Are intangibles running out of steam?

Is the Rise in Intangible Investment Intensity and Productivity Growth Getting Disconnected?

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April 2023

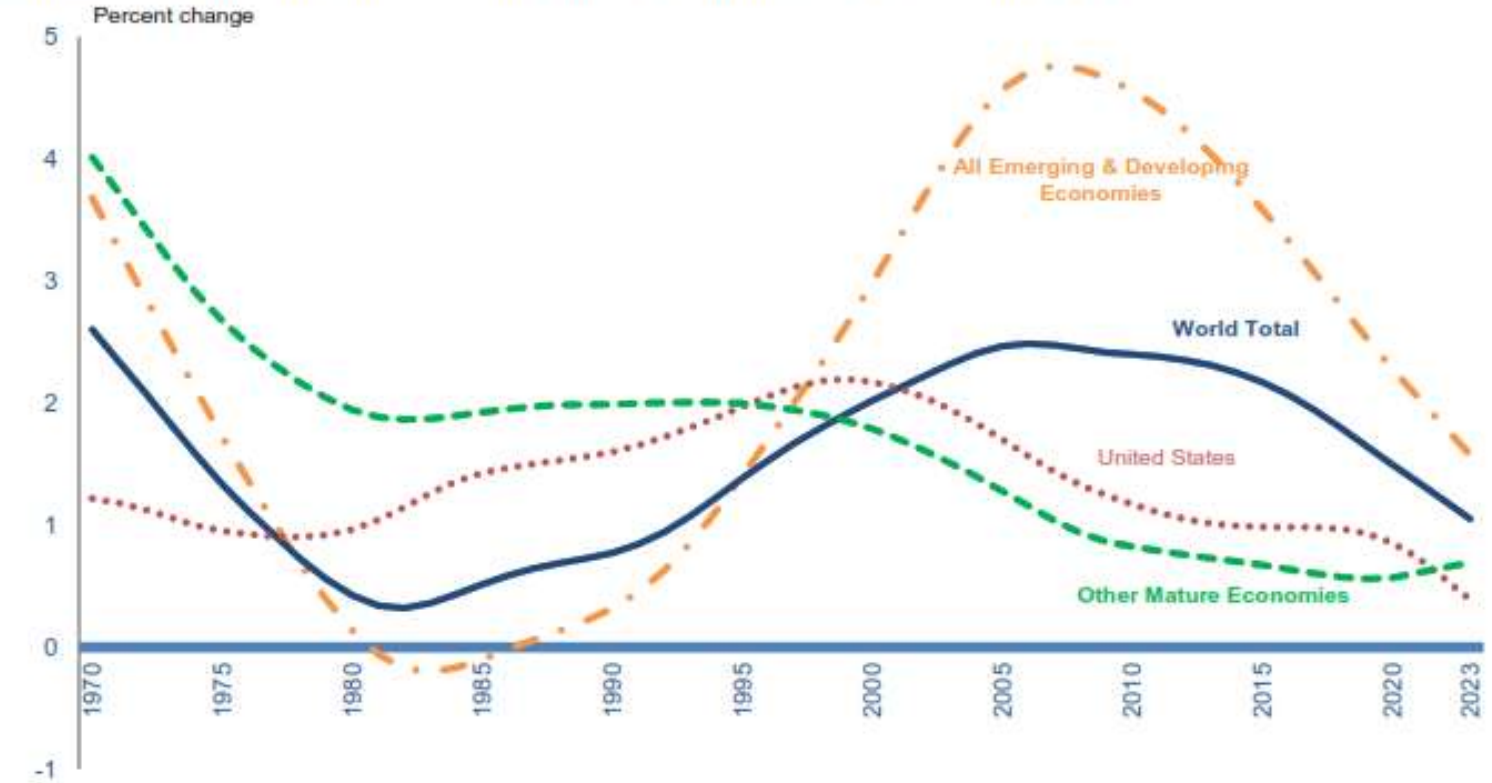
Agenda

- Current state of global productivity slowdown
- Why intangibles matter for productivity
- But … are intangibles running out of steam?

The answer is – as always – subtle and depends on what exactly you are looking at

The slowdown in the productivity trend is now almost two decades long

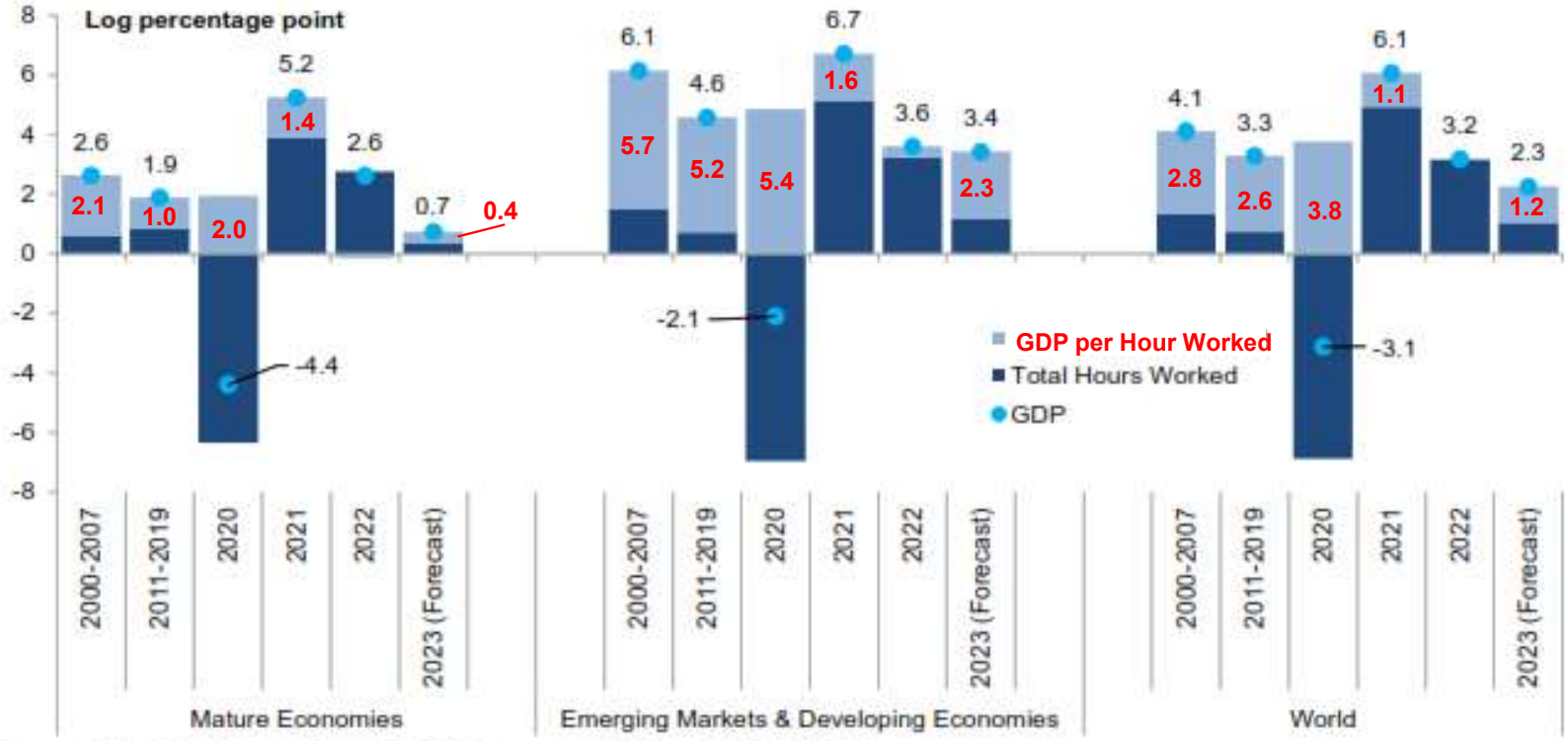
CHART 1: Trend growth of GDP per Person Employed using HP filter, Major Regions, 1970-2023



Source: The Conference Board Total Economy Database™ April 2023. (preliminary estimates)
Notes: Trend growth rates are obtained using HP filter, assuming lambda=100.

Most recent date point at a return to trend

Contribution of Growth of Labor Productivity and Total Hours Worked to GDP growth, Major Regions, 2000-2023



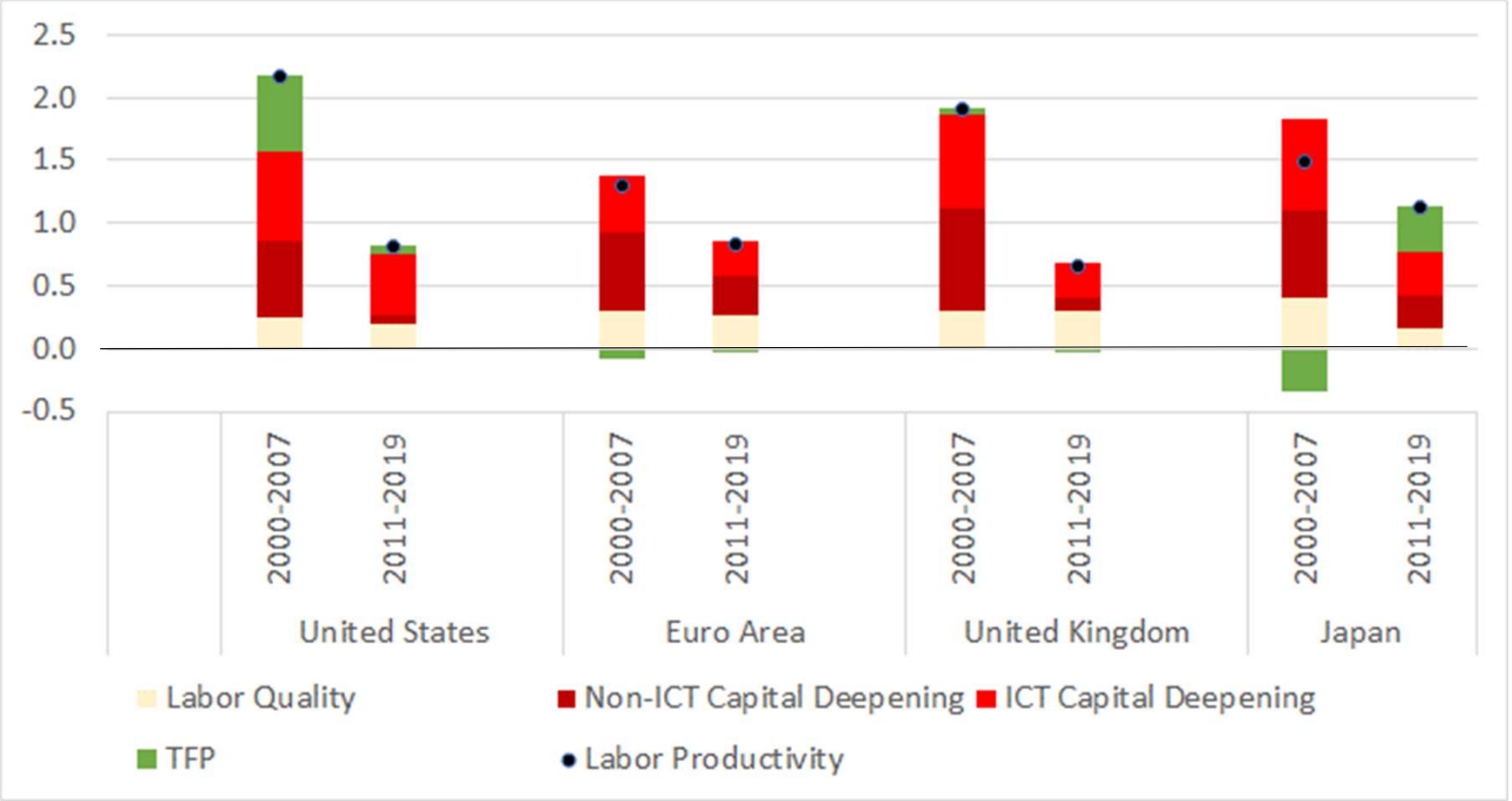
Source: The Conference Board Total Economy Database™ April 2023. (preliminary estimates)
Note: **Mature Economies** include Australia, Canada, European Union (27), Iceland, Israel, Hong Kong, Japan, South Korea, New Zealand, Norway, Singapore, Switzerland, Taiwan, United Kingdom and United States
Emerging Markets and Developing Economies include all other countries.

Causes of the global productivity slowdown

- Exacerbating effects from the ***global financial crisis*** (slow demand, weak investment, 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 cost-disease")
- ***Demographics***: ageing population, declining labour supply and weakening demand
- ***Structural policy effects***: regulatory effects, lack of competition, slowing global trade, FDI, supply chains, stagflation
- ***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
- ***Transformational challenges:*** climate crisis, aging, inequality (distribution of gains and access to sources of productivity growth)

Is the slowdown primarily due to investment or total factor productivity? A tricky question depending on HOW and WHAT you count

Contribution of ICT and non-ICT Capital Deepening, TFP and Labor Quality to growth in GDP per hour worked, 2000-2007 and 2011-2019



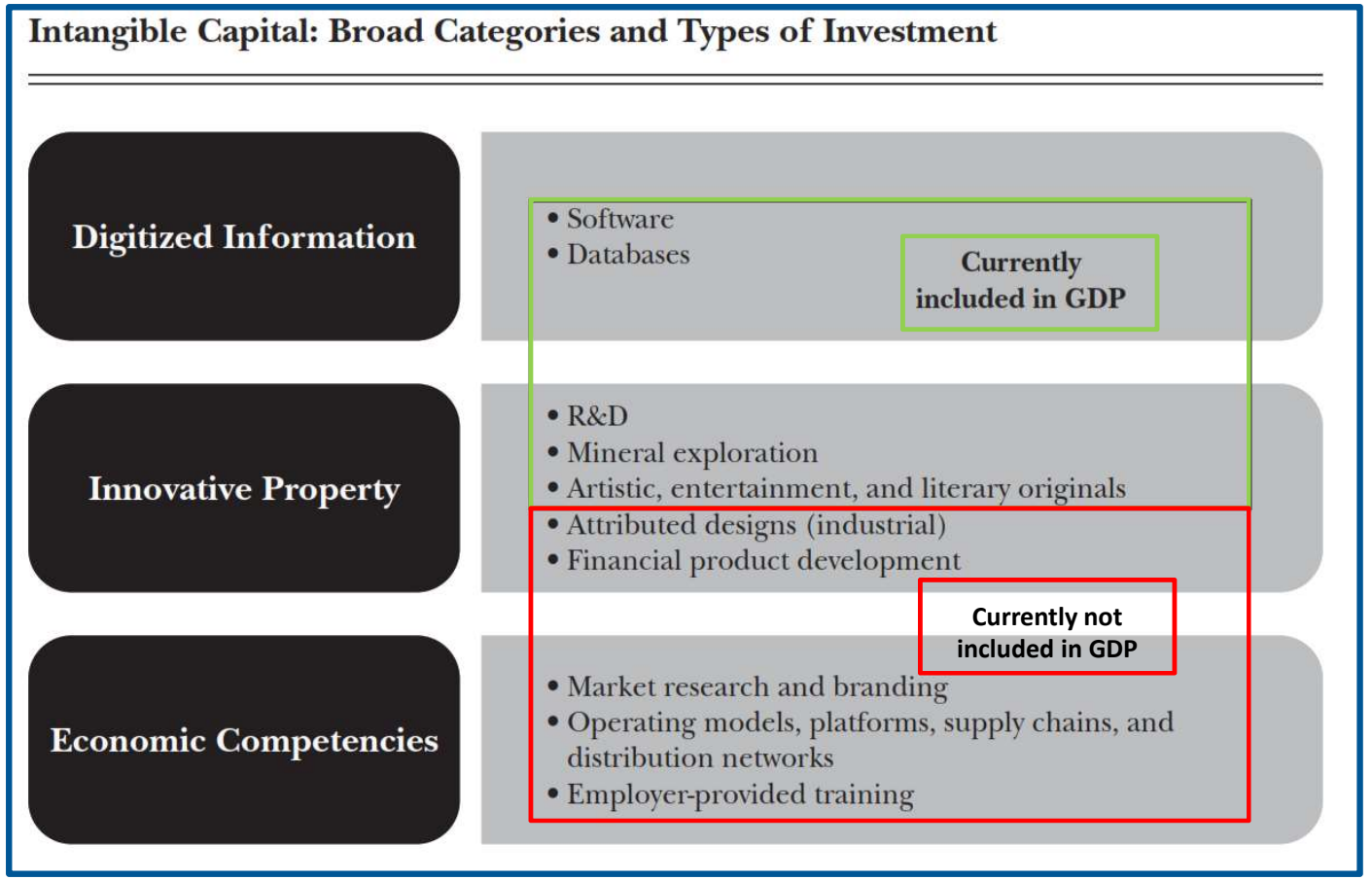
Source: The Conference Board, Total Economy Database (preliminary version)

Investment focus requires a broad based perspective including intangible capital

- Intangibles have become increasingly important (Corrado, Haskel, Jona-Lasinio, Iommoi, 2022a)
  - Spillovers (Corrado, Haskel & Jona-Lasinio, 2017; Haskel & Goodridge, 2018)
  - Complementarity (synergies) of intangibles (Brynjolffson, Rock & Syverson, 2021)
  - Data as an asset (Corrado et al., 2022b)
- But are intangibles contributing as much to productivity as they did before?
  - Some indications that the pace of intangibles capital accumulation has slowed since GFC (e.g. Haskel & Westlake, 2022)
  - "Ideas are getting harder to find" hypothesis (Bloom et al., 2020) and a fall in spillovers (Corrado et al. 2022a)
  - Is Brynjolfsson J-curve (slower impact now, bigger later) a matter of time or measurement?
  - Is the slowdown in globalisation (incl. finance) reducing the global spillovers from intangibles?
  - Greater difficulties to get productivity from complementarities of tangible and intangible assets?

ARE INTANGIBLES RUNNING OUT OF STEAM?

Intangibles are only gradually being recognized in our statistics



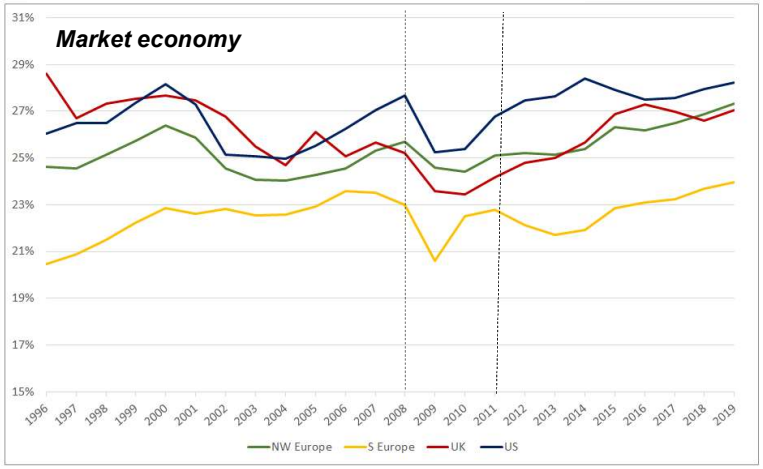
Source: Corrado et al., Intangible Capital and Modern Economies, *Journal of Economic Perspectives*, 36(3), 2022

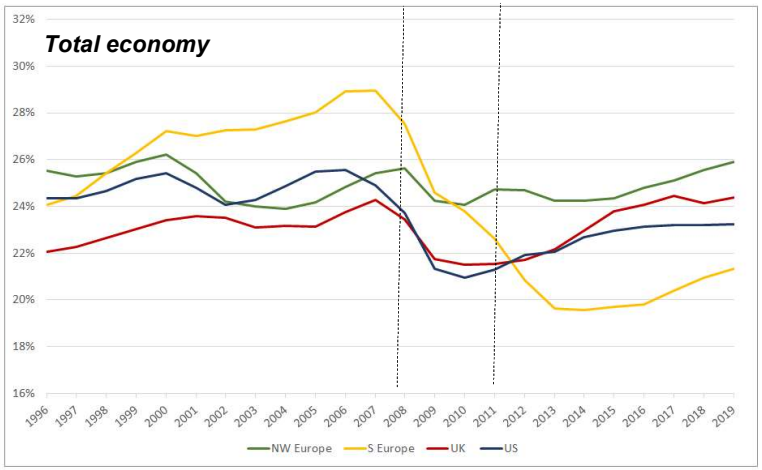
EUKLEMS-INTANProd (2023 version) combined traditional growth accounts and intangibles

- We stress-tested the new EUKLEMS & INTANProd - Release 2023:
  - Source: https://euklems-intanprod-llee.luiss.it/download/
  - Source documentation: Bontadini. F, C. Corrado., J.Haskel., M.Iommi., C.Jona-Lasinio, EUKLEMS & INTANProd: industry productivity accounts with intangibles, LUISS, February 2023.
- We looked at tangible & intangibles (NA share of GDP, real intangibles growth, and contributions to labour productivity growth
- We look at four regions/countries (calculate size GDP of total group):
  - Northwestern Europe (AT, BE, DE, DK, FI, FR, NL, SE),
  - Southern Europe (EL, ES, IT, PT),
  - UK
  - US
  - [Eastern Europe excluded from our calculations for now]
- Aggregate, intangible asset and sector decomposition (mainly focus on market sector)
- Focus largely on 1996-2007, 2008-2010 (GFC period) and 2011-2019

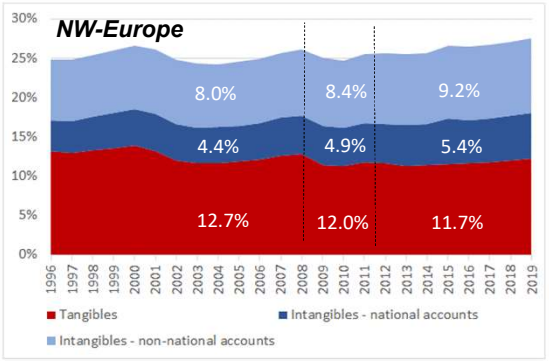
Tangible investment shares dropped while intangibles shares increased

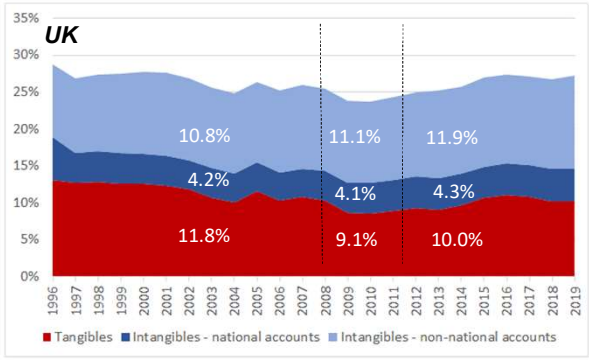
Panel A: Investment/GDP (tangibles + intangibles), % share

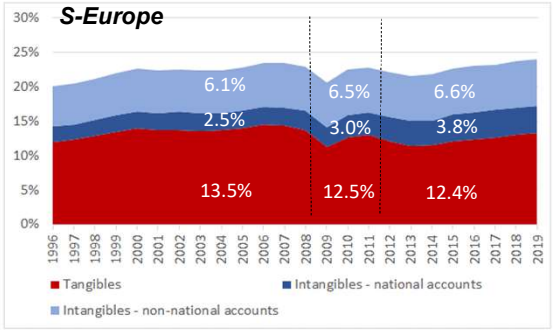


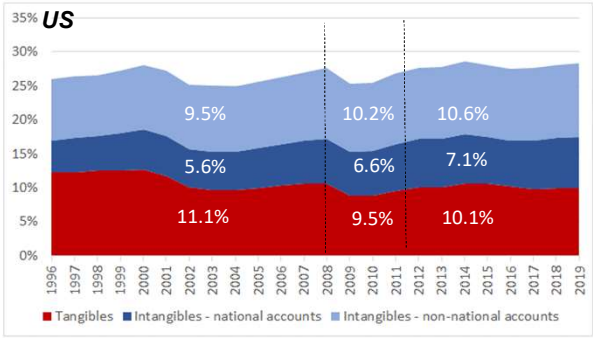


Panel B: Investment/GDP (tangibles, NA intangibles, non-NA intangibles), % share, market economy





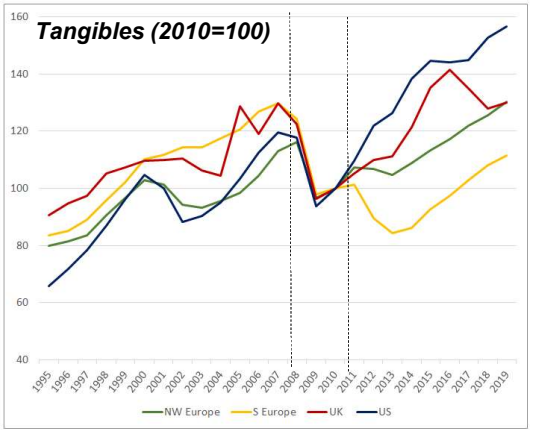


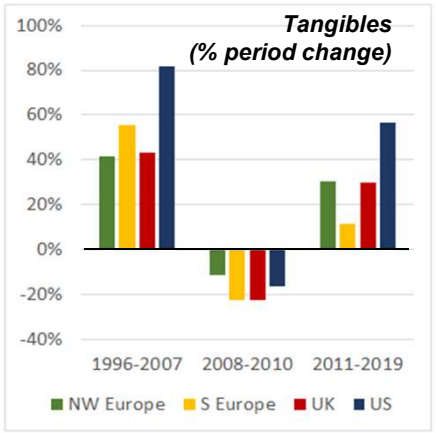


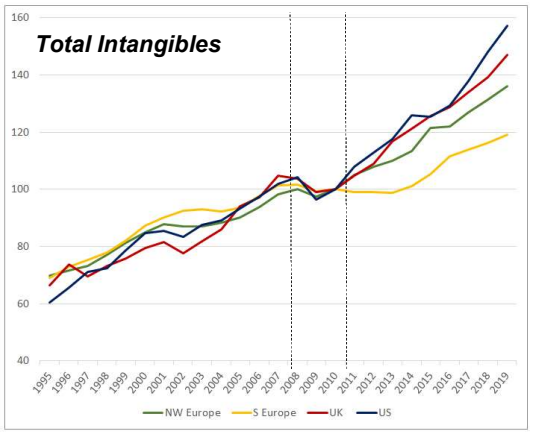
Note: Northwestern Europe (AT, BE, DE, DK, FI, FR, NL, SE), Southern Europe (EL, ES, IT, PT)
Note: country aggregation for six countries based on GDP PPPs to convert investment and value added into a common currency.
Source: EUKLEMS & INTANProd - Release 2023; authors' calculations

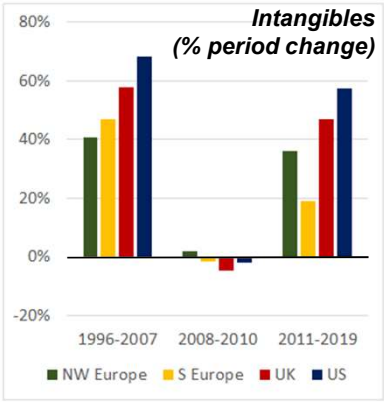
Increase in both *tangible* and *intangible investment volumes* & *capital services* stagnated or slowed after GFC, but tangibles clearly more

Panel A: Real Investment, market economy (2010=100 & % period change)



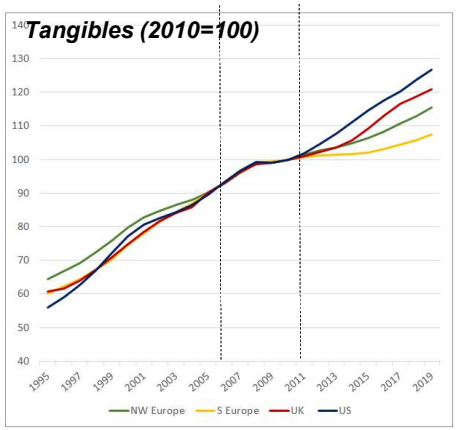


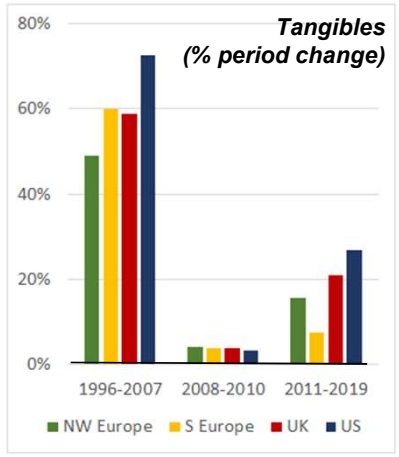


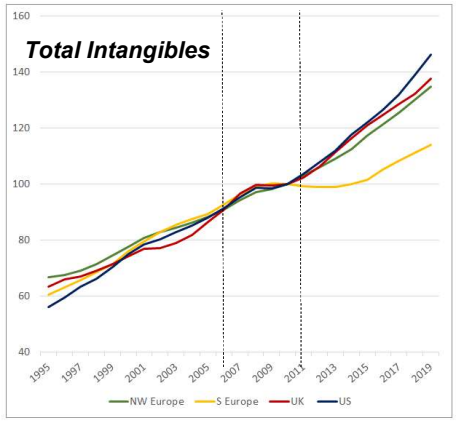


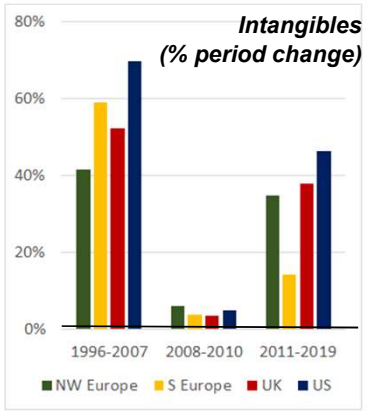
Source: EUKLEMS & INTANProd - Release 2023; authors' calculations

Panel B: Capital Services, market economy (2010=100 & % period change)



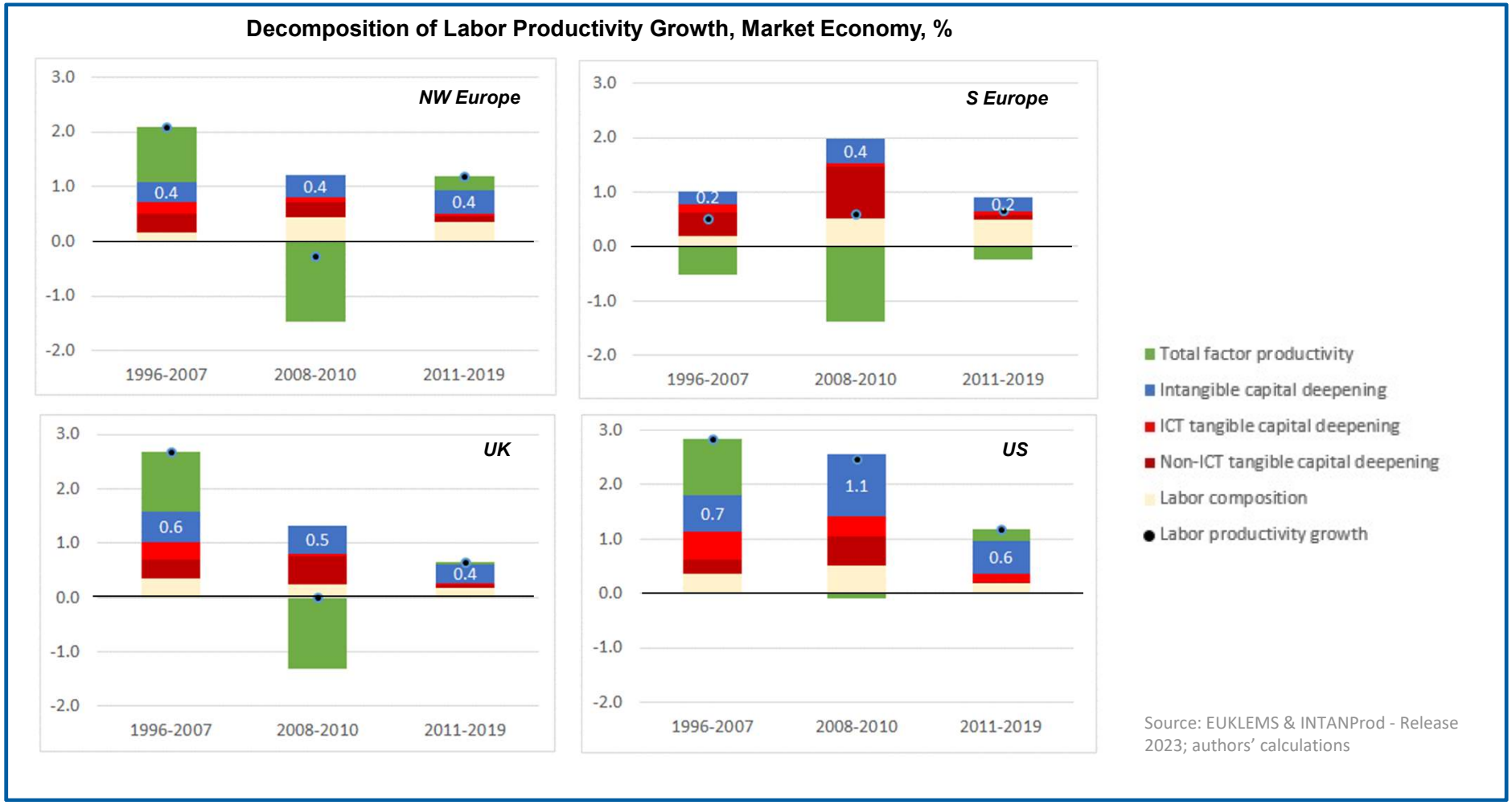






EUKLEMS & INTANProd - Release 2023; authors' calculations

In addition to slower tangible capital deepening and weakening TFP, the contribution of intangible capital deepening to labor productivity growth has also stagnated or slowed



Most weakness in intangible capital services growth in Services Sector (especially Information & Communication Services and Finance & Insurance); More mixed picture in Manufacturing, incl. ICT Production

Growth differential in intangible capital services, Non-Agr. Market Economy, 2011-2019 minus 1996-2006

		NW-EU	S-EU	E-EU	UK	US
MARKTxAG	Non-agricultural market economy (Market economy less industry A)	+/-	--	-	+/-	+/-
B	Mining and quarrying	++	-	++	+/-	+
C	Manufacturing	+	-	+	++	+/-
C26-27	Computer, electionic, optical products, electrical equipment	+/-	-	--	++	--
D-E	Electricity, gas, steam; water supply, sewerage, waste management	++	+	+	++	+/-
F	Construction	++	--	--	+/-	++
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	+/-	--	--	+	+
H	Transportation and storage	+/-	--	-	++	++
I	Accommodation and food service activities	+/-	--	+	++	--
J	Information and communication	--	--	--	-	--
K	Financial and insurance activities	-	-	--	--	--
M-N	Professional, scientific and technical activities; Admin & support services	-	--	+/-	+/-	-
R-S	Arts, entertainment and recreation; Other service activities	-	--	+/-	+/-	+/-

Note: The table shows the difference between average annual growth of the 2011-2019 period versus the 1996-2006 period

++ sign indicates a %-pt difference of above 1.5; + sign indicates a %-pt difference of between 0.5 and 1.5;
+/- sign a ppt difference of between -0.5 and 0.5; - sign between minus 0.5 and 1.5; -- sign more than minus 1.5.

Decomposing the sector contributions – two taxonomies

Intangible intensity taxonomy:

- Based on intangible investment share in GVA
- 1= most intensive (two lowest quartile values); 2= least intensive (two highest quartile values)
- Average based on simple average of intangible investment shares across all countries (excl. UK-GH)
- Distribution is +/- 50-50% in terms of value added

Digital intensity taxonomy:

- Based on OECD taxonomy used by Van Ark, Erumban and de Vries (2019)
- Separated out digital producing sectors

1 – most intensive

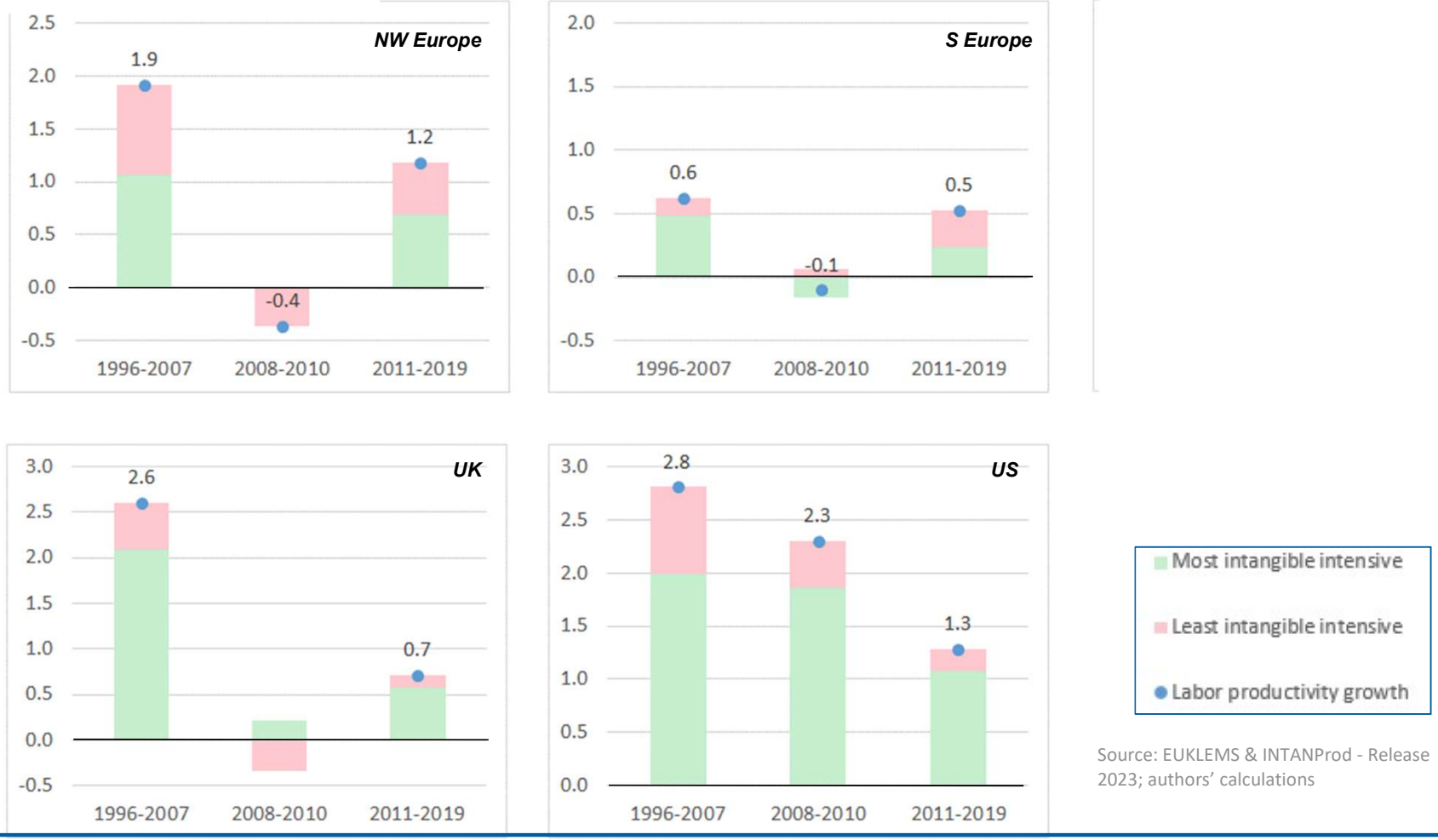
2 – least intensive

3 – digital producing

	Intangible intensity	Digital intensity
B-Mining and quarrying	1	2
C10-C12-Manufacture of food products; beverages and tobacco p	1	2
C13-C15-Manufacture of textiles, wearing apparel, leather and re	2	2
C16-C18-Manufacture of wood, paper, printing and reproduction	2	1
C19-Manufacture of coke and refined petroleum products	1	2
C20-C21-Chemicals; basic pharmaceutical products	1	2
C22-C23-Manufacture of rubber and plastic products and other n	1	2
C24-C25-Manufacture of basic metals and fabricated metal produ	2	2
C26-C27-Computer, electronic, optical products; electrical equipm	1	3
C28-Manufacture of machinery and equipment n.e.c.	1	1
C29-C30-Manufacture of motor vehicles, trailers, semi-trailers an	1	1
C31-C33-Manufacture of furniture; jewellery, musical instrument	1	1
D-Electricity, gas, steam and air conditioning supply	2	2
E-Water supply; sewerage, waste management and remediation	2	2
F-Construction	2	2
G-Wholesale and retail trade; repair of motor vehicles and motor	2	1
H-Transportation and storage	2	2
I-Accommodation and food service activities	2	2
J-Information and communication	1	3
K-Financial and insurance activities	1	1
M-N-Professional, scientific and technical activities; administrativ	1	1
R-Arts, entertainment and recreation	2	1
S-Other service activities	2	1

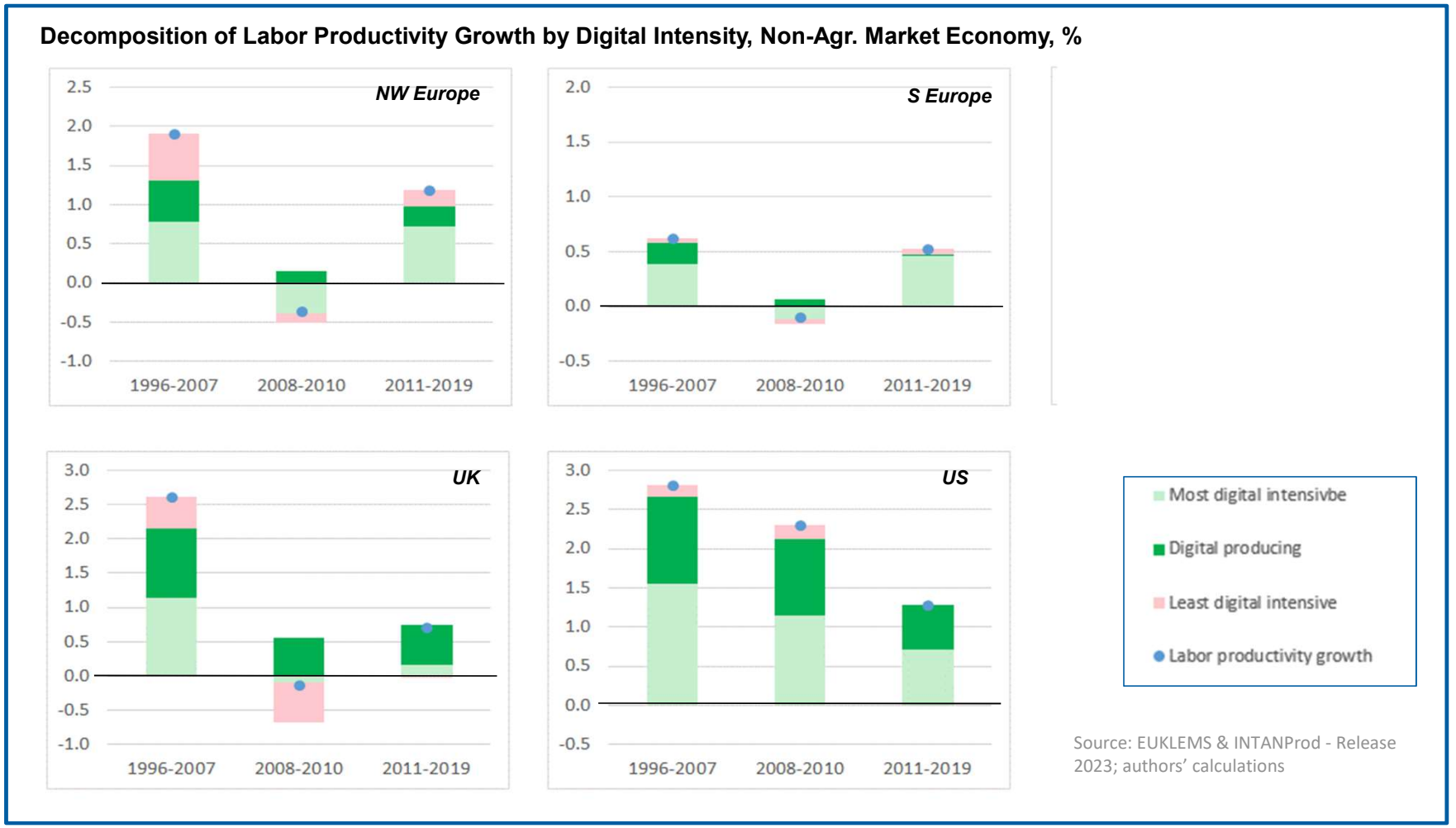
Intangible intensive sectors account for largest part of productivity growth, but also play a big role in the productivity slowdown

Decomposition of Labor Productivity Growth by Intangibles Intensity, Non-Agr. Market Economy, %



Source: EUKLEMS & INTANProd - Release 2023; authors' calculations

Digital intensive and producing sectors do account for lion share, but again their contribution is falling in absolute terms



ARE INTANGIBLES RUNNING OUT OF STEAM?
Intangibles keep contributing more to productivity growth but also account for part of the slowdown

- **Productivity growth has not increased as rapidly recently** as it did when tangible capital intensity was the main driver of growth
- In **relative terms** (i.e., as a % of slower productivity growth), the contribution of intangibles to productivity growth has increased
- But productivity contribution of intangibles stagnated or slowed in **absolute terms**.
- The positive contribution of intangible capital to productivity growth has **not been sufficient to make up for the decline** in the contribution of tangible capital
- Prelim econometric evidence supports the notion of **slowing impact from intangibles** on labour and total factor productivity growth.
- The role of **intangible and digital intensive industries** in strengthening productivity is mixed
- The slowdown in TFP growth suggests that the effects of spillovers from particular investments and complementarities between those investments have weakened

Areas for further work

- **Measurement** remains an issue, especially for intangibles-intensive industries, and stress-testing the EUKLEMS-INTANProd database is a priority
- Is this the **digital productivity paradox** all over again? How to interpret the Brynjolfsson J-curve?
- Econometrics should provide more evidence on the **channels through which intangibles is impacting on the slowdown in TFP**, for example (Corrado et al. 2022):
  - Directly through a reduction in spillovers from less intangible capital deepening
  - Indirectly as increasing returns are slowing, e.g. due to a fall in competitive intensity
  - Some forms of intangible capital (e.g. data) are increasingly trade protected – more rival.
- More analysis on i**ndustry-by-industry** case basis. For example, have some countries or industries "over-intangibilised" in pre-GFC period, and are others still catching up?
- **Weakening of institutions** around intangibles (e.g. science, technology and innovation institutions, the design of financial markets and policies, and competition) (Haskel and Westlake, 2022)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