I. The euro area's growth prospects over the coming decade ([1])

The European economy is showing signs of a turnaround from the economic and financial crisis. However, this has not been an ordinary cyclical downturn, as macroeconomic imbalances accumulated over many years. It is also not an ordinary cyclical upswing and return to growth. Structural trends in Europe have been weakening since the mid-1990s, most notably visible in total factor productivity. In addition, the credit boom that started in the early-2000s brought a misallocation of investment and resources, which now poses an additional weight on the recovery. The profound structural challenges in Europe are gradually being corrected. But the reallocation of resources remains slow, given the necessary deleveraging, the structural rigidities and the remaining weaknesses in the banking sector. Persistent efforts remain necessary to reverse long-lasting trends and to counter the forthcoming impact of ageing populations on growth. This chapter presents a simulation based on a "do-nothing"-scenario under which, over the coming decade, growth rates would be substantially lower than those enjoyed in the decade prior to the financial crisis, averaging less than 1%, which is about half the rate projected for the US. However, the chapter also shows that the euro area has enormous potential for catch-up growth, compared with the US. Consequently, with the introduction of a range of per capita income enhancing structural reforms, focussed in particular on the many unexploited growth opportunities linked to both labour and TFP, policy makers could significantly improve future growth prospects and ease the fiscal strains which any permanent deterioration in income growth inevitably implies. Over the last years with the reinforced economic governance, a strong framework has been created for advancing on the path of reforms, and Member States should implement the recommendations made to them.

Introduction

As the euro area starts to show signs of an economic turnaround, with growth expected to pick up gradually in 2014 and 2015, now is perhaps a good time to assess the longer term prospects for the area as a whole. In this chapter, we take a look at the euro area's growth outlook over the coming decade in a "do-nothing" scenario, comparing it with that of the last few years; with the decade prior to the financial crisis; as well as with the US. In overall terms, the chapter does not predict a period of secular stagnation, but without further reform efforts, it does point to relatively subdued growth prospects for the euro area over the next 10 years. The reasons for this to some extent pre-date the economic and financial crisis and its build-up phase. Especially total factor productivity (TFP) has been weak on average already for a longer period, and indicates missed reform opportunities already before. In the build-up phase of the financial crisis, the underlying low potential growth was hidden behind relatively benign actual growth rates, particularly in catching-up economies. The high debt associated with the financial crisis is a further drag on growth at present. Looking forward, the declining working-age population also impacts on growth. Whilst growth will be low on average, the expectation however is for an acceleration in growth over the second half of the decade, especially in those euro area countries currently undergoing significant economic adjustment programmes, with TFP trends starting to gain from restructuring efforts and with unemployment and investment rates recovering towards their pre-crisis levels.

Regarding the impact of the financial crisis, whilst quantifying its medium to long run effects still provokes controversy, with the literature on creditless recoveries suggesting that it may not necessarily act as a significant constraint on economic activity, ([2]) the results from the present chapter are much more in agreement with the considerable historical evidence that financial crises are associated with abnormally deep recessions; abnormally weak recoveries and prolonged, even permanent, reductions in the level of output. ([3]) As

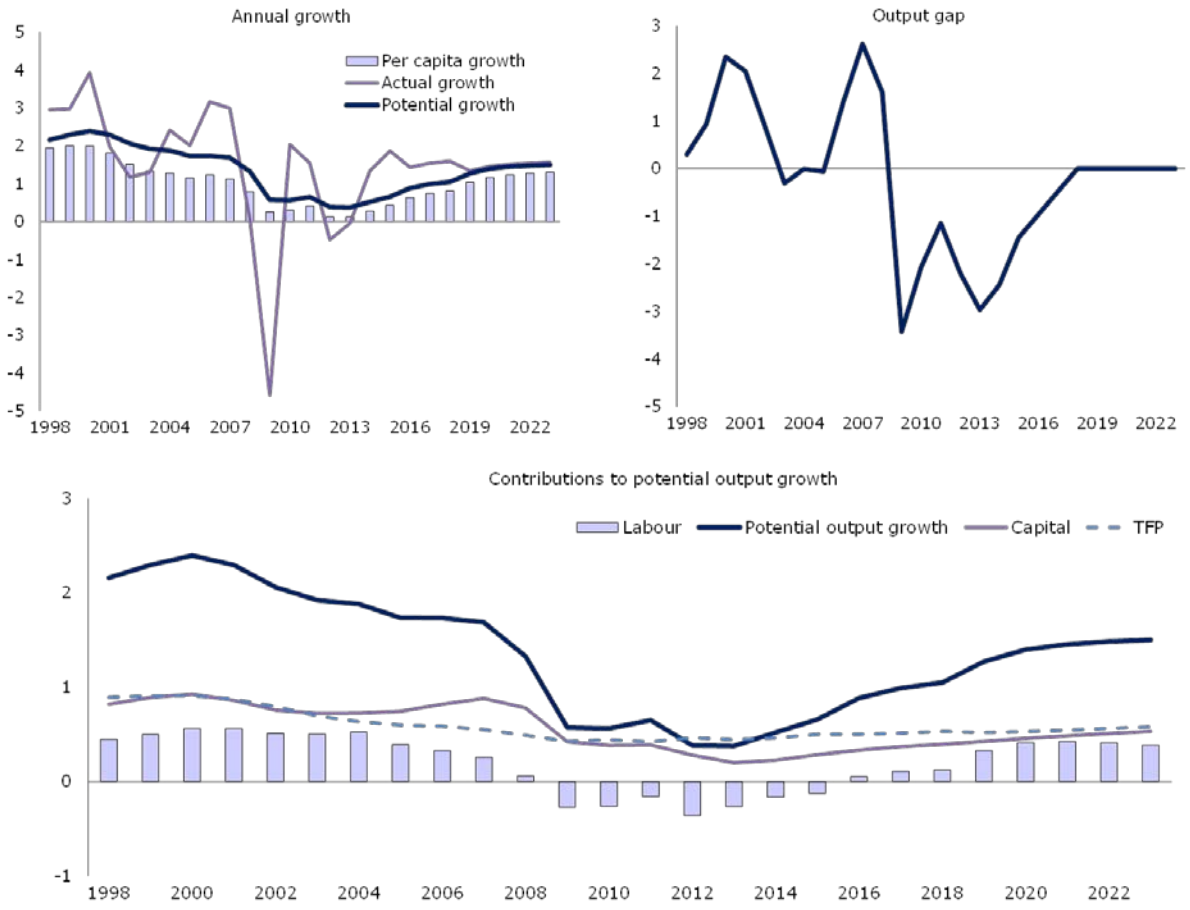
([1]) Section prepared by Kieran McMorrow and Werner Roeger

([2]) See for example: Takats, E and C. Upper (2013), "Credit and growth after financial crises", *BIS Working Papers*, No 416. Claessens, S, A. Kose and M. Terrones (2009), "What happens during recessions, crunches and busts?", *Economic Policy*, Vol. 24(60), pp. 653-700.

([3]) See for example: Cerra, V. and S. Saxena (2008), "Growth dynamics: the myth of economic recovery", *American Economic Review*, Vol. 98(1), pp. 439-457. Haugh, D., P. Ollivaud and D. Turner (2009), "The macroeconomic consequences of banking crises in OECD countries", *OECD Economic Department Working Paper*, No. 683. Reinhart, C.M. and K. Rogoff (2009), "The aftermath of financial crises", *NBER Working Paper*, No. 14656.

Graph I.1: **GDP, potential and per capita income growth, output gaps, euro area**

(1998-2023, in %)



Source: DG ECFIN.

well as looking at the evidence regarding the growth impact of the financial crisis, the present chapter will attempt to disentangle the effects of the crisis from the two other key influences on future growth, namely negative trends with respect to both the euro area's TFP (Total Factor Productivity) and demographic developments. (4)

Whilst this chapter is essentially analytical in nature, its overall message has clear policy implications. Without reform, the euro area's medium to long run growth potential inevitably implies weaker growth than that experienced in the past and continuing divergence relative to US standards of living. However, with reform, the euro area can be placed on a growth trajectory which will ensure the maintenance of past levels of income growth and a revival of the pre-1995 pattern of convergence to US living standards.

(4) TFP measures the overall efficiency of an economy's production processes.

I.1. Growth prospects for the euro area

Using an EPC-approved methodology for forecasting, namely a no-policy-change, (5) baseline growth scenario over the coming decade, Table I.1 and Graph I.1 show the likely outlook for the euro area's economy over the period to 2023. To put this outlook into its proper context, these forecasts are compared with the outturns for the pre-crisis decade (i.e. 1998-2007) and for the crisis period, 2008-2013.

Table I.1 looks at period averages, with Graph I.1 showing the evolution, of actual GDP, potential GDP and GDP per capita over the period 1998-2023. Regarding future growth prospects – actual and potential euro area growth rates are, on

(5) For more details on the EPC approved methodology, see D'Auria, F., C. Denis, K. Havik, K. Mc Morrow, C. Planas, R. Raciborski, W. Röger and A. Rossi (2010), "The production function methodology for calculating potential growth rates and output gaps", *ECFIN Economic Papers*, No. 420.

average, forecast to be nearly 1 percentage point lower in the next ten years than in the pre-crisis decade. Potential rates are expected to only gradually return towards their pre-crisis levels over the period to 2023, as the contributions from capital and labour slowly recover from the significant impact of the crisis. This indicates the need for more structural reform to remove rigidities in the allocations of resources, which is essential in order to raise living standards. Otherwise, per capita growth rates could be expected to fall by over half a percentage point over the coming decade compared with the pre-crisis period (i.e. from an annual average of 1.6% to less than 1%). Per capita growth rates had been trending lower already before the crisis. It can also be seen from the graph that the pre-crisis boost to capital accumulation did not lead to increased TFP growth. Post crisis, capital and labour resources are only gradually re-allocated to more productive uses, which further strains potential growth.

Table I.1: **Actual, potential and per capita growth, euro area (average annual in %)**

	GDP Growth	Potential Growth				
		Total Potential Growth	Contributions to Total			GDP per capita (Potential)
			Labour	Capital	TFP	
1998-2007	2.3	2.0	0.4	0.8	0.8	1.6
2008-2013	-0.3	0.7	-0.2	0.4	0.4	0.4
2014-2023	1.4	1.1	0.2	0.4	0.5	0.9

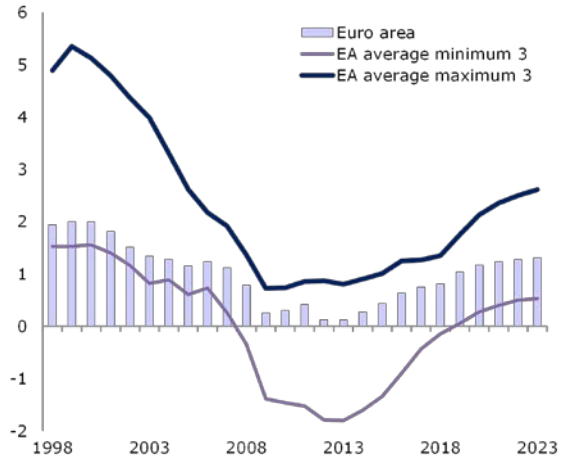
Source: DG ECFIN.

At the same time, actual GDP growth rates are expected to be slightly higher than potential rates over the coming decade since the euro area will still be faced with a significant negative output gap at the end of the short term forecasts in 2015, of the order of 1.5%. This should not be taken as a reason for complacency. In normal circumstances, given this negative output gap, one would expect that actual GDP growth rates would be higher than potential as the gap is progressively closed over the medium term to 2018. With potential growth rates averaging around 1% over the medium term, and with a linear closure of the output gap, one would therefore expect to see actual GDP growth rates of roughly 1.5% each year over the period 2016-2018. Once the gap is closed, actual GDP growth rates will then simply equal the potential growth rates for the period 2019 up to 2023.

Whilst the growth patterns for the euro area as a whole are expected to evolve along the path just described, the respective paths for the individual euro area countries are forecast to diverge significantly from the euro area average. This divergence pattern will represent a continuation of the trends seen since the mid-1990's and exacerbated by the crisis, where existing imbalances and differences with respect to the need for, and consequently the speed of, deleveraging have strongly influenced relative actual growth patterns in the euro area as a whole. Regarding potential growth, this deleveraging process is showing up in particular in a drop in investment rates and persistently high unemployment rates, with knock-on effects on per capita income developments. Regarding the latter, the expected, relatively weak, overall performance for the euro area as a whole over the coming decade is not shared by all of its constituent members, with a number of countries expected to achieve annual average growth rates substantially higher than that of the euro area average, with future growth rates, in some cases, broadly comparable to that of the pre-crisis decade.

Graph I.2: **Potential GDP per capita growth, euro area**

(1998 - 2023, in %)



Source: DG ECFIN.

One indication of the degree of dispersion in the respective performances of the individual euro area countries is highlighted in Graph I.2. This graph shows that the 3 best performing euro area countries in the pre-crisis decade were doing dramatically better than the average over that period, with the 3 weakest performers managing to

grow close to the euro area average. ([6]) During the crisis years (2008-2013), the striking feature was the dramatically worse performance of the 3 weakest countries, with the forecast recovery in per capita income growth rates, over the coming decade, expected to be accompanied by growing convergence in the individual euro area performances.

I.2. Pre-crisis and post-crisis growth drivers in the euro area

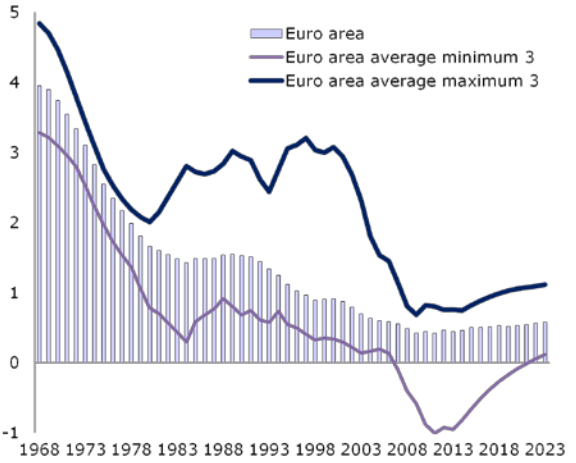
The current section of the chapter will try to show that the euro area's medium to long run growth outlook will mainly be driven by three key factors, firstly the influence of weak pre-crisis trends, most notably for TFP; secondly, the fallout from the financial crisis (including the misallocation of resources during the bubble years) provoking a slower than average recovery over time (especially with respect to structural unemployment and investment patterns) and finally by the expected impact from ageing populations.

Pre-crisis TFP trends:

Regarding TFP, Graph I.3 shows euro area TFP trends since the late-1960's, ([7]) with the Graph indicating that the euro area as a whole experienced relatively high rates of TFP growth in its successful catching up period from the mid-1960's up until the mid-1990's. This catching-up period was however increasingly marked by growing divergences in the respective performances of individual euro area countries from the early 1980's onwards. In addition, Graph I.3 highlights the significant break in the TFP series around 1995, with the post-1995 period not only marked by a sharp decline in the euro area's average TFP performance but also by striking differences in the outturns for individual euro area countries, with some experiencing robust TFP trend rates, whereas others have been characterised by TFP growth rates of close to zero for an extended period of time. The downward movement over the period from the mid-1990's up until the onset of the crisis was, in part, explained by a deceleration to more normal rates for some of the high TFP growth economies whereas the post-crisis period is marked by a further deterioration in some of the weakest TFP performers in the euro area, as well as by tentative signs of a recovery in some of the economies undergoing adjustment programmes.

Graph I.3: **Trend TFP growth, euro area**

(1965-2023, in %)



Source: DG ECFIN.

Whilst the origins of the growing heterogeneity in TFP performances in the euro area has a number of possible sources, there is little doubt that differences in the ability of the respective countries to produce and absorb new technologies, most notably in the ICT area, was a significant driver of growing internal euro area divergences in the post-1995 period. ([8]) Trend TFP breaks are clearly evident in a significant number of euro area countries around 1995, with this break especially evident in those countries where the share of ICT-production in overall output is relatively small, most notably in a number of the southern European countries. Whilst the break undoubtedly occurred, it is not however possible to disentangle the effects of ICT from other important TFP drivers such as non-ICT knowledge investments and changes in the skills composition of the euro

([6]) The composition of the 3 "strongest" and 3 "weakest" country groupings can change from year to year.

([7]) Note : Since trend TFP growth rates are calculated with two different estimation techniques for the pre-1980 (HP filter) and post-1980 (Kalman Filter) periods, this results in a break in the series around 1980. We have used linear interpolation to link these two TFP series, with the break being smoothed out over a four year period.

([8]) See for instance: Colecchia, A. and P. Schreyer (2002), "ICT investment and economic growth in the 1990's: Is the United States a unique case? A comparative study of nine OECD countries", *Review of Economic Dynamics*, Vol. 5(2), 408-442. Inklaar, R., M.P. Timmer and B. van Ark (2008), "Market service productivity across Europe and the US", *Economic Policy*, Vol. 23(53), pp. 139-194. Oulton, N. (2010), "Long term implications of the ICT revolution for Europe: applying the lessons of growth theory and growth accounting", *ICTNET 2nd Workshop on ICT, Intangibles and Innovation*, London.

area's labour force. At the aggregate euro area level, this break in TFP trends resulted in a drop in TFP growth rates from an annual average rate of 1.5% over the period 1985-1994 to 1% over the subsequent decade, with Graph 1.3 indicating both a significant deceleration in the growth rate of the best performing group post-2000 (linked perhaps to the waning TFP gains in the ICT producing sector and the bursting of the dot-com bubble) and a persistent decline in the performance of the weakest grouping. Regarding likely future developments, the current forecasts suggest a relatively subdued recovery in TFP growth rates over the coming decade, with an assumption of less heterogeneity in the performances of individual euro area Member States.

Impact of the financial crisis

On top of the deterioration in trend TFP since 1995, the euro area has been badly affected by the financial crisis. The build-up of the crisis started in the early 2000s and it erupted in autumn 2008, and over the last few years has had, and continues to have, a major impact on the euro area's economic performance. With an annual average actual GDP growth rate of -0.5% over the five year period 2009-2013, the immediate, highly negative, impact of the crisis on the euro area's growth performance is already resoundingly evident. However, the repercussions for growth over the medium and long-run are much less apparent, and depend on an assessment of the various channels via which the crisis could impact on labour market developments, investment and the rate of technological progress.

Regarding labour markets, the key determinants relate to the time needed to reallocate the newly unemployed into alternative employment opportunities in expanding industries, and whether countries can avoid "hysteresis effects" whereby a severe loss in human capital endowments, induced by long spells of unemployment, lead to long-lasting exclusion from the labour market. ([9]) Assessing the likely negative effects of the crisis with respect to the contribution of labour to potential growth depends strongly on an assessment of the impact of any real or nominal rigidities / frictions existing in the respective euro area economies, with the latter linked to rigid labour / product market institutions. The failure of labour / goods markets to provoke a sufficient degree of adjustment, following a large adverse shock such as the financial crisis, hinders the reallocation of labour, with considerable negative knock-on effects in terms of rising structural unemployment / falling employment rates. Currently, high unemployment levels are being mainly driven by medium term cycles which tend to persist for quite extended periods of time. Real adjustment rigidities (such as sectoral reallocation frictions, slow adjustment of reservation wages; skill mismatches etc…) are tending to slow down the necessary reallocation of labour out of crisis hit industries such as construction. These medium term real rigidities are expected to slowly resolve themselves over time, as resources are reallocated between sectors, with unemployment then progressively heading downwards towards its long run structural anchor. Whilst this scenario assumes no major hysteresis effects, it nevertheless implies that, in the absence of continued reforms, the euro area risks ending up with an unemployment rate in 2023 which is higher than in the pre-crisis period (see Orlandi (2012) ([10])).

With respect to investment, trends have already fallen dramatically in the crisis, resulting in a slowdown in the rate of accumulation of productive capital because of increases in risk premia on loans to firms and households, the more cautious lending behaviour of banks and a correction to more "normal" investment levels following the overinvestment pattern of the pre-crisis boom period (with Graph I.4 clearly indicating that investment was being driven by factors other than the fundamentals of trend employment and trend TFP from 2005 onwards, resulting in a pre-crisis potential growth path which was exaggerated by a number of unproductive, leverage-induced, investments). This slowdown, when combined with ongoing deleveraging and an impaired capital allocation system (resulting in a sub-optimal reallocation of capital resources in the restructuring phase), is contributing to a lowering

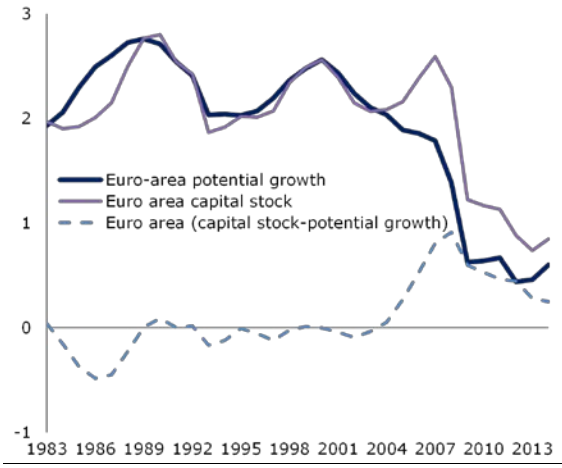
([9]) See Blanchard, O and L.H. Summers (1989), "Hysteresis in unemployment", *NBER Working Paper*, No. 2035; or Blanchard, O. and J. Wolfers (2000), "The role of shocks and institutions in the rise of European unemployment: The aggregate evidence", *The Economic Journal*, Vol. 110(462), pp. C1-C33.

([10]) Orlandi, F. (2012), "Structural unemployment and its determinants in the EU countries", *ECFIN Economic Papers*, No. 455.

of potential growth over the short- to medium-run. (11)

Graph I.4: **Pre-crisis divergence between the growth rates of potential output and of the capital stock**

(1983-2013, in %)



Source: DG ECFIN.

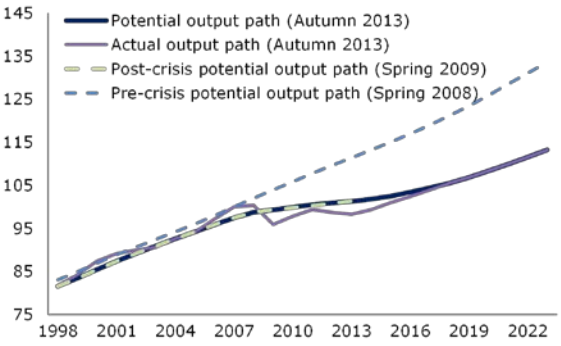
These tangible investment developments can also affect the rate of technological progress in the long run, if, for example, they lead to disincentive effects for intangible investments, such as R&D, and innovative activities in general, resulting in durably negative effects on long run innovation and TFP trends and lower success rates in the development and diffusion of new, leading-edge, technologies. (12) However, the overall impact of the crisis on long-run TFP remains ambiguous. Besides a number of mechanisms that tend to dampen TFP in the aftermath of a crisis, there are also arguments that downturns can have a positive TFP impact as they can induce a process of essential restructuring and cleansing in the economy. (13)

In spring 2009, the Directorate-General for Economic and Financial Affairs (DG ECFIN) looked at the various labour, capital and TFP channels and made an overall assessment of the implications of the crisis for potential output (14). It concluded that the most realistic scenario for the euro area's economy, would be for a prolonged period of slow growth in the aftermath of the crisis, as economies adjusted to their lower post-crisis growth paths, and with the most likely long-run effect being a cumulated loss in the level of the euro area's potential output of around 5% of GDP. This viewpoint was consistent with the mainstream predictions for such 'shocks' emanating from the literature and from an analysis of a number of relevant individual country experiences such as Finland, Sweden and Japan in the 1990's.

Given that the period 2009-2013 has indeed been highlighted by a prolonged period of slow growth, with significant implications in terms of the living standards of the euro area as a whole, a key question now arises, namely whether the outturn for growth over the last 4½ years fundamentally changes the spring 2009 assessment of the long run impact of the crisis. In this regard, Graph 1.5 shows the Autumn 2013 assessment of the future path of potential output in the euro area (produced by the official Production Function methodology and based on the current autumn 2013 Commission services forecasts) and compares this path with alternative pre-crisis (i.e. spring 2008) and post-crisis (spring 2009) potential output paths.

Graph I.5: **Potential and actual output paths, euro area**

(1998-2023)



Source: DG ECFIN.

This graph shows that whilst the real time performance of the PF method in the pre-crisis

(11) See Furceri, D. and A. Mourougane (2009), "The effect of financial crises on potential output: New empirical evidence from OECD countries", *OECD Economic Department Working Paper*, No. 699.

(12) See, for example, Aghion, P., P. Askenazy, N. Berman, G. Cette and L. Eymard (2008), "Credit constraints and the cyclicality of R&D investment: Evidence from France", *PSE Working Papers* or Barlevy, G. (2007) "On the cyclicality of Research and Development", *American Economic Review*, Vol. 97(4), pp. 1131-1164.

(13) Caballero, R.J. and M.L. Hammour (1994), "The cleansing effects of recessions", *American Economic Review*, Vol. 84(5), pp. 1350-1368.

(14) European Commission, Directorate-General for Economic and Financial Affairs (2009), "Impact of the current economic and financial crisis on potential output", *European Economy Occasional Papers 49*, June 2009.

Graph I.6: **Contribution to potential growth from labour input and key determinants of labour input, euro area**

(1998-2023)

Source: DG ECFIN.

period may not have been very good, ([15]) this is clearly not the case in the post-crisis period, with the euro area continuing to track the post-crisis potential output path produced using the spring 2009 forecasts.

In terms of the position of the euro area's economy at the present time relative to ECFIN's 2009 estimate of a long run loss of 5%, if one compares the Autumn 2013 potential output levels relative to the pre-crisis trend path, one can see from Graph I.5 that most of the effect of the crisis has been structural, not cyclical, in nature (with this structural decline in growth mainly driven by a much lower contribution from labour – i.e. increases in structural unemployment and a slower growth in the population of working age - and from weaker investment trends). In addition, since the pre-crisis trend growth path was predicated on an unrealistic TFP growth outlook and was also exaggerated by the pre-crisis investment boom conditions in some euro area economies, ([16]) the best estimate of the long run impact of the crisis continues to be a permanent loss of 5% in the level of the euro area's potential output compared with the most likely output trajectory in the absence of the crisis.

Ageing populations will start to weigh on the overall contribution of labour over the coming decade

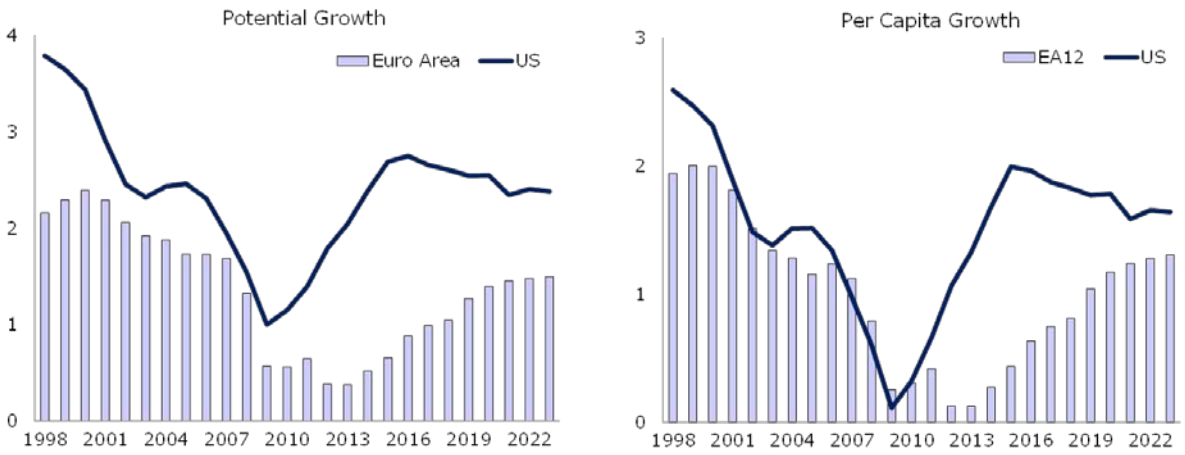
The earlier Table I.1 showed that labour is on average expected to contribute 0.2 p.p. to overall potential growth rates over the coming decade, half the contribution of the pre-crisis decade but nevertheless an improvement relative to the -0.2 experienced in the aftermath of the crisis from 2008-2013. Graph I.6 shows that this recovery in the contribution of labour will be slow but steady over the coming years before tapering off towards the end of the period. Regarding the key drivers of this recovery, positive contributions are expected from both the decline in the euro area's NAWRU and from a small increase in participation rates, with these positive influences being slowly offset towards the end of the period due to the declining contribution from developments in the population of working age. If one compares the contribution to potential from demographic changes over the coming decade compared with the pre-crisis decade, one sees that the contribution from population trends will be restricted to about ¼ of

([15]) The method produced a pre-crisis trend path which pointed to the euro area having a roughly zero output gap whereas subsequent revisions now show a relatively large positive output gap in the years preceding the crisis.

([16]) This implies that the underlying, "speed limit", rate of growth of the euro area's economy in the pre-crisis era was actually lower than the real time estimates suggested, due to the persistent pattern of resource misallocation in the bubble years.

Graph I.7: **US and euro area potential and per capita income growth**

(1998-2023, in %)



Source: DG ECFIN.

that of the pre-crisis period (on the basis of Eurostat's current population projections).

I.3. Euro area versus the US over the coming decade

Table I.2 and Graph I.7 provide a comparison between the euro area and the US over the period 1998-2023 with respect to potential and GDP per capita growth rates. The evidence provided in the table and graph suggests that not only has the US's growth performance been relatively less affected by the financial crisis but also that the US is expected to emerge from the crisis in a stronger position compared with the euro area. Following the inevitable rebalancing / restructuring of their respective economies in the immediate post-crisis period (i.e. 2008-2013), the US is expected to achieve average potential and per capita income growth rates over the period 2014-2023 which are broadly comparable with the pre-crisis decade, whereas the euro area's equivalent growth rates are expected to be halved. Why does the US come out faster? Were there fewer imbalances, fewer structural rigidities?

On the assumption that the euro area and US forecasts underpinning this scenario prove accurate, the euro area is forecast to end up in 2023 with living standards relative to the US which would be lower than in the mid-1960's. If this was to materialise, euro area living standards (potential GDP per capita) would be at only around 60% of US levels in 2023, with close to 2/3 of the gap in living standards due to lower labour productivity levels, and with the remaining 1/3 due to differences in the utilisation of labour (i.e. differences in hours worked per worker and the employment rate).

Table I.2: **Potential and per capita income growth in the euro area and the US (average annual in %)**

	Euro Area		US	
	Potential Growth	GDP per capita (Potential)	Potential Growth	GDP per capita (Potential)
1998-2007	2.0	1.6	2.8	1.7
2008-2013	0.7	0.4	1.5	0.7
2014-2023	1.1	0.9	2.5	1.8

Source: DG ECFIN.

Whilst divergences in euro area and US potential growth rates are of course problematic (with stronger US population trends playing a role), what is relatively more concerning is the emerging gap with respect to overall living standards (driven by a growing divergence with respect to labour productivity trends), with Graph I.8 putting recent, and expected future, euro area and US per capita income developments into their longer term historical perspective.

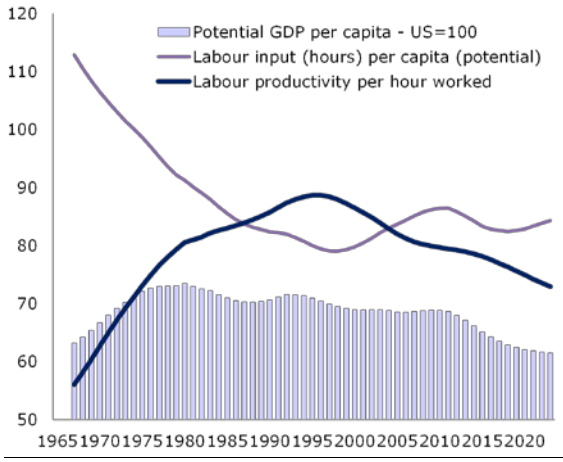
This graph shows that the euro area ([17]) enjoyed a relatively strong pace of convergence to US living standards over the 1960's and 1970's and broadly

([17]) A synthetic euro area aggregate, comprising 11 of the current 17 euro area countries, was constructed to enable a comparison to be made for the period from the mid-1960's up to the establishment of the Euro, with the 11 countries being Belgium, Germany, Ireland, Greece, Spain, France, Italy, the Netherlands, Austria, Portugal and Finland.

matched US GDP per capita trend growth rates over the 1980's and early 1990's. This process of convergence then went into reverse around the mid-1990's, with this shift been driven by a relatively abrupt reversal of long established labour input and labour productivity trends. On the positive side, the previously downward movement in the euro area's labour input trend relative to the US came to an end and, on the negative side, the post-World War II convergence of the euro area to US productivity levels went into reverse. In fact, after having peaked in the mid-1990's at close to 90% of US levels, relative hourly labour productivity levels in the euro area deteriorated by a full 10% points over the subsequent period to 2013 and are currently projected to decline a further 6% points to around 73% of US levels in 2023.

Graph I.8: **Potential GDP per capita, euro area relative to US**

(1965-2023, US=100)

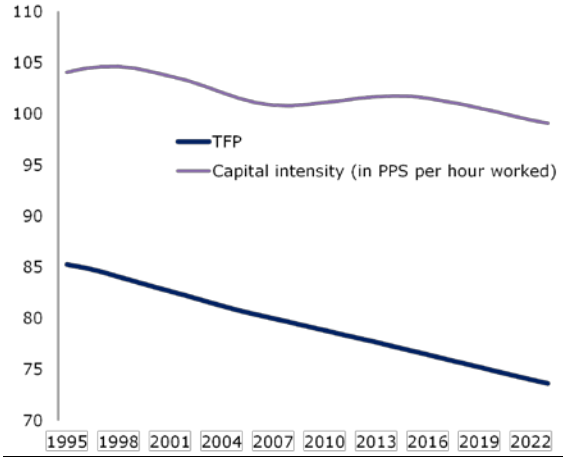


Source: DG ECFIN.

Graph I.8 makes it clear that the halt in the euro area's drive to converge to US living standards in the mid-1990s has been due to the euro area's persistently poor labour productivity performance over the subsequent period. A key supplementary issue is the need to understand what is driving these divergent labour productivity trends. Labour productivity per hour can be decomposed into two components, namely TFP and capital intensity (i.e. levels of investment per hour worked), with Graph I.9 showing that although there has been some relative deterioration in the euro area's investment performance relative to the US over the period since 1995, the main driver of the euro area's relatively dismal productivity performance over that time period has been the decline in euro area TFP levels relative to the US. Relative TFP levels fell from around 85% of US levels in 1995 to 78% currently, and are projected to fall further to a level of around 73% in 2023. Since TFP trends are what drive an economy's living standards over the long run, the premature halting of the euro area's convergence process at 85% of US TFP levels in the mid-1990's and the subsequent decline of the relative position of the euro area are a source of concern. This indicates that the divergence in future growth prospects is not only due to the crisis but has its roots reaching further back.

Graph I.9: **TFP and capital intensity levels, euro area relative to US**

(1995-2023, US=100)



Source: DG ECFIN.

As alluded to earlier, there appears to have been a break in the euro area's TFP series around 1995. Since that time the US and the euro area have diverged, with US TFP growth rates accelerating and those of the euro area decelerating. This divergence in TFP trends is undoubtedly linked to relative ICT developments, with the US enjoying a much stronger burst of TFP growth in a range of industries producing ICT equipment and with the falling relative prices of ICT boosting the rate of ICT capital deepening to a greater extent in the US than in Europe (see Jorgenson et al. (2008)). ([18]) These diverging euro area and US trends have persisted over time. Currently, there is relatively little evidence, at the overall euro area level, that TFP trend growth rates are converging to those in the US. However, as stated earlier, the performance

([18]) Jorgenson, D.W. and K.J. Stiroh, (2008) "US economic growth at the industry level", *American Economic Review*, Vol. 90(2), pp. 161-167. Jorgensen, D.W., M.S. Ho and K.J. Stiroh (2008), "A retrospective look at the US productivity growth resurgence", *Journal of Economic Perspectives*, Vol. 22(1), pp. 3-24.

of individual euro area Member States is very heterogeneous, with certain countries characterized by robust TFP trend growth rates relative to the US and with others continuing to diverge from the US technology frontier.

In overall terms therefore, whilst one must be cautious about making judgements regarding the expected ongoing impact of pre-crisis trends, or more importantly of the financial crisis itself, on future US and Euro Area growth prospects, what can be said is that the US entered the crisis in much better economic shape than the Euro Area (underpinned by a significantly better TFP performance). In addition, the US's future demographic and TFP trends are currently forecast to be substantially more favourable, with positive knock-on effects with respect to US investment (and overall productivity) developments over the coming decade.

I.4. Concluding remarks

This chapter has highlighted the structural decline in the euro area's growth rate over the last 15-20 years, and on the assumption that euro area governments do not react with appropriate policies, has suggested that this trend is forecast to continue over the coming decade. Low future growth rates will essentially reflect the influence of weak pre-crisis trends, most notably for TFP (especially since the mid-1990's), with these pre-existing problems being exacerbated over the coming decade by the ongoing negative fallout from the financial crisis and by the emerging drag on growth emanating from ageing populations.

Regarding the euro area's expected future performance relative to the US, annual average euro area potential growth rates, over the next 10 years, are forecast to be 1 ½% points lower than in the US (i.e. 1% versus 2 ½%). As to future prospects for euro area living standards, GDP per capita growth rates are expected to be only half those of the US.

Since this growth scenario to 2023 assumes unchanged policies, the picture presented could improve significantly with the implementation of an ambitious programme of structural reforms focussed on boosting the labour and TFP components of growth, with capital accumulation responding endogenously to a better outlook for both labour and TFP. Since TFP levels in the euro area are expected to be at less than 75% of US levels in 2023 and since structural unemployment rates will be substantially higher than those of the US, it is clear that there are a large number of significant, unexploited, growth sources in the euro area's economy.

Consequently, whilst commentators such as Gordon (2012) ([19]) may speculate about the reduced future prospects for the US to produce and exploit new technologies for extending its growth frontier, this prediction of a lower rate of US innovation is less of an immediate concern for the euro area given the enormous room for catch-up growth which currently exists. As stressed in the accompanying study in this edition of the QREA on the growth impact of structural reforms in euro area labour and product markets, if Member States could manage to close half of the gap with the three best performing euro area Member States, euro area GDP growth rates could be boosted by ½ a % point each year, over a 10 year period. Equivalent simulations for convergence to the US knowledge-technology frontier would produce significantly higher growth rate gains for the euro area.

This issue of the need to boost euro area growth prospects was forcefully highlighted at the launch of the Lisbon Strategy back in 2000, when EU potential growth rates were at a healthier 2 ½% annual rate. It is necessary to highlight this issue again, more than a full decade later, with the case for reform now being manifestly more pressing. As demonstrated by the wide variation in the past and current growth performances of individual euro area countries, policies matter greatly in determining medium to long run growth and income outcomes. Over the last years, Europe has reinforced its economic governance. In order to bring the growth potential of all euro area countries up to that of the best performers, structural reforms must be continued and further advanced in line with the priorities identified in the European Semester and the "Europe 2020" programme.

([19]) Gordon, R.J., (2012), "Is US economic growth over ? Faltering innovation confronts the six headwinds", *NBER Working Paper*, No. 18315.