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ICT and ethics: some empirical evidences from Chandler's lesson

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Abstract

"*The Visible Hand*" (Chandler, 1977) described how a century ago customers suddenly found goods more plentiful and cheap than they had ever been. The book showed the dramatic impact the railroads had on the modern economy.
Although the transition started in the 1840s, its most visible changes occurred between 1880 and 1920. Mass manufacturers of everything from typewriters to canned goods learned to bypass or swallow up the networks of jobbers, factors, merchants, and other independent middlemen who had controlled the flow of commerce throughout history. One of the fascinating aspects of "*The Visible Hand*" is the examination how innovation can change the ethical behaviors in a corporate system or in a society.
From the Chandler's lesson, this research wants to investigate about the potential correlations between innovation and ethics inside the Public Sector: with reference to the EU countries areas, following a Business Administration approach, the central part of the paper aims to aims to demonstrate an empirical correlation between these variables.
Keywords: Business Administration; Corporate Culture, Social Responsibility; Government Policy.

1 - Introduction

The technological innovation stands for a positive foundation in the values system evolution in a country (Chandler, 1990). Once involved in the modernizing process, the Public Sector shows an ever growing interest in the Information Technology and the management methods able to guarantee a higher level in the services control, efficiency and quality, against increasingly restricting expenditure constraints (Puddu, 2008). Governments and public corporations are therefore facing the need for more sophisticated methods providing more and more complex and precise/scrupulous instruments for the data analysis and (increasingly refined) reporting capacity (Bajjaly, 1998; Borgonovi 1996; D'Alessio, 1989).

As a consequence, the necessary instruments to sustain a strategic control and decision making are applied. Everywhere in the world we are reaching a new era for the integration of the administrative and organizational processes among the various sectors and the outset of regional networks in order to support innovative organizational models promoting quality in the services to the citizen's satisfaction (Anselmi, 1995; Farneti 2000). Most of all, we are increasingly integrating products and ICT services, which will result in a global impact on the system (Ho, 2002). The development of these technologies goes under the label of e-government (or e-administration) terms referring to the employment of the modern information and communication technologies (ICT – Information and Communication Technologies), linked to the development of electronics and the Internet in the Public Administration modernization (Heeks, 1999; Kettl, 2000).

In all technologically advanced countries national and regional governments have already set up a strategy for the transition process with the target of shooting ahead with the use of the ICT in the public sector (Northrop, 2002; Rocheleau, 1999). Several studies have evidenced that innovation is able to influence the ethical model, so triggering a virtuous circle (Rich, 1993; Rusconi, 1997). This way a citizen, satisfied with the service provided by the Public Administration, is induced to adopt an ethical conduct which will have positive effects on the Public Administration; this in turn will be induced to provide more efficient services. The concept of business ethics is also directly linked to the theme of corporate social responsibility (Sacconi, 1991; Terzani, 1984). The corporate organization has an ethical outline when - not only - it respects the laws, but it also manages its own business respecting the interest of the various stakeholders: in the business ethics are included the themes of the governance and of the accountability (Parmigiani, 2002; Carroll, 1993).

This paper tries to demonstrate the existing correlation between the innovation and ethical values related to the life standards in a country.

2 - Methodology

2.1 - *Structural route for the research of indicators*

In order to reach the above described target, we have identified two baskets of indicators, five ethical and five technological, all meeting the following parameters:

- availability over the three-year-period 2003/2005;
- applicability to all countries in the EU;
- representativeness of the State System;
- chance of comparison among the countries.

The research for such indicators has been carried out through the data of Eurostat, Transparency International, AEI, World Bank, and ONU.

2.2 - *List of the indicators used*

A) Presentation of technological indicators:

1. Summary Innovation Index (SII);
2. Broadband penetration rate (BPR);

3. E-government readiness index (EGR);
4. Total Gbaord as a perceptual of total general government expenditure (GBOARD);
5. Gross domestic expenditure on R&D as percentage of GDP (GDE/R&D);

B) Presentation of ethics indicators:

1. AEI Standard Ethics (AEI-SE);
2. Corruption Perception Index (CPI);
3. Control of Corruption (COC);
4. Voice and Accountability (V&A);
5. Government Effectiveness (GE).

2.3 - *Standardization original data*

For those indicators were easily comparable, their values were normalized and brought back to a single scale expressed in cents.

1. Summary Innovation Index. Standardization was obtained by multiplying 100 by the original values, according to this proportion: since the original: since normalized (x)=1:100.
2. Broadband penetration rate. Place the highest value (year by year 2003,2004,2005) of 100, the others are obtained through a proportionately; e.g. for Austria: 6.60:10.40 (highest value for 2003)=x:100;

8.70:15,60 (highest value for 2004)=x:100;

11.60:22.40 (highest value for 2005)=x:100.

3. E-government readiness index. Standardization obtained as to the Summary Innovation Index.
4. Total GBAORD as a percentage of total general government expenditure: standardization obtained as to the Broadband penetration rate.
5. Gross domestic expenditure on R&D (percentage of GDP): standardization obtained as to the Broadband penetration rate.
6. AEI Standard Ethics: mail the lowest scores (- E) of 0, the remaining possible evaluations are 7. So was divided 100 for 7 in order to find the difference between a judgment and the other: the gap is equal to 14.28571429, hence:

E= 14.28..*1;

E+=14.2..*2 (and so on).

Table 1 - AEI Standard Ethics Index. Conversion from qualitative values to quantitative values

EEE	**100**
EEE-	**85,71428571**
EE+	**71,42857143**
EE	**57,14285714**
EE-	**42,85714286**
E+	**28,57142857**
E	**14,28571429**
E-	**0**

7. Corruption Perception Index: considered that the scale is from 0 to 10, the proportion set is as follows (ex. Austria 2003): 8.0:x=10:100
8. Control of Corruption.
9. Voice and accountability.
10. Government effectiveness.

Table 2 - Control of Corruption Index, Voice and accountability Index and Government effectiveness Index. Conversion from original values to normalized values and conversion ratios

Original Values	Normalized Values (by spread 0,1)	Conversion Ratios
2,5	**100**	**2,50=100**
2,4	**98**	**2,45=99**
2,3	**96**	**2,40=98**
2,2	**94**	**2,35=97**
2,1	**92**	**2,30=96**
2	**90**	**2,29=95,8**
1,9	**88**	**2,28=95,6**
1,8	**86**	**2,27=95,4**
1,7	**84**	**2,26=95,2**
1,6	**82**	**2,25=95**
1,5	**80**	
1,4	**78**	
1,3	**76**	
1,2	**74**	
1,1	**72**	
1	**70**	
0,9	**68**	
0,8	**66**	
0,7	**64**	
0,6	**62**	
0,5	**60**	
0,4	**58**	
0,3	**56**	
0,2	**54**	
0,1	**52**	
0	**50**	
-0,1	**48**	
-0,2	**46**	
-0,3	**44**	
-0,4	**42**	
-0,5	**40**	
-0,6	**38**	

-1	**30**	
-1,1	**28**	
-1,2	**26**	
-1,3	**24**	
-1,4	**22**	
-1,5	**20**	
-1,6	**18**	
-1,7	**16**	
-10,8	**14**	
-1,9	**12**	
-2	**10**	
-2,1	**8**	
-2,2	**6**	
-2,3	**4**	
-2,4	**2**	
-2,5	**0**	

[Note: where these indexes are not reached, they are not considered (otherwise, putting score = 0, the final result is distorted)].

For these three recent indicators of World Bank there are 2 scale: the first that goes from 0 to 100 and the second ranging from -2.5 to +2.5.

It was choice the second scale, for which it was built a conversion table that lays equal 2.5 to 100 and -2.5 equal to the minimum value, 0. Starting from the highest value, any reduction of 0.1 (ex. from 2.5 to 2.4) corresponds to a reduction of 2 points on 100 (from 100 to 98).

A gap of 0.05 (from 2.5 to 2.45) corresponds to a reduction of one percentage point (from 100 to 99).

2.4 - *Correlation*

Once built the standardized score-tables, the research presents - for each year - two tables (see paragraph n. 3): the first table concerning the technological indicators (variable X therefore independent) (see tables: 23, 26 and 29), and the second one concerning the ethical indicators (variable Y) (see tables: 24, 27 and 30).

Each table contains (construction of the various columns):

- the column A lists the names of the 27 EU countries and the average of 27;
- the columns B, C, D, E, F show the data of 10 standardized indicators;
- the last column of both tables (on average respectively var (x) and average var (y)) shows the average for each country of 5 technological and ethical indicators (e.g. Austria 2004: 58.29 = (39 +55.77 +74.87 +60.47 +61.33) / 5 . In the absence of a missing data (e.g. Greece 2004), the average is calculated only on 4: the missing item is therefore regarded as non-existent and not as equal to 0.

At this point the research presents the last tables, named "Calculation of correlation between ethical and technology variables - Year 2003, 2004 and 2005" (see tables: 25, 28 and 31).

Each table contains (construction of the various columns):

- the column A lists the names of the 27 EU countries and the average of 27;
- the columns B and C report the last column of two previous tables (average var (x) and (y)).
- the column D lists: X-E (X) = for each country the research presents the difference between the single-country-average (average of the country for 5 technological indicators) and the total average of 27 EU countries (e.g. Austria 2004: 58,29-47.35);
- the column E lists: Y-E (Y) (same as above but considering the ethical indicators);
- the column F lists: [XE (X)] 2;
- the column G lists: [YE (Y)] 2;
- the column H lists: X-E (X) * Y-E (Y).

Once completed these tables the correlation index has been calculated, separately for each year, using the Pearson index.

In the final part of the paragraph the research presents the data results through a graph for each year (see charts: 1, 2 and 3).

3 - Results

3.1 – *Presentation of technological indicators*

1. Summary innovation index (SII)

Table of European innovations: basic results. The Indicator was detected through the processing of data by the European Commission. The index measures the "*innovation performance*" in five dimensions: Innovation drivers, knowledge creation, diffusion, Applications and intellectual property. The results include performance of innovation in Europe. The index of innovation provides us with a vision of all national aggregate data. The report highlights the strengths and weaknesses with more detailed information for each country.

Table 3 - Summary innovation index: original scores

ORIGINAL TABLE			
SUMMARY INNOVATION INDEX			
Scale 0-1			
Country/Year	**2003**	**2004**	**2005**
Austria	**0,37**	**0,39**	**0,51**
Belgium	**0,45**	**0,47**	**0,5**
Bulgaria	**0,18**	**0,28**	**0,24**
Cyprus	**0,11**	**0,17**	**0,28**
Czech Republic	**0,33**	**0,27**	**0,26**
Denmark	**0,57**	**0,54**	**0,6**
Estonia	**0,32**	**0,34**	**0,32**
Finland	**0,75**	**0,75**	**0,68**

France	**0,49**	**0,46**	**0,46**
Germany	**0,51**	**0,56**	**0,58**
Greece	**0,13**	**0,2**	**0,21**
Hungary	**0,29**	**0,25**	**0,31**
Ireland	**0,43**	**0,44**	**0,42**
Italy	**0,25**	**0,31**	**0,36**
Latvia	**0,22**	**0,18**	**0,2**
Lithuania	**0,27**	**0,26**	**0,27**
Luxembourg	**0,27**	**0,29**	**0,44**
Malta	**0,22**	**0,25**	**0,2**
Netherlands	**0,51**	**0,45**	**0,48**
Poland	**0,21**	**0,14**	**0,23**
Portugal	**0,14**	**0,3**	**0,28**
Romania	**0,08**	**0,15**	**0,16**
Slovakia	**0,26**	**0,24**	**0,21**
Slovenia	**0,29**	**0,32**	**0,32**
Spain	**0,26**	**0,3**	**0,3**
Sweden	**0,79**	**0,76**	**0,72**
United Kingdom	**0,6**	**0,49**	**0,48**
Average E.U. 27	**0,34**	**0,35**	**0,37**
Source: European Innovation Scoreboard, realized by European Commission			
Year 2003= http://www.trendchart.org/scoreboards/scoreboard2003/pdf/eis_2003_tp2_national_performances.pdf			
year 2004= http://www.trendchart.org/scoreboards/scoreboard2004/pdf/eis_2004.pdf, http://www.trendchart.org/scoreboards/scoreboard2004/pdf/EXISwebdata.xls			
Year 2005= http://www.trendchart.org/scoreboards/scoreboard2005/pdf/EIS2005.pdf, http://www.trendchart.org/scoreboards/scoreboard2005/docs/EIS2005_database.xls			

Table 4 - Summary innovation index: standardized scores

STANDARDIZED TABLE			
SUMMARY INNOVATION INDEX			
Scale 0-100			
Country/Year	**2003**	**2004**	**2005**
Austria	**37**	**39**	**51**
Belgium	**45**	**47**	**50**
Bulgaria	**18**	**28**	**24**
Cyprus	**11**	**17**	**28**
Czech Republic	**33**	**27**	**26**

Denmark	**57**	**54**	**60**
Estonia	**32**	**34**	**32**
Finland	**75**	**75**	**68**
France	**49**	**46**	**46**
Germany	**51**	**56**	**58**
Greece	**13**	**20**	**21**
Hungary	**29**	**25**	**31**
Ireland	**43**	**44**	**42**
Italy	**25**	**31**	**36**
Latvia	**22**	**18**	**20**
Lithuania	**27**	**26**	**27**
Luxembourg	**27**	**29**	**44**
Malta	**22**	**25**	**20**
Netherlands	**51**	**45**	**48**
Poland	**21**	**14**	**23**
Portugal	**14**	**30**	**28**
Romania	**8**	**15**	**16**
Slovakia	**26**	**24**	**21**
Slovenia	**29**	**32**	**32**
Spain	**26**	**30**	**30**
Sweden	**79**	**76**	**72**
United Kingdom	**60**	**49**	**48**
Average E.U. 27	**34,44**	**35,41**	**37,11**
Source: Department Business Administration – University of Turin.			
E.g.: Austria 0,37 *100 (Year 2003).			

2. Broadband penetration rate (BPR)

The indicator that was found by searching through the database of Eurostat, shows the Number of connections on the total population for each member of EU. This indicator also shows how to a large extent, the access on the internet broadband has expanded in various countries, but not specifying the type of use (e.g. business, home, etc.).

Table 5 - Broadband penetration rate: original scores

ORIGINAL TABLE			
BROADBAND PENETRATION RATE			
Number of connections (broadband) per 100 inhabitants			
Country/Year	**2003**	**2004**	**2005**
Austria	**6,60**	**8,70**	**11,60**
Belgium	**10,10**	**14,00**	**17,40**

Bulgaria			
Cyprus		**2,00**	**2,70**
Czech Republic		**0,70**	**4,30**
Denmark	**10,40**	**15,60**	**22,20**
Estonia		**7,60**	**11,10**
Finland	**6,60**	**11,00**	**18,70**
France	**4,00**	**8,20**	**13,90**
Germany	**4,80**	**6,70**	**10,20**
Greece	**0,00**	**0,20**	**0,80**
Hungary		**2,20**	**4,50**
Ireland	**0,20**	**1,70**	**4,40**
Italy	**2,80**	**6,10**	**9,50**
Latvia		**1,50**	**3,70**
Lithuania		**2,50**	**5,00**
Luxembourg	**2,30**	**5,70**	**11,70**
Malta		**3,50**	**10,40**
Netherlands	**9,80**	**14,70**	**22,40**
Poland		**0,50**	**1,90**
Portugal	**3,60**	**6,40**	**10,10**
Romania			
Slovakia		**0,40**	**1,50**
Slovenia		**3,80**	**7,80**
Spain	**4,30**	**6,70**	**10,00**
Sweden	**8,60**	**12,10**	**17,10**
United Kingdom	**3,70**	**7,40**	**13,50**
Average E.U. 27	**5,19**	**6,00**	**9,86**
Source: website Eurostat			
Directory: http://epp.eurostat.ec.europa.eu			

Table 6 - Broadband penetration rate: standardized scores

STANDARDIZED TABLE			
BROADBAND PENETRATION RATE			
Scale 0-100			
Country/Year	**2003**	**2004**	**2005**
Austria	**63,46**	**55,77**	**51,79**
Belgium	**97,12**	**89,74**	**77,68**
Bulgaria			
Cyprus		**12,82**	**12,05**
Czech Republic		**4,49**	**19,20**

Denmark	**100,00**	**100,00**	**99,11**
Estonia		**48,72**	**49,55**
Finland	**63,46**	**70,51**	**83,48**
France	**38,46**	**52,56**	**62,05**
Germany	**46,15**	**42,95**	**45,54**
Greece	**0,00**	**1,28**	**3,57**
Hungary		**14,10**	**20,09**
Ireland	**1,92**	**10,90**	**19,64**
Italy	**26,92**	**39,10**	**42,41**
Latvia		**9,62**	**16,52**
Lithuania		**16,03**	**22,32**
Luxembourg	**22,12**	**36,54**	**52,23**
Malta		**22,44**	**46,43**
Netherlands	**94,23**	**94,23**	**100,00**
Poland		**3,21**	**8,48**
Portugal	**34,62**	**41,03**	**45,09**
Romania			
Slovakia		**2,56**	**6,70**
Slovenia		**24,36**	**34,82**
Spain	**41,35**	**42,95**	**44,64**
Sweden	**82,69**	**77,56**	**76,34**
United Kingdom	**35,58**	**47,44**	**60,27**
Average E.U. 27	**49,87**	**38,44**	**44,00**
Source: Department Business Administration – University of Turin.			
Set the highest value. Others are obtained through a proportion.			
E.g.: Austria 2003 =(6,60*100)/10,40			

3. E-government readiness index (EGR)

The e-Government Readiness Index, extrapolated by United Nations, is derived from a combination of three sub-indices. The first of these is the Web Measure Index, which assesses the quality of "*online presence*" of a nation comparing it to the stages of a model. They range from the condition of "emerging", characterized by diffusion of statistical information on the net and very little interaction with citizens, to "*connected*", where the watchwords in the governance of public affairs are "*integration*" and "*connection*" at all levels and between all actors involved (between different structures of Public Administration, between PA on the one hand and citizens, the private sector, academia and civil society on the other) (Pollifroni, 2003).

The other two components are the "*Telecommunication Infrastructure Index*", which reveals the degree of ICT infrastructures of a country by measuring basic elements such as the number of personal

computers, Internet connections and broadband, and the "*Human Capital Index*", which takes into account the "*human*" by recording the level of adult literacy and the rate of enrolment at various levels of the education system.

Table 7 - E-government readiness index: original scores

ORIGINAL TABLE			
E-GOVERNMENT READINESS INDEX			
Scale 0-1			
Country/Year	**2003**	**2004**	**2005**
Austria	**0,676**	**0,7487**	**0,7602**
Belgium	**0,67**	**0,7525**	**0,7381**
Bulgaria	**0,548**	**0,5417**	**0,5605**
Cyprus	**0,474**	**0,5189**	**0,5872**
Czech Republic	**0,542**	**0,6214**	**0,6396**
Denmark	**0,82**	**0,9047**	**0,9058**
Estonia	**0,697**	**0,7029**	**0,7347**
Finland	**0,761**	**0,8239**	**0,8231**
France	**0,69**	**0,6687**	**0,6925**
Germany	**0,762**	**0,7873**	**0,805**
Greece	**0,54**	**0,5581**	**0,5921**
Hungary	**0,516**	**0,5857**	**0,6536**
Ireland	**0,697**	**0,7058**	**0,7251**
Italy	**0,685**	**0,6598**	**0,6794**
Latvia	**0,506**	**0,5486**	**0,605**
Lithuania	**0,557**	**0,5367**	**0,5786**
Luxembourg	**0,656**	**0,66**	**0,6513**
Malta	**0,636**	**0,6877**	**0,7012**
Netherlands	**0,746**	**0,8026**	**0,8021**
Poland	**0,576**	**0,6026**	**0,5872**
Portugal	**0,646**	**0,5953**	**0,6084**
Romania	**0,483**	**0,5504**	**0,5704**
Slovakia	**0,528**	**0,5565**	**0,5887**
Slovenia	**0,631**	**0,6506**	**0,6762**
Spain	**0,602**	**0,5844**	**0,5847**
Sweden	**0,84**	**0,8741**	**0,8983**
United Kingdom	**0,814**	**0,8852**	**0,8777**
AVERAGE UE 27	**0,6407**	**0,6709**	**0,6899**
Source: UNITED NATIONS.			
2003) http://unpan1.un.org/intradoc/groups/public/documents/un/unpan016066.pdf pag. 61			
2004) http://www.unpan.org/egovkb/datacenter/CountrySummary.aspx?ddl=8			
2005) http://www.unpan.org/egovkb/datacenter/CountrySummary.aspx?ddl=8			

Table 8 - E-government readiness index: standardized scores

STANDARDIZED TABLE			
E-GOVERNMENT READINESS INDEX			
Scale 0-100			
Country/Year	2003	2004	2005
Austria	67,6	74,87	76,02
Belgium	67	75,25	73,81
Bulgaria	54,8	54,17	56,05
Cyprus	47,4	51,89	58,72
Czech Republic	54,2	62,14	63,96
Denmark	82	90,47	90,58
Estonia	69,7	70,29	73,47
Finland	76,1	82,39	82,31
France	69	66,87	69,25
Germany	76,2	78,73	80,50
Greece	54	55,81	59,21
Hungary	51,6	58,57	65,36
Ireland	69,7	70,58	72,51
Italy	68,5	65,98	67,94
Latvia	50,6	54,86	60,50
Lithuania	55,7	53,67	57,86
Luxembourg	65,6	66,00	65,13
Malta	63,6	68,77	70,12
Netherlands	74,6	80,26	80,21
Poland	57,6	60,26	58,72
Portugal	64,6	59,53	60,84
Romania	48,3	55,04	57,04
Slovakia	52,8	55,65	58,87
Slovenia	63,1	65,06	67,62
Spain	60,2	58,44	58,47
Sweden	84	87,41	89,83
United Kingdom	81,4	88,52	87,77
AVERAGE UE 27	64,07	67,09	68,99
Source: Department Business Administration – University of Turin.			
E.g.: Austria 0,676 *100 (Year 2003)			

4. Total Gbaord as a percentage of total general government expenditure (GBOARD)

This index shows the total budget allocated by governments as a percentage of total GDP for expenditure on research and development in ICT. This domain provides users with data on the appropria-

tions of public money and expenditure in research and development measured taking into account the activities and priorities of disbursement in research and development. This indicator was constructed following the guidelines "*Proposed standard practice for surveys of research and experimental development*".

Table 9 - Total Gbaord as a percentage of total general government expenditure: original scores

ORIGINAL TABLE			
TOTAL GBAORD AS A % OF TOTAL GENERAL GOVERNMENT EXPENDITURE			
% of total general government expenditure			
Country/Year	**2003**	**2004**	**2005**
Austria	**1,26**	**1,3**	**1,32**
Belgium	**1,2**	**1,2**	**1,2**
Bulgaria	**0,86**	**0,84**	**0,79**
Cyprus		**1,23**	**1,22**
Czech Republic	**1,1**	**1,11**	**1,23**
Denmark	**1,32**	**1,29**	**1,34**
Estonia	**1,08**	**1,12**	**1,21**
Finland	**1,99**	**2,01**	**2,03**
France	**1,86**	**1,8**	**1,81**
Germany	**1,63**	**1,63**	**1,64**
Greece	**0,59**	**0,66**	**0,74**
Hungary			**0,74**
Ireland	**1,02**	**1,29**	**1,36**
Italy			**1,39**
Latvia	**0,6**	**0,5**	**0,55**
Lithuania		**1,1**	**1,06**
Luxembourg	**0,56**	**0,62**	**0,75**
Malta		**2,15**	**2,28**
Netherlands	**1,57**	**1,59**	**1,54**
Poland		**0,73**	**0,68**
Portugal	**1,34**	**1,37**	**1,52**
Romania	**0,47**	**0,52**	**0,65**
Slovakia	**0,74**	**0,79**	**0,74**
Slovenia	**1,18**	**1,29**	**1,28**
Spain	**1,91**	**2,05**	**2,18**
Sweden	**1,62**	**1,58**	**1,57**
United Kingdom	**1,76**	**1,62**	**1,61**
AVERAGE UE 27	**1,22**	**1,25**	**1,27**
Source: EUROSTAT.			
http://epp.eurostat.ec.europa.eu			

Table 10 - Total Gbaord as a percentage of total general government expenditure: standardized scores

STANDARDIZED TABLE			
TOTAL GBAORD AS A % OF TOTAL GENERAL GOVERNMENT EXPENDITURE			
Scale 0-100			
Country/Year	**2003**	**2004**	**2005**
Austria	**63,32**	**60,47**	**57,89**
Belgium	**60,30**	**55,81**	**52,63**
Bulgaria	**43,22**	**39,07**	**34,65**
Cyprus		**57,21**	**53,51**
Czech Republic	**55,28**	**51,63**	**53,95**
Denmark	**66,33**	**60,00**	**58,77**
Estonia	**54,27**	**52,09**	**53,07**
Finland	**100,00**	**93,49**	**89,04**
France	**93,47**	**83,72**	**79,39**
Germany	**81,91**	**75,81**	**71,93**
Greece	**29,65**	**30,70**	**32,46**
Hungary			**32,46**
Ireland	**51,26**	**60,00**	**59,65**
Italy			**60,96**
Latvia	**30,15**	**23,26**	**24,12**
Lithuania		**51,16**	**46,49**
Luxembourg	**28,14**	**28,84**	**32,89**
Malta		**100,00**	**100,00**
Netherlands	**78,89**	**73,95**	**67,54**
Poland		**33,95**	**29,82**
Portugal	**67,34**	**63,72**	**66,67**
Romania	**23,62**	**24,19**	**28,51**
Slovakia	**37,19**	**36,74**	**32,46**
Slovenia	**59,30**	**60,00**	**56,14**
Spain	**95,98**	**95,35**	**95,61**
Sweden	**81,41**	**73,49**	**68,86**
United Kingdom	**88,44**	**75,35**	**70,61**
AVERAGE UE 27	**61,40**	**58,40**	**55,93**
Source: Department Business Administration – University of Turin.			
Set the highest value. Others are obtained through a proportion			
E.g.: Austria = (1,26*100)/1,99 (Year 2003)			

5. Gross Domestic Expenditure on R&D (Percentage of GDP) (GDE/R&D)

This index has been extrapolated from Eurostat's database: it indicates spending on research and development as a percentage of total GDP of all countries of the European Union, including:

- the percentage of financing the industrial sector;
- the percentage of government funding;
- the percentage of funding from other areas.

Table 11 - Gross Domestic Expenditure on R&D (Percentage of GDP): original scores

ORIGINAL TABLE			
GROSS DOMESTIC EXPENDITURE ON R&D (PERCENTAGE OF GDP)			
Country/Year	**2003**	**2004**	**2005**
Austria	**2,23**	**2,22**	**2,41**
Belgium	**1,88**	**1,87**	**1,84**
Bulgaria	**0,5**	**0,5**	**0,49**
Cyprus	**0,35**	**0,37**	**0,4**
Czech Republic	**1,25**	**1,25**	**1,41**
Denmark	**2,58**	**2,48**	**2,45**
Estonia	**0,77**	**0,86**	**0,93**
Finland	**3,43**	**3,45**	**3,48**
France	**2,17**	**2,15**	**2,13**
Germany	**2,52**	**2,49**	**2,48**
Greece	**0,57**	**0,55**	**0,58**
Hungary	**0,93**	**0,88**	**0,94**
Ireland	**1,17**	**1,24**	**1,26**
Italy	**1,11**	**1,1**	**1,09**
Latvia	**0,38**	**0,42**	**0,56**
Lithuania	**0,67**	**0,76**	**0,76**
Luxembourg	**1,66**	**1,63**	**1,57**
Malta	**0,26**	**0,54**	**0,54**
Netherlands	**1,76**	**1,78**	**1,73**
Poland	**0,54**	**0,56**	**0,57**
Portugal	**0,74**	**0,77**	**0,81**
Romania	**0,39**	**0,39**	**0,41**
Slovakia	**0,57**	**0,51**	**0,51**
Slovenia	**1,29**	**1,42**	**1,46**
Spain	**1,05**	**1,06**	**1,12**
Sweden	**3,86**	**3,62**	**3,8**
United Kingdom	**1,78**	**1,72**	**1,76**
AVERAGE UE 27	**1,35**	**1,36**	**1,39**
Source: EUROSTAT.			
http://epp.eurostat.ec.europa.eu			

Table 12 - Gross Domestic Expenditure on R&D (Percentage of GDP): standardized scores

STANDARDIZED TABLE			
GROSS DOMESTIC EXPENDITURE ON R&D (PERCENTAGE OF GDP)			
Scale 0-100			
Country/Year	**2003**	**2004**	**2005**
Austria	**57,77**	**61,33**	**63,42**
Belgium	**48,70**	**51,66**	**48,42**
Bulgaria	**12,95**	**13,81**	**12,89**
Cyprus	**9,07**	**10,22**	**10,53**
Czech Republic	**32,38**	**34,53**	**37,11**
Denmark	**66,84**	**68,51**	**64,47**
Estonia	**19,95**	**23,76**	**24,47**
Finland	**88,86**	**95,30**	**91,58**
France	**56,22**	**59,39**	**56,05**
Germany	**65,28**	**68,78**	**65,26**
Greece	**14,77**	**15,19**	**15,26**
Hungary	**24,09**	**24,31**	**24,74**
Ireland	**30,31**	**34,25**	**33,16**
Italy	**28,76**	**30,39**	**28,68**
Latvia	**9,84**	**11,60**	**14,74**
Lithuania	**17,36**	**20,99**	**20,00**
Luxembourg	**43,01**	**45,03**	**41,32**
Malta	**6,74**	**14,92**	**14,21**
Netherlands	**45,60**	**49,17**	**45,53**
Poland	**13,99**	**15,47**	**15,00**
Portugal	**19,17**	**21,27**	**21,32**
Romania	**10,10**	**10,77**	**10,79**
Slovakia	**14,77**	**14,09**	**13,42**
Slovenia	**33,42**	**39,23**	**38,42**
Spain	**27,20**	**29,28**	**29,47**
Sweden	**100,00**	**100,00**	**100,00**
United Kingdom	**46,11**	**47,51**	**46,32**
AVERAGE UE 27	**34,94**	**37,44**	**36,54**
Source: Department Business Administration – University of Turin.			
Considering (every year) the higher score as 100, the other ones have been calculated as a percentage of it.			
E.g.: Austria =(2,23*100)/3,86 (Year 2003)			

3.2 - *Presentation of ethics indicators*

1. AEI standard ethics (AEI-SE)

The collection of information required for the issuance of listed companies Rating is made through the analysis of official documentation published by undertakings or Authorities.

Table 13 - AEI standard ethics: original scores

ORIGINAL TABLE			
AEI STANDARD ETHICS			
Scale from EEE to E-			
	2003	2004	2005
Austria	EEE-	EEE-	EEE-
Belgium	EEE-	EEE-	EEE-
Bulgaria	EE-	EE-	EE-
Cyprus			
Czech Republic	EE+	EE+	EE
Denmark	EEE	EEE	EEE
Estonia			
Finland	EEE-	EEE-	EEE-
France	EEE-	EEE-	EEE-
Germany	EEE-	EEE-	EEE-
Greece	EE+	EE+	EE+
Hungary	EE+	EE+	EE
Ireland	EEE-	EEE-	EEE-
Italy	EE+	EE+	EE
Latvia			
Lithuania			
Luxembourg	EE+	EE+	EE+
Malta			
Netherlands	EEE-	EEE-	EEE-
Poland		EE	EE
Portugal	EE+	EE+	EE+
Romania	EE-	EE-	EE-
Slovakia	EE	EE	EE
Slovenia			
Spain	EEE-	EEE-	EEE-

Sweden	**EEE**	**EEE**	**EEE**
United Kingdom	**EEE-**	**EEE-**	**EEE-**
Source: European Agency of Standard Ethics Investments.			
YEARS 2003-2004:http://www.aei-standardethics.org/Comunicati/Comunicato_15_luglio2004_PDF.pdF			
YEARS 2005: http://www.aei-standardethics.org/Comunicati/AEI-RATING-NAZIONI-2005-comunicato_PDF.pdf (year 2005)			

The organisms to which the AEI Standard Ethics leaves the task of defining - through acts, decisions and declarations - the concept of Ethics and Social Responsibility that is applied (as parameters of evaluation), are the United Nations, the OECD and the European Union.

Table 14 - AEI standard ethics: standardized scores

STANDARDIZED TABLE			
AEI STANDARD ETHICS			
Scale 0-100			
	2003	**2004**	**2005**
Austria	**85,71**	**85,71**	**85,71**
Belgium	**85,71**	**85,71**	**85,71**
Bulgaria	**42,86**	**42,86**	**42,86**
Cyprus			
Czech Republic	**71,43**	**71,43**	**57,14**
Denmark	**100,00**	**100,00**	**100,00**
Estonia			
Finland	**85,71**	**85,71**	**85,71**
France	**85,71**	**85,71**	**85,71**
Germany	**85,71**	**85,71**	**85,71**
Greece	**71,43**	**71,43**	**71,43**
Hungary	**71,43**	**71,43**	**57,14**
Ireland	**85,71**	**85,71**	**85,71**
Italy	**71,43**	**71,43**	**57,14**
Latvia			
Lithuania			
Luxembourg	**71,43**	**71,43**	**71,43**
Malta			
Netherlands	**85,71**	**85,71**	**85,71**
Poland		**57,14**	**57,14**
Portugal	**71,43**	**71,43**	**71,43**
Romania	**42,86**	**42,86**	**42,86**
Slovakia	**57,14**	**57,14**	**57,14**

Slovenia			
Spain	**85,71**	**85,71**	**85,71**
Sweden	**100,00**	**100,00**	**100,00**
United Kingdom	**85,71**	**85,71**	**85,71**
AVERAGE UE 27	**77,14**	**76,19**	**74,15**
Source: Department Business Administration – University of Turin.			
See Table 1 - AEI Standard Ethics Index. Conversion from qualitative values to quantitative values.			

The final evaluations of AEI Standard Ethics are expressed in the form of an eight-level Rating. Rating is the result of a statistical and scientific survey, made with the intent to photograph business world according to the ethical principles promoted by the biggest international organizations .

The European Agency for Standard Ethics Investments is a European Economic Interest Group based in Brussels, created in order to disclose the UN, OECD and EU Corporate Social Responsibility ideals (AEI Standard Ethics 2004, 2005, 2006).

2. Corruption Perception Index (CPI)

It's the same Transparency to admit that the CPI is a composite index, calculated on the basis of interviews collected between "*experts in the business*" and "*prestigious institutions*"; it is not referred to concrete data but to "perception" of its subjective authors.

The Corruption Perception Index (CPI), is an indicator annually published since 1995 by Transparency International: it ranks world countries on the basis of "*level that public and political offices perceive the existence of corruption*". A higher score means less corruption (perceived).

Table 15 - Corruption Perception Index (CPI): original scores

ORIGINAL TABLE			
CORRUPTION PERCEPTION INDEX			
Scale 0-10			
	2003	**2004**	**2005**
Austria	**8,0**	**8,4**	**8,7**
Belgium	**7,6**	**7,5**	**7,4**
Bulgaria	**3,9**	**4,1**	**4,0**
Cyprus	**6,1**	**5,4**	**5,7**
Czech Republic	**3,9**	**4,2**	**4,3**
Denmark	**9,5**	**9,5**	**9,5**
Estonia	**5,5**	**6,0**	**6,4**
Finland	**9,7**	**9,7**	**9,6**
France	**6,9**	**7,1**	**7,5**

Germany	**7,7**	**8,2**	**8,2**
Greece	**4,3**	**4,3**	**4,3**
Hungary	**4,8**	**4,8**	**5,0**
Ireland	**7,5**	**7,5**	**7,4**
Italy	**5,3**	**4,8**	**5,0**
Latvia	**3,8**	**4,0**	**4,3**
Lithuania	**4,7**	**4,6**	**4,8**
Luxembourg	**8,7**	**8,4**	**8,5**
Malta		**6,8**	**6,6**
Netherlands	**8,9**	**8,7**	**8,6**
Poland	**3,5**	**3,5**	**3,4**
Portugal	**6,6**	**6,3**	**6,5**
Romania	**2,8**	**2,9**	**3,0**
Slovakia	**3,7**	**4,0**	**4,3**
Slovenia	**5,9**	**6,0**	**6,1**
Spain	**6,9**	**7,1**	**7,0**
Sweden	**9,3**	**9,2**	**9,2**
United Kingdom	**8,7**	**8,6**	**8,6**
Source: Transparency International			
YEAR 2003: http://www.transparency.org/policy_research/surveys_indices/cpi/2003			
YEAR 2004. http://www.transparency.org/policy_research/surveys_indices/cpi/2004			
YEAR 2005: http://www.transparency.org/policy_research/surveys_indices/cpi/2005			

Table 16 - Corruption Perception Index (CPI): standardized scores

STANDARDIZED TABLE			
CORRUPTION PERCEPTION INDEX			
Scale 0-100			
	2003	**2004**	**2005,00**
Austria	**80**	**84**	**87**
Belgium	**76**	**75,00**	**74,00**
Bulgaria	**39**	**41,00**	**40,00**
Cyprus	**61**	**54,00**	**57,00**
Czech Republic	**39**	**42,00**	**43,00**
Denmark	**95**	**95,00**	**95,00**
Estonia	**55**	**60,00**	**64,00**
Finland	**97**	**97,00**	**96,00**

France	**69**	**71,00**	**75,00**
Germany	**77**	**82,00**	**82,00**
Greece	**43**	**43,00**	**43,00**
Hungary	**48**	**48,00**	**50,00**
Ireland	**75**	**75,00**	**74,00**
Italy	**53**	**48,00**	**50,00**
Latvia	**38**	**40,00**	**43,00**
Lithuania	**47**	**46,00**	**48,00**
Luxembourg	**87**	**84,00**	**85,00**
Malta		**68,00**	**66,00**
Netherlands	**89**	**87,00**	**86,00**
Poland	**35**	**35,00**	**34,00**
Portugal	**66**	**63,00**	**65,00**
Romania	**28**	**29,00**	**30,00**
Slovakia	**37**	**40,00**	**43,00**
Slovenia	**59**	**60,00**	**61,00**
Spain	**69**	**71,00**	**70,00**
Sweden	**93**	**92,00**	**92,00**
United Kingdom	**87**	**86,00**	**86,00**
AVERAGE UE 27	**63,15**	**63,56**	**64,41**
Source: Department Business Administration – University of Turin.			
Basis: 100			

3. Control of Corruption (COC)

Provided by the World Bank, it measures the ability of the political, legal and judiciary system to prevent and fight corruption. According to the World Bank, countries that keep under control corruption may increase their per capita income by 300%.

Table 17 - Control of corruption: original scores

ORIGINAL TABLE			
CONTROL OF CORRUPTION			
Scale -2,5/+2,5			
	2003	**2004**	**2005**
Austria	**2,09**	**2,13**	**1,99**
Belgium	**1,57**	**1,51**	**1,46**
Bulgaria	**-0,05**	**0,07**	**-0,01**
Cyprus	**0,94**	**0,75**	**0,70**
Czech Republic	**0,39**	**0,36**	**0,42**

Denmark	**2,31**	**2,42**	**2,24**
Estonia	**0,80**	**0,93**	**0,88**
Finland	**2,42**	**2,50**	**2,41**
France	**1,47**	**1,39**	**1,40**
Germany	**2,01**	**1,90**	**1,92**
Greece	**0,58**	**0,55**	**0,40**
Hungary	**0,63**	**0,67**	**0,60**
Ireland	**1,67**	**1,48**	**1,69**
Italy	**0,75**	**0,56**	**0,41**
Latvia	**0,25**	**0,24**	**0,37**
Lithuania	**0,28**	**0,31**	**0,22**
Luxembourg	**1,89**	**2,03**	**1,84**
Malta	**1,23**	**1,20**	**1,04**
Netherlands	**2,08**	**2,04**	**1,99**
Poland	**0,41**	**0,16**	**0,17**
Portugal	**1,30**	**1,17**	**1,15**
Romania	**-0,30**	**-0,26**	**-0,24**
Slovakia	**0,34**	**0,43**	**0,43**
Slovenia	**0,84**	**0,97**	**0,84**
Spain	**1,46**	**1,39**	**1,34**
Sweden	**2,21**	**2,17**	**2,10**
United Kingdom	**2,08**	**1,99**	**1,94**
Source: World Bank.			
http://papers.ssrn.com/sol3/papers.cfm_PaperDownload			

Table 18 - Control of corruption: standardized scores

STANDARDIZED TABLE			
CONTROL OF CORRUPTION			
Scale 0-100			
	2003	**2004**	**2005**
Austria	**91,80**	**92,60**	**89,80**
Belgium	**81,40**	**80,20**	**79,20**
Bulgaria	**49,00**	**51,40**	**49,80**
Cyprus	**68,80**	**65,00**	**64,00**
Czech Republic	**57,80**	**57,20**	**58,40**
Denmark	**96,20**	**98,40**	**94,80**
Estonia	**66,00**	**68,60**	**0,88**
Finland	**98,40**	**100,00**	**98,20**
France	**79,40**	**77,80**	**78,00**

Germany	**90,20**	**88,00**	**88,40**
Greece	**61,60**	**61,00**	**58,00**
Hungary	**62,60**	**63,40**	**62,00**
Ireland	**83,40**	**78,60**	**83,80**
Italy	**65,00**	**61,20**	**58,20**
Latvia	**55,00**	**54,80**	**57,40**
Lithuania	**55,60**	**56,20**	**54,40**
Luxembourg	**87,80**	**90,60**	**86,80**
Malta	**74,60**	**74,00**	**70,80**
Netherlands	**91,60**	**90,80**	**89,80**
Poland	**58,20**	**53,20**	**53,40**
Portugal	**76,00**	**73,40**	**73,00**
Romania	**44,00**	**45,20**	**45,80**
Slovakia	**56,80**	**58,60**	**58,60**
Slovenia	**66,80**	**69,40**	**66,80**
Spain	**79,20**	**77,80**	**76,80**
Sweden	**94,20**	**93,40**	**92,00**
United Kingdom	**91,60**	**89,80**	**88,80**
AVERAGE UE 27	**73,44**	**72,99**	**69,55**
Source: Department Business Administration – University of Turin.			

Conversion scale:
2,5=100
2,45=99
2,4=98
2,35=97
2,30=96
2,29=95,8
2,28=95,6
2,27=95,4
2,26=95,2
2,25=95

4. Voice and Accountability (V&A)

This index, provided by the World Bank, measures the degree of civil freedom and political rights and the real influence of population to elect political leaders; it measures the independence level of media system from political pressure.

It is the indicator in which instead Italy is one of the best performer of the planet.

Table 19 - Voice and accountability: original scores

ORIGINAL TABLE			
VOICE AND ACCOUNTABILITY			
Scale -2,5/+2,5			
	2003	2004	2005
Austria	1,35	1,51	1,41
Belgium	1,48	1,47	1,42
Bulgaria	0,52	0,56	0,51
Cyprus	1,06	1,00	0,98
Czech Republic	1,06	1,03	0,93
Denmark	1,60	1,83	1,79
Estonia	1,09	1,10	1,00
Finland	1,58	1,81	1,73
France	1,09	1,44	1,49
Germany	1,46	1,56	1,56
Greece	1,02	1,14	1,11
Hungary	1,25	1,25	1,18
Ireland	1,28	1,48	1,64
Italy	0,99	1,20	1,06
Latvia	0,87	0,78	0,76
Lithuania	1,04	0,99	0,92
Luxembourg	1,46	1,63	1,56
Malta	1,33	1,35	1,22
Netherlands	1,54	1,73	1,70
Poland	1,11	1,11	0,97
Portugal	1,38	1,47	1,43
Romania	0,38	0,39	0,38
Slovakia	1,06	1,05	0,93
Slovenia	1,18	1,16	1,07
Spain	1,25	1,32	1,12
Sweden	1,54	1,76	1,59
United Kingdom	1,31	1,61	1,49
Source: World Bank.			
http://papers.ssrn.com/sol3/papers.cfm_abstract_id_PaperDownload			

Table 20 - Voice and accountability: standardized scores

STANDARZIDED TABLE			
VOICE AND ACCOUNTABILITY			
Scale 0-100			
	2003	2004	2005
Austria	77,0	80,2	78,2
Belgium	79,6	79,4	78,4
Bulgaria	60,4	61,2	60,2
Cyprus	71,2	70,0	69,6
Czech Republic	71,2	70,6	68,6
Denmark	82,0	86,6	85,8
Estonia	71,8	72,0	70,0
Finland	81,6	86,2	84,6
France	71,8	78,8	79,8
Germany	79,2	81,2	81,2
Greece	70,4	72,8	72,2
Hungary	75,0	75,0	73,6
Ireland	75,6	79,6	82,8
Italy	69,8	74,0	71,2
Latvia	67,4	65,6	65,2
Lithuania	70,8	69,8	68,4
Luxembourg	79,2	82,6	81,2
Malta	76,6	77,0	74,4
Netherlands	80,8	84,6	84,0
Poland	72,2	72,2	69,4
Portugal	77,6	79,4	78,6
Romania	57,6	57,8	57,6
Slovakia	71,2	71,0	68,6
Slovenia	73,6	73,2	71,4
Spain	75,0	76,4	72,4
Sweden	80,8	85,2	81,8
United Kingdom	76,2	81,2	79,8
AVERAGE UE 27	73,9	75,7	74,4
Source: Department Business Administration – University of Turin.			

Scale conversion:			
2,5=100			
2,45=99			
2,4=98			
2,35=97			

2,30=96			
2,29=95,8			
2,28=95,6			
2,27=95,4			
2,26=95,2			
2,25=95			

5. Government Effectiveness (GE)

This index always published by the World Bank, measures the quality of public services, the Government's credibility for actions to be implemented, the quality of the bureaucratic system and independence of public services workers from political pressure.

Table 21 - Government effectiveness: original scores

ORIGINAL TABLE			
GOVERNMENT EFFECTIVENESS			
Scale -2,5/+2,5			
	2003	**2004**	**2005**
Austria	**1,94**	**1,78**	**1,62**
Belgium	**1,91**	**1,79**	**1,66**
Bulgaria	**0,06**	**0,1**	**0,23**
Cyprus	**1,21**	**1,12**	**1,16**
Czech Republic	**0,75**	**0,75**	**1,01**
Denmark	**2,22**	**2,26**	**2,14**
Estonia	**1,16**	**1,12**	**1,11**
Finland	**2,23**	**2,09**	**2,09**
France	**1,57**	**1,49**	**1,47**
Germany	**1,48**	**1,43**	**1,51**
Greece	**0,84**	**0,81**	**0,66**
Hungary	**0,86**	**0,82**	**0,75**
Ireland	**1,62**	**1,58**	**1,64**
Italy	**0,88**	**0,68**	**0,6**
Latvia	**0,69**	**0,66**	**0,64**
Lithuania	**0,94**	**0,89**	**0,9**
Luxembourg	**2,09**	**2,12**	**1,95**
Malta	**1,06**	**1,06**	**0,95**
Netherlands	**2,06**	**2,09**	**1,96**
Poland	**0,55**	**0,45**	**0,54**
Portugal	**1,24**	**1,07**	**1,03**
Romania	**-0,2**	**-0,15**	**-0,08**

Slovakia	**0,57**	**0,75**	**0,95**
Slovenia	**1,08**	**0,98**	**1,02**
Spain	**1,76**	**1,36**	**1,4**
Sweden	**2,09**	**2,07**	**1,95**
United Kingdom	**1,94**	**1,92**	**1,71**
Source: World Bank.			
http://papers.ssrn.com/sol3/papers.cfm?abstract_id_PaperDownload			

Table 22 - Government effectiveness: standardized scores

STANDARZIDED TABLE			
GOVERNMENT EFFECTIVENESS			
Scale 0-100			
	2003	**2004**	**2005**
Austria	**88,8**	**85,6**	**82,4**
Belgium	**88,2**	**85,8**	**83,2**
Bulgaria	**51,2**	**52,0**	**54,6**
Cyprus	**74,2**	**72,4**	**73,2**
Czech Republic	**65,0**	**65,0**	**70,2**
Denmark	**94,4**	**95,2**	**92,8**
Estonia	**73,2**	**72,4**	**72,2**
Finland	**94,6**	**91,8**	**91,8**
France	**81,4**	**79,8**	**79,4**
Germany	**79,6**	**78,6**	**80,2**
Greece	**66,8**	**66,2**	**63,2**
Hungary	**67,2**	**66,4**	**65,0**
Ireland	**82,4**	**81,6**	**82,8**
Italy	**67,6**	**63,6**	**62,0**
Latvia	**63,8**	**63,2**	**62,8**
Lithuania	**68,8**	**67,8**	**68,0**
Luxembourg	**91,8**	**92,4**	**89,0**
Malta	**71,2**	**71,2**	**69,0**
Netherlands	**91,2**	**91,8**	**89,2**
Poland	**61,0**	**59,0**	**60,8**
Portugal	**74,8**	**71,4**	**70,6**
Romania	**46,0**	**47,0**	**48,4**
Slovakia	**60,1**	**65,0**	**69,0**
Slovenia	**71,6**	**69,6**	**70,4**

Spain	**85,2**	**77,2**	**78,0**
Sweden	**91,8**	**91,4**	**89,0**
United Kingdom	**88,8**	**88,4**	**84,2**
AVERAGE UE 27	**75,6**	**74,5**	**74,1**
Source: Department Business Administration – University of Turin.			

Scale conversion:
2,5=100
2,45=99
2,4=98
2,35=97
2,30=96
2,29=95,8
2,28=95,6
2,27=95,4
2,26=95,2
2,25=95

3.3 – *Correlations' results: Year 2003*

Table 23 - Standardization average of technology variable - Year 2003

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country/Index	**SII**	**BPR**	**EGR**	**GBAORD**	**GDE/R&D**	**AVERAGE VAR (X)**
Austria	**37,00**	**63,46**	**67,60**	**63,32**	**57,77**	**57,83**
Belgium	**45,00**	**97,12**	**67,00**	**60,30**	**48,70**	**63,62**
Bulgaria	**18,00**		**54,80**	**43,22**	**12,95**	**32,24**
Cyprus	**11,00**		**47,40**		**9,07**	**22,49**
Czech Republic	**33,00**		**54,20**	**55,28**	**32,38**	**43,71**
Denmark	**57,00**	**100,00**	**82,00**	**66,33**	**66,84**	**74,43**
Estonia	**32,00**		**69,70**	**54,27**	**19,95**	**43,98**
Finland	**75,00**	**63,46**	**76,10**	**100,00**	**88,86**	**80,68**
France	**49,00**	**38,46**	**69,00**	**93,47**	**56,22**	**61,23**
Germany	**51,00**	**46,15**	**76,20**	**81,91**	**65,28**	**64,11**
Greece	**13,00**	**0,00**	**54,00**	**29,65**	**14,77**	**22,28**
Hungary	**29,00**		**51,60**		**24,09**	**34,90**

Ireland	**43,00**	**1,92**	**69,70**	**51,26**	**30,31**	**39,24**
Italy	**25,00**	**26,92**	**68,50**		**28,76**	**37,29**
Latvia	**22,00**		**50,60**	**30,15**	**9,84**	**28,15**
Lithuania	**27,00**		**55,70**		**17,36**	**33,35**
Luxembourg	**27,00**	**22,12**	**65,60**	**28,14**	**43,01**	**37,17**
Malta	**22,00**		**63,60**		**6,74**	**30,78**
Netherlands	**51,00**	**94,23**	**74,60**	**78,89**	**45,60**	**68,86**
Poland	**21,00**		**57,60**		**13,99**	**30,86**
Portugal	**14,00**	**34,62**	**64,60**	**67,34**	**19,17**	**39,94**
Romania	**8,00**		**48,30**	**23,62**	**10,10**	**22,51**
Slovakia	**26,00**		**52,80**	**37,19**	**14,77**	**32,69**
Slovenia	**29,00**		**63,10**	**59,30**	**33,42**	**46,20**
Spain	**26,00**	**41,35**	**60,20**	**95,98**	**27,20**	**50,15**
Sweden	**79,00**	**82,69**	**84,00**	**81,41**	**100,00**	**85,42**
United Kingdom	**60,00**	**35,58**	**81,40**	**88,44**	**46,11**	**62,31**
Average E.U. 27	**34,44**	**49,87**	**64,07**	**61,40**	**34,94**	**48,94**
SII = Summary Innovation Index		**BPR = Broadband Penetration Rate**			**EGR = E-Government Readiness Index**	
GBAORD =		**total GBAORD as a % of total general expenditure**			**GDE/R&D = Gross domestic expenditure on R&D**	

This table shows the standardization average of technology variable (X) in the 27 EU countries which is 48.94. In particular, the Scandinavian countries have higher values while the Mediterranean countries and those in Eastern values lower. Among those Italy shows a low level in terms of investment and technological infrastructures and much more.

Table 24 - Standardization average of ethical variable - Year 2003

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country/Index	**AEI-SE**	**CPI**	**COC**	**V&A**	**GE**	**AVERAGE VAR (Y)**
Austria	**85,71**	**80,00**	**91,80**	**77,00**	**88,80**	**84,66**
Belgium	**85,71**	**76,00**	**81,40**	**79,60**	**88,20**	**82,18**
Bulgaria	**42,86**	**39,00**	**49,00**	**60,40**	**51,20**	**48,49**
Cyprus		**61,00**	**68,80**	**71,20**	**74,20**	**68,80**
Czech Republic	**71,43**	**39,00**	**57,80**	**71,20**	**65,00**	**60,89**
Denmark	**100,00**	**95,00**	**96,20**	**82,00**	**94,40**	**93,52**
Estonia		**55,00**	**66,00**	**71,80**	**73,20**	**66,50**
Finland	**85,71**	**97,00**	**98,40**	**81,60**	**94,60**	**91,46**
France	**85,71**	**69,00**	**79,40**	**71,80**	**81,40**	**77,46**
Germany	**85,71**	**77,00**	**90,20**	**79,20**	**79,60**	**82,34**

Greece	**71,43**	**43,00**	**61,60**	**70,40**	**66,80**	**62,65**
Hungary	**71,43**	**48,00**	**62,60**	**75,00**	**67,20**	**64,85**
Ireland	**85,71**	**75,00**	**83,40**	**75,60**	**82,40**	**80,42**
Italy	**71,43**	**53,00**	**65,00**	**69,80**	**67,60**	**65,37**
Latvia		**38,00**	**55,00**	**67,40**	**63,80**	**56,05**
Lithuania		**47,00**	**55,60**	**70,80**	**68,80**	**60,55**
Luxembourg	**71,43**	**87,00**	**87,80**	**79,20**	**91,80**	**83,45**
Malta			**74,60**	**76,60**	**71,20**	**74,13**
Netherlands	**85,71**	**89,00**	**91,60**	**80,80**	**91,20**	**87,66**
Poland		**35,00**	**58,20**	**72,20**	**61,00**	**56,60**
Portugal	**71,43**	**66,00**	**76,00**	**77,60**	**74,80**	**73,17**
Romania	**42,86**	**28,00**	**44,00**	**57,60**	**46,00**	**43,69**
Slovakia	**57,14**	**37,00**	**56,80**	**71,20**	**60,14**	**56,46**
Slovenia		**59,00**	**66,80**	**73,60**	**71,60**	**67,75**
Spain	**85,71**	**69,00**	**79,20**	**75,00**	**85,20**	**78,82**
Sweden	**100,00**	**93,00**	**94,20**	**80,80**	**91,80**	**91,96**
United Kingdom	**85,71**	**87,00**	**91,60**	**76,20**	**88,80**	**85,86**
Average E.U. 27	**77,14**	**63,15**	**73,44**	**73,91**	**75,58**	**72,65**
AEI-SE= AEI Standard Ethics		**CPI = Corruption perception Index**		**COC = control of corruption**		
V&A = Voice and Accountability		**GE = Government Effectiveness**				

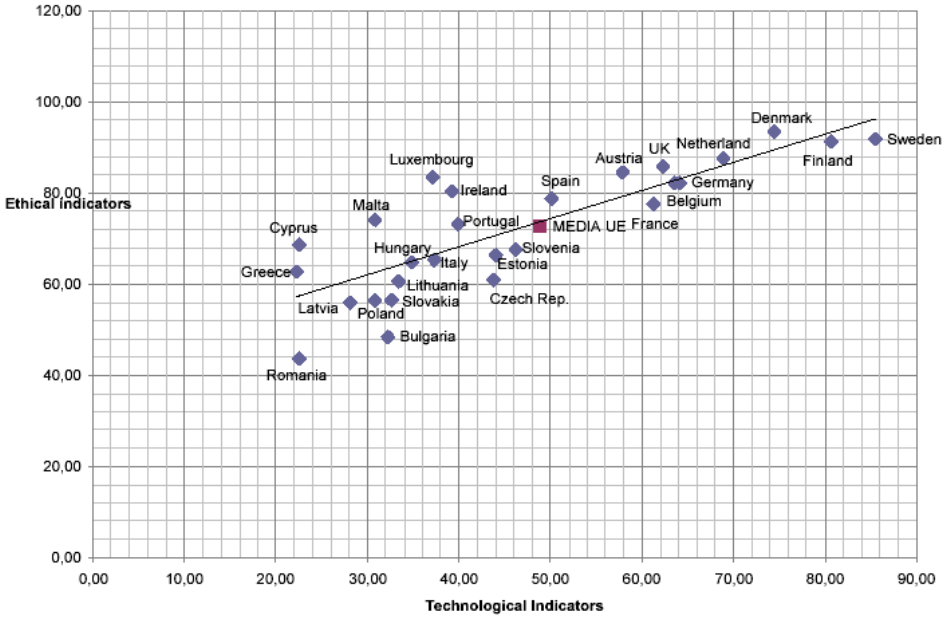
The table shows the standardization average of ethical variable (Y) and for EU 27 is equal to 72.65. It is known that countries of northern Europe have higher values whereas Europe and the Mediterranean area (with the exception of Spain) lower values. Italy (65.37) presents a value below the European average. Bulgaria and Romania have the lowest values.

Table 25 - Calculation of correlation between ethical and technology variables - Year 2003

Column A	**Column B**	**Column C**	**Column D**	**Column E**	**Column F**	**Column G**	**Column H**
Country	**Average VAR X**	**Average VAR Y**	**X- E(X)**	**Y- E(Y)**	**[X-E(X)]2**	**[Y-E(Y)]2**	**X-E(X)*Y-E(Y)**
Austria	**57,83**	**84,66**	**8,88**	**12,02**	**78,94**	**144,38**	**106,76**
Belgium	**63,62**	**82,18**	**14,68**	**9,54**	**215,46**	**90,93**	**139,97**
Bulgaria	**32,24**	**48,49**	**-16,70**	**-24,16**	**278,97**	**583,49**	**403,46**
Cyprus	**22,49**	**68,80**	**-26,46**	**-3,85**	**699,91**	**14,80**	**101,78**
Czech Republic	**43,71**	**60,89**	**-5,23**	**-11,76**	**27,35**	**138,33**	**61,51**
Denmark	**74,43**	**93,52**	**25,49**	**20,87**	**649,71**	**435,68**	**532,04**
Estonia	**43,98**	**66,50**	**-4,96**	**-6,15**	**24,65**	**37,79**	**30,52**
Finland	**80,68**	**91,46**	**31,74**	**18,82**	**1007,39**	**354,03**	**597,20**

France	**61,23**	**77,46**	**12,28**	**4,82**	**150,91**	**23,19**	**59,16**
Germany	**64,11**	**82,34**	**15,16**	**9,70**	**229,97**	**94,01**	**147,04**
Greece	**22,28**	**62,65**	**-26,66**	**-10,00**	**710,85**	**100,03**	**266,65**
Hungary	**34,90**	**64,85**	**-14,05**	**-7,80**	**197,32**	**60,86**	**109,59**
Ireland	**39,24**	**80,42**	**-9,71**	**7,78**	**94,22**	**60,46**	**-75,48**
Italy	**37,29**	**65,37**	**-11,65**	**-7,28**	**135,72**	**53,02**	**84,83**
Latvia	**28,15**	**56,05**	**-20,80**	**-16,60**	**432,48**	**275,46**	**345,15**
Lithuania	**33,35**	**60,55**	**-15,59**	**-12,10**	**243,12**	**146,34**	**188,62**
Luxembourg	**37,17**	**83,45**	**-11,77**	**10,80**	**138,59**	**116,61**	**-127,13**
Malta	**30,78**	**74,13**	**-18,17**	**1,49**	**330,01**	**2,21**	**-27,00**
Netherlands	**68,86**	**87,66**	**19,92**	**15,02**	**396,78**	**225,47**	**299,11**
Poland	**30,86**	**56,60**	**-18,08**	**-16,05**	**326,95**	**257,51**	**290,16**
Portugal	**39,94**	**73,17**	**-9,00**	**0,52**	**81,00**	**0,27**	**-4,67**
Romania	**22,51**	**43,69**	**-26,44**	**-28,96**	**699,04**	**838,43**	**765,57**
Slovakia	**32,69**	**56,46**	**-16,26**	**-16,19**	**264,28**	**262,13**	**263,20**
Slovenia	**46,20**	**67,75**	**-2,74**	**-4,90**	**7,51**	**23,98**	**13,42**
Spain	**50,15**	**78,82**	**1,20**	**6,18**	**1,44**	**38,14**	**7,42**
Sweden	**85,42**	**91,96**	**36,48**	**19,31**	**1330,43**	**372,99**	**704,44**
United Kingdom	**62,31**	**85,86**	**13,36**	**13,22**	**178,54**	**174,66**	**176,59**
Average	**48,94**	**72,65**			**330,80**	**182,42**	**202,22**
Numerator	**202,22**						
Denominator	**245,65**						
Correlation	**0,82**						

Chart 1 - Correlation between ethical and technological basket of indicators - Year 2003



The correlation coefficient between the ethical and technological variable is equal to 0.82, very high value which shows a high linear positive correlation.

The chart 1 shows the change of the technological level of a country which corresponds to a linear and positive matter of the ethical level.

It highlights, in particular, as countries at the top and right of straight line exhibit a high ethical level in relation with the high technological level reached; vice versa for countries below and left, including Italy.

3.4 – *Correlation's results: Year 2004*

Table 26 - Standardized average of the technology variable - Year 2004

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country/Index	SII	BPR	EGR	GBAORD	GDE/R&D	AVERAGE VAR (X)
Austria	39,00	55,77	74,87	60,47	61,33	58,29
Belgium	47,00	89,74	75,25	55,81	51,66	63,89
Bulgaria	28,00		54,17	39,07	13,81	33,76
Cyprus	17,00	12,82	51,89	57,21	10,22	29,83
Czech Republic	27,00	4,49	62,14	51,63	34,53	35,96
Denmark	54,00	100,00	90,47	60,00	68,51	74,60
Estonia	34,00	48,72	70,29	52,09	23,76	45,77
Finland	75,00	70,51	82,39	93,49	95,30	83,34
France	46,00	52,56	66,87	83,72	59,39	61,71
Germany	56,00	42,95	78,73	75,81	68,78	64,46
Greece	20,00	1,28	55,81	30,70	15,19	24,60
Hungary	25,00	14,10	58,57		24,31	30,50
Ireland	44,00	10,90	70,58	60,00	34,25	43,95
Italy	31,00	39,10	65,98		30,39	41,62
Latvia	18,00	9,62	54,86	23,26	11,60	23,47
Lithuania	26,00	16,03	53,67	51,16	20,99	33,57
Luxembourg	29,00	36,54	66,00	28,84	45,03	41,08
Malta	25,00	22,44	68,77	100,00	14,92	46,22
Netherlands	45,00	94,23	80,26	73,95	49,17	68,52
Poland	14,00	3,21	60,26	33,95	15,47	25,38
Portugal	30,00	41,03	59,53	63,72	21,27	43,11
Romania	15,00		55,04	24,19	10,77	26,25
Slovakia	24,00	2,56	55,65	36,74	14,09	26,61

Slovenia	**32,00**	**24,36**	**65,06**	**60,00**	**39,23**	**44,13**
Spain	**30,00**	**42,95**	**58,44**	**95,35**	**29,28**	**51,20**
Sweden	**76,00**	**77,56**	**87,41**	**73,49**	**100,00**	**82,89**
United Kingdom	**49,00**	**47,44**	**88,52**	**75,35**	**47,51**	**61,56**
Average E.U. 27	**35,41**	**38,44**	**67,09**	**58,40**	**37,44**	**47,35**

This table shows the average standard variable technology (X) in the 27 EU countries is 47.35 slightly lower than the previous value of 2003 (48.94).

Even in 2004 the Scandinavian countries have higher values while the Mediterranean countries and those in Eastern lower values.

Table 27 - Standardized average of the ethical variable - Year 2004

Column A	**Column B**	**Column C**	**Column D**	**Column E**	**Column F**	**Column G**
Country/Index	**AEI-SE**	**CPI**	**COC**	**V&A**	**GE**	**AVERAGE VAR (Y)**
Austria	**85,71**	**84,00**	**92,60**	**80,20**	**85,60**	**85,62**
Belgium	**85,71**	**75,00**	**80,20**	**79,40**	**85,80**	**81,22**
Bulgaria	**42,86**	**41,00**	**51,40**	**61,20**	**52,00**	**49,69**
Cyprus		**54,00**	**65,00**	**70,00**	**72,40**	**65,35**
Czech Republic	**71,43**	**42,00**	**57,20**	**70,60**	**65,00**	**61,25**
Denmark	**100,00**	**95,00**	**98,40**	**86,60**	**95,20**	**95,04**
Estonia		**60,00**	**68,60**	**72,00**	**72,40**	**68,25**
Finland	**85,71**	**97,00**	**100,00**	**86,20**	**91,80**	**92,14**
France	**85,71**	**71,00**	**77,80**	**78,80**	**79,80**	**78,62**
Germany	**85,71**	**82,00**	**88,00**	**81,20**	**78,60**	**83,10**
Greece	**71,43**	**43,00**	**61,00**	**72,80**	**66,20**	**62,89**
Hungary	**71,43**	**48,00**	**63,40**	**75,00**	**66,40**	**64,85**
Ireland	**85,71**	**75,00**	**78,60**	**79,60**	**81,60**	**80,10**
Italy	**71,43**	**48,00**	**61,20**	**74,00**	**63,60**	**63,65**
Latvia		**40,00**	**54,80**	**65,60**	**63,20**	**55,90**
Lithuania		**46,00**	**56,20**	**69,80**	**67,80**	**59,95**
Luxembourg	**71,43**	**84,00**	**90,60**	**82,60**	**92,40**	**84,21**
Malta		**68,00**	**74,00**	**77,00**	**71,20**	**72,55**
Netherlands	**85,71**	**87,00**	**90,80**	**84,60**	**91,80**	**87,98**
Poland	**57,14**	**35,00**	**53,20**	**72,20**	**59,00**	**55,31**
Portugal	**71,43**	**63,00**	**73,40**	**79,40**	**71,40**	**71,73**

Romania	**42,86**	**29,00**	**45,20**	**57,80**	**47,00**	**44,37**
Slovakia	**57,14**	**40,00**	**58,60**	**71,00**	**65,00**	**58,35**
Slovenia		**60,00**	**69,40**	**73,20**	**69,60**	**68,05**
Spain	**85,71**	**71,00**	**77,80**	**76,40**	**77,20**	**77,62**
Sweden	**100,00**	**92,00**	**93,40**	**85,20**	**91,40**	**92,40**
United Kingdom	**85,71**	**86,00**	**89,80**	**81,20**	**88,40**	**86,22**
Average E.U. 27	**76,19**	**63,56**	**72,99**	**75,69**	**74,51**	**72,59**

This table shows the standardized average of the ethical variable (Y) that for EU 27 is equal to 72.59.

It also confirmed in 2004 as countries, in general in northern Europe, have the highest values, while those of East and the Mediterranean area (with the exception of Spain) have lower values: Italy has a value below the European media and even lower than in 2003 (65.37); Bulgaria and Romania have once again lower values.

Table 28 - Calculation of correlation between ethical and technology variables - Year 2004

Column A	**Column B**	**Column C**	**Column D**	**Column E**	**Column F**	**Column G**	**Column H**
Country	**Average VAR (X)**	**Average VAR (Y)**	**X- E(X)**	**Y- E(Y)**	**[X-E(X)]2**	**[Y-E(Y)]2**	**X-E(X)*Y-E(Y)**
Austria	**58,29**	**85,62**	**10,93**	**13,04**	**119,50**	**169,95**	**142,51**
Belgium	**63,89**	**81,22**	**16,54**	**8,64**	**273,53**	**74,59**	**142,84**
Bulgaria	**33,76**	**49,69**	**-13,59**	**-22,89**	**184,72**	**524,17**	**311,17**
Cyprus	**29,83**	**65,35**	**-17,53**	**-7,24**	**307,16**	**52,36**	**126,82**
Czech Republic	**35,96**	**61,25**	**-11,40**	**-11,34**	**129,89**	**128,61**	**129,25**
Denmark	**74,60**	**95,04**	**27,24**	**22,45**	**742,09**	**504,17**	**611,67**
Estonia	**45,77**	**68,25**	**-1,58**	**-4,34**	**2,50**	**18,80**	**6,86**
Finland	**83,34**	**92,14**	**35,98**	**19,56**	**1294,90**	**382,46**	**703,74**
France	**61,71**	**78,62**	**14,36**	**6,04**	**206,07**	**36,44**	**86,66**
Germany	**64,46**	**83,10**	**17,10**	**10,52**	**292,45**	**110,60**	**179,85**
Greece	**24,60**	**62,89**	**-22,76**	**-9,70**	**517,91**	**94,10**	**220,76**
Hungary	**30,50**	**64,85**	**-16,86**	**-7,74**	**284,22**	**59,92**	**130,50**
Ireland	**43,95**	**80,10**	**-3,41**	**7,52**	**11,61**	**56,50**	**-25,62**
Italy	**41,62**	**63,65**	**-5,74**	**-8,94**	**32,91**	**79,93**	**51,29**
Latvia	**23,47**	**55,90**	**-23,89**	**-16,69**	**570,62**	**278,43**	**398,59**
Lithuania	**33,57**	**59,95**	**-13,78**	**-12,64**	**189,99**	**159,67**	**174,17**
Luxembourg	**41,08**	**84,21**	**-6,27**	**11,62**	**39,36**	**135,01**	**-72,90**

Malta	**46,22**	**72,55**	**-1,13**	**-0,04**	**1,28**	**0,00**	**0,04**
Netherlands	**68,52**	**87,98**	**21,17**	**15,40**	**448,12**	**237,06**	**325,93**
Poland	**25,38**	**55,31**	**-21,98**	**-17,28**	**482,97**	**298,52**	**379,70**
Portugal	**43,11**	**71,73**	**-4,24**	**-0,86**	**18,02**	**0,74**	**3,65**
Romania	**26,25**	**44,37**	**-21,10**	**-28,21**	**445,39**	**796,08**	**595,46**
Slovakia	**26,61**	**58,35**	**-20,74**	**-14,24**	**430,35**	**202,71**	**295,36**
Slovenia	**44,13**	**68,05**	**-3,23**	**-4,54**	**10,40**	**20,58**	**14,63**
Spain	**51,20**	**77,62**	**3,85**	**5,04**	**14,82**	**25,37**	**19,39**
Sweden	**82,89**	**92,40**	**35,54**	**19,81**	**1262,97**	**392,58**	**704,15**
United Kingdom	**61,56**	**86,22**	**14,21**	**13,64**	**201,91**	**185,96**	**193,77**
Media E.U. 27	**47,35**	**72,59**			**315,40**	**186,12**	**216,68**
Numerator	**216,68**						
Denominator	**242,29**						
Correlation	**0,89**						

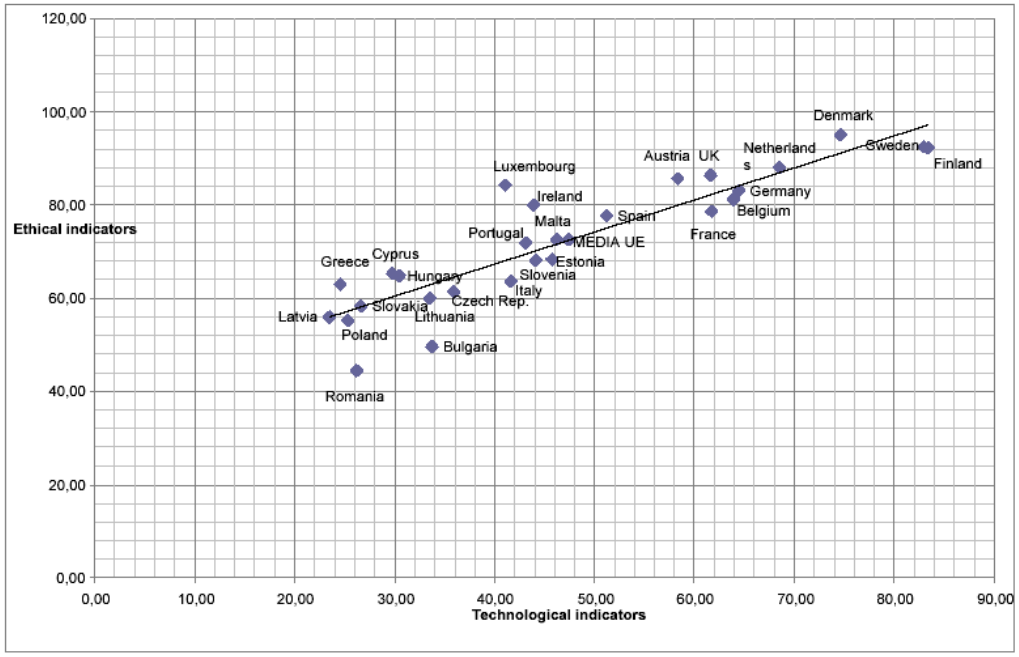
The correlation coefficient between ethical and technological variable is 0.89, which is very high, even higher than the 2003 value.

As mentioned above, it indicates a high positive linear correlation.

The chart 2 shows the ethical level varies in a linear and positive way when changing the level of technology.

It highlights, in particular, as the countries at the top and right of straight line exhibit a high level of ethics in relation to the high technological level reached; in the same way for the countries below and left, included Italy.

Chart 2 - Correlation between ethical and technological basket of indicators - Year 2004



3.5 – *Correlations' results: Year 2005*

Table 29 - Standardized average of the technology variable - Year 2005

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country/Index	SII	BPR	EGR	GBAORD	GDE/R&D	AVERAGE VAR (X)
Austria	51,00	51,79	76,02	57,89	63,42	60,02
Belgium	50,00	77,68	73,81	52,63	48,42	60,51
Bulgaria	24,00		56,05	34,65	12,89	31,90
Cyprus	28,00	12,05	58,72	53,51	10,53	32,56
Czech Republic	26,00	19,20	63,96	53,95	37,11	40,04
Denmark	60,00	99,11	90,58	58,77	64,47	74,59
Estonia	32,00	49,55	73,47	53,07	24,47	46,51
Finland	68,00	83,48	82,31	89,04	91,58	82,88
France	46,00	62,05	69,25	79,39	56,05	62,55
Germany	58,00	45,54	80,50	71,93	65,26	64,25
Greece	21,00	3,57	59,21	32,46	15,26	26,30
Hungary	31,00	20,09	65,36	32,46	24,74	34,73
Ireland	42,00	19,64	72,51	59,65	33,16	45,39
Italy	36,00	42,41	67,94	60,96	28,68	47,20
Latvia	20,00	16,52	60,50	24,12	14,74	27,18
Lithuania	27,00	22,32	57,86	46,49	20,00	34,73
Luxembourg	44,00	52,23	65,13	32,89	41,32	47,11
Malta	20,00	46,43	70,12	100,00	14,21	50,15
Netherlands	48,00	100,00	80,21	67,54	45,53	68,26
Poland	23,00	8,48	58,72	29,82	15,00	27,01
Portugal	28,00	45,09	60,84	66,67	21,32	44,38
Romania	16,00		57,04	28,51	10,79	28,08
Slovak Republic	21,00	6,70	58,87	32,46	13,42	26,49
Slovenia	32,00	34,82	67,62	56,14	38,42	45,80
Spain	30,00	44,64	58,47	95,61	29,47	51,64
Sweden	72,00	76,34	89,83	68,86	100,00	81,41
United Kingdom	48,00	60,27	87,77	70,61	46,32	62,59
U.E. 27	37,11	44,00	68,99	55,93	36,54	48,51

The table shows the average value standardized of the technology variable (X) in the 27 countries of EU is 48.51, returned almost to the value of 2003 (48.94). Even in 2005 the Scandinavian countries have higher values whereas the Mediterranean countries and the Eastern ones have lower values. It indicates a further increase in the technological level of our country, with a value of 10 points higher than the 2003 (37.29), although it is below the average European and, above all, far from Scandinavian countries.

Table 30 - Standardized average of ethical variables - Year 2005

Column A	Column B	Column C	Column D	Column E	Column F	Column G
Country/Index	AEI-SE	CPI	COC	V&A	GE	AVERAGE VAR (Y)
Austria	85,71	87,00	89,80	78,20	82,40	84,62
Belgium	85,71	74,00	79,20	78,40	83,20	80,10
Bulgaria	42,86	40,00	49,80	60,20	54,60	49,49
Cyprus		57,00	64,00	69,60	73,20	65,95
Czech Republic	57,14	43,00	58,40	68,60	70,20	59,47
Denmark	100,00	95,00	94,80	85,80	92,80	93,68
Estonia		64,00	0,88	70,00	72,20	51,77
Finland	85,71	96,00	98,20	84,60	91,80	91,26
France	85,71	75,00	78,00	79,80	79,40	79,58
Germany	85,71	82,00	88,40	81,20	80,20	83,50
Greece	71,43	43,00	58,00	72,20	63,20	61,57
Hungary	57,14	50,00	62,00	73,60	65,00	61,55
Ireland	85,71	74,00	83,80	82,80	82,80	81,82
Italy	57,14	50,00	58,20	71,20	62,00	59,71
Latvia		43,00	57,40	65,20	62,80	57,10
Lithuania		48,00	54,40	68,40	68,00	59,70
Luxembourg	71,43	85,00	86,80	81,20	89,00	82,69
Malta		66,00	70,80	74,40	69,00	70,05
Netherlands	85,71	86,00	89,80	84,00	89,20	86,94
Poland	57,14	34,00	53,40	69,40	60,80	54,95
Portugal	71,43	65,00	73,00	78,60	70,60	71,73
Romania	42,86	30,00	45,80	57,60	48,40	44,93
Slovak Republic	57,14	43,00	58,60	68,60	69,00	59,27
Slovenia		61,00	66,80	71,40	70,40	67,40
Spain	85,71	70,00	76,80	72,40	78,00	76,58
Sweden	100,00	92,00	92,00	81,80	89,00	90,96
United Kingdom	85,71	86,00	88,80	79,80	84,20	84,90
U.E. 27	74,15	64,41	69,55	74,41	74,13	71,33

This table shows the standardized average of ethical variable (Y) that for EU 27 is equal to 71.33, with a further slight decrease compared to previous years. It also confirmed in 2005 that countries, in general in northern Europe, have the highest values while the Europe and the Mediterranean area (with the exception of Spain) have lower values: Italy presents an alarming decrease compared to previous years with increasing distance from the European average; Bulgaria and Romania have once again lower values; Estonia, which has lost about 15 points in 3 years, has registered similar values.

Table 31 - Calculation of the correlation between ethical and technology variables - Year 2005

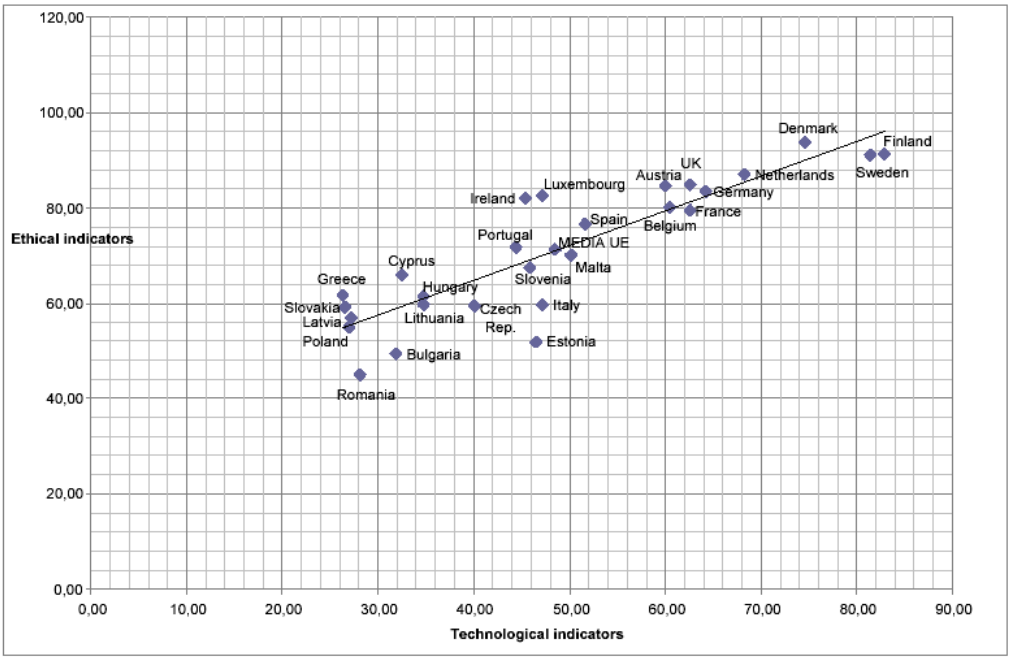
Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H
Country	Average VAR X	Average VAR Y	X- E(X)	Y- E(Y)	[X-E(X)]2	[Y-E(Y)]2	X-E(X)*Y-E(Y)
Austria	60,02	84,62	11,51	13,29	132,50	176,75	153,03
Belgium	60,51	80,10	11,99	8,77	143,87	76,99	105,25
Bulgaria	31,90	49,49	-16,62	-21,84	276,06	476,85	362,82
Cipro	32,56	65,95	-15,95	-5,38	254,46	28,93	85,79
Czech Republic	40,04	59,47	-8,47	-11,86	71,77	140,65	100,47
Denmark	74,59	93,68	26,07	22,35	679,80	499,60	582,77
Estonia	46,51	51,77	-2,00	-19,56	4,00	382,53	39,12
Finland	82,88	91,26	34,37	19,93	1181,13	397,39	685,10
France	62,55	79,58	14,03	8,25	196,98	68,14	115,85
Germany	64,25	83,50	15,73	12,17	247,50	148,22	191,53
Greece	26,30	61,57	-22,21	-9,76	493,44	95,31	216,86
Hungary	34,73	61,55	-13,79	-9,78	190,03	95,64	134,82
Ireland	45,39	81,82	-3,12	10,49	9,74	110,14	-32,76
Italy	47,20	59,71	-1,31	-11,62	1,73	135,02	15,26
Latvia	27,18	57,10	-21,34	-14,23	455,31	202,44	303,60
Lithuania	34,73	59,70	-13,78	-11,63	189,86	135,22	160,23
Luxembourg	47,11	82,69	-1,40	11,36	1,96	128,99	-15,89
Malta	50,15	70,05	1,64	-1,28	2,68	1,63	-2,09
Netherlands	68,26	86,94	19,74	15,61	389,76	243,81	308,27
Poland	27,01	54,95	-21,51	-16,38	462,61	268,30	352,30
Portugal	44,38	71,73	-4,13	0,40	17,07	0,16	-1,64
Romania	28,08	44,93	-20,43	-26,40	417,35	696,79	539,26
Slovak Republic	26,49	59,27	-22,02	-12,06	485,10	145,44	265,61
Slovenia	45,80	67,40	-2,71	-3,93	7,36	15,43	10,66
Spain	51,64	76,58	3,13	5,25	9,78	27,61	16,43
Sweden	81,41	90,96	32,89	19,63	1081,90	385,40	645,73
United Kingdom	62,59	84,90	14,08	13,57	198,24	184,27	191,13
Media U.E. 27	48,51	71,33			281,55	195,10	204,80
Numerator	204,80						
Denominator	234,37						
Correlation	0,87						

The coefficient of correlation between the ethical and the technological variable is also very high in 2005.

The chart 3 shows how the ethical level varies in a positive and linear way, when the technological level of a country varies. It highlights, in particular, as countries at the top and right of the straight line exhibit a high level of ethical in relation to the high technological level reached; in the same way for

the countries below and left - included Italy - although it demonstrates a continuous progress from the technological point of view.

Chart 3 - Correlation between basket of ethical and technological indicators - Year 2005



4 - Conclusions

The indicators are variables, as related to the object you want to observe, thus allowing to express opinions about the same object. They are selected, among the many possible, on the basis of assumptions, values, objectives of those who intend to describe, predict or evaluate something.

The indicators must in fact be useful to read and interpret reality, facilitate forecasts, design interventions, make judgments, allow decisions.

The quality of indicators (relevance, specificity, sensitivity, ease of detection, decision-making utility and others) can't be judged in absolute terms but only in relation to the evaluation and decisional-making process in which they are entered: so it is no possible really to assess an indicator without knowing the context and the reasons why it is used. The indicators for assessing the quality of services must be formulated in order to be detectable in a reproducible way, also by different observers in different locations. Therefore, in our research we observe that in technological field the Scandinavian countries reach higher score whereas the Mediterranean and the Eastern countries lower values. This would include Italy that shows a low level in terms of investment and technological infrastructures.

The same can be said about the ethical variables, by which we see that the countries of northern Europe have the highest values whereas Europe and the Mediterranean area (with the exception of Spain) lower ones. Italy is set at a level below the European average while Bulgaria and Romania are in the last places. This trend continues virtually unchanged throughout the 3 years take into account.

Italy does not believe or invest in innovations due to a lack of a thrust role of the institutions, a weak support system of credit, differences in the demand (cultural problem / educational), fragmentation and localism of the supply being the structure of the Italian business essentially based on small / medium enterprises, cultural division between the geographical size. This leads to two speeds in innovation creating the risk of negative impacts on the whole economic system.

The correlation coefficient between the ethical and technological variable is, on average, 0.86 - which is very high - indicates a high correlation linear positive.

The countries of northern Europe and especially Scandinavia have shown a high level both technological and ethical, whereas Europe and the Mediterranean countries have shown a low level of ethics and technology. The Italian case is interesting because in the period considered with increasing technological level has not been a decreasing ethical level, but an inflation of it. Looking at the data for Italy, first it is evident that the decisions of governments and changes in the wider political atmosphere - can significantly influence, even in the short term, the perception and confidence of economic agents (Freeman, 1984; Pollifroni, 2007; Scavo 2003). However, regardless of economic policy, Italy is seen on average as a partner less reliable than other European countries.

Moreover the research has shown a new indicator that we have called "*ethics index of polarization*": it derives from the correlation between a basket of technological indicators and one of ethical indexes. It expresses a high correlation between the level of technology achieved by a country and its level of ethics: in particular, this research shows that the increase of investments in technology and related infrastructure implemented increases the ethical conscience and improves the value system of a country (Cafferata, 1995; Coda, 1989).

References

AEI Standard Ethics (February 2005), (Agenzia Europea di Investimenti Standard Ethics G.E.I.E.), *Nation Rating*, Bruxelles, Reports, AEI Research Department, Bruxelles: pp. 1-2.
AEI Standard Ethics (February 2006), (Agenzia Europea di Investimenti Standard Ethics G.E.I.E.), *Nation Rating*, Bruxelles, Reports, AEI Research Department, Bruxelles: pp. 1-2.
AEI Standard Ethics (July 2004)], (Agenzia Europea di Investimenti Standard Ethics G.E.I.E.), *Nation Rating*, Bruxelles, Reports, AEI Research Department, Bruxelles: pp. 1-2.
Anselmi L. (1995), *Il processo di trasformazione della Pubblica Amministrazione*, Giappichelli, Turin.
Bajjaly S. T. (1998), Strategic information systems planning in the public sector, *American Review of Public Administration*, N. 28.
Borgonovi E. (1996), *Principi e sistemi aziendali per le amministrazioni pubbliche*, EGEA, Milan.
Cafferata R. (1995), *Sistemi ambiente e innovazione. Come si integrano la continuità e il mutamento nell'impresa*, Giappichelli, Turin.
Carroll A. C. (1993), *Business & Society. Ethics and Stakeholder Management*, South Western, Cincinnati.
Chandler A. D. Jr. (1977), *The Visible Hand: The Managerial Revolution in American Business*, Harvard University Press, Cambridge, Mass.
Chandler A. D., Jr. (1990), *Scale and Scope: The Dynamic of Industrial Capitalism*, Belknap Press of Harvard University, Cambridge, Mass..
Coda V. (1989), Etica e impresa: il valore dello sviluppo, in Corno F. (a cura di), *Etica e impresa: scelte economiche e crescita dell'uomo*, Cedam, Padua.
D'Alessio L. (1989), *Il controllo di efficienza nelle aziende pubbliche*, Liguori, Naples.

Farneti G. (2000), *Il bilancio dell'ente locale – determinazioni preventive e consuntive*, Giappichelli, Turin.
Freeman E. R. (1984), *Strategic Management. A Stakeholder Approach*, Pitman, Boston.
Heeks R. (1999), *Reinventing Government in the Information Age*, Routledge, New York.
Ho A. (2002), Reinventing local government and the e-government initiative, *Public Administration Review*, N. 62.
Kettl D. F. (2000), *The Global Public Management Revolution: A Report on the Transformation of Governance*, Brookings, Washington, D. C..
Northrop A. (2002), Lessons for managing information technology in the public sector, *Social Science Computer Review*, Vol. 20, N. 2.
Parmigiani M. (2002), *La responsabilità sociale ed etica dell'impresa*, ARPA Rivista, Bologna.
Pollifroni M. (2003), *Processi e modelli di e-government ed e-governance applicati all'azienda pubblica*, Giuffrè, Milan.
Pollifroni M. (2007), *Public Sector Social Responsibility. Strumenti di rendicontazione etico-sociale per l'azienda pubblica*, Giuffrè, Milan.
Puddu L. (2008), *Bilancio IPSAS: Sistema Integrato di Rilevazioni e Principi Contabili Pubblici*, RIREA, Rome.
Rich A. (1993), *Etica Economica*, Editrice Queriniana, Brescia.
Rocheleau B. (1999), Prescriptions for public-sector information management, *American Review of Public Administration*, N. 30.
Rusconi G. (1997), *Etica e impresa. Un'analisi economico-aziendale*, Clueb, Bologna.
Sacconi L. (1991), *L'etica degli affari. Individui, imprese e mercati nella prospettiva di un'etica razionale*, Il Saggiatore, Milan.
Scavo C. (2003), *Public information technology: policy and management issues*, Idea Group Publishing Hershey, PA, USA.
Terzani S. (1984), Responsabilità sociale dell'azienda, *Rivista Italiana di Ragioneria ed Economia Aziendale*, luglio-agosto, 1984.