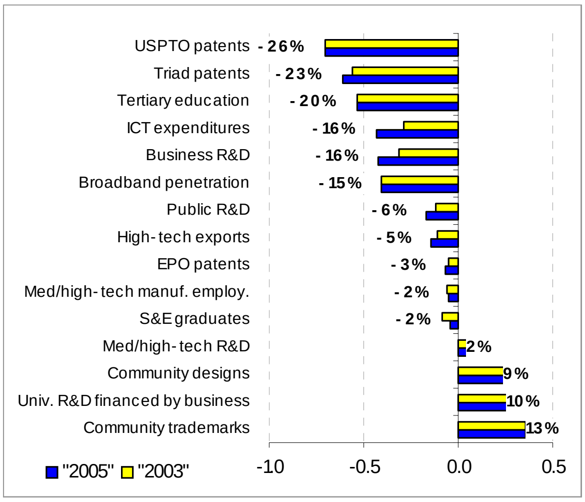


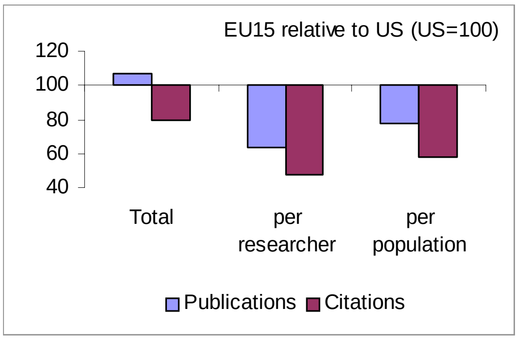
FIGURE 12. EU25-JAPAN INNOVATION GAP EXPLAINED



The innovation gap between the EU25 and Japan is increasing. The innovation gap is largely explained by lagging EU performance in three indicators: USPTO patents, triad patents and population with tertiary education (Figure 12). Looking at individual indicators, we see a significant increase between 2003 and 2005 in the EU gap for ICT expenditures, triad patents and both public and business R&D expenditures. Only for S&E graduates is the gap decreasing.

The economic interpretation of these statistical differences is, however, to be conducted with care. For example, where the patenting performance does not only reflect a difference in terms of innovation performance, but also in term of business usages and sector coverage.

FIGURE 13. LEADERSHIP IN SCIENCE: EUROPE IS LEADING IN NUMBER OF PUBLICATIONS, BUT NOT IN RELATIVE MEASURES NOR CITATIONS



Source: Dosi et al., EIS 2005 EU-US expert report

The EIS 2005 expert report "Evaluating and Comparing the innovation performance of the United States and the European Union"[18] evaluates and compares the innovation performance of the EU and the US in the fields of science output, R&D expenditures, education, patents and industry structure. The study notably suggests that Europe is behind the US in term of scientific output. Figure 11 illustrates the weak scientific output per capita in Europe, especially with regards to citations.

[18] Dosi, Giovanni, Patrick Llerena and Mauro Sylos Labini, "Evaluating and Comparing the innovation performance of the United States and the European Union", EIS 2005 expert report (available for download at http://www.trendchart.org/scoreboards/scoreboard2005/scoreboard_papers.cfm).

It confirms the leading position of the US with respect to R&D expenditures, underlining the well-known difference between the two areas with regard to the kind of public support to R&D whereby the US government is mainly focused on contracts and procurement (approximately 80% of the US government effort with a strong emphasis on defence and space). The US universities are also more integrated in the innovation process, largely contributing to the diffusion of an innovative spirit. The report also concludes that there is ample evidence of a widespread European corporate weakness given the fact that European firms have lower commitments to research and patenting and weak participation in the core international oligopolies.

3.4. Innobarometer – Impact of innovation demand

Sophisticated consumer demand should be an important driver for innovation products and services. One thesis is that firms primarily benefit from sophisticated consumer demand in their domestic market, while an alternative view is that export-oriented firms can build on sophisticated consumer demand in their foreign markets.

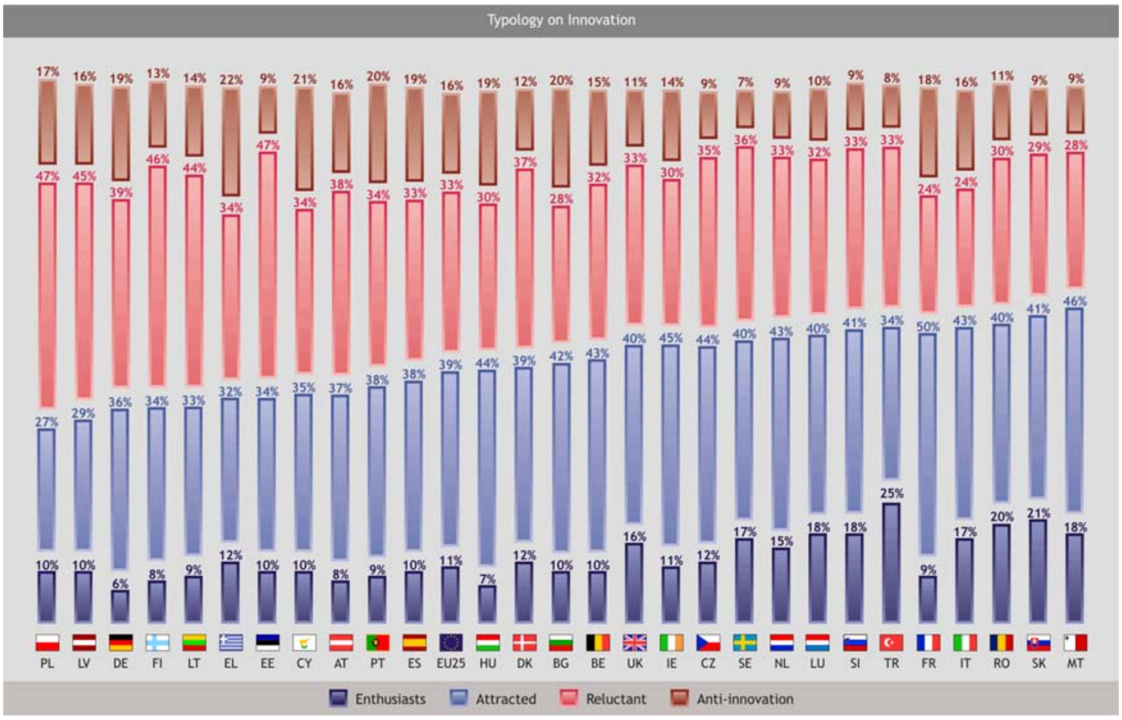
The 2005 Innobarometer[19] provides a measure of innovation demand based on a survey of 30,000 Europeans in the 25 Member States plus Bulgaria, Romania and Turkey. A set of questions was asked to identify how European citizens feel attracted by innovative products or services. Their replies characterise the demand for innovation from customers, an element that is generally only approximated through inappropriate indicators.

Innovative products or services were described as new or improved ones. For the first time, a typology based on attractiveness to innovative products or services is proposed for all Member States leading to 4 categories for EU-25 citizens (see Figure 14):

- 11% are enthusiasts towards innovation } Pro-innovation
- 39% are attracted by innovation } Pro-innovation
- 33% are reluctant to innovation
- 16% are anti-innovation

[19] ftp://ftp.cordis.lu/pub/innovation/docs/innovation_readiness_final_2005.pdf

FIGURE 14. INNOBAROMETER 2005: TYPOLOGY ON INNOVATION



The results indicate that Europe is evenly split between those attracted by innovation – those that are pro-innovation – and those more or less reluctant. Malta, Slovakia, Romania and Italy are countries with the highest proportion of pro-innovation citizens. However there is no clear gap with the following countries. On the other hand, the Typology Analysis shows that citizens in Poland, Latvia, Germany and Finland are least ready to embrace innovation.

The concept of pro-innovation is of interest as it could be an explaining factor for the differences in the transformation of innovation inputs into innovation outputs as described in section 2.4. The EIS 2005 indeed provides first clues of this relationship.

The case of countries with the highest proportion of pro-innovation citizens (Malta, Slovakia, Romania, Italy and France) is characteristic as these countries all have better results for the output indicators of the EIS than for the input indicators if compared with the European trend. More generally; among the 10 countries having the highest share of pro-innovation population, 9 have an output/input rate above the EU trend (Figure 7). Conversely, 7 countries among the 10 where the population readiness for innovation is the lowest have a below average output/input ratio. Significant exceptions in this last category are Germany and Austria, where results may indicate that the drivers for innovation do not lie in the public demand but rather come from the side of the firm.

3.5. National strengths and weaknesses

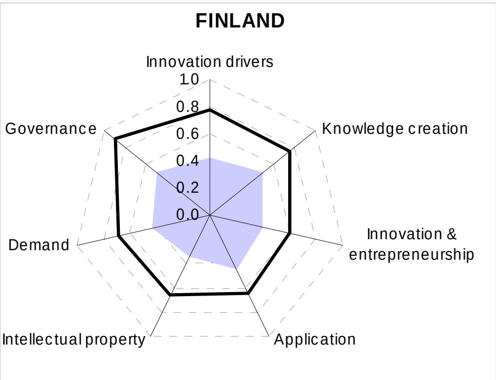
The EIS results by country, combined with EXIS[20] data for innovation demand and governance, were used to explore national strengths and weaknesses. Many countries show marked differences in innovation capabilities. For instance, the Czech Republic performs much better on innovation demand and applications than on intellectual property. An important question of policy significance is if the best policy response is to improve further the country strengths or to improve areas of weakness.

The optimal policy response will depend on specific national conditions that might make it easier to improve the strengths rather than the weaknesses, or vice versa. In some cases building up the areas of strengths could have a positive influence on the weaknesses, as when investment in knowledge creation leads to higher levels of patenting. Alternatively, this might not occur if very poor performance in innovation and entrepreneurship acts as a barrier to an improvement in patenting.

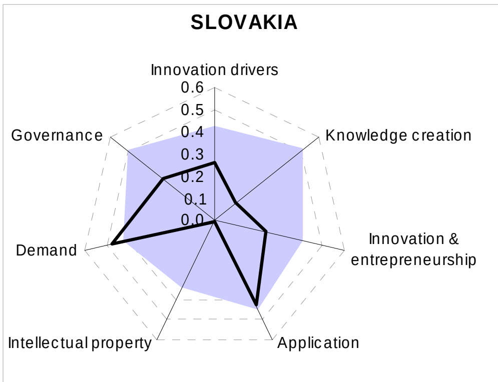
This example points to two opposing perspectives on how innovative capabilities develop. The first suggests that innovative capabilities can spill over from areas of strengths to areas of weakness. The second perspective suggests that all inputs must develop approximately equally – a 'blockage' in one field, such as poor knowledge creation or low levels of entrepreneurship, would prevent progress. Of course, both perspectives could also be true, depending on specific conditions or indicators.

A test of the second option is to correlate the variance for the seven composite indicators (the five EIS composite indices plus the two indices for demand and governance extracted from the EXIS report) against the SII. The variance is calculated after standardizing the results for each country to remove the performance effect, whereby some countries perform better on the EIS than other countries. A country with zero variance would perform identically on all seven composite indices. This could occur when all composite indices equal zero (very poor performance) or always equal to 1 (very good performance).

Low Variance



High Variance



EU average in grey – source : Strengths and Weaknesses report EIS 2005 & EXIS report

[20] For the EXIS report, see Arundel, A. and H. Hollanders, EXIS: An Exploratory Approach to Innovation Scoreboards (http://www.trendchart.org/scoreboards/scoreboard2004/scoreboard_papers.cfm).

FIGURE 15. NEGATIVE CORRELATION BETWEEN THE SII AND VARIANCE OF 7 INNOVATION DIMENSIONS

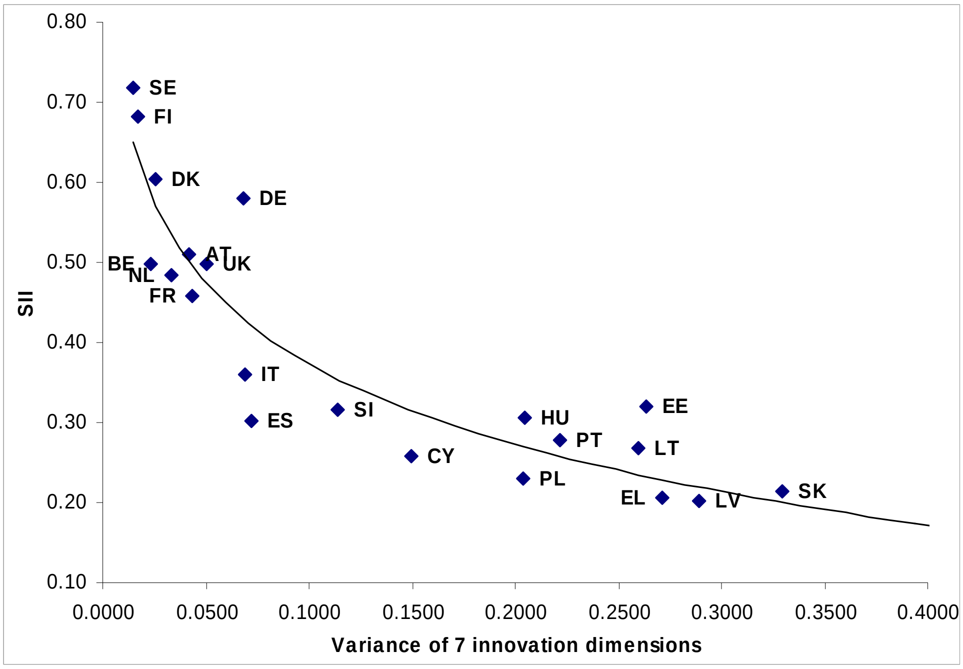


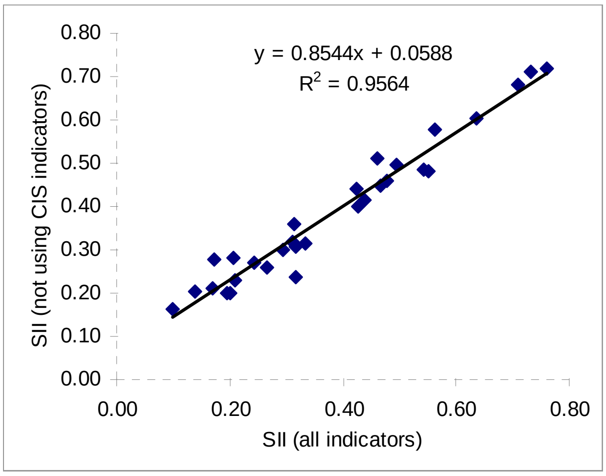
Figure 15 gives the correlation results between the variance and the SII for 21 countries for which there are complete data. Using a log-linear model, there is a statistically significant negative relationship, with performance on the SII declining with the amount of variance in the seven sub-indices (R^2 = 0.84, p < 0.001). This indicates that well-rounded and equivalent performance on all areas might increase innovation performance.

This implies that, given equal costs, policy would be more effective in improving overall innovation performance by concentrating on improving areas of weakness rather than on making further improvements to areas of strength. It also suggests that for countries where innovation performance is high, marginal gains are optimised when all dimensions of innovation are addressed together. This analysis could be taken into consideration when discussing policy orientations.

4. TECHNICAL ANNEX

Summary Innovation Index

The SII is calculated using re-scaled values of the indicator data, where the highest value within the group of EU25 countries, Iceland, Norway and Switzerland is set to 1 and the lowest value within the group of EU25 countries to 0. For Bulgaria, Romania, Turkey, the US and Japan for those cases where the value of an indicator is above the maximum or below the minimum the re-scaled value is set equal to 1 respectively 0. The SII is then calculated as the average value of all re-scaled values and is by definition between 0 and 1 for the EU25 countries. The Methodology report provides a more detailed explanation.



The SII values for TR, US and JP are estimated as for these countries available data was insufficient to calculate the SII directly. For the US data are available for only 16 indicators, for Japan for 15 indicators and for Turkey for 13 indicators. The SII for these countries was computed as follows:

- Step 1) For all 33 countries an SII is calculated using only data for the 19 non-CIS indicators, thus excluding indicators 2.4, 3.1, 3.2, 3.3, 3.6. 4.3 and 4.4.
- Step 2) A simple regression for the EU25 countries, Iceland, Norway, Switzerland, Bulgaria and Romania was run with the SII from Step 1 as the dependent variable and the 2005 SII as the independent variable.
- Step 3) The parameter values from Step 2 were then used to compute a 2005 SII estimate for TR, US and JP by substituting the value as computed in Step 2 in the regression equation as follows: SII = (computed SII - 0.059)/0.8564.

Trend data

Trends are calculated as the annual percentage change between the last year for which data are available and the average over the preceding three years, after a one-year lag. The three-year average is used to reduce year-to-year variability; the one-year lag is used to increase the difference between the average for the three base years and the final year and to minimize the problem of statistical/sampling variability. For example, when the most recent data are for 2004, the trend is based on the percentage change between 2004 and the average for 2000 to 2002 inclusive. The results for 2003 are excluded in order to provide a one-year lag.

5. ANNEX TABLES

ANNEX TABLE A: EUROPEAN INNOVATION SCOREBOARD 2005 – CURRENT PERFORMANCE

		EU25	EU15	BE	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU	MT	NL
1.1	New S&E graduates	12.2	13.1	11.0	6.4	12.5	8.4	8.8	--	12.6	22.2	24.2	7.4	3.6	8.6	16.3	1.8	4.8	3.1	7.3
1.2	Population with tertiary education	21.9	23.1	30.4	12.3	32.9	24.9	31.4	20.5	26.4	23.9	27.8	11.6	29.8	20.0	25.2	22.8	16.7	11.1	27.5
1.3	Broadband penetration rate	6.5	7.6	14.0	0.7	15.6	6.7	7.6	0.2	6.7	8.2	1.7	6.1	2.0	1.5	2.5	5.7	2.2	3.5	14.7
1.4	Participation in life-long learning	9.9	10.7	9.5	6.3	27.6	7.4	6.7	3.9	5.1	7.8	7.2	6.8	9.3	9.1	6.5	9.4	4.6	5.0	16.5
1.5	Youth education attainment level	76.7	73.8	82.1	90.9	76.1	72.8	82.3	81.9	61.8	79.8	85.3	72.9	80.1	76.9	86.1	69.8	83.4	47.9	74.5
2.1	Public R&D expenditures	0.69	0.70	0.56	0.50	0.80	0.77	0.53	0.41	0.48	0.81	0.40	0.60	0.27	0.25	0.54	0.20	0.62	0.19	0.75
2.2	Business R&D expenditures	1.26	1.30	1.33	0.77	1.84	1.75	0.28	0.20	0.57	1.34	0.77	0.55	0.08	0.14	0.14	1.58	0.36	0.08	1.01
2.3	Share of medium-high-tech and high-tech R&D	--	89.2	83.8	85.4	86.7	93.5	69.8	--	78.3	87.2	84.6	91.1	71.9	--	62.1	--	87.8	83.3	85.2
2.4	Enterprises receiving public funding for innovation	n/a		11.5	3.7	3.2	12.1	2.4	8.9	8.9	10.3	--	14.8	11.0	2.0	--	7.4	7.3	1.5	14.7
2.5	University R&D expenditures financed by businesses	6.6	6.6	12.7	1.0	2.7	12.5	6.3	6.9	6.4	2.9	4.8	3.8	2.9	23.9	7.4	--	10.6	0.2	6.8
3.1	SMEs innovating in-house	n/a		38.3	23.3	25.9	43.4	29.8	17.5	22.9	29.2	--	28.8	39.2	14.9	22.1	28.0	13.2	2.9	18.0
3.2	Innovative SMEs co-operating with others	n/a		9.6	5.3	16.6	9.2	11.3	6.3	4.4	9.3	--	2.7	22.6	6.2	12.3	8.1	32.9	1.6	8.0
3.3	Innovation expenditures	n/a		2.65	0.92	2.15	2.50	1.43	2.08	1.04	2.53	0.24	1.54	2.55	1.40	1.74	1.29	0.30	3.29	0.79
3.4	Early-stage venture capital	--	0.025	0.028	0.001	0.063	0.021	--	0.008	0.012	0.029	0.023	0.005	--	--	--	--	0.002	--	0.027
3.5	ICT expenditures	6.4	6.3	6.4	7.1	6.7	6.2	8.6	5.1	5.2	6.0	5.4	5.3	--	7.6	5.8	6.8	7.1	8.5	7.5
3.6	SMEs using non-technological change	n/a		49.0	40.1	26.0	65.0	52.5	59.0	46.0	23.0	--	49.0	--	35.7	30.7	74.0	29.3	13.4	38.0
4.1	Employment in high-tech services	3.19	3.49	3.94	3.18	4.50	3.32	2.32	1.75	2.35	4.07	3.92	2.93	2.00	2.31	1.66	2.94	3.14	2.96	3.72
4.2	Exports of high technology products	17.8	17.2	7.4	12.3	13.4	14.7	9.4	7.4	5.9	20.4	29.9	7.1	4.2	2.7	3.0	29.3	21.7	55.5	18.8
4.3	Sales of new-to-market products	n/a		5.1	1.4	5.9	4.5	4.5	2.9	4.5	5.8	--	8.1	1.4	1.5	4.3	9.1	0.8	4.8	3.8
4.4	Sales of new-to-firm not new-to-market products	n/a		13.9	5.9	25.6	23.3	5.4	8.9	2.9	11.9	--	5.8	3.9	4.1	10.6	4.4	2.0	1.3	2.5
4.5	Employment in medium-high/high-tech manufacturing	6.60	7.10	6.42	8.71	6.12	11.04	3.35	1.99	5.15	6.50	6.28	7.42	1.24	1.85	3.03	1.36	8.27	6.14	4.06
5.1	EPO patents per million population	133.6	158.5	148.1	10.9	214.8	301.0	8.9	8.1	25.5	147.2	89.9	74.7	9.9	6.0	2.6	201.3	18.3	17.7	278.9
5.2	USPTO patents per million population	59.9	71.3	70.4	3.9	83.8	137.2	2.7	1.9	8.0	68.1	32.4	30.3	2.1	0.3	0.5	96.3	4.9	2.5	86.6
5.3	Triad patents per million population	22.3	36.3	35.1	0.9	47.6	70.3	1.5	0.6	2.8	36.1	11.9	13.5	1.2	1.1	0.3	38.0	3.3	0.8	53.8
5.4	Community trademarks per million population	87.2	100.9	81.6	27.1	139.9	116.6	22.2	24.9	129.4	73.1	134.9	83.6	116.2	3.0	4.9	571.2	11.4	67.7	127.8
5.5	Community industrial designs per million population	84.0	98.9	92.2	10.5	199.1	147.1	5.2	1.1	71.1	69.8	69.1	129.2	2.8	5.2	6.4	131.1	9.3	7.6	125.9

ANNEX TABLE A: EUROPEAN INNOVATION SCOREBOARD 2005 – CURRENT PERFORMANCE (CONTINUED)

		EU25	EU15	AT	PL	PT	SI	SK	FI	SE	UK	BG	RO	TR	CH	IS	NO	US	JP
1.1	New S&E graduates	12.2	13.1	8.2	9.0	8.2	8.7	8.3	17.4	13.9	21.0	8.3	9.4	5.2	7.7	9.2	9.3	10.9	13.2
1.2	Population with tertiary education	21.9	23.1	18.3	15.6	12.5	19.0	12.8	34.2	28.2	29.2	21.7	10.6	9.7	28.2	29.2	32.3	38.4	37.4
1.3	Broadband penetration rate	6.5	7.6	8.7	0.5	6.4	3.8	0.4	11.0	12.1	7.4	--	--	0.3	14.5	15.5	11.4	11.2	12.7
1.4	Participation in life-long learning	9.9	10.7	12.0	5.5	4.8	17.9	4.6	24.6	35.8	21.3	1.3	1.6	--	28.6	31.7	19.1	--	--
1.5	Youth education attainment level	76.7	73.8	85.3	89.5	49.0	89.7	91.3	84.6	86.3	76.4	76.0	74.8	--	82.9	53.9	95.3	--	--
2.1	Public R&D expenditures	0.69	0.70	0.70	0.43	0.52	0.63	0.26	1.03	1.02	0.68	0.39	0.17	0.47	0.67	1.37	0.82	0.86	0.89
2.2	Business R&D expenditures	1.26	1.30	1.42	0.16	0.26	0.90	0.31	2.45	2.93	1.30	0.10	0.23	0.19	1.90	1.67	1.10	1.91	2.65
2.3	Share of medium-high-tech and high-tech R&D	--	89.2	82.9	77.4	68.2	85.0	68.6	88.1	93.7	91.1	85.9	50.3	--	90.1	--	72.7	90.6	86.8
2.4	Enterprises receiving public funding for innovation	n/a	n/a	19.2	0.7	13.7	4.1	1.8	18.7	9.1	3.8	1.0	1.7	--	5.3	4.8	8.0	--	--
2.5	University R&D expenditures financed by businesses	6.6	6.6	4.1	6.0	1.5	9.6	0.3	5.8	5.5	5.6	31.4	8.5	22.0	6.0	10.9	5.0	4.5	2.7
3.1	SMEs innovating in-house	n/a	n/a	44.7	12.5	36.2	14.9	15.7	23.8	35.2	22.4	9.4	12.5	--	54.8	46.5	28.8	--	--
3.2	Innovative SMEs co-operating with others	n/a	n/a	13.2	8.2	7.0	8.8	3.8	18.6	13.4	7.2	2.3	3.4	--	10.4	12.6	12.5	--	--
3.3	Innovation expenditures	n/a	n/a	--	2.25	2.62	0.92	2.40	2.50	--	1.61	0.69	1.00	--	3.48	1.70	1.22	--	--
3.4	Early-stage venture capital	--	0.025	0.013	0.007	0.026	--	0.002	0.065	0.081	0.038	--	0.003	--	0.038	0.048	0.032	0.072	--
3.5	ICT expenditures	6.4	6.3	6.4	7.2	7.1	5.2	6.0	7.1	8.7	7.9	8.6	1.5	3.2	7.8	--	6.2	7.8	8.0
3.6	SMEs using non-technological change	n/a	n/a	58.0	--	51.0	50.8	10.1	47.0	44.0	--	8.5	77.3	--	63.0	54.0	38.0	--	--
4.1	Employment in high-tech services	3.19	3.49	3.32	--	1.45	2.67	2.54	4.68	4.85	4.40	2.69	1.45	--	4.04	4.81	3.85	--	--
4.2	Exports of high technology products	17.8	17.2	15.3	2.7	7.4	5.8	3.4	20.6	13.1	21.0	2.9	3.3	1.8	22.3	2.0	3.7	26.9	22.7
4.3	Sales of new-to-market products	n/a	n/a	7.6	3.4	10.8	3.5	10.9	5.1	--	1.7	2.1	7.6	--	--	2.0	1.9	--	--
4.4	Sales of new-to-firm not new-to-market products	n/a	n/a	10.6	9.6	15.1	3.4	2.8	16.4	--	16.7	3.8	1.3	--	20.5	7.7	7.0	--	--
4.5	Employment in medium-high/high-tech manufacturing	6.60	7.10	6.21	4.35	3.17	8.94	8.00	6.85	7.03	6.27	4.66	5.32	--	7.09	2.02	4.53	4.89	7.40
5.1	EPO patents per million population	133.6	158.5	174.8	2.7	4.3	32.8	4.3	310.9	311.5	128.7	3.7	0.9	1.0	460.1	121.8	131.3	154.5	166.7
5.2	USPTO patents per million population	59.9	71.3	65.4	0.4	1.3	8.4	1.9	158.6	187.4	64.5	0.8	0.2	0.2	188.3	58.0	55.1	301.4	273.9
5.3	Triad patents per million population	22.3	36.3	34.2	0.3	0.8	4.0	0.8	94.5	91.4	30.0	--	0.0	0.1	110.8	14.9	24.2	53.6	92.6
5.4	Community trademarks per million population	87.2	100.9	158.8	14.3	47.8	38.6	3.0	82.7	111.5	105.8	0.3	1.1	1.0	180.0	58.7	23.9	32.0	11.1
5.5	Community industrial designs per million population	84.0	98.9	143.6	5.2	26.3	24.6	5.9	91.7	89.0	65.8	0.9	0.0	2.0	161.2	17.3	41.0	12.4	15.1

ANNEX TABLE B: EUROPEAN INNOVATION SCOREBOARD 2005 – YEARS USED FOR CURRENT PERFORMANCE

		EU25	EU15	BE	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU	MT	NL
1.1	New S&E graduates	2003	2003	2003	2003	2003	2003	2003	--	2003	2003	2003	2002	2003	2003	2003	2000	2003	2003	2003
1.2	Population with tertiary education	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2003
1.3	Broadband penetration rate	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
1.4	Participation in life-long learning	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
1.5	Youth education attainment level	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2003	2004	2004	2004
2.1	Public R&D expenditures	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2002	2003	2003	2003	2003	2003	2003	2003
2.2	Business R&D expenditures	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003
2.3	Share of medium-high-tech and high-tech R&D	--	1999	2001	2002	1999	2002	2002	--	2001	2002	1999	2001	2002	--	2002	--	2002	2001	2000
2.4	Enterprises receiving public funding for innovation			CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	--	CIS3	CIS3	CIS3	--	CIS3	CIS3	CIS3	CIS3
2.5	University R&D expenditures financed by businesses	2002	2002	2001	2003	2003	2003	2003	2001	2003	2002	2003	1996	2003	2003	2003	--	2003	2003	2003
3.1	SMEs innovating in-house			CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CISlight	CIS3	--	CISlight	CISlight	CISlight	CIS3	CISlight	CISlight	CIS3	CISlight
3.2	Innovative SMEs co-operating with others			CIS3	CISlight	CISlight	CIS3	CIS3	CIS3	CISlight	CIS3	--	CISlight	CISlight	CISlight	CIS3	CISlight	CISlight	CIS3	CISlight
3.3	Innovation expenditures			CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CISlight	CIS3	CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CISlight	CIS3	CISlight
3.4	Early-stage venture capital	--	2002-03	2002-03	2002-03	2002-03	2002-03	--	2002-03	2002-03	2002-03	2002-03	2002-03	--	--	--	--	2002-03	--	2002-03
3.5	ICT expenditures	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	--	2004	2004	2002	2004	2004	2004
3.6	SMEs using non-technological change			CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	--	CIS3	--	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3
4.1	Employment in high-tech services	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2002
4.2	Exports of high technology products	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003
4.3	Sales of new-to-market products			CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CISlight	CIS3	--	CISlight	CISlight	CISlight	CIS3	CISlight	CISlight	CIS3	CISlight
4.4	Sales of new-to-firm not new-to-market products			CIS3	CISlight	CISlight	CIS3	CIS3	CIS3	CISlight	CIS3	--	CISlight	CISlight	CISlight	CIS3	CISlight	CISlight	CIS3	CISlight
4.5	Employment in medium-high/high-tech manufacturing	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2002
5.1	EPO patents per million population	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
5.2	USPTO patents per million population	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
5.3	Triad patents per million population	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
5.4	Community trademarks per million population	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
5.5	Community industrial designs per million population	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2003	2004

ANNEX TABLE B: EUROPEAN INNOVATION SCOREBOARD 2005 – YEARS USED FOR CURRENT PERFORMANCE (CONTINUED)

		EU25	EU15	AT	PL	PT	SI	SK	FI	SE	UK	BG	RO	TR	CH	IS	NO	US	JP
1.1	New S&E graduates	2003	2003	2003	2003	2003	2003	2003	2002	2003	2003	2003	2003	2003	2003	2002	2003	2003	2003
1.2	Population with tertiary education	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2003	2004	2004	2004	2003	2003
1.3	Broadband penetration rate	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	--	--	2004	2004	2004	2004	2004	2004
1.4	Participation in life-long learning	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	--	2004	2003	2004	--	--
1.5	Youth education attainment level	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	--	2004	2004	2004	--	--
2.1	Public R&D expenditures	2003	2003	2002	2003	2003	2003	2003	2003	2003	2003	2003	2003	2002	2000	2003	2003	2003	2003
2.2	Business R&D expenditures	2003	2003	2002	2003	2003	2003	2003	2003	2003	2003	2003	2003	2002	2000	2003	2003	2003	2003
2.3	Share of medium-high-tech and high-tech R&D	--	1999	2002	2001	2001	2002	2002	2002	2001	2001	2002	2002	--	2000	--	1998	2000	2001
2.4	Enterprises receiving public funding for innovation			CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	CIS3	--	CIS3	CIS3	CIS3	--	--
2.5	University R&D expenditures financed by businesses	2002	2002	2002	2003	2003	2003	2001	2003	2003	2003	2003	2003	2002	2002	2001	2003	2003	2003
3.1	SMEs innovating in-house			CISlight	CIS3	CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CIS3	CISlight	--	CIS3	CIS3	CIS3	--	--
3.2	Innovative SMEs co-operating with others			CISlight	CISlight	CIS3	CISlight	CISlight	CISlight	CIS3	CIS3	CIS3	CISlight	--	CIS3	CIS3	CIS3	--	--
3.3	Innovation expenditures			--	CISlight	CIS3	CISlight	CISlight	CIS3	--	CIS3	CIS3	CISlight	--	CIS3	CIS3	CIS3	--	--
3.4	Early-stage venture capital	--	2002-03	2002-03	2002-03	2002-03	--	2002-03	2002-03	2002-03	2002-03	--	2002-03	--	2002-03	2001-02	2002-03	2001-02	--
3.5	ICT expenditures	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2003	2004	--	2004	2004	2004
3.6	SMEs using non-technological change			CIS3	--	CIS3	CIS3	CIS3	CIS3	CIS3	--	CIS3	CIS3	--	CIS3	CIS3	CIS3	--	--
4.1	Employment in high-tech services	2003	2003	2003	--	2003	2003	2003	2003	2003	2003	2003	2003	--	2003	2002	2003	--	--
4.2	Exports of high technology products	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003	2003
4.3	Sales of new-to-market products			CISlight	CISlight	CIS3	CISlight	CISlight	CISlight	--	CIS3	CIS3	CISlight	--	--	CIS3	CIS3	--	--
4.4	Sales of new-to-firm not new-to-market products			CISlight	CISlight	CIS3	CISlight	CISlight	CISlight	--	CIS3	CIS3	CISlight	--	CIS3	CIS3	CIS3	--	--
4.5	Employment in medium-high/high-tech manufacturing	2003	2003	2003	2002	2003	2003	2003	2003	2003	2003	2003	2003	--	2003	2002	2003	2001	2002
5.1	EPO patents per million population	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
5.2	USPTO patents per million population	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002
5.3	Triad patents per million population	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	--	2000	2000	1999	2000	2000	2000	2000
5.4	Community trademarks per million population	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004
5.5	Community industrial designs per million population	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004	2004

ANNEX TABLE C: EUROPEAN INNOVATION SCOREBOARD 2005 – TREND PERFORMANCE

		EU25	EU15	BE	CZ	DK	DE	EE	EL	ES	FR	IE	IT	CY	LV	LT	LU	HU	MT	NL
1.1	New S&E graduates	9.4	9.0	5.4	9.2	8.1	0.8	13.2	--	10.8	6.4	1.4	16.7	-0.5	9.8	10.6	--	4.1	-3.6	11.2
1.2	Population with tertiary education	4.3	3.8	4.9	2.7	8.2	3.6	2.5	8.4	5.6	2.9	11.7	8.3	5.0	3.8	6.9	11.2	8.9	18.5	8.2
1.3	Broadband penetration rate	--	49.5	29.1	--	32.4	29.4	--	--	45.8	77.6	312.3	79.2	--	--	--	122.6	--	--	35.1
1.5	Youth education attainment level	0.2	0.1	1.0	-0.1	--	-0.7	0.7	1.2	-2.7	-1.2	1.0	3.3	-2.4	2.5	4.2	-1.7	--	9.4	1.5
2.1	Public R&D expenditures	2.2	2.0	-0.3	3.5	2.6	2.7	3.3	-5.1	6.1	0.4	10.7	5.4	16.2	-5.5	6.4	24.0	14.0	--	-3.8
2.2	Business R&D expenditures	1.3	1.4	-5.6	2.2	10.9	1.3	22.5	0.0	9.4	-1.0	-2.9	1.6	26.5	3.8	9.5	0.0	3.4	--	-4.2
2.5	University R&D expenditures financed by businesses	0.6	0.9	8.1	-1.2	--	3.1	-8.2	14.0	-9.2	2.9	-4.4	--	23.3	--	-25.2	--	41.5	--	-1.5
3.5	ICT expenditures	6.9	-1.3	-3.0	-8.9	-1.2	-0.5	-12.8	-4.6	-2.2	-0.6	-1.5	0.6	--	-6.5	-4.1	--	-12.4	0.4	-0.2
4.1	Employment in high-tech services	0.1	1.3	4.1	1.0	-3.4	5.0	-11.7	4.0	-0.4	1.9	-1.6	0.6	9.9	2.7	-9.1	-2.7	1.9	-4.0	-5.1
4.2	Exports of high technology products	-6.3	-6.2	-6.9	22.5	-2.5	-2.2	-26.6	9.2	-1.9	-9.7	-13.8	-6.8	7.0	10.0	9.5	17.6	1.7	-3.3	-8.3
4.5	Employment in medium-high/high-tech manufacturing	-2.8	-3.4	-3.5	-1.5	-3.8	-0.2	-12.3	-5.3	-2.8	-5.0	-6.5	-0.9	6.7	3.7	-2.4	-9.8	-0.9	-19.0	-4.5
5.1	EPO patents per million population	5.3	5.2	0.2	-0.6	12.7	4.5	8.8	7.0	5.0	4.9	10.6	3.5	-9.9	16.5	--	--	10.3	20.0	17.7
5.2	USPTO patents per million population	--	5.9	2.2	14.4	0.6	8.4	19.9	4.2	11.0	2.6	9.9	4.4	37.9	-53.3	--	--	7.0	-20.1	4.0
5.3	Triad patents per million population	1.2	1.0	-2.8	-7.8	6.7	0.6	-11.0	-23.6	4.5	-2.1	9.0	4.4	166.7	28.4	62.0	-2.0	17.3	-14.9	1.5
5.4	Community trademarks per million population	15.6	13.9	18.5	240.2	1.5	16.2	449.9	17.5	18.4	12.7	10.3	13.2	50.5	--	--	4.0	198.3	130.8	39.4

		EU25	EU15	AT	PL	PT	SI	SK	FI	SE	UK	BG	RO	TR	CH	IS	NO	US	JP
1.1	New S&E graduates	9.4	9.0	7.2	16.5	13.8	1.2	17.9	2.5	11.2	3.8	8.9	16.6	--	13.6	12.8	8.5	6.4	2.1
1.2	Population with tertiary education	4.3	3.8	11.0	14.4	16.9	12.0	9.3	2.8	1.7	0.1	3.5	4.5	8.2	6.2	9.3	-1.3	2.6	6.2
1.3	Broadband penetration rate	--	49.5	24.1	--	58.4	--	--	51.4	35.4	67.1	--	--	--	--	--	--	--	--
1.5	Youth education attainment level	0.2	1.5	--	0.8	6.1	1.2	-1.6	-1.3	0.1	-0.3	-1.2	-0.9	--	0.5	3.9	0.0	--	--
2.1	Public R&D expenditures	2.2	2.0	3.8	2.0	-4.5	-1.0	7.1	2.0	4.4	5.3	-2.5	19.0	10.3	--	4.7	9.4	11.9	2.3
2.2	Business R&D expenditures	1.3	1.4	12.1	-20.5	10.0	4.1	-14.4	2.5	-1.6	2.3	-4.7	-7.1	-3.3	--	5.7	8.2	-2.1	10.8
2.5	University R&D expenditures financed by businesses	0.6	0.9	--	-13.5	23.5	10.9	--	1.4	7.7	-10.1	5.2	-6.6	8.9	-1.1	20.8	-4.4	-12.9	6.8
3.5	ICT expenditures	6.9	-1.3	0.5	6.9	1.9	-9.5	-9.3	1.7	-0.2	0.2	0.0	-52.9	-41.5	2.3	--	4.0	0.0	8.2
4.1	Employment in high-tech services	0.1	1.3	8.3	--	6.7	4.0	-6.6	3.7	-3.2	-0.4	-0.4	1.9	--	2.3	8.3	-2.1	--	--
4.2	Exports of high technology products	-6.3	-6.2	6.7	1.9	15.6	16.1	-4.6	-2.7	-12.0	-9.1	30.6	-10.3	-28.6	4.7	8.5	-1.3	-4.5	-5.8
4.5	Employment in medium-high/high-tech manufacturing	-2.8	-3.4	-3.2	-6.8	-5.9	1.9	8.9	-3.1	-4.6	-7.7	-8.0	0.8	--	-4.7	9.9	0.7	-4.3	-2.4
5.1	EPO patents per million population	5.3	5.2	9.1	12.0	7.6	20.2	--	1.9	-2.2	6.5	3.2	-13.7	0.3	0.3	8.8	2.4	3.3	9.9
5.2	USPTO patents per million population	--	5.9	6.2	-13.6	18.8	3.0	--	14.6	8.6	3.2	61.1	-3.7	58.7	1.5	20.4	4.9	-0.1	5.5
5.3	Triad patents per million population	1.2	1.0	6.1	9.6	19.7	9.7	23.9	11.0	-2.0	3.3	--	-30.1	16.5	0.4	-6.7	7.4	-1.4	2.9
5.4	Community trademarks per million population	15.6	13.9	33.5	525.4	14.1	106.6	--	-1.0	11.3	4.1	42.2	90.7	45.6	14.7	54.6	14.0	-1.9	13.9

ANNEX TABLE D: EUROPEAN INNOVATION SCOREBOARD 2005 – DEFINITIONS AND INTERPRETATION

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
1.1	New S&E graduates per 1000 population aged 20-29	Number of S&E (science and engineering) graduates. S&E graduates are defined as all post-secondary education graduates (ISCED classes 5a and above) in life sciences (ISC42), physical sciences (ISC44), mathematics and statistics (ISC46), computing (ISC48), engineering and engineering trades (ISC52), manufacturing and processing (ISC54) and architecture and building (ISC58).	The reference population is all age classes between 20 and 29 years inclusive.	The indicator is a measure of the supply of new graduates with training in Science & Engineering (S&E). Due to problems of comparability for educational qualifications across countries, this indicator uses broad educational categories. This means that it covers everything from graduates of one-year diploma programmes to PhDs. A broad coverage can also be an advantage, since graduates of one-year programmes are of value to incremental innovation in manufacturing and in the service sector.
1.2	Population with tertiary education per 100 population aged 25-64	Number of persons in age class with some form of post-secondary education (ISCED 5 and 6).	The reference population is all age classes between 25 and 64 years inclusive.	This is a general indicator of the supply of advanced skills. It is not limited to science and technical fields because the adoption of innovations in many areas, in particular in the service sectors, depends on a wide range of skills. Furthermore, it includes the entire working age population, because future economic growth could require drawing on the non-active fraction of the population. International comparisons of educational levels however are difficult due to large discrepancies in educational systems, access, and the level of attainment that is required to receive a tertiary degree. Differences among countries should be interpreted with caution.
1.3	Broadband penetration rate (number of broadband lines per 100 population)	Number of broadband lines. Broadband lines are defined as those with a capacity equal to or higher than 144 Kbit/s.	Total population as defined in the European System of Accounts (ESA 1995).	Realising Europe's full e-potential depends on creating the conditions for electronic commerce and the Internet to flourish, so that the Union can catch up with its competitors by hooking up many more businesses and homes to the Internet via fast connections. The Community and the Member States are to make available in all European countries low cost, high-speed interconnected networks for Internet access and foster the development of state-of-the-art information technology and other telecom networks as well as the content for those networks (Lisbon European Council, 2000). The Barcelona European Council (2002) attached priority to the widespread availability and use of broadband networks throughout the Union by 2005 and the development of Internet protocol IPv6. Further development in this area requires accelerated broadband deployment; in this respect the Brussels European Council (2003) called on Member States to put in place national broadband / high speed Internet strategies by end 2003 and aim for a substantial increase in high speed Internet connections by 2005.

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
1.4	Participation in life-long learning per 100 population aged 25-64)	Number of persons involved in life-long learning. Life-long learning is defined as participation in any type of education or training course during the four weeks prior to the survey. Education includes both courses of relevance to the respondent's employment and general interest courses, such as in languages or arts. It includes initial education, further education, continuing or further training, training within the company, apprenticeship, on-the-job training, seminars, distance learning, and evening classes.	The reference population is all age classes between 25 and 64 years inclusive	A central characteristic of a knowledge economy is continual technical development and innovation. Individuals need to continually learn new ideas and skills or to participate in life-long learning. All types of learning of valuable, since it prepares people for "learning to learn". The ability to learn can then be applied to new tasks with social and economic benefits.
1.5	Youth education attainment level (% of population aged 20-24 having completed at least upper secondary education)	Number of persons aged 20-24 having completed at least upper secondary education, i.e. with an education level ISCED 3-4 minimum.	The reference population is all age classes between 20 and 24 years inclusive	The indicator measures the qualification level of the population aged 20-24 years in terms of formal educational degrees. In so far it provides a measure for the "supply" of human capital of that age group and for the output of education systems in terms of graduates. A study for OECD countries suggests a positive link between education and economic growth. According to this study an additional year of average school attainment is estimated to increase economic growth by around 5% immediately and by further 2.5% in the long run (De la Fuente and Ciccone, "Human capital in a global and knowledge-based economy", Final report for DG Employment and Social Affairs, 2002). Completed upper secondary education is generally considered to be the minimum level required for successful participation in a knowledge-based society. It is increasingly important not just for successful entry into the labour market, but also to allow students access to learning and training opportunities offered by higher education. School attainment is a primary determinant of individual income and labour market status. Persons who have completed at least upper secondary education have access to jobs with higher salaries and better working conditions. They also have a markedly higher employment rate than persons with at most lower secondary education (Employment in Europe 2004).

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
2.1	Public R&D expenditures (% of GDP)	Difference between GERD (Gross domestic expenditure on R&D) and BERD (Business enterprise expenditure on R&D). Both GERD and BERD according to Frascati-manual definitions, in national currency and current prices.	Gross domestic product as defined in the European System of Accounts (ESA 1995), in national currency and current prices.	R&D expenditure represents one of the major drivers of economic growth in a knowledge-based economy. As such, trends in the R&D expenditure indicator provide key indications of the future competitiveness and wealth of the EU. Research and development spending is essential for making the transition to a knowledge-based economy as well as for improving production technologies and stimulating growth. Recognising the benefits of R&D for growth and being aware of the rapidly widening gap between Europe's R&D effort and that of the principal partners of the EU in the world, the Barcelona European Council (March 2003) set the EU a target of increasing R&D expenditure to 3 per cent of GDP by 2010, two thirds of which should come from the business enterprise sector.
2.2	Business R&D expenditures (% of GDP)	All R&D expenditures in the business sector (BERD), according to Frascati-manual definitions, in national currency and current prices.	Gross domestic product as defined in the European System of Accounts (ESA 1995), in national currency and current prices.	The indicator captures the formal creation of new knowledge within firms. It is particularly important in the science-based sector (pharmaceuticals, chemicals and some areas of electronics) where most new knowledge is created in or near R&D laboratories.
2.3	Share of medium-high-tech and high-tech R&D (% of manufacturing R&D expenditures)	R&D expenditures in medium-high and high-tech manufacturing, in national currency and current prices. These include chemicals (NACE24), machinery (NACE29), office equipment (NACE30), electrical equipment (NACE31), telecommunications and related equipment (NACE32), precision instruments (NACE33), automobiles (NACE34) and aerospace and other transport (NACE35).	R&D expenditures in total manufacturing, in national currency and current prices.	This indicator captures whether a country invests in future technologies (medium-high and high-tech manufacturing industries) or rather in historical industries (medium-low and low-tech manufacturing industries). This follows a recent report published by the JRC (R&D expenditure scoreboard), which highlights that the R&D problem observed in Europe is more a business structure problem. In most sectors R&D intensity is as high in the EU as in the rest of the world, however the relative importance of R&D intensive sectors in the total business is relatively low in Europe.
2.4	Share of enterprises receiving public funding for innovation	Number of innovative enterprises that have received public funding. Public funding includes financial support in terms of grants and loans, including a subsidy element, and loan guarantees. Ordinary payments for orders of public customers are not included. (*Community Innovation Survey*)	Total number of enterprises, thus both innovating and non-innovating enterprises. (*Community Innovation Survey*)	This indicator measures the degree of government support to innovation. The indicator gives the percentage of all firms (innovators and non-innovators combined) that received any public financial support for innovation from at least one of three levels of government (local, national and the European Union).
2.5	University R&D expenditures financed by business sector	R&D expenditures in the higher education sector financed by business, in national currency and current prices.	Total R&D expenditures in the higher education sector (HERD), in national currency and current prices.	This indicator measures public private co-operation. University R&D financed by the business sector are expected to explicitly serve the more short-term research needs of the business sector.

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
3.1	SMEs innovating in-house (% of SMEs)	Sum of SMEs with in-house innovation activities. Innovative firms are defined as those who introduced new products or processes either 1) in-house or 2) in combination with other firms. This indicator does not include new products or processes developed by other firms. (*Community Innovation Survey*)	Total number of SMEs. (*Community Innovation Survey*)	This indicator measures the degree to which SMEs, that have introduced any new or significantly improved products or production processes during the period 1998-2000, have innovated in-house. The indicator is limited to SMEs because almost all large firms innovate and because countries with an industrial structure weighted to larger firms would tend to do better.
3.2	Innovative SMEs co-operating with others (% of SMEs)	Sum of SMEs with innovation co-operation activities. Firms with co-operation activities are those that had any co-operation agreements on innovation activities with other enterprises or institutions in the three years of the survey period. (*Community Innovation Survey*)	Total number of SMEs. (*Community Innovation Survey*)	This indicator measures the degree to which SMEs are involved in innovation co-operation. Complex innovations, in particular in ICT, often depend on the ability to draw on diverse sources of information and knowledge, or to collaborate on the development of an innovation. This indicator measures the flow of knowledge between public research institutions and firms and between firms and other firms. The indicator is limited to SMEs because almost all large firms are involved in innovation co-operation.
3.3	Innovation expenditures (% of turnover)	Sum of total innovation expenditure for enterprises, in national currency and current prices. Innovation expenditures includes the full range of innovation activities: in-house R&D, extramural R&D, machinery and equipment linked to product and process innovation, spending to acquire patents and licenses, industrial design, training, and the marketing of innovations. (*Community Innovation Survey*)	Total turnover for all enterprises, in national currency and current prices. (*Community Innovation Survey*)	This indicator measures total innovation expenditure as percentage of total turnover. Several of the components of innovation expenditure, such as investment in equipment and machinery and the acquisition of patents and licenses, measure the diffusion of new production technology and ideas. Overall, the indicator measures total expenditures on many activities of relevance to innovation. The indicator partly overlaps with the indicator on business R&D expenditures.
3.4	Early-stage venture capital (% of GDP)	Venture capital investment is defined as private equity raised for investment in companies. Management buyouts, management buyins, and venture purchase of quoted shares are excluded. Early-stage capital includes seed and start-up capital. *Seed* is defined as financing provided to research, assess and develop an initial concept before a business has reached the start-up phase. *Start-up* is defined as financing provided for product development and initial marketing, manufacturing, and sales. Companies may be in the process of being set up or may have been in business for a short time, but have not yet sold their product commercially.	Gross domestic product as defined in the European System of Accounts (ESA 1995), in national currency and current prices.	The amount of early-stage venture capital is a proxy for the relative dynamism of new business creation. In particular for enterprises using or developing new (risky) technologies venture capital is often the only available means of financing their (expanding) business. *Note: in order to reduce volatility, the indicator is based on a two-year average.*

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
3.5	ICT expenditures (% of GDP)	Total expenditures on information and communication technology (ICT), in national currency and current prices. ICT includes office machines, data processing equipment, data communication equipment, and telecommunications equipment, plus related software and telecom services.	Gross domestic product as defined in the European System of Accounts (ESA 1995), in national currency and current prices.	ICT is a fundamental feature of knowledge-based economies and the driver of current and future productivity improvements. An indicator of ICT investment is crucial for capturing innovation in knowledge-based economies, in particular due to the diffusion of new IT equipment, services and software. One disadvantage of this indicator is that it is ultimately obtained from private sources, with a lack of good information on the reliability of the data. Another disadvantage is that part of the expenditures is for final consumption and may have few productivity or innovation benefits.
3.6	SMEs using non-technological change (% of SMEs)	CIS question 12.1 asks firms if, between 1998 and 2000, they implemented 'advanced management techniques', 'new or significantly changed organizational structures', or 'significant changes in the aesthetic appearance or design in at least one product '. A 'yes' response to at least one of these categories would identify a SME using non-technical change. (*Community Innovation Survey*)	Total number of SMEs. (*Community Innovation Survey*)	The Community Innovation Survey mainly asks firms about their technical innovation, Many firms, in particular in the services sectors, innovate through other non-technical forms of innovation. Examples of these are innovation through the introduction of advanced and more efficient management techniques or through the introduction of new and more efficient ways of organization. Evidence on non-technical innovation is scarce. This indicator tries to capture the extent that SMEs innovate through non-technical innovation.
4.1	Employment in high-tech services (% of total workforce)	Number of employed persons in the high-tech services sectors. These include post and telecommunications (NACE64), information technology including software development (NACE72) and R&D services (NACE73).	The total workforce includes all manufacturing and service sectors.	The high technology services both provide services directly to consumers, such as telecommunications, and provide inputs to the innovative activities of other firms in all sectors of the economy. The latter can increase productivity throughout the economy and support the diffusion of a range of innovations, in particular those based on ICT.
4.2	Exports of high technology products as a share of total exports	Value of high-tech exports, in national currency and current prices. High-tech exports includes exports of the following products: aerospace; computers and office machinery; electronics-telecommunications; pharmaceuticals; scientific instruments; electrical machinery; chemistry; non-electrical machinery and armament (cf. OECD STI Working Paper 1997/2 for the SITC Revision 3 codes).	Value of total exports, in national currency and current prices.	The indicator measures the technological competitiveness of the EU i.e. the ability to commercialise the results of research and development (R&D) and innovation in the international markets. It also reflects product specialisation by country. Creating, exploiting and commercialising new technologies is vital for the competitiveness of a country in the modern economy. This is because high technology sectors are key drivers for economic growth, productivity and welfare, and are generally a source of high value added and well-paid employment. The Brussels European Council (2003) stressed the role of public-private partnerships in the research area as a key factor in developing new technologies and enabling the European high-tech industry to compete at the global level.

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
4.3	Sales of new-to-market products (% of turnover)	Sum of total turnover of new or significantly improved products for all enterprises. (*Community Innovation Survey*)	Total turnover for all enterprises, in national currency and current prices. (*Community Innovation Survey*)	This indicator measures the turnover of new or significantly improved products, which are also new to the market, as a percentage of total turnover. The product must be new to the firm, which in many cases will also include innovations that are world-firsts. The main disadvantage is that there is some ambiguity in what constitutes a 'new to market' innovation. Smaller firms or firms from less developed countries could be more likely to include innovations that have already been introduced onto the market elsewhere.
4.4	Sales of new-to-firm not new-to-market products (% of turnover)	Sum of total turnover of new or significantly improved products to the firm but not to the market for all enterprises. (*Community Innovation Survey*)	Total turnover for all enterprises, in national currency and current prices. (*Community Innovation Survey*)	This indicator measures the turnover of new or significantly improved products to the firm as a percentage of total turnover. These products are not new to the market. Sales of new to the firm but not new to the market products are a proxy of the use or implementation of elsewhere already introduced products (or technologies). This indicator is thus a proxy for the degree of diffusion of state-of-the-art technologies.
4.5	Employment in medium-high and high-tech manufacturing (% of total workforce)	Number of employed persons in the medium-high and high-tech manufacturing sectors. These include chemicals (NACE24), machinery (NACE29), office equipment (NACE30), electrical equipment (NACE31), telecommunications and related equipment (NACE32), precision instruments (NACE33), automobiles (NACE34) and aerospace and other transport (NACE35).	The total workforce includes all manufacturing and service sectors.	The share of employment in medium-high and high technology manufacturing sectors is an indicator of the manufacturing economy that is based on continual innovation through creative, inventive activity. The use of total employment gives a better indicator than using the share of manufacturing employment alone, since the latter will be affected by the hollowing out of manufacturing in some countries.
5.1	EPO patents per million population	Number of patents applied for at the European Patent Office (EPO), by year of filing. The national distribution of the patent applications is assigned according to the address of the inventor.	Total population as defined in the European System of Accounts (ESA 1995).	The capacity of firms to develop new products will determine their competitive advantage. One indicator of the rate of new product innovation is the number of patents. This indicator measures the number of patent applications at the European Patent Office.
5.2	USPTO patents per million population	Number of patents granted by the US Patent and Trademark Office (USPTO), by year of grant. Patents are allocated to the country of the inventor, using fractional counting in the case of multiple inventor countries.	Total population as defined in the European System of Accounts (ESA 1995).	The capacity of firms to develop new products will determine their competitive advantage. One indicator of the rate of new product innovation is the number of patents. This indicator measures the number of patents granted by the US Patent and Trademark Office.

#	EIS 2005 indicators	Numerator	Denominator	Interpretation
5.3	Triadic patent families per million population	Number of triad patents. A patent is a triad patent if and only if it is filed at the European Patent Office (EPO), the Japanese Patent Office (JPO) and is granted by the US Patent & Trademark Office (USPTO).	Total population as defined in the European System of Accounts (ESA 1995).	The disadvantage of both the EPO and USPTO patent indicator is that European countries respectively the US have a 'home advantage' as patent rights differ among countries. A patent family is a group of patent filings that claim the priority of a single filing, including the original priority filing itself, and any subsequent filings made throughout the world. Trilateral patent families are a filtered subset of patent families for which there is evidence of patenting activity in all trilateral blocks (USPTO, EPO, JPO). No country will thus have a clear 'home advantage'.
5.4	Number of new community trademarks per million population	Number of new community trademarks. A trademark is a distinctive sign, which identifies certain goods or services as those produced or provided by a specific person or enterprise. The Community trademark offers the advantage of uniform protection in all countries of the European Union on the strength of a single registration procedure with the Office for Harmonization.	Total population as defined in the European System of Accounts (ESA 1995).	The Community trade mark gives its proprietor a uniform right applicable in all Member States of the European Union on the strength of a single procedure which simplifies trade mark policies at European level. It fulfils the three essential functions of a trade mark at European level: it identifies the origin of goods and services, guarantees consistent quality through evidence of the company's commitment vis-à-vis the consumer, and is a form of communication, a basis for publicity and advertising. The Community trade mark may be used as a manufacturer's mark, a mark for goods of a trading company, or service mark. It may also take the form of a collective trade mark: properly applied, the regulation governing the use of the collective trade mark guarantees the origin, the nature and the quality of goods and services by making them distinguishable, which is beneficial to members of the association or body owning the trade mark.
5.5	Number of new community designs per million population	Number of new community designs. A registered Community design is an exclusive right for the outward appearance of a product or part of it, resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation.	Total population as defined in the European System of Accounts (ESA 1995).	A design is the the outward appearance of a product or part of it resulting from the lines, contours, colours, shape, texture, materials and/or its ornamentation. A product can be any industrial or handicraft item including packaging, graphic symbols and typographic typefaces but excluding computer programs. It also includes products that are composed of multiple components, which may be disassembled and reassembled. Community design protection is directly enforceable in each Member State and it provides both the option of an unregistered and a registered Community design right for one area encompassing all Member States.

ANNEX TABLE E: EUROPEAN INNOVATION SCOREBOARD 2005 – SII SCORES OVER A 3 YEAR PERIOD

	SII	T-1	T-2	Growth	Rank SII	Rank T-1	Rank T-2
EU25	0.42	0.42	0.42	0.0			
EU15	0.46	0.47	0.47	-0.2			
BE	0.50	0.50	0.50	0.1	9	8	9
CZ	0.26	0.25	0.25	2.2	25	25	25
DK	0.60	0.62	0.61	-0.7	5	5	5
DE	0.58	0.57	0.57	1.0	7	7	7
EE	0.32	0.31	0.34	-2.5	18	18	18
EL	0.21	0.20	0.20	1.6	29	30	29
ES	0.30	0.31	0.30	-0.6	21	19	19
FR	0.46	0.46	0.46	-0.7	12	12	12
IE	0.42	0.42	0.44	-3.1	15	15	14
IT	0.36	0.35	0.35	1.4	17	17	17
CY	0.28	0.28	0.27	1.7	22	22	22
LV	0.20	0.19	0.19	1.9	30	31	31
LT	0.27	0.25	0.26	2.1	24	24	24
LU	0.44	0.42	0.44	-0.3	14	14	13
HU	0.31	0.28	0.28	4.3	20	21	21
MT	0.20	0.21	0.19	1.2	31	29	30
NL	0.48	0.48	0.48	0.7	10	11	11
AT	0.51	0.50	0.49	2.4	8	9	10
PL	0.23	0.23	0.23	0.3	27	27	27
PT	0.28	0.27	0.27	1.9	23	23	23
SI	0.32	0.30	0.30	3.2	19	20	20
SK	0.21	0.21	0.21	0.2	28	28	28
FI	0.68	0.68	0.67	0.9	3	3	3
SE	0.72	0.74	0.74	-1.5	1	1	1
UK	0.48	0.49	0.51	-2.6	11	10	8
BG	0.24	0.25	0.24	-0.7	26	26	26
RO	0.16	0.16	0.16	-0.2	32	32	32
TR	0.06	0.06	0.06	-4.3	33	33	33
IS	0.45	0.44	0.42	4.0	13	13	15
NO	0.40	0.40	0.40	0.3	16	16	16
US	0.60	0.60	0.60	-0.2	6	6	6
JP	0.65	0.64	0.63	2.0	4	4	4
CH	0.71	0.70	0.70	0.5	2	2	2

SII at T-1 and T-2 computed using 2005 methodology

ANNEX TABLE F: EUROPEAN INNOVATION SCOREBOARD 2005 – INDIVIDUAL COUNTRY DATA SHEETS