



Labour Productivity Indicators: latest progress in Eurostat

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Joint
Research
Centre

In this presentation, we show some highlights on the works performed during the last couple of years by the Joint Research Centre of the European Commission in cooperation with Eurostat.

In this presentation...

- 1 Proposal for a new portfolio of Labour Productivity Indicators for Eurostat
- 2 Comparability issues
- 3 Makes any difference to consider the composition of the workforce?
- 4 Looking at the Digital Economy
- 5 Conclusions

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1. Proposal for new portfolio of LPIs for Eurostat



Dimensions of new LPIs



Variable	Description
D1_SAL_	Relative Compensation
NLPR_	Nominal labour productivity
RLPR_	Real labour productivity
NULC_	Nominal unit labour cost
HW_POP	Labour utilisation
PER_POP	Activity rate
HW_PER	Labour intensity

Breakdowns	Description
NUTS	0, 2, 3
NACE	TOT, A*10, A*21, A*38, A*64

Variables	Units
B1GQ, B1G	CUP / CLV / PPS
EMP, ESE, EME	PER / HW
POP	PER
B1G'	g_CLV

Trans.	Description
Level	Levels
GRW	Growth (Rate t-1, t-3, t-5 or index)
%EU	EU = 100

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The potential new indicators become from two sources:

- Exploring further combinations of the breakdowns, units and transformations of the indicators currently published
- Incorporating indicators based on Population.

We only considers Value Added (GVA) based indicators disregarding output based indicators. Despite in ESA2010 productivity is “measure of output from a production process, per unit of input”, GVA based indicators are more suitable for comparison across industries. Moreover, the increasing outsourcing and slicing of Global Value Chains make that output based indicators tend to be meaningless as the output of one industry can be almost completely based on inputs from other industries/countries.

Despite indicators per HW are theoretically superior, indicators by PER are also considered because beyond A*21 coverage for HW decreases dramatically and because the doubts on the comparability of HW that we will discuss later.

Priority areas are:

- The expansion of PPS and even CLV PPS indicators
- Indicators of labour utilisation/intensity
- t-3 and t-5 relevant for trends and comparability

Proposal for new portfolio of LPs for Eurostat

INDICATOR	AGG	level				%EU		Growth	
		CP	CP-PPS	CLV	CLV-PPS	PPS_CP	PPS_CL	CP	CLV
Compensation per employee	TOT	✓	✓			✓			
	NUTS2	+	+			+			
Compensation of employees per hour worked	TOT	✓	✓			✓			
Real Labour productivity per person employed	TOT			+	+		+		✓
	A*21								+
Real Labour productivity per hour worked	TOT								✓
	A*21								+
Real GDP per capita	TOT			✓	+		+		✓

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✓ shows current availability in Eurobase, + indicates proposed new indicator

We propose to add industry and regional granularity to some already existing indicators.

On the other hand, we propose new transformations not existing in Eurobase as PPS-CLV.

Proposal for new portfolio of LPIs for Eurostat

INDICATOR	AGG	level				%EU		Growth	
		CP	CP-PPS	CLV	CLV-PPS	PPS_CP	PPS_CLV	CP	CLV
Nominal GDP per capita	TOT	✓	✓			✓			
	NUTS2	+	+			✓			
	NUTS3					✓			
Nominal labour productivity per person employed	NUTS2					+			
	NUTS3					+			
Nominal labour productivity per hour worked	NUTS2					+			
Nominal unit labour cost based on hours worked	TOT							✓	
	A*21							+	
Nominal unit labour cost based on persons	TOT							✓	

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✓ shows current availability in Eurobase, + indicates proposed new indicator

Despite we focus in CLV-based indicators, we include nominal indicators where CLV are not available (regional) but also because some users are interested on them.

Proposal for new portfolio of LPIs for Eurostat

INDICATOR	AGG	level	%EU	Growth
Activity rate	TOT	+	+	+
	NUTS2	+	+	+
Labour utilisation	TOT			+
	NUTS2			+
Hours worked per person employed	TOT	+	+	+
	A21			+
	NUTS2	+	+	+
	NUTS2 A*10			+

LPIs portfolio widely expanded!

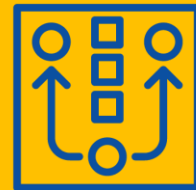
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✓ shows current availability in Eurobase, + indicates proposed new indicator

We propose to add new indicators based on population which are completely new in Eurobase.

2. Comparability issues



Some reasons for disregarding LPIs



Meaningless indicators

- i.e. Nominal LPIs in GRW

Lack of data

- HW and CLV, D1 in regional data or mixed income
- PPS by Industry
- Jobs

Regional data by population

- Cross-border commuters

Non market sectors

- Avoid some industries (only B-K+MN)

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Icon credits: <https://www.flaticon.local/authors/freepik>


Meaningless indicators: i.e. Nominal LPIs in GRW because growth contaminated by prices effects which jeopardises comparability.

Lack of data

- HW, D1 and CLV in regional data, or mixed income not available in ESA 2010 TP
- PPS by Industry are only experimental
- Jobs coverage is rather low

Regional data by population: Cross-border commuters: people working in a territory different of their one of residence which compromises comparability in regions with large daily flows of workers like major hubs/capital cities.

Non market sectors: given that ESA 2010 TP do not comprises institutional accounts by industry, a pragmatic solution is to avoid some industries and restrict publication to only B-K+MN NACE sections




Issues in the comparability of Persons

Levels not comparable across industries (but only growth): secondary activities

Jobs? FTE?

Regional data (3 countries)

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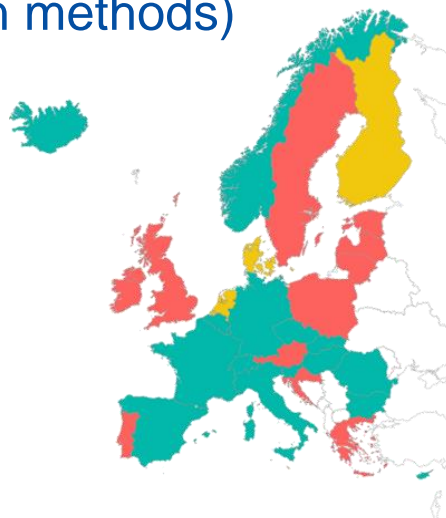
Workers in secondary activity are not recorded as PER, but their HW are. This creates distortions in HW/PER at the industry level.

PER is not suitable for cross industry comparisons. Maybe Jobs is better but a worker can have multiple jobs within a single industry (i.e. a waiter working in secondary activity in more than one restaurant) and preferably FTE.



Hours Worked (main methods)

Method	Based on Hours	Absences	Adjustment needed
Direct Method	Actual	Self reported	Significant
Other Methods			
Component Method	Usual	Modelled	Modelled



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Source: Own elaboration based Ward, Zinni and Mariana (2019)

DM: Annualizes Actual Hours adjusting it with self-reported data on absences.

CM: Annualizes Usual Hours adjusting it with statutory data on absences.

Countries using **DM** tend to report more HW/PER than countries using **CM**

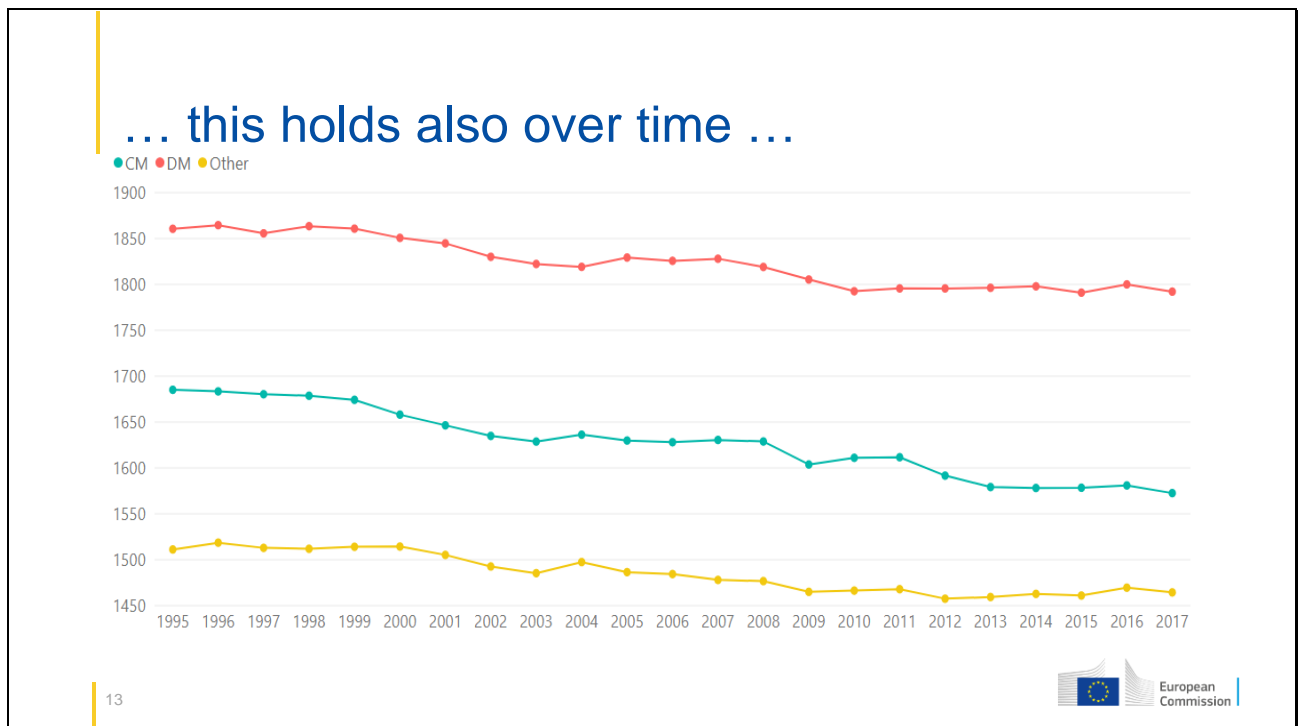


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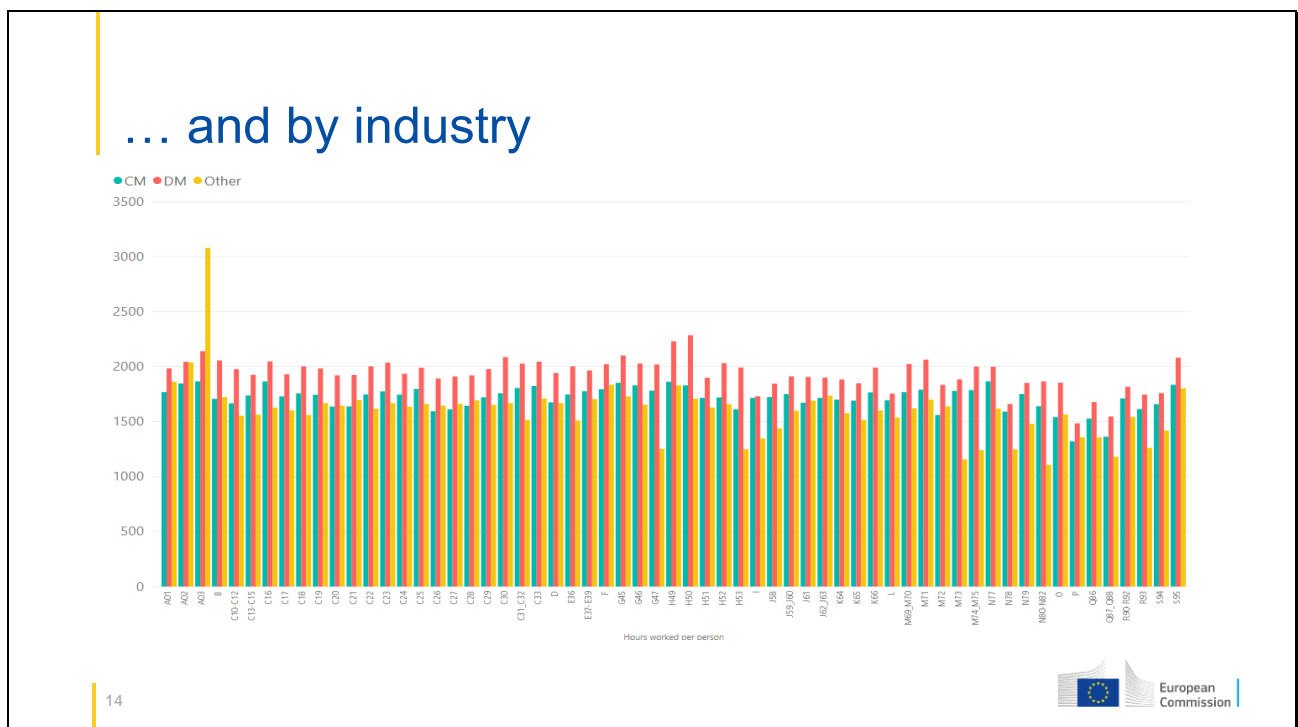
Source: Own elaboration based Eurobase

Most red in the left show largest gap are for DM countries



Source: Own elaboration based Eurobase

Generalized decreasing trend in HW/PER with exception to explore with countries NSIs



Source: Own elaboration based Eurobase

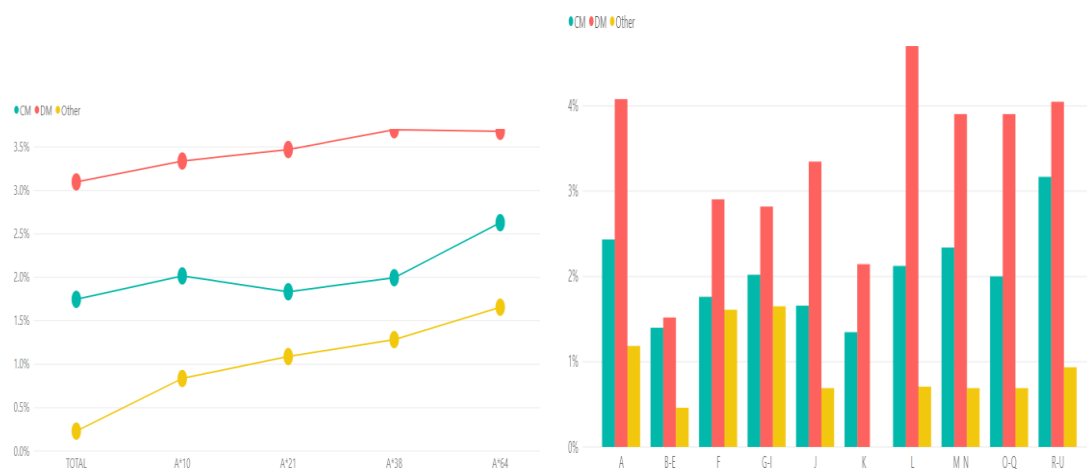
High HW/PER in some industries misleading due to high share of workers in secondary activity
(Outlier: A03 In FI)

Comparing the distributions of LPIs

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Deeper industrial breakdown imply more outliers but not concentrated in specific NACE



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Source: Own elaboration based Eurobase

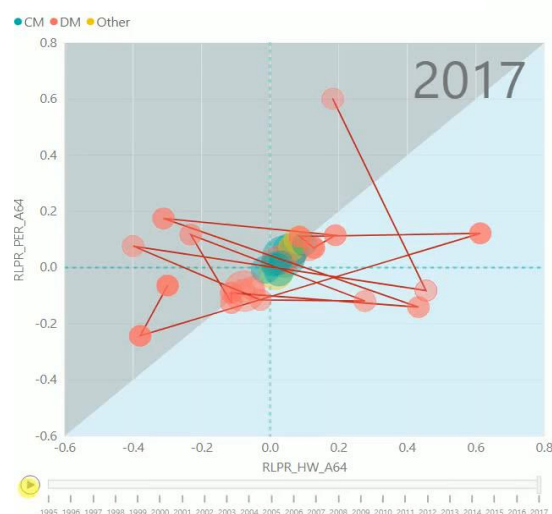
Non-mirrored outliers: outlier in LPI_HW vs outlier LPI_PER

Comparative Dynamics of LPIs

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Similar development of LPIs



Most cases
behave similarly
(main diagonal)

More diverging
cases in **DM**
countries

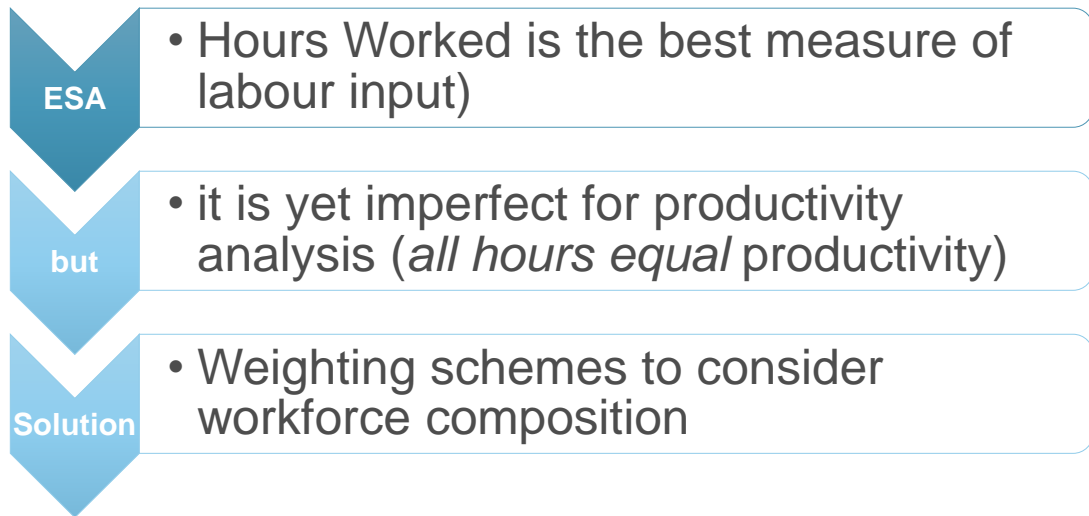
Exc. one country
it is a geo-nace
specific issue

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Source: Own elaboration based Eurobase

This happens in several specific-industries and in one country for most industries.
The example is C22 - Manufacture of rubber and plastic products



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Quality-Adjusted Labour Input (experimental statistics)

Törnqvist Index

Age	Skill
15-29	High (ISCED97= 0-2)
30-49	Medium (ISCED97= 3-4)
50+	Low (ISCED97= 5-6)

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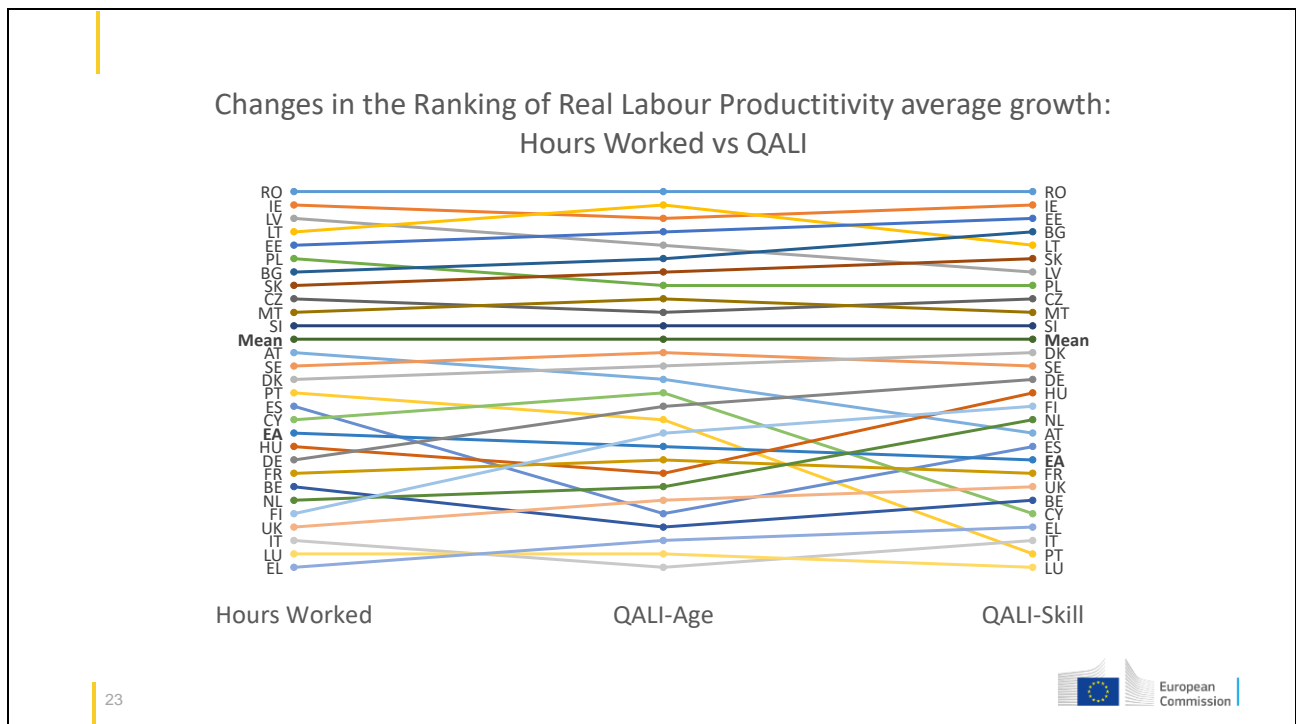


3. Makes any difference to consider the composition of the workforce?



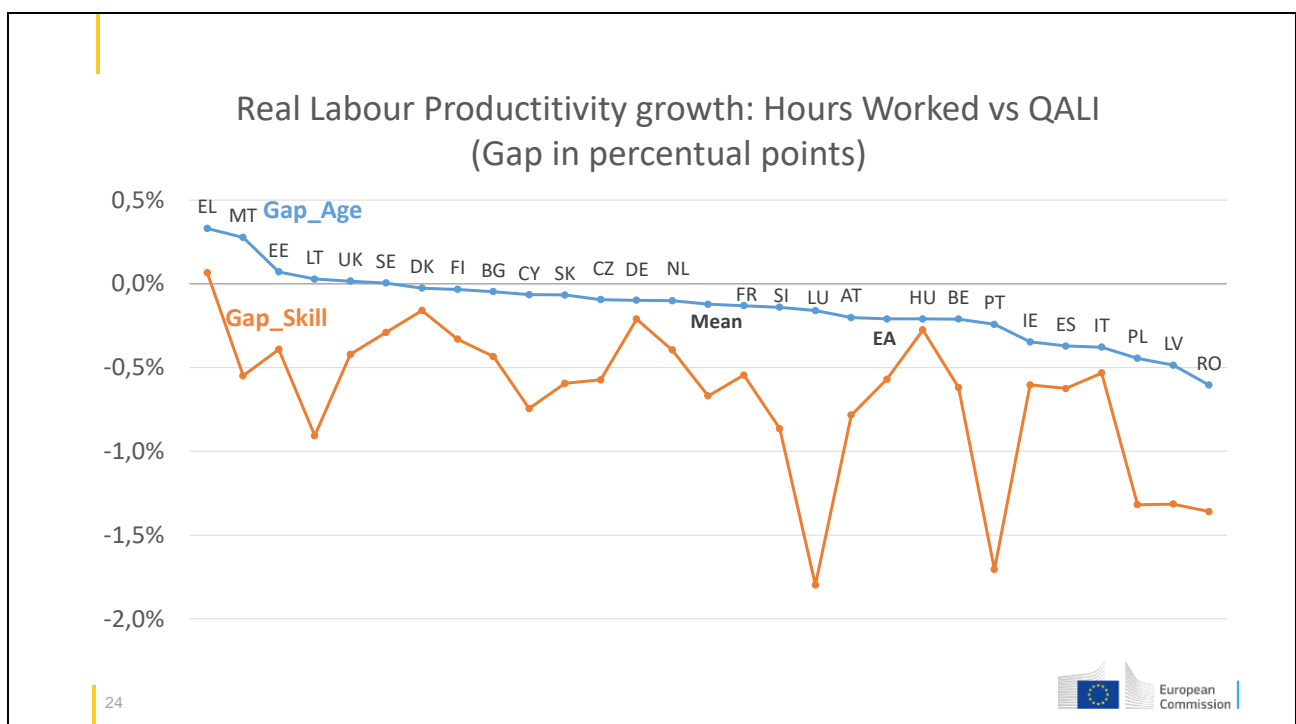
Source: teaser of a paper to be presented on 16 March 2021 in 6th WorldKLEMS conference

We compare the growth of Real Labour Productivity per Hour Worked with the same indicator based on Hours Worked adjusted by QALI Age or Skill and we look at the gap.



Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>

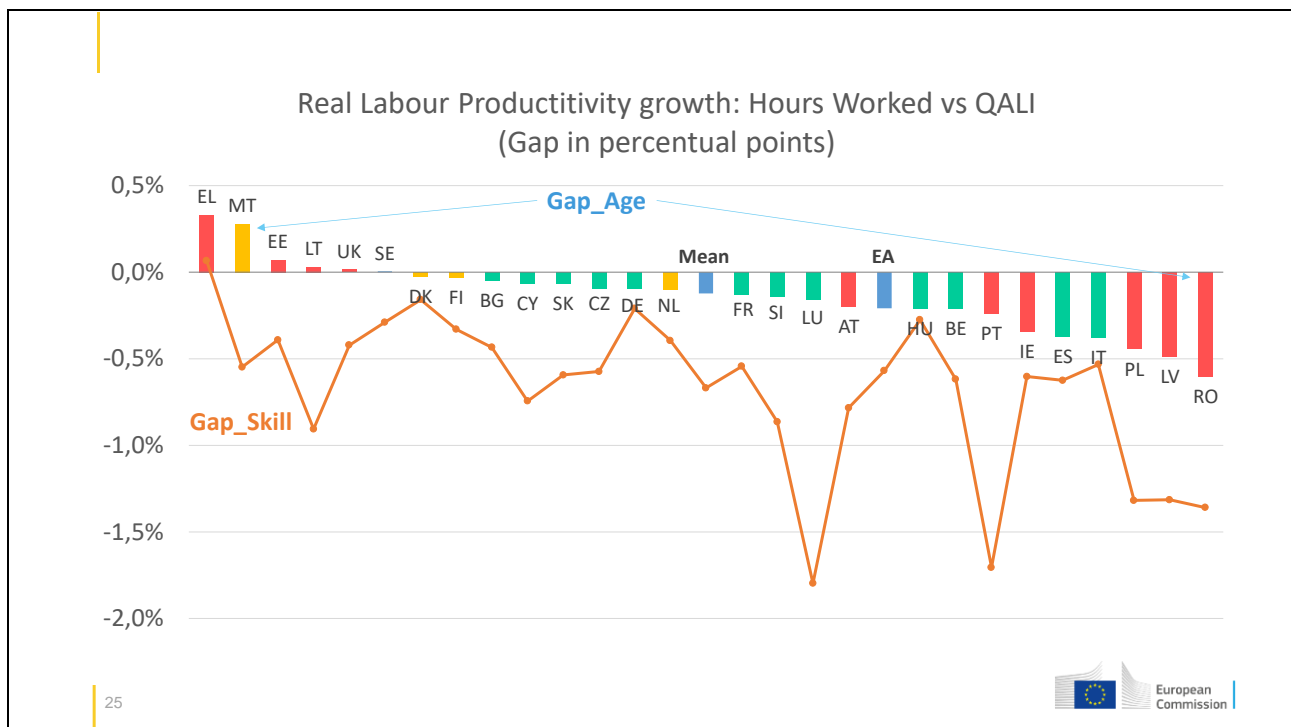
Rankings change, specially in top and bottom



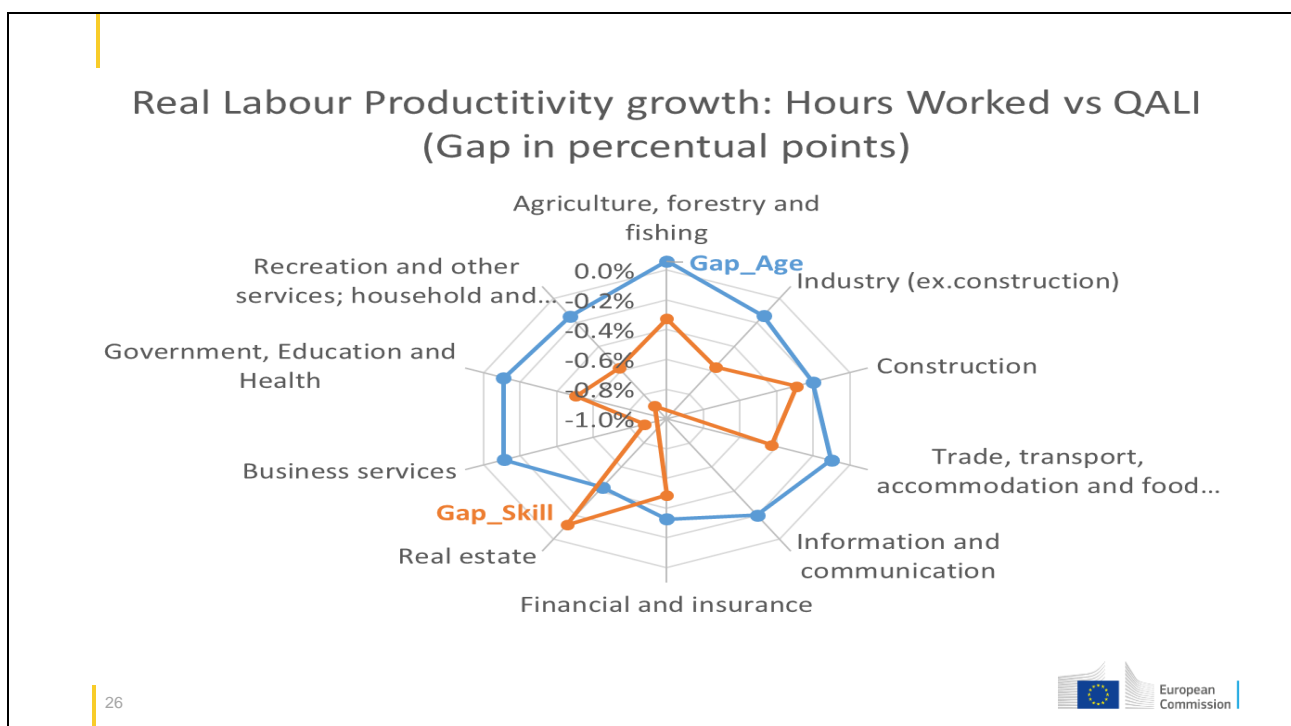
Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>

Gap_Age is smaller than Gap_Skill and this difference is country specific.

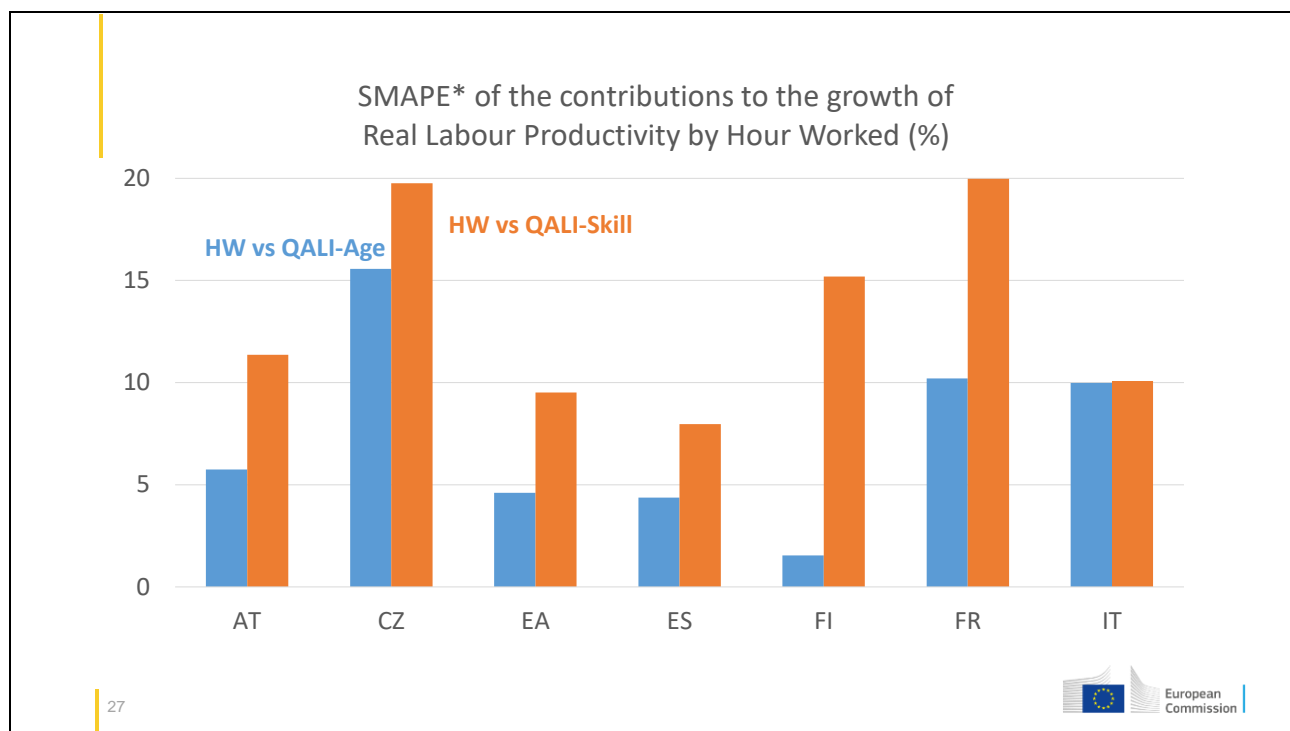
Gap is mostly negative, this is HW tend to overestimate productivity growth.



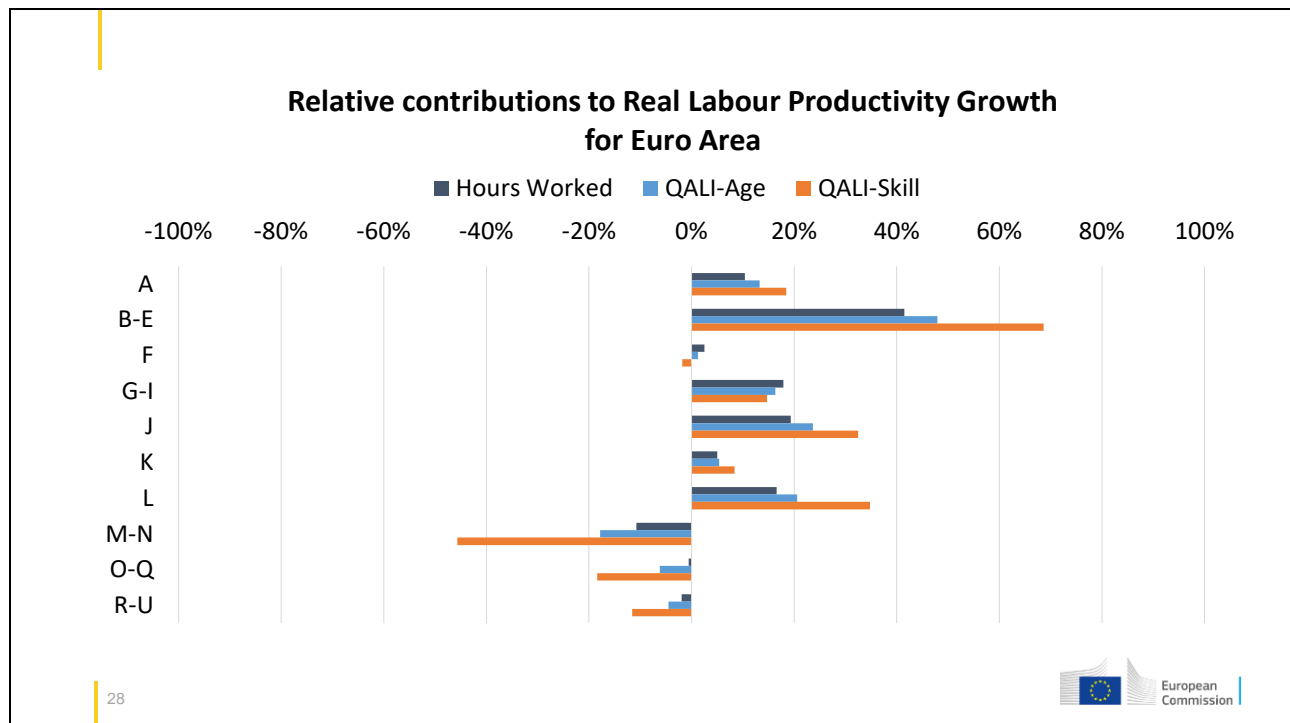
Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>
Gap_age correlated with Methods HW (largest absolute values are in DM countries -red)



Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>
Gap_Age is smaller than Gap_Skill and this difference is industry specific
Largest gap in ICT, business services and industry where a lot of high skilled people is working,
while the gap in construction is far smaller



Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>
 Industry contributions to growth change when considering QALI and labour force composition.
 The difference is larger considering skill than age. Difference in skill even change sign what drives the SMAPE to its maximum (20)



Source: Own elaboration based in Eurobase and <https://ec.europa.eu/eurostat/web/experimental-statistics/qali>

Industry contributions to growth change when considering QALI and labour force composition. Difference is mostly larger considering skill than age

4. Looking at the digital economy



Options for Digital QALI

Option	Skills	Scope	Data sources	Challenges	Pros	Cons
<u>Digital Skills</u>	Digital	Total of the economy	ICT surveys	ICT survey microdata: PER (not HW), income	Better to trace the impact digitalisation	Not useful to describe the 'Digital Economy'
<u>Digital Economy</u>	ISCED	'Digital Economy'	LFS, SES	Lack of NACE granularity to identify Digital Economy	Useful to describe the 'Digital Economy'	<ul style="list-style-type: none"> • Lack of source data • Restrictive approach

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Given data availability and purpose, we recommend to go for the Digital Skills option

5. Conclusions



Conclusions

Portfolio of Labour Productivity Indicators widely expanded

- Chain linked volumes
- Industry granularity
- New indicators

QALI suggests that HW overestimate productivity growth

- Skill produce more difference than Age
- Change ranking and contributions
- Method HW relevant for Age not so much for Skill

Comparability issues

- PER by industry: only growth
- HW: challenging. To be further investigated with NSIs
- Users should look at metadata

Digital Economy

Digital QALI based in digital skills

