

# Quarterly Economic Commentary

David Duffy  
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Spring 2015



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## Special Articles

## Research Notes

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The *Quarterly Economic Commentary* has been accepted for publication by the Institute, which does not itself take institutional policy positions. It has been peer reviewed by ESRI research colleagues prior to publication. The authors are solely responsible for the content and the views expressed.

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*Research Notes* are short papers on focused research issues. They are subject to refereeing prior to publication.

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## Summary Table

	2012	2013	2014	2015	2016
<b>Output (Real Annual Growth %)</b>					
Private Consumer Expenditure	-1.2	-0.8	1.1	2.0	2.4
Public Net Current Expenditure	-2.1	1.4	0.1	0.5	0.7
Investment	5.0	-2.4	11.3	12.5	9.2
Exports	4.7	1.1	12.6	5.1	4.5
Imports	6.9	0.6	13.2	4.4	4.6
Gross Domestic Product (GDP)	-0.3	0.2	4.8	4.4	3.7
Gross National Product (GNP)	1.1	3.3	5.2	4.1	3.5

<b>Prices (Annual Growth %)</b>					
Consumer Price Index (CPI)	1.7	0.5	0.2	0.1	1.0
Growth in Average Hourly Earnings	0.9	2.4	0.0	1.0	1.0

<b>Labour Market</b>					
Employment Levels (ILO basis (000s))	1,843	1,880	1,914	1,964	2,019
Unemployment Levels (ILO basis (000s))	316	282	243	211	185
Unemployment Rate (as % of Labour Force)	14.7	13.1	11.3	9.7	8.4

<b>Public Finance</b>					
General Government Balance (€ bn)	-13.9	-10.0	-6.8	-4.5	-0.6
General Government Balance (% of GDP)	-8.0	-5.7	-3.7	-2.3	-0.3
General Government Debt (% of GDP)	121.7	123.3	109.6	106.5	101.3

<b>External Trade</b>					
Balance of Payments Current Account (€ bn)	1.5	6.6	10.5	13.4	15.2
Current Account (% of GNP)	1.0	4.5	6.6	7.9	8.5

<b>Demand</b>					
Final Demand	2.4	0.5	8.8	4.4	4.1
Domestic Demand	-0.6	-0.3	3.6	3.4	3.6
Domestic Demand (excl. Stocks)	-0.2	-0.7	2.9	3.9	3.7

## National Accounts 2014

### A: Expenditure on Gross National Product

	2013	2014	Change in 2014		
	€ bn	€ bn	Value	Price	Volume
Private Consumer Expenditure	83.3	85.6	2.7	1.6	1.1
Public Net Current Expenditure	26.0	26.0	0.0	-0.1	0.1
Gross Fixed Capital Formation	26.5	30.4	14.5	2.9	11.3
Exports of Goods and Services	184.1	207.8	12.9	0.3	12.6
Physical Changes in Stocks	0.8	1.8			
<b>Final Demand</b>	<b>320.7</b>	<b>351.6</b>	<b>9.6</b>	<b>0.8</b>	<b>8.8</b>
less:					
Imports of Goods and Services	147.7	168.1	13.8	0.6	13.2
Statistical Discrepancy	1.8	1.9			
<b>GDP at Market Prices</b>	<b>174.8</b>	<b>185.4</b>	<b>6.1</b>	<b>1.2</b>	<b>4.8</b>
Net Factor Payments	-27.3	-27.0			
<b>GNP at Market Prices</b>	<b>147.5</b>	<b>158.4</b>	<b>7.4</b>	<b>2.1</b>	<b>5.2</b>

### B: Gross National Product by Origin

	2013	2014	Change in 2014	
	€ bn	€ bn	€ bn	%
Agriculture	3.0	3.1	0.1	2.5
Non-Agriculture: Wages, etc.	71.9	73.1	1.3	1.8
Other	61.1	68.4	7.2	11.8
Adjustments: Stock Appreciation	0.6	0.6		
Statistical Discrepancy	-1.8	-1.9		
<b>Net Domestic Product</b>	<b>134.8</b>	<b>143.3</b>	<b>8.5</b>	<b>6.3</b>
Net Factor Payments	-27.3	-27.0	0.3	-1.1
<b>National Income</b>	<b>107.5</b>	<b>116.3</b>	<b>8.8</b>	<b>8.2</b>
Depreciation	23.7	24.0	0.3	1.4
<b>GNP at Factor Cost</b>	<b>131.2</b>	<b>140.3</b>	<b>9.1</b>	<b>7.0</b>
Taxes less Subsidies	16.3	18.1	1.8	11.1
<b>GNP at Market Prices</b>	<b>147.5</b>	<b>158.4</b>	<b>10.9</b>	<b>7.4</b>

### C: Balance of Payments on Current Account

	2013	2014	Change in 2014
	€ bn	€ bn	€ bn
X - M	36.4	39.7	3.3
F	-27.3	-27.0	0.3
Net Transfers	-2.5	-2.3	0.2
<b>Balance on Current Account</b>	<b>6.6</b>	<b>10.5</b>	<b>3.9</b>
as % of GNP	4.5	6.6	2.4

## National Accounts 2015

### A: Expenditure on Gross National Product

	2014	2015	Change in 2015		
	€ bn	€ bn	Value	Price	Volume
Private Consumer Expenditure	85.6	88.7	3.6	1.6	2.0
Public Net Current Expenditure	26.0	25.9	-0.1	-0.6	0.5
Gross Fixed Capital Formation	30.4	34.9	14.8	2.1	12.5
Exports of Goods and Services	207.8	220.7	6.2	1.0	5.1
Physical Changes in Stocks	1.8	1.0			
<b>Final Demand</b>	<b>351.6</b>	<b>371.3</b>	<b>5.6</b>	<b>1.1</b>	<b>4.4</b>
less:					
Imports of Goods and Services	168.1	176.0	4.7	0.4	4.4
Statistical Discrepancy	1.9	1.9			
<b>GDP at Market Prices</b>	<b>185.4</b>	<b>197.1</b>	<b>6.3</b>	<b>1.8</b>	<b>4.4</b>
Net Factor Payments	-27.0	-28.9			
<b>GNP at Market Prices</b>	<b>158.4</b>	<b>168.2</b>	<b>6.2</b>	<b>2.0</b>	<b>4.1</b>

### B: Gross National Product by Origin

	2014	2015	Change in 2015	
	€ bn	€ bn	€ bn	%
Agriculture	3.1	3.2	0.1	2.5
Non-Agriculture: Wages, etc.	73.1	76.1	2.9	4.0
Other	68.4	76.0	7.7	11.2
Adjustments: Stock Appreciation	0.6	0.6		
Statistical Discrepancy	-1.9	-1.9		
<b>Net Domestic Product</b>	<b>143.3</b>	<b>154.0</b>	<b>10.7</b>	<b>7.4</b>
Net Factor Payments	-27.0	-28.9	-1.9	7.1
<b>National Income</b>	<b>116.3</b>	<b>125.1</b>	<b>8.7</b>	<b>7.5</b>
Depreciation	24.0	25.0	1.0	4.2
<b>GNP at Factor Cost</b>	<b>140.3</b>	<b>150.1</b>	<b>9.7</b>	<b>6.9</b>
Taxes less Subsidies	18.1	18.1	0.0	0.1
<b>GNP at Market Prices</b>	<b>158.4</b>	<b>168.2</b>	<b>9.8</b>	<b>6.2</b>

### C: Balance of Payments on Current Account

	2014	2015	Change in 2015
	€ bn	€ bn	€ bn
X - M	39.7	44.6	4.9
F	-27.0	-28.9	-1.9
Net Transfers	-2.3	-2.4	-0.1
<b>Balance on Current Account</b>	<b>10.5</b>	<b>13.3</b>	<b>2.9</b>
as % of GNP	6.6	7.9	1.7



## National Accounts 2016

### A: Expenditure on Gross National Product

	2015	2016	Change in 2016		
	€ bn	€ bn	Value	Price	Volume
Private Consumer Expenditure	88.7	92.2	3.9	1.5	2.4
Public Net Current Expenditure	25.9	26.3	1.3	1.0	0.7
Gross Fixed Capital Formation	34.9	39.1	12.1	2.7	9.2
Exports of Goods and Services	220.7	233.0	5.6	1.1	4.5
Physical Changes in Stocks	1.0	1.0			
<b>Final Demand</b>	<b>371.3</b>	<b>391.6</b>	<b>5.5</b>	<b>1.3</b>	<b>4.1</b>
less:					
Imports of Goods and Services	176.0	184.7	4.9	0.3	4.6
Statistical Discrepancy	1.9	1.9			
<b>GDP at Market Prices</b>	<b>197.1</b>	<b>208.8</b>	<b>5.9</b>	<b>2.2</b>	<b>3.7</b>
Net Factor Payments	-28.9	-30.6			
<b>GNP at Market Prices</b>	<b>168.2</b>	<b>178.2</b>	<b>6.0</b>	<b>2.4</b>	<b>3.5</b>

### B: Gross National Product by Origin

	2015	2016	Change in 2016	
	€ bn	€ bn	€ bn	%
Agriculture	3.2	3.3	0.1	2.5
Non-Agriculture: Wages, etc.	76.1	79.1	3.0	4.0
Other	76.0	83.3	7.3	9.6
Adjustments: Stock Appreciation	0.6	0.6		
Statistical Discrepancy	-1.9	-1.9		
<b>Net Domestic Product</b>	<b>154.0</b>	<b>164.4</b>	<b>10.4</b>	<b>6.8</b>
Net Factor Payments	-28.9	-30.6	-1.7	5.9
<b>National Income</b>	<b>125.1</b>	<b>133.8</b>	<b>8.7</b>	<b>7.0</b>
Depreciation	25.0	25.5	0.5	2.0
<b>GNP at Factor Cost</b>	<b>150.1</b>	<b>159.3</b>	<b>9.2</b>	<b>6.1</b>
Taxes less Subsidies	18.1	19.0	0.8	4.5
<b>GNP at Market Prices</b>	<b>168.2</b>	<b>178.2</b>	<b>10.0</b>	<b>6.0</b>

### C: Balance of Payments on Current Account

	2015	2016	Change in 2016
	€ bn	€ bn	€ bn
X - M	44.6	48.3	3.6
F	-28.9	-30.6	-1.7
Net Transfers	-2.4	-2.5	-0.1
<b>Balance on Current Account</b>	<b>13.3</b>	<b>15.2</b>	<b>1.8</b>
as % of GNP	7.9	8.5	1.0



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## The Irish Economy - Forecast Overview and Summary

We continue to believe that the Irish economy will grow strongly in 2015 with GNP set to increase by just over 4 per cent. Recent data from the Quarterly National Accounts show the economy grew by 2.3 per cent between Q3 and Q4 2014. The strong expected performance in 2015 comes after the Irish economy grew by over 5 per cent in 2014 with a significant portion of that growth due to increases in labour productivity.

While 2014 saw the sources of growth re-balancing with a greater contribution coming from domestic sources, foreign demand for Irish exports will continue to be very important for the growth outlook in 2015. The poor performance of the Euro Area is an ongoing concern; however, a mitigating consideration is the positive outlook for the US and UK markets. The recent economic assessment of the Euroframe<sup>1</sup> group forecasts relatively strong performances for the US and UK economies with growth rates in 2015 of 3.2 and 2.8 per cent respectively. Overall, we expect total exports to increase by 5.1 per cent in 2015 with imports increasing by 4.4 per cent.

Domestic sources of growth increased in relevance through 2014 and we envisage continued strong contributions from investment, in particular, and to a lesser extent consumption in 2015. In terms of the housing market, for example, we forecast 16,000 new housing units to be built in 2015, which is up from 11,000 in 2014. Investment, in general, is forecast to increase by just under 13 per cent in 2015.

The increased level of activity in the economy should see unemployment rates falling by the end of 2015 to less than 10 per cent for the first time since 2008. One interesting puzzle in the labour market is the continued stagnant rate of labour force participation. We expect this to increase marginally as labour market conditions continue to improve.

We outline our first forecast for 2016 in this *Commentary*. Given the expected significant increases in investment in 2015 and continued improvements in productivity, we expect the Irish economy to be quite near its potential level at

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<sup>1</sup> The ESRI is a member of Euroframe, a network of ten independent European research institutes, which produces forecasts and macroeconomic policy analysis of the European economy.

the end of the present year. Only the rate of unemployment will be divergent from its long-run equivalent rate.<sup>2</sup> Taking these factors into consideration leads us to a growth rate in GNP of 3.5 per cent in 2016. Based on an assumption of fiscal neutrality,<sup>3</sup> we forecast a fiscal deficit in 2016 of 0.3 per cent.

In this *Commentary* we focus, to quite an extent, on the performance of the Euro Area. *Research Note 2015/1/2* by McQuinn and Whelan summarises a new research paper entitled “Europe’s Long-Term Growth Prospects: With and Without Structural Reforms”.<sup>4</sup> Based on long-run growth forecasts from a Solow model, McQuinn and Whelan conclude that a baseline outlook for the European economy over the medium and longer-term is quite pessimistic with annual growth rates between 2014 and 2020 set to average only 0.7 per cent per annum. Additionally the research shows that, even when fairly ambitious structural reforms are implemented, the European economy is still likely to grow at a slower pace than it has in the past.

The *Commentary* also focuses on the likely implications of the recently announced macro-prudential measures implemented by the Central Bank of Ireland. Forthcoming research by Duffy, McInerney and McQuinn<sup>5</sup> empirically examines the implications of these measures for house prices, housing supply and mortgage lending in the Irish market. Overall, the research concludes that the impact of the measures will be contractionary suggesting that, while house price inflation may be reduced due to these new measures, this reduction may come at the expense of fewer houses being supplied and fewer mortgage loans being extended than would otherwise be the case.

Finally, this *Commentary* introduces an Appendix, which outlines what the nowcasting approach, recently adopted by the *Commentary*, suggests is the current rate of GDP growth in the Irish economy. The Appendix, which will be a regular feature of future *Commentaries*, indicates that the economy is growing by approximately 1 per cent in Q1 2015 with respect to Q4 2014.

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<sup>2</sup> Over the period 1960 to 2014 the median unemployment rate is 7.8 per cent.

<sup>3</sup> Fiscal neutrality means that demand in the economy is neither stimulated nor diminished by taxation and Government spending.

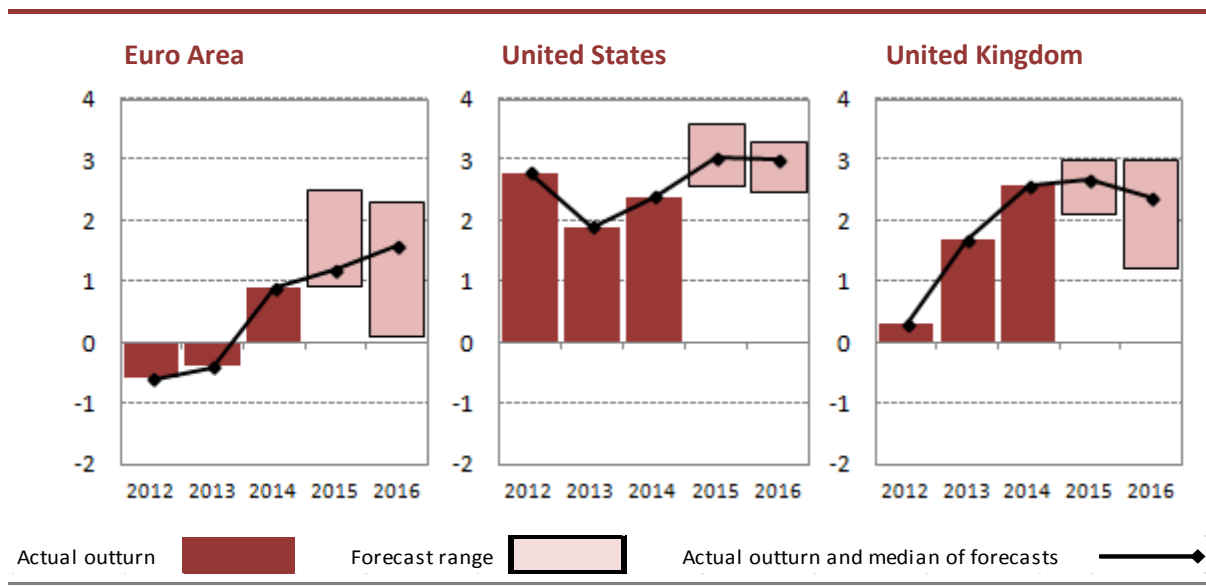
<sup>4</sup> McQuinn K. and K. Whelan (2015). “Europe’s Long-Term Growth Prospects: With and Without Structural Reforms”, ESRI and UCD *Working Paper*, forthcoming.

<sup>5</sup> Duffy D., N. McInerney and K. McQuinn (2015). “Macro-Prudential Policy in a Recovering Housing Market: Too Much Too Soon?” ESRI *Working Paper*, forthcoming.

## The International Economy

Since the last *Commentary*, inflation fell further from target in most developed countries, while worldwide growth in the second half of 2014 proved to be weaker than expected. This has prompted monetary policy actions from a number of authorities in response, most notably the launching of the European Central Bank’s Quantitative Easing (QE) programme. Declining oil prices have played a major part in the widespread fall in inflation. The oil price movements should, however, provide some stimulus to global growth. There is also considerable benefit to Ireland and the Euro Area from the recent depreciation of the Euro versus other major currencies. Figure 1 shows forecast growth in Ireland’s main trading partners. The United States and United Kingdom economies are forecast to grow by approximately 3 per cent and 2.5 per cent respectively. The Euro Area returned to some growth in 2014 and is forecast to grow moderately in 2015 and 2016 also.

**FIGURE 1** Real GDP Growth (% change, year-on-year)



Sources: FocusEconomics, IMF, OECD, HM Treasury and Federal Reserve.

### The World Economy

Oil prices fell by approximately a half between the second quarter of 2014 and the first quarter of 2015, caused by strong supply, weak demand growth and accumulating oil inventories. Growth in global oil demand has been hampered by general international macroeconomic weakness and has been outstripped by supply. In November, OPEC decided not to cut its supply levels, widely seen as an

attempt to defend its market share against competition from US shale oil and gas production. The US producers have relatively higher costs of production and require the price per barrel of oil to be higher to break even. The year to date has seen oil supply begin to respond, however, and the International Energy Agency forecasts that oil supply will continue to fall in 2015. Oil price forecasts from the Energy Information Administration put Brent crude oil prices at US\$58 per barrel in 2015 and US\$75 per barrel in 2016, compared with the January 2015 trough of US\$48 per barrel.

In a recent assessment of the Euro Area and global economies, Euroframe included a simulation<sup>6</sup> of the potential stimulatory impacts of the recent drop in oil prices<sup>7</sup> on economic growth. This simulation includes two scenarios; one in which the decline in oil prices is permanent and one where it is temporary. The baseline forecasts for global GDP growth for 2015 and 2016 are 3.7 per cent and 3.8 per cent respectively. A permanent fall in oil prices gives rise to an additional 0.5 per cent growth in each year. The United States is shown to benefit more strongly from a permanent fall than the Euro Area due to the US having more oil-intensive production in its economy. A temporary decline in oil prices also has a positive impact on global growth; however the magnitude of the impact is much smaller. Given the open nature of the Irish economy, Ireland would be likely to benefit by more than the Euro Area average from the increase in global growth following the oil price shock.

The recent movements in energy prices have been the largest contributor to worldwide falling inflation, leaving inflation rates significantly below target. In contrast to previous episodes in which oil prices fell significantly, nominal interest rates are currently close to the zero lower bound. This leaves little scope for conventional monetary policy to become more accommodative so as to offset the impact on consumer prices. As a result, it is likely that inflation will remain low for some time to come. With market-based measures of inflation expectations falling appreciably over the last year, the anchoring of inflation expectations has become a significant cause for concern.

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<sup>6</sup> The simulation was conducted using the NiGEM model of the world economy from the National Institute of Economic and Social Research.

<sup>7</sup> The Euroframe simulation assumes a Dollar/Euro exchange rate of approximately 1.25 in 2015 and 2016. This is substantially higher than the current exchange rate. Euroframe notes the potential for output and demand to grow faster than expected as a result of more favourable exchange rates.

## The Euro Area Economy

Real GDP in the Euro Area grew by 0.9 per cent in 2014, marking annual GDP growth for the first time since 2011. As emphasised by Figure 1, growth in the Euro Area remains weaker and more uncertain than in other major economies. Economic data for the Euro Area provide a mixed picture; some indicators show growth returning or picking up, while others remain less promising. The Euro Area unemployment rate was 11.2 per cent in January, down from 11.3 per cent in the previous month and from 11.8 per cent in January 2014. An increasing rate of money supply growth and a return to growth in loans to the private sector are also indicative of a return to economic growth. However, GDP growth continues to lag particularly badly in France and Italy. Recent research<sup>8</sup> has shown that the structural reforms typically called for by Euro Area institutions are not likely to provide a strong addition to Euro Area growth over the medium term.

Euro Area policies and institutions continue to provide an ongoing source of debate. It is unlikely that fiscal policy across the Euro Area will provide any stimulus to growth over the next two years, leaving it necessary for monetary policy to become more accommodative. The negotiations in early 2015 between the Greek government and its creditors proved to be much more prolonged and difficult than was expected. The negotiations were reminiscent of earlier years of the Euro crisis, with frequent talk of exit from the single currency against a backdrop of rising sovereign bond yields and deposit flight from the banking sector. While an interim deal was reached, these negotiations serve as a reminder that Europe and its institutions are not beyond returning to crisis situations.

Annual inflation in the Euro Area was -0.3 per cent in February, a small increase from -0.6 per cent in January, with 15 of the 19 members of the Euro Area in deflation in February. Energy price inflation was -7.9 per cent in February while core inflation, excluding energy prices, was 0.6 per cent. While falling energy prices have played a significant part in the low inflation across most developed countries, core inflation in the Euro Area is low and had been falling throughout 2014. In January, ECB President Mario Draghi highlighted the possibility of “second-round effects” from low inflation. Despite the significant impact of energy prices, low rates of inflation could lead to impacts on wage and price-setting and affect inflation developments over the medium term. This point is underscored by recent declines in a range of market-based measures of inflation expectations. Given deflation and the possibility of inflation expectations

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<sup>8</sup> McQuinn K. and K. Whelan (2015). “Europe’s Long-Term Growth Prospects: With and Without Structural Reforms”, ESRI and UCD *Working Paper*, forthcoming.

becoming more unfavourable to price stability, monetary policy had not been sufficiently accommodative to deal with the risks of a deflationary spiral.

Against this backdrop, in January the ECB announced a range of new measures to achieve its price stability objective. The most notable of these measures is the launching of a QE programme, one which purchases sovereign bonds in addition to the existing programmes to purchase asset-backed securities and covered bonds. The programme started in March 2015 and involves the Euro System making €60 billion in purchases per month until September 2016 at least. The announced schedule for these purchases allows sufficient scope for them to continue further, should that be necessary to achieve a sustained adjustment in the path of inflation. Initially, QE is set to expand the ECB balance sheet by over €1 trillion, or approximately 10 per cent of Euro Area nominal GDP. This is relatively moderate in size compared with recent QE programmes in the US (20 per cent of GDP), UK (25 per cent of GDP) and Japan (40 per cent of GDP).

The QE programme has had an immediate impact as a foreign exchange instrument and is likely to continue to do so. Weakening the Euro further will benefit Euro Area exporters and thereby have the welcome impact of promoting growth. Furthermore, QE helps the ECB to achieve its mandate by leading to imported inflation, with the effect magnified if QE leads to outward investment flows into foreign currency debt. QE is likely to have a signalling effect also because, as noted above, the ECB has given guidance that it will continue the programme until at least September 2016. In January, the ECB also lowered the cost of borrowing as part of its TLTRO operations to increase lending to the real economy.

While the announcement of Euro Area QE has been widely welcomed, the practical implementation has received some criticism. The Euro Area and United States, for example, have significant differences which may lead to QE being less effective in Europe. In the US, the dominance of household debt over liquid assets means that lower real interest rates lead to greater household spending. The opposite holds in Germany<sup>9</sup> and France.<sup>10</sup> Rising stock market valuations also do not spur spending in Euro Area households as much as American ones, given households in Europe hold less in equities.

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<sup>9</sup> Geiger, F., J. Muellbauer and M. Rupperecht (2014). "The Housing Market, Household Portfolios and the German Consumer". Presented at the Bundesbank, DFG and IMF conference, Eltville, June 2014.

<sup>10</sup> Chauvin, V. and J. Muellbauer (2013). "Consumption, Household Portfolios and the Housing Market: a Flow of Funds Approach for France". Presented at Banque de France, December 2013.



## The US Economy

As noted in the *Winter Commentary*, discussion in the US has turned to the normalisation of monetary policy. Given recent inflation developments and relatively weaker economic growth in the second half of 2014, it now appears likely that interest rates will rise in the second half of 2015, rather than the first. In its communication, the Federal Open Market Committee has said that it will wait for further improvement in the labour market, and until it is reasonably confident that inflation is returning to target over the medium term, before it raises the federal funds rate. Market expectations indicate that the first rise will occur in the second half of 2015, with the federal funds rate eventually rising to 1.5 per cent by 2018. Headline CPI inflation was -0.7 per cent in January, driven by a 9.7 per cent fall in energy prices.

Real GDP in the US rose by 2.4 per cent in 2014 compared with 2013. For the fourth quarter, growth was 2.2 per cent, revised down from 2.6 per cent in the advanced estimate. This represented a slowdown in the rate of growth from the 4.6 and 5.0 per cent growth rates in the second and third quarters respectively. While real personal consumption expenditure grew at a stronger rate than in the previous quarter, investment growth slowed and net trade provided a drag on GDP growth. Real exports grew at 3.2 per cent in the fourth quarter compared with growth of 4.5 per cent in Q3, while imports grew at 10.1 per cent in Q4 compared with -0.9 per cent in Q3. The robust economic growth in the United States is significant for Irish exports, contrasting with the still-tentative recovery in the Euro Area.

The unemployment rate in the United States was 5.5 per cent in February, falling slightly from 5.6 per cent the previous month. The unemployment rate has fallen from 6.7 per cent in February 2014. Employment growth in February was 295,000, exceeding market expectations, and marking the 12<sup>th</sup> consecutive month of jobs growth in excess of 200,000. There has also been a trend of procyclical revisions in US employment data over the last year, with revised estimates for November and December adding 147,000 jobs, bringing the total for those months to 752,000. Under-utilisation of labour appears to be a lessening problem in the US, with some indicators such as long-term unemployment and marginal attachment to the labour force improving. The labour force participation rate has remained near historic lows over the past year, however, and there has been little wage growth despite the tightening labour market.

### **The UK Economy**

Inflation in the United Kingdom was 0.3 per cent in January, a fall from 0.5 per cent in December. Like the Euro Area and US, inflation in the UK has fallen significantly below its target. The Bank of England forecasts inflation to fall further in the short term and into negative territory, due to continued pass-through of falling energy prices. Based on international forward interest rates, markets have priced in a mid-2016 interest rate rise in the UK, with the Bank Rate reaching 1 per cent by 2018. This represents a later initial interest rate rise and a more gradual schedule of rises than had been the expectation during the second half of 2014.

Real GDP in the United Kingdom grew by 0.5 per cent quarter-on-quarter in Q4 2014 and by 2.7 per cent compared with the same quarter of 2013, according to the Office for National Statistics. GDP for the year 2014 as a whole rose by 2.6 per cent compared with 2013. The peak-to-trough decline in GDP was 6 per cent, a deeper impact than the 5.5 per cent decline in the early 1970s downturn, the 5.6 per cent decline of early 1980s, and 2.2 per cent of the early 1990s. The recovery in growth has proved to be weaker than from these previous recessions also, taking longer to exceed the pre-downturn peak and having less cumulative growth in like-for-like comparisons of the recoveries. Despite its historical weakness, the recovery in the UK has importance for Ireland given the United Kingdom's stature among Ireland's trade partners. Similarly, the recovering UK labour market has pass-through effects on the labour market in Ireland.

The unemployment rate fell to 5.7 per cent in the fourth quarter, from 6.0 per cent the previous quarter and from 7.2 per cent the previous year. Quarterly employment growth was 103,000 in the fourth quarter, with an increase of 608,000 compared with Q4 2013. As a result, the employment rate rose to 73.2 per cent of the working age population, compared with 72 per cent a year earlier. The UK employment rate is the highest it has been since records began in 1971. With labour force participation flat for the year, employment growth is the driver of the declining unemployment rate.

### **Monetary Developments in Other European Economies**

The year to date has seen some significant events take place in European countries which are not members of the Euro Area. In the week before the ECB announced its QE programme in January, Switzerland surprised markets by

abandoning its currency cap versus the Euro.<sup>11</sup> The SNB cited divergent monetary policies between the Euro Area and United States and the likelihood that this would become even more pronounced. In addition, the Rouble crisis had meant that investors in search of a “safe haven” had led to further pressure on the Franc. The abandonment of the cap is likely to hurt Swiss exporters, given the subsequent appreciation of the Franc.

Similar inflows of foreign currency have been observed in Denmark, particularly in the wake of the moves by the SNB and ECB. To inhibit these flows, the Nationalbank cut its deposit rate four times between January 1 and February 5, from -0.1 per cent finally to -0.75 per cent. It has also committed to unlimited interventions in foreign exchange markets to maintain its policy of a fixed exchange rate between the Krone and Euro. In Sweden, in response to low inflation and fears of expectations of low inflation becoming entrenched, the Riksbank became the first central bank to bring its main policy rate into negative territory, while it also launched a QE programme.

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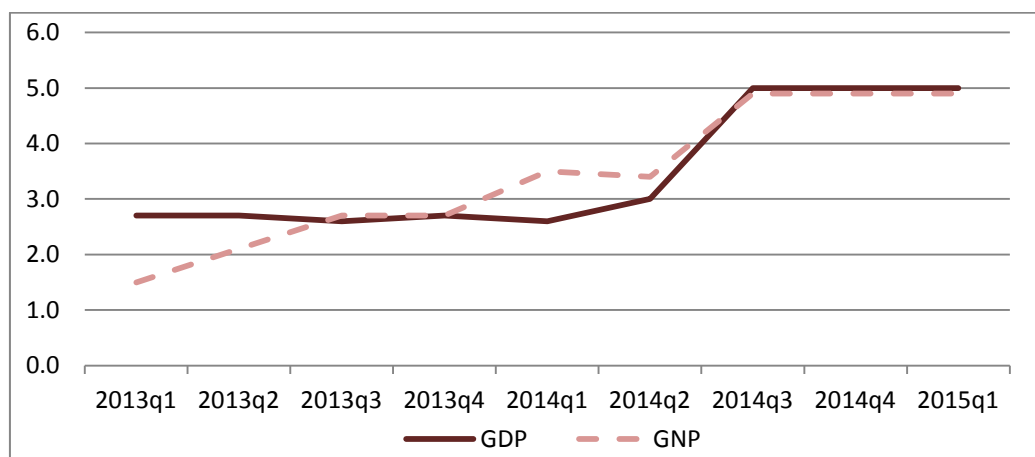
<sup>11</sup> Since 2011, the Swiss National Bank (SNB) had implemented a cap which prevented the Swiss Franc from rising above CHF 1.20 versus the Euro.

## The Domestic Economy

### Output

The recovery in the Irish economy, evident since mid-2013, gathered apace through 2014 with overall GNP growing by just over 5 per cent. Figure 2 demonstrates the degree to which the speed of growth increased throughout 2014 as growth forecasts picked up significantly in the third quarter. We expect this strong performance to continue into 2015 with output set to increase by just over 4 per cent.

**FIGURE 2** Irish Real GDP and GNP Year-on-Year Forecasts for 2015 (%)



Source: QEC forecasts.

The sizeable increase in activity indicated by the CSO Quarterly National Accounts in September 2014 was picked up by the nowcasting model now used in the *Commentary* to accompany the standard forecasting exercise.<sup>12</sup> Key variables in the nowcasting model indicate strong growth, including PMI (Purchasing Managers' Indices), retail sales and certain housing market variables. Moving into 2015, the approach suggests that the economy grew by approximately 1 per cent between Q4 2014 and Q1 2015.

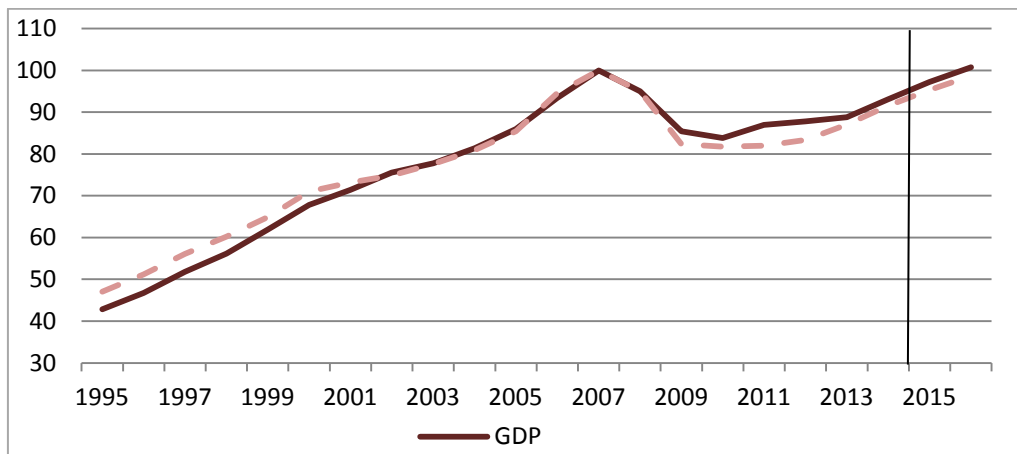
In this *Commentary* we publish our initial forecast for 2016. In thinking about a more medium-term outlook for the economy, we use a growth accounting

<sup>12</sup> See Appendix for more details on the latest nowcasting estimates.

framework presented in Byrne and McQuinn (2014)<sup>13</sup> and McQuinn and Whelan (2015).<sup>14</sup> This approach takes into account the productive capacity of the economy and, consequently, enables us to establish whether the economy is operating at or near potential levels of output.

Our analysis suggests that, given the relatively strong outlook for 2015, the Irish economy is set to be almost at its potential level by the end of the year. Key parameters such as the investment rate and total factor productivity growth will be at or slightly above their long-run median values by the end of 2015, with only the unemployment rate still divergent from its long-run equivalent path. Based on this medium-term perspective, we would expect that GNP will grow by 3.5 per cent in 2016. Figure 3 illustrates that, even with these strong forecasts, both GNP and GDP will only be back to the pre-financial crisis peak in 2007 by the end of 2016. The full extent of the lost output due to the financial crisis is clearly apparent from the graph.

**FIGURE 3** Actual (1995-2014) and Forecast (2015-2016) Level of Irish Real GDP and GNP (2007 = 100)



Sources: Central Statistics Office and QEC forecasts.

A key feature of economic performance in 2014 was the extent to which domestic demand and investment, in particular, played an increasing role in overall performance. Housing supply would appear to be increasing with the overall number of units built in 2015 projected to exceed 16,000 for the first time since 2009. Business investment is also likely to witness significant increases through 2015. While overall consumption levels have increased somewhat

<sup>13</sup> Byrne, D. and K. McQuinn (2014). "Irish Economic Performance 1987-2013: A Growth Accounting Assessment". *Research Note 2014/4/1*.

<sup>14</sup> McQuinn K. and K. Whelan (2015). "Europe's Long-Term Growth Prospects: With and Without Structural Reforms", ESRI and UCD *Working Paper, forthcoming*.

marginally, retail sales and car sales, in particular, saw large increases for the second half of last year. Our outlook for consumption is influenced by the significant levels of household debt which still prevail in the economy. Unfortunately, the near glacial speed with which households' balance sheets are being repaired, highlighted especially by the slow pace of the mortgage arrears resolution process, continues to act as a drag on economic activity.

Foreign demand for Irish goods and services is expected to continue to be an important part of the economic recovery in 2015. There would appear to be two sets of countervailing forces confronting the domestic economy; recent forecasts from the Euroframe group indicate that both the United States and the United Kingdom (still significant trading partners) are set to experience robust rates of economic activity in 2015 and 2016. However, the growth outlook for the Euro Area, as comprehensively assessed in McQuinn and Whelan (2015), continues to face significant structural as well as cyclical challenges.

Of the 5 per cent growth rate in the Irish economy in 2014, analysis of the labour market suggests that a sizeable component of the growth (3 per cent) is due to productivity developments with the residual due to employment growth. Our outlook for the labour market in 2015 indicates that the unemployment rate will be less than 10 per cent for the first time since 2008. Overall growth in the economy of at least 3.5 per cent in 2016 would see the unemployment rate down to its long-run median rate of approximately 8 per cent by the end of that year.

**TABLE 1** Industry and Output

	2013	2013	2014	2015	2016
	Value	Volume Change			
	€ bn	%	%	%	%
Agriculture	3.8	16.5	10.0	7.0	8.0
Industry	35.2	-2.3	1.1	3.0	4.0
Distribution, Transport, Software and Communications	43.9	-5.2	8.0	9.0	10.0
Public Administration and Defence	6.3	-2.2	1.1	2.0	3.0
Other Services	68.2	2.4	3.4	3.5	-1.5
<b>GVA at Factor Cost</b>	<b>158.5</b>	<b>-0.4</b>	<b>4.3</b>	<b>5.1</b>	<b>3.6</b>

Source: ESRI forecasts.

## Monetary and Financial Conditions

In January, the Central Bank announced the results of its consultation process concerning the proposed macro-prudential regulations<sup>15</sup> announced in October 2014. The measures introduce proportionate limits for loan-to-value (LTV) and loan-to-income (LTI) ratios for principal dwelling houses and for LTV ratios for buy-to-let mortgages. One modification to emerge following the consultation process was a higher loan-to-value limit being set for first-time buyers on the first €220,000 of the value of a residential property. In the *Winter Commentary*, Duffy and McQuinn (2014) had outlined a counter-cyclical rules approach which suggested that the specific limits for the LTVs and LTIs be set on the basis of a regular analysis of four different criteria which evaluate the state of the property and mortgage credit market. While the Central Bank has acknowledged that there will be some counter-cyclical dimension to these regulations, we still feel that an explicit rules-based approach would result in greater transparency and a more efficient overall market outcome.

Also, it is not clear what the rationale is for first-time buyers enjoying relatively more liberal conditions. A wide number of studies such as Chambers, Garriga and Schlagenhauf (2007a, 2007b and 2008) and Ortal-Magné and Rady (1999) and (2006)<sup>16</sup> conclude that when credit conditions are liberalised it is relatively younger and poorer households who tend to “benefit” from greater credit provision. In an Irish context, Duffy and O’Hanlon (2014)<sup>17</sup> find that first-time buyers are more likely to be in negative equity, with, for example, over 79 per cent of FTBs who drew down a mortgage between 2005 and 2012 experiencing negative equity. Thus, if the purpose of the new regime is to prevent households from experiencing credit-related issues, it is unclear why the conditions should be less binding for first-time buyers.

In terms of overall deleveraging, the private sector continued, in net terms, to repay loans with Irish banks during the second half of 2014. Non-Financial

<sup>15</sup> In the “Household Sector Consumption” section, we discuss the implications of the macro-prudential measures on the rental market, while the possible effects on housing supply are discussed in the “Supply Conditions” section.

<sup>16</sup> Chambers, S.M., C. Carriga and D. Schlagenhauf (2007a). “Mortgage Contracts and Housing Tenure Decisions”. Federal Reserve Bank of St. Louis, *Working Paper 2007-040A*, September 2007.

Chambers, S.M., C. Carriga and D. Schlagenhauf (2007b). “Equilibrium Mortgage Choice and Housing Tenure Decisions with Refinancing”. Federal Reserve Bank of Atlanta, *Working Paper 2007-25*, December 2007.

Chambers S.M., C. Carriga and D. Schlagenhauf (2008). “The Loan Structure and Housing Tenure Decisions in an Equilibrium Model of Mortgage Choice”. Federal Reserve Bank of St. Louis, *Working Paper 2008-024B*, July 2008.

Ortal-Magné and S. Rady (1999). “Boom In, Bust Out: Young Households and the Housing Price Cycle”. *European Economic Review*, 43, pp. 755-766.

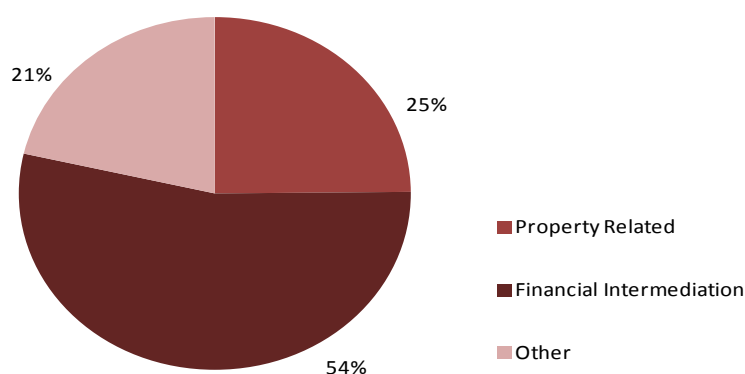
Ortal-Magné and S. Rady (2006). “Housing Market Dynamics: On the Contribution of Income Shocks and Credit Constraints”. *The Review of Economic Studies*, 73, No. 2, pp. 459-485.

<sup>17</sup> Duffy, D., and N. O’Hanlon (2014). “Negative Equity in Ireland: Estimates Using Loan Level Data”. *Journal of European Real Estate Research*, Vol. 7, No. 3, pp 327-344.

Corporation (NFC) loan repayments continued to exceed draw-downs in December 2014. The monthly decrease in December of €1.5 billion was reflected across all three maturity categories of NFC loans - short, medium, and long-term. The post-crisis decline in NFC lending was initially concentrated in longer-term loans, while short-term loans including the use of overdrafts continued to increase, albeit at a much slower pace. Lending to Irish resident NFCs reported a year-on-year decline of 7.2 per cent in December 2014, following an annual decrease of 6.4 per cent in November. Longer-term NFC lending has been declining since mid-2013 which may be an indication of a declining investment focus in the NFC sector. However, the pace of decline has slowed in recent months.

Certain sectors of the economy are registering increases in lending. For example new business lending to small and medium-sized enterprises (SMEs), excluding financial intermediation and property-related sectors, increased during Q3 2014 for the third consecutive quarter. Financial Intermediation and the property-related sectors of Real Estate and Construction activities account for approximately 80 per cent of total credit advanced. Of the remaining 21 per cent, Wholesale/Retail Trade and Repairs, Hotels and Restaurants, Manufacturing and Primary industries are the main sectors accessing credit from Irish resident credit institutions. To provide an indication of current lending practices within the Irish economy, Figure 4 plots credit advanced by sector in Q4 2014.

**FIGURE 4** Credit Advanced by Sector



Source: Central Bank of Ireland.

Certain Irish financial institutions have, of late, returned to profitability for the first time since 2008. In the first half of 2014, Allied Irish Bank and Bank of Ireland, in particular, have both recorded profit-before-tax of €437 million and €327 million respectively. While the continued presence of both mortgage arrears and other non-performing loans hinders a more robust recovery in the



balance sheets of Irish credit institutions, the improving profitability and the completion of the ECB stress tests in Q4 2014 should see an increase in the amount of credit extended to the real economy in 2015.

Ireland raised €4 billion at its first 30-year bond sale buoyed, to a certain extent, by the European Central Bank QE program outlined in January which includes government bond purchases. The 30-year debt was sold at a yield of just below 2.1 per cent with investors bidding over €11.2 billion in the sale. Along with raising €4 billion in 7-year debt in early January, the National Treasury Management Agency (NTMA) is already half way towards meeting its target of €12 - €15 billion in long-term bonds. Most recently, the NTMA auctioned off €500 million of the benchmark 15-year government bond at a yield of 1.56 per cent. Total bids received amounted to €1,576 million which was 3.15 times the amount on offer.

In mid-February the yield on the 10-year Irish sovereign fell below 1 per cent for the first time, as fears of Greece exiting the euro zone receded. This has been viewed as further evidence of Ireland's strong recovery from the debt crisis. In the short term, the improvement in borrowing costs is a positive development for Irish sovereign bonds. However, as noted in previous *Commentaries*, any deterioration of international sentiment will have significant implications for the borrowing costs of both the State and domestic financial institutions.

### Prices and Earnings

The annual rate of inflation was negative for the third month in a row in February. Data from the CSO show that prices on average, as measured by the Consumer Price Index (CPI), were 0.5 per cent lower in February 2015 compared with 12 months previously, the lowest level in four and a half years. Similarly, prices on average, as measured by the EU Harmonised Index of Consumer Prices (HICP), decreased by 0.4 per cent compared with February 2014.

However, consumer prices in February, as measured by the CPI, rose by 0.6 per cent in the month. While deflation is a threat for Ireland, and with euro zone inflation far below the 2 per cent target, it is widely accepted that Ireland is in a much stronger position than the euro zone as a whole. Also, while the CPI has been negative for three successive months, much of the fall has been influenced by global trends in oil prices and interest rates. Both of these lower costs are, of course, positive developments for the consumer.

Water supply and sewage collection charges were introduced in Ireland on 1 January 2015. The coverage of the CPI/HICP is defined as those goods and services purchased by households for the purposes of consumption. The contribution of water supply added 0.22 per cent and sewage collection added 0.19 per cent to the annual inflation rate.

We forecast that inflation will remain subdued in 2015 and 2016 but will rise slightly compared to the rate recorded in 2014. These modest increases reflect both the combination of increased domestic economic activity and increases in Euro Area inflation rates due, partially, to the QE measures announced in January.

**TABLE 2** Inflation Measures

	2013	2014	2015	2016
	Annual Change			
	%	%	%	%
CPI	0.5	0.2	0.1	1.0
Personal Consumption Deflator	1.9	1.6	1.6	1.5
HICP	0.5	0.3	0.2	1.2

Sources: Central Statistics Office and ESRI forecasts.

Preliminary estimates from the CSO on Earnings and Labour Costs for Q4 2014 reveal that Average Hourly Earnings increased by 1.7 per cent over the year. This compares with a decrease of 1.6 per cent in the year to Q3 2014 from €21.36 to €21.02 per hour.

To put recent increases in context, we note that in the four years to Q4 2014, overall Average Hourly Earnings increased by just 0.2 per cent. Across the sectors hourly earnings have increased in seven of the 13 sectors. The largest percentage increase was recorded in the Information and Communication sector which rose 8.5 per cent. The largest percentage decrease in Average Hourly Earnings over the same period was recorded in the Human Health and Social Work sector, which was down 5.7 per cent. As in previous *Commentaries*, we assume that the falling numbers in the public sector may help to explain the aforementioned falling Average Hourly Earnings. If those leaving employment earned above the average wage then this change in the composition of the public sector workforce would inevitably lower the average earnings in this sector. Within the private sector Average Hourly Earnings increased 2.4 per cent in the year to Q4 2014, while public sector hourly earnings rose by 0.2 per cent in the same period.

We forecast growth in average earnings of 1 per cent in 2015 and 2016. While these increases may appear somewhat modest, it is worth noting that unemployment, while falling in 2015 and 2016, will still be above its long-run median rate by the end of 2016. The continued presence of over-capacity in the Irish labour market may well result in modest wage and pay increases. In some respects, this is similar to developments in the U.S. and U.K. labour markets at present; falling unemployment rates have not resulted in a significant increase in wage rates. We also forecast current transfers (social welfare payments) will continue to decline in line with the rise in employment. Based on the increase in employment we also forecast a continuing increase in personal disposable income.

### **Components of Demand**

#### *Exports, Imports and Balance of Payments*

The latest CSO figures indicate that exports (merchandise) fell by 5 per cent in the month to January 2015 but were up 15 per cent on an annual basis. Similarly, imports were up 8 per cent over the year to January 2015 but recorded a 1 per cent drop from December 2014. In the 12 months to December 2014 both exports and imports increased (in volume terms) by 17 per cent and 9 per cent respectively.

In 2014 the value of imports reached its highest level since 2008. The main contributors to growth were Machinery and Transport Equipment, at 27 per cent, and Chemicals and Related Products, at 21 per cent. In 2014, 30 per cent of Irish imports came from the UK with the US accounting for 11 per cent of total imports for the year.

In terms of Irish exports, both the US and the UK continue to be our largest single trading partners. In total, the US (22 per cent), UK (13 per cent), Belgium (13 per cent) and Germany (7 per cent) made up 55 per cent of total exports from Ireland in 2014. With very low growth rates and the threat of deflation in the Euro Area there has been some concern that Irish exports will be adversely affected. As seen in Table 3 however, growth in the UK and US remains relatively strong compared to the Euro Area. It is also worth noting that the euro currency is currently at its lowest value for 12 years against the dollar and its lowest level for seven years against Sterling. This weakness will provide a further boost to exports to both the US and UK.

**TABLE 3** Proportion of Total Exports from Ireland (%) and Growth Rates

	2010	2011	2012	2013	2014
	<b>Proportion of Total Exports from Ireland (per cent)</b>				
UK (incl. Northern Ireland)	15.5	15.6	16.5	16.2	15.1
EU Member States (excl. UK & NI)	42.6	42.0	42.5	40.8	39.7
US & Canada	24.2	24.4	20.7	22.0	23.0
	<b>Growth Rate (GDP)</b>				
UK	1.9	1.6	0.7	1.7	2.6
EU Member States	2.0	1.8	-0.4	0.1	1.3
US	2.5	1.6	2.3	2.2	2.4

Sources: Central Statistics Office and Euroframe.

Export developments in 2014 were dominated by the impact of foreign processing of Irish-owned goods for export, or what is commonly known as “contract manufacturing”. While this is a long-standing feature of Irish trade, changes in the business structure of multinational enterprises during 2014 led to a change in the size of this activity. In the most recent Quarterly National Accounts, the CSO reiterated the fact that the related addition to gross value added from contract manufacturing, over and above wages and salaries paid, is not particularly significant in explaining the recent growth in Irish GDP. We forecast that any growth associated with this phenomenon will begin to dissipate in 2015 and 2016.

A Balance of Payments current account surplus of 7.7 per cent of GDP was recorded in Q4 2014. Compared with Q4 2013, merchandise exports were up 27 per cent while merchandise imports were up 16.5 per cent. On the services side, exports were up 8 per cent over the same period. This was mainly due to increased computer services exports of 13 per cent. Services imports experienced an increase of almost 22 per cent driven primarily by growth in royalties and licensing payments of 38.5 per cent.

Based on the declining relevance of contract manufacturing, we forecast growth in merchandise exports of 7 per cent in 2015 with a further growth of 5.2 per cent in 2016. We also forecast that the growth in total services will continue in 2015 and 2016. Following on from very strong growth recorded for total exports of goods and services (volume) in 2014, we forecast that growth rates will return to relatively more modest levels in 2015 and 2016. Our forecasts for imports in 2015 remain largely unchanged from the *Winter Commentary*. We forecast similar levels of growth in both merchandise and services imports into 2016.

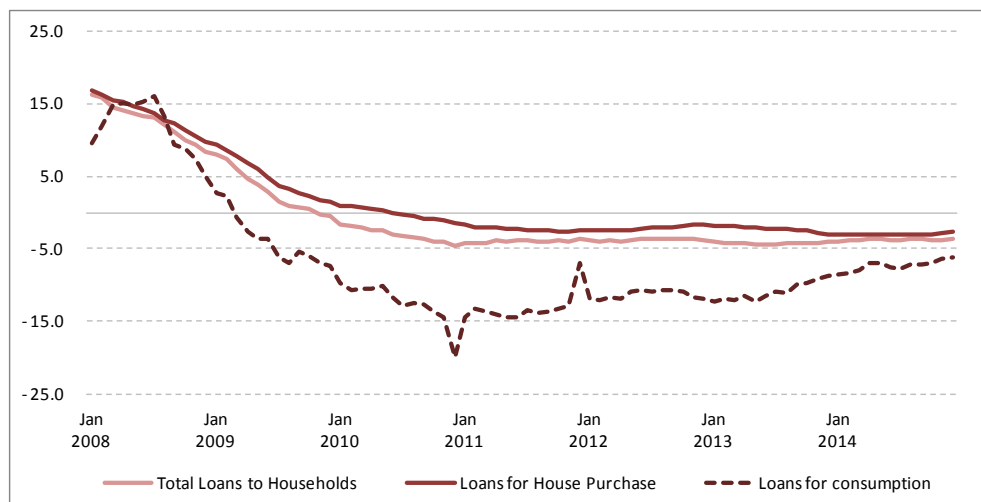
### Household Sector Consumption

Certain indicators suggest that increases can be expected in household consumption levels in 2015. The volume of retail sales grew by 8.8 per cent year-on-year in January 2015. When car sales are excluded, there was an increase of 0.1 per cent in the volume of retail sales in January 2015 when compared with the month previous and an increase of 4.8 per cent in the annual figure. The number of new private cars licensed for the first time increased by 29.2 per cent in February 2015 compared to February 2014, while the number of new goods vehicles licensed was up 58 per cent from January 2014.

Similarly, the three-month moving average of the KBC Ireland/ESRI *Consumer Sentiment Index* continues on an upward trend increasing from 92.3 in January to 95.9 in February. When compared to values of 83.3 in February 2014 and 57.8 in 2013, there is strong evidence that consumer confidence has grown steadily over the past two years.

However, as can be seen in Figure 5, lending to Irish households continues to fall on an annual basis, decreasing by 3.7 per cent in December 2014. Loans for house purchase, which account for 81 per cent of total household loans, declined at an annual rate of 2.7 per cent. Lending for consumption and other purposes also declined by 7.5 per cent year-on-year.

**FIGURE 5** Lending to Irish Resident Households (Annual Percentage Change)



Source: Central Bank of Ireland.

Additionally, along with other sectors of the economy, household deleveraging continued into December 2014 with loan repayments exceeding new draw-downs by €3.9 billion over the entire year. In the *Winter Commentary* we noted that household loan draw-downs exceeded repayments in September 2014 for the first time since September 2013. This relationship reversed again in December with household loan repayments exceeding draw-downs by €43 million during the month. In the case of loans for house purchase, repayments exceeded draw-downs by €2.2 billion in the year to end-December 2014. Repayments also exceeded draw-downs by €1.7 billion for non-housing loans to households in 2014.

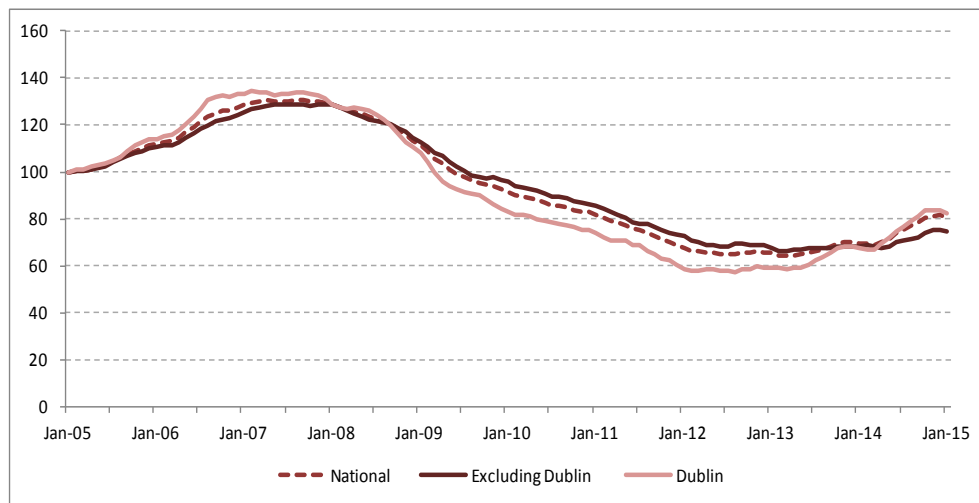
Consequently, in forecasting consumption levels it is evident that legacy effects from the financial crisis may still act as a drag in this area. Micro-level evidence of the effects of deleveraging on household consumption for Irish households is evident in McCarthy and McQuinn.<sup>18</sup> Based on the most recent Quarterly National Accounts from the CSO for the year 2014, personal consumption increased by just 1.1 per cent between 2013 and 2014. Therefore, in combining the overall effects of increased earnings and growing employment with the continued presence of distressed household balance sheets, we forecast relatively modest increases in consumption of 2 per cent and 2.4 per cent in 2015 and 2016 respectively.

### *Property Market Developments*

In January residential property prices fell by 1.4 per cent nationwide. This is the largest fall in national prices observed in a single month since February 2012. Despite this fall, residential property prices remain 15.5 per cent higher than 12 months previous. In Dublin residential property prices fell by 1.9 per cent in January, while house prices outside of Dublin fell by less than 1 per cent in January. Overall, as seen in Figure 6, residential prices are still substantially higher than the same period last year with a 21.6 per cent rise in Dublin and an annual increase of 9.3 per cent in the rest of the country.

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<sup>18</sup> McCarthy, Y. and K. McQuinn (2014). “Deleveraging in a highly indebted property market: who does it and are there implications for household consumption?”. Research Technical Papers, 05/RT/14, Central Bank of Ireland.

**FIGURE 6** Residential Property Price Index (Base Jan 2005 =100)

Source: Central Statistics Office.

In spite of substantial house price increases in recent months and in light of the small decline recorded in January, house prices in Dublin are currently 38.5 per cent lower than at their highest level in early 2007. Outside of Dublin, residential property prices are also substantially lower (41.9 per cent) than their highest level in September 2007. In Duffy, McNerney and McQuinn,<sup>19</sup> the estimates from a house price model in McQuinn<sup>20</sup> are updated. This suggests that, as of Q4 2014, Irish house prices were still *undervalued* by approximately 10 per cent.

The introduction of the new macro-prudential measures by the Central Bank is likely to lead to some uncertainty in terms of how key housing variables evolve over the next year. Duffy *et al.*, using the Gerlach-Kristen and McNerney<sup>21</sup> model, examine the impact of the LTV and LTI restrictions on mortgage credit levels, house prices and housing supply. Overall, they find that house prices and housing supply declines by approximately 4 per cent to 5 per cent vis-à-vis a baseline level due to these measures. The impact may take up to four years to be fully realised. Duffy *et al.* also find that mortgage lending may fall by between 15 to 20 per cent due to these measures.

One other area affecting certain households which may also be impacted by the recent macro-prudential measures is the rental market. As can be seen from

<sup>19</sup> Duffy, D., N. McNerney and K. McQuinn (2015). "Macro-Prudential Policy in a Recovering Housing Market: Too Much Too Soon?" ESRI Working Paper, forthcoming.

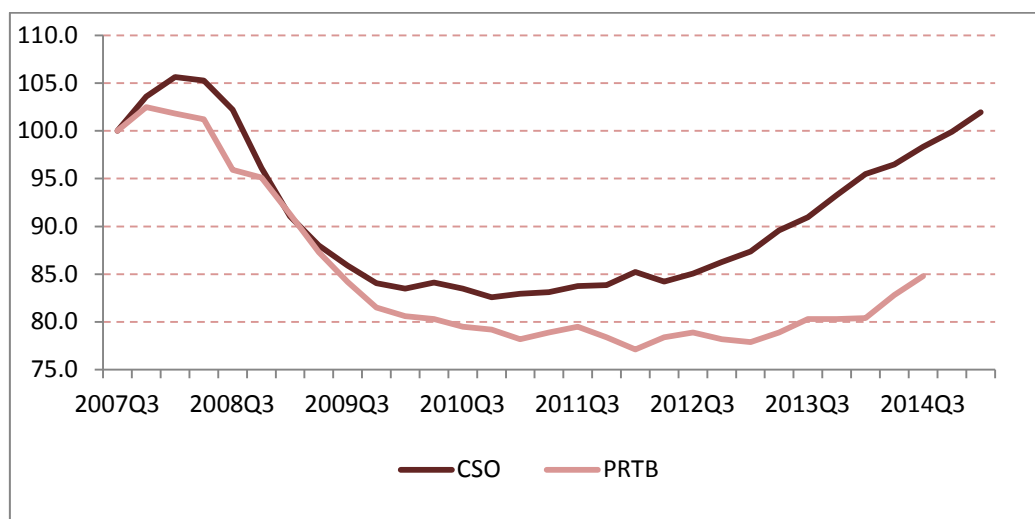
<sup>20</sup> McQuinn, K. (2014). "Bubble, Bubble Toil and Trouble? An Assessment of the Current State of the Irish Housing Market". Special Article, *Quarterly Economic Commentary*, Summer 2014.

<sup>21</sup> Gerlach-Kristen, P. and N. McNerney (2014). "The Role of Credit in the Housing Market", ESRI Working Paper No. 495.

Figure 7, rental rates in the economy have been trending upwards since early 2012, with the CSO rate, in particular, indicating that present rental rates are almost back to the peak of the “boom” period. While house prices fell by over 50 per cent during the recession, the peak to trough in the rental market was lower, with a decline at just over 25 per cent. This may in part be due to the increase in the number of households opting to rent, as shown in Census 2011. Between 2006 and 2011 the number of households in Ireland increased by 187,000 or almost 13 per cent, to 1,649,000, while the number of households renting increased by 160,060. Thus, almost 86 per cent of the households formed between 2006 and 2011 were in the private rented sector.

There has been some speculation that the introduction of the new limits on LTVs and LTIs may lead to further increases in rents as certain marginal households may not now be able to raise the new down-payment level required. Certain aspects of the housing literature do lend some credence to this viewpoint; Duca, Muellbauer and Murphy,<sup>22</sup> for example, show that in the case of the US rental market, when limits were imposed on LTVs, rents were *permanently* increased for a given house price level.

**FIGURE 7** CSO and PRTB/ESRI Rent Index (Index Q3 2007 = 100)



Sources: CSO and PRTB/ESRI.

<sup>22</sup> Duca J., J. Muellbauer and A. Murphy (2011). “House Prices and Credit Constraints: Making Sense of the U.S. Experience”. *Economic Journal*, Royal Economic Society, Vol. 121(552), pp. 533-551.



## Supply Conditions

### *Investment*

Preliminary National Accounts data for 2014 show that the volume of investment grew by 11.3 per cent in 2014. Analysis of available indicators continues to suggest that investment will make a large contribution to growth in domestic demand and hence to economic growth over the short term. Registrations, completions and planning permissions suggest that the volume of housing completions will increase again in each of the next two years, to an annual average of 18,000 units in 2016. This remains below the rate of new household formation, estimated at approximately 25,000 new households per annum (Duffy, Byrne and FitzGerald<sup>23</sup>). Growth in construction will also be driven by a continuation of the upward trend in commercial construction. Thus, the volume of investment in building and construction is forecast to grow by 14 per cent in 2015. Having grown strongly in both 2014 and 2015, some moderation in growth is expected in 2016 at over 13 per cent, although this in part will reflect the higher base. However, as noted in the previous section, the introduction of the new macro-prudential measures may have implications for our forecasts with housing supply levels not increasing by as much as expected.

Investment in machinery and equipment generally responds to the same stimuli as investment in construction and so this component of investment is also forecast to grow. While this is a volatile component, especially due to aircraft purchases, the underlying trend is still one of growth. The continuing low interest rate environment should also contribute to growth of 7.7 per cent in 2015, with marginally slower growth of just over 6.5 per cent in 2016. Based on growth in the component parts, our expectation is that overall investment will grow by close to 13 per cent in 2015. Following the strong growth rates of recent years we will experience some moderation in investment growth in 2016. However, investment growth will remain strong at over 9.5 per cent in volume terms.

### *Labour Market*

Since the fourth quarter of 2012 there has been a continuous expansion of employment and reduction in unemployment in Ireland. These improvements in labour market conditions remain one of the most reliable indicators of recovering economic activity. The latest Quarterly National Household Survey (QNHS) for the final quarter of 2014 reports an annual increase in employment of 1.5 per cent in

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<sup>23</sup> Duffy, D., D. Byrne and J. FitzGerald, (2014). "Alternative Scenarios for New Household Formation in Ireland". Special Article, *Quarterly Economic Commentary*, Spring 2014.

the year to Q4 2014. This compares with an increase of 3.3 per cent in the year to Q4 2013. Total employment now stands at its highest level since Q3 2009.

The increase in total employment of 29,100 in the year to Q4 2014 was comprised of an increase of 2.7 per cent in full-time employment and a decrease in part-time employment of 2.3 per cent. Employment increased in 11 of the 14 economic sectors over the year and fell in only three (Agriculture, Forestry and Fishing; Public Administration and Defence; and Human Health and Social Work Activities). The largest rate of increase was recorded in Construction, up 12.6 per cent in the year followed by annual growth of almost 5 per cent in Financial, Insurance and Real Estate Activities. It is possible that reductions in the long-term unemployment rate over the year are largely driven by the fact that the Construction sector is beginning to return to more long-term sustainable levels.

The proportion of total unemployment currently accounted for by long-term unemployment stands at 57.8 per cent in the fourth quarter of 2014. This compares to a value of 61.4 per cent recorded 12 months previous and 59.9 per cent in Q4 2012. The long-term unemployment rate fell to 5.7 per cent in the fourth quarter of 2014 down 1.5 per cent from Q3. The seasonally adjusted unemployment rate is now 10.4 per cent which is the lowest recorded rate since the Q1 2009 when it stood at 10.2 per cent. Unemployment decreased by 15.6 per cent in the year. This is the tenth quarter in succession where unemployment has declined on an annual basis.

The number of employees in the public sector continued to decline in the fourth quarter of 2014 bringing the total reduction in employment in the public sector over the three years (Q4 2011 - Q4 2014) to 4.2 per cent. Private sector employment continues to remain strong with annual growth in Q4 2014 of 3.2 per cent compared with the increase of 2.4 per cent recorded in the year to Q4 2013.

In recent months it has become apparent that the participation rate is failing to rise as quickly as anticipated given the sharp fall in unemployment. CSO data indicate that this may be influenced by changes within the 15-19 year old age group. In Q3 2007 the participation rate within this age group was 33.4 per cent of which 35.6 per cent were male. By Q4 2014 this rate had fallen to 15.3 per cent. It may be the case that many within this age group returned to education in the aftermath of the financial crisis and continue to remain in education even with improving labour market conditions. Therefore, we forecast that the participation rate will rise marginally in 2015 and 2016. We also forecast that the

annual average unemployment rate will be 9.7 per cent in 2015 and 8.4 per cent in 2016. Employment growth will continue in both industry and services with strong employment growth in Construction likely to continue into 2016.

### Public Finances

A key feature of the improved economic performance of the economy has been the strength of the tax take throughout 2014. The end-year Exchequer returns show that the public finances performed well in 2014, in line with expectations, given the buoyancy of the monthly Exchequer returns and strong growth in the economy. Overall taxation receipts increased by over 9 per cent in 2014, with the 5 per cent increase in pay related social insurance (PRSI) for the same period indicating a significant increase in labour market activity. Net voted expenditure was down 2 per cent, although this masked an overrun on net current voted expenditure as a result of higher health spending. On the basis of these returns, we estimate that the general government balance was 3.7 per cent, once again well within the target set under the bailout agreement.

The Exchequer returns for February suggest that the growth in tax revenues has continued into 2015. Ongoing growth in employment as well as increases in personal incomes, improving consumer sentiment and corporate profits should underpin growth in tax revenue throughout 2015 and 2016. However, our belief remains that it will be difficult to reduce expenditure levels over the forecast period.

If our expectations for growth in these variables prove to be correct, then the deficit should decline to 2.3 per cent of GDP this year, with a further reduction to 0.3 per cent in 2016. This represents a significant improvement in the public finances particularly when compared with the sizeable deficits incurred in 2010 and 2011. As stated in the “Output” section above we believe that, given our growth forecasts, the Irish economy will be near to its potential level at the end of 2015. In that context, if the economy continues to grow significantly in 2016, budgetary policy will play an important role in moderating economic activity and ensuring that there is no repeat of the destabilising pro-cyclical policy evident in the run up to the financial crisis of 2007/08. This may require, for example, that budgetary policy targets fiscal surpluses in 2017 and 2018.

As a result of these forecasts, gross debt as a proportion of GDP will fall steadily. Having peaked at over 123 per cent of GDP in 2013 we estimate that by the end of 2016 gross debt will be the equivalent of 101 per cent.

TABLE 4 Public Finances

	2014	2015	2015	2016	2016
	€bn	€bn	% change	€bn	% change
<b>Income</b>					
Taxes on income incl. Social insurance	31.8	33.5	5.2	36.2	8.2
Taxes on expenditure	20.9	21.1	1.3	22.0	4.1
Gross trading and investment income	3.3	3.1	-6.7	3.1	0.0
Other Income	3.1	3.2	1.9	3.2	0.0
Total receipts: Current	59.2	61.0	3.0	64.5	5.9
Total receipts: Capital	0.6	0.7	15.6	0.7	0.0
<b>Total receipts: Current and Capital</b>	<b>59.8</b>	<b>61.7</b>	<b>3.1</b>	<b>65.3</b>	<b>5.8</b>
<b>Expenditure</b>					
Subsidies	1.6	1.8	16.0	1.9	1.9
National debt interest	7.5	7.1	-5.0	6.8	-4.2
Transfer payments	27.8	27.4	-1.5	27.0	-1.5
Expenditure on Goods and Services	26.1	26.5	1.2	26.8	1.3
Total expenditure: Current	63.0	62.8	-0.4	62.5	-0.5
Total expenditure: Capital	3.7	3.4	-7.0	3.5	1.5
<b>Total expenditure: Current and Capital</b>	<b>66.7</b>	<b>66.2</b>	<b>-0.7</b>	<b>65.9</b>	<b>-0.4</b>
General Govt. Balance	-6.8	-4.5		-0.6	
<b>As % of GDP</b>	<b>-3.7</b>	<b>-2.3</b>		<b>-0.3</b>	

Sources: Central Statistics Office and ESRI Forecasts.

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## General Assessment

At 5.2 per cent, the Irish economy experienced the most significant rate of growth across the Euro Area in 2014. The strong recovery in economic activity is set to continue into 2015 where we forecast both GNP and GDP to grow by approximately 4.1 and 4.4 per cent respectively. Whereas most of the growth up to the mid-point of last year was heavily dependent on external demand, domestic investment, in particular, and consumption to a lesser extent are now playing a more prominent role in overall performance.

Notwithstanding the increasing contribution of domestic sources of growth, the performance of key foreign markets continues to be essential for any positive Irish outlook. In that regard some recent research and analysis is of particular interest. The annual report from the Euroframe group<sup>24</sup> expects a relatively strong performance in Ireland's export destinations of the US and UK markets in 2015, with rates of growth of 3.2 and 2.8 per cent envisaged respectively. Using a coherent international modelling framework, the report also examines the implications of an oil price shock. The results, which are commented on more extensively in the "International Economy" section of the *Commentary*, suggest that output growth in the OECD could be increased by 1 per cent in 2015 and half a per cent in 2016 due to lower prices.<sup>25</sup>

As the first *Commentary* of the year, we also release our initial forecast for 2016. In framing a more medium-term outlook, it is useful to examine the productive capacity of the Irish economy given the recent strong performance. Using the growth accounting framework presented in Byrne and McQuinn (2014) and McQuinn and Whelan (2015), this suggests that, particularly given the relatively strong outlook for 2015, the Irish economy is set to be almost at its potential level by the end of 2015. Certainly, key parameters such as the investment rate and total factor productivity growth will be at, or slightly above, their long-run median values by the end of 2015, leaving only the unemployment rate still divergent from its equivalent long-run rate. Based on this, we forecast a growth rate in GNP in 2016 of 3.5 per cent. Associated with this is our forecast, under the assumption of fiscal neutrality, of a deficit in 2016 of 0.3 per cent.

A significant policy development in Q1 2015 was the decision in January by the ECB and the national central banks of the Eurosystem to instigate a programme

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<sup>24</sup> Available online at <http://www.euroframe.org/>.

<sup>25</sup> This is under the assumption that the fall in oil prices is a permanent decline.

which will purchase €60 billion in securities each month until the end of September 2016 at the earliest (cumulatively €1.114 trillion in purchases). The majority of the purchases will be of national sovereign bonds. Overall, while QE is unlikely to trigger much growth in bank lending across the Euro Area, it should have a number of positive effects. For example, the yields on sovereign bonds is likely to be lowered, thereby reducing further the costs of borrowing for Euro Area governments. Arguably, more important is the impact QE will have on inflation expectations. It signals the intention of the ECB to get inflation back to its target of 2 per cent. By raising inflation expectations, it should lead the way to increases in actual inflation - something very much needed across Europe at this time.

Despite the relatively positive domestic outlook for this and next year, there are a number of downside risks which we would note.

While there has been a recent minor improvement in the European growth outlook, the medium and longer-term performance is of continued significant concern. The *Research Note 2015/1/2* by McQuinn and Whelan summarises a new research paper entitled “Europe’s Long-Term Growth Prospects: With and Without Structural Reforms”.<sup>26</sup> The work takes a Solow growth model and derives long-run growth forecasts for the Euro Area using standard assumptions. A number of key results arise from the analysis; the first is the finding that the impending change in the demographic structure of the European population has significant implications for future growth prospects. At present the proportion of the European population in the key 15 to 64 age category is 64 per cent; however by 2040, according to EuroStat, this will have fallen to 56 per cent. This will lead to a significant decline in the growth rate of labour supply across the continent.

In a baseline scenario McQuinn and Whelan believe that output growth in the Euro Area will average just 0.7 per cent per annum between 2014 and 2020. They also assess the implications for growth of a significant collection of structural reforms in the labour market and for total factor productivity. Even with the successful application of an ambitious set of reforms, the baseline growth rate would be improved by just 1 per cent per annum. The research concludes by calling for a significant joint Euro Area funded capital investment programme, which would address the large output gap and increase the supply-side potential of the European economy.

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<sup>26</sup> McQuinn K. and K. Whelan (2015). “Europe’s Long-Term Growth Prospects: With and Without Structural Reforms”, ESRI and UCD, *forthcoming*.

Such a relatively weak medium and longer-term outlook for the European economy has clear policy implications from an Irish perspective. Over the longer-term, McQuinn and Whelan (2014) argue that, in the case of Europe, a return to higher rates of migration may be necessary if European authorities wish to keep the future supply of labour growing. While the demographic pressures confronting certain European countries are more acute than those likely to transpire in Ireland, an expansion of the Irish labour force over the longer period of time will also require sizeable future inward migration. In the more short to medium-term, the analysis has implications for the export strategies adopted by firms in the Irish economy. The relatively weak European outlook indicates that ongoing policies to increase the diversity of potential export destinations should be reinforced; increasing efforts should continue to target regions and economies with younger populations and, as a result, more dynamic growth prospects. Finally, the results underscore the importance of continued improvements in both domestic labour and total factor productivity in securing future sustainable rates of economic growth.

Ongoing developments in the Irish housing market also continue to warrant some concern. In January the Central Bank of Ireland outlined its finalised proposals for macro-prudential measures aimed at preventing future unsustainable house price movements. In forthcoming research, Duffy, McNerney and McQuinn<sup>27</sup> analyse the implications of these measures for the Irish mortgage and property market given the current state of both markets. At present, the Irish property and credit market is still emerging from the complete market failure which pertained between 2007 and 2012. Housing supply is somewhat below fundamental levels, based on underlying structural demand, while growth rates in mortgage lending are still negative. Furthermore, house prices have increased significantly since early 2013, against the backdrop of a 50 per cent fall in prices between 2007 and 2012. This period, almost inevitably, saw actual prices fall below the level which would have been suggested by the state of fundamental variables in the economy.

The results in Duffy, McNerney and McQuinn indicate that, while the macro-prudential measures proposed will more than likely result in house prices being lower than they otherwise would be, they may also result in fewer houses being supplied to the market and fewer mortgage loans being issued than a “baseline” or no policy change scenario. As a result, as noted by Whelan,<sup>28</sup> the measures may well end up curbing house price inflation but at the cost of generating a sub-

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<sup>27</sup> Duffy D., N. McNerney and K. McQuinn (2015). “Macro-Prudential Policy in a Recovering Housing Market: Too Much Too Soon?” ESRI *Working Paper*, forthcoming.

<sup>28</sup> Whelan, K. (2014). “The Central Bank and the Property Market”. Blog post. Available at [www.karlwhelan.com](http://www.karlwhelan.com).

optimal equilibrium in the housing market. In this market the measures result in restricted demand for new houses, while the supply-side response is impaired by credit and other regulatory restrictions.

An additional issue which may also arise from the macro-prudential measures is further upward pressure on Irish rental levels. There is some evidence from the international literature to support the view that the presence of additional credit constraints in the mortgage market may result in rental rates increasing vis-à-vis house prices. Certain rental rates in the domestic market, as noted in the *Commentary*, are already now approaching their pre-financial crisis peak.



# Detailed Forecast Tables

**FORECAST TABLE A1** Exports of Goods and Services

	2013	% change in 2014		2014	% change in 2015		2015	% change in 2016		2016
	€ bn	Value	Volume	€ bn	Value	Volume	€ bn	Value	Volume	€ bn
Merchandise	91.8	16.4	17.2	106.8	7.9	7.0	115.2	6.0	5.2	122.2
Tourism	3.4	8.7	7.0	3.7	5.1	3.4	3.8	5.0	3.4	4.0
Other Services	88.9	9.4	8.0	97.3	4.4	3.0	101.6	5.1	3.6	106.8
Exports Of Goods and Services	184.1	12.9	12.6	207.8	6.2	5.1	220.7	5.6	4.5	233.0
FISM Adjustment	0.0			0.0			0.0			0.0
Adjusted Exports	184.1	12.9	12.6	207.8	6.2	5.1	220.7	5.6	4.5	233.0

**FORECAST TABLE A2** Investment

	2013	% change in 2014		2014	% change in 2015		2015	% change in 2016		2016
	€ bn	Value	Volume	€ bn	Value	Volume	€ bn	Value	Volume	€ bn
Housing	3.2	18.7	15.0	3.8	16.9	13.3	4.5	11.5	8.0	5.0
Other Building	7.3	6.6	3.6	7.7	21.8	18.3	9.4	19.5	15.8	11.3
Transfer Costs	0.5	6.0	2.9	0.5	13.3	10.0	0.6	13.3	10.0	0.7
Building and Construction	11.0	10.1	8.8	12.1	19.9	14.4	14.5	16.8	13.2	17.0
Machinery and Equipment	15.5	15.4	13.0	17.9	13.7	11.3	20.4	8.8	6.6	22.2
Total Investment	26.5	14.5	11.3	30.4	14.8	12.5	34.9	12.1	9.2	39.1

**FORECAST TABLE A3** Personal Income

	2013	% change in 2014		2014	% change in 2015		2015	% change in 2016		2016
	€ bn	%	€ bn	€ bn	%	€ bn	€ bn	%	€ bn	€ bn
Agriculture, etc	3.0	2.5	0.1	3.1	2.5	0.1	3.2	2.5	0.1	3.3
Non-Agricultural Wages	71.9	1.8	1.3	73.1	4.0	2.9	76.1	4.0	3.0	79.1
Other Non-Agricultural Income	15.2	22.8	3.5	18.6	13.4	2.5	21.1	11.2	2.4	23.5
Total Income Received	90.1	5.3	4.8	94.9	5.8	5.5	100.4	5.4	5.5	105.8
Current Transfers	24.5	-0.9	-0.2	24.3	-2.3	-0.6	23.7	-2.1	-0.5	23.2
Gross Personal Income	114.6	4.0	4.6	119.2	4.1	4.9	124.1	4.0	5.0	129.1
Direct Personal Taxes	25.3	5.6	1.4	26.7	4.7	1.2	28.0	7.7	2.2	30.1
Personal Disposable Income	89.3	3.6	3.2	92.5	4.0	3.7	96.2	2.9	2.8	99.0
Consumption	83.3	2.7	2.3	85.6	3.6	3.1	88.7	3.9	3.5	92.2
Personal Savings	5.9	15.3	0.9	6.8	8.6	0.6	7.4	-9.1	-0.7	6.7
Savings Ratio	6.6			7.4			7.7			6.8
Average Personal Tax Rate	22.0			22.3			22.4			23.2

**FORECAST TABLE A4** Imports of Goods and Services

	2013	% change in 2014		2014	% change in 2015		2015	% change in 2016		2016
	€ bn	Value	Volume	€ bn	Value	Volume	€ bn	Value	Volume	€ bn
Merchandise	55.6	9.6	8.8	60.9	7.5	7.2	65.5	8.2	7.4	70.8
Tourism	4.7	0.6	1.2	4.7	4.2	1.2	4.9	4.9	1.8	5.1
Other Services	87.4	3.2	2.8	102.5	3.1	2.8	105.6	2.9	2.9	108.7
Imports of Goods and Services	147.7	13.8	0.0	168.1	4.7	0.0	176.0	4.9	0.0	184.7
FISM Adjustment	0.0			0.0			0.0			0.0
Adjusted Imports	147.7	13.8	13.2	168.1	4.7	4.4	176.0	4.9	4.6	184.7

**FORECAST TABLE A5** Balance of Payments

	2013	2014	2015	2016
	€ bn	€ bn	€ bn	€ bn
Exports of Goods and Services	184.1	207.8	220.7	233.0
Imports of Goods and Services	147.7	168.1	176.0	184.7
Net Factor Payments	-27.3	-27.0	-28.9	-30.6
Net Transfers	-2.5	-2.3	-2.4	-2.5
Balance on Current Account	6.6	10.5	13.4	15.2
As a % of GNP	4.5	6.6	7.9	8.5

**FORECAST TABLE A6** Employment and Unemployment, Annual Average

	2013	2014	2015	2016
	000s	000s	000s	000s
Agriculture	107	109	106	106
Industry	343	348	368	382
Of which: Construction	102	109	118	125
Services	1,431	1,453	1,490	1,531
Total at Work	1,880	1,914	1,964	2,019
Unemployed	282	243	212	185
Labour Force	2,163	2,157	2,176	2,204
Unemployment Rate, %	13.1	11.3	9.7	8.4

# Appendix



# Nowcasting Appendix

## Introduction

A recent QEC *Research Note*<sup>29</sup> outlined the introduction of the “nowcasting” methodology to the suite of forecasting models used at the ESRI. Nowcasting allows forecasters to produce estimates of economic growth at short-term horizons. The growth estimates are based on a large panel of indicators which are predominantly at monthly frequency, with the movements in these giving an early estimate of quarterly growth. For this Spring *Commentary*, estimates have been produced for the first and second quarters of 2015. The estimate for Q1 2015 is termed a nowcast, i.e. growth in the current calendar quarter, while the estimate for Q2 2015 is a forecast.

The nowcasting model uses approximately 50 indicators. These include, for instance, Quarterly National Accounts data for Ireland and its main trading partners, Industrial Production and Turnover, Labour Market data, Purchasing Managers’ Indices (PMIs) for Services and Manufacturing, Retail Sales, Goods Exports and Imports, Private Sector Credit, Exchequer Returns and Consumer Sentiment Indices.

## Results

Table 1 shows the nowcast and forecast of GDP growth in Q1 and Q2 with confidence intervals included. The nowcasting methodology also allows the marginal impact on the quarterly growth estimate of a movement in an individual series to be calculated. For example, Industrial Production and Turnover in January 2015 lowered the nowcast estimate by 25 basis points suggesting that developments in this indicator lowered the growth rate in GDP for that quarter, while the February Services PMI for Ireland increased the estimate by 12 basis points.

**TABLE 1** Current Nowcast and Forecast of Irish Quarter-on-Quarter GDP Growth Rates

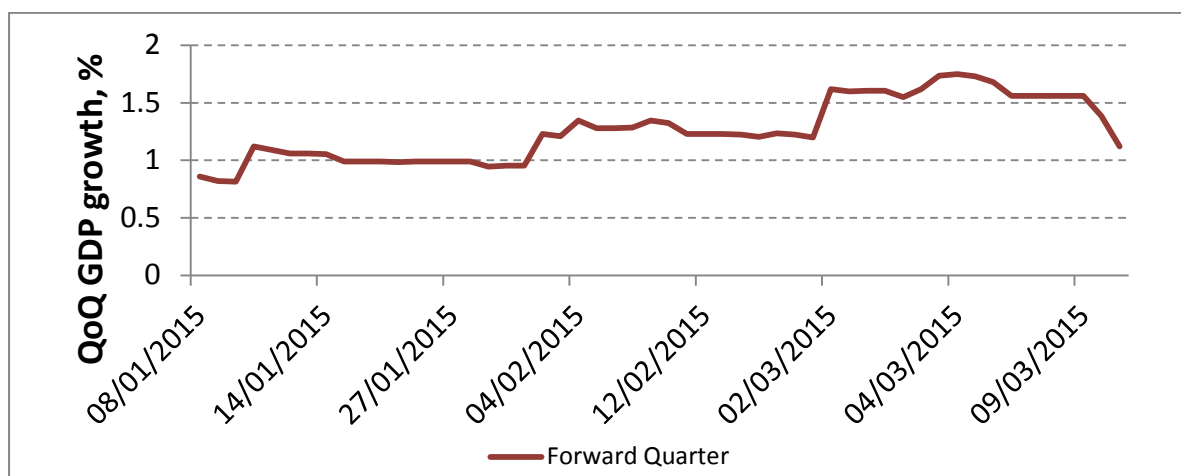
Period	Nature of Estimate	GDP Estimate %	95% Confidence Interval	
Q1 2015	Nowcast	1.26	-0.27	2.78
Q2 2015	Forecast	0.98	-0.63	2.60

Source: Own estimates.

<sup>29</sup> Byrne, D., C. Morley and K. McQuinn (2014), “Nowcasting and the Need for Timely Estimates of Movements in Irish Output”. *Research Note 2014/3/1, Quarterly Economic Commentary*, Autumn 2014.

Figure 1 shows the evolution of the growth estimates through the first three months of 2015. A new GDP growth estimate is produced as each of the indicators in the panel is updated throughout the quarter (so, for example, if an update of a particular series becomes available on the 12<sup>th</sup> of February, an estimate of GDP growth is then produced based on this and the other series already available at that date). Figure 1 shows the progression of “forward quarter” estimate, which is the average of the nowcast and forecast. Overall, based on this approach, it would indicate that the economy is growing by approximately 1 per cent in Q1 2015 with respect to Q4 2014.

**FIGURE 1** Progression of GDP Growth Estimates During Q1 2015



Source: Own estimates.



# Research Notes



# The Irish Electricity Market: New Regulation to Preserve Competition

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\* Valeria di Cosmo and Muireann Á. Lynch<sup>30</sup>

## 1. Introduction

In the electricity sector there are two different markets: the wholesale (or spot) market, in which electricity generators generate and sell electricity at a new price every half hour, and the retail market, in which electricity supply companies sell electricity to the final consumers. Supply companies tend not to change the price they charge their consumers very frequently, and so these companies typically enter into longer-term contracts for electricity with generators to avoid the risks they would face if they bought at a new price every half hour. Internationally, many electricity markets also include a specific capacity payment mechanism, which ensures generators receive sufficient revenue to cover their fixed costs, thereby incentivising investment.

The Single Electricity Market (SEM) of the island of Ireland has been in place since 2007. The market takes the form of a centrally-traded pool where all electricity is bought and sold. In 2014, the payments made to generators for the electricity they provided came to €2.2 billion and capacity payments came to €556 million.<sup>31</sup> Since the SEM was launched, wholesale electricity prices have tracked input fuel prices closely and the costs and bids of generators have been open and transparent.

The European Union is working to harmonise electricity markets in its Member States by specifying a Target Model for electricity markets across Europe. The SEM has some technical features that render it incompatible with the European Target Model and so a number of changes to the market are necessary.<sup>32</sup> The SEM will therefore be replaced by a new Integrated Single Electricity Market (I-SEM), which will be Target-Model compatible, by 2017. The new market will

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<sup>31</sup> See [http://www.sem-o.com/pages/MDB\\_ValueOfMarket.aspx](http://www.sem-o.com/pages/MDB_ValueOfMarket.aspx) for full details.

<sup>32</sup> The rationale behind the Target Model is to promote efficient trading of energy between different countries. This includes allowing the cheapest generators to meet demand at each point in time while respecting their technical constraints, enhancing security of supply in each market, and facilitating the integration of renewable generation.

affect the spot and retail markets and the mechanisms through which supply companies buy electricity in advance to manage their risks.<sup>33</sup> We have concerns about some possible undesired consequences of the new market design for the I-SEM, relating to both spot and retail markets. There are also proposed changes to the capacity payment mechanism which are of concern.

Traditionally, electricity was generated and supplied to final consumers by state-owned monopolies. In the past two decades, electricity markets worldwide have been liberalised, with many players competing in both generation and retail markets. Often, however, the legacy monopolist retains a large market share in generation and retail markets. The SEM is no exception.

The legacy monopolist in the SEM has both a generation and a retail arm. Thus, one firm owns a large amount of the generation units on the system, provides a large proportion of total power generated and has the largest number of retail consumers. This allows the firm, in theory, to hide the true costs in each market by passing costs between its retail and generation arms. The legacy monopolist therefore has the potential to influence prices in both wholesale and retail markets. Any redesign of the SEM should take these structural issues, namely a low number of players and a dominant firm, into account.

The paper is structured as follows. Section 2 analyses the challenges facing the new I-SEM in spot and retail markets. Section 3 analyses the risks associated with the new capacity mechanism and Section 4 concludes.

## **2. Market Power in Spot and Retail Markets: the Role of Forward Markets**

Both theoretical literature and international experience suggest that in order to promote competition in electricity markets with a small number of players, three measures may be employed. The first is where generators are required to base their bids on their true costs, and the regulator closely monitors spot market prices. The second is to improve the links between local and international electricity markets (this is achieved by building interconnectors). The final option is to incentivise local generators to commit to sell electricity at a competitive price in advance (this is achieved with a liquid forward market).<sup>34</sup> These options should not be seen as exclusive, as they can successfully be integrated. In particular, a liquid forward market can also prevent the retail price, which

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<sup>33</sup> See *Directive 2009/72/EC* on common rules for internal market and *Regulation 713/2009/EC* for coordination in the Single European Market.

<sup>34</sup> See Di Cosmo and Lynch (2015) for more details.

represents the ultimate cost to consumers, from rising in the long term, as we will discuss below.

Competition in the current SEM spot market is currently ensured primarily through the first of these options, namely by regulating and monitoring spot market bids. This efficiently prevents generators from setting prices which do not reflect their true costs. This is achieved by the so called "Bidding Code of Practice", which legally requires generators to declare (or bid) their short-run marginal costs. This is the cost of producing one extra unit of electricity, and therefore is directly linked to generators' costs of fuel and carbon. These short-run marginal costs are bid separately from all other costs, such as the costs of starting or running the plant without producing electricity. Instead, generators include start costs and running costs in separate bids. Generators are also required to bid these other costs truthfully.

In the I-SEM, a new bidding structure will be used, which will bring new challenges to the Irish electricity market. In particular, it will no longer be possible to declare the different components of generation costs (start costs, running costs and short-run marginal costs) separately. This may weaken the link between generators' costs and market prices, and will also increase the responsibility generators must bear for ensuring their generation schedules are such that all their running costs are met. This new responsibility for meeting all costs may necessitate extra payments to generators. Furthermore it will be more difficult, but not impossible, for the regulatory bodies to impose conditions on the bids generators make in the new market, as they do at present. Given these limitations, in order to maintain the competitive spot market prices seen to date, we recommend that generators' bids be monitored carefully by the regulatory authorities to prevent them from exhibiting strategic behaviour.

Interconnection is the second of the three mechanisms through which competition is promoted. If there is a good level of interconnection between countries, generators compete not only within their country, but also with generators in other countries. In this case the number of market players is likely to be high enough to promote competition and, by extension, to keep electricity prices at their competitive level (which is the lowest level achievable). Although the efficient use of interconnectors will be beneficial for competition, the potential benefits and costs associated with higher interconnection levels may deserve further analysis.

The Irish market will be interconnected with the UK market, but not directly with Europe. As the UK market cannot be considered completely integrated with the rest of the European markets (i.e. the prices in the two zones won't necessarily always be the same), the existing interconnection is unlikely to open the Irish market to other EU players. Moreover, some companies in the UK are also owners of electricity companies in the Irish market, and this may reduce the benefits in terms of competition which can be gained through interconnection. Therefore the potential for interconnection to act as a means of ensuring competition in the new I-SEM, as with the current SEM, is limited.

Forward markets are the third measure often used to promote competition in electricity markets. In forward markets, generators commit to sell electricity in advance at a certain price. However, forward markets are also unlikely to underpin effective competition in Ireland, because the SEM is probably too small to support a liquid financial forward market. More realistically, the main forward contracts in this market will be bilateral contracts between generators and suppliers. Nevertheless, forward markets could still contribute to competition in I-SEM if they are properly designed. In particular, forward markets should be transparent, with the forward prices emerging from bilateral contracts made public.

If forward prices are made public, suppliers that earn high profits (which, in turn, will be associated with high retail prices) can be easily detected. This will provide a signal for new companies to enter the retail market and take advantage of the high profit margins. Furthermore, given the availability of such information on prices and suppliers, consumers can switch supplier and secure the best price. The regulator should facilitate such switching by ensuring there is sufficient information available to consumers. In particular, the regulator should require supply companies to publish all details of the components of the tariffs they applied to consumers who are not willing to switch their provider.<sup>35</sup> Extra consumer charges to subsidise renewable generators should also be published separately.

In summary, there are several challenges the I-SEM design encounters: it must keep spot prices at the lowest level achievable and ensure that supply companies transfer this price to final consumers, without earning extra profits. The low level

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<sup>35</sup> These include the price at which the electricity was bought (either on the forward or spot market) and the costs of billing and metering. The focus on information and the role of the regulatory authority is particularly important, as recent economic theories highlight that consumers who are offered sufficient choice between plans sometimes do not select products that maximise their best interests. Wilson and Waddams (2010) used survey data from the UK electricity market and found that 20-32 per cent of consumers who switched supplier in order to obtain cheaper electricity actually ended up paying more, while less than 20 per cent switched to the firm offering the highest saving.

of interconnection and the lack of a liquid forward market may prevent the I-SEM from delivering an efficient price. Therefore, it seems regulation is the best way to ensure a competitive final price for consumers.

In particular, regulation should monitor the quantity and the price of the forward contracts in order to ensure that forward sales are at a reasonable price.<sup>36</sup> On the retail side, the regulator should require supply companies to publish the components of their tariffs, enabling consumers to make an informed decision when choosing supplier and to encourage new entrants if retail margins are high.

### **3. New Capacity Payment Mechanism**

Capacity payments are payments made to generators to cover the fixed costs of the plant, as revenues from the sale of energy may not prove sufficient to ensure an appropriate level of investment arises. At present, capacity is paid for by dividing a capacity “pot”, the size of which is determined by the regulatory authorities, among all available generators. This mechanism will be replaced by a reliability options mechanism in the I-SEM.

In a reliability options framework, generators participate in a competitive auction to hold reliability options in a given year. The total amount of options sold in the auction is equal to the estimated maximum level of electricity demand for the year. Thus consumers pay generators to hold reliability options, and in return receive assurance that there will be sufficient generation plants installed on the system to meet the maximum demand.

Generators that hold reliability options can be called upon by the Transmission System Operator (TSO - i.e. the System Operator of Northern Ireland or EirGrid) to generate at periods of system stress. These are identified as periods when spot prices rise above a “strike price” which will be predetermined by a central regulating body and announced in advance of the reliability option auction. In these circumstances, generators holding reliability options are required to repay the difference between the market price and the strike price to the TSO. This shields consumers from the effects of high spot prices. Reliability options have been implemented in the New England electricity market and are proposed for the Italian market.

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<sup>36</sup> See Di Cosmo and Lynch (2015) for more details.

There is a danger that if the total amount of options cannot be sold without the participation of one particular firm, this firm will have both the ability and incentive to bid a high price for holding these options, which will lead to the auction clearing at a high price. The current capacity payment mechanism was not vulnerable to this exercise of market power, as the regulatory bodies determined the capacity pot. Therefore firms could not cause total capacity payments to rise through strategic behaviour.

The regulators remain confident that appropriate measures can be identified to mitigate this potential strategic bidding which can be implemented along with the move to reliability options. However, there is no examination in the academic literature to date of the interaction of reliability options with a dominant firm or a low number of players. Indeed, much of the literature specifically ignores such issues when examining reliability options. These structural issues, which are present in the SEM, do not hold in other markets operating such capacity payment mechanisms.

Given this background, the authors are of the view that the only feasible way to protect consumers from the exercise of market power in the capacity market is to regulate prices. The regulator should perform a pivotal supplier test every year, which ascertains whether there is one firm without which the total allocation of options cannot be sold. If such a pivotal supplier is found, the price and quantity bid into the reliability options auction by every unit owned by the pivotal supplier should be regulated.<sup>37</sup> However, this would lead to the regulatory bodies determining not only the demand, but also a large portion of the supply curve of capacity in the I-SEM. Such a regulatory regime would also prove a significant administrative burden for the regulatory authorities. Finally, it could lead to a risk of litigation.

One final question regarding reliability options relates to wind generation, which is of increasing importance in the SEM. At present, the capacity payment pot is divided amongst all available generators, including wind generators. The revenue wind generators receive from the capacity payment mechanism is taken into account when determining the subsidy to which wind generators are entitled.

Under the new regime it is unlikely that wind generators will hold many if any reliability options, as periods of system stress may not coincide with positive wind output. Wind generators will therefore be reluctant to participate in the auction

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<sup>37</sup> Similar practices exist in other jurisdiction, see for example <http://www.ferc.gov/CalendarFiles/20130826142258-Staff%20Paper.pdf>.



at a low price, and are unlikely to hold these options. Thus, in determining whether a reliability options framework represents a net benefit for the consumer compared with the current regime, the total cost of the current mechanism should be compared with the cost of the new mechanism plus any addition to wind subsidies caused by the loss of capacity payments to wind generators.

#### **4. Conclusion**

The design of the Integrated Single Electricity Market raises concerns about the potential to realise a competitive outcome in the spot market, the retail market and the capacity market. The capability of forward trading to mitigate these risks is limited due to the nature of the Irish market. In a small market with limited interconnection capacity, liquid and transparent forward markets are unlikely to develop.

Therefore we recommend that the dominant firm face regulation of its forward sales and also the prices and quantities it bids into the new capacity payment mechanism. Furthermore spot market prices and retail prices should be closely monitored and regulation of retail tariffs, by means of a default tariff, should be considered.

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# Demographics and the Growth Outlook for Europe

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## 1. Introduction

With low inflation in the Euro Area taken as a given, a return to steady real GDP growth is likely to be the most effective mechanism for restoring Europe's highly indebted governments, businesses and households to sustainable situations. This paper examines prospects for growth in the Eurozone. It follows up on an earlier paper of ours (McQuinn and Whelan, 2008) that focused on trends up to mid-2006. While the period of growth in Europe prior to the global crisis of 2008 is sometimes referred to as "the boom", our previous paper had noted that long-run trends in both productivity and per capita hours worked were deteriorating to the point where potential output growth in the Euro Area was at a historical low point and apparently on a negative trend. After a long period of catching up with US levels of labour productivity, Euro Area productivity growth had, from the mid-1990s onwards, fallen significantly behind.

In this paper, we update our calculations from our 2008 paper and provide projections of Eurozone growth out to 2060, based on recovery scenarios and long-term demographic trends. Because of data restrictions, we restrict our analysis to the twelve countries that participated in the Euro Area prior to the most recent accessions.<sup>39</sup>

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<sup>38</sup> Whelan is professor of economics at UCD. The authors would like to thank all those who participated at the second CSPR-Modena conference on growth in mature economies for comments on an earlier draft. Any remaining errors are the responsibility of the authors.

<sup>39</sup> These are Ireland, Belgium, the Netherlands, Luxembourg, France, Spain, Portugal, Germany, Finland, Austria, Greece and Italy.

Overall, our findings are sobering for those expecting economic growth to deal with the Euro Area’s debt problems over the next decade. Among the results we report are the following:

1. Total Factor Productivity (TFP) growth in the Euro Area has almost ground to a halt: it averaged 0.2 per cent per year over the period 2000-2013.
2. The ongoing slump in investment is having negative supply-side effects: low capital stock growth is subtracting about 0.6 per cent per year from potential output growth.
3. The working age (15 to 64) population of the Euro Area has been declining since 2010.
4. We project real GDP growth of less than half of one per cent over the next decade even if unemployment and investment return to their pre-crisis rates by 2020.

## 2. Growth Accounting Framework

The analytical framework which we use to assess the performance of European countries is similar to that outlined in Byrne and McQuinn (2014) and is based on the standard assumption that output is produced according to a Cobb-Douglas production function

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

where  $Y_t$  is real output,  $K_t$  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 expressed as

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

Using data on output growth, capital growth and labour growth, TFP growth can be calculated. As there is no official capital stock series for the European economy, we construct this series ourselves. To do this we assume that the initial stock of capital in 1970 equals the steady-state value implied by the Solow growth model in this year based on the trends at that point for GDP growth, the

investment share of GDP and the growth rate of labour input. The rest of the capital stock series is then derived using the following definition

$$K_t = (1 - \delta)K_{t-1} + I_{t-1}$$

with a depreciation rate of six per cent per annum. For more on the assumptions underpinning the growth calculations see McQuinn and Whelan (2007) and McQuinn and Whelan (2008).<sup>40</sup>

### 3. Historical Assessment and Likely Future Trends in TFP and Labour Supply

Table 1 presents results for the Euro Area and the US of the growth accounting exercise which allocates output growth according to its three components. Amongst the trends to emerge from the table is the declining rate of TFP growth. Euro Area TFP growth was running at 2.7 per cent in the first half of the 1970s, fell to 1.6 per cent over 1977-1986, 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 3 per cent decline in 2009. In terms of assessing likely future trends in Euro Area TFP, we believe that the average growth rate over the period 2000-2013 of 0.2 per cent may well represent a reasonable value for the medium-term growth rate. This period incorporated a number of years of expansion and falling unemployment as well as two periods of rising unemployment so the total cyclical effect on this average is probably quite low.

We now turn to labour market developments in the Euro Area. Labour productivity and hours worked together determine the path of GDP in any economy. Table 2 provides a decomposition of the percentage change in total hours worked as a function of four different components: changes in population, the participation rate (labour force divided by the total population), the employment rate (employment as a fraction of the labour force) and the change in average work week per employee. Figure 1 provides graphical evidence of related variables. It shows that in the period since 1970, European population growth has fluctuated around a relatively low average value of about half of one

<sup>40</sup> All of the data, with the exception of the average work week is taken from the European Commission AMECO database. Data on the work week is taken from the Groningen Growth and Development Centre (GGDC): [www.rug.nl/research/ggdc/](http://www.rug.nl/research/ggdc/).

per cent and has gradually fallen over the past decade. Rising female labour force participation has driven a significant increase in the fraction of the population that is available for work but this series has levelled off in recent years. Offsetting the longer-term rise in participation, the average work week has declined steadily and unemployment rates have risen to a much higher average value than those recorded in the early 1970s.

Rather than focus in detail on the factors that have driven past fluctuations in labour input, we want to focus on the outlook for the future. A number of patterns are now in place that point against significant increases in total hours worked in the Euro Area economy in the next few decades.

1. The population of the Euro Area 12 group of countries is expected to grow very slowly over the next few decades. Eurostat projections show 0.18 per cent per year growth in population between 2013 and 2023 followed by a gradual reduction in population growth until population levels begin declining in 2046 (see Figure 2).
2. More seriously, Eurostat estimate that the Euro Area's population in the normal working-age bracket of 15 to 64 years old peaked in 2010 and is set to decline steadily over the next few decades. Eurostat project that the population in the 15 to 64 years old bracket will fall at an average annual rate of 0.21 per cent in the decade finishing in 2023 and then fall at a rate of 0.48 per cent per year in the subsequent decade.
3. Among those who are in the working-age bracket of 15 to 64 years old, the increase in participation rates has gradually tailed off in recent years. This represents female labour force participation reaching a plateau in many countries but also the effects of population ageing. Participation rates fall off as people get closer to the "official" retirement age so the ageing of Europe's population is likely to limit further gains in the participation rate.
4. There is also no evidence, as of yet, that the trend decline in the average work week is about to end.

#### 4. Longer-Run Outlook

How are these trends likely to shape economic growth in the coming decades? Here, 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 with low investment and high unemployment. Everything up to 2013 is taken from historical data, so 2014 is the first year of the simulation. The model's ingredients are described as follows:

$$\begin{aligned}
 Y_t &= A_t K_t^\alpha L_t^{1-\alpha} \\
 K_t &= (1 - \delta)K_{t-1} + I_{t-1} \\
 L_t &= (1 - u_t)(p_t \times Pop_t) \times H_t \\
 I_t &= s_t Y_t \\
 \Delta \log A_t &= g
 \end{aligned}$$

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. Labour input is modelled as a product of the country's employment rate ( $1 - u_t$ ), the participation rate for those in the work-age population, ( $p_t$ ), the working age population, ( $Pop_t$ ) and the average length of the work week ( $H_t$ ). The assumptions underlying the simulation are as follows:

1. TFP growth is assumed to continue to grow at the Euro Area 2000-2013 average of 0.2 per cent.
2. The ratio of investment to GDP is projected to recover to its 1998-2007 average by 2020 and remain constant thereafter.
3. The unemployment rate is projected to fall gradually to their 1998-2007 averages by 2020 and be constant thereafter.
4. European participation rates of work-age population remains at 2013 levels.
5. The average work week continues to change over the period 2014 to 2020 at the same rate as the 2000 to 2013 average and then stays flat.
6. The work-age population follows Eurostat projections.

Figures 3 and 4 provide graphic illustrations of how our assumptions translate into Euro Area aggregate labour market outcomes. The reduction in the unemployment rate leads to a temporary increase in total employment up to 2020 before demographic patterns reassert themselves and produce a gradual decline in employment from there onwards. Our projected decline in the average work week, however, undoes the positive effect of rising employment so that total hours worked declines by about 1.6 per cent in the decade ending in 2023. Figure 5 illustrates the assumptions for TFP growth and the investment share of GDP with the Euro Area assumed to move towards its average investment rate of the period 1998-2007.

Putting these figures together, we project that output per hour will grow at an average rate of 0.54 per cent over the period 2014-2023 while GDP will grow at an average rate of only 0.38 per cent per year because of declining hours worked (see Figure 6). After this decade, output per hour is projected to grow in the subsequent decades at average rates of 0.68 per cent in 2024-2033 (declining employment leads to a temporary boost via a capital deepening effect), 0.5 per cent in 2034-2043, and 0.4 per cent in 2044-2053 as this rate gradually eases towards its steady-state value of 0.3 per cent. With falling hours worked, Euro Area GDP grows at 0.18 per cent per year in 2023-2033. The decline in hours growth tails off in subsequent decades, thus allowing total GDP growth to settle down at about 0.25 per cent per year despite declining productivity growth.

## 5. Concluding Comments

Despite the need for the Euro Area to return to faster rates of economic growth to deal with severe balance sheet problems affecting many of its members, the current set of supply-side trends are not at all encouraging for the growth prospects over the medium- and long-term. TFP growth is very poor, investment is low and demographic problems are going to restrain the growth of labour input in the coming years. Combined with a series of demand-side problems, such as tight fiscal policy and restrictions on bank credit, the prospects for the Euro Area economy over the next decade do not look so good.



Indeed, even allowing for a return of investment and unemployment to pre-crisis levels, we project growth in the Euro Area that is well below one per cent over the next decade. In this sense, despite the intense focus on debt levels, the Euro Area is facing a growth crisis as much as it is facing a debt crisis, with the latter perhaps more a symptom of the former.

The Euro Area's current ratio of public debt to GDP is high by modern historical standards at 95 per cent but many of its Member States are able to borrow at very low rates and the pricing of ESM-issued securities shows that there are few concerns about the solvency of the Euro Area as a whole. There is thus a strong economic case for a large investment programme aimed at reducing unemployment and raising the supply capacity of the economy, funded by the Euro Area as a whole. Given that public capital funding is usually the first item slashed when governments cut back on spending in a crisis, it is likely that many of the projects funded by such an initiative involve spending that will need to be undertaken at some time in the future anyway so a programme of this sort may have limited long-run effects on debt levels. Unfortunately, Europe's political constraints are likely to rule out such a programme for the foreseeable future.

Over the longer-term, Europe needs a plan for dealing with a pattern of population ageing that is set to have enormous effects. Policy initiatives to delay retirement ages and to encourage labour force participation are undoubtedly part of the solution to the problems posed by ageing. However, these initiatives are likely to be very unpopular politically and may have negative implications for productivity. A policy of large planned increases in the amount of immigration into the EU, while also politically challenging, may turn out to be the only way to keep the European economy expanding in the future.

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**TABLE 1** Decomposition of Euro Area and US Output Growth Rates (%)

Period	Euro Area				United States			
	$\Delta y$	$\Delta a$	$\Delta k$	$\Delta l$	$\Delta y$	$\Delta a$	$\Delta k$	$\Delta l$
1970-1976	3.6	2.7	1.5	-0.5	3.1	0.9	1.2	1.0
1977-1986	2.1	1.6	0.8	-0.4	3.1	0.7	1.2	1.2
1987-1996	2.3	1.5	0.8	0.0	2.9	0.9	1.1	0.9
1997-2006	2.2	0.7	0.8	0.7	3.1	0.9	1.6	0.7
2007-2013	-0.3	-0.2	0.5	-0.6	1.0	0.5	0.7	-0.2
2000-2013	0.9	0.2	0.7	0.0	1.7	0.5	1.1	0.2
2010-2013	0.1	0.3	0.3	-0.5	2.1	0.7	0.5	0.9

Source: McQuinn, K. and K. Whelan. *Demographics and the Growth Outlook for Europe*. ESRI Working Paper, forthcoming.

Notes: The table shows the contribution of growth in labour inputs, capital inputs and TFP to total output growth, where  $\Delta a$  denotes change in TFP;  $\Delta k$  denotes change in capital inputs;  $\Delta l$  denotes change in labour inputs and  $\Delta y$  denotes change in total output growth.

**TABLE 2** Decomposition of Growth in Hours Worked (%)

Period	Euro Area				
	Total	Pop.	P. Rate	Emp. Rate	Work Week
1970-1976	-0.8	0.5	0.0	-0.4	-1.0
1977-1986	-0.6	0.3	0.5	-0.5	-0.8
1987-1996	0.1	0.4	0.2	-0.1	-0.4
1997-2006	1.1	0.5	0.7	0.3	-0.4
2007-2013	-0.9	0.3	0.0	-0.8	-0.4
2000-2013	0.0	0.5	0.3	-0.3	-0.4
2010-2013	-0.8	0.2	0.0	-0.7	-0.3

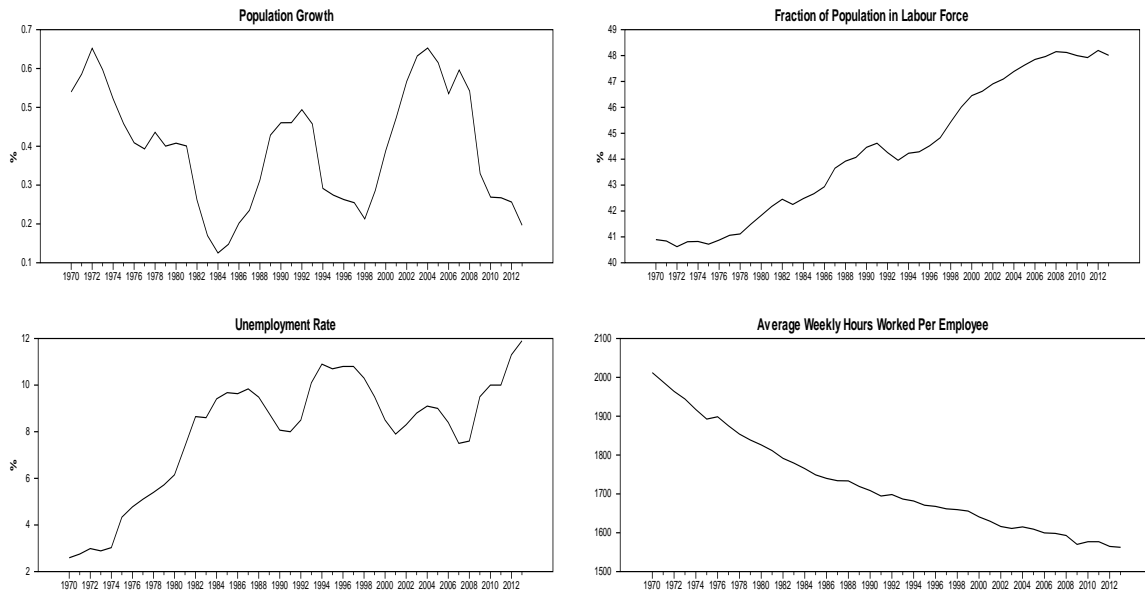
  

Period	United States				
	Total	Pop.	P. Rate	Emp. Rate	Work Week
1970-1976	1.5	1.0	1.5	-0.5	-0.5
1977-1986	1.8	1.0	0.9	0.0	-0.1
1987-1996	1.3	1.2	0.1	0.1	0.0
1997-2006	1.0	1.0	0.2	0.0	-0.2
2007-2013	-0.3	0.8	-0.5	-0.5	0.0
2000-2013	0.2	0.9	-0.2	-0.3	-0.1
2010-2013	1.4	0.7	-0.4	0.8	0.2

Source: McQuinn, K. and K. Whelan. *Demographics and the Growth Outlook for Europe*. ESRI Working Paper, forthcoming.

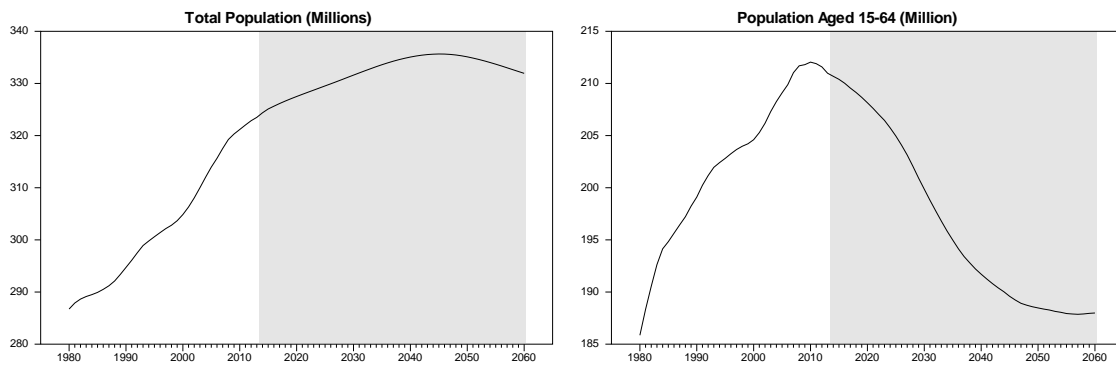
Notes: Pop. refers to changes in population, P. denotes participation; EMP. denotes employment; and Work Week refers to change in average work week hours.

**FIGURE 1** Determinants of Euro Area Hours Growth: 1970-2013



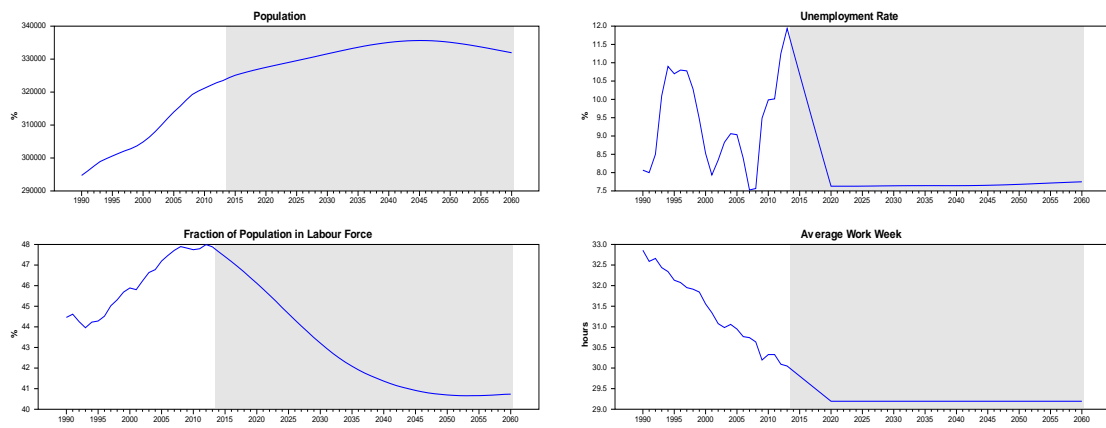
Source: AMECO.

**FIGURE 2** Euro Area Demographic Changes



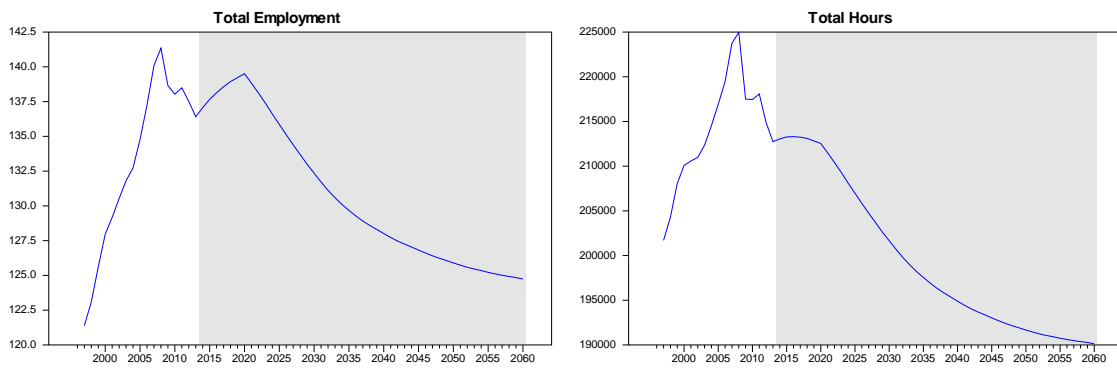
Source: AMECO + own estimates.

**FIGURE 3** Labour Market Assumptions



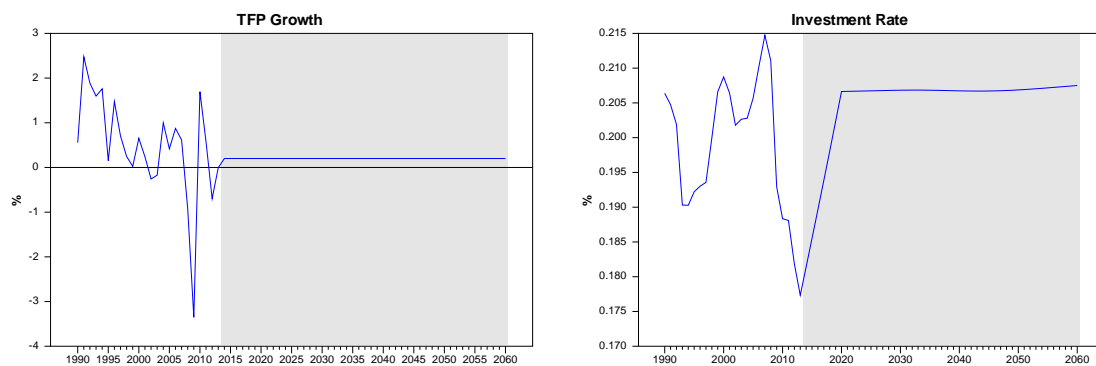
Source: AMECO + own estimates.

**FIGURE 4** Labour Supply



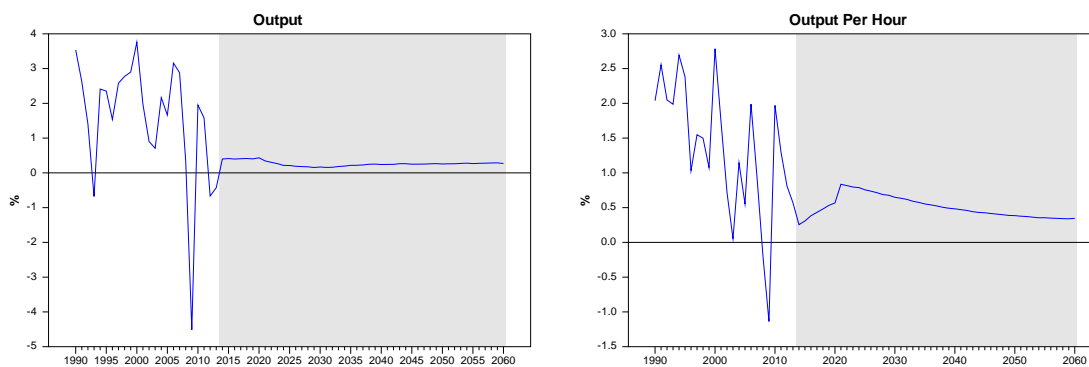
Source: AMECO + own estimates.

**FIGURE 5** Investment and TFP Assumptions



Source: AMECO + own estimates.

**FIGURE 6** Output Growth Rates



Source: AMECO + own estimates.





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