

Fiscal Priorities for Long-run Growth

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Dr. Tom McDonnell
NERI (Nevin Economic Research Institute)
Dublin
Tom.mcdonnell@nerinstitute.net



Research for new economic policies

Technical progress and economic change

- The stories of economic growth and human history are the stories of technological change and changing beliefs and ideas.
 - New ideas and technologies are the fodder for economic growth
- Solow (1956, 1957) and Swan (1957) - diminishing returns to capital and labour make it impossible to sustain economic growth in the absence of productivity improvements.
- Arrow (1962, 1991) learning by doing raises the marginal productivity of capital over time - *while the cost of acquiring knowledge is independent of the scale on which the knowledge is eventually used, the benefit obtained from the knowledge very much depends on the scale at which it is eventually used.*
- The cost of knowledge (its creation and diffusion) is the main determinant of the rate of technological change (Rosenberg, 1974).
 - Romer (1990) describes how ***'influencing the cost of finding new ideas'*** is the key to economic growth.
 - Technology diffusion (National System of Innovation, proximity to people, network analysis)

Modern growth theory

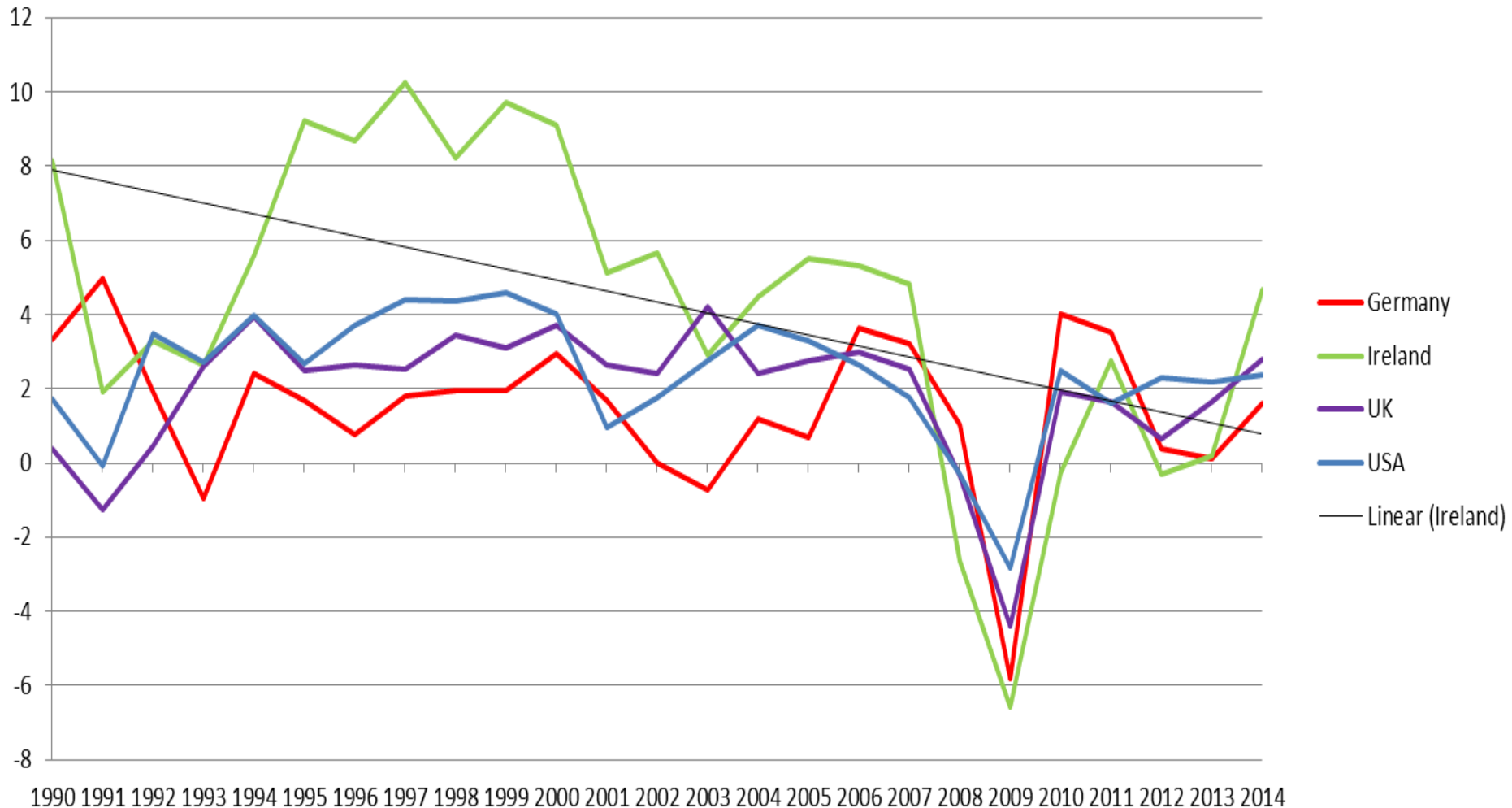
- The **new growth models** treat technological change as endogenous
 - The growth process is seen as driven by the purposive accumulation of human and physical capital together with the production of new knowledge, often created through R&D activities, and the diffusion of that knowledge.
 - The inability of knowledge producers to internalise all of the benefits of investing in R&D, as well as the uncertainty of production, reduces the incentive to undertake such activity.
- The **evolutionary models** argue that economic change occurs as part of a historically grounded path-dependent process
 - Innovation is blind. Individuals and organisations with bounded rationality will learn and search experimentally in uncertain and permanently changing environments and with uncertain outcomes
- **Complexity models** describe economic change occurring through the exploitation of increasing returns from new and useful innovations.
 - Complex adaptive system with emergent properties. Optimal outcomes cannot be guaranteed while new possibilities are continuously emerging as part of a dynamic process within the system
- The **neo Schumpeterian models** retain many elements of the new growth framework yet combines the evolutionary perspective of technological change as a path-dependent process with an understanding of the economy as a complex system.
 - Competition between innovations, rather than competition between firms, is seen as the central force propelling economic growth. The process of economic upheaval and change is seen as perpetual.
 - Create gales of destruction. Transformative technologies generate periods of radical change.

Real GDP Growth, 1990-2014

Four country 25 year unweighted average = 2.5%

(Ireland = 4.3%; unweighted Western Europe/North America/Oceania = 2.2%)

Source: The Conference Board (May 2015)

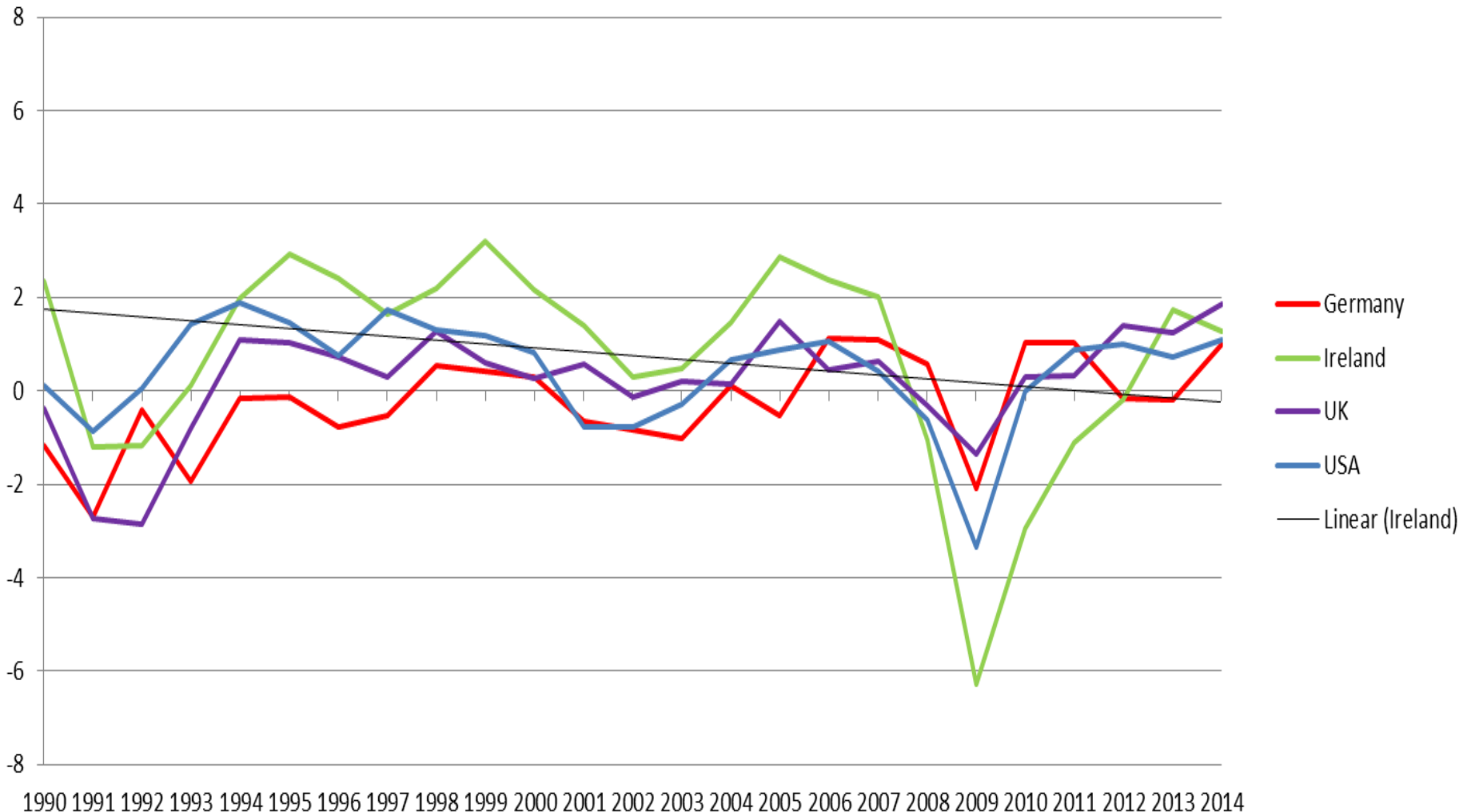


Labour Quantity, 1990-2014

Contribution to GDP growth

Four country 25 year unweighted average = 0.3 percentage points

(Ireland = 0.8; unweighted Western Europe/North America/Oceania = 0.4)

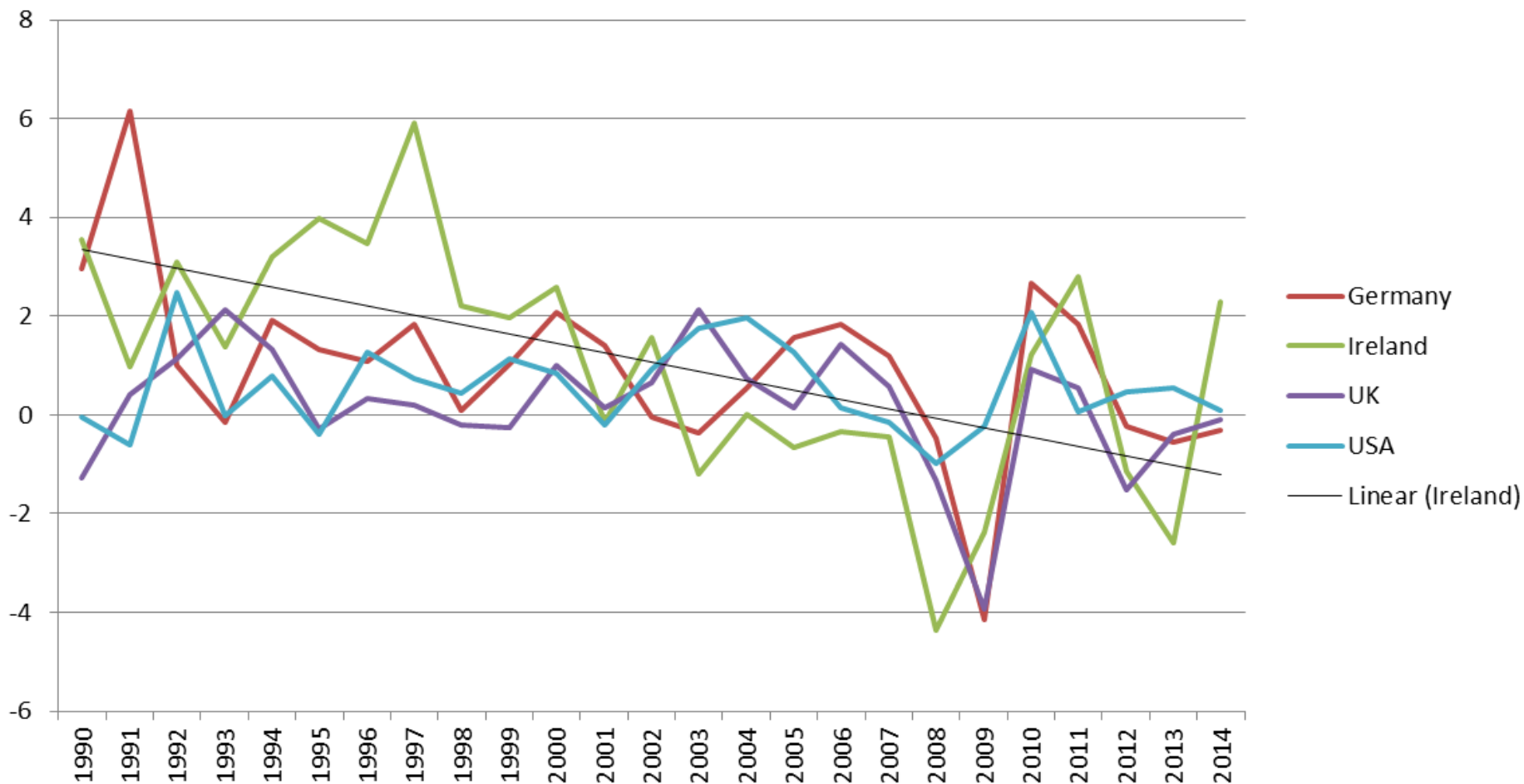


Total Factor Productivity, 1990 – 2014

Contribution to GDP growth (Source: The Conference Board)

Four country 25 year unweighted average = 0.7 percentage points

(Ireland = 1.1; unweighted Western Europe/North America/Oceania = 0.2)



Growth Accounting: 1990-2014

Average annual GDP growth and average annual factor contributions

Source: Conference Board, Total Economy Database (May 2015)

	GDP Growth	Labour Quantity	Labour Quality	Capital ICT	Capital Non-ICT	TFP	Labour prod.
Ireland	4.3	0.8	0.3	0.8	1.4	1.1	3.5
UK	1.9	0.2	0.4	0.6	0.6	0.2	1.7
Germany	1.5	-0.2	0.1	0.4	0.3	1.0	1.7
France	1.5	0.1	0.3	0.3	0.7	0.1	1.4
Italy	0.7	0.0	0.1	0.2	0.4	-0.1	0.7
Spain	2.1	0.7	0.4	0.4	1.2	-0.5	1.4
Switzer.	1.6	0.5	0.1	0.6	0.3	0.2	1.1
USA	2.4	0.4	0.2	0.6	0.6	0.6	2.0
Canada	2.3	0.6	0.3	0.6	0.9	-0.2	1.7
Japan	1.1	-0.4	0.2	0.3	0.6	0.3	1.5
China	8.6	0.4	0.1	0.9	4.7	2.5	8.2
Australia	3.0	0.8	0.2	0.7	1.2	0.0	2.2

Growth Accounting: 2000-2014

Average annual GDP growth and average annual factor contributions

Source: Conference Board, Total Economy Database (May 2015)

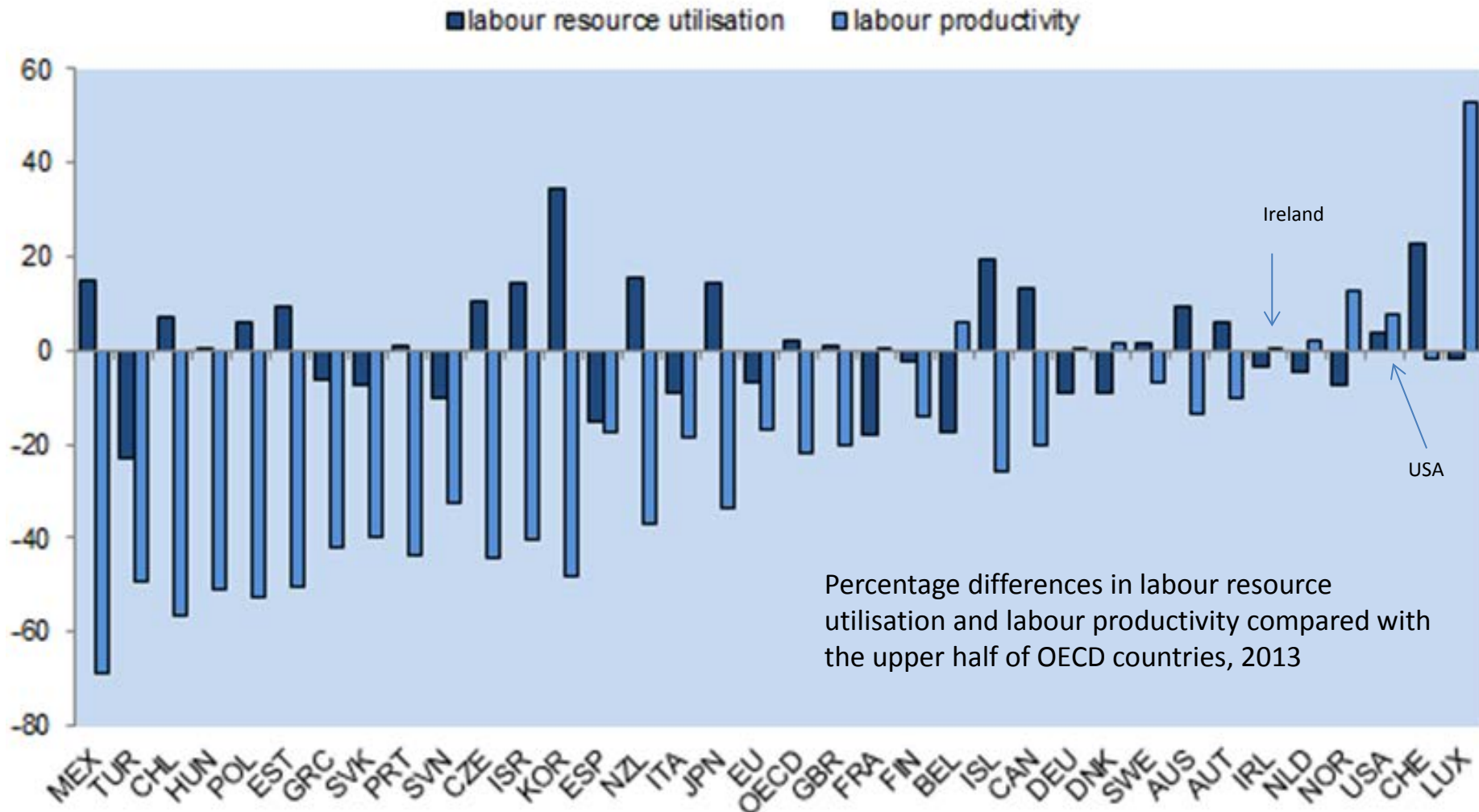
	GDP Growth	Labour Quantity	Labour Quality	Capital ICT	Capital Non-ICT	TFP	Labour prod.
Ireland	2.7	0.3	0.3	0.8	1.6	-0.2	2.4
UK	1.8	0.5	0.2	0.5	0.6	0.1	1.3
Germany	1.2	0.1	0.1	0.4	0.2	0.5	1.1
France	1.3	0.1	0.2	0.2	0.7	0.0	1.2
Italy	0.2	0.0	0.1	0.2	0.4	-0.5	0.2
Spain	1.6	0.4	0.4	0.4	1.1	-0.7	1.2
Switzer.	1.9	0.6	0.1	0.5	0.3	0.5	1.3
USA	1.9	0.1	0.2	0.5	0.5	0.6	1.8
Canada	2.2	0.7	0.2	0.6	0.9	-0.2	1.5
Japan	0.8	-0.2	0.2	0.3	0.2	0.4	1.0
China	9.9	0.2	0.1	1.0	5.2	3.4	9.7
Australia	2.9	0.9	0.2	0.8	1.6	-0.6	2.0

Growth prospects

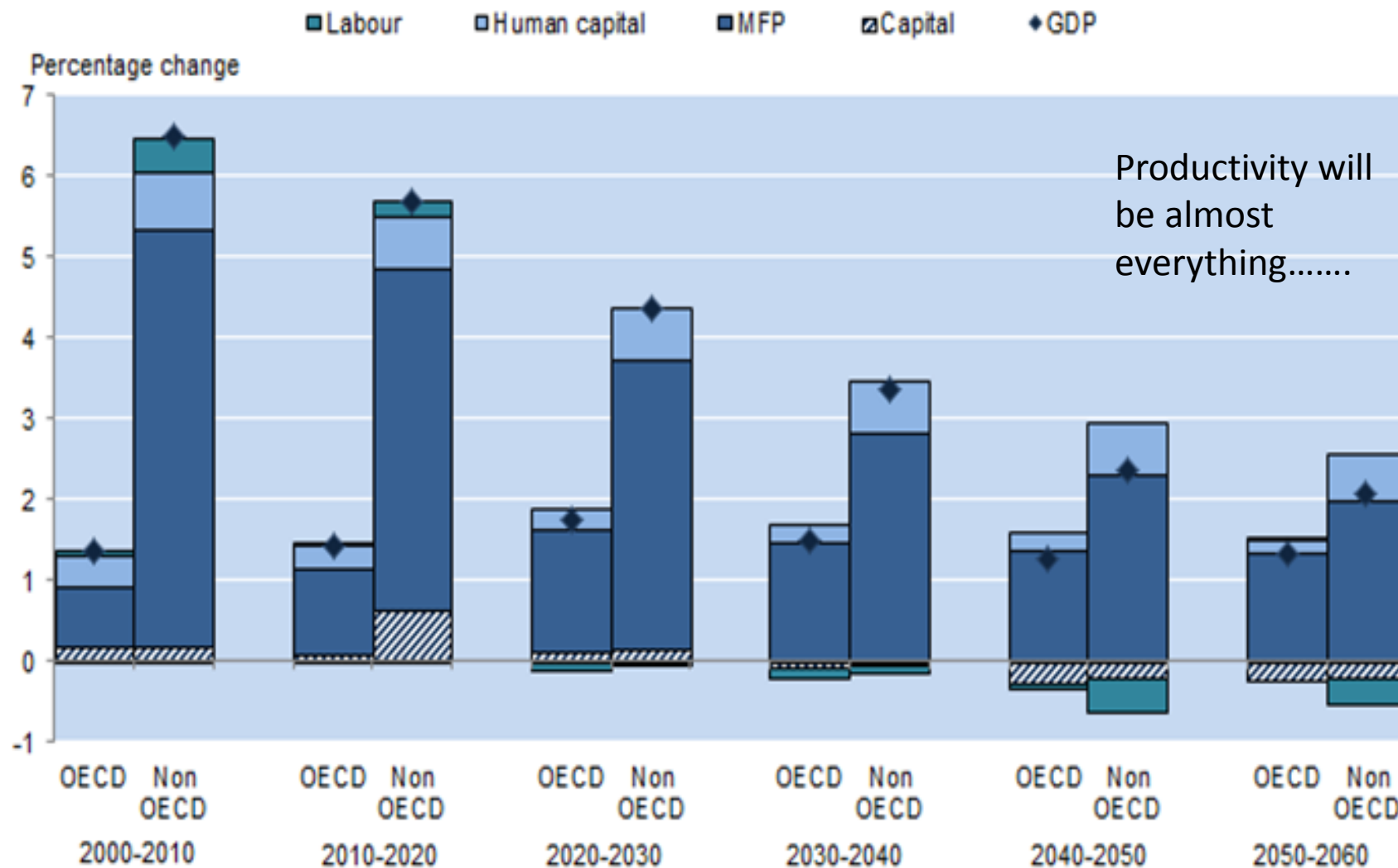
- The investment rate, demographic changes, participation and unemployment rates, and changes in total factor productivity are the key parameters underlying future prospects for the Irish economy.
- Ireland is now a high productivity economy with GDP per worker close to US levels. This suggests that opportunities for catch-up productivity gains may be lower in the future.
- The OECD (2013) projects a 3% real GDP growth rate through 2030 predicated on employment growth of 1.3% and **labour productivity growth of 1.7%**
 - Projection for productivity growth may be too pessimistic – Ireland may have more scope for ‘structural reforms’ as labour productivity measured in GDP terms is almost certainly overestimated (transfer pricing, GDP/GNP gap)
- There are a range of estimates for future TFP:
 - Byrne, Duffy and McQuinn (2015) assume TFP converges to a steady-state of 1.8% by 2020
 - McQuinn and Whelan (2015) assume TFP growth of just 0.2% consistent with their estimates for TFP’s contribution to output growth in the Euro area between 2000 and 2013.
 - TFP growth of 1% per annum seems reasonable.....

Differences in income per capita mostly reflect labour productivity gaps

Source: OECD 2015, Going for Growth Database




OECD forecasts for contribution to growth in GDP per capita; 2000-2060 (annual average)



Dept. of Finance Projections for potential GDP growth (Source: DOF, October 2015)

Table 11: Cyclical developments

<i>As % of GDP unless otherwise stated</i>	2015	2016	2017	2018	2019	2020	2021
1. Real GDP growth (%)	6.2	4.3	3.5	3.2	3.1	3.0	2.9
2. General government balance	-2.1	-1.2	-0.5	0.2	1.0	1.8	2.5
3. Interest expenditure	3.2	3.0	2.9	2.8	2.6	2.5	2.3
4. One-off and temporary measures	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
5. Potential GDP growth	3.4	4.1	4.3	3.8	3.3	3.2	3.5
<i>Contributions to potential GDP growth</i>							
Labour	1.2	1.7	1.9	1.5	1.0	0.8	1.1
Capital	0.8	1.0	1.2	1.2	1.3	1.3	1.3
 Total factor productivity	1.4	1.3	1.2	1.1	1.0	1.0	1.0
6. Output gap (% pot GDP)	2.3	2.5	1.6	1.0	0.8	0.6	0.0
7. Cyclical budgetary component	1.2	1.3	0.9	0.6	0.4	0.3	0.0
Structural budget balance(2-4-7)	-3.2	-2.5	-1.4	-0.3	0.6	1.5	2.5
<i>annual improvement in SBB</i>	0.2	0.8	1.1	1.1	0.9	0.9	1.1
Structural primary balance (2+3-4-7)	0.0	0.5	1.5	2.4	3.2	4.0	4.8

Growth Potential

- Ireland's growth potential depends on the economy's ability to generate productivity gains year-on-year.
 - Productivity growth in Ireland has been on a downward trend for over 20 years.
- The paper argues that the best way to sustain growth in productivity over the long-term is to
 - (A) invest in education and skills,
 - (B) in productivity enhancing infrastructure, and
 - (C) in the production and diffusion of new ideas and technologies.
- Underlying all of this is the need for a supportive institutional environment.

Policies for Productivity Growth

(A) Labour quality/Education and Skills

Labour productivity increases as learning and experience increase.

Human capital not only enhances labour productivity but is also a necessary input for innovation and technology adoption.

Strong education systems are empirically associated with increases in the long-run rate of per capita economic growth (OECD contends half of the growth achieved by OECD countries since WWII has been driven by progress in education).

COFOG (Eurostat 2015)

Education spending, % GDP, 2013

Ireland 4.1%

Ireland Hybrid 4.4%

EU 5.0%

UK 5.5%

- 1 *Increase teacher autonomy and accountability and reduce classroom sizes*
- 2 *Increase education budget for early years learning*
- 3 *Use fiscal policy to reduce economic inequality (income and wealth) and promote social and economic inclusion*
- 4 *Protect childcare, family and housing supports and healthcare services at sufficient levels to avert child poverty*
- 5 *Mismatch - Annually review the efficacy of activation programmes and training schemes and reallocate resources to well-performing programmes and schemes*

Human Capital

- Human capital represents the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity
 - a critical input for growth because it enhances labour productivity and is a necessary input for innovation, technical progress and technology adoption
 - not just about schooling. The child's home environment determines much of the early development in cognitive and non-cognitive skills.
 - The early years are the most important for development, and external factors, like poverty, can have extremely damaging and lasting effects on human capital. It is for this reason that family supports and in-kind public health services are positively associated with long-run growth.
 - human capital development is a life-long process and training programmes providing market-relevant skills may generate economy-wide employment gains under conditions of skill shortages or mismatches
- Children possess powerful learning abilities in their early years and Heckman (2000) argues that investing in learning in early childhood brings greater returns than at any other stage in life.

Policies for Productivity Growth

(B) Innovative capacity

R&D and innovation are key determinants of competitiveness, productivity and economic growth. Innovative capacity is itself a function of education levels, government policies that support R&D, and the quality of capital markets, among other things.

Combined government and higher education expenditure on R&D in Ireland was 0.4% of GDP in 2012 compared to 0.7% for the EU and the US.

Eurostat (2015)

R&D expenditure, % GDP, 2012

Ireland 1.6%

Ireland Hybrid 1.7%

EU 2.0%

UK 1.6%

USA 2.8%

Germany 2.9%

- 1 Increase spending on basic and applied research as % of GDP as well as on seed funding for high potential start-ups
- 2 Incentivise (subsidise) take-up of science, technology, engineering and mathematics courses at undergraduate and postgraduate levels
- 3 Reform the patent system to promote innovation and the use of new technologies (shorten, weaken, use-it-or-lose-it)
- 4 Establish a state investment bank to raise affordable funding for innovating enterprise
- 5 Provide grants to SMEs for adoption of new technology
- 6 Increase support for horizontal linkages between the state, higher level institutes and enterprise
- 7 Reform bankruptcy law to not overly penalise failure
- 8 Address market failures in the provision of high speed broadband access

Innovative capacity

- An economy's 'Innovative capacity' is its ability to generate original ideas and communicate and assimilate existing innovations.
 - Innovative capacity is itself a function of education levels, the quality of capital markets and government policies that support R&D.
- **Policymakers can incentivise the production and diffusion of innovations** through measures to increase the productivity of R&D and other knowledge production activities. This can be achieved by reducing the cost of innovation inputs (subsidies/tax breaks) or by improving the quality and efficiency of those inputs.
 - One way to increase the productivity of knowledge production is to invest in human capital. This is because human capital is a complement to the production and exploitation of ideas
 - A second way to increase the productivity of knowledge production is for governments to support and invest in those technologies which themselves reduce the cost of knowledge search and the diffusion of useful ideas (e.g. broadband)
- Mazzucato (2013) argues that Germany's competitiveness strategy has been driven by its ability to build a strong innovation system, with patient long-term finance (e.g. KfW), strong science industry links (Fraunhofer institutes) and above average R&D/GDP spending.

Policies for Productivity Growth

(C) Infrastructure

Efficient investment in infrastructure is strongly related to long-run increases in the economy's productive capacity.

Increased investment in public infrastructure raises output in the short-term because of demand effects and in the long term as a result of supply effects.

Not all investments are equally productive. Certain types of investment contribute to knowledge based growth (schools, broadband) and are therefore particularly beneficial in the long-run.

Eurostat (2015)

GFCF, % GDP, 2014

Ireland 1.9%

Ireland Hybrid 2.0%

EU 2.9%

UK 2.8%

- 1 Spend more on independently evaluated public infrastructure projects (circa 3% to 4% of GDP)
- 2 Establish an infrastructure bank to facilitate the provision of stable, long-term finance for infrastructure and to engage in counter cyclical investment
- 3 Establish an expert group to independently evaluate infrastructure needs and co-ordinate ex ante and ex post evaluation of specific projects

Investment in infrastructure

- Investment in infrastructure is strongly related to long-run increases in the economy's productive capacity (OECD, 2015).
 - Meta-analysis of 68 studies by Bom and Ligthart (2014) concludes public capital investment has positive long run effects on output.
 - IMF (2014) argue that increased investment in public infrastructure raises output in the short-term because of demand effects and in the long term as a result of supply effects.
 - Net benefits (multipliers) are particularly high during periods of economic slack, in a liquidity trap environment, where the cost of borrowing is low, and where investment efficiency is high.
 - WEF (2014) places Ireland just 36th in the world in terms of the overall quality of infrastructure
- The net benefit hinges on the efficiency of the investment process and public capital investment carries risks (e.g. electoral/political interference).
 - Arguments for an independently run Strategic Investment Bank – ‘optimal public investment ratio?’
 - Model has worked well elsewhere (e.g. Germany's KfW)
- Can private investment do the job?
 - Ireland has historically had low rates of productive investment for a number of reasons and Irish banks have a poor record in providing capital for productive investment
 - Capital was systematically misallocated in the 2000s
 - Ireland ranks just 61st in the world for financial market development and 117th for ease of access to loans (WEF, 2014)
- **Strategic Investment Bank could act counter cyclically with the investment/GNP rate**

Policies for Productivity Growth

(D) Efficiency of use of Capital and Labour

Productivity and technological progress are not the same things.

Scale economies and improvements in the efficiency of use of capital and labour use also contribute to productivity growth.

Lack of competition will lead to inefficiencies in the absence of robust regulatory measures.

In general, subsidies and tax breaks negatively affect growth by distorting allocative efficiency, by creating inefficiencies in production and consumption, and by diverting economic activity toward rent-seeking behaviour.

Jerzmanowski (2007)

Estimates that 69 per cent of cross country variation in output per worker was attributable to TFP in 1995.

26 per cent of the variation came from technology differences

while 43 per cent of the variation came from differences in efficiency of use.

- 1 Phase out the system of tax expenditures (simplify the tax code) and ensure horizontal equity of tax treatment across all asset classes to the greatest extent possible (though see below)
- 2 Phase out most subsidies for home ownership, business and agriculture
- 3 Ensure independence and enforcement power for all regulators.
- 4 Establish independent regulators with enforcement powers for all professional bodies
- 5 Rebalance the tax system with increased taxes on land, property net wealth, inheritances, passive income and gifts
- 6 Increase financial market development and competition e.g. through genuine banking union

Efficiency of use....

- Cross-country differences in productive and allocative efficiencies may be just as, if not more, important for output per worker than technology differences.

Phase out most subsidies and tax breaks

- Political lobbying and economic rent seeking in the form of requests for subsidies and tax breaks always present a danger to economic development.
- Subsidies for home ownership, business and agriculture are deleterious to long-run growth because they skew economic activity and distort resource allocation (Ford and Suyker, 1990; OECD, 2001).
- Tax expenditures change the incentive structure for households and firms, thus influencing their behaviour.
- In general, tax expenditures negatively affect growth by distorting allocative efficiency, by creating inefficiencies in production and consumption, and by diverting economic activity toward rent-seeking behaviour.

Appropriate regulation and licensing

- A lack of competition will drive a propensity to market failure and allocative and technical inefficiency in the absence of appropriate regulatory measures
- This includes independent regulation of professional bodies (e.g. legal and accounting services) to ensure that non-essential barriers to entry are not being set and to ensure that service providers are not colluding to inflate service costs.

Policies for Labour Quantity Growth

(E) Labour Market Barriers

Output also depends on the level of employment and the average number of hours worked. One way to increase the number of hours worked is to remove barriers to labour market entry.

The cost of childcare is one such barrier and Ireland has very high costs of childcare (as per cent of average wage) compared to other OECD countries.

State subsidised childcare would incentivise the labour force participation of second earners and lone parents. This would increase the effective size and quality of the available workforce while retaining human capital within the workforce.

More generally, employment can be incentivised by gradually tapering down housing and welfare supports along with increases in income, instead of removing these supports completely along with employment.

- 1 Provide substantial state subsidies for childcare
- 2 Gradually taper down housing and welfare supports with increases in income instead of making supports conditional on employment status
- 3 Remove barriers to inward migration and migrants working legally in the economy
- 4 Eliminate and avoid step-effects in the tax and social insurance system

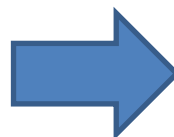
A context of strict fiscal rules.....

(structural balance rule, expenditure benchmark rule, convergence margin)

(Source: DOF, October 2015)

Table A8: Application of Expenditure Benchmark

<i>€ billions unless otherwise stated</i>	2015	2016	2017	2018	2019	2020	2021
1. General government expenditure	73.8	74.1	75.0	76.0	76.9	77.6	78.3
2. Interest expenditure	6.7	6.6	6.7	6.7	6.7	6.7	6.4
3. Government expenditure co-financing EU expenditure	0.4	0.4	0.5	0.5	0.5	0.5	0.6
4. Gross fixed capital formation (t)	4.1	4.2	4.2	4.5	5.1	5.4	5.8
5. Annual average gross fixed capital formation (t -3 to t)	3.7	3.8	4.1	4.3	4.5	4.8	5.2
6. Cyclical unemployment expenditure	-0.3	-0.4	-0.3	-0.3	-0.4	-0.6	-0.4
7. Corrected expenditure aggregate 1-2-3-(4-5)-6	66.5	67.0	67.9	68.8	69.5	70.4	71.1
8. Net discretionary revenue measures (DRM)*		-0.7	0.1	0.5	0.4	0.4	0.4
9. Corrected expenditure aggregate net of DRM 7-8		67.8	67.8	68.3	69.1	70.0	70.7
Reference rate potential growth**		1.9	2.8	3.1	3.3	3.4	3.5
Convergence margin		1.8	2.0	2.1	2.1	2.2	2.2
11. Benchmark growth rate applied (RR-CM)		0.1	0.8	1.0	1.2	3.4	3.5
12. Real expenditure growth rate $100^*(1+14)/100/(1+13)/100)-1$		0.1	0.0	-0.6	-0.7	-0.6	-0.8
13. GDP deflator (%PVGd)		1.7	1.2	1.2	1.2	1.2	1.2
14. Permitted nominal expenditure growth $1+(11/100)*13)-1$		1.8	1.9	2.2	2.4	4.6	4.7
15. Permitted expenditure ceiling $7^*(1+14)-1$		67.7	68.4	69.4	70.4	72.7	73.7
Gross fiscal space available $15t-7t-1$							
Net fiscal space available							
<i>Deviation in year t from benchmark ceiling $7^*(-12+11)$</i>							
<i>Deviation as % GDP (negative indicates breach of benchmark)</i>							



Source: Department of Finance

*Net DRM including carryover of Budget 2015 measures and the net impact of 2016 budgetary package. DRM from 2018 onwards includes indexation of tax bands only. **The 2016 reference rate set as 10-year average potential GDP growth as of Spring 2015 Commission forecasts. From 2017, the reference rate is an annually updated moving average consistent with Budget 2016 harmonised potential output estimates. 2016 GDP deflator taken as average of SPR15 PVGD for 2016 and Budget 2016 estimate for 2016. Convergence margin set to deliver 0.6pp per annum structural adjustment until MTO is met. Benchmark rate applied from 2020 onwards contains no margin as MTO is met in 2019.

Implications for fiscal policy

Any additional resources for infrastructure, education, R&D or childcare will have to be funded from somewhere.

Report of the LSE Growth Commission in the UK (2014) points out that: *‘there is no reliable evidence that the growth potential of an economy is limited by the size of the government over the wide range we see in OECD countries.’*

IMF (2015) estimates that... *redistribution is generally benign in terms of its impact on growth and that the combined direct and indirect effects of redistribution are on average pro-growth.*

Arguments that redistribution is in itself bad for growth appear to have little if any empirical grounding.

- 1 In the long-run, resources for education, R&D, infrastructure and childcare must be funded by taxes and charges or by cuts to other areas of public spending
- 2 Whatever fiscal space there is should be channelled to growth enhancing areas of spending as well as to measures to fight poverty and promote social inclusion
- 3 There is scope for increasing taxes on wealth (inheritances, gifts, net wealth, property, land) for redistributive purposes as well as for more directly growth enhancing policies
- 4 De-emphasise use of market distorting fiscal instruments such as tax expenditures and housing/business/agriculture subsidies

Welfare Outcomes

Balancing Equity and Growth:

Hierarchy of Fiscal Consolidation Instruments (OECD, 2013)

Generic Rank	Instrument	Generic Rank	Instrument	Generic Rank	Instrument
1	Business and other subsidies	4-8	Environmental taxes	13	Public investment
2-3	Pensions	4-8	Unemployment benefits	14-15	Health services (in kind)
2-3	Other property taxes	9-10	Other government consumption	14-15	SSCs
4-8	Recurrent taxes on immovable property	9-10	Sales of goods and services	16	Childcare/family
4-8	Personal income taxes	11-12	Sickness and disability payments	17	Education
4-8	Corporate income taxes	11-12	Consumption taxes (non-environment)	<u>The lower the ranking the more damaging the impact from cutting expenditure or increasing revenue</u>	

Reductions in public pension spending scores highly in the hierarchy of consolidation instruments. However this ranking refers to an increase in the retirement age which keeps productive workers in the labour force and increases output. Reducing the pension rate (payments to individuals) does not score highly from a welfare perspective mainly because such a measure would be highly regressive.

Conclusions

- **Understanding the growth process**
 - Productivity is almost everything....policy can influence productivity e.g. more basic research and stronger university-industry linkages in the case of Ireland (Saia, Andrews and Albrizio, 2015)
 - What are the key processes?
 - What are the available levers?
- We have criticised subsidies and tax expenditures but there are some areas where well-designed subsidies and tax expenditures can be appropriate (context dependent)
 - Good examples include tax breaks for genuine R&D and subsidies for childcare
- Available fiscal space should prioritise education (in particular for early years), innovation and infrastructure
- Other issues:
 - Eliminating credit market imperfections
 - Countercyclical fiscal policy (hysteresis effects on human capital)
 - Technology diffusion
 - Institutions (generalised vs. particularised)
 - Product market efficiency
 - Trade
 - Culture
 - Targeted growth (industrial policy)
 - Ease of market entry and exit
 - Patents (software and business process patents)
 - Enterprise policy
 - Inequality (inclusive growth) and sustainability
 - Energy efficiency
 - Innovation ecosystems