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## **5. DOES LOW PRICE MEAN HIGH COMPETITIVENESS?**

**Key words:** competitiveness, comparative price level, statistical analysis

### **Introduction**

Generally speaking, in the most common and popular understanding, to compete equals to guarantee low prices. More competition between firms should cause better allocation of capital, higher production efficiency and these will lead prices to converge at the level: *“better argued in view of economic and technical effectiveness”*<sup>1</sup>. From the course of microeconomics we remember that the lowest prices and the highest output are guaranteed under perfect competition model.

It is widely recognized that most people associate competitiveness with low prices. They say: it is hard to compete with products imported from Asia (for example) as they are cheaper than our products. But is this understanding of things correct? Does competitive really mean cheap? Do nations that produce and sell their products cheaply are also these which are considered to be the most competitive ones? And consequently: do nations which sell cheaply are those who enjoy highest welfare?

In the following article we verify whether there is positive relationship between level of comparative prices and level of macroeconomic competitiveness, which would mean that country where products and services are relatively expensive are also these highly competitive.

First we present the definition of competitiveness from macro perspective together with tools used to measure it. Then we introduce the concept of comparative price level which we use in the last section to examine the relationship between level of macroeconomic competitiveness and comparative price level. Is that relationship positive or negative, and what is its strength? Finally, the conclusions are drawn together with suggestions for future studies.

### **Competitiveness – means what?**

At the very beginning of our discussion we shall define, in the most precise way, what competitiveness really is. Defining properly the term constitutes a starting point for the further study, but also the definitions that we are going to introduce provide broad basis for the required analysis.

Generally speaking the very idea of competitiveness is broadly defined and understood as the capacity to compete with rivals. But considering national competitiveness it does not fit in well, and that is why economists have been trying to introduce some measures which would reflect nations' ability to compete with others. Firstly as a measure of national competitiveness has been used mean labor productivity. It is because, it is thought that high productivity can guarantee long-run growth of national income. Secondly – mean price, namely

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<sup>1</sup> Price competition and price convergence, The Single Market Review Series , June 1996,

speaking real effective exchange rate and unit labor cost, have been considered as a good measure of nation's competitiveness. But considering these two last measures some problems arise. To get reliable and up to date data for all of the countries is difficult, we do not really know how to convert labor costs – obtained for individual economies – into some comparable units. Let's go a little bit further. If we understand competitiveness in terms of unit labor cost, it would be right to state that if in a country we notice a rise in unit labor cost relative to other country, that should also mean a decline in its competitiveness which should translate into lower global market share. But what we know from some empirical studies, it is just the opposite. Shares in global market and unit labor cost tend to move together – if one rise, the other one follows it (they both change in the same direction). Besides, some economies may try to keep on its price competitiveness by keeping their currencies undervalued. This can result positively in short term, but we know that exchange fluctuations are quite volatile. And often changes in exchange rates would mean sudden and frequent changes in competitiveness level. It is widely recognized that countries which rely on undervalued currencies in order to keep its competitiveness level high often fail in achieving technological progress.

As we can see, these measures presented above fail to express nations' ability to compete, and what is more they do not really explain what competitiveness actually means. But this "price competitiveness" is what most people have in mind when thinking about competitiveness, and that for sure is a big mistake which should be avoided if one wants to assess nations' competitiveness properly.

There is also another way to examine national competitiveness. World Economic Forum<sup>2</sup> has elaborated a methodology to be able to measure an overall, macroeconomic competitiveness of a country. In the last two decades the methodology has evolved in a way which reflects some changing in perception of competitiveness. The way it is understood changes over time. The measure introduced by WEF is Growth Competitiveness Index (GCI), and it tries to capture all of the factors that determine the country's ability to compete in the world markets. It is a composite measure, composed of three main components: the technology index, the public institution index and the macroeconomic environment index. Broadly speaking: the technology index measures the capacity for innovation and diffusion of technology, the public institutions index measures the role of politics and the bureaucracy in supporting market-based economic activity and the division of labor, and the macroeconomic environment index measures most of the variables related to capital accumulation and the efficiency of the division of labor<sup>3</sup>. So far GCI has been calculated for 117 economies. GCI composition captures different aspects of the growth and general development process, and bringing together all the determinants which are aggregated in the so called competitiveness "score" (GCI value).

As mentioned before GCI encompasses three indexes, where each one evaluates different dimension of nation's activity. Each index is calculated using both "hard data" and "survey data". "Hard data" captures these dimensions which can be quantified easily. "Survey data" refer to these dimensions that cannot be quantified and are based on the responses acquired in the interviews conducted. The sample of countries for which GCI is calculated are divided into two sets: the core innovators and the non – core innovators. Countries called as core innovators are these where at least 15 patents for invention per million population were registered in the most recent year.

The methodology of GCI calculating is as follows<sup>4</sup>:

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<sup>2</sup> Since 2001 the methodology is based on a model invented by Jeffrey Sachs and John McArthur

<sup>3</sup> McArthur J., Sachs J.: The Growth Competitiveness Index: Measuring Technological Advancement and the Stages of Development; [www.weforum.org](http://www.weforum.org), 2006

<sup>4</sup> Appendix A: Composition of Growth Competitiveness Index, [www.weforum.org](http://www.weforum.org), 2006

**For core innovators**

$$GCI = \frac{1}{2}TI + \frac{1}{4}PII + \frac{1}{4}MEI$$

Where:

*TI* – technology index,

*PII* – public institution index

*MEI* – macroeconomic environment index

Where the components of each index are the following:

$$TI = \frac{1}{2}ISI + \frac{1}{2}ICTSI$$

Where:

*ISI* - innovation subindex

*ICTSI*- information and communication technology subindex

$$PII = \frac{1}{2}CLS + \frac{1}{2}CS$$

Where:

*CLS* – contracts and law subindex

*CS* – corruption subindex

Macroeconomics environment index has the formula:

$$MEI = \frac{1}{2}MS + \frac{1}{4}CCR + \frac{1}{4}GW$$

where:

*MS* - macroeconomic stability

*CCR* - country credit rating

*GW* - government waste

**For non – core innovators**

$$GCI = \frac{1}{3}TI + \frac{1}{3}PII + \frac{1}{3}MEI$$

Where the components of each index are the following:

$$TI = \frac{1}{8}ISI + \frac{3}{8}TTS + \frac{1}{2}ICTSI$$

$$PII = \frac{1}{2}CLS + \frac{1}{2}CS$$

$$MEI = \frac{1}{2}MS + \frac{1}{4}CCR + \frac{1}{4}GW$$

All notations are as before. In technology index we have additional element: technology transfer subindex (*TTS*).

Now we will specify what all three indexes consist of. The tables below show what determines value of each index.

Table 1. Components of technology index

***Innovation subindex:***

*Survey data:*

What is your country`s position in technology relative to world leaders`?

Companies in your country are not interested/aggressive in absorbing new technology?

How much do companies in your country spend on R&D relative to other countries?

What is the extent of business collaboration in R&D with local universities?

<p><i>Hard data:</i>  US utility patents granted per million population  Gross tertiary enrollment rate in most recent available year</p>
<p><b><i>Technology transfer subindex:</i></b>  Is foreign direct investment in your country an important source of new technology?  Is foreign technology licensing in your country a common means of acquiring new technology?</p>
<p><b><i>Information and communication technology subindex:</i></b>  <i>Survey data</i>  How extensive is Internet access in schools?  Is there sufficient competition among ISPs<sup>5</sup> in your country to ensure high, infrequent interruptions and low prices?  Is ICT an overall priority for government?  Are government programs successful in promoting use of ICTs?  Are law relating to ICT well developed and enforced?  <i>Hard data</i>  Cellular mobile subscribers per 1000 inhabitants  Internet users per 10 000 inhabitants  Internet host per 10 000 inhabitants  Main telephone lines per 100 inhabitants  Personal computers per 100 inhabitants</p>

Source: Composition of the Growth Competitiveness Index, [www.weforum.org](http://www.weforum.org), 2006

Table 2. Components of public institutions index

<p><b><i>Contracts and law subindex:</i></b>  Is the judiciary in your country independent from political influences of members of government, citizens or firms?  Are financial assets and wealth clearly delineated and well protected by law?  Is your government neutral among bidders when deciding among public contracts?  Does organized crime impose significant costs on business?</p>
<p><b><i>Corruption subindex:</i></b>  How commonly are bribes paid in connection with import and export permits?  How commonly are bribes paid when getting connected with public utilities?  How commonly are bribes paid in connection with annual tax payments?</p>

Source: Composition of the Growth Competitiveness Index, [www.weforum.org](http://www.weforum.org), 2006

Table 3. Components of macroeconomic environment index

<p><b><i>Macroeconomic stability subindex</i></b>  <i>Survey data:</i>  Is your country's economy likely to be in a recession next year?  Has obtaining credit for your company become easier or more difficult over the past year?  <i>Hard data:</i></p>
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<sup>5</sup> ISP – Internet Service Provider

Government surplus/deficit
National saving rate
Inflation
Real exchange rate relative to the United States
Lending-borrowing interest rate spread
<b><i>Government waste composite</i></b>
Do government subsidies to business in your country keep uncompetitive industries alive artificially or do they improve the productivity of industries?
In your country, how common is the diversion of public funds to companies, individuals or groups due to corruption?
How high is the public trust in the financial honesty of politicians?

Source: Composition of the Growth Competitiveness Index, www.weforum.org, 2006

The composition of GCI shows how wide and complex is the idea of international competitiveness. But also the components of GCI tell a lot about the major determinants of competitiveness level. What is crucial for our considerations – price is not mentioned at all, which would mean that price level does not determine directly competitiveness possibilities of nations. The only determinant of GCI level is the rate of annual inflation. But the rate of annual inflation reflects changes in price level, it does not say anything about whether prices are low or high. So in other words we would state, that stability of price level is one of the factors determining GCI level, but on this base it is not right to conclude that the low price level determines overall macroeconomic competitiveness.

To have a general look at the ranking of countries according to its competitiveness, in table 4 the score of GCI for top and last ten countries is presented.

Table 4. GCI values for top and last ten countries, data for 2005

Top ten countries		Last ten countries	
Country	GCI score	Country	GCI score
Finland	5,49	Madagascar	2,95
United States	5,81	Zimbabwe	2,89
Sweden	5,65	Bangladesh	2,86
Denmark	5,65	Cameroon	2,84
Taiwan	5,58	Cambodia	2,82
Singapore	5,48	Paraguay	2,80
Iceland	5,48	Benin	2,74
Switzerland	5,46	Guyana	2,73
Norway	5,40	Kyrgyz Republic	2,62
Australia	5,21	Chad	2,37

Source: World Competitiveness Report 2005, World Economic Outlook Database 2005 (IMF)

It is not surprise that most of the countries of highest score are from Western Europe plus United States while the countries with lowest GCI score comes from Africa and South America.

### **Prices – but what prices?**

In the section above we saw that although GCI consists of bulk of hard data, the price

level is not included. Our goal is to find out what is the relationship between price level and competitiveness level in the given economy. Before proceeding we have to choose the exact measure of price level of a given economy.

In studies concerning prices, the method used to calculate price levels is very important because it is possible to aggregate them in space and in time. Having the economy with only one good or service the price level would be just the price of that good or service expressed in currency units that a customer has to pay.

The situation becomes more complicated when having two or even  $k$ -number of goods, while their prices and quantities purchased change at the same time.

The careful selection of price indexes is needed. The most frequently used measures are: CPI - Consumer Price Index, PPI - Producer Price Index and WPI - Wholesale Price Index. They can be an adequate tool to compare prices in time, but they become useless when spatial comparison is needed. An internationally comparable aggregation can be obtained by using exchange rate calculation. But as it could result in over or under valuation – because exchange rates are also determined by factors different from price fluctuations – these drawbacks can be avoided by using Purchasing Power Parity (PPP) and relating it to Comparative Price Level (CPL). In OECD research PPPs are given in national currency units per US dollar while in Eurostat per EUR. The index is obtained by dividing the purchasing power parity (PPPs - the third column in table 6) by the official exchange rate to the dollar (in case of Eurostat to the euro) for each country ( $E_{USD}$  - the second column). It can be expressed by the following formula .

$$CPL = \frac{PPP}{E_{USD}} \times 100 \quad (1)$$

Table 5. Purchasing Power Parities and relative price level, 2005

Country	Exchange rate to dollar [ $E_{USD}$ ]	Purchasing power parity (1PPS = .....national cur- rency units)	Comparative price level [CPL]
Canada	1,237624	1,25	101
Mexico	11,16667	7,37	66
United States	1,020408	1,0	98
Australia	1,339806	1.38	103
Japan	113,1579	129	114
New Zealand	1,455446	1,47	101
Austria	0,821296	0,887	108
Belgium	0,825472	0,875	106
Greece	0,828235	0,704	85
Czech Republic	24,48276	14,2	58
Poland	3,327586	1,93	58
OECD - 30	:	:	100

Source: own compilation based on data from OECD available at <http://oecd.org//>

Purchasing power parity explains how many of national currency units equals the standard unit (PPS - Purchasing Power Standard). One PPS buys the same amount of goods and services in all countries, whereas different amounts of national currency are needed to

buy this volume of goods and services – as it depends on the national price level. In OECD calculations 1 PPS equals 1US dollar while in Eurostat – 1EUR. CPLs gives also the picture of under- or over-valuation of a given currency. Although common currency was introduced in the euro-area and the prices can be compared directly, the euro has a different purchasing power in the different euro-zone countries and PPPs still have to be constructed<sup>6</sup>. For example in 2005 one PPS in Austria equaled 0.887 USD while in Greece only 0.704 (table 6).

The comparative price level makes it possible to compare prices in relation to the OECD average (OECD average = 100). An index higher than 100 indicates that the country is relatively expensive (in comparison with the OECD average); an index lower than 100 indicates that the country is relatively cheap.

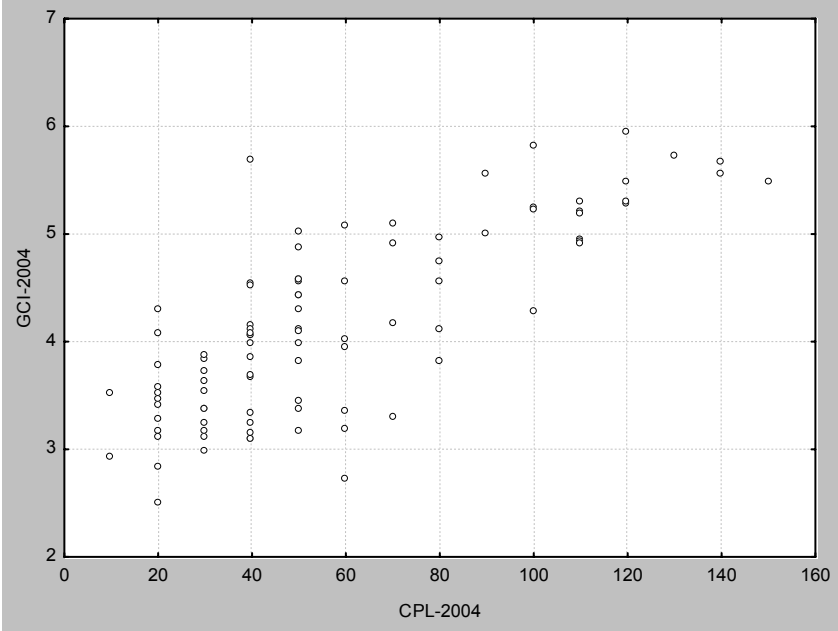
For example in 2005 the price level in Japan was 14 % above the OECD average, while in Poland it was 42 % below.

In all statistical papers concerning PPPs methodology and technical aspects complicate the calculations. Consequently, the interpretation of the CPL should be carried out very carefully. Moreover OECD reminds us that PPPs and related economic indicators are constructed primarily for a spatial comparison and not for a comparison over time. This should be kept in mind while comparing the results of different years.

**The relation between competitiveness and price level**

After defining the measures of competitiveness and price level we can perform the statistical analysis of its relationship. Before proceeding, let us have a closer look at table 5. Among top ten of most competitive countries five are Scandinavian countries which for sure are not the cheap ones, while the least competitive ones seem to be poor and cheap countries.

Picture 1. The relationship between Growth Competitiveness Index (GCI) and Comparative Price Level (CPL)– 2004



Source: Own compilation

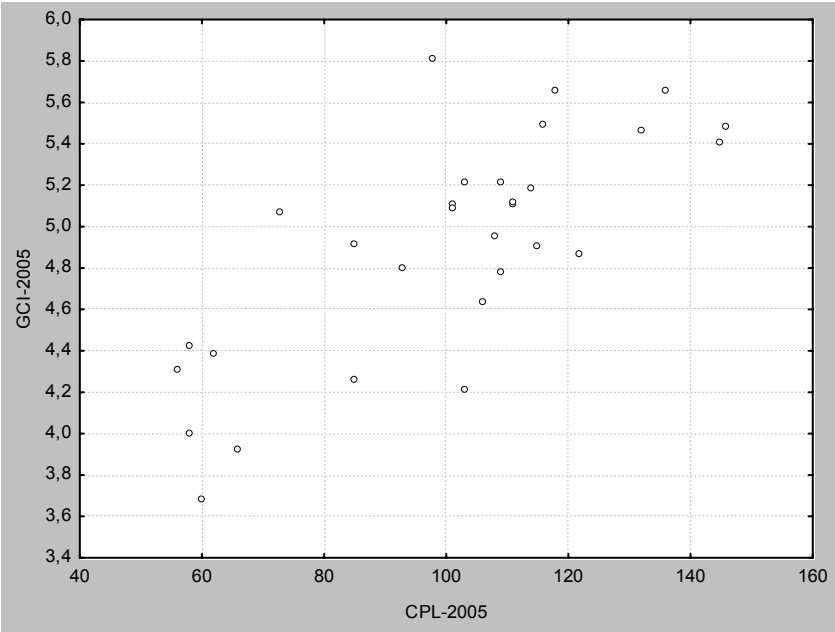
<sup>6</sup> Statistics in Focus, Theme 2 – 42/2002 Prices and Purchasing Power Parities, pp. 7.

To check the relationship between competitiveness and price level, the linear regression was tested. The depended variable was GCI so we can see the extent to which competitiveness score is caused by comparative price level.

Picture 1 shows the relationship between GCI index and CPL for 2004. There is a positive correlation between GCI and price level, which indicates that the higher price level, the higher competitiveness. In other words, it can be said that an expensive country is also a competitive one. The coefficient is statistically significant, which means that results of the analysis could be extended to all countries which for technical reasons are excluded from the analysis. In 2004, 60% of the differences in GCI could be explained by the differences in comparative price levels.

We repeat the analysis for 2005 but only for OECD countries because of data restriction. The results are presented in Picture 2. The coefficient was statistically significant again. In 2005, 65% of the differences in GCI can be explained by the differences in comparative price levels. These statistical tests confirm strong positive relationship between GCI and price level.

Picture 2. The relationship between GCI and price level in OECD countries – 2005



Source: own calculations.

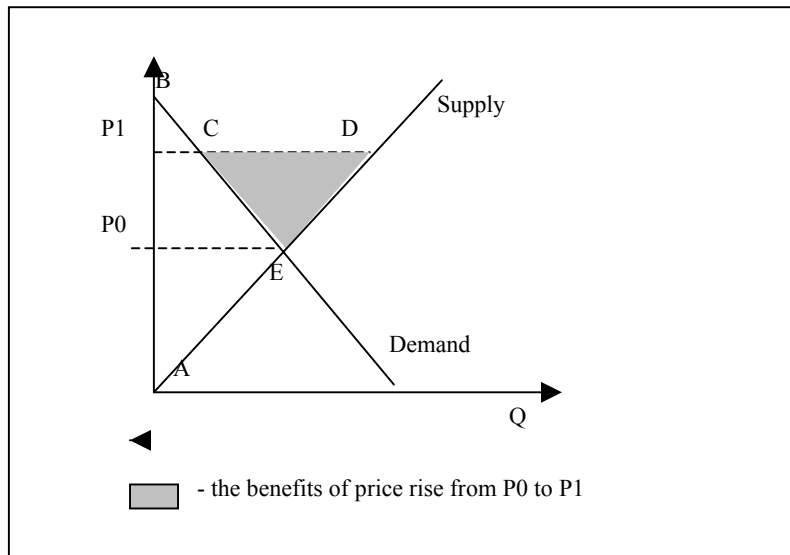
In our analysis we showed that as far as competitiveness is considered, it is better to be expensive country than cheap one. This is a contradiction to all common views that are based on the fear of rising the price levels.

The benefits for one country for its GDP from increase of its price level can be also easily proved in theoretical background. Let's consider a simple static model of demand and supply as shown in Picture 3.

At the beginning price is set at level P0 as the effect of interaction of demand and supply. As prices rise to the P1 level, supply increases to D while demand decreases to C. The difference between quantities D and C constitutes export.

Picture 3. Benefits from rising prices





Source: own compilation based on Hufbauer G.C., Wada E., Warren T., (2002), The Benefits of Price Convergence Speculative Calculations, Policy Analyses in International Economics 65, January 2002, pp.82.

The consumer initial surplus (area P0EB) decreases and now corresponds to the area of triangle P1CB. The situation is opposite as far as producers are concerned and their surplus increases from area AEP0 to ADP1. The overall effect is the difference between the change in the producer and consumer surplus. The net gain calculating as total welfare (consumer plus producer surplus) is positive.

In empirical studies, based on shown assumption, the potential benefits of rising prices were conducted (Hufbauer et al. 2002). The benefits are calculated in terms of additional GDP from price convergence towards the broad world price band which is defined as prices in USA +/- two standard deviation. In table 7 the potential benefits of low income countries are shown.

Table 6. Potential benefits gained from rising prices

Country	Potential gain in GDP (milliards of US dollars)
Bangladesh	32,9
Cameron	8,5
India	379,0
Indonesia	98,8
Kenya	5,4
Pakistan	61,3

Source: Hufbauer G.C., Wada E., Warren T., (2002), The Benefits of Price Convergence Speculative Calculations, Policy Analyses in International Economics 65, pp.6-7.

Similar studies were performed by the European Commission where the benefits were calculated as prices converge to the EU average.

## Conclusion

We can clearly see that competitiveness is a process which goes far beyond price level. Literally speaking it means that it does not depend solely on price level and its changes, but it is determined by lots of different elements. It captures a broad set of factors which are crucial to understand the process fully, but at the same time index composition provides a concept explaining what exactly determines competitiveness and what does not.

Of course everyone should agree that swift reductions in the costs of transport, distribution, communication facilitated to multinational corporations the shift production from one place to another in order to create a right combination of skills and low labor costs. And that is what consequently enables many companies to sell cheaply their products and services. But we hope that no one would agree that low price determines high competitiveness.

The statistical analysis we have conducted, has proved that low price does not determined higher competitiveness, but it is actually just the opposite. We found a strong positive relationship between comparative price level index and growth competitiveness index. It means that the higher price level a country experiences the higher level of macroeconomic competitiveness it enjoys. We do realize that the relationship we have found does not have to indicate cause and effects relationship, but taking account the correlation coefficient results to be high and statistically significant, we can conclude that existing of such relationship is highly probable. In the case of relationship we have analyzed, we have to deal with two different processes - changes in price levels and increasing competitiveness. These processes are interdependent ones, and one influences another.

Our study constitutes a kind of negation of existing paradigm in economics about price competitiveness. Does it mean that in global, modern economy there is no space for such kind of competitiveness, and global actors primary need to compete with quality and not low prices? We all agree that such statement needs more reliable justification.

Although our analysis was performed from the macro perspective it has an important consequences to the micro level. It should be clear for the producers what tools they should or should not use in the competitive fight. The argument of low price is not satisfied so they should rather concentrate on the quality of the products. Unfortunately according to the recent questionnaire survey (2006) it seems that polish producers as the main element of their compete strategy consider low price. It has to be pointed out that low price is a short perspective strategy

In future we want to extend our studies in the direction of micro level to check which sectors of Polish economy are most competitive, which groups of export are most competitive.

We are aware that the field of analysis is broad. Additionally one should realize that competitiveness is a complex area determined by number of different – not necessarily economic – factors. Proving direct and unquestionable links between comparative price level and abilities of increasing macroeconomic competitiveness is not fully possible.

According to that, more detailed and deep analysis would be required, which we intend to conduct in the future. Nevertheless, we are sure that the article constitutes a good hint for further studies.

## Comprehensive check:

1. Give examples of definitions of competitiveness?
2. What is the most common measure of macroeconomic competitiveness and what are its main components?
3. Do you have any suggestion how to simplify GCI or maybe you think that any deter-

- minants should be added?
4. What is the comparative price level and how is it constructed?

### **Exercise:**

Log on World Economic Forum web side to get the GCI index for last 10 years.

- Compare ranking of countries between given years.
- What was the most competitive country in 1995 and what in 2005?
- What was the least competitive country in 1995 and what in 2005?
- Is the overall ranking similar – exemplify some statistical tests for example the Spearman rank index to check weather the ranking of countries considerably changed or was stable in time?
- What is Poland's position in the ranking and how it was changing in time? Relate Polish score to the EU countries.

Log on Eurostat web page to get comparative price levels (CPLs) for EU member countries

- Rank the countries from most expensive to the cheapest ones?
- Is the dispersion of prices in the EU large or small?
- What is the position of Poland?

Exemplify a statistic test to check the relation between GCI and CPL such as in picture 1 and 2 but only for EU countries, use GDI and this time CPL calculated in relation to the EU average.

### **Recommended reading:**

1. Price Competition and Price Convergence, (1996), The Single Market Review Series
2. Sachs J., McArthur J.: The Growth Competitiveness Index: Measuring Technological Advancement and the Stages of Development;
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