EUROPEAN CONFERENCE ON QUALITY IN OFFICIAL STATISTICS 2024 ESTORIL - PORTUGAL

Results of a pilot study towards an early labour cost index: successes and failures in the multi-source Italian production system

Eleonora Cimino* cimino@istat.it
Maria Cirelli* cirelli@istat.it
Francesca Romana Pogelli* frpogell@istat.it (*presenter)
Donatella Tuzi* tuzi@istat.it
*Istat - Social Statistics and Population Census

INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

eurostat

The conference is partly financed by the European Union

The conference is partly financed by the European Union

Outline of the presentation

A new early indicator: the flash Labour Cost Index(**LCI**)

- Reasons and requirements ('LMI* Review' Task Force)
- Sources and data availability
- Different methodological approaches
- Results of the most promising solution
- Conclusions

*Labour Market Indicators(LMI)

The conference is partly financed by the European Union

Labour Cost Index (LCI):

- An official harmonized short-term quarterly indicator of the hourly total labour costs incurred by employers (Regulation (EC) n. **450/2003**).
- Published at EU/EA and country level trough Eurostat €-Indicators and DB
- For the **current official index**:
  - **Time delivery is *t*+70** days from the end of the reference quarter
  - Release at NACE Rev.2 section level and main aggregates (B to S sections)
- Laspeyres Chain Index of the ratios: $\frac{TLC}{HW}, \frac{WAG}{HW}, \frac{OTH}{HW}$

TLC is Total Labour Cost $= WAG + OTH$

WAG are wages and salaries

OTH the non-wage costs such as employer's social contributions

HW the number of hours worked

The conference is partly financed by the European Union

LCI is one of the Principal European Economic Indicators (PEEI):

- A key statistic for the assessment of the inflationary pressure caused by wage developments, i.e. from the production factor “labour”.
- Essential for the co-ordination of economic policies, the assessment of convergence and the conduct of monetary policy.

In 2019 Eurostat launched a pilot study on the feasibility of a flash estimate

Why?

→ To publish a “whole economy” European aggregate for the euro area and the European Union, based on a subset of flash countries.

→ Early availability (anticipating 25 days) is relevant for the European Central Bank, the European Commission and the Social partners involved in wage negotiations.

→ To integrate the already published flash statistics of labour market (job vacancy and unemployment) both form the demand and supply side.

The conference is partly financed by the European Union

Flash LCI quality background

Key quality aspects for the feasibility (fixed by the Task Force):

1. Accuracy of the European aggregates obtained from a subset of Member States ('flash countries');
2. Coverage of the total costs by the subset of 'flash countries' with respect to EU aggregate at t+45;
3. Accuracy of the LCI Flash estimates at country level.

For accuracy 1 3 comparing flash and final estimates in terms of y-on-y growth rates revisions

A precision target of 0.6 percentage point **on the wage component** was fixed as maximum revision value to consider figures releasable **at EA20 level**.

2 Criteria to be elected as 'flash country': share over 3% of employees in Euro Area Total.

Now **9 countries** contribute to the flash LCI (IT included)

The conference is partly financed by the European Union

Sources for regular LCI (t+70 days)

For **B-N** sections of NACE classification (business activities)

1 source: 'LES' census data (Large enterprises) **Monthly** WAG, OTH, HW, number of Jobs

2 source: 'OROS' almost complete admin data (Small and Medium enterprises) **Monthly** WAG, OTH, *number of Jobs*)

3 source: 'JVHW' sample data **Quarterly** per capita Hours Worked

For **O-S** sections of NACE classification (business + non business economy activities)

4 source: 'Quarterly National Accounts' ad hoc estimate (**Quarterly** totals of WAG, OTH and HW)

The conference is partly financed by the European Union

The LCI compilation into the Italian "OROS-LES-JVHW-QNA system"

Per-capita total labour cost (OROS source)

Per-capita total labour cost (LES source)

Number of jobs (OROS source)

Number of jobs (LES source)

Gross values TLC (QNA source)

Gross values THW (QNA source)

$$ {}^{BS}_{hw}TLC^{q} = \frac{{}^{BS}TLC^{q}}{{}^{BS}THW^{q}} = \frac{\left({}^{BN}tlc^{q}_{LES+OROS}\right)*\left({}^{BN}J^{q}_{LES+OROS}\right)+\left({}^{OS}TLC^{q}_{QNA}\right)}{\left({}^{BN}thw^{q}_{LES+JHWS}\right)*\left({}^{BN}J^{q}_{LES+OROS}\right)+\left({}^{OS}THW^{q}_{QNA}\right)} $$

Per-capita hours worked (JVHW source)

Per-capita hours worked (LES source)

Number of jobs (OROS source)

Number of jobs (LES source)

Reconciliation in BN guaranteed by JOBS (LES-OROS source)

The conference is partly financed by the European Union

Information framework: Regular estimate VS Flash

Source	LCI component	Data availability	Coverage rate for t+70 (Regular estimate)	Coverage rate for t+45 (Flash estimate)	Data processing degree for t+45 (Flash estimate)
LES-OROS-JVHW (B to N, Nace breakdown)	Employment Total labour cost Wages Other labour costs	Monthly Social Security admin data: m1, m2 available at **t+38** days m3 available at **t+45** days	**98%** for months m1, m2, m3	**98%** for months m1, m2 **0%** for month m3	**Partial** for months m1, m2 **Not available** for month m3
		Monthly Large Enterprises Survey on labour input and labour costs (LES): m1, m2 available at **t+34** days m3 available at **t+40** days	**100%** for months m1, m2, m3	**100%** for months m1, m2 **74%** for month m3	**Completed** for months m1, m2 **Partial** for month m3
	Per capita hours worked	Quarterly Job Vacancies and Hour Worked Survey (JVHW): q available at **t+40** days	**65%** for quarter	**30%** for quarter	**no E&I, no calibration**
		Monthly Large Enterprises Survey on labour input and labour costs (LES): m1, m2 available at **t+34** days m3 available at **t+40** days	**100%** for months m1, m2, m3	**100%** for months m1, m2, m3 **74%** for month m3	**Completed** for months m1, m2 **Partial** for month m3
Quarterly National Accounts (O to S, Nace breakdown)	Total labour cost Wages Total hours worked	Quarterly National Accounts estimates: - available at **t+56** days, - forecasts at **t+30** days, based on very few indicators	**100%** for quarter	**100%** for quarter (forecasts at t+30)	**Forecast completed**

Methodological solutions for FLASH LCI

CURRENT METHODOLOGY:AVAILABLE MICRO DATA + FORECAST

B-N

1 'LES' census data (Large ent.) **PARTIAL INFO (first 2 months)** WAG, OTH, HW, Jobs

2 'OROS' admin data (Small and Medium ent.) **PARTIAL INFO (first 2 months)** WAG, OTH, Jobs

3 'JVHW' sample data **Forecast on** per capita Hours Worked

O-S

4 'Quarterly National Account' **quarterly data at t+30** WAG, OTH and HW

PAST SOLUTIONS: TOTALLY FORECAST (ARIMAX with full information until *t*-1 and auxiliary early signals on *t*)

The conference is partly financed by the European Union

Points for (+) and against (-) of the current solution:

(+) More similar to that used for the t+70 estimates (Eurostat recommendations)

(-) absence of data for the third month implies a lack of relevant information:

- high volatility of the wage component (contract renewals, arrears..)
- active polices on the labour market that acts trough social contributions

(+) Employment is more inertial (-) but the recent pandemic caused strong shocks

(-) Unfeasibility of using micro data on the hours worked:

- (-) More solutions tested without suitably stable results (test on earlier respondents: with JHWS partial microdata or using proxy variables)
- (+) Best solution in terms of accuracy: time series forecasting with ARIMAX model based on careful choice of regressors for each NACE section (LES per-capita hours worked, flash estimate of GDP, hours “paid” by employers) using Jdemetra+

The conference is partly financed by the European Union

Summary measures (19 vintages)

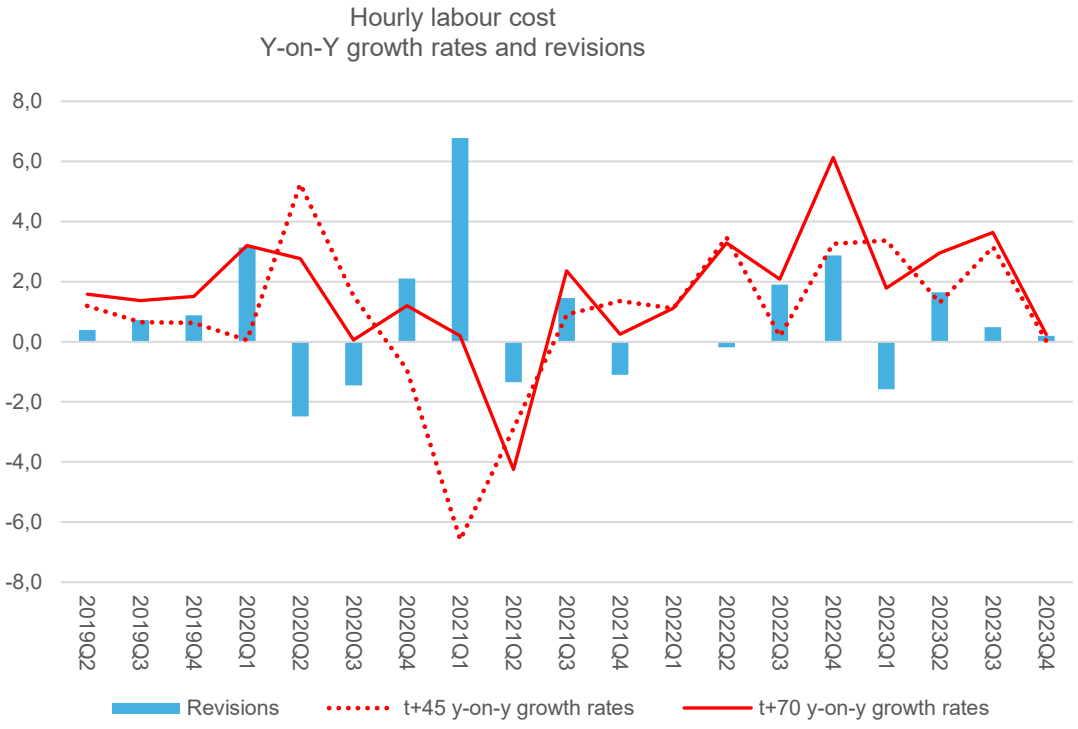
MR mean Revision (for direction of revisions); MAR Mean Absolute Revision (for revision size);

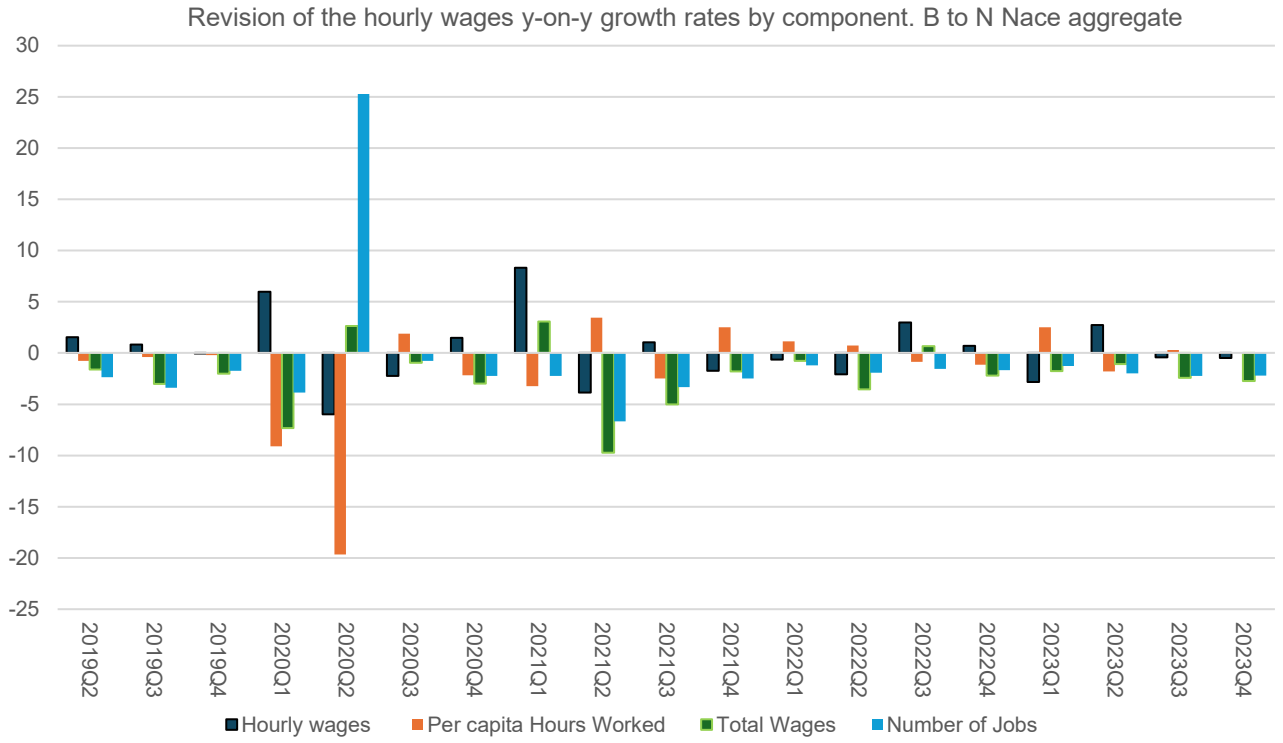
RMAR Relative Mean Absolute Revision (normalizing MAR by the average size)

	Hourly wages	Hourly other costs	Hourly Total Labour Cost	Total Wages	Total Other Costs	Total Labour Cost	Per capita Hours Worked	Number of Jobs	Total Hours Worked
B to S aggregate									
MR	0.9	0.8	0.9	-0.8	-0.9	-0.8	-	-	-1.8
MAR	2.0	1.9	1.9	1.4	1.6	1.4	-	-	2.5
RMAR	0.9	0.7	0.9	0.2	0.7	0.2	-	-	0.4
MAX (abs value)	6.8	6.6	6.8	4.8	4.8	4.8	-	-	9.4
MIN (abs value)	0.0	0.0	0.0	0.0	0.1	0.0	-	-	0.1
% negative R	31.6	36.8	31.6	68.4	63.2	63.2	-	-	73.7
B to N aggregate									
MR	0.3	0.3	0.3	-2.2	-2.2	-2.2	-1.5	-0.9	-2.4
MAR	2.4	2.3	2.4	2.9	2.9	2.9	2.9	3.6	3.3
RMAR	0.8	0.6	0.8	0.3	0.3	0.3	0.8	0.7	0.4
MAX (abs value)	8.3	8.3	8.3	9.7	9.2	9.6	19.7	25.3	12.6
MIN(abs value)	0.0	0.2	0.1	0.7	0.2	0.3	0.0	0.8	0.0
% negative R	47.4	52.6	52.6	84.2	89.5	84.2	57.9	94.7	73.7
O to S aggregate									
MR	1.7	1.1	1.5	1.8	1.2	1.7	-	-	0.1
MAR	2.2	2.1	2.0	2.0	2.1	1.9	-	-	1.3
RMAR	1.4	1.3	1.4	1.0	1.0	0.8	-	-	1.6
MAX(abs value)	6.5	6.6	6.5	9.4	9.5	9.4	-	-	2.7
MIN (abs value)	0.2	0.0	0.1	0.1	0.1	0.1	-	-	0.0
% negative R	21.1	31.6	21.1	21.1	15.8	26.3	-	-	52.6

The conference is partly financed by the European Union

Results (current solution): year-on-year growth rates and revisions. Q2:2019 - Q4:2023





The conference is partly financed by the European Union

Conclusions

- Approach with partial micro data appeared the most promising, but necessary complementing with more flexible solutions in a parallel production process.
- Improvements in the early LCI estimates need important efforts in terms of resources and synergy between structures to get an output that is not necessary a priority for the NSI.

The quality of flash estimates could not be assured in a context of partial information and changing economic/legislation situation, implying a high risk of providing misleading early signals.

EUROPEAN CONFERENCE ON QUALITY IN OFFICIAL STATISTICS 2024 ESTORIL - PORTUGAL

THANKS FOR YOUR ATTENTION!

INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

eurostat

The conference is partly financed by the European Union