Society of Actuaries in Ireland

Finance & Investment Forum

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The Ultimate Forward Rate

Stuart Redmond

26.10.2016

UFR Working Party

- Shane O’Farrell (Chair)
- Daragh Burns
- Dermot Mannion
- Rob Murphy
- Frank O’Regan
- Karl Murray
- Richard McMahon
- Stuart Redmond

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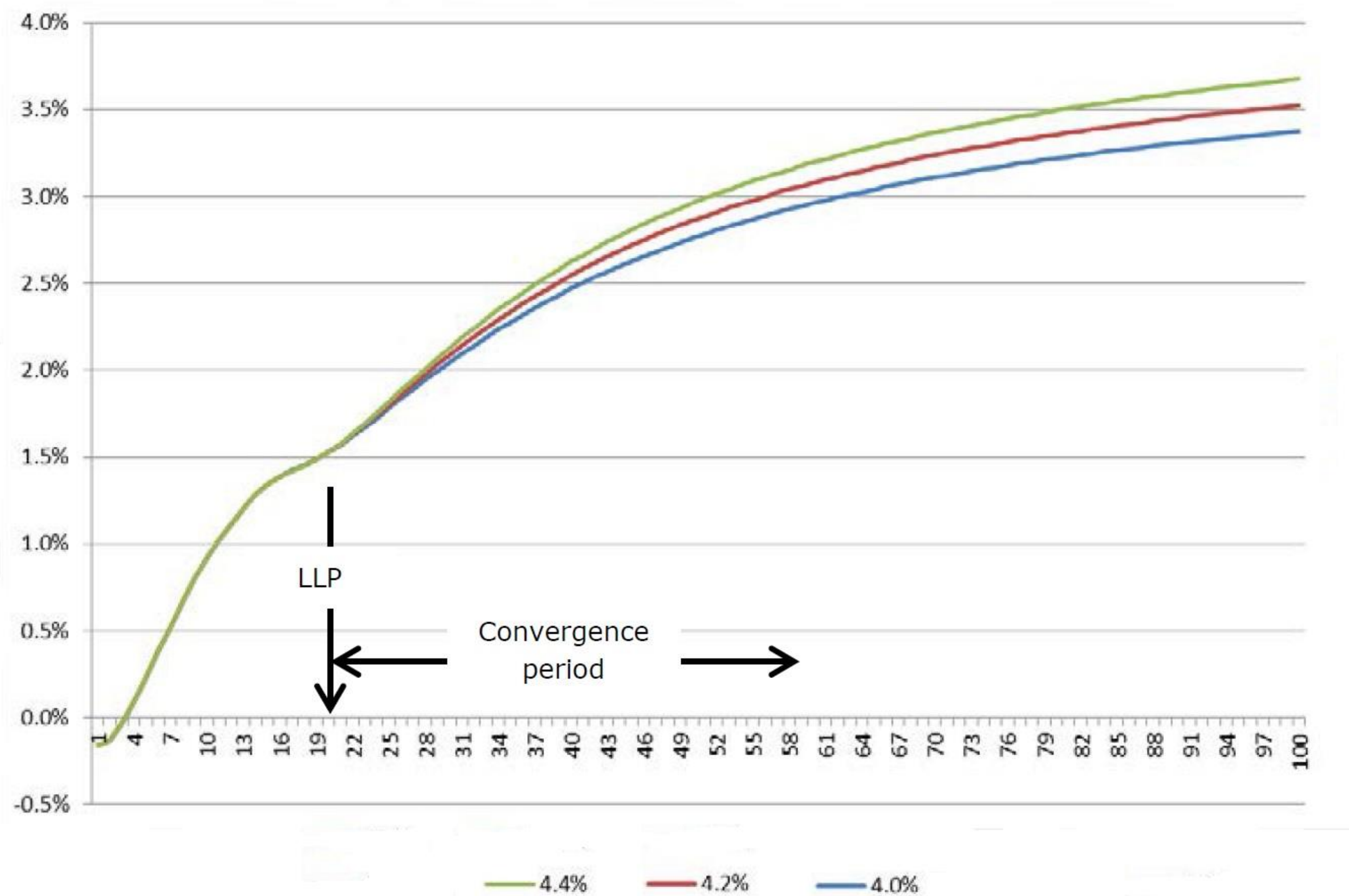
Agenda

- Discount Rates and Solvency II
- Determining the Ultimate Forward Rate (UFR)
- Consultation Feedback
- Future Developments

Discount Rates and Solvency II

- SII discount rate requirements:
  - Insurers shall be able to earn the rate risk-free in practice
  - Determined based on relevant financial instruments traded in deep, liquid and transparent markets
    - Interest rate swaps or government bonds
    - Adjusted for credit risk
  - Calculated separately for each currency and maturity
  - Determined in a transparent, prudent, reliable and objective manner that is consistent over time
- Interpolation
- Extrapolation
- Last Liquid Point
- Ultimate Forward Rate (UFR)

SII: Basic Risk-Free Term Structure



The Ultimate Forward Rate

- Criteria set out in Article 47 of the Delegated Acts:
  - Stable and only change as a result of changes in long-term expectations
  - Methodology to derive it clearly specified
  - Takes account of expectations of long-term interest rates and expectations of inflation
  - Does not include a term premium
  - Determined in a transparent, prudent, reliable and objective manner that is consistent over time

The Ultimate Forward Rate: Current Approach

Item	Current Methodology
General Methodology	UFR = Real Interest Rate + Inflation
Setting the Expected Real Rate	Single rate based on the arithmetic average of historic real rates from 12 countries
Data for Real Rate	Dimson, Marsh & Staunton data from 1950 to 2000
Exclusion of Term Premium	Unclear
Setting the Expected Inflation Rate	2% standard rate with the potential to allocation to low / high inflation buckets based on historical data
Data for Inflation	OECD data (1994-2009)

Euro UFR = 2.2% + 2% = 4.2%

The Ultimate Forward Rate: Proposed Approach

Item	Current Methodology
General Methodology	UFR = Real Interest Rate + Inflation
Setting the Expected Real Rate	Single rate based on the geometrically weighted average of historic real rates from 7 countries
Data for Real Rate	European Commission annual macro-economic (AMECO) database from 1960 onwards
Exclusion of Term Premium	Yes by using short-term real rates
Setting the Expected Inflation Rate	2% standard rate with the potential to allocation to low / high / very high inflation buckets based on historical data
Data for Inflation	OECD data (1994-2009)

Euro UFR = 1.7% + 2% = 3.7%

Consultation Feedback

- SAI Feedback
  - Supportive of the new approach
  - Methodology generally favours stability over prudence
  - Completely focussed on historical data and ignores market data after the LLP
  - Justification of a single real rate assumption for all countries
- Other Feedback
  - Too soon to be making changes to a long-term parameter
  - Assessment of prudence should be made in the overall context of Solvency II
  - Changes to the UFR should be infrequent and gradual

Future Developments

- Results of the consultation were due to be published in September
- Revised methodology to be implemented in 2017. First UFR calculated by end of March and applied to calculate the risk-free interest rate term structure for end-June 2017

Over to you ….

The Economic Outlook

Alan Barrett
Economic and Social Research Institute
26 October 2016

Outline

- Short term outlook, drawing on the ESRI's Quarterly Economic Commentary
  - Recent growth patterns
  - Policy issues including the public finances
- The possible implications of Brexit, also drawing on ESRI work

Economic growth to continue in 2016 and 2017

Output

- Real GDP to grow by 4.3% in 2016 and by 3.8% in 2017
- Adjusted 2015 figures indicate GDP growth in 2015 of 5.5 per cent

Employment

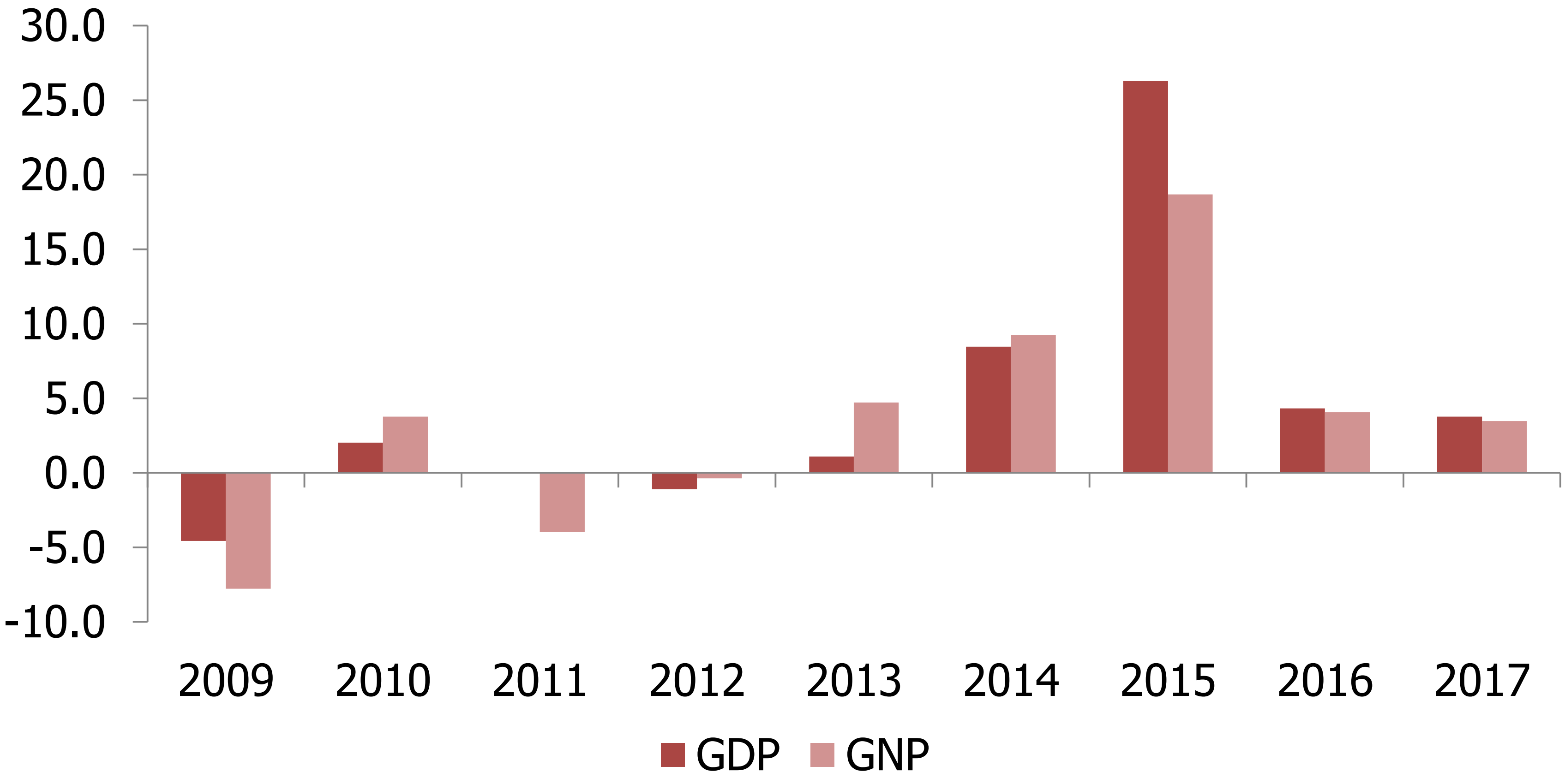
- Numbers employed to increase to an annual average of 2.043 million in 2017
- Unemployment rate below 6.8% by Q4 2017

Public finances

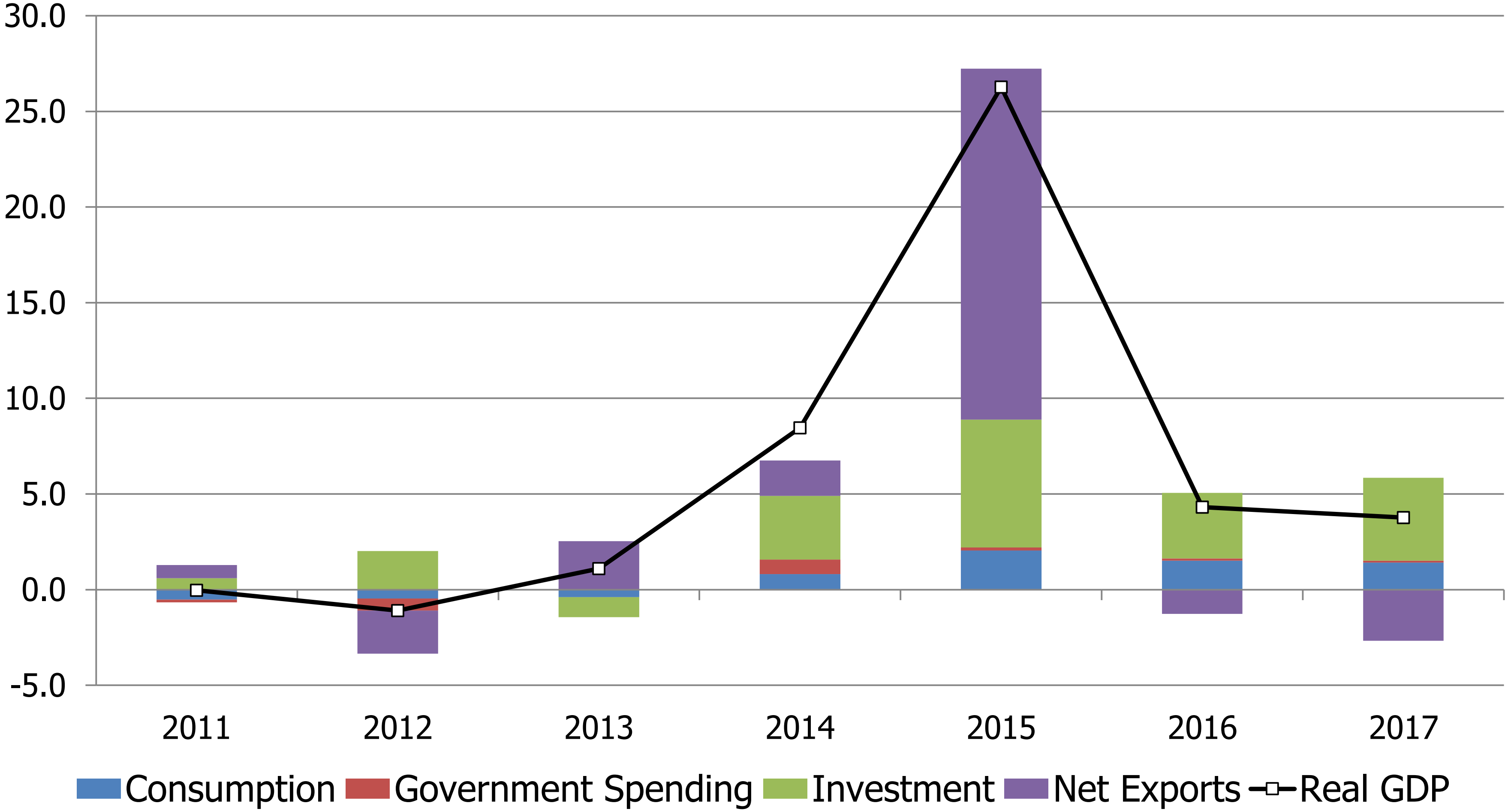
- Growth reflected in improving state of the public finances
- 2016: 0.1%, 2017: 0.5%

Irish economy showing strong growth

- Revised National Accounts GDP growth



Domestic demand accounting for growth

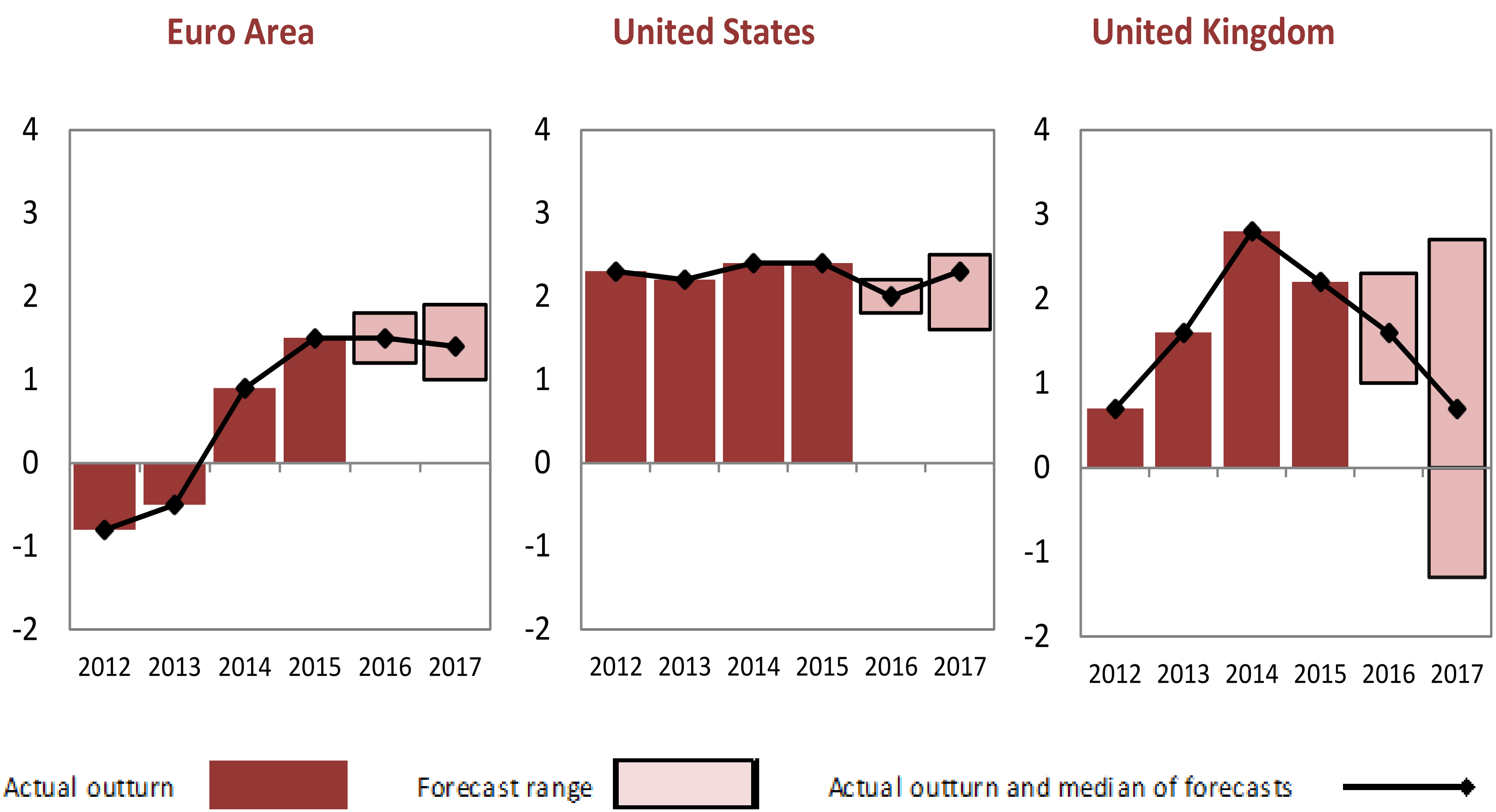


External Environment

- Export growth of 8.3% in 2016.
- ECB maintains accommodative policy.
- Global trade uncertainty.
    - China.
- Brexit result
- Main impact on Trade
    - Currency
    - UK GDP revised down substantially for 2017
    - Lower demand for Irish exports

External Environment

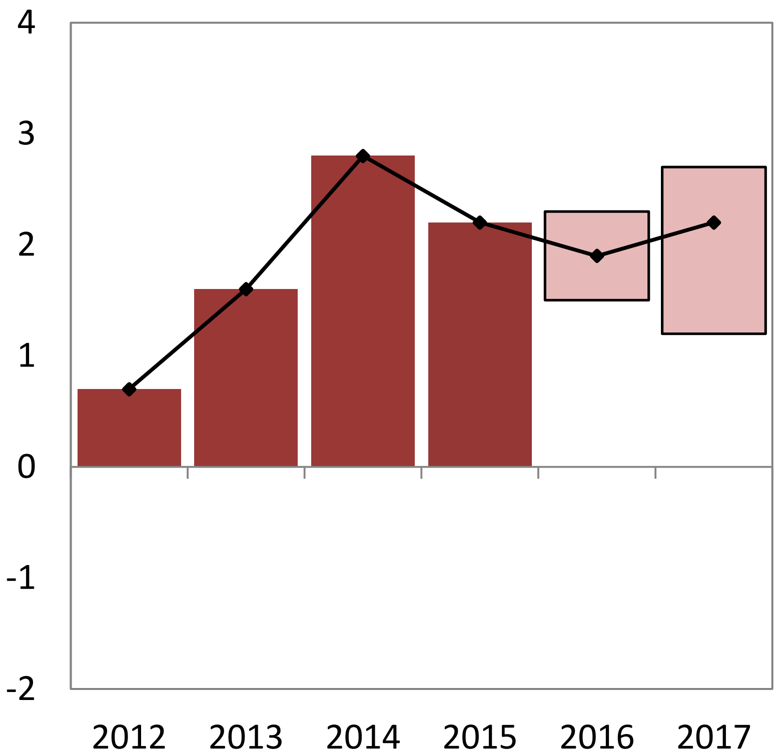
FIGURE 1 **Real GDP Growth (% Change, Year-on-Year)**



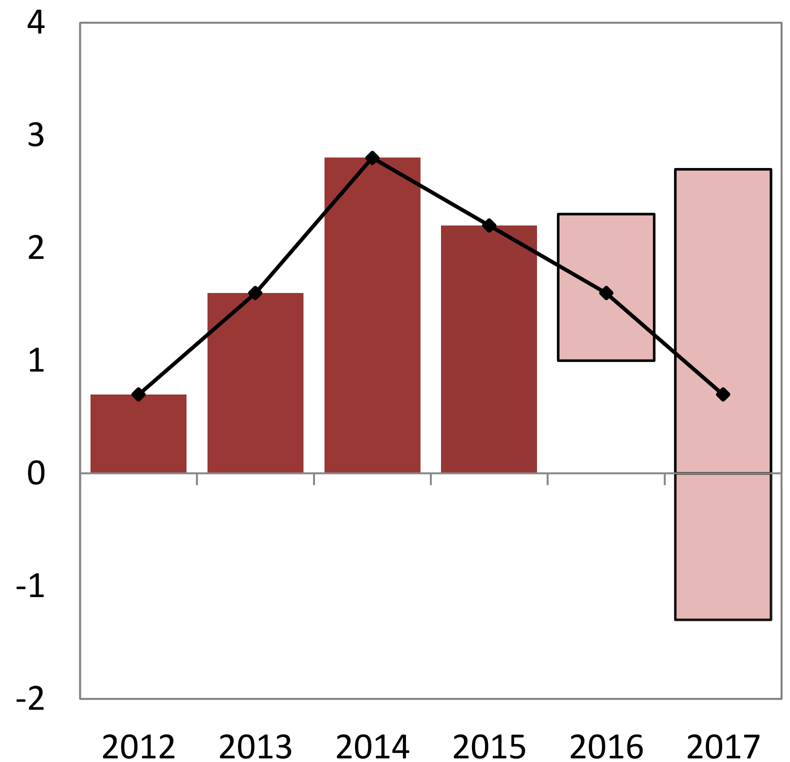
Sources: FocusEconomics, IMF, OECD, HM Treasury and Federal Reserve.

UK GDP forecasts increased uncertainty

Pre Brexit GDP forecast



Post Brexit GDP forecast



Irish National Accounts I

- 2015 GDP growth revised to 26.3 per cent
  - Contract manufacturing
  - Intangible asset transfers.

- Important for accounts to reflect
  - What is going on in real economy

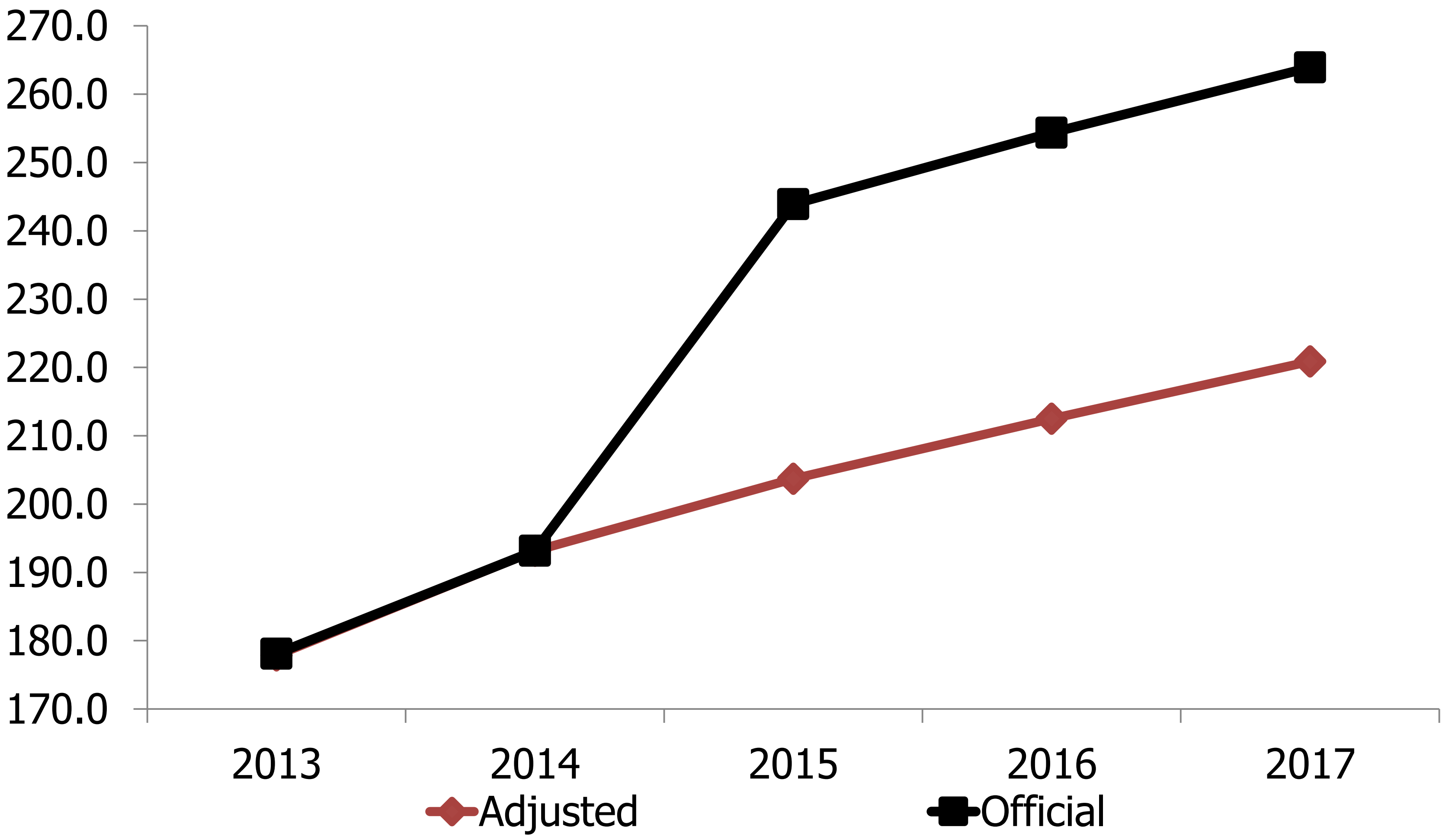
- Our approach - adjusted Output method
  - Model based estimates,
  - Depreciation, Manufacturing output and
  - Net Factor Flows

Irish National Accounts II

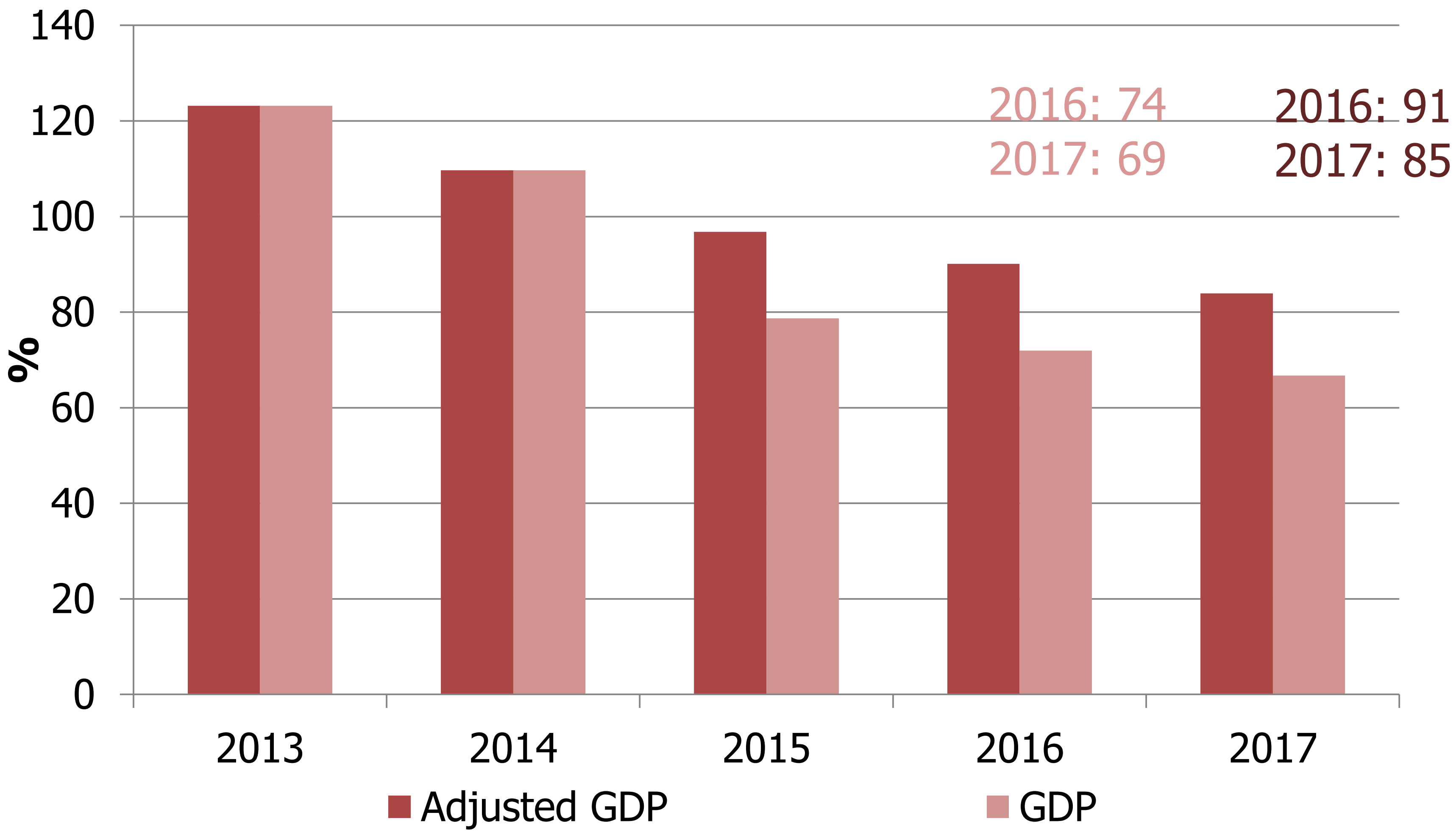
- Adjusted GDP 5.5 per cent in 2015.

- Implications for
  - Debt to GDP
  - Potential GDP
  - Budgetary Stance

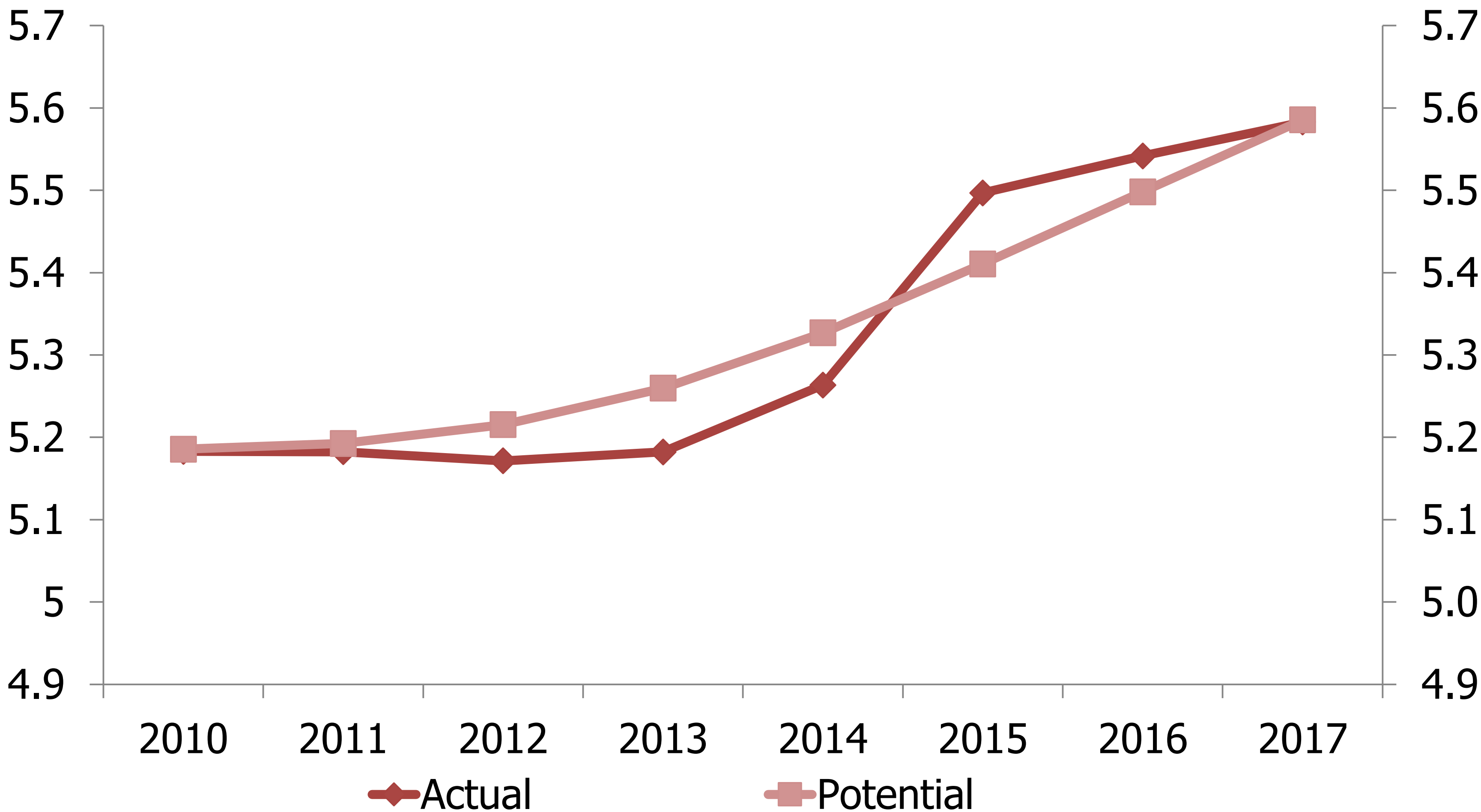
Alternate GDP scenarios



Alternative debt to GDP



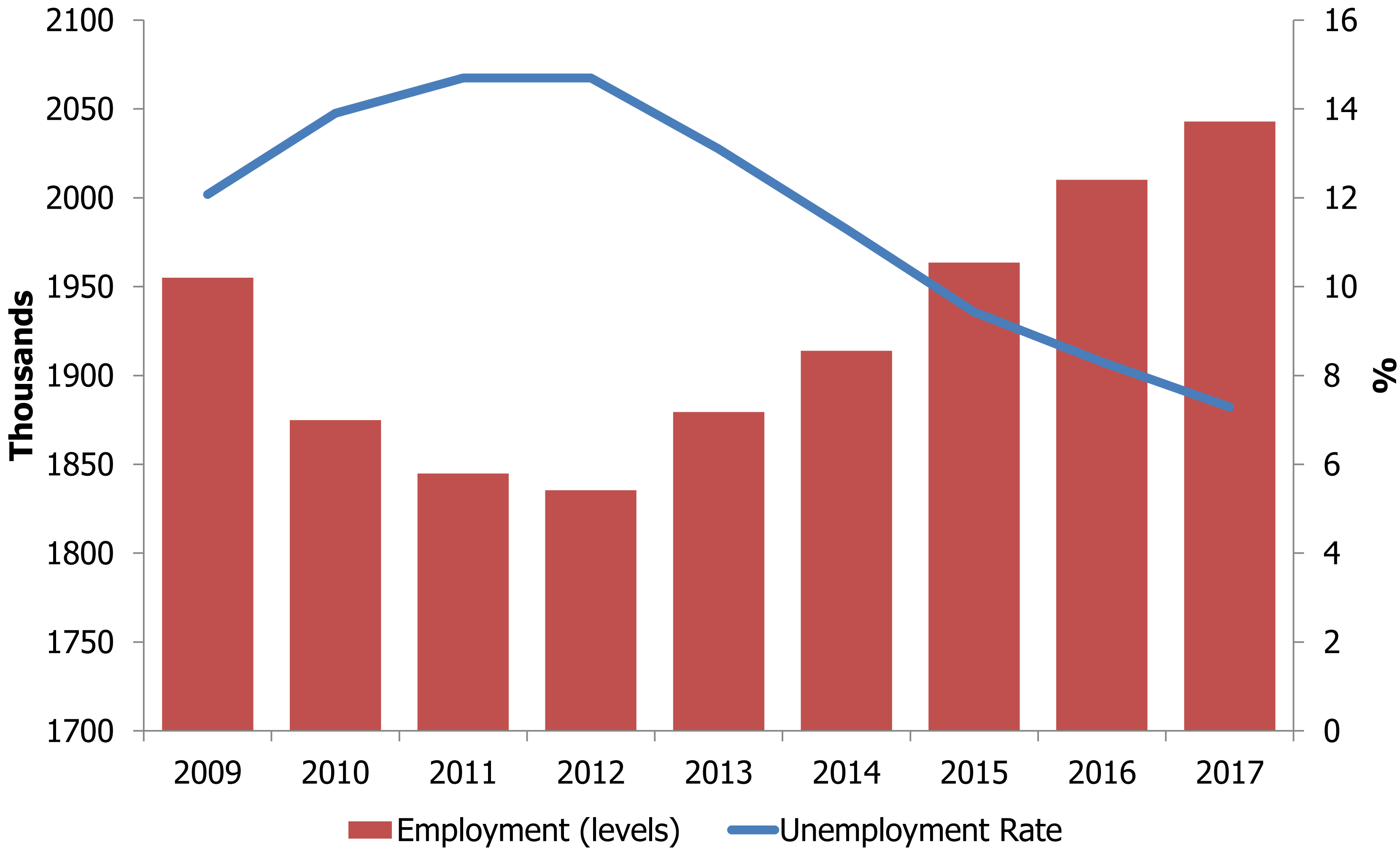
Potential GDP and implications



Implications for fiscal policy

- Between 2013 and 2016
  - Potential output growth averages over 7 per cent
- However, actual growth rate in 2015 of 26 per cent
- Suggests the Irish economy significantly above trend.
- Government would need to
  - introduce an intensely contractionary budget
  - to prevent the economy from further overheating.

Labour market



Forecast Summary

Real Annual Growth %	2014	2015	2016	2017
Consumption	1.7	4.5	4.2	4.0
Govt. Expenditure	5.4	1.2	1.0	1.0
Investment	18.2	32.7	16.2	18.6
Exports	14.4	34.4	8.3	7.6
Imports	15.3	21.7	12.1	11.9
Gross Domestic Product (GDP)	8.5	26.3	4.3	3.8
Gross National Product (GNP)	9.2	18.7	4.1	3.5

Assessment of the Public Finances

- Strong tax receipts in 2015, continuing in 2016
  - Corporation Tax, Income Tax growth
- General Government deficit/surplus
  - 0.1 in 2016
  - 0.5 in 2017
- Broadly in balance this year and further surplus in 2017.

Public Finances – Policy Implications

- Subject to indexation
- Budgetary policy should be neutral
- Economy does not need to be further stimulated
- In particular domestic consumption quite strong
- Need to maintain
  - Income tax as a sizeable source of Government revenue
- Uncertainty about corporation tax returns
- Any increase in expenditure
  - Increase the productive capacity of the economy

Now Brexit……..

Areas covered in our scoping study

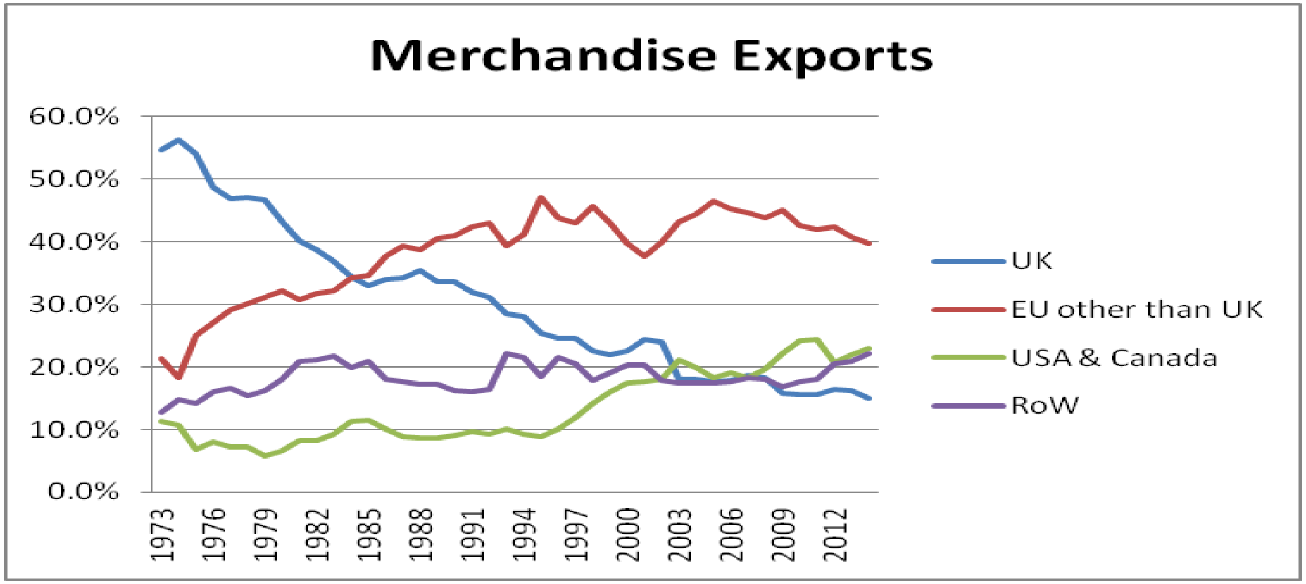
- Political economy
- Economic areas:
  - Trade
  - FDI
  - Energy
  - Migration
- Conclusions on what are the big issues

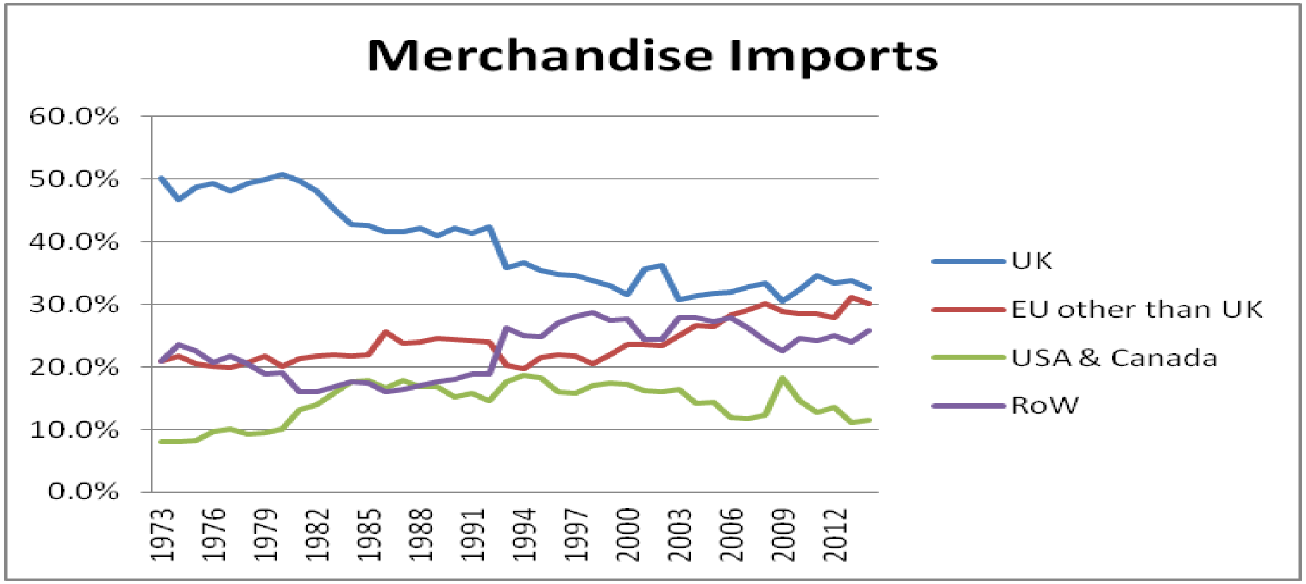
Some key points

- Don’t assume that post-Brexit the UK will be part of the EEA
- When people talk about trade they tend to focus on exports but imports will matter too
- On exports, Irish-owned firms will be most affected
- On FDI, Ireland’s interest is served by increased FDI into the UK, economic growth there and increased demand for our exports
- Any diversion of FDI to Ireland will be small
- FDI diversion effect likely to be bigger for financial services but this will bring positives and negatives
- With respect to energy, implications largely via the single electricity market and potentially disruptive
- On migration, don’t assume the continuation of the common travel area

TRADE

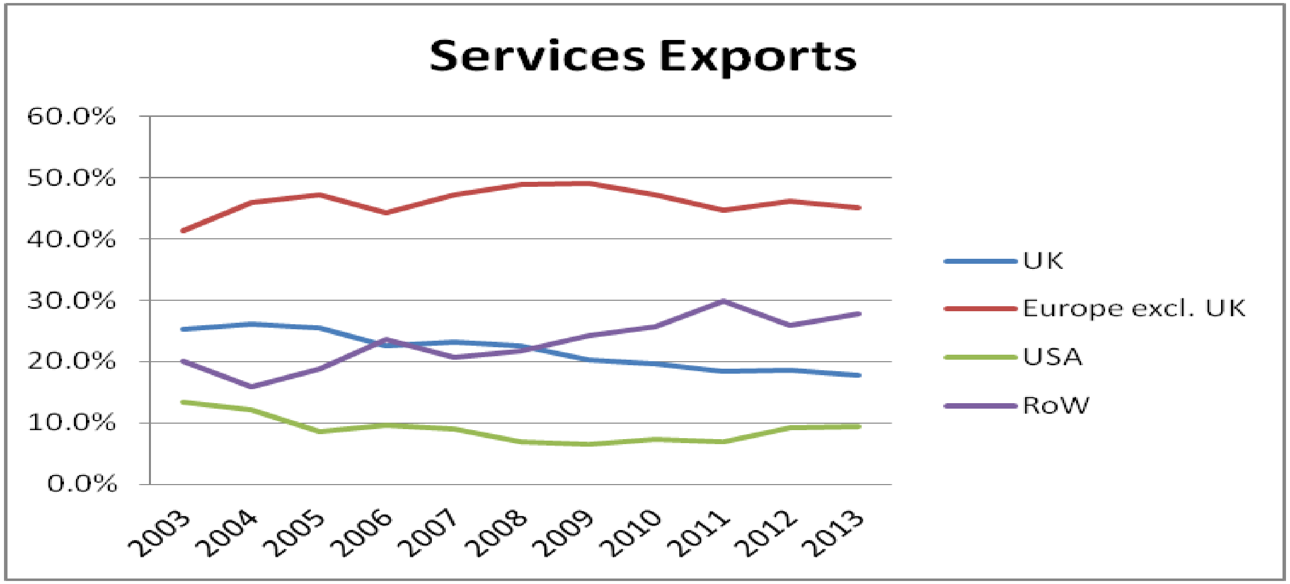
Trade Shares - Merchandise

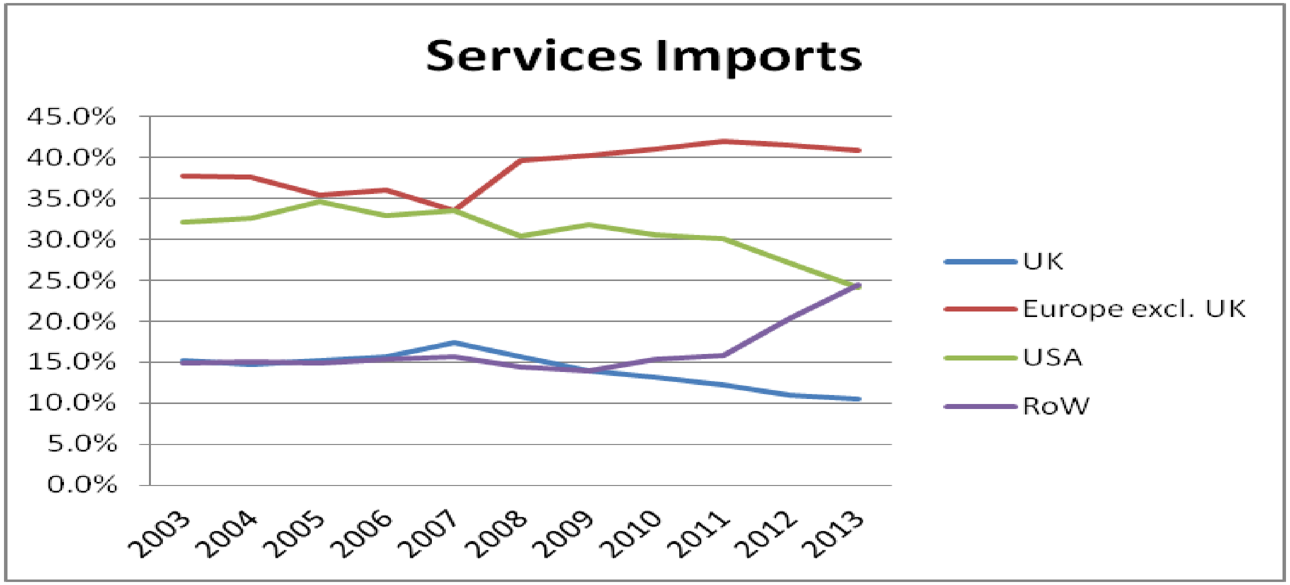




UK shares declining but still large – about 15% of merchandise exports and 30% of imports

Trade Shares - Services



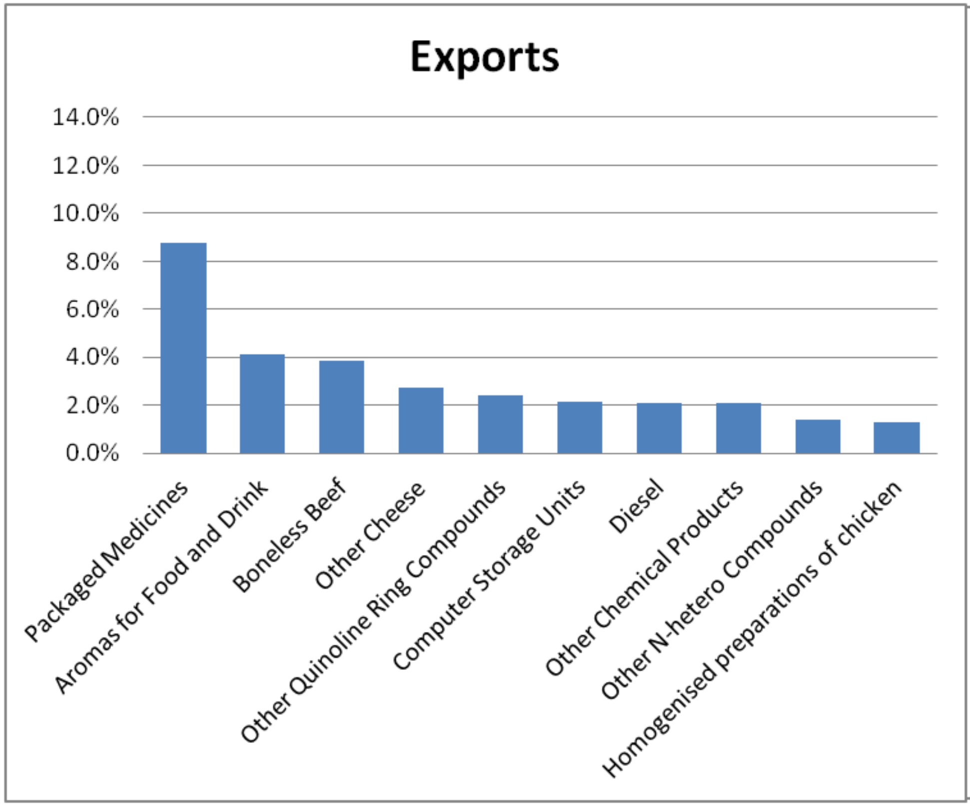


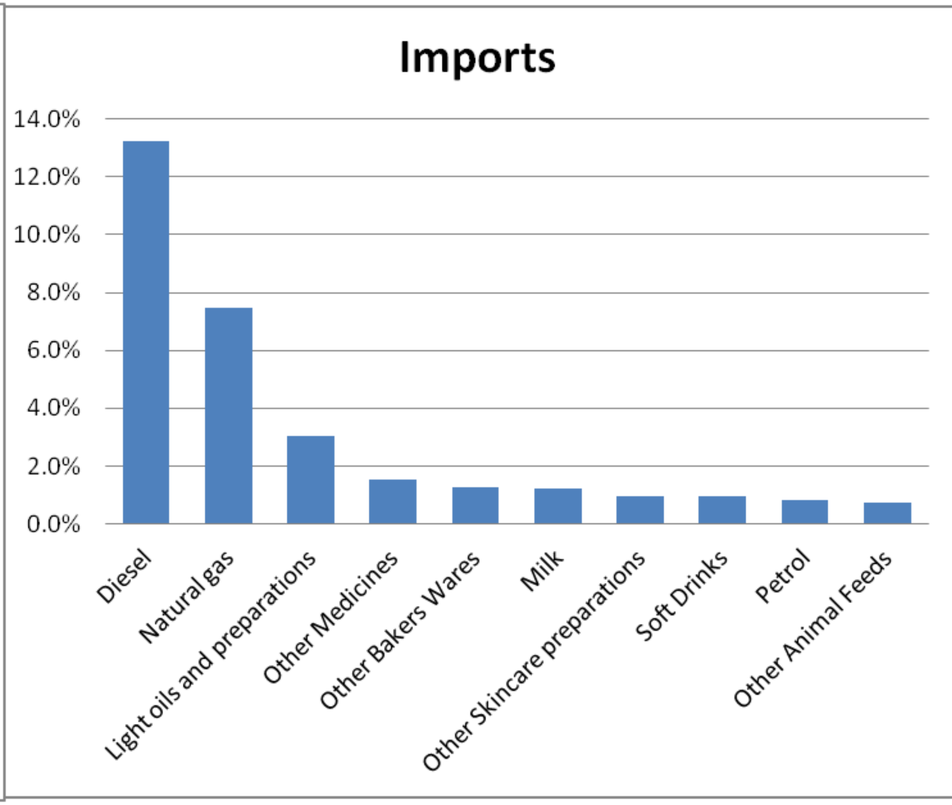
UK shares not declining at the same pace as merchandise trade – currently just under 20% of services exports and just over 10% of services imports

Possible Brexit effects

- Morgenroth (2015) attempts to quantify the effects of Brexit on trade
- Basic idea is to use estimates of the trade-enhancing effect of the EU and then to ask what happens if the process reverses
- If the UK left the EU but maintained a preferential trade agreement, Irish merchandise exports to the UK could fall by 21.6%
- This would equal 3.2% of total merchandise exports

But aggregate effects miss some important details....

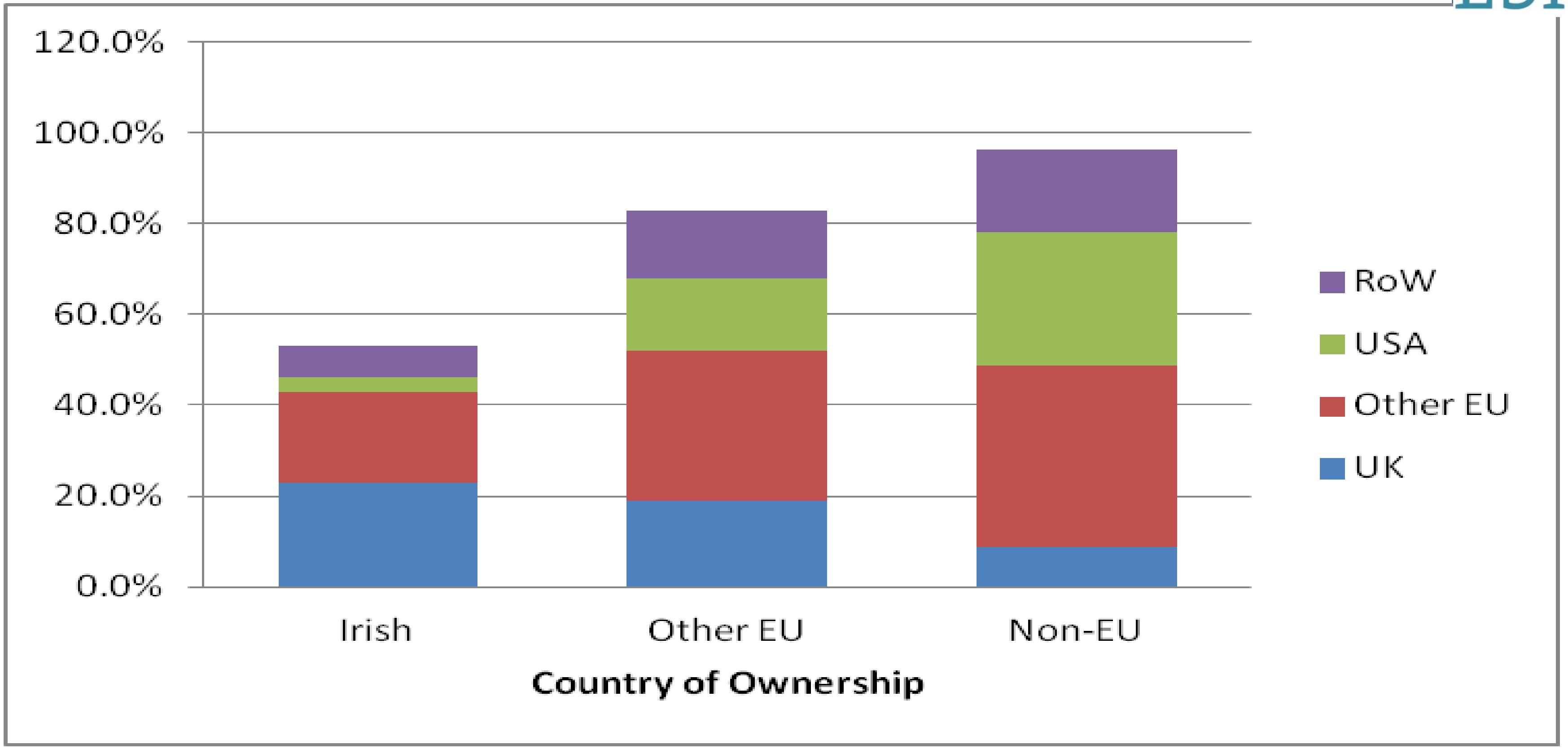




Source: UN COMTRADE database

Exports and imports are heavily concentrated in a limited range of products – for example, the top 10 products out of 3200 account for 31% of exports

Export Shares by Country of Ownership (Industrial Products, 2012)



Irish industrial firms export just 53% of their output of which 43.5% is exported to the U
In contrast, foreign owned firms export more (91% for non-EU owned companies), but a smaller proportion to the UK (11%).

Imports

- Shown above that over 30% of merchandise imports come from the UK
- Many Irish retailers are UK-based and supply chains are highly-integrated
- Emergence of customs posts would impose costs, apart from any possible tariffs
- These would have price effects and hence impacts on real standards of living

FDI

Patterns of the UK's Inward FDI

- The UK's inward FDI stock is the largest in Europe, and the second in the world after the US (UNCTAD, 2015)
- Evidence suggests that EU membership has been a key factor in attracting FDI to the UK from outside as well as inside the EU.
- The main holders of FDI stock in the UK are: the US (29%); the Netherlands (15%); France (8%); Germany (7%) - the EU accounts for 50% of the UK's inward FDI stock; Ireland's share: 1.5%
- The UK's inward FDI stock is highly concentrated in financial services (45%); other important sectors are mining and quarrying (9%) and ICT (8%)

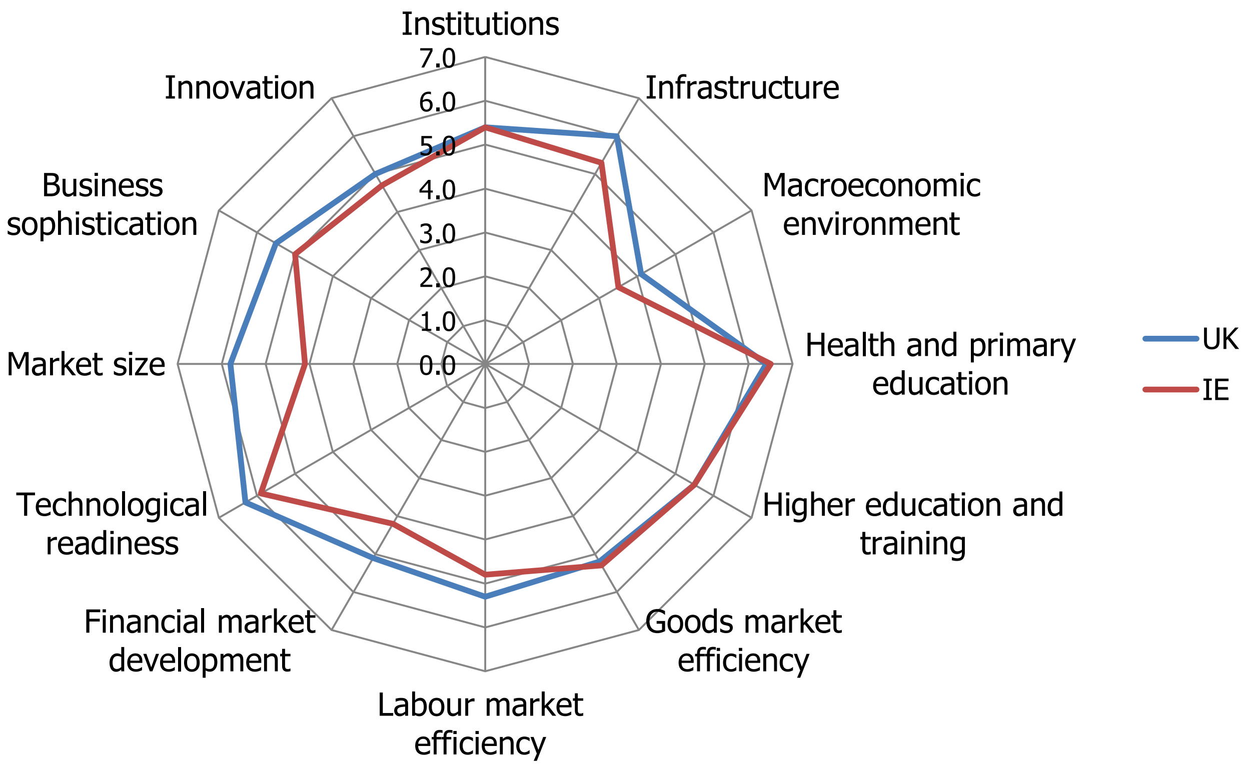
The UK outside the EU: Both negative and positive effects

- The UK would be less attractive to FDI due to uncertainty and loss of market access to the EU – lower output and productivity growth in the UK is likely to impact negatively on economic growth in Ireland
- Ireland may attract additional FDI– but positive effects on Ireland are likely to be small
- **Important note:** financial services the most mobile sector
- Quantifying the FDI effects – see next slide

Corporate taxation and FDI: Possible BREXIT scenarios

Policy change in the UK	Location probability of new FDI projects in the UK (%) 2005-2014	Location probability of new FDI projects in Ireland(%) 2005-2014	Change in the UK's location probability of new FDI projects	Change in Ireland's location probability of new FDI projects
Corporate tax rate: 18%	12.7	4.0	5.7	-0.2
Corporate tax rate: 12.5%	12.7	4.0	9.7	-0.4
EU Single Market access lower by 25%	12.7	4.0	-5.6	0.2
EU Single Market access lower by 50%	12.7	4.0	-9.8	0.4
Corporate tax rate at 18% and EU Single Market access lower by 25%	12.7	4.0	-2.0	0.1

Indicators of FDI Attractiveness: The UK and Ireland



Source: Based on The Executive Opinion Survey, the World Economic Forum, *Global Competitiveness Report 2014-2015*.

ENERGY

Electricity Market

- Since 2007 we have a single all-Ireland electricity market that works well.
- Desirable that Ireland becomes part of an EU electricity market, with or without Brexit
- If the UK remains in the EU as part of a developing EU market, this would help us attain this goal
- If the UK leaves we would need to consider expensive electricity interconnection to the EU
- Hence, if Brexit occurs Ireland would face a dilemma – very expensive direct connection to the EU or further integration in the GB market

Environmental Policy

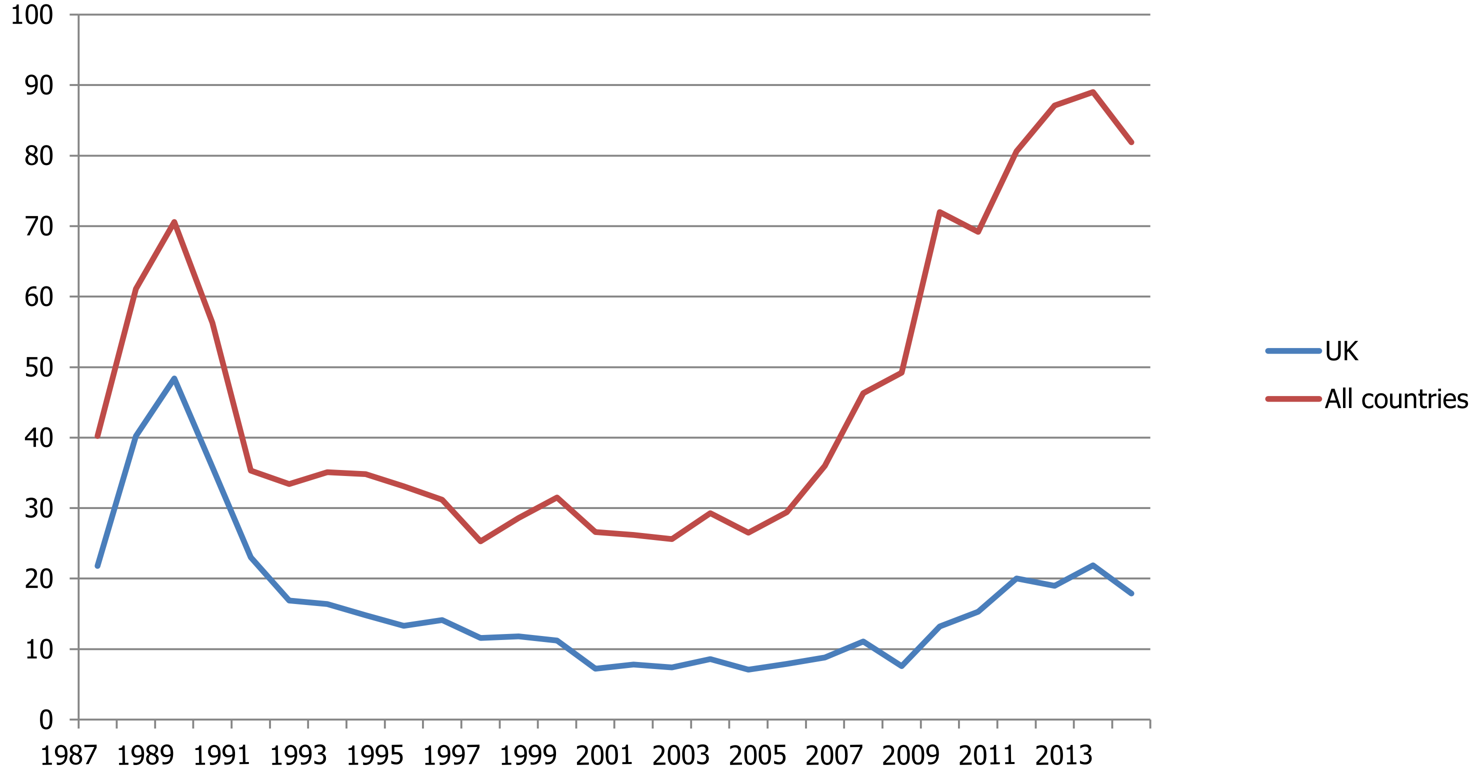
- Currently, like the UK, we are part of the EU emissions trading scheme and share EU renewables obligations.
- If the UK pursued a different environmental policy outside the EU it could be very disruptive
- Because of all-island electricity market, UK environmental policy could have significant effects disruptive on Irish markets
- For example, if the UK raised its carbon price this would raise the price of electricity in Ireland
- If it lowered its carbon price, this could lower prices with implications for Irish producers

MIGRATION

Two issues

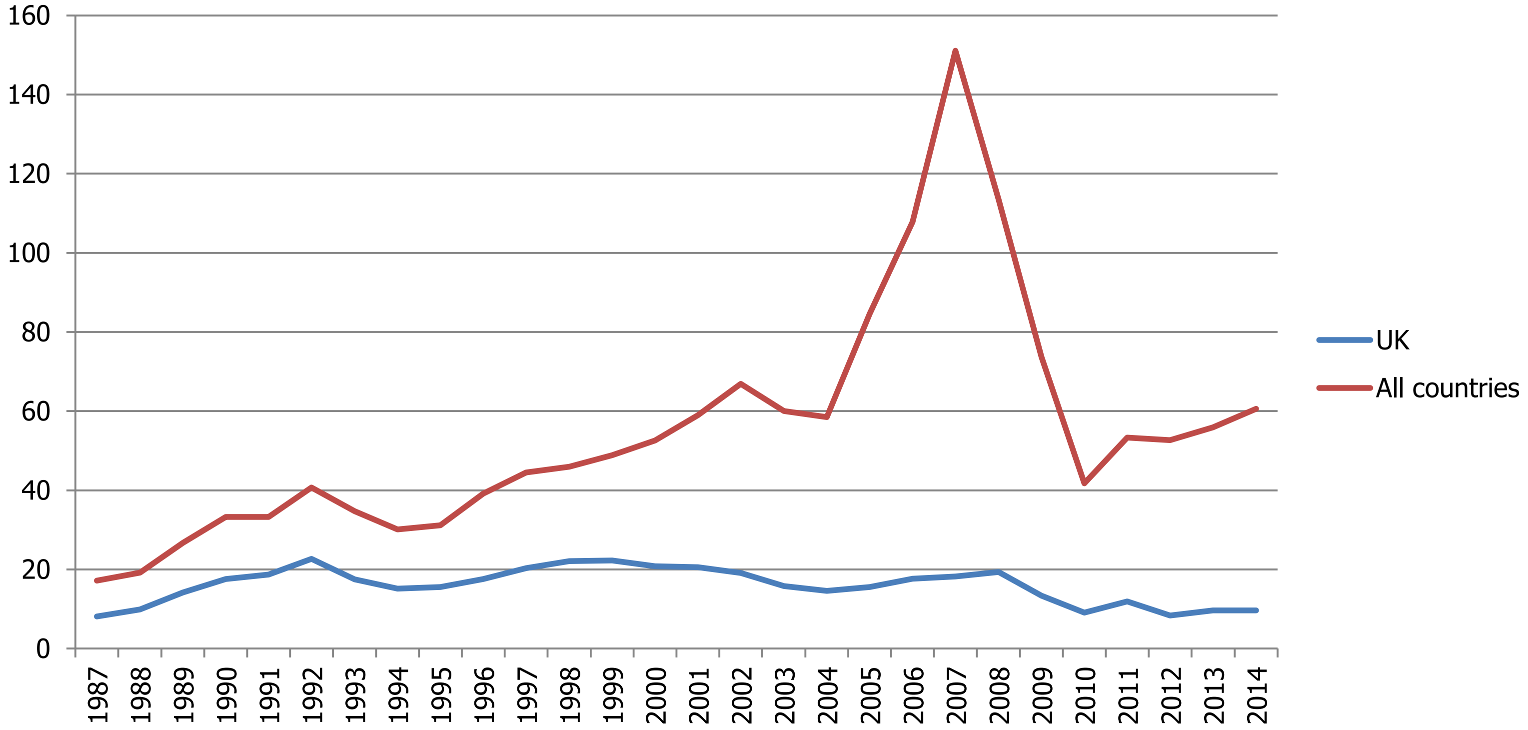
- Free movement in terms of no border controls
  - The Common Travel Area; Schengen
- Free movement of labour
  - Would Brexit prevent emigration that would otherwise happen?
  - Would Brexit result in a displacement of migrants from the UK to Ireland?

Emigration in 1,000s



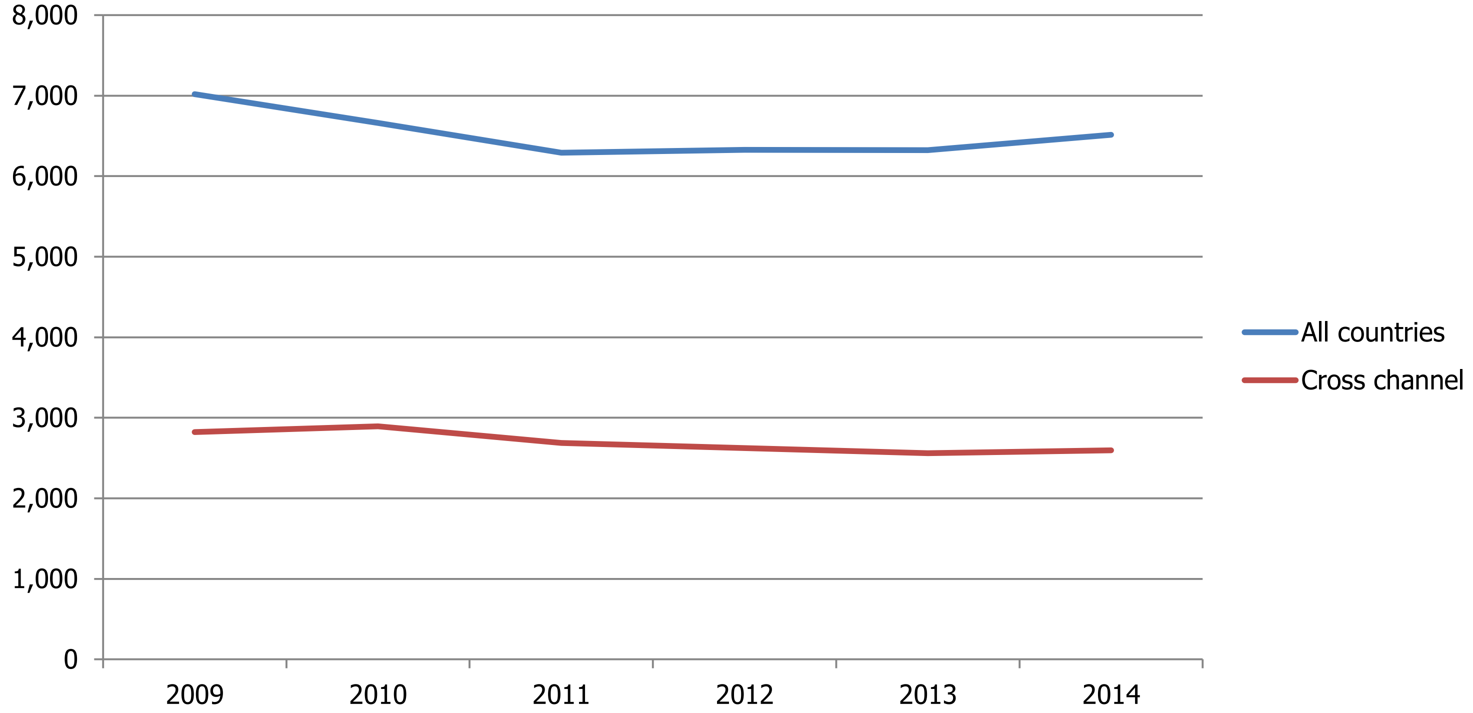
55% in 1987; 22% in 2014

Immigration in 1,000s



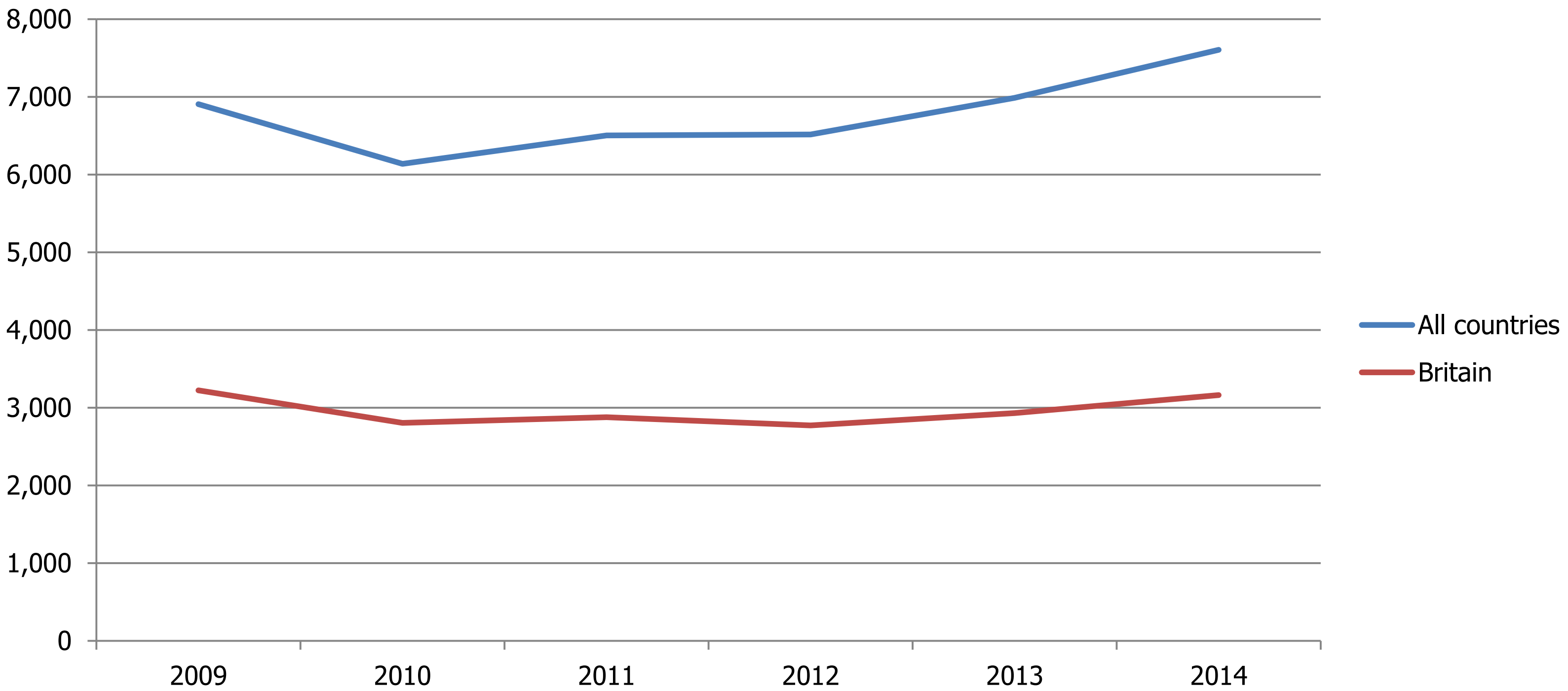
47% in 1987; 16% in 2014

Overseas trips by Irish residents in 1,000s



In 2014, 40% of overseas trips were cross channel

Overseas trips to Ireland by non-residents, in 1,000's



42% in 2014

Simulating migration impacts – 60,000 extra migrants (circa 20% of UK net inflow in 2014)

	Low-skilled unemployment adjusts	Low-skilled wages adjust
	% Change	
GNP per head	0.9	0.8
GNP per worker	0.8	0.8
GNP	3.0	2.8
Total Employment	2.2	2.0
Average wage	-3.9	-3.7
High-skilled	-5.0	-4.8
Low-skilled	0.0	0.8
	As % of labour force:	
Unemployment rate	-0.4	0.0
Low-skilled unemployment rate	-1.0	0.0

Brexit: An over-arching view via HERMES

- Broadly, foreign demand is proxied in HERMES as GDP in the UK, USA, Euro Area and OECD.
- The UK is the main driver of demand in the traditional manufacturing and food sectors.
- The impact of a 1 per cent reduction in the level of UK output would lead to GDP being around 0.3 per cent lower than the baseline scenario over the medium-term
- Note: this does not capture the Brexit effects on other EU countries and the indirect effect on Ireland
- Some studies estimate that UK GDP could be 3% lower

Conclusions

- Our sense is that trade is the big issue and so important to understand UK/Ireland trade links
- Concentration issues are important – by ownership and product type
- An example of a policy issues: can strategies be put in place to ensure that Irish-owned exporters to the UK are assisted in finding new markets?
- Similarly, can we identify which types of foreign-owned firms export to the UK?

Thanks you!