THE PRODUCTIVITY INSTITUTE

UKRI Economic and Social Research Council

PRODUCTIVITY AND GROWTH: PAST AND FUTURE TRENDS

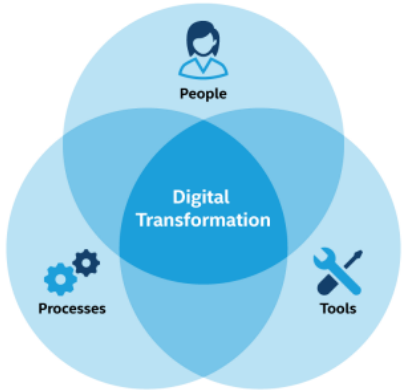
9 November 2022

University of Cambridge · Cardiff University · ESCoE Economic Statistics Centre of Excellence · University of Glasgow · King's College London · The University of Manchester · National Institute of Economic and Social Research · Queen's University Belfast · The University Of Sheffield. · Warwick

AGENDA

Recent trends in growth and productivity

Why has growth slowed down?



The role of ICT and digital transformation

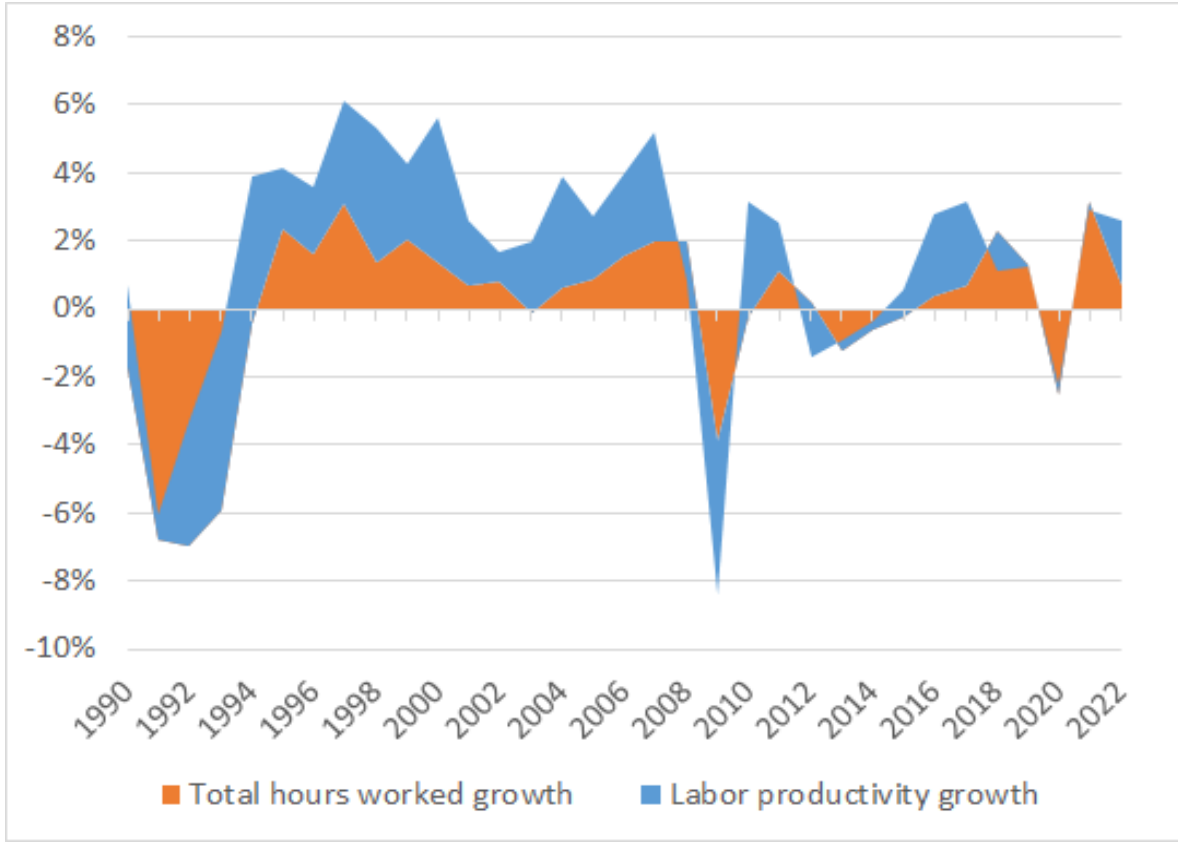
Projections of economic growth

Towards an intangible and sustainable economy

THE ECONOMY HAS BECOME "PRODUCTIVITY-POOR"

Euro Area has become more labour intensive and productivity poor …

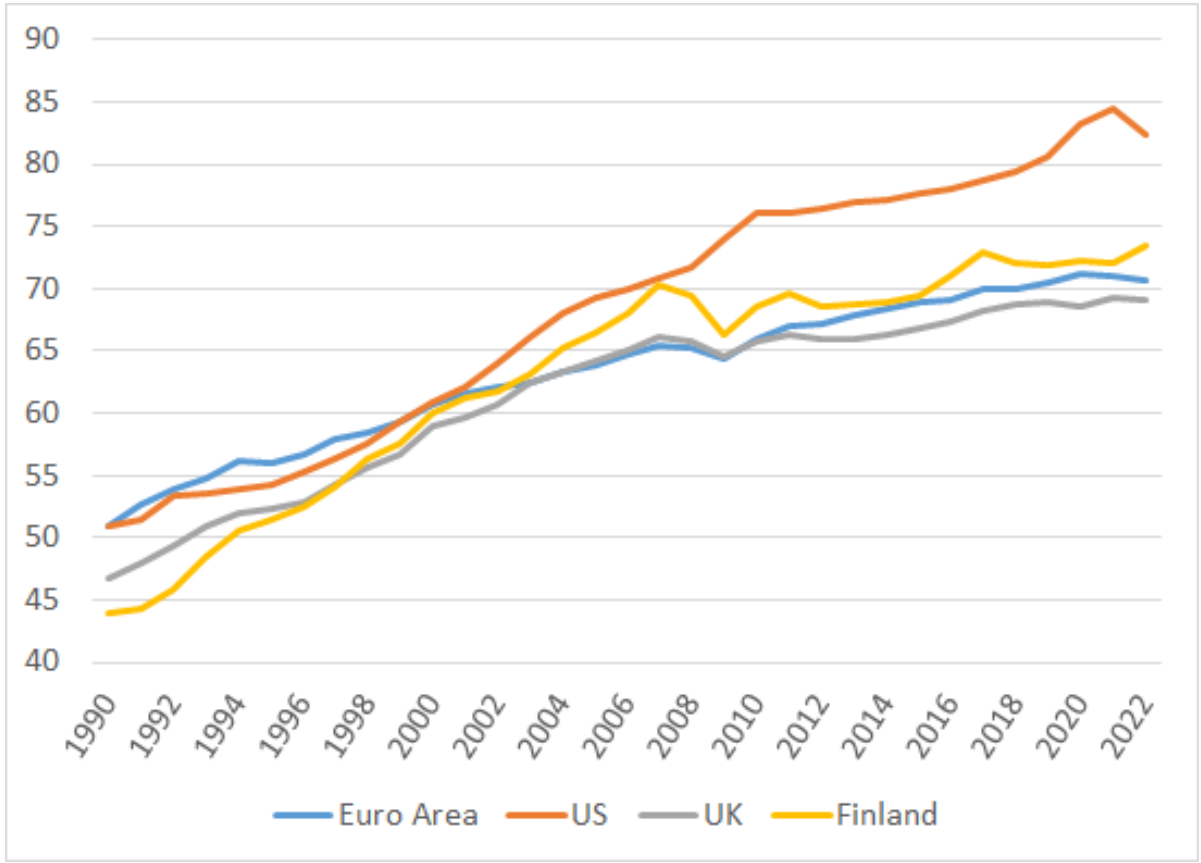
… even more visible in Finland



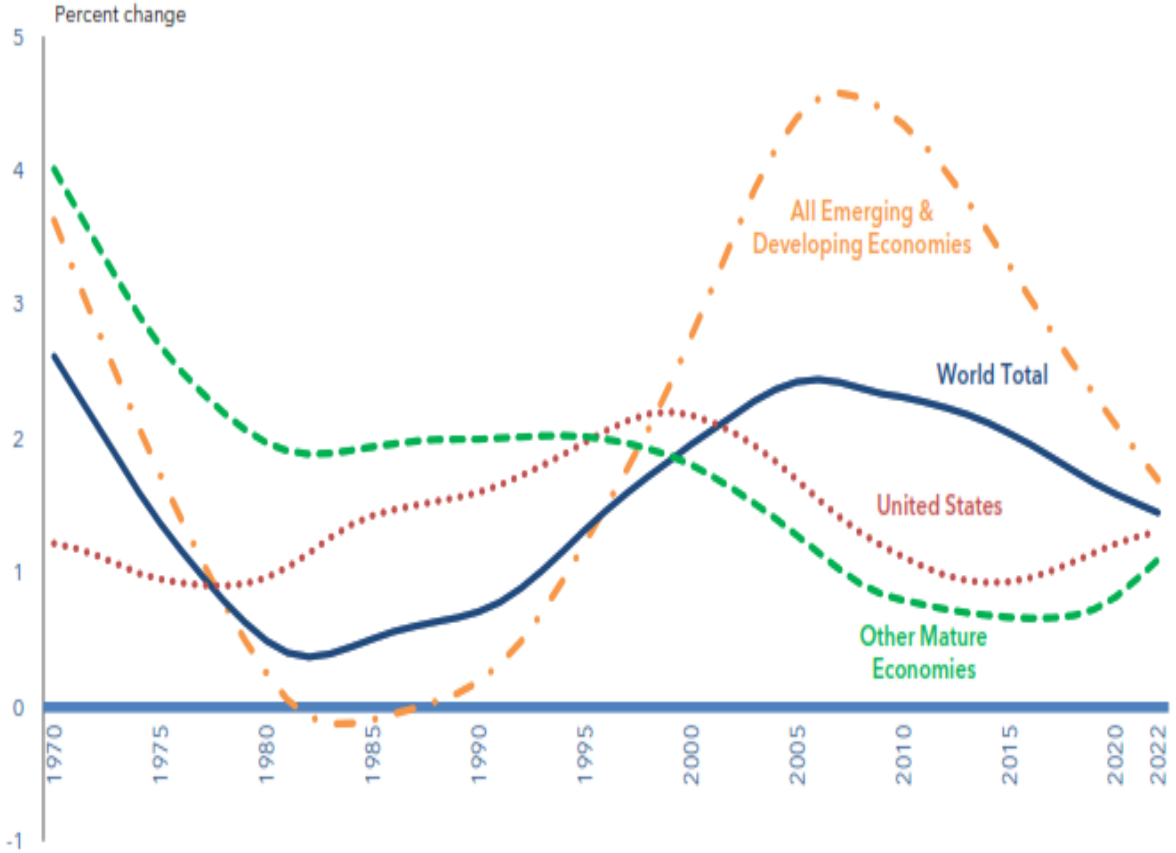
Source: The Conference Board, 2022

SLOWER PRODUCTIVITY GROWTH IS A GLOBAL PROBLEM

Increase in productivity (GDP per hour) has slowed for almost 15 years across OECD (in US$ PPP)

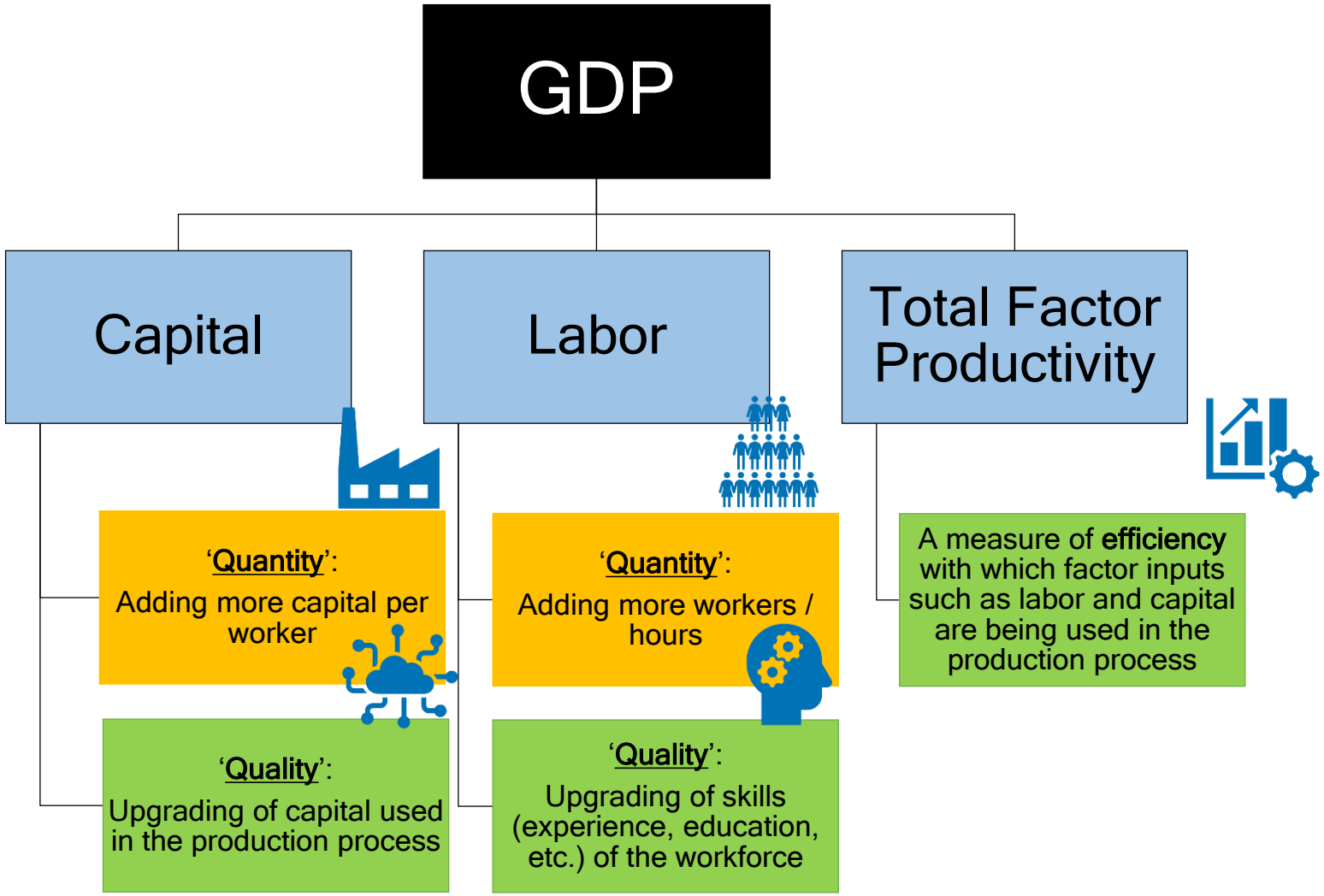


In fact the productivity slowdown is a global problem (trend growth of global output per person employed)

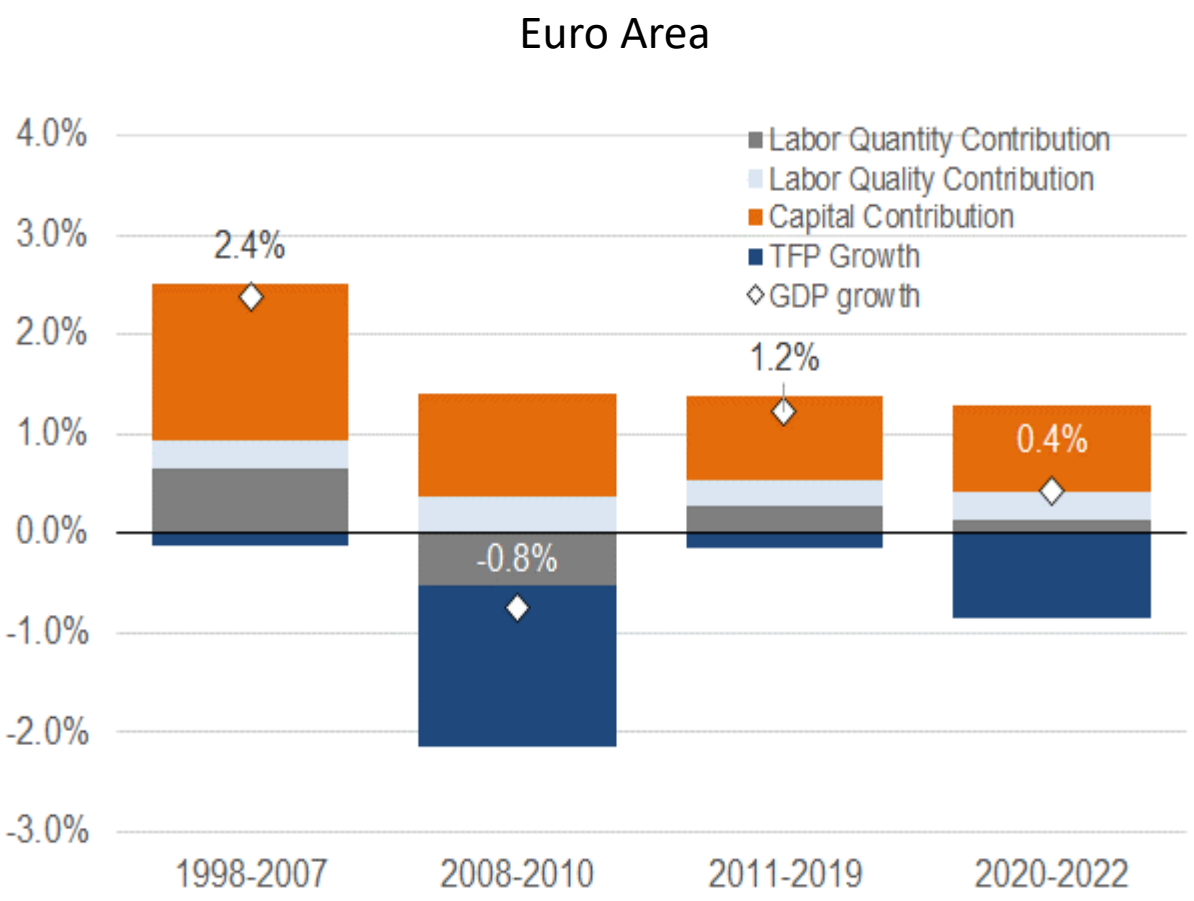


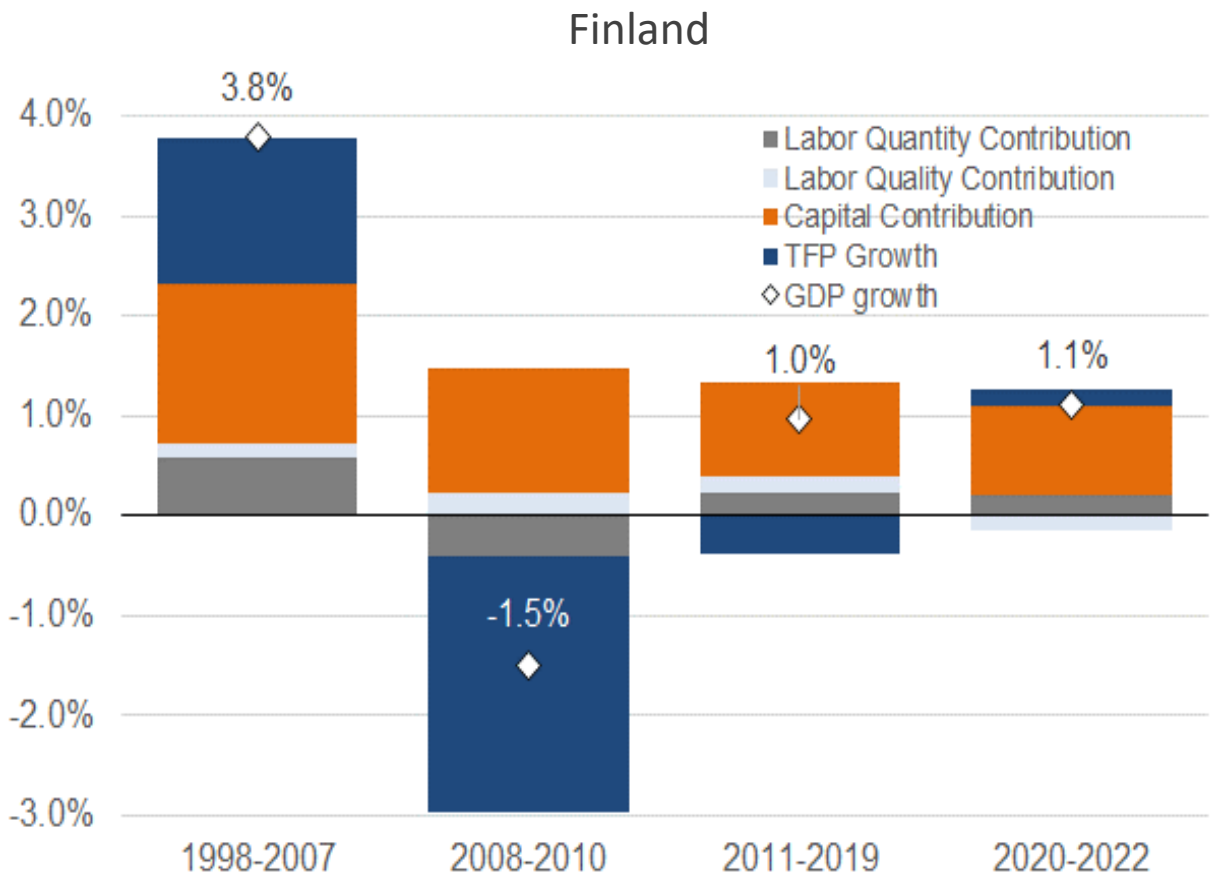
Source: The Conference Board, 2022
Note: Trend growth rates are obtained using HP filtering method

GROWTH ACCOUNTING APPROACH



EUROPEAN ECONOMIES HAVE ALSO BECOME "TFP-POOR": CAPITAL IS THE KEY BUT WEAKENING DRIVER OF GROWTH



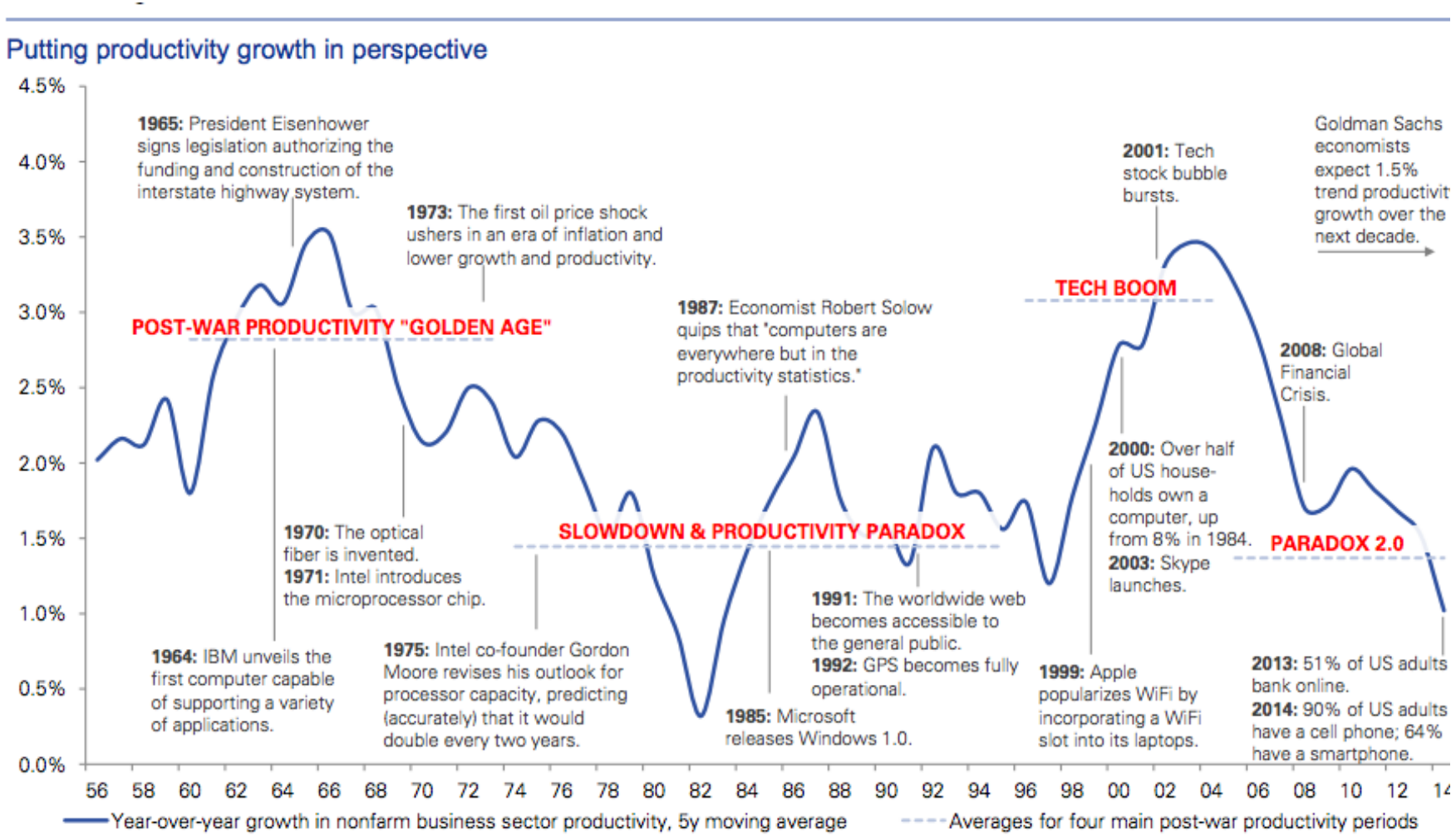


Source: The Conference Board, 2022

CAUSES OF THE GROWTH SLOWDOWN

- Exacerbating effects from the ***global financial crisis***
  - Slow demand
  - Weak investment
  - Too low interest rates
  - Failing fiscal policies
- ***Slowing catch-up growth*** in emerging markers, especially China – one-off bonus gone?
- Greater share of ***low-productivity personal services*** in advanced economies ("Baumol effect")
- ***Demographics***: ageing population, declining labour supply and weakening demand
- ***Structural policy effects***: increased regulation, lack of competition, declining global trade, FDI, supply chains
- ***Transformational challenges***: climate crisis, stagflation, inequality
- ***Measurement problems***: output and inputs in a digital and intangible economy are harder to catch in the statistics
- ***Weaker technological change and innovation***:
  - Technology and innovation pessimism & winner-takes-all effects
  - The Productivity Paradox of the New Digital Economy

A REVIVAL OF THE PRODUCTIVITY PARADOX



Source: BLS, Pew Research Center, US Census, PBS, various news sources, Goldman Sachs Global Investment Research.

Goldman Sachs Global Investment Research

THE NEW PRODUCTIVITY PARADOX ("PARADOX 2.0")

The Old Digital Economy (1980s-mid 2000s)

Digitization driven by the rise of the PC and the internet as key drivers of greater business efficiency, creating access for individuals to digitization and the beginning of e-commerce.

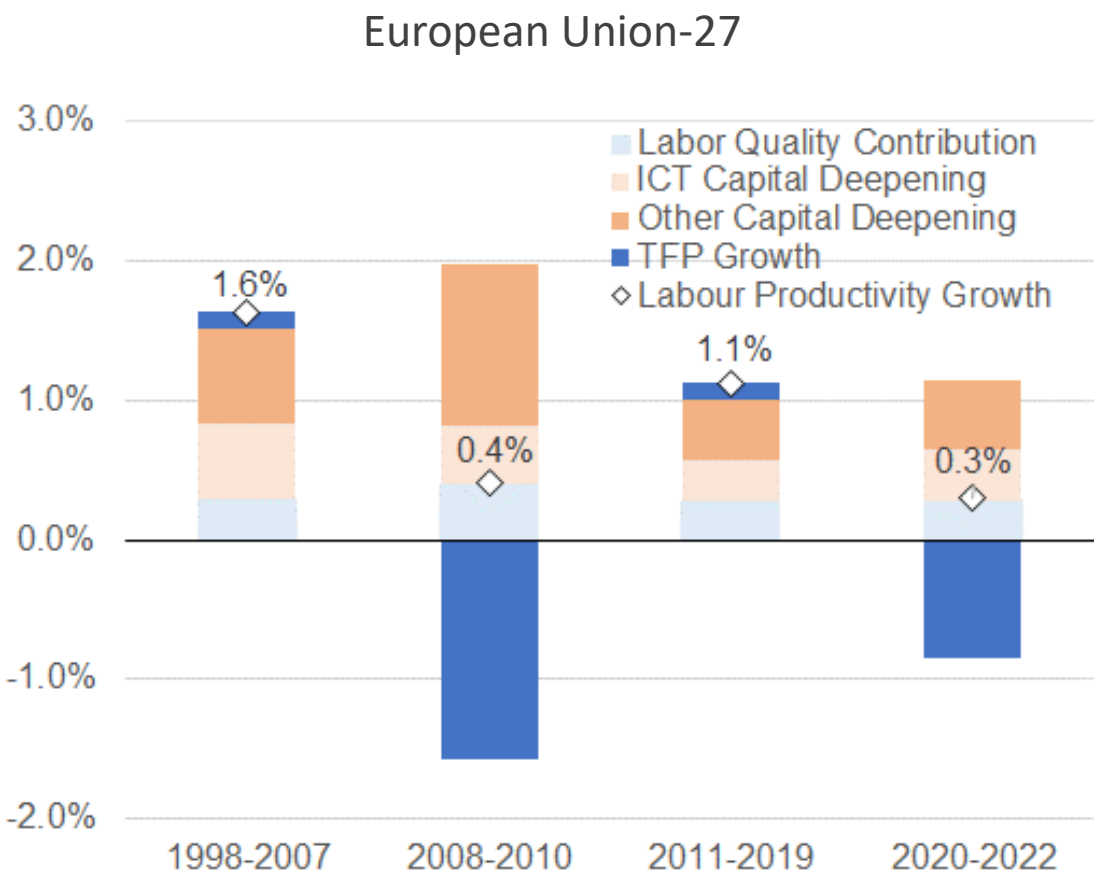
The New Digital Economy (as of mid 2000s)

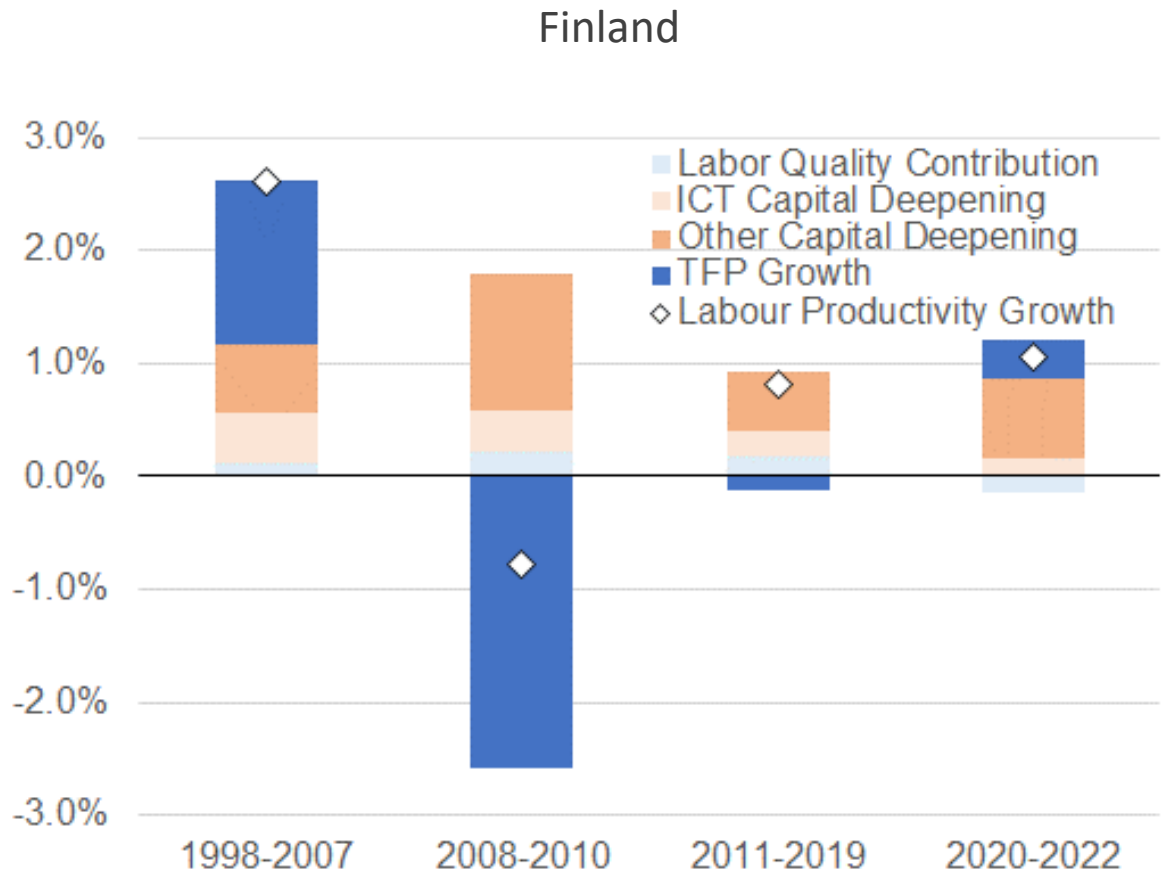
Digitization driven by a combination of mobile technology; ubiquitous internet access; shift toward cloud, and more recently artificial intelligence and robotics

DIGITAL TRANSFORMATION is an enterprise strategy that leverages digital technologies and the data they produce to connect organizations, people, physical assets and processes, etc.

1st: The Industrial Revolution → 2nd: Steam and Railways → 3rd: Steel and Heavy Engineering → 4th: Energy and Combustion Engine → 5th: Digital Age

CONTRIBUTION OF ICT CAPITAL TO LABOUR PRODUCTIVITY STABILIZED BUT TFP GROWTH DID NOT RECOVER





Source: The Conference Board, 2022

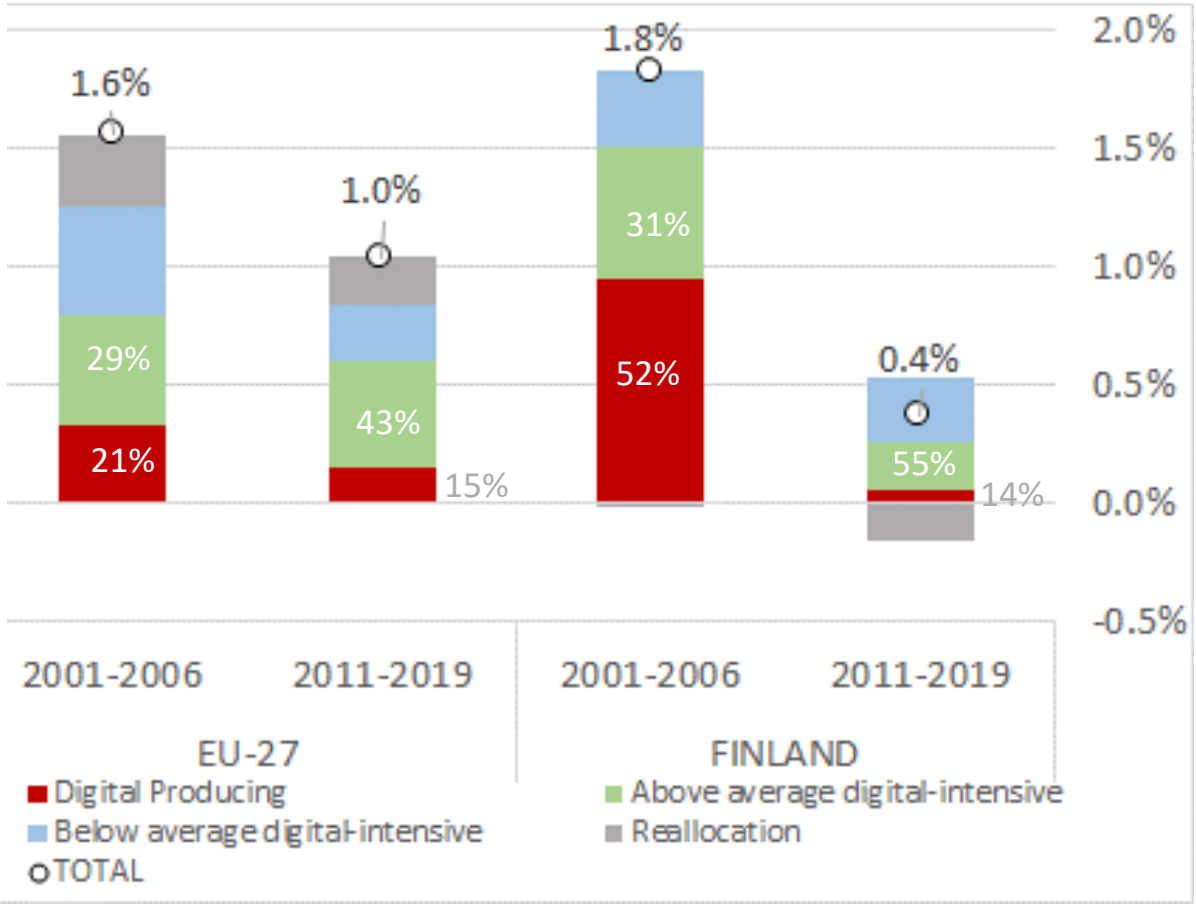
MOST DIGITAL-INTENSIVE INDUSTRIES CONTRIBUTE TO PRODUCTIVITY GROWTH BUT DIGITAL PRODUCERS IN EUROPE DROP OFF

DIGITAL INDUSTRY TAXONOMY

NACE SECTORS		Used in this study
A	Agriculture, forestry & fishing	LDIU
B	Mining & quarrying	LDIU
10-12	Food, beverages & tobacco	LDIU
13-15	Textiles & leather	LDIU
16-18	**Wood, paper, printing & media**	**MDIU**
19	Coke & petroleum products	LDIU
20-21	Chemicals	LDIU
22-23	Rubber & plastics; non-metallic mineral	LDIU
24-25	Basic metals & metal products	LDIU
26-27	Electrical & optical equip.	DP
28	**Machinery & equipment n.e.c.**	**MDIU**
29-30	**Transport equipment**	**MDIU**
31-33	**Other manufacturing**	**MDIU**
D-E	Electricity, gas & water supply	LDIU
F	Construction	LDIU
G	**Trade**	**MDIU**
H	Transportation & storage	LDIU
I	Accommodation & food services	LDIU
58-60	Publishing & broadcasting	DP
61	Telecommunications	DP
62-63	IT & information services	DP
K	**Financial & insurance activities**	**MDIU**
L	Real estate activities	LDIU
M-N	**Professional services**	**MDIU**
O	**Public administration & defence**	**MDIU**
P	Education	LDIU
Q	Health & social work	LDIU
R	**Arts, entertainment & recreation**	**MDIU**
S	**Other services**	**MDIU**

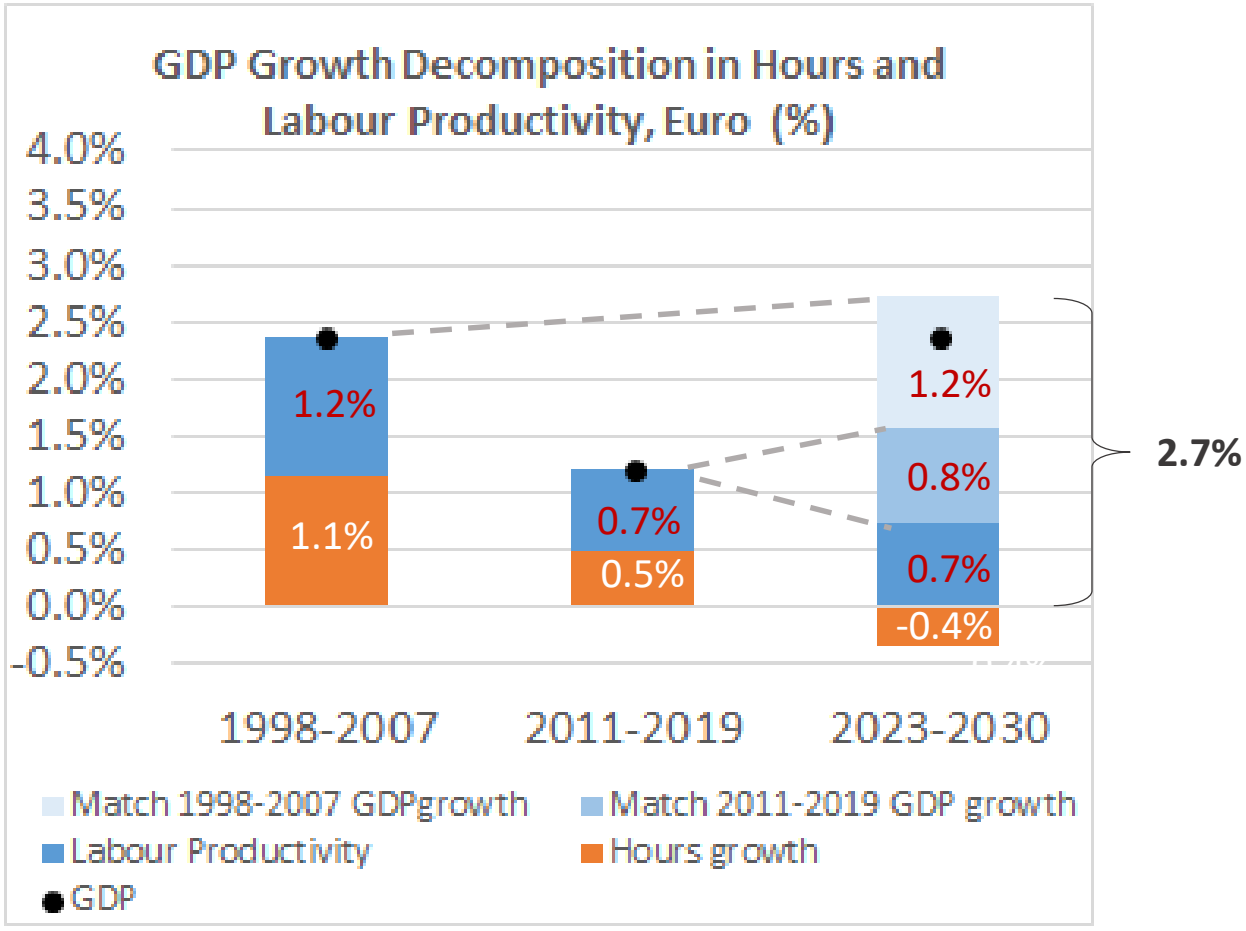
*Note: * Based on OECD's 2013-2015 grouping. LDIU=Least digital intensive using, DP=Digital Producing, MDIU=Most digital intensive-using, M-LOW=Medium Low, M-HIGH=Medium High, LIIU=Least ICT intensive-using and MIIU=Most ICT intensive -sing*
Sources: Van Ark, Erumban and de Vries (2019), based on OECD (2018), Van Ark et al (2016)

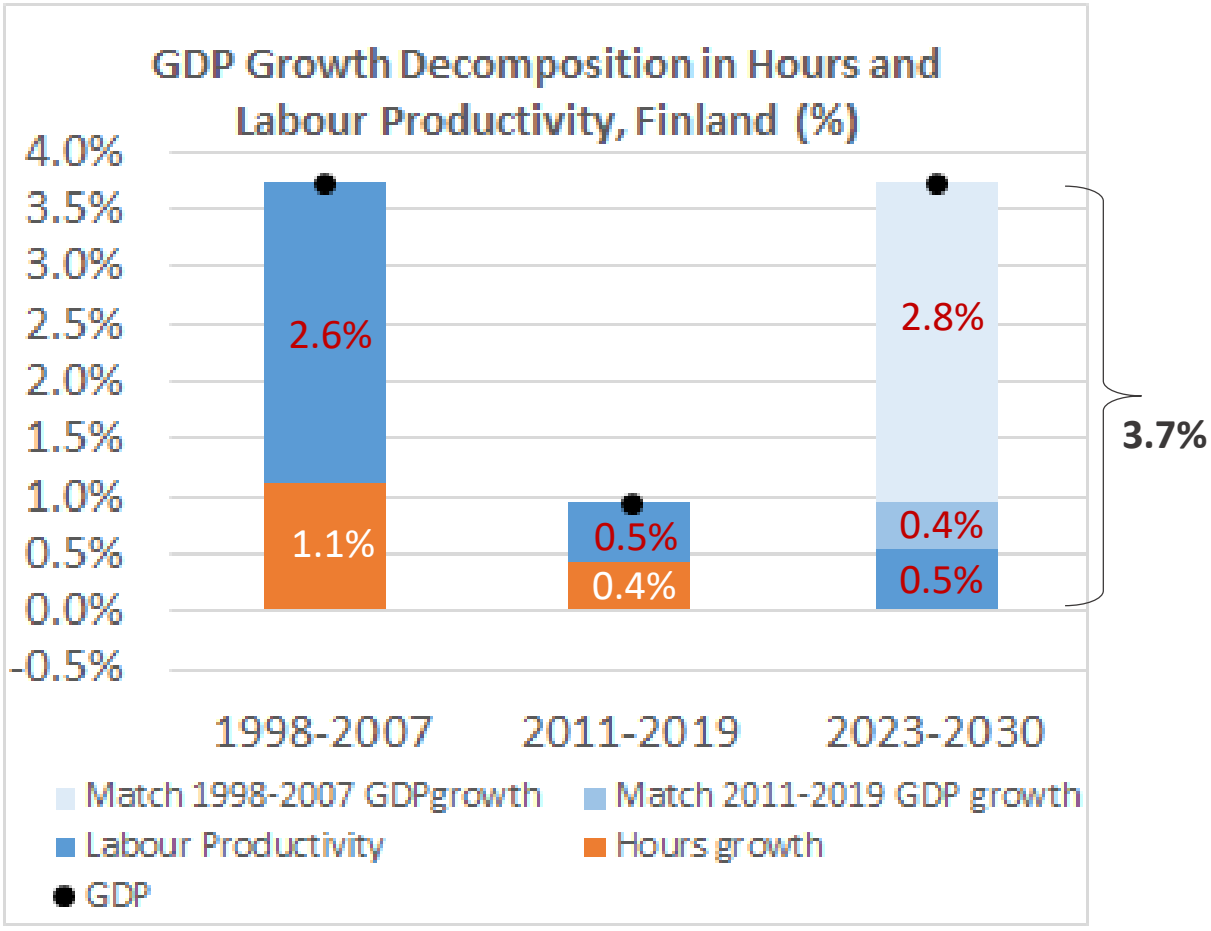
LaboUr productivity growth and contributions from digital-producing and –using sectors, in %



Source: van Ark, de Vries, Erumban (2021)

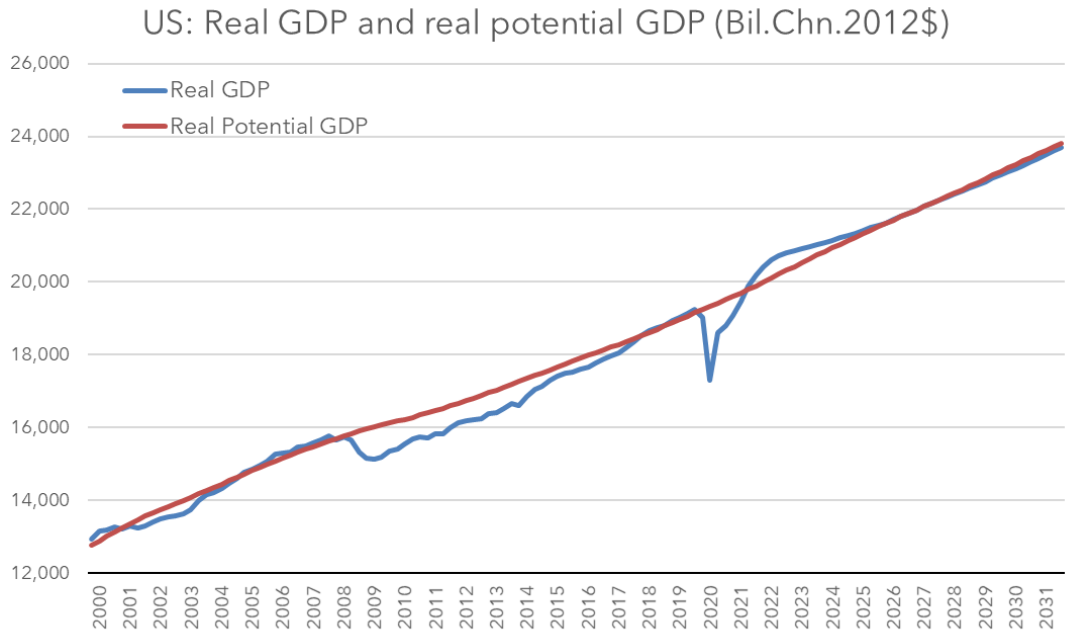
HOW TO GET GROWTH BACK ON TRACK?





PROJECTED GROWTH ACCOUNTS IN THE CONFERENCE BOARD GLOBAL ECONOMIC OUTLOOK MODEL

- **Labor quantity** projections are based on working-age population growth rates.
- **Labor quality** projections are based on projections of educational attainment and average returns to schooling.
- **Capital input** projections are estimated based on structural factors such as the saving rate, depreciation rate, capital deepening, wage growth, etc.
- **Total factor productivity** (TFP) projections are estimated using structural factors such as corruption, growth in R&D, the Human Development Index, etc.
- Resultant **GDP** projections should be thought of as potential or trend growth rates–i.e., what the economy could be producing when it fully employs its available economic resources (at normal levels).



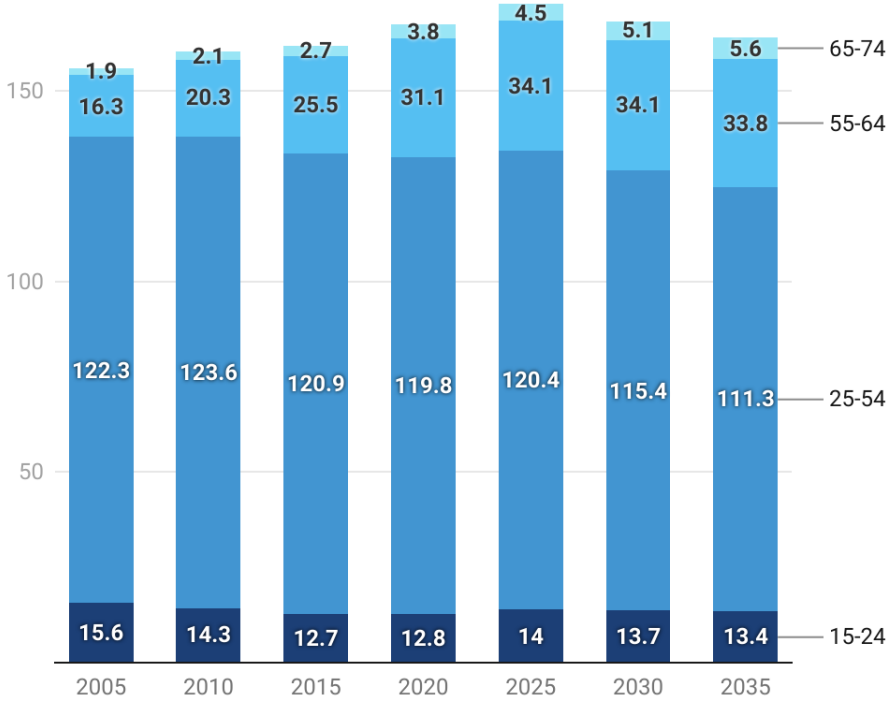
Source: US Congressional Budget Office

For more details, please refer to our working paper:
https://www.conference-board.org/topics/global-economic-outlook/Global-Growth-Projections-2018

DEMOGRAPHICS IS A MAJOR FORCE BEHIND WEAKENING GROWTH DYNAMICS

The Euro Area workforce is ageing and shrinking

Euro Area: Employment by broad age-groups (millions)

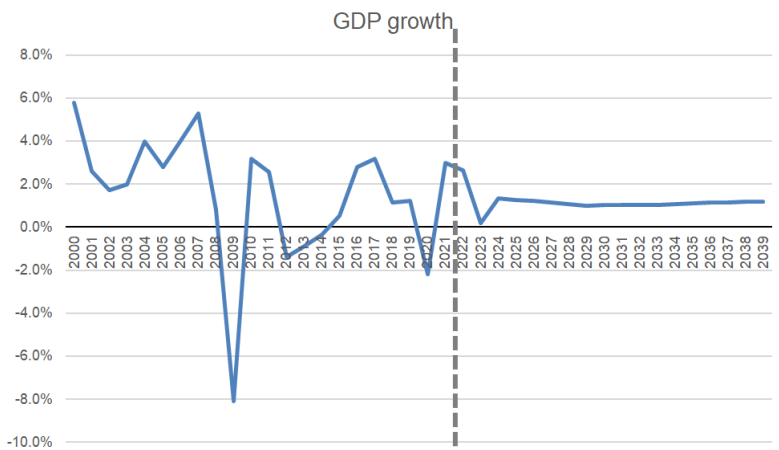


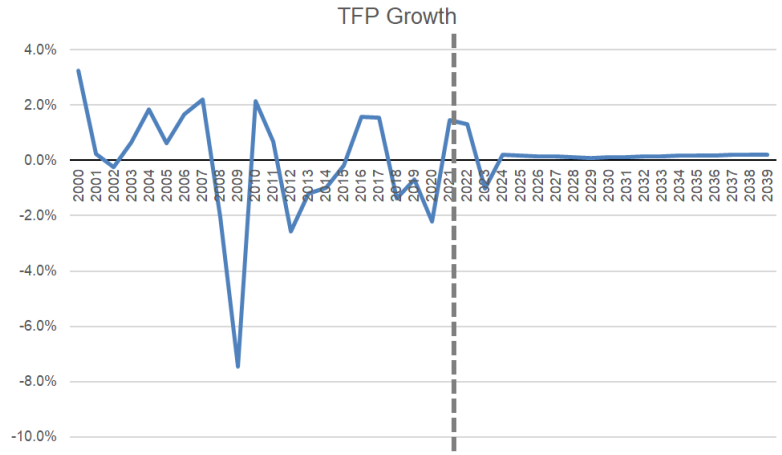
Data up to 2020 taken from Eurostat. Data for 2025, 2030 and 2035 are based on own assumptions regarding participation rates combined with population projections sourced from the UN World Population Prospects 2022

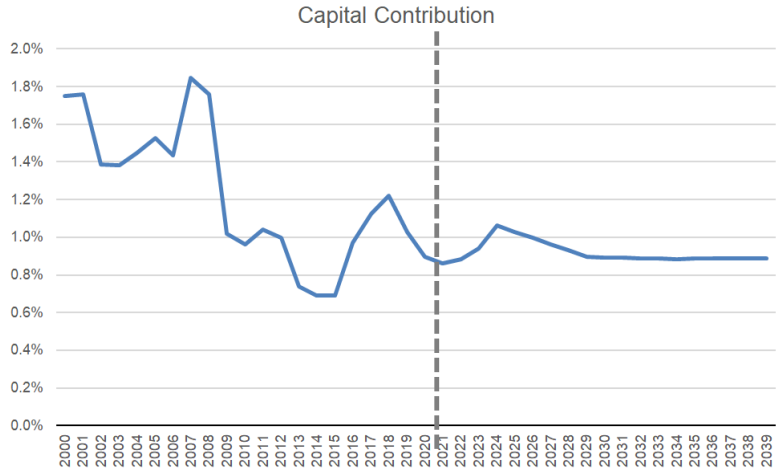
Source: The Conference Board calculations using data from Eurostat and UN • Created with Datawrapper

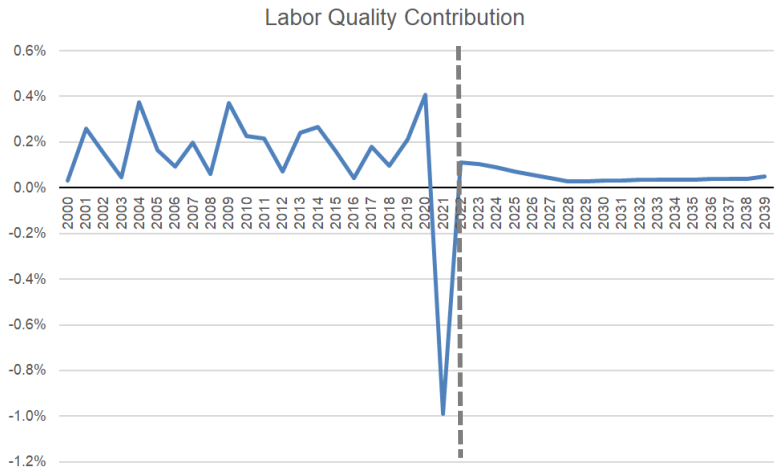
- An ageing population requires less investment in the economy
- The demand for less-capital intensive & lower productivity services, such as tourism and elderly care, will rise
- The role of the public sector, which struggles more with new technologies and innovation, becomes larger
- The evidence on productivity of older workers is mixed: level of education, reskilling, sector composition, health & well-being play large roles

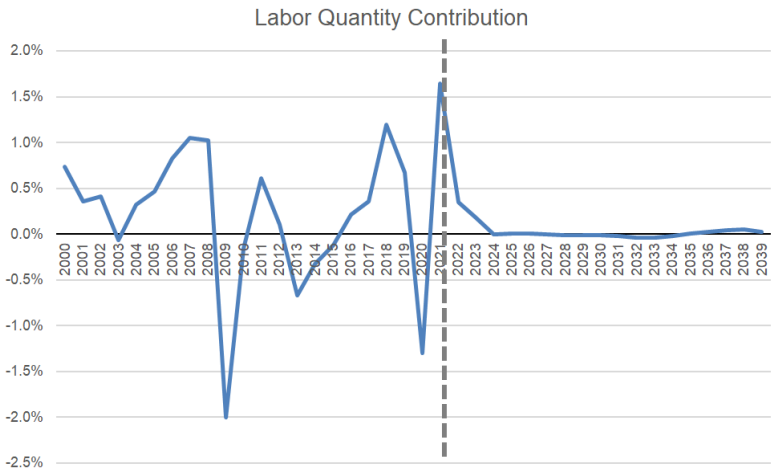
PROJECTED GROWTH ACCOUNTS FOR FINLAND, 2000-2039







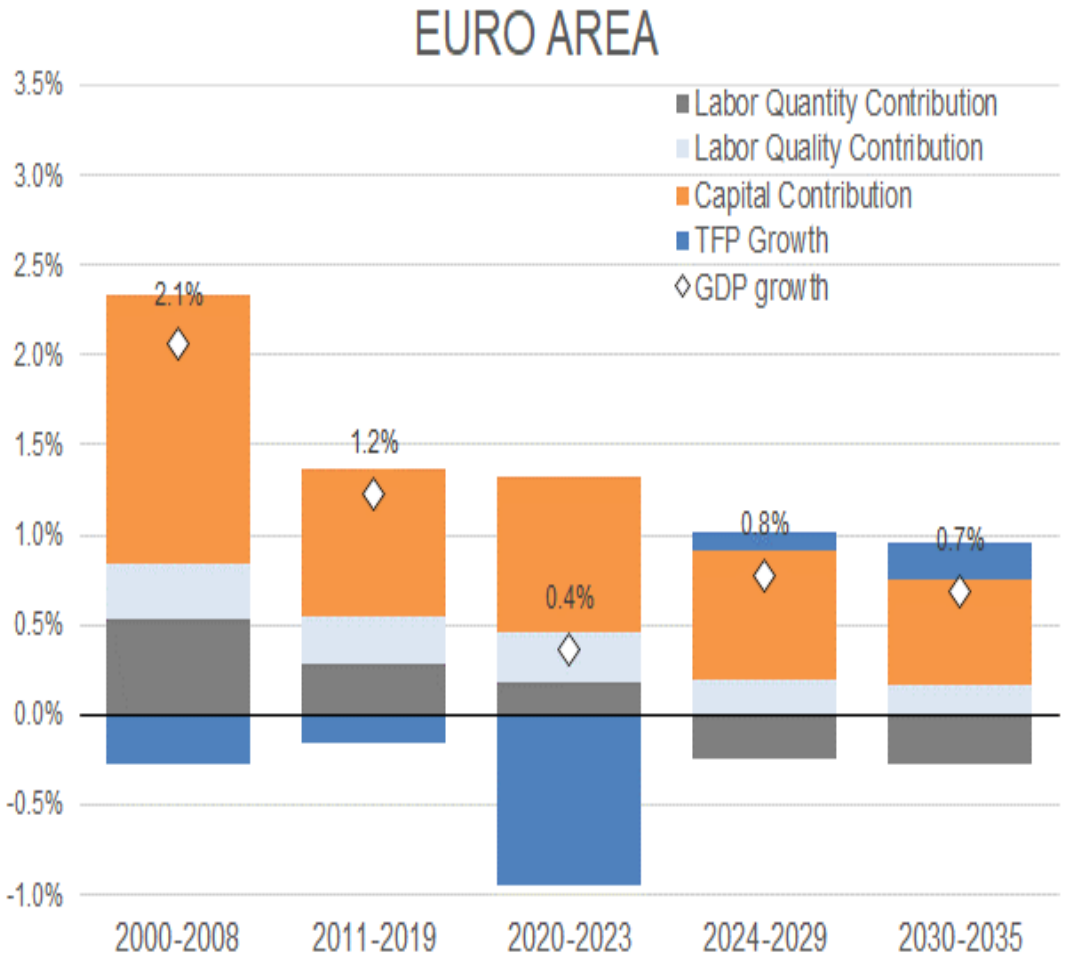


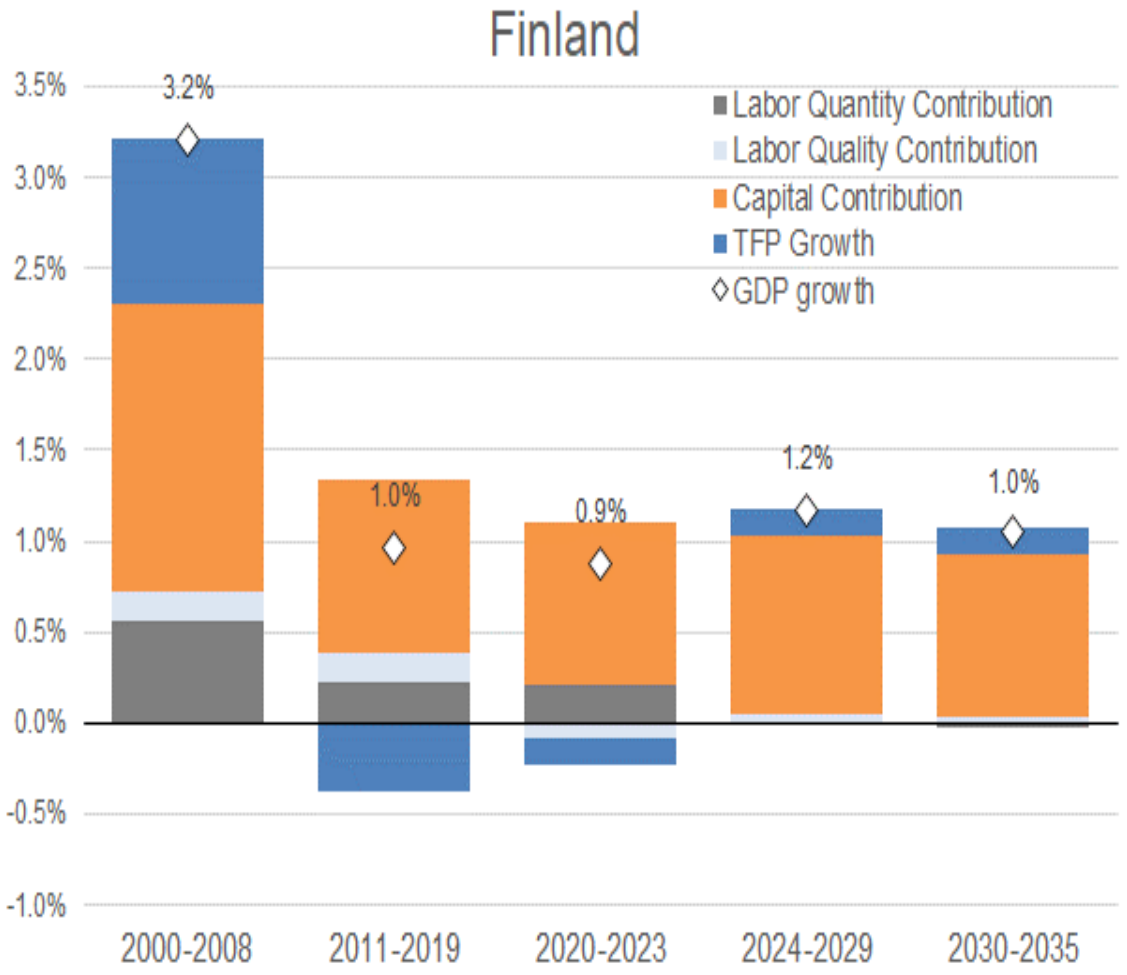


Source: The Conference Board, Global Economic Outlook (October 2022)

https://www.conference-board.org/topics/global-economic-outlook

ECONOMIC GROWTH IS PROJECTED TO STABILIZE BUT REQUIRING MORE INVESTMENT AND TFP GROWTH





THE RISE OF THE INTANGIBLE ECONOMY

Tangible Assets

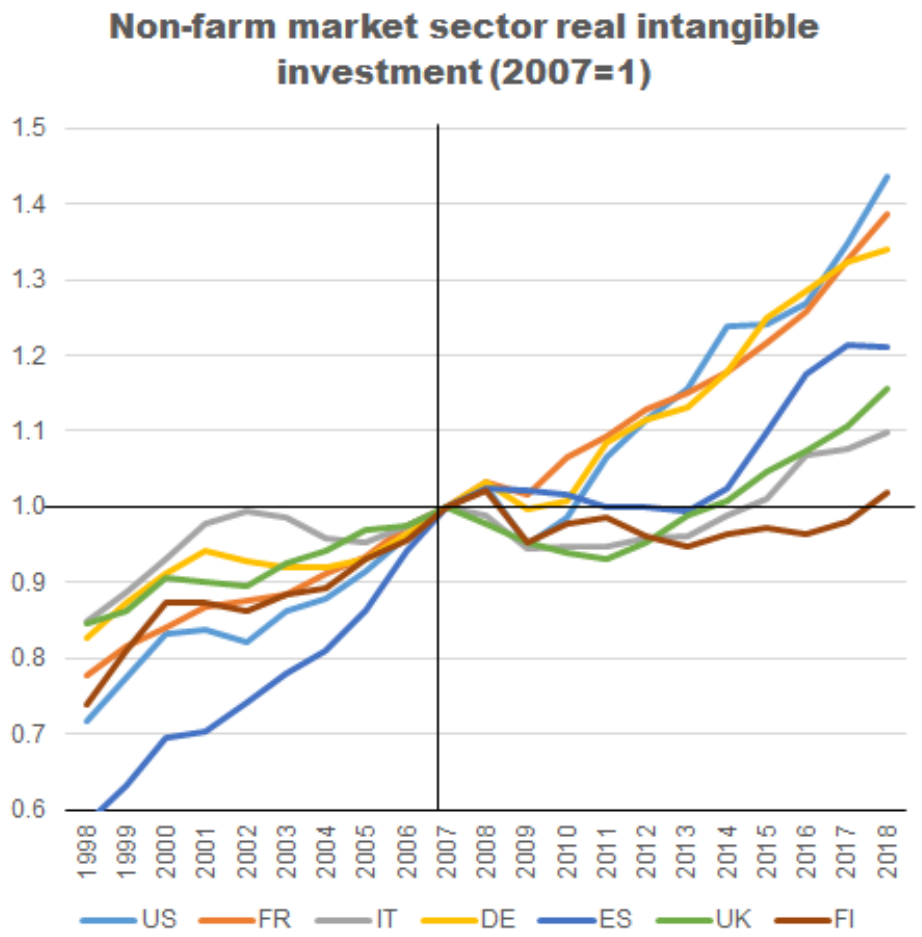
Equipment
Machinery
Buildings
Vehicles
ICT hardware
Land

Intangible Assets

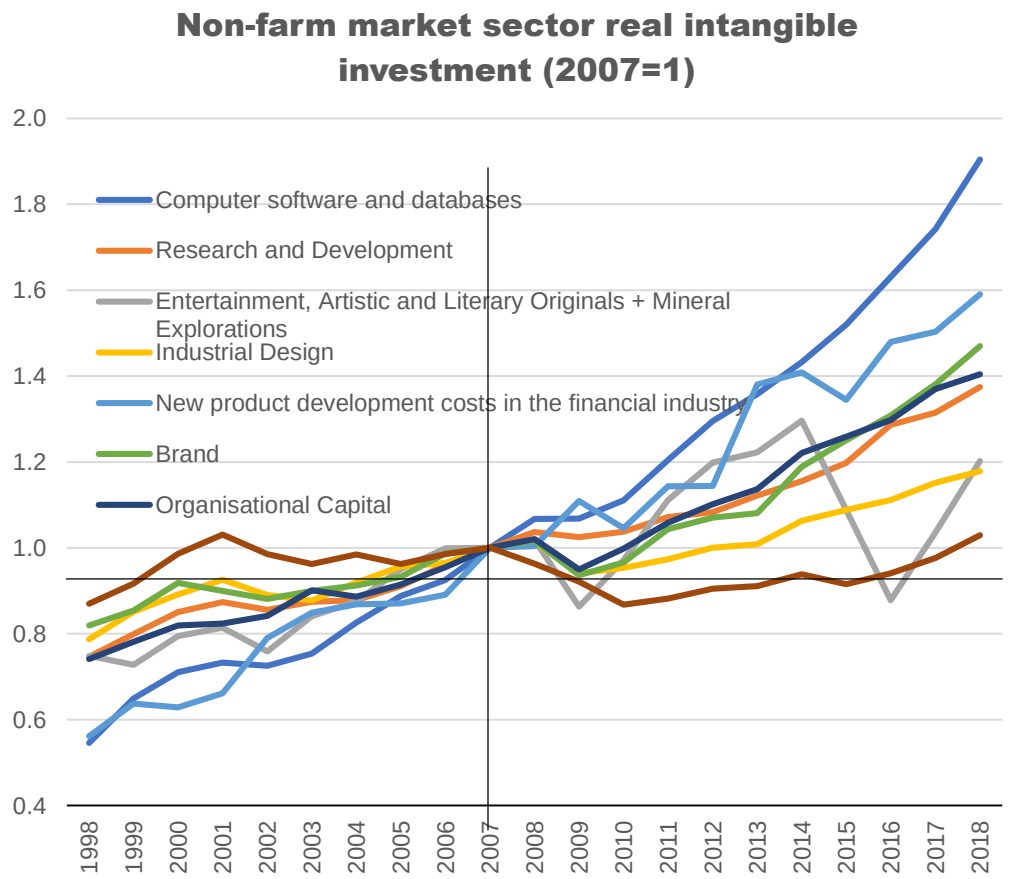
Software & databases

Innovation property:
- R&D
- Mineral exploration
- Design & originals

Economic competencies
- Market research & branding
- Organisational capital
- Business training



Source: EUKLEMS-INTANProd, 2021



Note: Weighted aggregate for Germany, France, Italy, Spain, UK and US
Source: EUKLEMS-INTANProd, 2021

DESPITE THE GROWTH SLOWDOWN, THE CONTRIBUTION OF INTANGIBLE CAPITAL HAS INCREASED

Tangible Assets

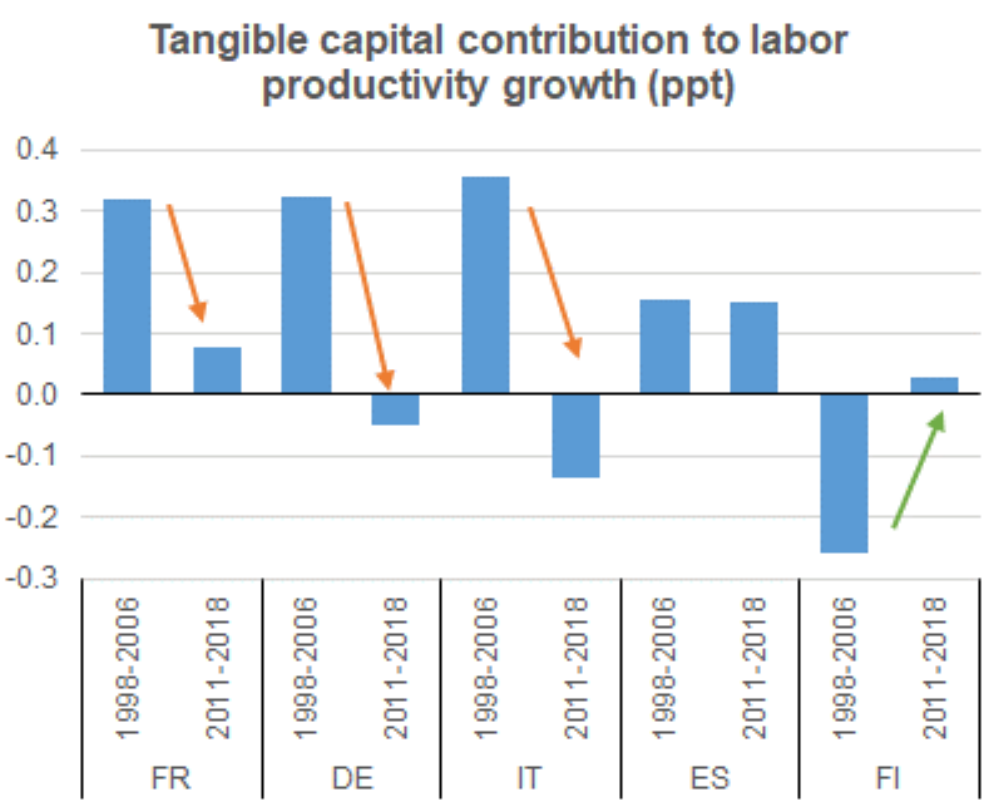
Equipment
Machinery
Buildings
Vehicles
ICT hardware
Land

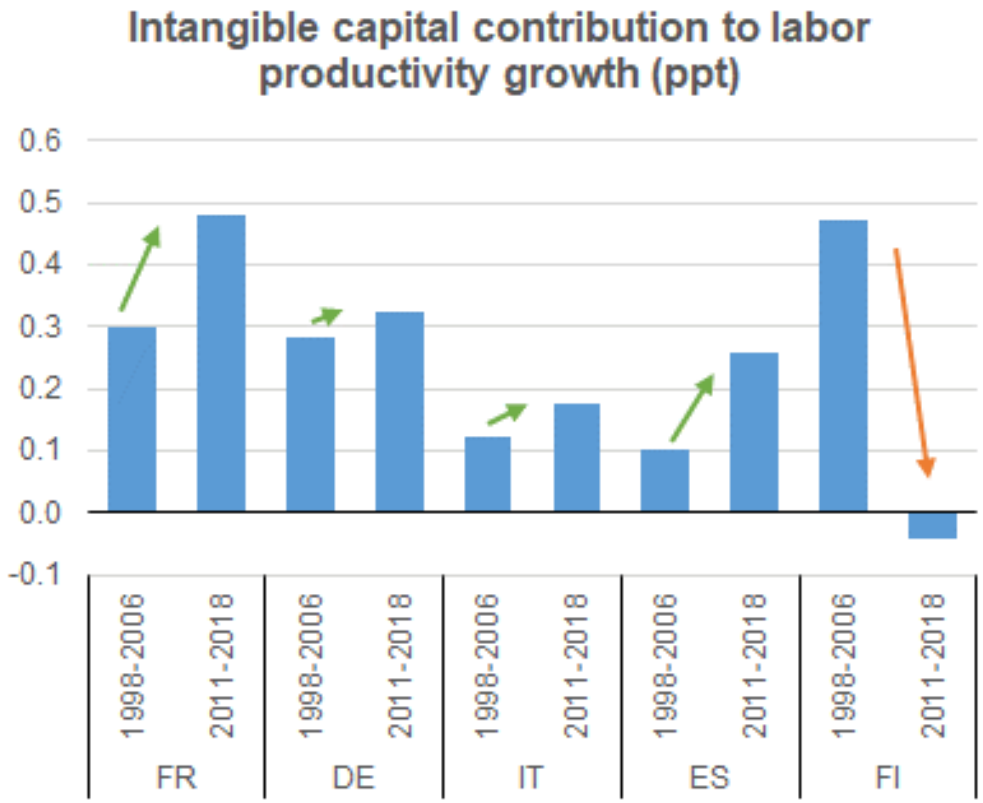
Intangible Assets

Software & databases

Innovation property:
- R&D
- Mineral exploration
- Design & originals

Economic competencies
- Market research & branding
- Organisational capital
- Business training



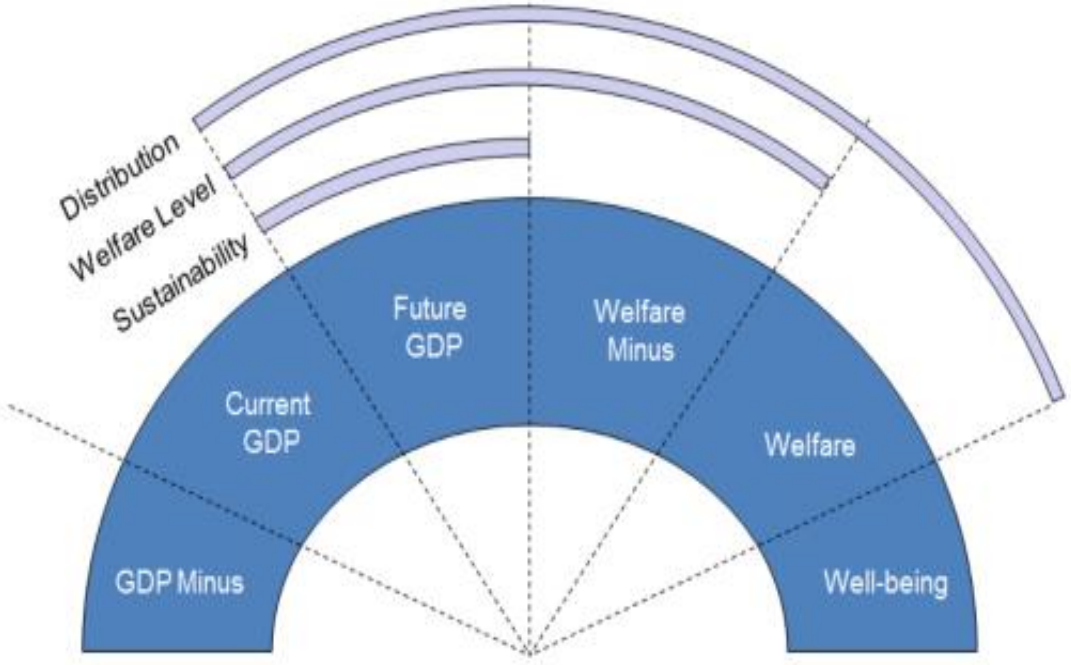


Source: UKLEMS-INTANProd, 2021

TOWARDS A BROADER INVESTMENT CONCEPT OF INPUTS AND OUTPUTS

Output / Input = Economic Productivity

Source: International Integrated Reporting Council

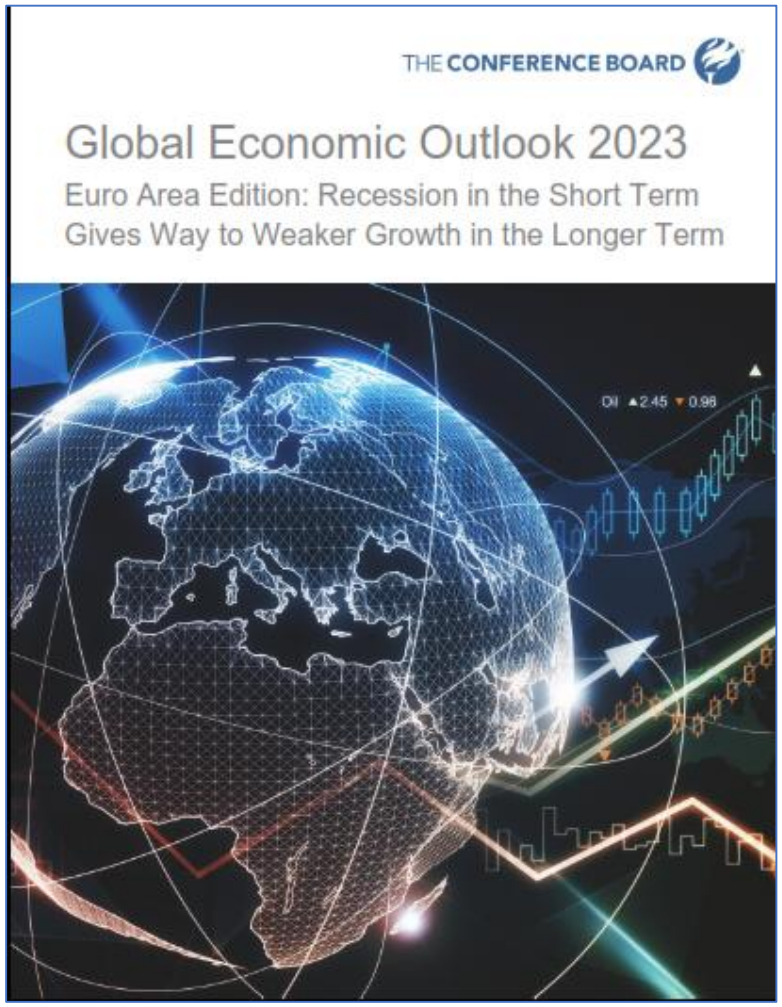


Source: Heys, Martin and Mkandawire, GDP and Welfare: A spectrum of opportunity , ESCoE Discussion Paper 2019-16

Outcome / Resources = Societal Productivity

https://www.productivity.ac.uk/

Source data: THE CONFERENCE BOARD



The Conference Board, Total Economy Database (April 2022)

https://www.conference-board.org/data/economydatabase/

The Conference Board, Global Economic Outlook (October 2022)

https://www.conference-board.org/topics/global-economic-outlook

The Productivity Institute

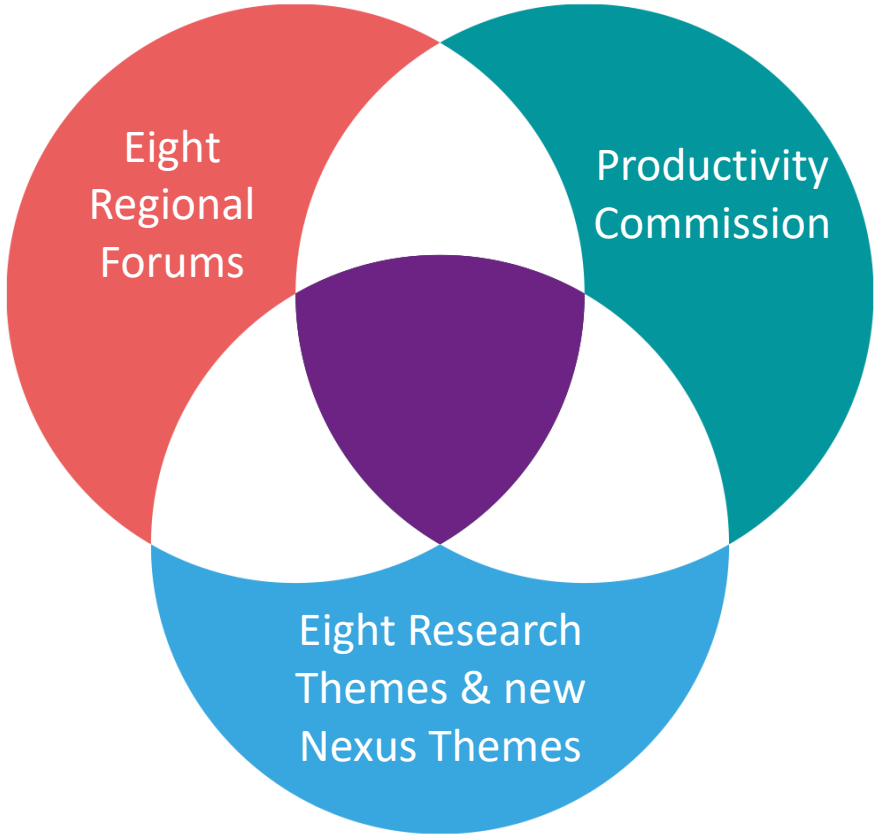
TPI'S MISSON AND HOW WE ARE GOING TO ACHIEVE THIS

Lay the foundations for an era of sustained and inclusive productivity growth and help policy makers and business leaders across the UK understand how to improve productivity and raise living standards

Interdisciplinary approaches

Interaction between research, policy and business

Develop a clear narrative around productivity



Make link to business competitiveness

Identify regional specificities

Make link to access to education, health, and a better environment "

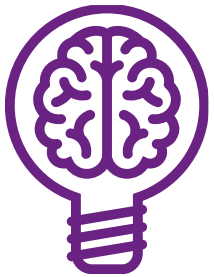
Solving the Productivity Puzzle requires getting many things right

THE PRODUCTIVITY INSTITUTE

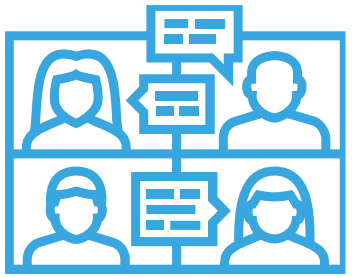
UKRI Economic and Social Research Council

Invest in people, ideas and your organisation

Human capital



Knowledge capital



Organisational capital

Leverage power of place

Geography and place

Macroeconomic trends and policy

Institutions and governance

Collaborate

Measurement and methods

Measure success

Social, environmental and technological transitions

Focus on the big picture