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POTENTIAL ECONOMIC GROWTH AND CRISIS EU TENDENCIES AND POSSIBILITIES OF ECONOMIC POLICIES

ABSTRACT

The study analyzes the impacts of the financial and economic crisis on the potential growth in the European Union. It carries out quantitative analysis in order to reveal the medium and long-term trends. According to the analysis the impacts of the crisis are significantly different in the Member States, which are however to be categorized in country-groups. The basic structural problem of the EU is considered the decreasing trend in the potential growth. It can be further strengthened through the lasting consequences of the crisis.

***Key words:** potential economic growth, growth accounting, production function, convergence crisis*

***JEL classification:** F15, O10, O40, O52*

1. INTRODUCTION

The dramatic decline in the actual output of the European economy is considered to be more than a cyclical discrepancy from the potential output. At the same time the previous financial and economic crises have had lasting negative impact on the output and the employment. Both the level and the growth rate of the potential output show an unfavourable development. On the one hand the economic performance is getting closer to its potential level only slowly after combating the recession. On the other hand – and this implication is more serious – if the crisis has a negative impact on the medium-term and long-term growth potential, Europe will follow a more unfavourable growth path for a long time. (The erosion of the European growth potential has progressed particularly during the last one and half decade.)

Taking these aspects into account the paper is aimed at revealing medium-term and long-term trends in potential growth in the European Union following the crisis.

In the analysis the *production function approach* was applied. The impacts of the financial and economic crisis on potential growth are described (Section 2). This part contains on the one hand the impact mechanism of the crisis and on the other hand the main experiences gained during previous crises.

The impacts of the crisis on potential growth were revealed by means of broad mid-term quantitative analyses (for the period 2010-2014) using the production function approach. The study includes the growth trends in the EU27 (both EU15 and EU12) and the USA (Section 3). The focus was set, however, on the relatively homogeneous country-groups of the EU (5 country-groups) elaborated by the authors (Section 3.1).

In the end alternative long-term scenarios were outlined (Section 4) and main conclusions were drawn.

2. POTENTIAL IMPACT OF THE CRISIS ON THE POTENTIAL GROWTH

The financial and economic crisis might have a significant impact on potential growth. (The impacts on the long-term potential growth are particularly difficult to reveal.)

In the short run the significant decrease in the level of potential output is the result of the decrease in the productive capital stock (increasing capital depreciation), and the negative impact on labour supply and structural unemployment. The decisive question is the impact of the crisis on the *long-term potential output growth*. If the potential growth will be strengthened following the crisis, then the loss caused by the decrease in the output level might be compensated after a while. The economy might get on a higher, sustainable growth path due to the effects of the crisis forcing out structural transformation. (As for these processes, the development in Sweden and Finland following the crisis at the beginning of the 1990s might serve as a good example.)

In order to understand profoundly the impacts of the crisis on the potential output and its growth the individual growth factors need to be analyzed at large. Applying the production function approach the recession might have an impact on growth through three different channels: capital accumulation, labour input and total factor productivity. The labour supply can be divided into participation rate, average working hour and working age population and structural unemployment rate. (The latter is NAIRU: Non-Accelerating Inflation Rate of Unemployment.) TFP shows the effectiveness of the use of production factors. (As the latter is actually directly unobservable it is often calculated as residue besides labour and capital factors.)

The financial crises have deep impacts on the long-term output growth. According to Cerra and Saxena analysis (2008) the recession was not followed by rapid recovery. The loss of trend output has not been fully recovered later on. The loss of the GDP level was generally not set off by higher growth after the crisis. In the countries analyzed (in the case of 7 countries out of 14) the growth pace experienced during the decade following the trough of the crisis is somewhat lower than that prior to the crisis.

Bank crises and bigger recessions share several common peculiarities. Both are characterized by the decline in the activity and the industrial reallocation and the significant decrease in the investment. All these have remarkable impact on potential growth.

Recessions following a financial market crisis are deeper than 'ordinary' recessions. Those are generally associated with a significant decrease in housing prices and construction output. (Reinhard and Rogoff, 2008, Claessens et al., 2008) The decrease in consumption is high during recessions. It reflects also the loss of assets (e.g. decrease in housing prices.)

During the past decades the impacts of the economic recessions (not only the financial crises) are mixed as regards the long-term potential growth in the European countries. Potential growth has increased in about half of the countries during the decade following the crisis.

The dynamics of the capital accumulation has decelerated in most European economies in the short- and medium term. (Haugh et al., 2009, EC, 2009b) In the long run the contribution of the capital accumulation to the potential growth has basically not changed in most EU Member States. Although the recession affected the capital accumulation in the short run, *in the long run the structural factors played a decisive role.* The *growth model* of these economies changed significantly in the 1990s. Due to the change in the industrial structure the capital accumulation declined and the contribution of the TFP to the potential growth increased.

After the severe recession the contribution of labour to the potential growth increased in most countries analyzed. During the decade following the recession the contribution of labour increased in 7 countries out of 10 countries analyzed. *The level of NAIRU grew during recessions but it generally declined after it.*

After the big recessions the dynamics of the total factor productivity was different, but it was considered the main driving force behind the long-term output growth. In certain countries (EL, FI, SE and UK) the dynamics of TFP intensified and in other countries (BE, DE, ES, FR, IT, and PT) declined. *The TFP and the increasing dynamics of the potential growth coincided in the countries considered.* (The only exception was Spain, where the participation rate grew significantly. Thus the contribution of labour to the potential growth increased.) Output losses after banking crises are 2 to 3 times higher. It takes on average twice as long for output to recover back to its potential level. (Haugh et al., 2009) In comparison with other financial and real-estate crisis driven recessions the current slump is considered to be severe as regards both output and investments.

In terms of the *demand components* the main factor of the downturn was the *collapse in fixed capital formation*. The household consumption, stock formation and net-exports contributed to the recession as well.

The likelihood of lasting effects on potential growth is much higher in the case of the current crisis than of previous recessions. The length of the crisis its global

characteristics and the change in the risk related behaviour might explain that. According to the forecast of the European Commission published in Spring 2010, *the crisis is expected to be longer* than the previous crises. (EC, 2010) The crisis has an adverse effect on the investments - on intangible investments in particular (namely R&D) – which has a severe impact on the TFP growth and the potential output. On the one hand the NAIRU might increase due to the hysteresis effect (See Blanchard et al., 1989) resulting in further drop in the potential output level and slowing down the potential growth in the short and medium term. Many discouraged workers leave the labour market decreasing this way the labour supply.

As the crisis is a global one the possibilities of recovery through rechanneling of resources from sectors producing non tradable goods into sectors producing for export is limited. In the middle of the 1990's - following the financial crisis – the essential factor of the Finnish and Swedish 'miracle' was structural transformation, reallocation of resources based on effectiveness and competitiveness into ICT sectors.

The risk-related output losses can be estimated only vaguely. The long recession has a severe and down-out effect on the main factors of the production function. On the potential growth path negative structural changes might occur, none the less the downturn will gradually stop.

After the crisis hit the bottom the *recovery has started* both in the global economy and the economy of the EU. Economic policy measures (liquidity enhancement through monetary policy, additional fiscal demand stimulus etc.) have played a significant role in the moderation in the downturn and the initial recovery. The pace of this recovery is, however, lagging behind the dynamics experienced following previous recessions. (Reinhart (2010), IMF (2009)) Differences between countries are significant.

At the same time the *fiscal stimulus applied broadly while handling the crisis has led to an increase in fiscal deficit and public debt*. In 2010 the government deficit might reach 6.5% expressed as percentage of the GDP and the public debt might exceed 80% of the GDP in 2011 (European Commission (2010)) *Adjustment of the public finances is unavoidable*. Fiscal consolidation might result in the fall of economic growth in the short run. In the long run its impact is positive, especially if it comes also to the introduction of growth enhancing structural reforms. The high public debt ratio causes significantly lower growth both in developed and emerging economies. (Reinhart and Rogoff (2010). Besides the crowding out effect also the financing of the deficit through distorting taxation and the increase in the government risk premium need to be underlined in its mechanism.)

The current crisis leads to *potential output loss* in the European Union. While the effect on the potential growth is much more uncertain, *the decline in the dynamics of the potential output – by having basically the same policies – is unavoidable in the medium and long run, due to the decrease in the TFP dynamics in particular*.

3. SLOWDOWN IN POTENTIAL GROWTH (MEDIUM-TERM QUANTITATIVE ANALYSIS)

In the medium term estimations *uncertainty is considerably high as regards the forecasts on investments and total factor productivity*. On the one hand the moderate investment dynamics of the recovery period that is caused by financial market problems, growing cost of capital, and shocked capital allocation system, on the other hand the problems of the capital allocation system and because of all of these the slower dynamics of the inevitable structural transformation intensify uncertainty and the possibility of adverse trends. So there are several factors having significant impact through the capital accumulation channel. Thus change in the TFP or capacity utilization can be measured only loosely. Considerable depreciation rate and at the same time the impacts of the crisis on innovation and structural transformation of sectors need to be taken into account.

In 2009-2010 the *potential growth rate of the old Member States (EU15) will drop to nearly half of that measured in 2007-2008*.¹ (I.e. the annual growth rate of 1.3-1.6% is likely to decrease to 0.8-0.9%.) The new MSs (EU12) show the same situation, the growth rate is, however, higher in their case as they are catch-up countries (in average 2.8-3.1% per year in 2009-2010). In the EU15 the decrease in potential output is to be explained mainly by the significant decrease in labour- and capital factors. The structural unemployment is expected to rise by 1-1.5% and the investment as a share of GDP might decrease by more than 3%. The dynamics of TFP is in average low in the EU15 (0.5% per year) and it is increasing only slightly - by approximately 0.1% per year - between 2011 and 2014 (This TFP assessment is relatively conservative. It does not take into account that there is a one-off downward shift in the TFP level related to the change in the industrial structure.)(See table 1)

In the EU12 the financial crisis is likely to result in a strong decrease in the potential growth rate: from an annual 4.1% in 2008 to 3.1% in 2009 and 2.8% in 2010. The different factors of the potential growth react basically similarly to the financial crisis both in the Euro zone and the EU15.

¹ The analysis is based on the 2010 Spring forecast database calculated according to the production function methodology of the EPC Output Gap Working Group (OGWG). The data were grouped and processed by the authors.

Table 1: Potential growth in the European Union

	Potential growth (as percentage of the annual change)	Contribution to the potential growth			NAIRU (as percentage of the labour force)	Investment rate (as percentage of the potential output)
		Labour	Capital	TFP		
<i>EU15</i>						
2001-2005	1.9	0.4	0.7	0.8	7.8	20.1
2006	1.7	0.3	0.8	0.8	7.7	21.1
2007	1.6	0.3	0.9	0.9	7.8	21.9
2008	1.3	0.1	0.8	0.8	7.9	21.4
2009	0.8	-0.1	0.5	0.5	8.3	18.8
2010	0.9	-0.1	0.4	0.4	8.5	18.2
2011	1.0	0.0	0.4	0.4	8.7	18.5
2012	1.3	0.1	0.5	0.5	8.8	19.0
2013	1.5	0.2	0.6	0.6	8.9	19.5
2014	1.7	0.2	0.6	0.6	8.9	19.9
<i>EU12</i>						
2001-2005	3.6	-0.3	1.7	2.3	11.7	22.7
2006	4.5	-0.2	2.0	2.7	10.1	25.2
2007	4.5	-0.2	2.3	2.4	9.2	27.7
2008	4.1	-0.2	2.2	2.1	8.6	28.0
2009	3.1	-0.2	1.6	1.7	8.4	23.9
2010	2.8	-0.1	1.4	1.4	8.4	23.5
2011	2.9	0.0	1.5	1.4	8.6	24.1
2012	3.2	0.1	1.5	1.6	8.6	24.8
2013	3.2	0.1	1.5	1.6	8.7	25.0
2014	3.0	0.1	1.4	1.5	8.7	24.7
<i>E27</i>						
2001-2005	2.0	0.2	0.8	1.0	8.6	20.3
2006	1.8	0.4	0.9	0.6	8.2	21.3
2007	1.8	0.4	0.9	0.5	8.1	22.2
2008	1.5	0.2	0.9	0.4	8.1	21.8
2009	0.9	-0.1	0.6	0.5	8.3	19.1
2010	1.0	-0.1	0.5	0.5	8.5	18.5
2011	1.2	0.0	0.5	0.6	8.7	18.8
2012	1.4	0.1	0.6	0.8	8.8	19.3
2013	1.6	0.1	0.6	0.9	8.8	19.8
2014	1.7	0.1	0.7	0.9	8.9	20.2

Source: own compilation based on the OGWG database

As regards the direction of the growth dynamics in 2009-2010 it is to be considered similar both in the old and the new MSs. *There is, however, a significant difference in the case of the medium term trends of 2011-2014.* The potential growth rate in EU15 is expected to be recovered by and large in this period. (The dynamics will be similar to that prior the crisis.) *The prospects of the EU12 are more unfavourable.* The contribution of the investments and the TFP won't be recovered fully from the 2009-2010 level. The labour market trends are also unfavourable. (Primarily, due to the significant deceleration of the growth rate of the working age population.)

3.1 Potential growth in the main country groups

The financial crisis has affected the different MSs to different extent. *The symmetric shock has had asymmetric consequences.*

The intensity of the impacts of the financial crisis depends on the *initial circumstances* and the *vulnerability* originating from them. The overestimation of the housing markets, export dependency of the economies, their current account position, the size of the financial sector and the exposure to risky assets might have a significant role. In the individual MSs – in relation to the factors mentioned – the potential growth rate, the investment rate, the structural unemployment (NAIRU) etc. differ to a great extent.

In our quantitative analysis the countries of the EU27 are categorized into 5 groups based on four main economic and economic policy peculiarities. These main peculiarities are as follows: potential growth rate, investment ratio, current account balance, the advancement in the field of the Lisbon Agenda.

The '*continental countries*' (BE, DE, FR, LU) are members of the Euro zone. The potential growth rate fell remarkably prior the crisis. These are countries with current account surplus (with the exception of FR). The Lisbon-type reforms have been carried out restrainedly.

The '*reform countries*' (AT, DK, FI, IE, NL, UK, SE) have shown significant improvement as regards the structural reforms. The 'Anglo-Saxon' and the 'Scandinavian' model have proved to be more competitive than the continental one during the globalization period. The potential growth rate exceeded that of the continental countries. At the same time the growth dynamics moderated preceding the crisis and it converged towards the dynamics of the continental countries. The smaller countries belong mainly to the Euro zone. 3 MSs (DK, SE, UK) are not members of the Euro zone. Characteristically there is a current account surplus (with the exception of UK and IE).

The potential growth dynamics has been very low in some '*Mediterranean*' countries for years (IT, PT), but it fell also in the others (EL, ES, CY, MT) at the outset of the crisis. The current account deficit and significant structural deficiencies are typical in these MSs.

In the '*catch-up*' group there are the MSs joined the EU in 2004 which showed favourable growth and convergence prior the crisis (CZ, PL, SK, SL). 2 smaller countries among them are members of the Euro zone, but the two bigger countries are not. All the countries classified as 'catch-up' countries have current account deficit. (It is, however, relatively moderated in this group.)

The '*vulnerable*' group contains the Baltic States (EE, LT, LV) and Hungary which joined the EU in 2004 and Bulgaria and Romania which joined the EU in 2007. With the exception of these two countries (BG, RO) the potential growth rate decreased before the crisis. There is relatively little advancement as regards the structural

reforms. None of the countries is a member of the Euro zone². The current account deficit is high (two digit! in several countries), *the dependency on external financing and their vulnerability is very high.*

Through the abovementioned categorization relatively homogeneous groups were to be outlined as regards the issues analysed. The characteristics of the groups and the countries in the groups are indicated in table 2 and the potential growth is shown in figure 1. (Additional aspects and analyses may further refine the method, which requires however to carry out researches in the near future.

Table 2: Potential growth, current account, the investment ratio and Lisbon performance in the country groups

Country group	Potential growth rate		Current account balance (as percentage of the GDP)		Investment ratio (as percentage of the potential output)		Lisbon performance ^b (2005 data in brackets)
	2005	2008	2005	2008	2005	2008	2008
'Continental' ^(a) (BE, DE, FR, LU)	0.8-1.9 ^(a)	1.0-1.8 ^(a)	2.2-5.2 ^(a) (except FR)	1.1-6.7 ^(a)	18.7-22.0 ^(a)	21.2-23.5 ^(a)	10.8 (10.0)
'Reform countries' (AT, DK, FI, IE, NL, UK, SE)	1.3-5.3	1.4-2.1	3.9-7.5 (except IE, UK)	2.7-8.9	17.7-22.3	18.6-22.0	4.0(4.0)
'Mediterranean' (CY, EL, ES, IT, MT, PT)	0.6-3.9	0.4-2.6	from-1.2 to -11.0	from-3.1 to -16.4	20.3-28.3	15.7-28.2	20.4 (19.4)
'Catch-up' (CZ, PL, SK, SL)	3.3-5.7	3.2-5.1	from-1.2 to -8.6	from-0.8 to -6.9	18.7-28.0	22.8-31.2	16.3 (17.8)
'Vulnerable' (BG, EE, HU, LT, LV, RO)	3.2-6.6	0.9-5.3	from-7.1 to -12.5	from-6.9 to -20.6	24.8-37.0	24.6-40.0	19.7 (19.8)
EU27	1.8	1.5	-0.3	-1.0	20.5	21.8	
USA	2.5	1.8	-5.9	-4.7	19.9	18.0	

Note: (a): Without the date for LU

(b): Based on the ranking by Tilford and Whyte (2010), the average value of the ranks of each MSs are calculated. The increasing number indicates that the "Lisbon performance" is getting increasingly unfavourable.

Source: own calculation

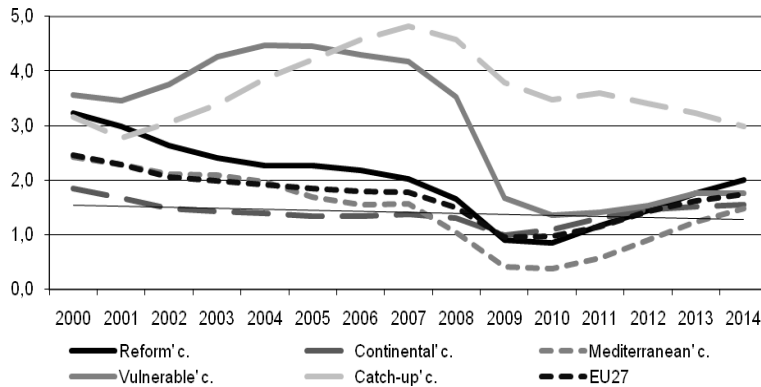
The following consequences offer themselves based on the analysis of medium-term growth processes of the country groups (the main factors of which are listed in table 3.)

² Estonia has become a member of the Euro zone from 1st of January 2011.

Summarising: *the financial crisis might generate significant decrease in the potential output and it might have a remarkably negative impact on labour (on non-demographic driving-forces, such as the NAIRU), capital and TFP.*

As regards the potential growth the individual country groups show substantially *different trends*. While the more developed countries and those being a member in the Euro zone will get close to their previous growth performance³, the potential growth rate will decrease in the Member States which are less developed than the average. *Due to that the growth dynamics of the country groups will converge compared to the period preceding the crisis.* (But it cannot occur as regards the level of the potential growth.) That is: *a surprising convergence might develop in the potential growth rate of the basically different country groups.* (See figure 1)

Figure 1: Potential growth in the country-groups of the EU



Source: own calculation

The contribution of the individual factors to the potential growth is very different. The structural unemployment (NAIRU) (Figure 2) will slightly decrease in the ‘catch-up’ countries, it won’t change in the ‘continental’ group, it will increase by about 2% in the reform countries and it will increase by about 2.2-2.5% in the ‘Mediterranean’ and the ‘vulnerable’ country groups. The investment ratio⁴ in the ‘continental’ and the ‘reform’ countries will be recovered by and large at the level preceding the crisis. (Figure 3) It decreases by 2% in the catch-up countries, by about 4% in the ‘Mediterranean’ group and by more than 6% in the ‘vulnerable’ countries. The contribution of labour input is modest on the whole, while its contribution is negative in the case of the ‘catch-up’ and ‘vulnerable’ countries. The contribution of the capital factor is the most modest in the ‘continental’ and ‘Mediterranean’ countries. The TFP as the decisive factor of the potential growth in structural terms will grow after the crisis has hit the bottom but it will remain at a low level on the whole. The most unfavourable dynamics of this

³At the same time there is a significant difference in the potential growth rate. The trend of the ‘reform countries’ is better (1.9% in 2014 according to the simulations) than that of the ‘continental countries’ (1.5% in 2014).

⁴Investment ratio is expressed as percentage of the potential output.

structural component is to be expected in the ‘Mediterranean’ and ‘vulnerable’ country groups.

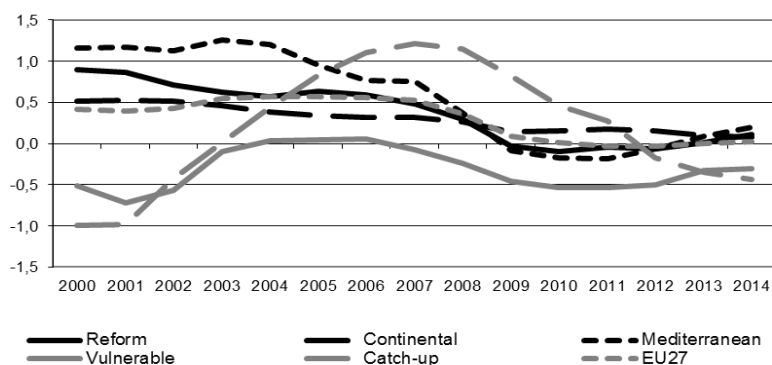
Table 2: Potential growth and its factors in the country groups

	Potential growth rate		Contribution to the potential growth					
			Labour		Capital		TFP	
	2010	2014	2010	2014	2010	2014	2010	2014
Continental	1.1	1.5	0.1	0.2	0.5	0.5	0.5	0.8
Reform countries	0.9	1.9	-0.2	0.2	0.4	0.7	0.7	1.0
Mediterranean	0.4	1.5	-0.2	0.3	0.4	0.6	0.2	0.6
Catch-up	3.5	3.0	0.3	-0.1	1.5	1.5	1.6	1.6
Vulnerable	1.4	1.8	-0.6	-0.3	1.4	1.3	0.5	0.7
EU27	1.0	1.7	-0.1	0.1	0.6	0.7	0.5	0.9
USA	1.4	2.1	0.0	0.2	0.5	0.9	0.9	1.0

Source: own calculation

As regards the potential growth and the contribution of individual factors *the most unfavourable trends can be experienced in the case of the Mediterranean and vulnerable countries.* (Figure 1-5) In the period analysed the catch up with the average of the EU27 will practically stop in the country groups indicated.

Figure 2: Development of Labour

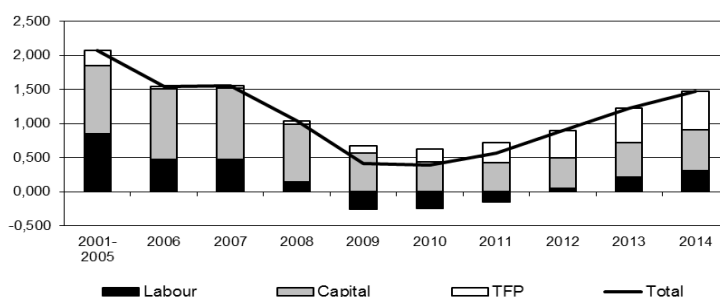


Source: own calculation

The decrease in the dynamics of the potential output to be predicted for the coming years shows a dramatic size. (Figure 5) In the Baltic States the annual increase in the potential output is expected to fall from 5-6% to 1.6-2%. In the case of Hungary the potential growth rate of 3-4% might fall under an annual 1%! That is: *in certain new member states the real convergence might stop in the short and medium run. (In certain cases even divergence might occur compared to the more developed countries.)*

This *convergence crisis* might cause severe tensions in the broader medium-term period both in the countries affected and the EU.

Figure 4: Development of the potential growth and its factors – Mediterranean countries



Source: own calculation

3.2 Potential growth in the EU and the USA

In a broader context it is to state that the potential growth rate shows in general a downward trend both in the USA and the Euro zone countries. (There is an exception in the USA from the mid 1990s onwards.) The potential growth rate represented a downward trend both in the Euro zone and the USA prior the financial crisis.

Table 3: Potential growth in the Euro Area and the USA

	Potential growth (as percentage of the annual change)	Contribution to the potential growth			NAIRU (as percentage of the labour force)	Investment rate (as percentage of the potential output)
		Labour	Capital	TFP		
<i>Euro area (EA-16)</i>						
2001-2005	1.8	0.5	0.7	0.6	8.5	20.9
2007-2008	1.4	0.2	0.8	0.4	8.5	22.5
2009-2010	0.7	-0.2	0.5	0.4	9.3	19.5
2011-2012	1.3	0.2	0.5	0.6	9.9	19.7
2013-2014	1.7	0.4	0.6	0.8	10.0	20.5
<i>USA</i>						
2001-2005	2.5	0.2	1.1	1.2	4.9	19.2
2007-2008	1.9	0.1	0.9	0.9	6.1	18.6
2009-2010	1.3	0.0	0.4	0.9	7.2	15.5
2011-2012	1.8	0.2	0.6	1.0	7.7	16.7
2013-2014	2.1	0.2	0.9	1.0	7.9	18.2

Source: own compilation based on the OGWG database

The current crisis is linked with repeated mitigation that occurred on the supply side earlier both in the USA and the Euro zone. The potential growth rate was much lower in 2008 than in 2000 (It is lower by 1.5% in the USA and by 0.8% in the Euro zone.) The current financial crisis decreases these rates by 0.25-0.50% in 2009-2010. (see

table 3) According to table 3 the deterioration induced by the financial crisis might be relatively short-lived. The main scenario of the *medium-term simulation based on the production function indicates the recovery of the potential growth rate* (annual 2%) until 2013 in the USA. In the Euro zone the potential growth rate might reach the level of 1.7%.

According to the analyses carried out using the production function method, the financial crisis might strengthen the models that differ between the Euro zone and the USA as regards the contribution of the growth factors to be experienced. The contribution of labour exceeds that of the USA further on, while in the latter the increase in the investment is expected to be significantly stronger from 2011 onwards.

The annual contribution of the TFP to the potential growth decreased from 1.5% prevailing at the end of the 1990s to approximately 0.8% in 2007-2008. But this dynamics was still more than twice as high as the rate in the Euro zone. In both regions the TFP contribution will be moderated due to the financial crisis in 2009-2010. These contribution rates return to the level prior the crisis. According to the forecast the contribution of the TFP to the potential growth in the USA will be significantly higher during the period from 2009 to 2013 than in the Euro zone. In order to explain why the performance of the USA is continuously higher there is a need to analyse the key driving forces of tangible and intangible investments.

4. EROSION OF THE EUROPEAN GROWTH POTENTIAL. ALTERNATIVE LONG-TERM SCENARIOS

The long-term potential trends need to be overviewed as well. The potential growth rate of the EU15 has been increasingly lagging behind the dynamics of the global competitors among them that of the USA since 1990's. Due to severe structural productivity problems of the EU15 and the insufficient adjustment to globalization a permanent and significant decline in the potential growth rate is to be expected. (Carone et al (2006)) The unfavourable investment environment promotes a higher level of capital outflow and a notable increase in the share of imported products and services.

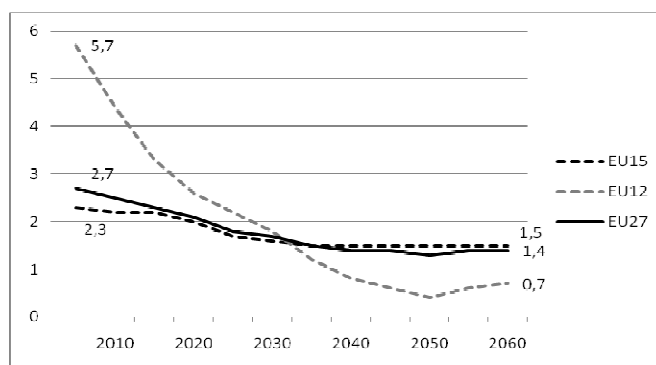
Applying the *production function* approach the longer-term simulations indicate that the potential growth rate falls both in the EU15 and the EU27. ⁵(EC (2008b), (2009b)) According to the base scenario this reduction will be continuous, moving from an annual 2.4% in 2007-2020 to an average 1.7% in 2021-2030 and then down to 1.4% in 2031-2060.

The forecast decline in the potential rate of growth is far greater in the EU10 and EU12 countries than in the EU15 states. According to this longer term simulations output in the EU12 will expand far more rapidly until 2030 than in the EU15 countries, i.e. the convergence process will continue. But as time passes the pace of convergence will

⁵ In this section we used the quantitative analysis - based on the production functions - that was carried out for the European Commission, (2008b), (2009b).

slow down, and then stop after 2030. (Based on the simulations, annual GDP in the EU12 will grow by only 0.6% in 2041-2060, compared to a figure of 1.5% for the EU15 countries. That is there is a switch from convergence to divergence, see Figure 6)

Figure 6: Potential GDP growth rate (annual average as percentage)



Source: EC, 2008b

In the new MSs the potential growth rate will decline at a greater pace, thus the real convergence will stop from 2030 onwards and even a moderate divergence from the EU15 might occur. It can be explained by the following factors: on the one hand the productivity growth rate might be rebalanced by 2050, on the other hand the demographic simulation are significantly more unfavourable in the NMSs than in the old ones.

The long-term paths indicating the erosion of the European growth potential could be considered rather optimistic based on the analysis of the impacts of the current crisis on potential growth.

In order to calculate the impacts of the current crisis alternative scenarios need to be set up. (see part 1) In view of the large uncertainty regarding the length of the slump in economic activity the case of the temporary shock and the case of the permanent shock needs to be defined.⁶

Two temporary shock scenarios can be described: a *'lost decade'* and a *'rebound' scenario*.⁷ Those figures are much lower than the baseline projection for the period until 2014.

The potential growth components will then converge to reach the growth rate projected in the baseline:

⁶ In the case of the permanent shock the risk aversion changes significantly. There is a long lasting increase in the risk premia and at the same time in the capital cost, the investment rate and the TFP dynamics is shrinking and at the same time there is a permanent increase in the NAIRU.

⁷ The analysis is based on the database applying the production function method of the EPC Output Gap Working Group and the database of the Ageing Report. See EC (2009b)

- in the *'lost decade'* scenario, labour productivity is assumed to reach the baseline growth rate in 2020. Labour input is assumed to reach the baseline growth rate in 2020, too.
- in the *'total rebound'* scenario, labour productivity and labour input are expected to reach the baseline level in 2020.

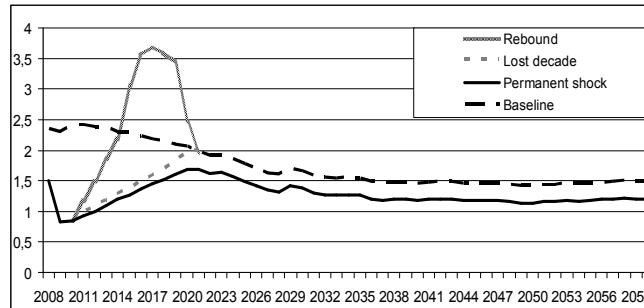
Given the current economic crisis and a very considerable degree of uncertainty, the impact of a permanently worse situation of the growth potential can also be analyzed. This is the 'lasting and increasing loss' (or *'permanent shock'*) scenario. These numbers are much lower than the values calculated until 2014 in the comprehensive long term baseline scenario. According to this analysis the annual potential GDP growth in the EU27 countries is lower in both scenarios by about 0.9% than in the baseline scenario. The potential growth rate converges to the growth rate of the baseline scenario following these corrections:

According to the 'lasting and increasing loss' scenario from 2014 to 2020 the labour productivity growth and labour input growth will reach the baseline figures, but the unemployment rate will be permanently 1% higher than in the baseline from 2020 onwards; and the labour productivity growth rate will be 0.25 % lower than that from 2020 onwards.

The *'lost decade scenario'* causes a lower per-capita GDP level at the end of the period examined compared with the baseline. It implies a *lower expected potential growth* up to 2020. This period is 'lost' in terms of accumulated wealth creation. The loss in GDP per capita in the EU27 is around 11% in 2020. This scenario carries over the loss in the rest of the projection period. The growth projection remains broadly unchanged between 2020 and 2060. In the *'total rebound' scenario*, the GDP per capita by 2060 is the same as in the baseline (The deterioration relative to the baseline up to 2014 is offset by the improvement between 2015 and 2020). (EC, 2009e)

A more marked reduction in the GDP per capita level occurs in the 'lasting and increasing loss' scenario. In that case the GDP per capita is 12% lower than in the baseline in 2020, 16% lower in 2040 and 20% lower in 2060. It means that this scenario reflects significant lower growth throughout the projection period than it was assumed before. (The growth path of the different variables is summarized by figure 7)

Figure 7: Potential GDP growth under different shocks (annual growth rate)



Source: EC, 2009b

The permanent shocks would result in the complete collapse of the growth and catch-up models in Europe. In the long term one fifth of the GDP would fall out and the chances of real convergence would deteriorate dramatically, though differently country by country.

5. SOME CONCLUSIONS

Main conclusions are summarized as follows:

1. Applying the supply side approach *the recession has an impact on growth through three different channels*: capital accumulation, labour input and total factor productivity. The probability of the lasting impacts on potential growth is much higher as regards the recent crisis than it was in the case of previous recessions. It has to be particularly highlighted, that the *risk related* behaviour might change permanently.
2. The financial and economic crisis of 2008 - 2009 resulted in the deepest recession we have seen since WWII. New risks appeared. In the EU the new MSs have been experiencing a continuous fall in potential growth since 2008. The potential decrease in the rate of the potential growth in the medium term is of dramatic size in certain new NMSs. In these countries *real convergence might stop in the short run and it might even come to a divergence*. We call it '*convergence crisis*'.

The financial crisis hit the different countries to different extent. *The symmetric shock resulted in asymmetric consequences*. As regards the potential growth and the contribution of the individual factors *the most unfavourable trends were to be experienced in the case of the Mediterranean and vulnerable countries*. In the period analysed the catch up will practically stop in the country group indicated.

3. It is important to compare the European and the US growth model. In the long run the potential growth rate shows a declining trend both in the USA and the Euro zone countries. The TFP growth rate is much higher in the USA from the middle of the

1990's onwards than in the Euro zone. This higher dynamics is expected to last also in the medium term.

4. In relation with challenges of the globalisation and competitiveness problems of the European Union's economy - the current average annual rate of *potential growth in the European Union of 2.4% could fall to half this level on average in the coming decades*. The potential growth rate will be cut in half, despite the prognosis containing relatively benign development in labour productivity. This may also indicate adverse demographic changes. But its decisive structural element is the decreasing dynamics of the total factor productivity.

5. The risk of shock repetition is high. These changes project *further erosion of the growth potential in Europe*. That is: due to the crisis and its potential long-term impacts there might be scenarios which are more unfavourable than those indicating decreasing potential growth in the previous point. *The trajectory of permanent shocks threatens with the complete collapse of the European growth and catch-up model*.

Precondition of creation and implementation of adequate policies (policy mixes) is considered the analysis of potential growth and growth potential. The analysis of the determinants of the growth potential might contribute to the inevitable structural reforms and macroeconomic adjustment, which however can not be discussed in this study.

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