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Preserving EU Competitiveness

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Abstract

The competitiveness of the European Union (EU), as a global trade actor is achieved through a combination of three elements: investments into research and development, technology based industry and functioning of the Internal Market. But the recent economic crisis, revealed a number of structural weaknesses of the Union which caused a lowering of the competitiveness on the global markets. This paper has the aim to identify the underlying reasons for decreased competitiveness and point out potential future challenges for the EU. Even though the EU has a sizeable advantage in higher value added economic activities as a result of a high level of innovations and research and development, in the recent years USA is gaining competitiveness over primary innovations. Also, EU technology based industry which uses a highly educated workforce creates disadvantages for the EU in commoditized markets where price plays the most important role. That creates emerging opportunities for low costs productions. China has become the global leader in labor intensive manufacturing based on a comparative advantage in cheap labor, and it is increasing the quality and the share in the sectors which have traditionally been important to the European economy such as industrial machinery, automotives, computer equipment and certain chemicals. As a result of that, the EU is losing the dominant position in emerging markets such as ASEAN, South America, the Middle East and Africa. Finally, the third element, the Internal market is fragmented between national manufacturers who lacked economies of scale, still not harmonized national policies and increased usage of barriers to trade (especially during the economic crisis), which again has an influence on the lower EU competitiveness on the world market.

Keywords: Internal market, EU competitiveness, Economic crisis

Theoretical Concept of Competitiveness

Under the term "competitiveness" in the literature can be found many different definitions. Generally, an economy is competitive if it does things that are likely to encourage economic growth. The simple measure of economic growth is the value of the gross domestic product (GDP). But, if a country is increasing its GDP that would not mean that the country's competitiveness has improved. For instance, if the growth is based on natural resources and their favorable price developments, the GDP will grow (GDP = quantity multiplied by prices), but the economy will not have significant improvements in competitiveness. In the case where the reason for the dynamics and the quality of economic growth is determined from the level of labor productivity, then we can make a difference. In the macro economy it is widely accepted that the difference in labor productivity is the reason for the great differences in the level of economic growth in the countries in the world economy (Mankiw, 2010).

Krugman (1996) has also declared that the real essence of competitiveness is reflected in the productivity. Still, many economists (particularly in Europe) do not agree with this kind of simplification about competitiveness. They believe that not only the quantity of economic produc-tion is important, but also the quality of living of the people (Aiginger, 2004). That would mean, greater opportunities for education, healthy life, rich cultural life, etc. That can be measured by the second indicator of economic growth, GDP per capita. A higher GDP per capital means higher living standards for the population. Still, GDP per capita does not take into account the country's ability to distribute the gained wealth in a fair manner (it is calculated on an average level). Another weakness is that we can get a wrong conclusion. For example, if we have the same value of the GDP, but decreasing growth rates of population, we will get higher GDP per capita.

Some authors (Haiman & Altena, 2006) find the linkages between competitiveness and trade (traditional theories). Popular discussion often views 'competitiveness' as a way to narrow the current account deficit of the balance of payments. That can be measured by the growth of the export of the market share (participation of the total value of the export in the total world export). The essence of this theory is compounded by openness to trade tending to be associated with openness to ideas. Especially for small economies, openness to trade should boost economic growth by increasing

domestic competitive pressures (from imports) and allowing domestic producers access to wider markets and so economies of scale (from exports). Still these theories do not take into account the quality of the product or the service or the branding of the products. In the long run, non pricing factors (structural and technological aspects) such as: research and development, regulatory regimes and others have a significant influence on the competitiveness of the products and of the economy.

Finally, if we summarized all the above mentioned views, the competitiveness of one country can be defined as the ability of the country to compete on the world market, with final goal to increase the wealth of the country and the living standards (Ottaviano et al, 2009).

In this paper, we focused on the EU competitiveness and its sustainability/trends in the future. We will analyse the indicators of competitiveness, that we already mentioned by using time series. Mainly, we will focus on the factors that determine EU productivity as the main drivers of competitiveness. The main trumps of the EU productivity are: investments into research and development, technology based industry and functioning of the Internal Market (economies of scale, lower costs, etc.). Therefore, we will make an historical overview of the main indicators of productivity and a comparison between the EU and its most important competitors USA, Japan and in the last decade China. The underlying reason for analyzing the competitiveness of the EU is the influence of the world economic crisis on the EU that revealed some of the weaknesses of the EU that makes its sustainability nowadays doubtful.

Dynamics of EU Competitiveness in the World Economy

In the previous section we discuss about the different understanding of the term competitiveness. In order to compare and measure the level of competitiveness, we will use the real rate of GDP growth and indicators of productivity (labor productivity and total factor productivity).

Since the mid 1990s the average growth rates of real GDP, labor productivity and total factor productivity in the European Union have fallen behind those in the United States of America – USA (table 2, 3 and 4). What makes this remarkable is that, this is the first time since World War II that these performance measures have shown lower growth rates for the EU for several years in a row. The recent economic slowdown (as a result of the world economic crisis) in the USA and the EU has not changed this trend.

During the early 1990s the GDP growth slowed in all three regions, but both the USA and the EU saw a substantial recovery during the second half of the 1990s. However, the recovery was much faster in the USA than in the EU. More importantly, the USA recovery was accompanied by a large upswing in labor input and productivity growth. In contrast, the EU realized a substantial expansion in labor input but productivity growth slowed down to a rate that was substantially lower than that achieved during the 1980s. It created a labor productivity gap between the USA and the EU.

Back in the 80s and first half of the 90s, the EU had a substantially higher rate of labor productivity (2.6% compared with 1,1 % in USA, table 1), but afterwards the convergence process was replaced with stagnation. During 2005-2010 the EU labor productivity was 0,7% compared with 1,2% for USA (table 1). The labor productivity gap in the EU relative to the US has widened by 0.2 percentage points in 2000, to 2.7 percentage points in 2009 (table 3).

This might suggest that the EU has entered onto a low productivity growth track. Or, it might not be the case. First, many EU countries are still in the midst of an adjustment process towards a new arrangement of their economies, with less emphasis on capital intensive manufacturing, and a greater emphasis on technology use and diffusion in services. Secondly, there is still a much greater potential in terms of underutilized resources to be employed in the EU. This latter view is consistent with the notion that the EU is merely lagging behind the USA in the adoption of new technology and that the EU will see the benefits within the next decade. The key issue for the EU is whether these resources can be mobilized in a productive way (Mahony & Ark, 2003).

But, it seems that implications of a deeper integration in the EU are still not achieved and the expected benefit within the next decade might not be realized. The world economic crisis (2008-2010) revealed the EU weaknesses. The internal balance was impaired as a result of intensive fiscal spending that the countries were using in order to compensate for the decline of domestic consumption. Supplemented with intensive credit growth in the period before the crisis, this resulted in unproductive spending. That makes the amount of discrepancy with the real wages of labor productivity in favor of higher wages, which led to high budget deficits without a development component.

Simultaneously, the external balance deteriorated, reflected by disturbed relations in international trade and economic growth. The rate of

economic growth has the lowest level in 2009 (-4,3%, table 2). Even before the crisis, huge macro-economic imbalances existed inside the Euro zone (surplus versus deficit countries; divergence in competitiveness; etc.). This points out the inadequate decision making procedures and lack of leadership in the EU/eurozone. Also, fast-growing economies, such as China, base its economic growth on a high level of net exports. In contrast, developed countries, such as the EU rely on import oriented domestic demand that creates a problem of high trade deficits. Such positions in foreign trade had a direct impact on the international value of the currencies and the competitiveness of the EU as a whole.

EU as a Global Actor

As we mentioned in section 1, in general, three important factors contribute to enhancing EU competitiveness: investments into research and development, technology based industry and functioning of the Internal Market (economies of scale, lower costs, etc.). We can first start with focusing on the advantages and disadvantages of the internal market.

The EU is the biggest economy in the world according to the number of population. The EU population in 2010 (Eurostat, 2012) creates 7, 3% of the total world population (501.105 million people). Second largest economy is USA with 4, 5% of the world population (307.007 million people). We can associate higher population growth with higher growth in real GDP, but probably a little less than proportionately (Haijman & Altena, 2007). But, in case of the EU, even though it is the largest economy by number of population, still, the rates of population growth in Europe are the smallest compared to other continents. Europe has a 0.8% population growth in the period 2000-2010. That creates a disadvantage in labor intensive manufacturing. Having in mind that the EU has the competitive disadvantages of not being a producer of raw materials (we already mentioned that the productivity is achieved through technological factors) and having a relatively expensive work force makes a huge disadvantage in the price competitiveness.

Regarding trade, the EU is a global leader. In the whole period of existence of the EU, with the exception of 1958-1960, EEC/EU has the biggest part in the value of the world export. The second largest world exporter is USA, whose global participation decreases continuously from 2000. China as a fast-growing economy succeeds and from 2005 onwards is the third largest exporter in the world, pushing Japan into fourth place.

The strength as a trade leader comes from the high integration effects of the Union (monetary and economic union). The EU is functioning as a single market (free movement of goods, services, capital and labor) and has a single currency. But even thought it reached a high level of integration monetary union) internal trade is hampered by a long list of trade barriers such as: different technical standards and industry regulations, controls on capital, preferential procurement, administrative and border formalities, different VAT and excise rates and different transport regulations.

Although most of these policies seemed to be insignificant, their joint effect significantly determines the intra-Community trade (Baldwin & Wyplosz, 2003).

That makes the Union less competitive on the world markets. Aiginger (2005) claims that the reason why the EU is lagging behind the USA in productivity is high welfare cost, rigid labor market rules and higher environmental standards in the EU compared with the USA. The EU single market is still far away from an area of free movement of the four freedoms. The existing trade barriers are constantly supported by new ones introduced by the countries that want to protect domestic economy.

The second and third factors that contribute to EU productivity is the technological knowledge and investments into R&D. Since the 1957 in the EEC Treaty, a certain amount of money for R&D for the private sector was defined that would contribute to improving the manufacturing and distribution process of the products or promote technical or economic progress (Article 107.3).

In 1968, the Commission permits contracts between firms (even large firms) for the exclusive opportunity to develop joint R&D projects. In 1984, it expanded its responsibilities. A Single European Act in 1987, aimed to strengthen scientific research and the technological base of the Community in order to become competitive globally. In 1996 the Commission issued a new guide to R&D in order to comply with the rules of WTO. Hence, it makes the difference between R&D that are according to the rules of WTO and illegal R&D activities (like marketing new products).

Hence, the main instrument to increase the innovative activity of the Union is investing into R&D. According to the objectives set by the European Commission in the strategy ”,Europe 2020" the cost for R&D should be 3% of GDP for each Member State (same as in the Lisbon strategy). In the period of 1995-2010, the costs for R&D calculated as a percentage of GDP within the

EU and the euro zone were relatively fixed and moving with an average of 1.8% of GDP (table 5). With regard to other regions, the EU and euro zone have higher costs for R&D only compared with China. Thus, the cost of R&D in 2008 as a percentage of GDP in the EU (27) amounted to 1.92%, which is below the level of 3% (the target rate). Within the EU, Sweden (3.7) and Finland (3.7) exceed the target. Among other countries that have a higher rate than the average EU are Germany (2.69%) and Denmark (2.85%). In 2008, Japan has the highest percentage of R&D cost of 3,45%, followed by South Korea (3:36%) and USA (2.76%). Significant growth of the costs for R&D were seen in South Korea during the reporting period and it is expected to grow in the future.

What are the dominant industries in which most of the R&D cost are invested into and industries that create the EU competitiveness? Regarding the industries, there are also some similarities in the time pattern in 'traditional' industries such as food, drink and tobacco, leather, fabricated metals, hotels, and other services with declining growth rates through time in both regions, EU and USA. But on the whole productivity growth rates in EU manufacturing industries remain somewhat above that of the USA counterparts (Inkalaar, O`Mahony, et al., 2003). Manufacturing goods are very important for the EU, since the trade in 2009 consist of 85% exports of manufactured goods 85%, and import of about 75%.

According to the Balassa index of comparative advantage, the euro zone is specializing in the export of medium and high technological productions (especially products that are difficult to copy). USA has a high comparative advantage in producing high tech products (especially in the technology sector of IT), while Japan has the highest value of the index in high technological products. As regards the utilization of the factors of produc-tion, the euro zone is specialized in capital intensive, research-intensive and labor-intensive production (Tables 6 and 7).

Developments in the global economy, suggests that the decade before the crisis was characterized by integration of countries in large and dynamic markets such as BRIC. Their export structure is very different from industrialized economies, but over time their export structure is approaching that of the developed economies. Such a change is very visible in China, where export structure changes aimed at increasing exports of products with the research base and IT equipment. Thus, the participation of Japan and the United States reduces as a result of the increasing share of these countries.

However, according to Table 6, China has the largest percentage of high-tech manufacturing, it is not true. The rapid growth of communication technologies and falling transport costs has enabled multinational companies to perform allocations of separate stages of production in different countries. Thus, the analysis of the export structure must be correlated with the analysis of the trade balance, suggesting that the weakened position of the USA and Japan is due to the process of outsourcing (Baldwin, 2006).However, there are some countries in the EU like Portugal, Italy and Greece that have low technological specialization of production, which gradually lose their export positions as a result of increased competition of low-price products.

Generally, if we observe the export performance of the euro zone we can reveal some weaknesses. Specialization in medium and high tech products going before the crisis when the value of exports of these categories (at a time when demand for these products is high such as machinery and equipment, motor machinery and transport equipment). The share of low technology products (textiles and furniture) in exports decreases. It is noticeable that instead of specialization in fast growing high tech, the euro zone retreats from these sectors, with certain exceptions for medical and optical equipment.

The main export products, machinery and the transport services (which include industrial machinery, computers, electrical and electronic parts and equipment, vehicles and parts for cars, ships, aircraft and parts for trains) tend to decline in flavor of China. China is becoming the global leader in labor intensive industries based on comparable advantage in cheap labor force, which is likely to be maintained in the foreseeable future. The labor productivity growth in China (table 4) was highest in 2003 when it amounted to 13,1%, while the EU had 1.1% growth. Low prices together with aggressive export created high rates of economic growth. China is reaching high rates of economic growth from 2000 onwards (table 2). For example, the EU economy in the middle of the world financial crisis in 2009 fell with -4,3%, USA with -3,5% while in the same year China grew with 8,8%.

China has become the global leader in labor intensive manufacturing based on a comparative advantage in cheap labor, and it is increasing the quality and the share in the sectors which have traditionally been important to the European economy such as industrial machinery, automotives, ICT equipment and certain chemicals. As a result of that, the EU is losing the dominant position in emerging markets such as ASEAN, South America, the Middle East and Africa (Schultmann & Sunke, 2010). Also, direct policy

towards a low Yuan rate makes unfair competition on the world market in favour of China. Artificial depreciation of the Chinese Yuan, makes the Chinese export cheaper and lead to distortions of competition and thus to decreesed competitiveness of the EU. In this context we can mention also the exchange rate policy of the USA that keeps the dollar depreciated and puts the EU in an unsatisfactory position.

Finally, in order to remain competitive and to face the challenges on the global market, the EU must enhance its position as a knowledge economy through innovation by facilitating technology transfer, creating a sustainable economy, and improving standards policies as well as better functioning of the Internal market.

Future Opportunities and Challenges of EU Competitiveness

In order to improve the competitiveness and research based activity, the Lisbon strategy set a goal to establish the European Research Area (ERA). Such a zone would create an internal market "for researching where researchers, technology and knowledge would circulate freely through the effective coordination of national and regional research activities, programs and policies." This concept was initiated in 2000 through the initiative of the European Commission to the European research area and gets more pronounced in 2007 by the Green Paper Commission, the European Research Area new perspectives (Delanghe at al., 2009).

The Lisbon Strategy adopted in March 2000, aimed to turn Europe into the most competitive economy and knowledge-based economy by 2010. There were several challenges that the Union faced in the first decade of 21st century that prevent the Union to reach this goal (world economic crisis being the most significant reason). That is why this goal was revised by the European Commission with a new European strategy ", *European strategy for development of Europe by 2020*", adopted by the European Council in 2010. The establishment of the European area of research remained one of the main priorities of the Union.

There are also other programs that outline the need for future innovations and improving competitiveness in the fields. In 2006, it was "*Putting knowledge into practice*: *A broad based innovation strategy for the EU*". The main priorities of this program are: support of education, establishing a European institute of technology, enhances of labor market for researchers, and

so on. In addition, a 2007 communication entitled *"Lead market Initiative for Europe"* outlines the EU plan to lift obstacles to innovation in six markets: eHealth, sustainable construction, bio-based products, protective textiles, recycling and renewable energy. According to the Commission, as these markets are already highly innovative, supporting their growth and international expansion could give European producers a competitive advantage as lead producers (i.e. first mover advantage).

Beginning from 2007, the EU has adopted a "*Competitiveness and innovation program for 2007-2013 (CIP) mainly for small and medium enterprises-SMEs".* (Luxemburg, 12 October 2006, 13855/06, Presse 284). Each program has its specific objectives, aimed at contributing to the competitiveness of enterprises and their innovative capacity in their own areas, such as ICT or sustainable energy:

- The Entrepreneurship and Innovation Program (EIP)
- The Information Communication Technologies Policy Support Program (ICT-PSP)
- The Intelligent Energy Europe Program (IEE).

Also, The Seventh Framework Program (2007-2013) is the Union's main instrument for the funding of research in Europe. It contributes to the creation of a European Research Area (ERA) as a vision for the future of research in Europe. It aims at scientific excellence, improved competitiveness and innovation through the promotion of increased cooperation, greater complementarity and improved coordination between the relevant actors at all levels.

Many programs are already in force within the EU and the main goal is to promote two-way knowledge transfer between enterprises and academic science-based institutions. They seek to encourage enterprises to build up collaborative R&D networks with supply-chain partners as well as universities and research institutes. The main focus is high-tech industry, in which large proportions of PhD students in engineering and science subjects have access to industrial training during their studies.

Despite these negative trends within and outside the EU, the European Union needs to make an effort to implement these programs. The competitive strength in this area is comprehensive. European operators are consolidating their strengths in services by offering new 'integrated solutions' which go far beyond the traditional selling of commoditized goods. There are some advantages in which the EU can straighten it's own competitiveness (Schultmann & Sunke, 2010).

- Innovation and R&D
- Design
- Marketing and Branding
- Servicing (after-sales, customized solutions)
- Management operating systems
- Overall superior quality of goods and services
- Financial strength (applies mainly to multinationals)

These strategies suggest that these programs aimed at promoting knowledge transfer and fostering innovation try to build on institutional strengths within each country. By fostering the education and training that would make improvement of the mobility of labor market. Together with the technological factors, they are the main resources on which the EU should continue to build its competitive strength.

But, there are threats to the accomplishment of these goals. The main threat for the Union is China. Not only that China became a factory for middle and high tech products, but it is expected to boost growth by creating new innovations. Although reforms in the EU were implemented, reduced taxes, regulations simplified and liberalized labor markets; however the effects are not so significant. This policy had many flaws and because it was revised by the European Commission with a new strategy, Europe 2020 for smart, sustainable and comprehensive development, which is accepted by the European Council (2010).

Another challenge for accomplishing the planned objectives of the Union is the financial crisis. The financial crisis not only that created challenges for the Union, but also point out the inefficient spending of the public finances. The budget deficit reached levels above 3% of the GDP, and public debt above 60% of GDP, which is an upper limit regulated by the Maastricht Treaty. The average rate of the budget deficit for the EU27 in 2009 was -6,9% of GDP and in 2010 it was -6,6% of the GDP (Eurostat, 2012a). Public debt has a value of 74,4 % of GDP in 2009 and 80,1% in 2010 (Eurostat, 2012b). In this regard during 2012, the EU introduced a new financial agreement in order to strengthen the coordination of the European policies.

This agreement was ratified by 23 member states, with the exception of Great Britain and the Czech Republic. The Member States have to include these budgetary rules in their national legislation in a period of one year. The agreement provides strict fiscal constraints, i.e. budget deficit to be in the

amount of 0.5% -1% of GDP and financial penalties for those who will violate it. The penalty is 0.1% of GDP. The responsible body for implementing the reforms should be the European Court of Justice that gives legal framework to the agreement (Walker, 2012).

These strict rules in the spending are a serious challenge for achievement of the proposed measures for increasing the EU competitiveness. Also, the investors are pessimistic about the future economic development, and they restrain from investing. Even this is a serious constrain for further investing, it can be reason for rational spending of the public and private finances of the member states of the EU. That is why we believe that the fiscal rules will be implied in order to make the distinction between productive and unproductive spending and that the Union will continue to support productive and innovative projects that will boost economic growth.

Conclusion

The European Union is struggling to keep up with the United States and Japan in the economic competitiveness race and is feeling the heat from emerging powers such as India, Brazil and China. Low prices together with aggressive exports created high rates of economic growth. Since the mid 1990s the average growth rates of real GDP, labor productivity and total factor productivity in the European Union have fallen behind those in the United States of America – USA. The growing evidence of the recent fall of the EU competitiveness is suggesting that the EU is losing track.

The main trumps of the EU productivity are: investments into research and development, technology based industry and functioning of the Internal Market (economies of scale, lower costs, etc.). But, it is noticeable that instead of specialization in fast growing high tech, euro zone retreats from these sectors, with certain exceptions for medical and optical equipment. At the same time investment into research and development are not on an adequate level, lagging behind USA and Japan. Above all, the internal market it is securing the four freedoms (free movement of labor, goods, services and capital) that make the functioning of the Internal market less effective. What needs to be done is a combined set of strategies from three fields, designed:

- to reduce or remove unnecessary administrative burdens and barriers to competition.

- to reform institutions, and to make labour and product markets more competitive, but not by means of a simple deregulation strategy, rather by targeted reforms such as training, education, and increasing geographical mobility and incentives to work.
- to boost long-run growth and productivity by supporting and encouraging innovation, education and the diffusion of new technologies.

The European Union needs to make an effort to implement these programs. The competitive strength in this area is comprehensive. The new proposed measures for fiscal constrains, should not present a barrier for new investments. The objectives of the EU reform should not only be to sustain economic growth, but also to strengthen the competitiveness on the global level.

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Tables

Table 1.

Aggregate Annual Growth Rates of Real GDP,
Labor Input and Labor Productivity (1980-2010)

	Real GDP				Total hours worked (labor input)				GDP/hours (labor productivity)			
	1980-90	1990-95	1995-05	2005-10	1980-90	1990-95	1995-05	2005-10	1980-90	1990-95	1995-05	2005-10
EU	2.4	1.6	2.4	0.9	0.1	-1.0	0.6	0.2	2.3	2.6	1.8	0.7
USA	3.2	2.4	3.3	0.7	1.7	1.2	1.0	-0.5	1.4	1.1	2.3	1.2
Japan	4.0	1.4	1.1	0.1	1.0	-0.4	-0.9	-1.0	3.0	1.8	2.0	1.1

Note. Growth rates are based on the difference in the log of the levels of each variable
Source: The Conference Board total economy database, September 2011.

Table 2.
Real GDP Growth for Regions (annual average, percent)

	US	EU-27	Japan	China	India	Euro Area
1990	1.7	2.5	5.0	3.5	5.1	2.9
1991	-0.3	1.9	3.3	6.4	1.4	2.4
1992	3.3	1.2	0.8	9.3	5.2	1.3
1993	2.8	-0.3	0.2	9.2	5.5	-0.7
1994	4.0	2.8	0.9	9.5	6.2	2.5
1995	2.5	3.0	1.9	14.1	7.0	2.7
1996	3.7	2.0	2.6	2.0	7.7	1.6
1997	4.4	2.7	1.6	5.1	4.2	2.6
1998	4.3	2.9	-2.1	0.3	6.5	2.8
1999	4.7	3.0	-0.1	6.4	6.2	2.9
2000	4.1	3.8	2.8	8.6	4.3	3.8
2001	1.1	2.0	0.2	10.2	5.6	1.9
2002	1.8	1.3	0.3	11.7	3.7	1.0
2003	2.5	1.5	1.4	14.1	8.2	0.9
2004	3.4	2.6	2.7	9.6	7.2	2.2
2005	3.0	2.1	1.9	9.9	9.1	1.7
2006	2.6	3.4	2.0	12.0	9.1	3.1
2007	1.9	3.1	2.3	13.3	8.9	2.8
2008	-0.3	0.6	-1.2	9.2	6.5	0.4
2009	-3.5	-4.3	-6.5	8.8	7.7	-4.2
2010	3.0	1.8	3.9	9.9	8.2	1.7
2011	1.5	1.7	0.5	8.6	7.2	1.6

Source: The Conference Board Total Economy Database™, September 2011,
http://www.conference-board.org/data/economydatabase/

Table 3.

Labor Productivity Growth for Regions
(GDP per person, annual average, percent)

	US	EU-27	Japan	China	India	Euro Area
1990	0.6	1.4	3.3	1.5	2.7	1.7
1991	0.6	1.1	1.3	4.9	-0.9	1.0
1992	2.7	3.6	-0.3	8.2	2.9	2.5
1993	1.4	1.3	-0.2	8.2	3.2	0.9
1994	1.7	2.9	0.7	8.6	4.5	2.8
1995	1.0	2.8	1.7	13.1	5.6	2.0
1996	2.2	1.4	2.2	0.9	6.2	1.0
1997	2.1	2.1	0.9	3.9	2.7	1.8
1998	2.7	1.7	-0.9	-0.9	5.0	1.0
1999	3.1	2.3	1.2	5.2	4.8	1.1
2000	2.6	2.4	3.4	7.6	2.1	1.5
2001	1.0	1.2	0.9	9.0	3.2	0.5
2002	2.1	1.4	1.8	10.6	1.3	0.3
2003	1.7	1.1	1.7	13.1	5.7	0.4
2004	2.3	2.0	2.5	8.6	4.8	1.4
2005	1.3	1.1	1.5	9.0	6.6	0.8
2006	0.8	1.7	1.6	11.2	6.7	1.5
2007	0.8	1.3	2.0	12.5	6.5	1.0
2008	0.1	-0.3	-0.8	8.5	4.8	-0.3
2009	0.2	-2.5	-4.9	8.1	6.0	-2.3
2010	3.6	2.3	4.3	9.1	6.1	2.2
2011	1.1	1.0	0.5	7.9	5.1	0.8

Source: The Conference Board Total Economy Database™, September 2011,
http://www.conference-board.org/data/economydatabase/

Table 4.

TFP Growth for Regions (annual average, percent)

	US	EU-27	Japan	China	India	Euro Area
1990	-0.1	0.0	2.3	-0.7	1.1	0.3
1991	-0.8	0.3	0.3	2.1	-2.4	0.3
1992	1.8	0.6	-1.4	4.3	1.6	0.4
1993	0.1	0.0	-0.2	3.1	1.8	-0.4
1994	0.9	1.9	-0.6	3.0	2.6	1.9
1995	-0.1	2.5	0.7	7.5	2.8	1.6
1996	1.3	0.5	0.5	-4.8	3.6	0.3
1997	0.7	0.9	0.1	-1.4	0.4	1.1
1998	0.4	0.4	-2.4	-5.9	2.6	0.3
1999	1.5	0.4	-0.1	0.5	2.2	0.3
2000	1.3	1.4	1.4	3.3	-0.2	1.4
2001	-0.2	-0.2	-0.2	4.7	1.3	-0.1
2002	0.5	0.2	0.6	5.9	-0.6	-0.2
2003	0.9	0.1	0.6	7.7	3.7	-0.4
2004	1.7	0.6	1.7	2.5	2.3	0.2
2005	0.8	0.4	1.2	2.4	3.6	0.3
2006	0.0	1.3	0.8	4.5	3.4	1.1
2007	-0.1	0.5	1.6	5.9	2.9	0.3
2008	-1.1	-1.2	-1.1	2.2	0.9	-1.4
2009	-1.0	-3.3	-4.5			-3.1

Source: The Conference Board Total Economy Database™, September 2011, http://www.conference-board.org/data/economydatabase/

Table 5.

Cost for R&D Calculated as % of GDP

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EU 27	1,8	1,75	1,78	1,79	1,84	1,86	1,87	1,88	1,87	1,83	1,83	1,85	1,85	1,92	2,01	2
EU 15	1,85	1,8	1,83	1,84	1,89	1,92	1,93	1,94	1,93	1,89	1,89	1,92	1,93	2,01	2,1	2,09
Euro zone 17	:	:	:	:	:	1,84	1,86	1,88	1,87	1,85	1,84	1,87	1,88	1,96	2,06	2,06
USA	2,48	2,52	2,55	2,58	2,63	2,69	2,71	2,6	2,6	2,53	2,56	2,6	2,66	2,79	:	:
China	:	:	:	:	:	:	0,95	1,07	1,13	1,23	1,32	1,39	1,4	1,47	:	:
Japan	2,91	2,8	2,87	3	3,02	3,04	3,12	3,17	3,2	3,17	3,32	3,4	3,44	3,45	:	:
South Korea	:	:	:	2,26	2,17	2,3	2,47	2,4	2,49	2,68	2,79	3,01	3,21	3,36	:	:

Sourse: Eurostat database, Available at:
http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do

Table 6.

Comparative Advantage of Technological Aspect (2005/2008), Balassa index of competitive advantage

	EU	USA	Japan	Great Britain	China
High technology industries	0,9	1,3	1,0	1,2	1,5
Medium technology industries	1,2	1,1	1,5	1,0	0,7
Medium-Low technology industries	0,8	0,8	0,9	0,7	0,6
Low technology industries	0,9	0,8	0,4	0,9	1,2

Source: CHELEM data, Mauro, di F., Forster, K., Lima, A. (2010). *The global downturn and its impact on euro area exports and competitiveness*. Frankfurt: European Central bank.

Table 7.

Competitive Advantage in Productions According to the Intensity of Factor of Production

	EU	USA	Japan	Great Britain	China
Raw material	0,5	0,7	0,1	0,6	0,4
Labor intensive productions	1,1	0,8	0,5	1,0	2,3
Capital intensive productions	1,2	0,9	1,6	1,1	0,3
Research intensive production	1,1	1,4	1,4	1,2	1,0

Source: CHELEM data, Mauro, di F., Forster, K., Lima, A. (2010). *The global downturn and its impact on euro area exports and competitiveness*. Frankfurt: European Central bank.