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**Article**

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End of previous Forum article

Kieran McQuinn and Karl Whelan

## The Prospects for Future Economic Growth in the Euro Area

What are the prospects for future growth in the euro area? How can these prospects be improved through structural reforms? In this paper, we report some tentative answers to these big questions based on findings from McQuinn

and Whelan.<sup>1</sup> We use a growth accounting framework to isolate the historical sources of growth in the euro area and then use a simple simulation model to project the future path of GDP in the euro area as a whole, as well as in individual member states.<sup>2</sup> We then illustrate the potential

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1 K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

2 Because of data limitations, we restrict our analysis to the 12 countries that constituted the euro area prior to the accessions of recent years. These are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. We apologise in advance for using the shorthand "euro area" to describe our analysis, though these countries do account for the vast majority of euro area GDP.

impact that a set of successful structural reforms could have on economic growth, where success is defined as achieving a set of clear targets for variables such as the unemployment rate, labour force participation and total factor productivity (TFP).

Our answers to the questions posed above are sobering, particularly for those hoping that structural reforms will ignite a new era of fast growth in Europe. We find that TFP growth in the original 12 euro area countries has declined in each decade since the 1970s. Over the years 2000–2013, a period that includes multiple slowdowns and expansions, TFP growth has averaged only 0.2 per cent per year. We also find that the slump in investment over the past decade has caused significant negative supply-side effects. We estimate that this factor alone is currently reducing the supply-side growth potential of the euro area economy by about 0.6 percentage points per year. With a long-term projection of TFP growth of 0.2 per cent, a gradual decline in the work-age population and a static average workweek, we project a “baseline” average real GDP growth rate in the euro area of just 0.6 per cent over the next decade – even if the unemployment rate and investment share of GDP return to their pre-crisis levels by 2020.

We also describe a negative longer-term picture due to demographic factors. While Europe’s demographic ageing pattern is sometimes presented as a distant issue that will cause problems relating to pension systems in future decades, the ageing process is actually affecting Europe’s growth potential right now. The work-age population of the euro area has peaked, and Eurostat projections anticipate that the decline in this age group will accelerate in the coming decades.<sup>3</sup> We project that, if current patterns of labour market participation persist, total hours worked will decline significantly in the coming decades.

In response to these gloomy projections, some assert that Europe would implement various structural reforms to product and labour markets that would boost labour force participation and productivity. We discuss the potential impact of two such reforms: a labour market reform and a pension reform. Our approach is to focus on the potential outcomes that could be achieved by ambitious reform programmes if they were to be successful, with the details of precisely what these programmes would consist of likely varying widely across countries.

3 Eurostat EUROPOP2013, available at <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-projections-data>.

While the reforms that we consider are relatively radical in nature, we argue that the growth from these reforms is small relative to the decline in average growth rates from historical levels that we project in our baseline scenario. Thus, even with a significant reform programme, the euro area is likely to grow at a slower average pace in the future.

### Accounting for growth in Europe

Throughout our analysis, we use a simple Cobb–Douglas production function

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha}$$

where  $Y_t$  is real GDP,  $K_t$  is capital input,  $L_t$  is labour input (defined in this paper as total hours worked) and  $A_t$  is total factor productivity. Output growth can then be written as

$$\frac{\dot{Y}_t}{Y_t} = \frac{\dot{A}_t}{A_t} + \alpha \frac{\dot{K}_t}{K_t} + (1 - \alpha) \frac{\dot{L}_t}{L_t}$$

With data on output, capital and labour growth to hand and a value for  $\alpha$ , this equation can be used to calculate TFP growth. We implement this framework using annual data from 1970 to 2013 taken from AMECO, the annual macroeconomic database of the European Commission’s Directorate General for Economic and Financial Affairs. We construct capital stocks from investment data based on a depreciation rate of six per cent per year and an assumed elasticity of output with respect to capital of  $\alpha = 1/3$ . While these are very specific assumptions, we do not find that our calculations about the recent performance of the euro area economy are significantly affected by reasonable changes to these assumptions.

Table 1 presents results of the growth accounting exercise which allocates output growth according to the three components of the equation above. A number of patterns are worth noting.

- While there have been regular cyclical fluctuations, GDP growth in the euro area appears to have been on a downward trend since the 1970s. During the 1970s, GDP growth averaged 3.7 per cent per year. During the 1980s, this fell to 2.2 per cent. In the 1990s, the average growth rate was 2.1 per cent, and the period from

**Table 1**  
**Decomposition of euro area growth rates**

in %

Period	$\Delta Y$	$\Delta A$	$\Delta K$	$\Delta L$
1970-1976	3.6	2.7	1.5	-0.5
1977-1986	2.1	1.6	0.8	-0.4
1987-1996	2.3	1.5	0.8	0.0
1997-2006	2.2	0.7	0.8	0.7
2007-2013	-0.3	-0.2	0.5	-0.6
2000-2013	0.9	0.2	0.7	0.0
2010-2013	0.1	0.3	0.3	-0.5

Source: K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

2000 onwards has seen an average growth rate of only 1.1 per cent.

- The growth rate of total hours worked in the euro area has shown little trend in either direction since 1970. Over the period 2000-2013, total hours worked in the euro area has been effectively flat.
- We estimate capital stock growth in the euro area was over four per cent per year in the early 1970s but then fluctuated between two and three per cent annually between the late 1970s and 2008. Recent years, however, have seen a significant decline in the investment share of GDP, and we estimate that the euro area capital stock is now growing at an annual rate below one per cent.
- The rate of TFP growth has also declined gradually over time. Table 1 provides estimates for each of the ten-year intervals preceding 2007. TFP growth was running at 2.7 per cent in the first half of the 1970s, fell to 1.6 per cent over 1977-86, to 1.5 per cent over 1987-1996 and to 0.7 per cent over 1997-2006. The period from 2007-2013 has seen TFP decline at an average rate of 0.2 per cent per year, mainly due to a three per cent decline in 2009.

The very low rate of TFP growth in the euro area since 2000 should be a source of serious concern when thinking about prospects for future growth. It is well known that TFP growth is the ultimate long-run driver of growth in output per unit of labour input. For example, as discussed in McQuinn and Whelan,<sup>4</sup> over the long run and with con-

4 K. McQuinn, K. Whelan: Prospects for Growth in the Euro Area, in: CESifo Economic Studies, Vol. 54, No. 4, 2008, pp. 642-680.

stant values for  $g$  the economy converges towards a long-run steady-state growth rate of output per hour of  $g/(1-\alpha)$ . If 0.2 per cent per year is indeed the new "trend" growth rate of TFP in the euro area, then our value for  $\alpha$  would imply a long-run growth rate of output per hour of only 0.3 per cent per year.

### Longer-run outlook

Here, we develop a baseline scenario for future GDP growth in the euro area. We report results from a simulation of a simple supply-side model that projects growth using recent trends for TFP, uses the demographic projections just described and also assumes an unwinding of the cyclical problems of low investment and high unemployment. The model is implemented on a country-by-country basis and then aggregated to give results for the 12 euro area countries. Because our historical analysis was based on data through 2013, we use 2014 as the first year of the simulation. The point of the exercise, however, is not for forecasting growth in particular years but to see the implications for growth of both projected demographic changes and the continuation of current trends in TFP growth and other key variables.

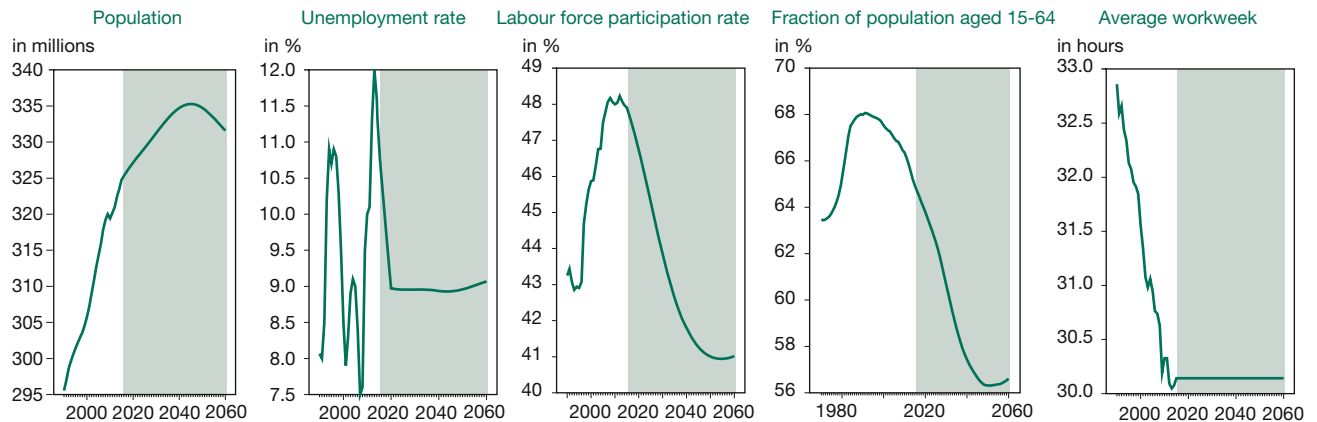
We project future movements in hours worked based on five different factors: population, the fraction of the population of standard work age (i.e. between 15 and 64), the participation rate (by which we mean the labour force divided by the work-age population), the employment rate (employment as a fraction of the labour force) and the average workweek per employee. These factors determine hours worked as follows:

$$\begin{aligned}
 \text{Total hours worked} &= \text{Population} \\
 &\times \left( \frac{\text{Work-age population}}{\text{Population}} \right) \\
 &\times \left( \frac{\text{Labour force}}{\text{Work-age population}} \right) \\
 &\times \left( \frac{\text{Employment}}{\text{Labour force}} \right) \\
 &\times \text{Average hours worked per employee}
 \end{aligned}$$

A number of patterns are now in place that point towards a potentially sharp contraction in total hours worked in the euro area economy over the next few decades. Figure 1 illustrates projections for the total population and work-age population from Eurostat's EUROPOP2013 forecasts.<sup>5</sup>

5 These forecasts are available at Eurostat EUROPOP2013, op. cit.

Figure 1  
Baseline model, labour market assumptions



Source: Eurostat EUROPOP2013.

These projections are based on detailed projections for trends in life expectancy, fertility and migration. The population of the 12 euro area countries is expected to grow very slowly over the next few decades. Eurostat projections indicate 0.18 per cent annual population growth between 2013 and 2023, followed by a gradual reduction in population growth until population levels begin declining in 2046. The fraction of the population that is of working age is set to drop rapidly in the coming years, falling from 65.2 per cent in 2013 to 63.5 per cent in 2020 and 57.2 per cent in 2040.

To obtain a projection for total hours worked, we need to combine the projection for the total potential number of workers with assumptions about labour force participation, unemployment and the average workweek. We did this as follows:

- Among those who are in the work-age bracket of 15 to 64 years old, increases in participation rates have gradually tailed off in recent years. We model the labour force participation rate using age cohort projections from Eurostat's EUROPOP2013 projections. Specifically, we assume that participation rates in each five-year age cohort (starting from age 15-19 and moving up to age 70-75, with a final category of over 75) remain at their 2013 levels.
- Unemployment rates in each country are projected to fall gradually to their 1998-2007 averages by 2020 and be constant thereafter. Two exceptions to this procedure are Germany and Finland, where the rates in 2013 were below these averages. We projected the unemployment rates in these countries to stay constant from 2013 onwards.

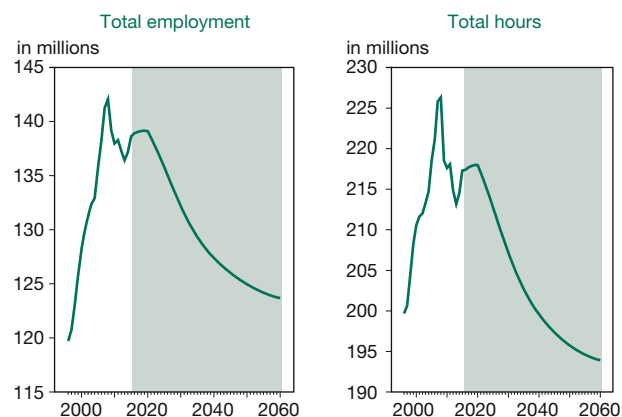
- We projected that the average workweek of employees remains flat from 2014 onwards, thus ending a decades-long pattern of decline.

Figures 1 and 2 provide graphic illustrations of how our assumptions translate into euro area aggregate labour market outcomes. Figure 1 illustrates the five variables that determine total hours worked. Population growth is projected to be weak over the next few decades before turning negative near the middle of the century. The labour force participation rate of those aged between 15 and 64 is projected to decline by a couple of percentage points over the next few decades as the fraction of workers in the older cohorts with lower participation rates increases. Meanwhile, the fraction of people in the traditional working age bracket of 15 to 64 will decline sharply.

Figure 2 shows how our assumptions translate into projections for total employment and hours worked. The reduction in the unemployment rate leads to a temporary increase in total employment through 2020 (with an average annual growth rate of employment of 0.32 per cent) before demographic patterns reassert themselves and produce a gradual decline in employment from that year onwards. Our assumption of a constant workweek for employees means the projection for hours worked roughly parallels that for employment, with an average annual growth rate of 0.38 per cent per year up to 2020, followed by declines over the course of subsequent decades.

Moving beyond projecting labour input, we produce a baseline simulation for GDP which uses the following model:

Figure 2  
Baseline model, labour supply



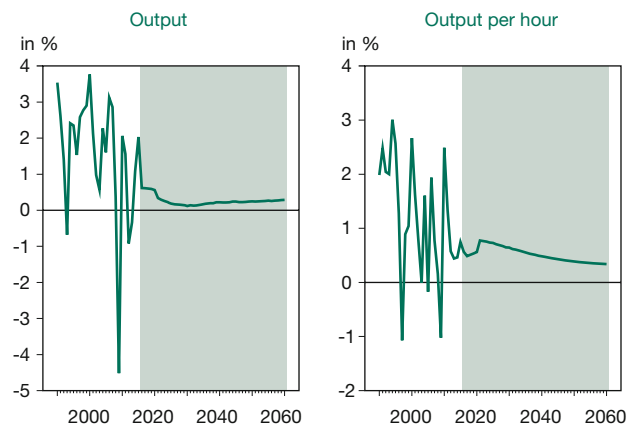
Source: Eurostat EUROPOP2013.

$$\begin{aligned}
 Y_{it} &= A_{it} K_{it}^{\alpha} L_{it}^{1-\alpha} \\
 K_{it} &= (1 - \delta) K_{it-1} + I_{it} \\
 L_{it} &= (1 - U_{it}) (PART_{it} \times WorkPop_{it}) \times H_{it} \\
 I_{it} &= s_{it} Y_{it} \\
 \Delta \log A_{it} &= g
 \end{aligned}$$

The evolution of each country's capital stock depends on last period's rate of investment, which we project as a time-varying ratio of total real GDP. Beyond the assumptions about labour input described in Figure 1, we assume that TFP in each country is expected to continue to grow at the euro area average for 2000-2013 of 0.2 per cent. We also assume that the ratio of investment to GDP in each country is projected to recover to its 1998-2007 average by 2020 and remain constant thereafter.

Overall, with these assumptions, our goal is to summarise the idea of a gradual recovery in the economy that reflects underlying trends in the labour market and in TFP. Unsurprisingly, the TFP growth assumptions are perhaps the trickiest to settle on. At an aggregate euro area level, the assumption of 0.2 per cent growth per year is certainly very low by longer-term historical standards, but we believe this low growth rate has prevailed for a sufficiently long enough period of time to be considered the current underlying trend. In relation to specific national economies, one could argue for projecting a continuation of country-specific trends. However, decade-by-decade growth rates of country-specific TFP tend to be volatile, and it would be unwise to spuriously extrapolate from recent trends into the far future. In general, we view the 0.2 percentage point TFP growth assumption for each country as representing a sluggish future performance con-

Figure 3  
Baseline model, output growth rates



Source: K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

sistent with the disappointing trends that have been seen for almost all euro area countries.

Figure 3 shows the growth rates in output and output per hour generated by this model, while Table 2 reports averages over decade-long periods. Positive cyclical factors play some role in boosting growth in the years up to 2020. However, despite rising investment, falling unemployment and a stabilisation in the average workweek, the average growth rate of GDP is only 0.71 per cent in the years up to 2020 and only 0.60 per cent per year over the period 2014-2023. The average growth rate of hours worked over the full decade 2014-23 is only 0.11 per cent, as declines after 2020 because of demographic factors erode the gains due to falling unemployment during the projected recovery. Capital stock growth falls to only 0.58 per cent in 2014 but then picks up due to rising investment to average 1.1 per cent per year. This combination of weak growth in labour input, capital input and TFP produces anaemic growth over the decade despite a recovery in investment and unemployment.

Table 2  
Long-run growth projections for the euro area from baseline simulation

	GDP	GDP per hour	Hours
2014-2023	0.60	0.49	0.11
2024-2033	0.21	0.71	-0.50
2034-2043	0.25	0.71	-0.27
2044-2053	0.26	0.40	-0.14
2054-2060	0.28	0.35	-0.07

Source: K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

We project that output per hour will grow at an average rate of 0.49 per cent over the period 2014-2023. After this decade, output per hour is projected to grow in the subsequent decades at average rates of 0.71 per cent in 2024-2033 (declining employment leads to a temporary boost via a capital deepening effect), 0.52 per cent in 2034-2043, and 0.4 per cent in 2044-53 as this rate gradually eases towards its steady-state value of 0.3 per cent. With falling hours worked, euro area GDP grows at 0.21 per cent per year in 2024-2033. The growth decline in hours worked tails off in subsequent decades, thus allowing total GDP growth to settle at about 0.28 per cent per year despite declining productivity growth.

### The potential impact of structural reforms

The outlook we have just painted may be considered a fairly grim one. It is reasonable to ask, however, whether Europe's governments will permit an outcome as poor as the one we project to occur. From reviewing policy-related literature as well as annual country reports from the IMF, European Commission and OECD,<sup>6</sup> it is clear that there are many potential changes to economic policy that could help to boost labour productivity as well as the number of hours worked in the economy. Perhaps the implementation of some of these measures will boost growth rates in the coming decades.

Here, we focus on the potential boost that such reforms could achieve if they were to be successful. We focus on two different types of reforms: a labour market reform scenario and a pension reform scenario.

#### Labour market reform

The fact that unemployment is high across a wide range of euro area economies at present is not, on its own, sufficient evidence to suggest that labour market imperfections are a key cause of high unemployment in these countries. A number of countries that currently have high unemployment rates had relatively low levels of unemployment prior to the crisis. Indeed, in our recovery scenario above, there are five countries that we project to have unemployment rates below six per cent even in the absence of labour market reforms. Germany, where we project the unemployment rate to remain at its current low levels, is one of these countries. However, based on our assumptions that unemployment rates will eventually return to their 1998-2007 averages, Austria, Ireland, the Netherlands and Luxembourg are also projected to re-

6 For example, see Å.J. Johansson et al.: Long-Term Growth Scenarios, OECD Economics Department Working Papers, No. 1000, OECD Publishing, 2013.

Table 3

### Effect of labour market reform on growth rates

in average annualised percentage points

	2014-2023	2024-2033	2034-2043	2014-2043
Euro area	0.13	0.05	0.01	0.06
Belgium	0.13	0.05	0.01	0.06
Germany	0.00	0.00	0.00	0.00
France	0.20	0.07	0.02	0.10
Greece	0.28	0.10	0.03	0.14
Ireland	0.00	0.00	0.00	0.00
Italy	0.17	0.06	0.02	0.08
Spain	0.35	0.12	0.03	0.17
Finland	0.14	0.05	0.02	0.07
Luxembourg	0.00	0.00	0.00	0.00
Portugal	0.04	0.01	0.00	0.01
Austria	0.00	0.00	0.00	0.00
Netherlands	0.00	0.00	0.00	0.00

Source: K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

turn to unemployment rates below six per cent. This still leaves a number of other countries that are projected to have relatively high unemployment rates even after a recovery. Italy's average unemployment rate is projected to return to 8.7 per cent, France's to 9.0 per cent, Greece's to 10.2 per cent and Spain's to 11.1 per cent.

It is likely that this latter group of countries could benefit from substantial reforms of their labour markets. Here, we consider the impact of the implementation of an unspecified set of labour market reforms that would act, in addition to the baseline recovery scenario, to reduce the unemployment rates in each of these countries to six per cent in 2025. The additional reductions in the unemployment rate due to these reforms are assumed to occur in equal amounts in each year from 2014 onwards. The phase-in period of 12 years combines an assumption that reforms may take time to pass and that they may also take time to have their desired impact.

Table 3 presents the country-by-country results for output growth. Despite a significant boost to the growth rates of some individual countries, such as Spain (where GDP growth would be raised by 0.35 percentage points over the next decade), the overall effects on euro area growth are very small. The overall euro area unemployment rate eventually declines to 5.6 per cent as opposed to the 7.7 per cent in the baseline, but because this impact phases in over a decade, its implications for European growth as a whole are very small.

**Table 4**  
**Effect of pension reform on growth rates over 30 years**

in average annualised percentage points

Euro area	0.20	Spain	0.27
Belgium	0.26	Finland	0.12
Germany	0.11	Luxembourg	0.26
France	0.27	Portugal	0.02
Greece	0.29	Austria	0.20
Ireland	0.05	Netherlands	0.07
Italy	0.26		

Source: K. McQuinn, K. Whelan: Europe's Long-Term Growth Prospects: With and Without Structural Reforms, University College Dublin Centre for Economic Research, Working paper No. 15/08, 2015.

### Pension reform

Another area in which there is room to boost growth is the reform of pension systems.

Many European countries have generous pension systems that provide strong incentives for people to retire early, and as a result, labour force participation rates among the over-50s are very low in some of these countries. With the process of demographic ageing now accelerating, many European governments are aware of the potential problems with the sustainability of their pension systems and have passed various laws aimed at reducing the generosity of these systems in the future.

Here we consider the effect of a potential reform to pension systems that would produce an increase in labour force participation rates in the euro area. Johansson et al. note that Switzerland is the country in Europe with the highest rates of labour force participation among the over-50s.<sup>7</sup> We consider a scenario in which there is a gradual transition such that the probabilities of all workers over 50 continuing to work at ages 55, 60, 65, 70, and 75 and over in 2033 are equal to the corresponding current probabilities for Swiss workers.

Table 4 presents the implications of this “Swiss-style” pension reform for average growth rates for the euro area and for each individual country over the 30 years after the beginning of the reform. The overall effects on growth are larger than those for the simulated labour market reform, but the effects are small relative to the decline in average growth rates from historical levels that we project in our baseline scenario.

<sup>7</sup> Ibid.

### Conclusions

The previous calculations suggest that if the euro area is to experience a reform-generated transformation in growth, it will not occur through getting more people at work via reduced unemployment and higher labour force participation.

This probably is not too surprising to those familiar with neoclassical growth models. Increases in labour input are a “level effect”, so they can only provide a temporary boost to growth. And we believe our assumptions about relatively long phase-in periods for these reforms (12 years for the labour market reforms, 20 years for the Swiss-style pension reform) are realistic, so these policies provide a steady but small boost to growth rates.

For these reasons, if reforms are to give a substantial boost to growth, they must also act to increase TFP. We have assumed that the labour and pension market reforms described here have no impact on TFP but have a negative impact on labour productivity via the standard “diminishing marginal productivity of labour channel”. It is possible that these reforms could have a positive effect on TFP through various channels in which reduced labour market red tape means that labour is reallocated to more efficient sectors. However, one can equally think of caveats that go in the negative direction. For example, we have been assuming that the workers added to the labour force by labour market and pension reforms will have the same average productivity (and work the same average work-week) as other workers. This seems an overly-positive assumption.

Of course, one could imagine a broader regulatory reform strategy in which reforms to product markets, such as taking various steps to improve the functioning of the European single market, could boost productivity. However, any reforms of this type are likely to have a far smaller impact than the many previous rounds of reforms that have been introduced over the past few decades by the EU, so there is relatively little reason to believe these reforms could have a substantial impact on growth throughout the euro area.

Ultimately, we believe it is unlikely that structural reforms will undo the negative impact on longer-run growth trends of the looming contraction in the labour force due to ongoing demographic patterns. There is, of course, one suggested alternative policy that has the potential to offset these demographic trends, namely a policy of substantially increased immigration. However, the current political environment in Europe suggests there is unlikely to be much movement in this direction over the next few years.