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Productivity in Ireland

Michael Connolly, Yvonne Hayden, Tamsin Greene Barker

Different Productivity Approach's

- Value Added versus EUKLEMS Approach
- Value Added and Gross Output
- Role of Intermediate Inputs
- To date: Value Added Approach
- Going Forward: EUKLEMS Approach

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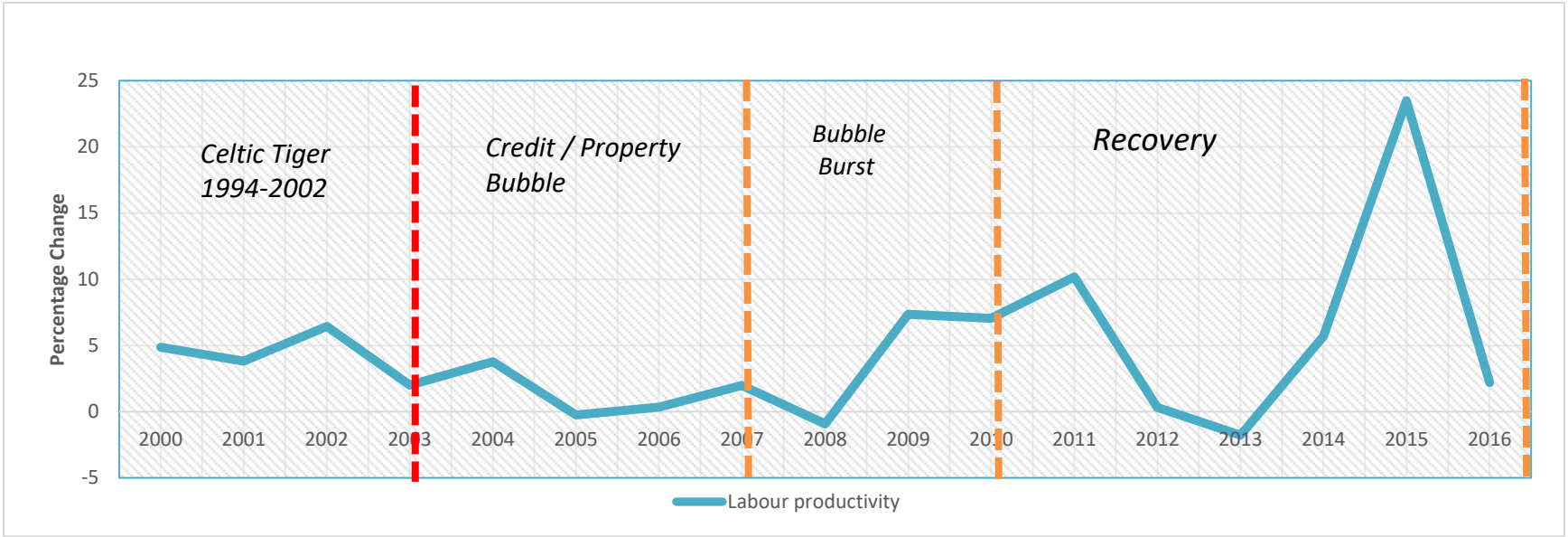
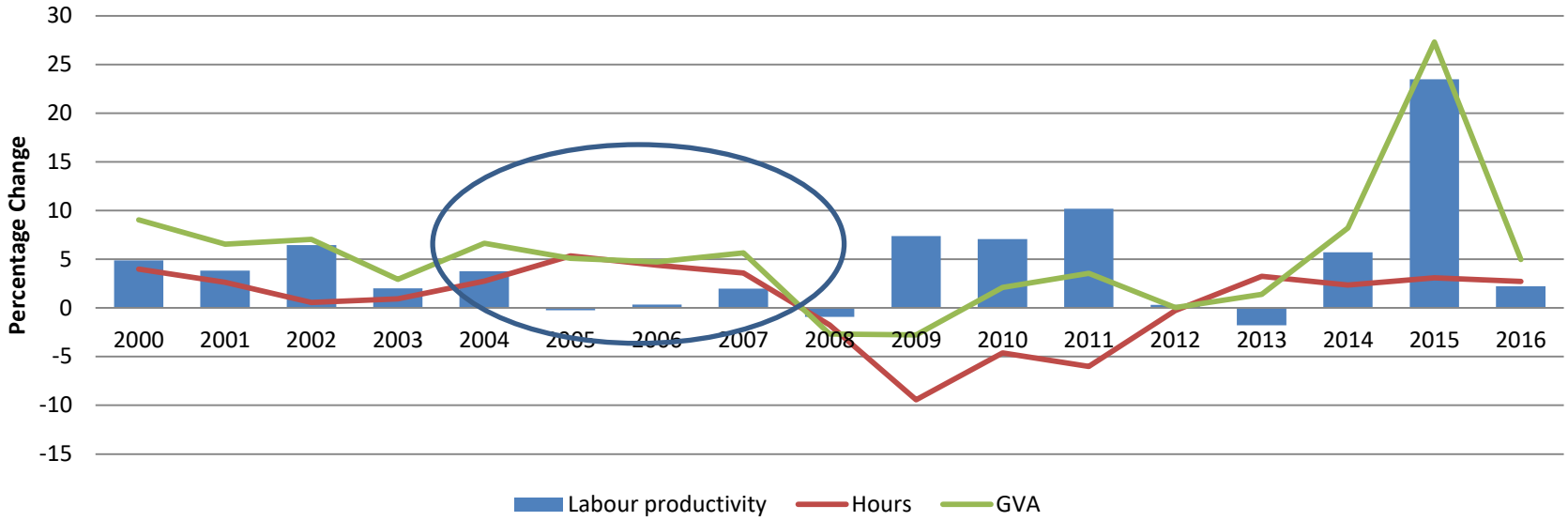
Productivity work to date

Labour Productivity



Labour Productivity Breakdown



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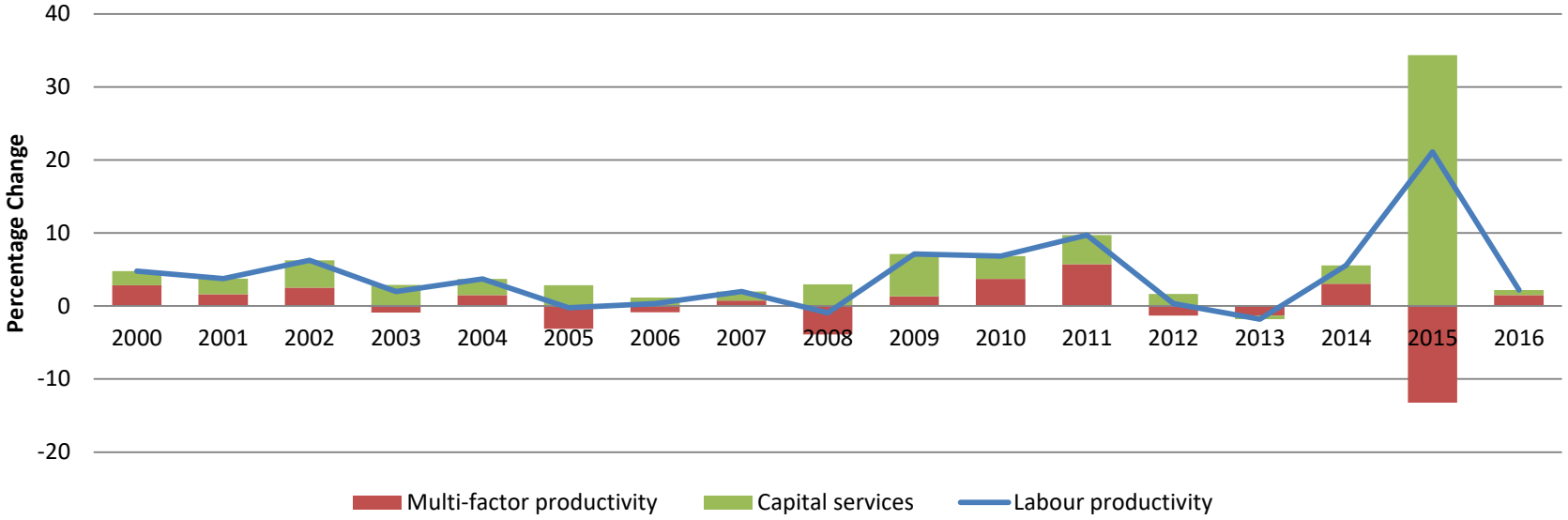
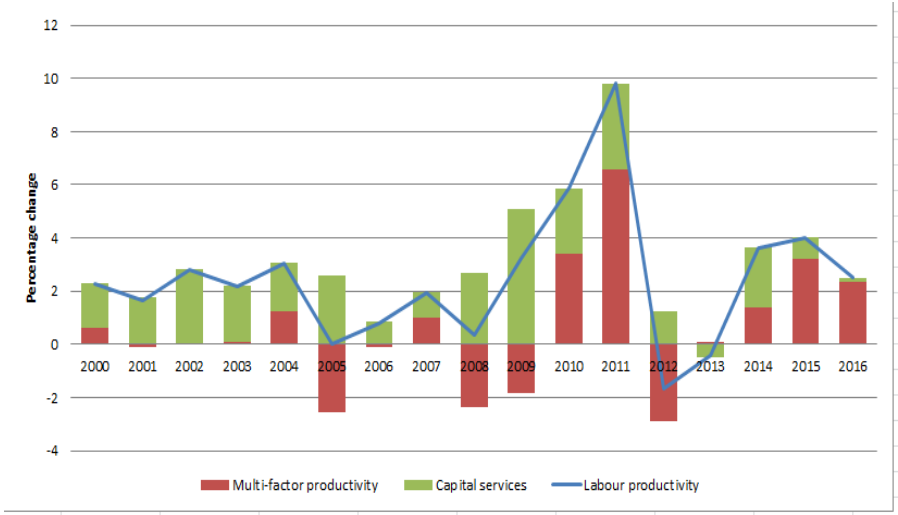
Labour Productivity: Further Analysis

Labour Productivity Breakdown 2

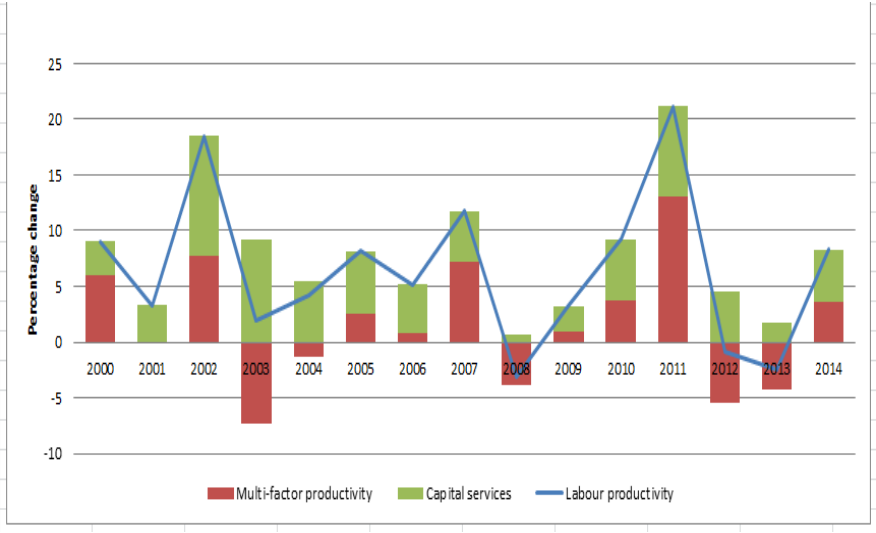


Comparison of Domestic and Other Labour Productivity with Foreign

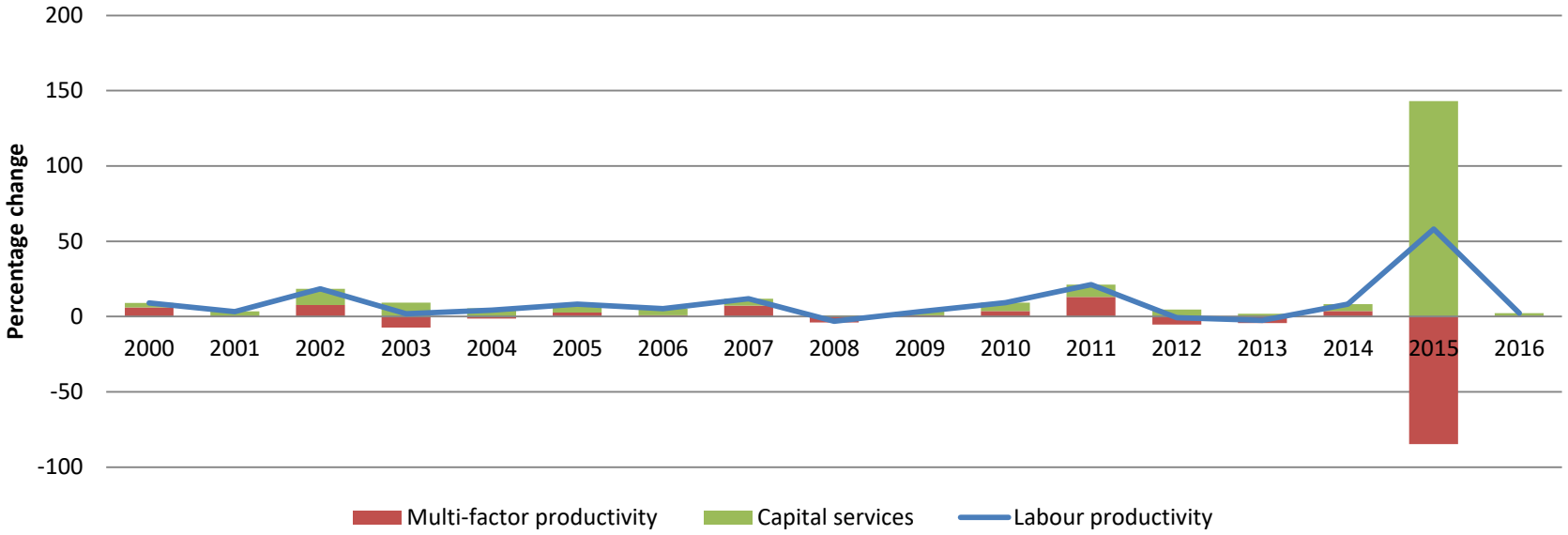
Domestic and Other



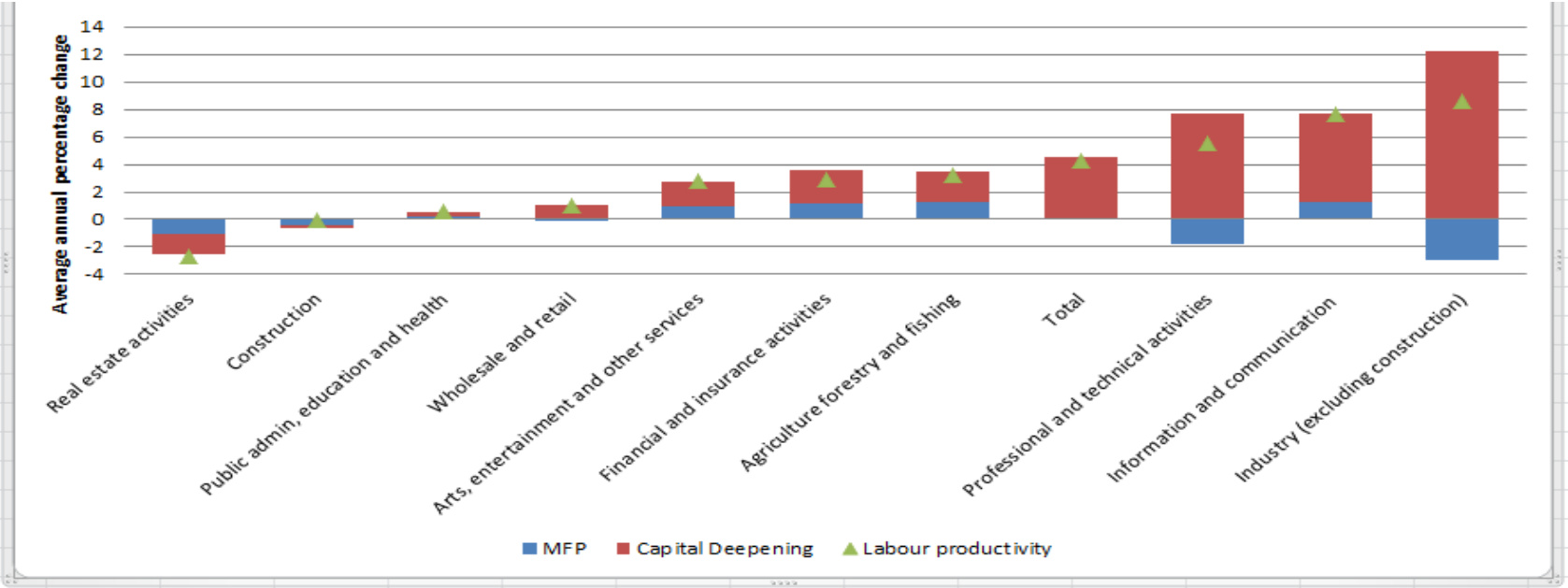
Foreign Dominated to 2014



Foreign Labour Productivity to 2016



Average Annual Labour Productivity Growth by Sector: 2000-2016



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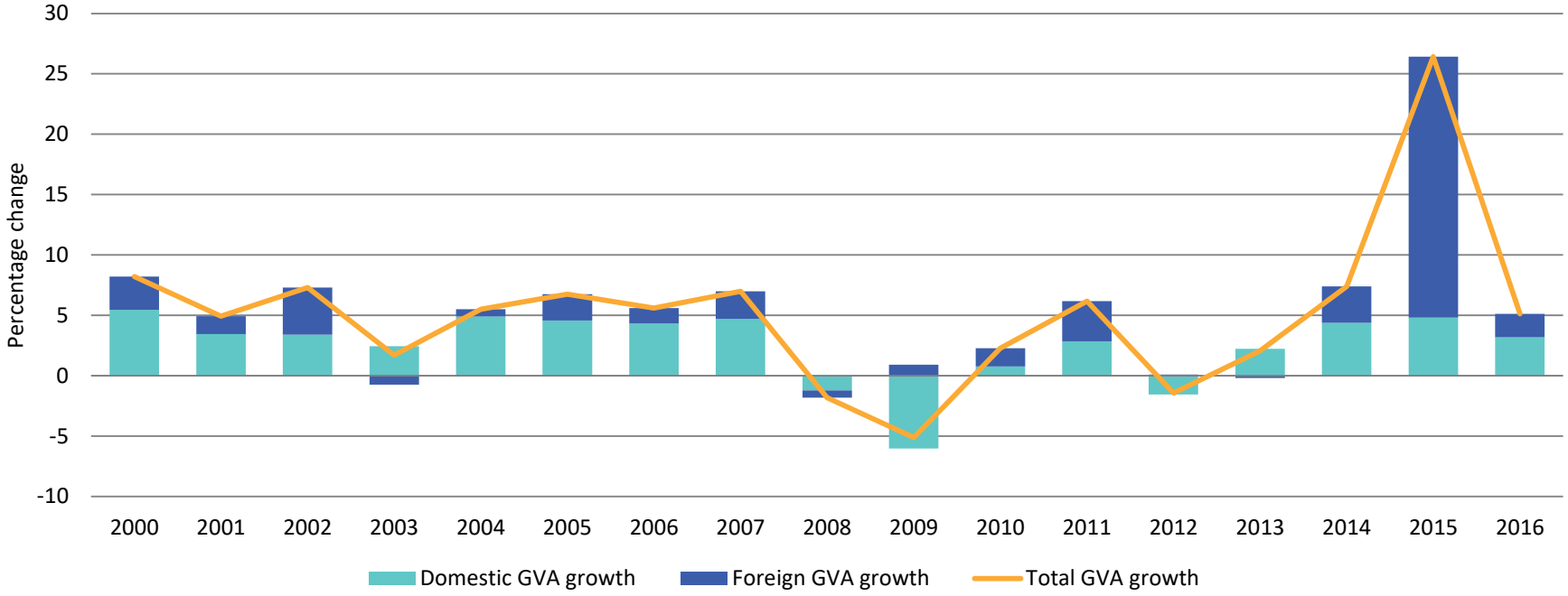
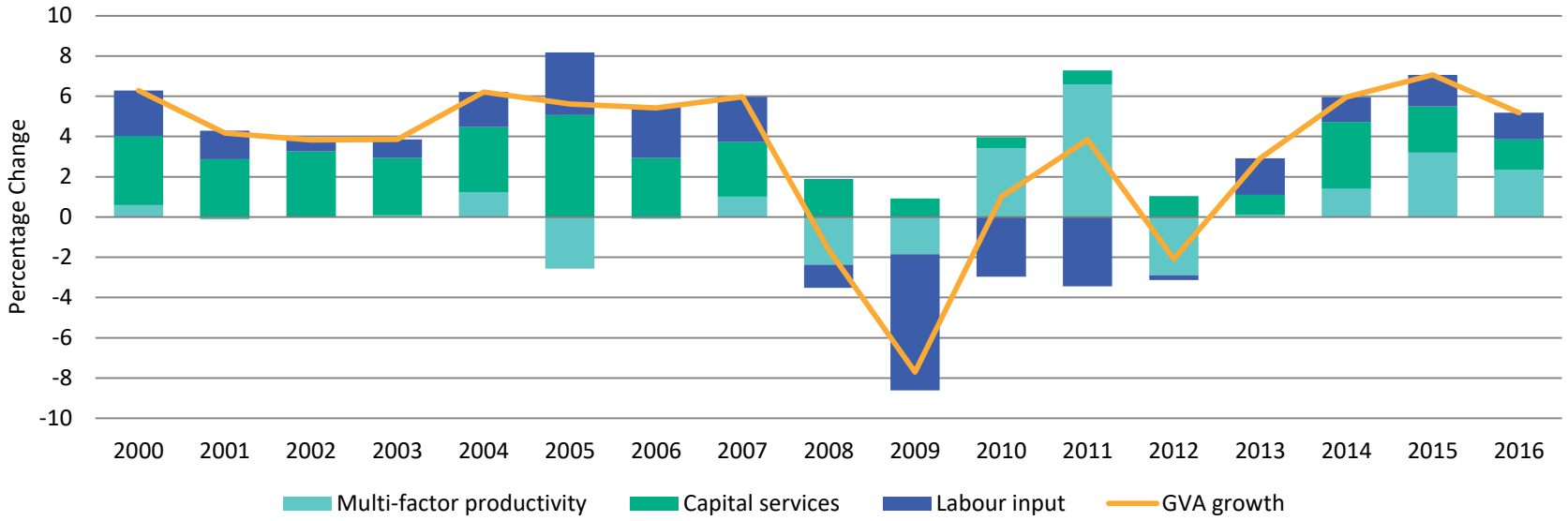
GVA Growth

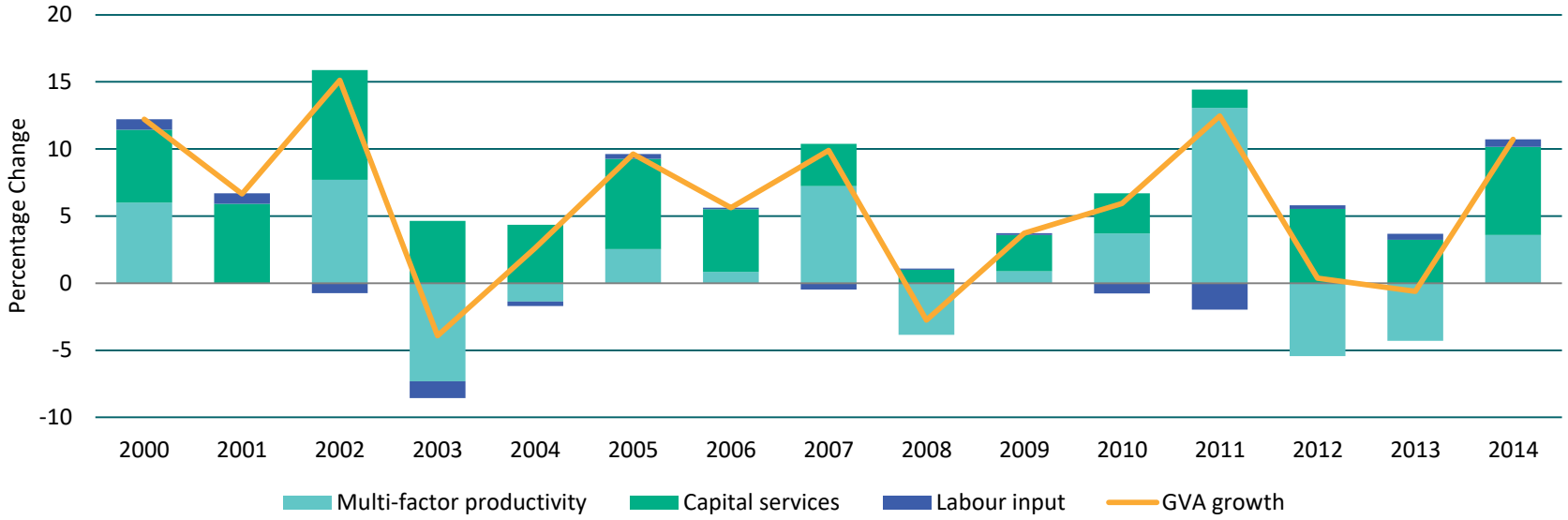
Foreign and Domestic & Other GVA growth



Domestic and Other GVA Growth



Foreign sector GVA growth: 2000 – 2014



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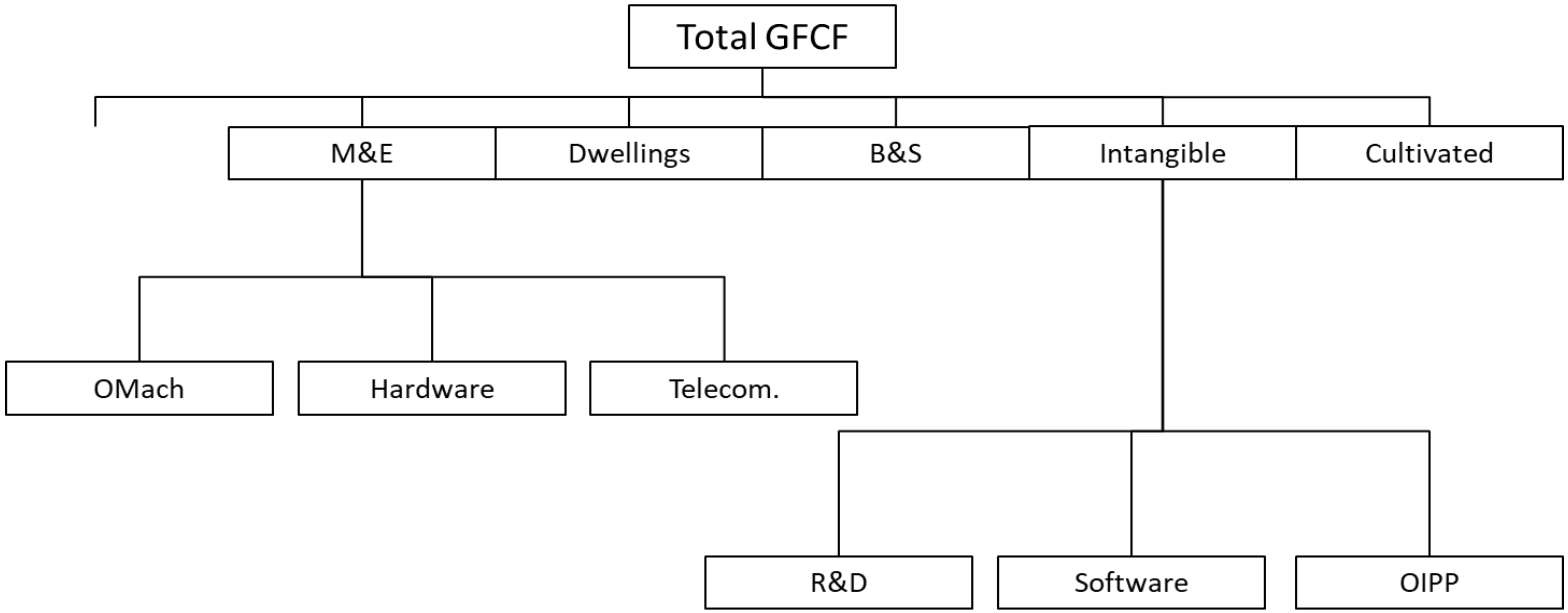
Future Productivity Analysis

Klems Approach

- EUKLEMS Main Equation
- Gross Output= Capital + Labour +Energy+ Materials+ Services + MFP
- Capital= ICT +non-ICT
- Labour= Hours worked+ QALI analysis
- MFP = Residual

Capital Assets Breakout



Work Programme Going Forward

- Gross Output and Value Added Approach
- Labour and Capital Breakdown
- Intermediate Input Breakdown

The QALI Project

Creating a quality-adjusted labour productivity index for the Irish economy

Quality adjusted labour input (QALI)

What is QALI?

- Quality-Adjusted Labour Input (QALI) is an input into measuring productivity that measures the growth of hours worked (labour input) taking into account the composition of the workforce.

- QALI captures the following:

    1. Variation in labour hours worked

    2. Variation in the composition (or “quality”) of the employed workforce.

Context

- Currently Ireland's productivity estimates are derived using measures that capture the **quantity** rather than the **quality** of Ireland's labour input

  e.g. total number employed or hours worked.

- This implicitly assumes that each hour worked is of the same quality

  i.e. there are no differences in the experience, qualifications or skill levels of the labour employed

In reality, labour input is not homogenous.

Some hours worked may be more effective than others.

For example, an hour worked by a new employee may not produce as much output as an hour worked by an employee that has worked in a business for many years.

The aim of this project is to account for such differences.

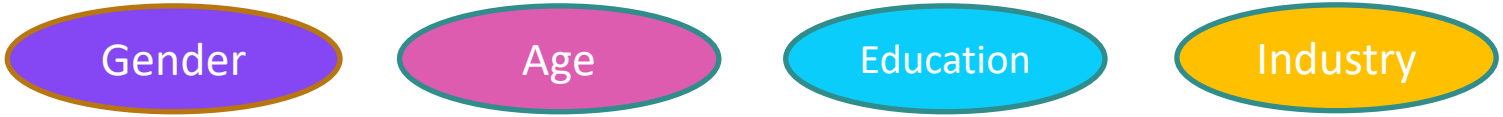
There is no perfect measure of the effectiveness of hours worked.

We are going to proxy for this using hourly income.

This method rests on the assumption that higher wages reflect higher worker productivity.

Constructing a QALI series for Ireland for 1998-2016

Step 1: Categorise workers into groups defined by identifiable characteristics



Categories

Gender	M, F
Age	16-29, 30-49, 50-65
Education	Low: Below level 5 (no education - Junior cert) Medium-Low: level 5 (Leaving cert) Medium-High: levels 6 & 7 (Higher cert, Advanced cert, Ordinary Bachelor degree) High: levels 8, 9 & 10 (Honours Bachelor degree, Masters, PHD)
Industry	A64

Constructing a QALI series for Ireland for 1998-2016

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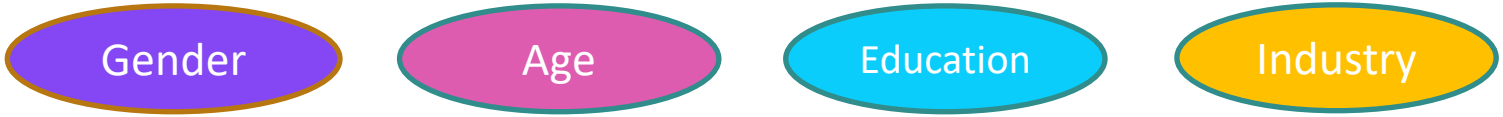

Step 2: Calculate the average compensation for one hour of work by each labour type in each industry on an annual basis from 1998-2016.

For example, the hourly income of women age 50+ with bachelor degrees in industry 33 (air transport services)

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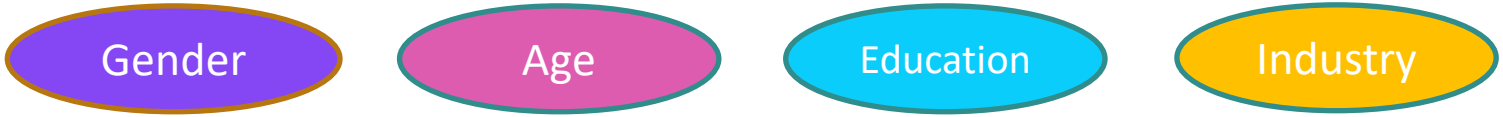


Step 2: Calculate the average compensation for one hour of work by each labour type in each industry on an annual basis from 1998-2016.

For example, the hourly income of women age 50+ with bachelor degrees in industry 33 (air transport services)

Step 3: Calculate the number of hours worked by each labour type in each industry.

Constructing a QALI series for Ireland for 1998-2016

- Step 4: Construct a Törnqvist Index weighting the changes in hours worked for each group by their share of total labour income

$$\Delta \ln L_t = \sum_l \bar{v}_{l,t} \Delta \ln H_{l,t}$$

$$\bar{v}_{l,t} = \frac{1}{2}[v_{l,t} + v_{l,t-1}]$$

Two period average

$$v_{lt} = (\sum_l p_{lt}^L H_{lt})^{-1} p_{lt}^L H_{lt}$$

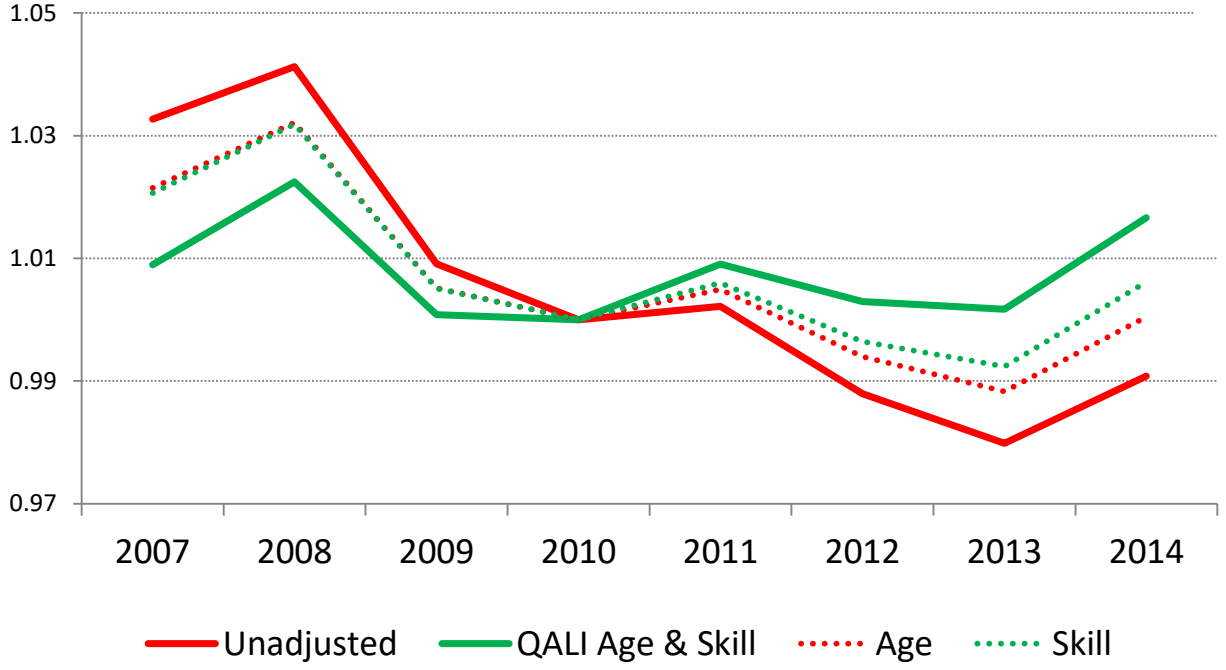
Weights are labour income shares

- *QALI differs from traditional measures of hours worked as it weights the hours worked by different types of workers by their relative contribution to economic production. As a result, a QALI index will be more sensitive to changes in the hours worked of relatively high productivity workers compared with relatively low productivity workers.*

(ONS, 2017)

Results

EU index



Why construct a QALI index?

- Demographic trends in employment affect the productivity of labour input.

  A QALI measure for Ireland will demonstrate how the effectiveness (or quality) of Ireland's labour input has evolved over time.

Why construct a QALI index?

- Multi-factor productivity (MFP) is measured as a residual, i.e. it is that part of GDP growth that cannot be explained by changes in labour and capital inputs.

Variation in MFP reflect the effects of changes in management practices, brand names, organizational change, general knowledge, network effects, spillovers from production factors, adjustment costs, economies of scale, the effects of imperfect competition and measurement errors (OECD, 2018).

By accounting for productivity changes due to employee characteristics, QALI will facilitate **more accurate estimation of multi-factor productivity**.

Questions?

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Thank you