THE EFFECTS OF POLITICAL RISK AND CORRUPTION ON INOVATION – BASED COMPETITIVENESS

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Abstract: *Contemporary society is currently facing major global challenges of a transnational nature whose solutions can only be identified and implemented through collaboration with international organisations and national governments. The main challenge for which an immediate solution is needed is to identify solutions to support sustainable development. Sustainable development can't be sustained under conditions of political crises, corruption, imminent risks for which nations don't provide insurance against. This requires collaborative action between governments, international organisations, universities, NGOs and individuals. This paper focuses on one side on the influence of the most prominent obstacle, corruption by analysing its relationship with innovation-based competitiveness, and on the other side on the effects of political risk influencing innovation-based competitiveness. Specifically, the study carried out on corruption and political risk include many social, political and ethical indicators. The topic of debate presented in this study is closely related to the variation of the influence of the indicator of perception of corruption in the public sector on innovation-based competitiveness and the intensity of the relation between political risk and the decline of innovation-based competitiveness. The research of innovation database was collected from the Global Innovation Report 2018-2021, corruption database was collected from the Corruption Perception Index report 2018-2021 and Political Risk database was collected from the Political Risk Report 2018-2021. According to the results it was found that in most of the cases, nations with reduced level of corruption indicator are the most competitive nations in terms of innovation. For example, according to the analyzed period, Western European as well as Northern countries still maintain on the top positions in the analyses of the overall innovation index, corruption perception and political risk perception. This article accentuate the importance of the corruption indicator and political risk for European countries and the generated impact on innovation – based competitiveness.*

Keywords: *Innovation, corruption, political risk, sustainable development*
JEL Classification: F63, I15, I25, J17, O31, P51

Introduction

The international business environment faces multiple challenges. These challenges result from the intersection of the work of organisations with the action of internal or external factors under the impact of continuous changes in the international business environment. Recent years have brought major changes to society, characterised by the abundance of information we have access due to technology, the diversity of products and services, the opportunity for people to travel freely and express themselves freely. However, not all political systems have decided to apply development strategies similar to those implemented in developed countries.

In this regard, analysing the challenges and opportunities for development is a priority, as this can lead to (theoretical and practical) research that can be considered as a benchmark for foreign investors and entrepreneurs, economic analysts and political systems that haven't yet found solutions to exceed internal crises. Contemporary society has placed its trust and resources in the

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DOI: 10.29302/oeconomica.2023.25.1.2

competitive spirit of entrepreneurs who generate positive effects for the national economy. Since the 1990s, the competitive environment has been strongly influenced by new incentive and out - sourcing systems (Hood and Dixon, 2015). These reforms have been sustained by authorities such as the OECD.

The accelerating pace of change (whether technological change or changes related to increasingly demanding consumer requirements) is placing more and more emphasis on the correct interpretation of risks. Identifying and managing risks brings to the fore one of the most notable issues facing organisations today.

Like many other negative attitudes acquired by humans over time, corruption joins deception, lying, dishonesty and immorality in limiting economic development in a country. Corruption has historically challenged the socio-cultural, political and economic progress of a country and continues to cause major damage globally. Corruption is the most common problems of the modern era. It needs to be tackled, in theory and in practice, by experts with diverse professional backgrounds who can devise answers and obtain the relevant support from the public authorities.

The purpose of this paper is to analyse, at the European level, the relation between the terms that presents the general quality of the economic, political, social, and institutional environment - innovation, political risk and corruption.

The objective of the research is to underline the correlations over during 2018 – 2021 period across Europe between innovation-based competitiveness and the perceived corruption index, i.e. the political risk index.

Literature review

„The essence of risk is not that it happens, but that it might happen" (Adam et. Al., 2000). Risk is often defined as a probability that something will happen in the future. Unlike our ancestors, who believed that the future was determined solely by God's will or fate, today's generations believe that they can influence the future by managing risk. The possibility of undesirable events happening is an inherent part of life. Rowe (1975) defines risk as *„the probability of the realisation of negative, unintended consequences of an event or activity, being a measure of the severity of adverse effects."* Rescher (1983) considers that *„risk is the modification of an outcome. To measure risk, we must measure accordingly both its components and its likelihood of propagation."* On the other hand, Gratt (1987) considers that *„estimates of a risk are usually based on the expected outcome of the probability of the event occurring or the consequences of the event occurring."*

The concept of country risk has become increasingly present in geopolitical and economic research as well as in discussions generated at various scientific conferences. Managers confirm that country risk is dangerous unless thorough preparations are made to limit this risk. Country risk is the risk associated with investing in a foreign country. By definition, country risk is the condition in which the government of the host country fails to meet its obligations or other political, economic or financial commitments. Political and economic instability are two of the most important reasons for analysing country risk. In the vast majority of analyses carried out by specialists, one common factor of major importance is found in the analysis of country risk, namely **political risk**.

The political risk is an element of country risk report in order to analyse the causes and the effects of threats to an economy that aren't related to traditional factors. As Howell (1994) notes *„political risk refers to the possibility that political decisions or political events in a country may affect the business climate in such a way that investors suffer losses or fail to achieve the level of return they expected when the investment was made."* Most political risk analyses are driven by investor concerns following experienced events. Aimed at strengthening institutional capacity and promoting transparency, political risk analyses provide investors and entrepreneurs with information to help them manage their investments. Kobrin's (1978) research states that *„political risk results from actions by national governments that impede commercial transactions or alter the terms of agreements by seizing wholly or partially owned commercial property"*. Conklin (2002)

also considers that political risk encompasses a wide range of unethical governmental and political activities on business interests: *expropriation, imposed regulations, restrictions on foreign investment, tariff and non-tariff barriers imposed on imports, bribery and corruption*. From emerging to developed economies, international trade is increasingly susceptible to uncertainty and political risks threaten stakeholders. Today the global balance has shifted with a clear distinction between developing and developed countries. It has become imperative how to manage political risk, making it a major source of concern. In order to manage such a risk, several relevant indicators measuring the effects of political risk have been developed, one of which would be the Political Risk Index (The PRS Group, 2022). **The PRI (**The PRS Group, 2022) analyses factors that may represent a country's vulnerabilities in order to provide investors with access to information on political risk management and to draw attention to new trends in global politics. The PRI includes 17 components covering both social and political factors such as government stability, socio-economic environemt, investment profile, internal conflict and external conflict, bureaucracy quality. In the absence of political accountability, corruption becomes a major challenge, political leaders and institutions lose legitimacy and public trust, diminishing their ability to govern, thus undermining the foundations of society.

Corruption has historically challenged a country's socio-cultural, political and economic progress and continues to cause major damage globally. In the study by Wraith and Simpkins (1963), they liken corruption to *„weeds that choke the growth and development of carefully tended plants"*, linking plant growth and development to the internal environment of a society. They also argue that a corrupt society is like a *„jungle of nepotism and temptation''*, where the enthusiasm of the young entrepreneur is constrained, turning into cynicism, preventing *„attitudes of progress and development''*. A particular contribution on corruption is made by the political scientist Nye (1967) who defines corruption as *„conduct which deviates from the responsibilities normally assigned to a public official for personal reasons or for the optimization of income or social status; it may also act illegally in order to exert pressure for private gain"*. Nye states that the actions of a corrupt public official are manifested in *"abusive practices of influence, nepotism (allocation of positions, benefits not by professional merit but by personal relationships), embezzlement (illegal use of public funds for private use).''* As tools for analysing and measuring corruption worldwide, numerous indices have been developed to study the level of corruption in each country, the causes of corruption, influences and recommendations to fight corruption.

The Corruption Perceptions Index (CPI) is a benchmark which is presented in a report by Transparency International. It measures *„the perceived level of corruption in a country, as determined by expert assessments and opinion polls''.* There are some difference between European countries like the Northern region (Scandinavian countries, Denmark being a model of good practice in reducing the corruption level) and the Ex-comunist region. According to Transparency International's annual analysss, countries in the former communist bloc have a difficult bureaucratic model system, charged with bribery and fraud at the highest levels of the administrative hierarchy. As a solution, increased transparency and integrity in the public sector will create fewer opportunities for corruption. This manifests itself in higher levels of competitiveness and a strengthening of the rule of law. As a result, competition improves as anti-corruption measures are implemented and corruption is no longer a problem for trade and investment.

Innovation has been identified as the leading constituent that plays a fundamental role in a company's success in achieving a sustainable competitive advantage. The relation between innovation and competitiveness has received broad empirical support. Previous studies also support the idea that innovation has a significant positive effect on the competitiveness of companies in the business environment. Innovation is a component of competitiveness package for companies to generate profits sustainably. According to Schwab (2010) there are several components that can stimulate a company's competitiveness and the most important is innovation. At the same time,

according to Osterle, Hubert, et. al. (2001), consider that the main pillars of an organization's competitiveness are innovation and networks/connections. Innovation is an important stimulent that can boost competitiveness (OECD, 2001). According to Kuratko & Howard Frederick, (2016) innovation-based organizations can be a determinant of competitiveness.

Regarding to this research, the link between innovation-based competitiveness and corruption is one of the most important and recurring challenges of modern society and influence each other. In addition the macro-economic landscape is not the only component that stimulates economic growth, it is a general condition for improving innovation-based competitiveness. The correlation between political risk and innovation-based competitiveness is also analysed. Competitiveness is often described as the action of gaining a key position or some advantages by outperforming the direct adversary.

Methodology

This research proposes to analyse the relationship between the input variables (independent), the *Political Risk Index* and the *Corruption Perceptions Index*, and output variable, the *Global Innovation Index*, at the level of European countries. The analysis uses the baseline data provided by *Transparency International* on the *Corruption Perceptions Index*, the *PRS Group Political Risk Index* and the *WIPO on the Global Innovation Index*. The type of research is exploratory, namely to confirm or refute a correlation of the input variables and out variable applied at European level. The research is focused on 21 countries in Europe. The research examines the correlation between innovation, corruption and political risk at European level.

The working hypothesis assumes a positive correlation between the innovantion and the corruption and risk. In order to establish the validity of the research hypothesis, the statistical correlation between the three variables is analysed. The data analyzed are for the 2018 - 2021 period and the general subject of the discussion and result presents future research in the nature of the perspective of the correlation between innovation and the two corruption respectively political risk.

Data collection and validation

The research of the data about Innovation factor was collected from the *WIPO Report*, the data about Corruption was collected from the Corruption Perception Index analysis and the data about *Political Risk* was collected from the *PRS Group Report*. The nature of the research is exploratory, in order to confirm or decline the presence of a correlation between the input variables *„Corruption Perception Index"* and *„Political Risk Index"* and the output variable *„Global Innovation Index"* at the level of the European area as a whole.

Definition of indicators

The Global Innovation Index (GII) gather the innovation ecosystem of 132 countries and present the innovation trends. The GI Index uses around 80 indicators, including data about ***knowledge creation, infrastructure, political environment***, and ***education*** of each country. The results and the interpretation of the GII offers support to investors and benchmark developments against economies within the same region.

The Corruption Perception Index (CPI) is a socio-economic indicator analyzed in an annual report written by Transparency International. It measures the *perceived level of corruption in a country, established by expert assessments and opinion polls.* " The Corruption Perceptions Index is one of the most popular tools used by investors for analysis. It is a complex indicator, which is based on corruption analysis through surveys conducted by several independent institutions. The surveys used to construct the CPI ask questions about factors that determine corruption such as fraud, bribery, money laundering focusing on public authorities or questions about the anti-corruption policies, thereby determining both political and administrative corruption.

The **Political Risk Index (PRI)** is a general indicator of risk for an national economy, calculated by using 17 risk components from the PRS Methodology including direct investment, tax

levels and bureaucratic system, and export - inport markets. PRS Country Reports analyses events that can destabilize the domestic market, the actions of key political figures, but also develops forecasting scenarios based on the historical national context including the operational functions of government, public authorities, the social environment and the economy as well as other key sectors.

Preliminary data validation

The validation of the model is demonstrated by the numbers of data expressed in the sample. The model is valid, if the sample contain a minimum of 30 data, thus in this case the model is valid because the model has 84 data analyzed.

Table 1. **Descriptive statistics**

GII		*CPI*		*PRI*	
Mean	50.0925	Mean	66.77380952	Mean	81.38095238
Standard Error	0.926715399	Standard Error	1.69474494	Standard Error	0.599029805
Median	49.36	Median	70	Median	83
Mode	57.3	Mode	85	Mode	83
Standard Deviation	8.493486927	Standard Deviation	15.53259394	Standard Deviation	5.490198851
Sample Variance	72.13932018	Sample Variance	241.2614745	Sample Variance	30.14228342
Kurtosis	-0.890465168	Kurtosis	-1.479031483	Kurtosis	-0.758055068
Skewness	0.206736992	Skewness	-0.151374511	Skewness	-0.611695377
Range	32.8	Range	46	Range	20
Minimum	35.6	Minimum	42	Minimum	69
Maximum	68.4	Maximum	88	Maximum	89
Sum	4207.77	Sum	5609	Sum	6836
Count	84	Count	84	Count	84

Results and discussions

We proposed the *Global Innovation Index (GII)* as the output variable (dependent) *„Y"* , the *Corruption Perception Index (CPI)* as the first input variable (independent) *„X1"* and the *Political Risk Index (PRI)* as the second input variable (independent) *„X2"*.

Sigma rule

With the 3 sigma rule we can find out if the overall data distribution is useful by checking and removing outliers. If values outside this range appear in the present sample, they must be removed.

Table 2. **Sigma rule**

GII (Y)	CPI (X1)	PRI (X2)
$Yi \in (Y \pm 3\sigma\gamma)$	$X1i \in (X1i \pm 3\sigma\gamma)$	$X2i \in (X2i \pm 3\sigma\gamma)$
$24.61 \leq Yi \leq 75.57$	$20.17 \leq X1i \leq 113.37$	$64.91 \leq X2i \leq 97.85$

✓ **Valid data regarding to the 3 sigma rule**

Since no value exceeds the limits (upper and lower limit) imposed by the 3 sigma rule, all data will be kept in this form.

Regression model

Table 3. **Regression between the GII (output variable) and the CPI respectively PRI (input variables)**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,8841427
R Square	0,78170831
Adjusted R Square	0,77631839
Standard Error	4,01699383
Observations	84

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	4680,528181	2340,264091	145,0315671	1,70219E-27
Residual	81	1307,035394	16,13623943		
Total	83	5987,563575			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	15,2877	6,845263127	2,233325393	0,028285731	1,667773537	28,90762638	1,667773537	28,90762638
CPI	0,476227	0,033855983	14,06625831	1,88053E-23	0,408864214	0,543589786	0,408864214	0,543589786
PRI	0,0369289	0,095783641	0,385544961	0,700844378	-0,1536505	0,2275083	-0,1536505	0,2275083

- ✓ **Forms, variables and parameters of the regression model**

At the European level the analysis shows a strong and statistically significant link between the Corruption Perceptions Index and the Global Innovation Index. In contrast, the link is statistically insignificant between the Political Risk Index and the Global Innovation Index at the same European level.

- **Theoretical basis:**

Yi $= \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \varepsilon_i$ (1)

$Y_i(GII) = \beta_o + \beta_1 \cdot Corruption\ Perception\ Index + \beta_2 \cdot Political\ Risk\ Index + \varepsilon_i$ (2)

Where:

Y_i – Global Innovation Index (GII)

X_1 – Corruption Perception Index (CPI)

X_2 – Political Risk Index (PRI)

- **In the sample of the 21 countries:**

$Y_i = b_0 + b_{1X1i} + b_{2X2i} + \varepsilon_i$ (3)

$Y_i(GII) = 15.2877 + 0.476227 \cdot Corruption\ Perception\ Index + 0.0369289 \cdot Political\ Risk\ Index + \varepsilon_i$ (4)

If the CPI **increases** or **decreases by** 10 points then the GII changes by the value of the coefficient X_1, which means $0.476227 \cdot 10 = 4.76227$, while the other factors remain constant.

If the political risk index index increases or **decreases by** 10 points then the GII changes by the value of the coefficient X_2, which means $0.0369289 \cdot 10 = 0.369289$ when the other factors remain constant

According to the results we ask if inovative economis have different levels of political risk and corruption. In addition, we want to define the correlation that analyzes the impact of the political risk and corruption on innovation.

We used **DataAnalysis** menu to calculate the regression coefficient for determining the correlation between GII, (output variable) and CPI respectively PRI (input variables), according to the 2018 – 2021 period, both at EU level.

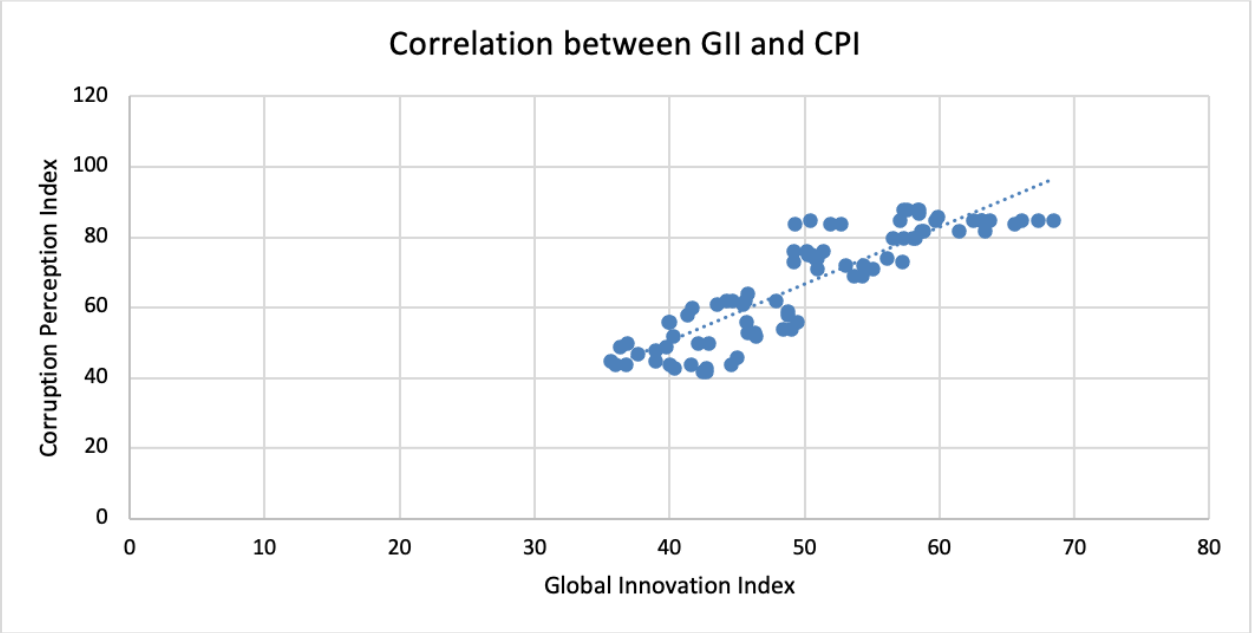

Fig. no. 1 Correlation between GII and CPI

The graph shows that the correlation between GII and CPI at European level expresses a direct dependence between the output variable (dependent) Y (GII) and the input variable (independent) X1(CPI): The regression line shows that innovation increases with the growth of the corruption perception index. These results show a significant correlation of at least medium intensity between corruption and innovation in most European countries, making it necessary to adopt measures to reduce it.

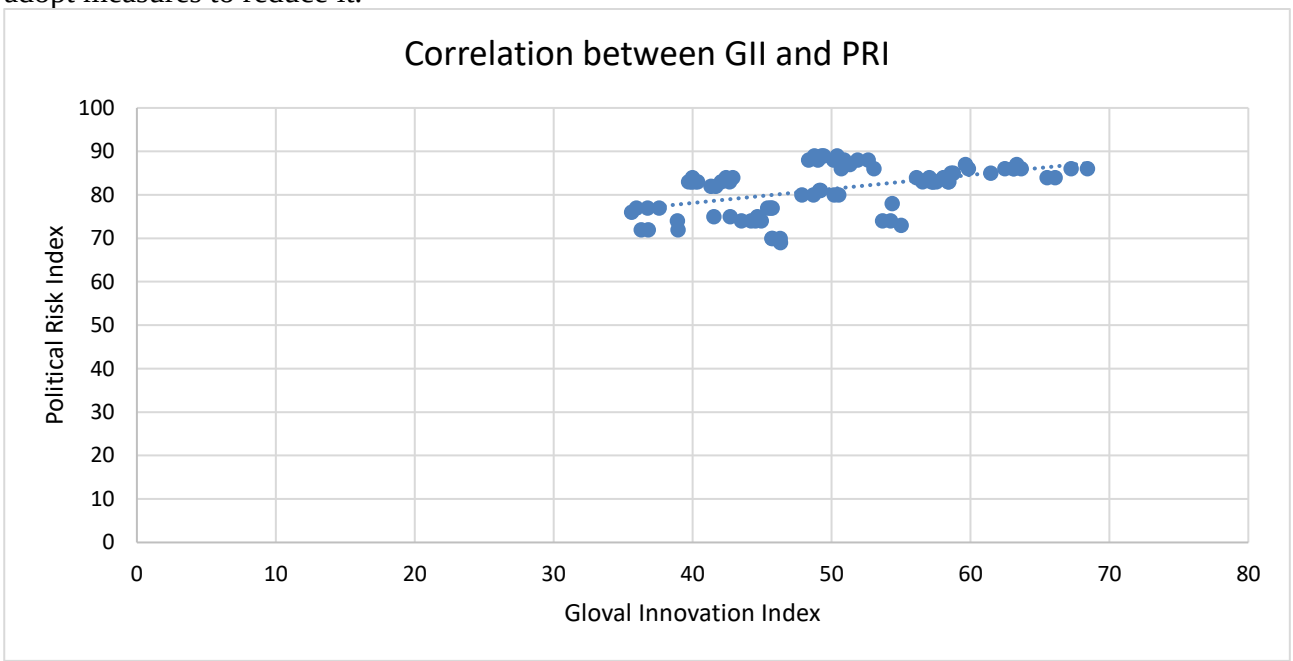

Fig. no. 2 Correlation between GII and PRI

Plotting the correlation between political risk and innovation at the European level shows that there is a weak dependence between the output variable (dependent) Y (GII) and the out variable (independent) X2 (PRI): the regression line shows an increase in innovation as the political risk index improves. These results show an insignificant weak link between political risk and innovation.

Conclusions

While in the past, political risk was often conceptualised in terms of hostile action by host governments, today the significance of political risk has increasingly attracted the interest of researchers in various fields. The current approach to political risk focuses on the social component, i.e. citizens' satisfaction.

Corruption is clearly an obstacle to economic growth. Corruption creates uncertainty in the business environment, slowing down activity and generating additional costs. This makes the society less attractive to foreign investors and thus to doing business, the level of private investment and competitiveness will decrease accordingly, and the economy will not be able to realise its full potential.

We can systematise the concept of innovation as a defining element of the century in which we live, and it can be found in various economic fields. Today, innovation-based competitiveness means a connection between individuals, organisations and countries. Innovation is successfully a goal that should be taken up by every nation.

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Annexes

Retrieved data from the Reports on the Global Innovation Index, the Corruption Perception Index and the Political Risk Index

Countries	2018			2019			2020			2021		
Index	GII	CPI	PRI	GII	CPI	PRI	GII	CPI	PRI	GII	CPI	PRI
Austria	51.32	76	87	50.94	71	87	50.13	76	88	50.9	74	88
Belgium	50.5	75	80	50.18	75	80	49.13	76	81	49.2	73	81
Bulgaria	42.65	42	83	40.35	43	83	39.98	44	84	42.4	42	84
Czech Republic	48.75	59	89	49.43	56	89	48.34	54	88	49	54	88
Denmark	58.39	88	83	58.44	87	83	57.53	88	83	57.3	88	83
Finland	59.63	85	87	59.83	86	86	57.02	85	84	58.4	88	84
France	54.36	72	78	54.25	69	74	53.66	69	74	55	71	73
Germany	58.03	80	84	58.19	80	84	56.55	80	83	57.3	80	83
Greece	38.93	45	72	38.9	48	74	36.79	50	72	36.3	49	72
Hungary	44.94	46	74	44.51	44	74	41.53	44	75	42.7	43	75
Ireland	57.19	73	83	56.1	74	84	53.05	72	86	50.7	74	86
Italy	46.32	52	69	46.3	53	70	45.74	53	70	45.7	56	70
Netherlands	63.32	82	87	61.44	82	85	58.76	82	85	58.6	82	85
Norway	52.63	84	88	51.87	84	88	49.29	84	89	50.4	85	89
Poland	41.67	60	82	41.31	58	82	39.95	56	83	39.9	56	83
Portugal	45.71	64	77	44.65	62	75	43.51	61	74	44.2	62	74
Romania	37.59	47	77	36.76	44	77	35.95	44	77	35.6	45	76
Slovakia	42.88	50	84	42.05	50	83	39.7	49	83	40.2	52	83
Spain	48.68	58	80	47.85	62	80	45.6	62	77	45.4	61	77
Sweden	63.08	85	86	63.65	85	86	62.47	85	86	63.1	85	86
Switzerland	68.4	85	86	67.24	85	86	66.08	85	84	65.5	84	84