

Erste Innovation Barometer 2013

Tomáš Drvoštěp, Jan Jedlička, Tomáš Kozelský
EU Office České spořitelny

EU OFFICE

Česká spořitelna, a.s.
Budějovická 1518/13a
140 00 Praha 4
tel.: +420 956 718 012
fax: +420 224 641 301
EU_office@csas.cz
<http://www.csas.cz/eu>

Jan Jedlička

+420 956 718 014
jjedlicka@csas.cz

Iva Dlouhá

+420 956 718 015
idlouha@csas.cz

Jana Majchráková

+420 956 718 012
jmajchrakova@csas.cz

Tomáš Kozelský

+420 956 718 013
tkozelsky@csas.cz

WHAT IS THE ERSTE INNOVATION BAROMETER?

Index purpose and objective

The Česká spořitelna EU Office has prepared the Erste Innovation Barometer, a tool, which is a guide for comparing the attractiveness of all 28 economies in the EU from the point of view of their future competitiveness and innovative capabilities. The current phase of advanced globalisation shows that if individual European economies want to succeed in the increasingly strong international competitive environment, they must focus on innovation, research, the information society, knowledge-based economy and products with high value added. The Erste Innovation Barometer measures how successful this effort is.

The Erste Innovation Barometer consists of nine statistics, which determine a country's competitiveness, innovation potential and future prosperity. An important part of the Innovation Barometer is its dynamic dimension, based on the results of which it is possible to evaluate whether the potential for innovation in the particular country has developed positively or instead has been dominated by negative aspects. For this purpose, the index has been calculated retroactively starting from 2010. The Erste Innovation Barometer is not only a one-time analysis, but will be re-figured each year in reaction to changing key characteristics.

Monitored areas

As has already been stated, the Erste Innovation Barometer is comprised of nine indicators. Their selection has been governed by a few rules. First of all, the statistics must be relevant from the point of view of economic competitiveness. A few areas were identified, which determine the innovative potential of each economy and among them the most representative statistics were found. An important role during selection of statistics was also played by their availability for all 28 EU member states, along with the option of regular updating and in particular high credibility. All of the statistics must originate from a renowned institution, so that the data is not questionable.

R&D expenditures

In each publication devoted to a country's competitiveness, the key indicators include expenditures for research and development, and therefore these characteristics are not missing in the Erste Innovation Barometer either. The data are monitored by Eurostat and involve total expenditures of the public and private spheres directed towards research and development in relation to the particular economy's GDP.

Number of patents

A greater focus on innovation and competitive production with high value added also determines the number of patents, i.e. exclusive rights to industrial use of inventions registered by entities in the particular economy. Therefore, we have included in the Erste Innovation Barometer the indicator of applications for patent protection according to the patent applicant's country of origin.

This is the total number of applications for granting international patents within the Patent Cooperation Treaty per 1,000 inhabitants according to the applicant's country of origin. The source of the data is the World Intellectual Property Organisation.

Technical university graduates

A country that wants to be successful over the long term in international competition must also focus on developing a knowledge-based economy. Its major bases for measurement include the number of university graduates with technical majors, and the more of these there are, the better the conditions are created for greater orientation in knowledge-based economy.

Therefore, we have included in the Erste Innovation Barometer the indicator of university graduates in mathematical, scientific and technological fields per 1,000 inhabitants between ages 20 and 29. The data originates from Eurostat statistics. The higher these expenditures are, the better conditions are created for an increase in the country's competitiveness and strengthening of its innovative potential.

List of included variables

Statistics	Description	Unit	Source
R&D expenditures	Total R&D expenditures as of GDP	%	Eurostat
Number of patents	Number of patent applications per 1,000 inhabitants by country of origin	pcs	WIPO
Technical university graduates	Number of graduates in mathematics, science and technology per 1,000 inhabitants aged 20-29	pcs	Eurostat
Citable publications	Number of citable publications per 1,000 inhabitants	pcs	SCImago
Venture capital investments	Venture capital investments in seed- and start-up companies as of GDP	%	EVCA
Households with broadband internet connection	Percentage of households with broadband internet connection	%	Eurostat
Public expenditure on education	Total public expenditure on education as of GDP	%	Eurostat
High-technology exports	High-technology exports as of all exports	%	Eurostat
E-government usage	Percentage of individuals that in the last year interacted with public authorities via internet	%	Eurostat

Source: EU Office; WIPO - World Intellectual Property Organisation, SCImago = agency SCImago Journal & Country Rank, EVCA = European Private Equity and Venture Capital Association

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Citable publications

A greater focus on knowledge-based economy and innovations to a significant extent also determines the number of citable articles, reviews and conference papers (meaning those, which were cited in corresponding documents due to their significance). This statistic is monitored by the SCImago Journal & Country Rank agency, and for possible comparisons among various large states, we relate this number of citable publications by authors from each country to 1,000 inhabitants of the particular country.

Venture capital investments

Several successful companies creating products and services with high value added at the time of their establishment could not due to high risks rely on standard external financing and were supported by capital injections from venture capital funds.

We can state that higher investments of venture capital funds into starting companies (often from progressive sectors such as ICT, bio-technology, nano-technology, etc.) create conditions enabling easier development of innovatively focused companies and through mediation also competitiveness of the entire economy. Therefore, we have included the statistics from the European Private Equity and Venture Capital Association regarding the volume of venture capital fund investments into seed- and start-up companies compared to GDP of the economy receiving the investments.

Households with broadband internet

Each economy's innovative potential is also determined to a certain extent by equipping of entities with modern IT and communications resources. Their more widespread implementation and use also reflects a better perspective for countries in the future. In the interest of presenting this factor, the Erste Innovation Barometer also includes statistics from Eurostat monitoring the share of households equipped with broadband internet connection.

Public expenditure on education

The volume of expenditures directed towards the education system is also tied to development of a knowledge-based economy and indirectly also to the competitive ability of a country to succeed on international markets. Therefore, the Erste Innovation Barometer is enhanced with data from Eurostat, which monitors public spending for all three education levels – primary, secondary and tertiary – in relation to the particular country's GDP.

High-technology exports

Each country's ability to compete on demanding global markets is also reflected in foreign trade statistics, which monitor the volume of each country's high-tech exports. An inseparable part of the Erste Innovation Barometer is the share of high-tech exports in the particular country's overall exports, as monitored by Eurostat. A higher number means that the particular country is focused more on products with high value added and can succeed with them on global markets.

E-government usage

The knowledge-based economy and the information society can be attributed to a certain extent not only to the extent of ICT infrastructure, but as well to the degree and purpose of its use. A good way of measuring this characteristic is to examine the offering of e-government services and their real use by entities in the particular country. Therefore, another indicator of the Erste Innovation Barometer is the percentage share of individuals who in the last twelve months have communicated with public administration bodies via the internet. The higher this share of people is, the more e-government is used and the more innovative and knowledge potential the country has. The statistics originate from Eurostat.

Methodology in a nutshell

Following data collection, the statistics were converted to dimensionless numbers from 0 to 100. The worst results registered 0, while the results that are very advantageous for competitive ability were given 100 points. In order to avoid extremes, the results were limited to a distance of two standard deviations from the arithmetic average in the entire European Union. The resulting index is the direct unweighed average of all points. The index measures the competitive ability of the included 28 EU member states not in an absolute value, but in a relative value. If a country in the included indicators improves less than to the extent that the entire EU average improved, it will drop to a lower position.

Erste innovation barometer 2013 - overall results

Without structural changes, the countries of CEE will never catch up economically with their Western counterparts

In the past twenty years, with intensity since the greatest enlargement of the EU in 2004, we witnessed in Europe a shift of capital and production capacities from Western Europe to former Communist countries of Central and Eastern Europe (CEE) and to South Eastern Europe (SEE).

Companies' motives were obvious; cheaper labor costs, lower costs of other inputs and lower taxes. These advantages often outweighed shortcomings such as more bureaucracy, less developed infrastructure, higher instability of the legal environment and overall higher risk.

The massive influx of capital to CEE and SEE countries led to significant growth of their economies and living standards and supported the process of economic convergence in relation to Western Europe and the EU average as a whole.

The first cracks appeared in this so far functioning model when the financial crisis erupted in 2008, and now it appears certain that the "low-cost" game will not lead to long-term prosperity or put these countries' economies on par with economically developed Western Europe.

An even cheaper economic environment is offered by other Eastern European countries as well as countries in Southeast Asia, to where a number of production plants have been relocated recently from Central and Eastern Europe, to which they had been relocated a decade or earlier before.

In order for CEE and SEE countries to maintain their competitive advantage, they must resort to structural reforms and refocus their economies on production of products with higher value added, on the knowledge-based economy and on greater use of innovations, bigger investments into education, research and development, etc. How well they achieve this, if they do at all, will be shown by the Erste Innovation Barometer. The unfavourable results in CEE and SEE countries reflect the fact that only two countries made it to the first half of the 28 countries monitored in the Erste Innovation Barometer: 10th Estonia and 13th Slovenia. The other countries remain in the second half, where the Erste Innovation Barometer ladder measuring competitiveness is finished off by penultimate Romania and the last Bulgaria.

These countries' poor result is not the result of a failure in a few little monitored categories, but rather across all of the relevant statistics, with occasional exceptions. Besides Slovenia and Estonia, the countries of Central, Eastern and South-eastern Europe lag behind in investments into science and research. In the category monitoring patent protection for inventions, not even a single country from those regions fared better than the EU average. If it were not for Slovenia, we could say the same thing about the indicator of the number of quoted publications and about the investments from venture capital funds into start-up companies, with Hungary as the only successful country.

Hungary, along with the Czech Republic and Estonia are global exceptions in terms of the number of exports of high-tech products, with which they can somewhat compete with Western European countries. With the exception of Estonia and partially also Slovenia and Latvia, CEE and SEE countries are so far in their beginning phase with the use of e-government, which certainly is not aided by the below-average number of households with broadband internet connections.

Erste Innovation Barometer - Δ points in 2010 \rightarrow 2013

Country	Δ points	Country	Δ points
1. Estonia	+10.7	15. Germany	-0.0
2. Hungary	+6.3	16. Croatia	-0.7
3. Slovenia	+5.7	17. Greece	-1.2
4. Slovakia	+4.6	18. Romania	-2.1
5. Lithuania	+4.4	19. Portugal	-2.1
6. Ireland	+3.6	20. Cyprus	-2.9
7. Latvia	+2.9	21. UK	-3.0
8. Spain	+2.3	22. the Netherlands	-3.5
9. Bulgaria	+0.5	23. Denmark	-3.6
10. Austria	+0.5	24. Luxembourg	-4.1
11. Poland	+0.5	25. Italy	-4.1
12. CR	+0.4	26. Belgium	-5.2
13. France	+0.3	27. Sweden	-5.2
14. Malta	+0.0	28. Finland	-7.6

Source: EU Office

Nonetheless, the single category in which the countries of Central, Eastern and South-Eastern Europe are not lagging behind their Western counterparts significantly is the share of university graduates with technical majors. This is true even though the volume of public resources invested into education is much lower than in the rest of Europe.

Scandinavia as the driving force of competitiveness and prosperity

The Erste Innovation Barometer has confirmed that the cradle of competitive and innovative strength in Europe is located in its northern part. During all four monitored years, the first trio has not changed, and in 2013 the order is 1st Sweden, 2nd Denmark and 3rd Finland. The differences among these countries are minimal. This is true both in the current year and for all other three monitored previous periods 2010–2013. Something very significant is the obvious and consistent distance from the rest of Europe.

And what is the cause of such excellent results in Scandinavian countries? Simply everything, well nearly everything. An exception from strongly above-average performance is represented only by one indicator. In the share of exports with high-tech products, the Scandinavian trio achieves only average or slightly above-average results. For other indicators, the commentary is very clear – Scandinavian countries always achieve above-average results (one only exception could be the average number of technical university graduates in Sweden and high-tech exports from Finland and Denmark).

The Scandinavian model remains even in the "post-crisis" period an example for other European countries, whether from Western Europe or from Central, Eastern and Southern Europe. And this was not affected by the fall from grace of the so far corporate flagship of the region, mobile phone maker Nokia.

Celtic tiger plans a comeback, France is more competitive than Germany

The "potato medal" for 4th place in the Erste Innovation Barometer ladder goes to the Netherlands which, with the exception of a low share of university graduates with technical majors reports above-average results in all of the monitored categories. The land of tulips and wind mills beats 5th place holder Ireland by a hair.

Ireland is one of five states relying on assistance from European rescue mechanisms, but due to the conditions for growth of competitiveness and innovative potential, we predict that it will leave the position of problematic "peripheral" Eurozone economies in years to come and will again become the "Celtic Tiger". The country does not have a major weak spot, and for an even better position in the Erste Innovation Barometer ladder the so far below-average share of households with broadband internet connections should increase.

Besides its absolute position this year the hope for a future restart of Ireland because in the past four years, Ireland has been improving continuously, while in 2010 it held seventh place. Something interesting is the sixth place position occupied by France. Due to unfavourable growth outlooks and the situation in public finances, France is called as another "sick man of Europe". However, from the point of view of innovative potential, it is not bad at all. France produces the largest number of university graduates in technical majors per 1,000 inhabitants between ages 20 and 29 in the entire EU. However, French authors of professional publications have a lot of room for improvement. The number of citable documents is the only category in which the country is below the EU average.

Germany's position is also interesting, although with the opposite characteristic. The current leader and driving force of Europe ended up way down in 8th place. Economic prosperity will be determined increasingly in the future by the knowledge-based economy and science and research, and for maintaining the German economic hegemony, it will be important for Germany not to fall behind in these areas.

Public finances are not the main problem for Greece or Italy

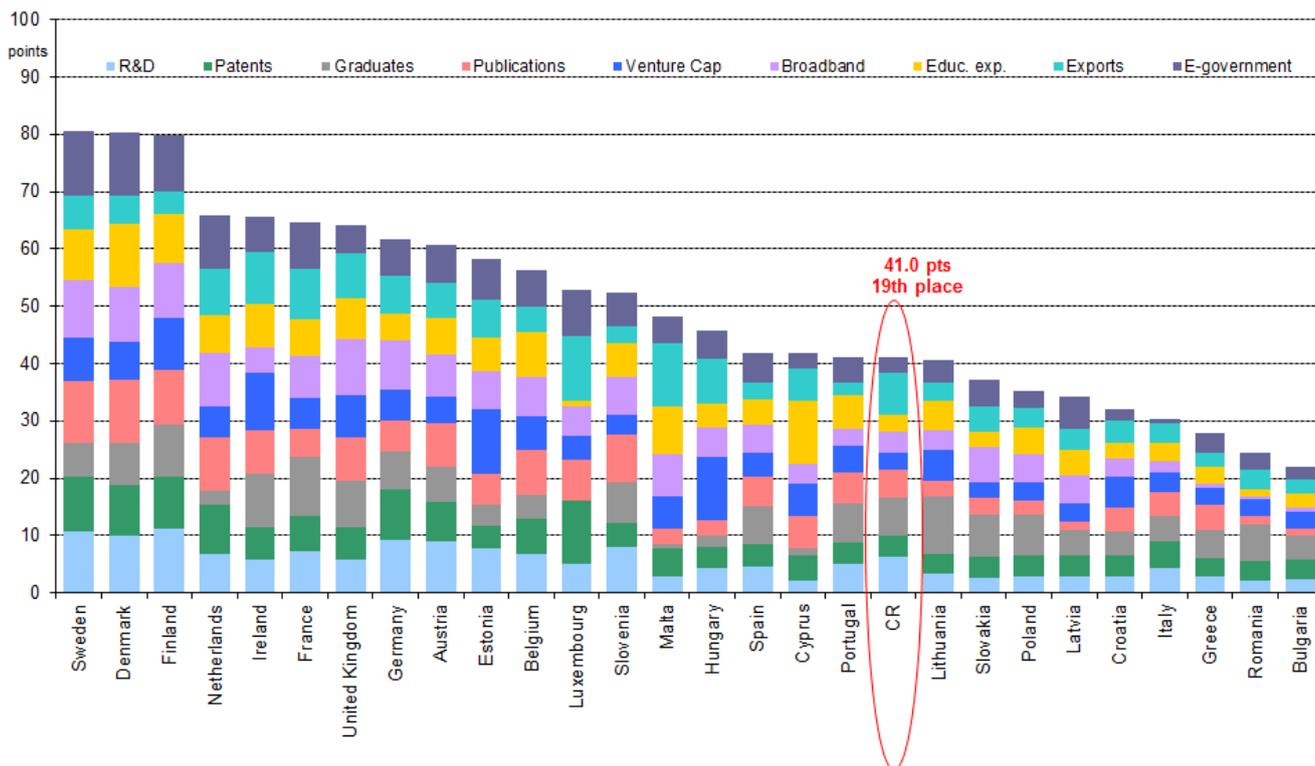
The results of the Erste Innovation Barometer 2013 have even proved wrong one cliché that Greece and Italy primarily suffer from a crisis of public budgets. Yes, the public treasuries in both states are not exactly overflowing with euros, but this is a consequence rather than a cause. The main reason for weak public finances is insufficient economic growth due to structural causes. Values above the European average were not reported in any of the nine monitored statistics for these countries.

In certain indicators, the countries were the absolute weakest in the entire EU 28. This is the case of Italy as with the lowest number of individuals who communicate with public administration bodies via the internet (less than every fifth

person) and in case of Greece the lowest number of registered patents per 1,000 inhabitants. Both countries differ in development over time. Greece suffers from long-term stagnation in 26th place, whereas Italy is suffering from a worsening trend. While in 2011 Italy held 21st place, its position worsened in the next two years, and now it holds 25th place.

The situation is alarming particularly in Italy, because if the country does not implement structural reforms to strengthen the country's competitive ability and innovation potential, it will become another victim of the debt crisis and another client of the European Stability Mechanism.

Erste Innovation Barometer 2013



Erste innovation barometer - Context

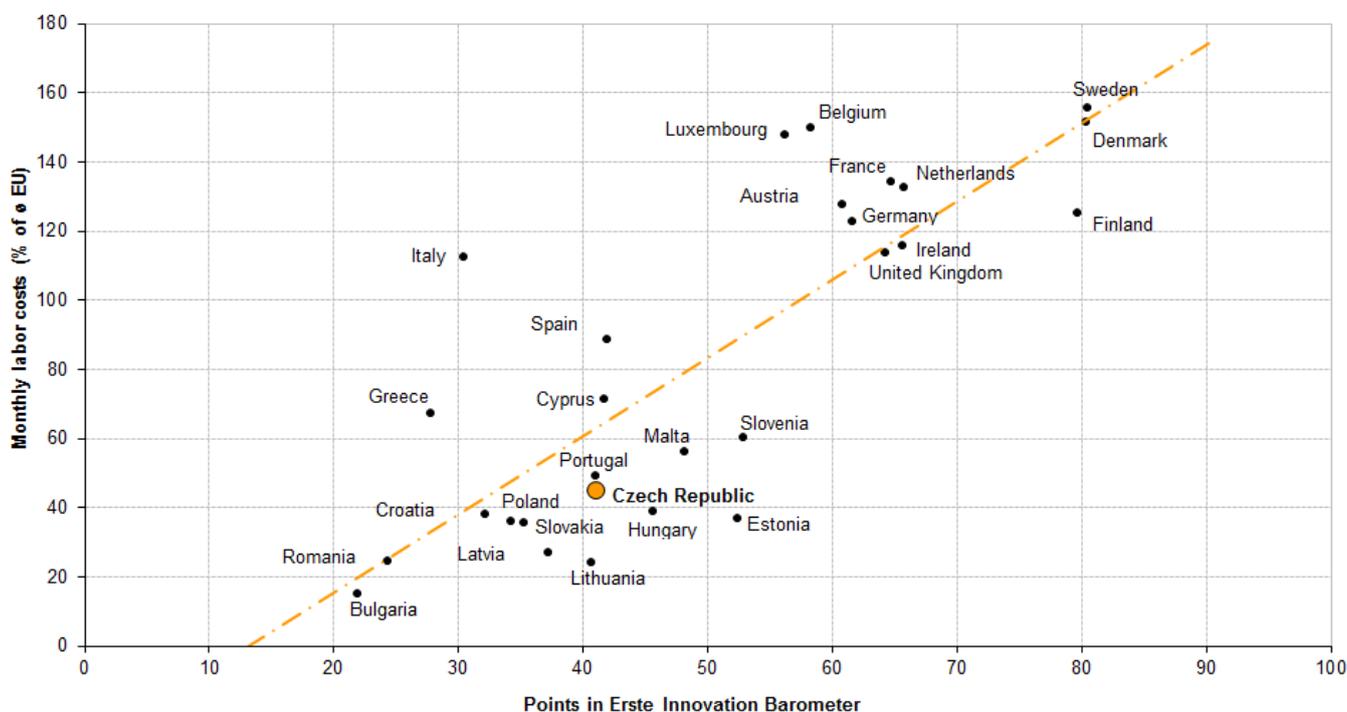
Link between labour costs and Erste Innovation Barometer

The Erste Innovation Barometer provides an overview of the innovation capabilities and future competitiveness of each EU member state, but it also reveals certain interesting details. Individual states that want to succeed in global economic competition must take the path of low input or increase their innovation potential.

If we compare the monthly costs of labour in the business sector and the results of the Erste Innovation Barometer 2013, we will discover a strong correlation (see graph below). In the lower left part of the graph, there is a group of countries, mostly from the region of Central, Eastern and Southern Europe, which thanks to their innovation potential focus mainly on production of goods with lower added value. In order for these states to remain attractive for investors, they cannot afford to pay lower wages or overall HR costs. Partially excluded from this group are Italy, Greece and Spain, where local labour costs are higher than costs that would correspond to these countries' innovation potential. This could be one of the explanations of their lagging competitiveness and current debt difficulties. However, shown in the upper right are countries of Western Europe and Scandinavia, which, despite their much higher labour costs, due to their current high competitiveness cannot afford such an approach.

An analysis of the Erste Innovation Barometer and Labour Costs tell us that a condition for increasing wages and/or overall labour costs is that the country's innovation potential also be increased: greater investments into education, developed information society, advanced knowledge economy, effective research and development, etc.

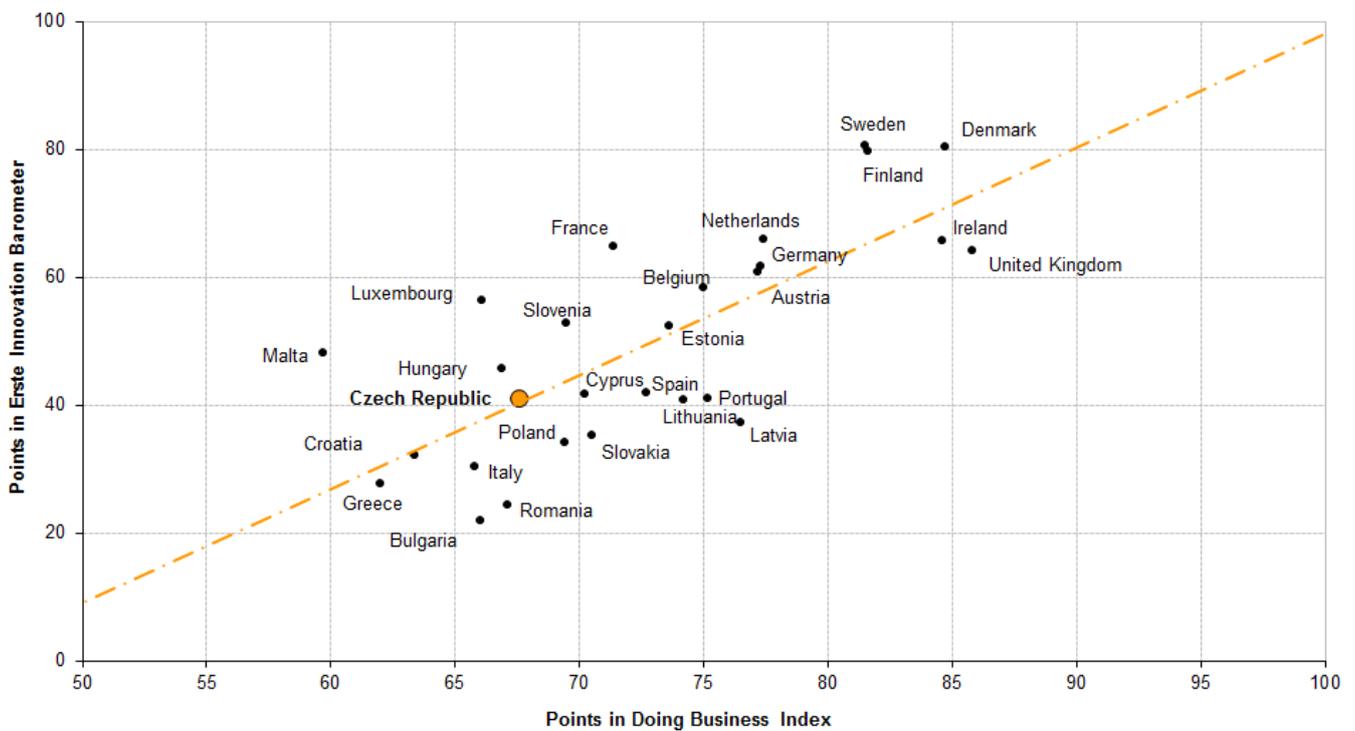
Monthly labor costs and Erste Innovation Barometer



Link between Erste Innovation Barometer and public administration performance

Our analysis has also shown a strong relationship between the performance of public administration measured by the World Bank's Doing Business Index and innovation potential. The relationship is positive and reveals that the states with effective public administration and low bureaucracy levels and which are most successful in the Doing Business Index are countries with greater innovation potential. Based on this relationship, we can state that essential conditions for increasing of a country's innovation potential and future competitiveness are effective public administration and minimisation of bureaucratic burden for the business sector.

Erste Innovation Barometer / Doing Business Index



Erste Innovation Barometer – results for the Czech Republic

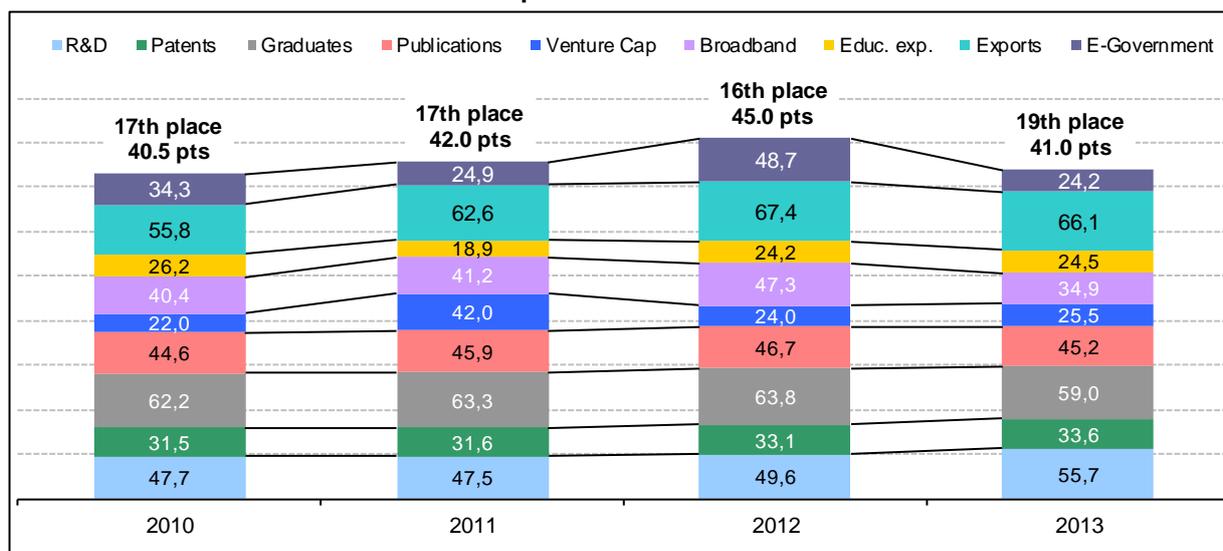
Czech Republic – greater competitiveness is being held down by below-average spending on education

The data for the Erste Innovation Barometer 2013 have confirmed that the Czech Republic in its effort to increase its future competitiveness and innovative strength still has some catching up to do. Of the 28 EU member states, the Czech Republic finished in 19th place with a below-average score of 41.0 points (the average value is 50 points). Compared to the previous year, the CR even worsened by 3 places on the ladder.

Significant driving forces of the country's future prosperity include the share of university graduates in technical fields in the population between ages 20 and 29. In that category, the Czech Republic achieved the 12th best result in the EU with a value of 16.6 graduates per 1,000 inhabitants. The Czech Republic achieved an even better position, 8th place, for relatively high shares of exports of high-tech products in overall exports.

The Czech Republic is also among the countries that do not underestimate spending on research and development. According to current figures, the Czech Republic is the 11th country in the ladder of the highest investments into research and development in relation to its GDP. A major obstacle for the country in relation to the knowledge-based economy according to the Erste Innovation Barometer is low public spending on education. In terms of that indicator, the Czech Republic is in 24th place in the EU with spending amounting to 4.24% of GDP (the EU average is 5.44%).

Erste Innovation Barometer for Czech Republic in 2010-2013



Source: EU Office České spořitelny

For increasing the innovative strength of the Czech economy, it is also necessary to increase the use of e-government significantly. According to Eurostat statistics, in the last 12 months only 30% of citizens communicated with public administration bodies via internet, and worse results were achieved only by three EU member states. Another barrier to increasing of the country's future competitiveness is insufficient involvement of venture capital funds in financing of starting companies, which often do business in progressive areas with high value added (ICT, bio-technology, nano-technology, etc.) and for which it is often difficult to receive standard debt financing.

In terms of time development, the Czech Republic in this year's evaluation worsened by three places on the ladder, from last year's 16th place to the current 19th place. The main reason is the decline in categories that are among the major weak spots in relation to economic competitiveness: for example - the share of citizens who use e-government services and graduates with technical majors. The overall worsening result has not been overcome even by spending on research and development, which in a year-on-year comparison grew.

Conclusion

The Erste Business Index is an ideal tool for quick comparison of all 28 EU member states to get an overview of the future competitiveness and innovation strength of their economies and consists of nine relevant areas. The European Innovation Barometer for 2013 has yielded certain interesting findings, such as those related to the fact that labour costs are directly linked with a country's innovation capacity measured by the Erste Innovation Barometer.

This comparison has delivered an important message to states in Central and South-eastern Europe: "If you want to increase your average wages and indirectly also your living standards in the future, you must increase your innovation abilities. Otherwise you can end up experiencing serious macroeconomic problems like states in Southern Europe, where labour costs do not correspond to economies' innovation potential."

Although Central and South-eastern European countries have managed to attract important foreign investors, in order for them to remain and move up on the value chain, they must offer more than low taxes, low business starting costs and cheap labour. Most of these countries lag behind in relevant statistics measuring competitive abilities of the economy, innovation potential, development of the knowledge economy and information society and the quality of human capital. If these countries do not make significant structural reforms soon focused on strengthening in the specified areas, there is a risk that the process of catching up economically with Western Europe will stall, and these states will remain the poorer ones in Europe.

The results of the Erste Innovation Barometer 2013 have confirmed that the EU's future competitiveness likes in Scandinavia. Three Scandinavian states in 2013, 1st place Sweden, 2nd place Denmark and 3rd place Finland, did better than the other EU countries in more or less all categories. Their distance from the fourth-place country, the Netherlands, has been significant, and it needs to be added that in the last four years it has been reducing only gradually. A possible disappointment is Germany's 8th place. Although Germany remains a locomotive of economic growth, it could lose that status in the future if it does not catch up in a few areas, including spending on education.

The last places are held by the poorest EU members – Romania and Bulgaria. The Erste Innovation Barometer 2013 has shown that the competitiveness of these countries remains at a low level, and so the positions of the poorest EU member states will remain occupied in the near future. The Erste Innovation Barometer 2013 also revealed one misconception: the debt crisis affecting Greece (26th place) and Italy (25th place) is not caused primarily only by the bad condition of public finances, but also by low (and in Italy's case declining) competitiveness and innovation potential.

The results of the Erste Innovation Barometer are an important contribution to maintaining of future prosperity, but it is necessary to take them into consideration with caution to a certain extent. The reason is that based on the logic of the matter, they cannot reveal all aspects determining the future competitiveness and prosperity of individual member states. A current key condition for future prosperity is undoubtedly the country's macroeconomic stability, a healthy financial sector and reasonable taxation, on which the Erste Innovation Barometer does not function, due to its purpose. These two areas belong among disciplines in which states of Central and Eastern Europe do not have as many problems as their Western European counterparts.