Labour Effort and the European Wage Phillips Curve

Joint OGWG - ECFIN - JRC Conference

Brussels, 30/09/2021

Atanas Hristov

Directorate General for Economic and Financial Affairs

European Commission

Introduction

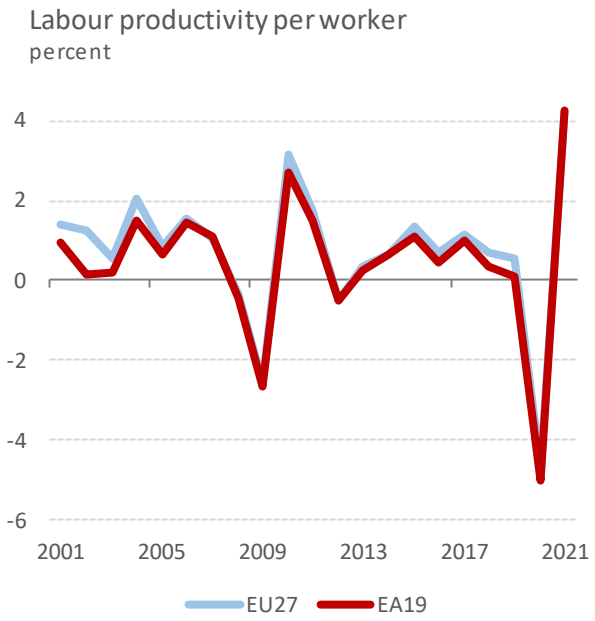
- Robert Solow (1976) observed that “any time seems to be the right time for reflections on the Phillips curve.”
- Right now seems to present again particularly appropriate moment to take stock of the empirical evidence on wage inflation dynamics.
- Recent history of inflation and unemployment is a puzzle
- COVID 19: up to 45% of employees on short-term work schemes in some EU member states in mid-May 2020
  - Knock-on effects on productivity and hours worked
  - There have been lots of stories *in the media* about how wages are *rising strongly*.

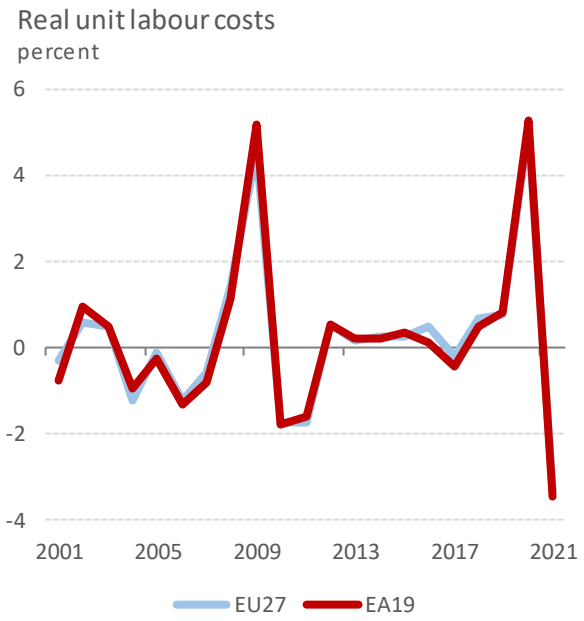
The New Keynesian Phillips Curve

- Gali (2011) and Havik et al. (2014) derive a New Keynesian Phillips curve (NKP)

$$\Delta \mathrm{r}_t = \lambda^w \left(u_t - u_t^* \right) + \mathbb{E}_t \beta \Delta \mathrm{r}_{t+1}$$

which stresses a relationship between real unit labour costs and unemployment gap. => u_t^* rises in recessions.





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- One solution that has been adopted to deal with the problem of "spurious" cyclical productivity is to assume that the true pricing rule is closer to a markup over unit labor costs based on the *trend rate of productivity* (Blanchard and Katz, 1997; OECD, 1997).

var(Total Hours gap)
=
var(average Hours gap)
+
var(Employment gap)
+
2*covar(Hours and Empl gap)

MS	Standard deviation (Hours worked gap)	Standard deviation (Employment gap)	Covariance 2*Cov(H*E)
AT	0.61	0.46	0.67
BE	0.90	0.58	0.17
DE	0.47	0.73	0.01
DK	0.44	1.06	-0.07
ES	0.54	2.68	0.29
FI	0.32	1.15	-0.23
FR	0.80	0.57	0.39
IE	0.55	1.04	0.66
IT	0.81	0.90	0.24
NL	0.42	0.79	-0.08
PT	0.87	1.06	-0.50
SE	0.44	1.05	-0.22
UK	0.66	0.99	0.51
BG	0.45	1.50	0.54
CY	0.66	2.26	0.04
CZ	0.53	0.42	-0.74
EE	0.94	2.06	0.97
EL	0.77	3.01	0.22
HR	0.44	1.68	-0.32
HU	0.35	1.26	0.38
LT	0.94	2.00	0.13
LU	0.71	0.62	0.19
LV	0.74	2.44	0.00
MT	0.86	0.72	0.31
PL	0.40	1.77	0.37
RO	0.46	1.06	-0.84
SI	0.57	1.32	-0.53
SK	0.60	1.37	-0.05

- 1/3 of variation in total hours worked is attributed to average hours worked per employed.

The New Keynesian Phillips Curve with Labour Effort (NKPE)

- A New Keynesian model with unemployment based on a search and matching model (Pissarides 1985; Mortensen and Pissarides, 1994). No reliance on a time-varying mark-up due to trade unions power.
- Staggered bargaining over *monthly* wages (Gertler and Trigari; Thomas, 2008).
- Bargaining over number of hours worked.
- Combining the wage Phillips curve and the condition for hours worked delivers the NKPE ($\Delta \hat{e}_t^{inv}$ labour hoarding)

$$\Delta \mathbb{r}_t = \ell^w \mathbb{u} \left(u_t - u_t^* \right) + (1+\phi) \Delta e_t^{inv} + \mathbb{E}_t \beta \left(1 - \chi \right) \Delta \mathbb{r}_{t+1}$$

The New Keynesian Phillips Curve with Labour Effort (NKPE), cont

- By guess and verify, obtain the backward solution to the Phillips curve
- Use the standard unobserved component framework (Kuttner, 1994; Gordon, 1997), to obtain latent variables for all EU Member States

NKPE for EU Member States

$$\Delta \mathrm{r}_t = \alpha \Delta \mathrm{r}_{t-1} - \beta_1 u_t^{gap} + \beta_2 u_{t-1}^{gap} + \delta_1 e_t^{inv}$$

	β		δ		Rsq	
Coef	NKP	NKPE	NKP	NKPE	NKP	NKPE
at	0	-0.52	na	0.44***	0.36	0.12
be	-1.01***	-1.13***	na	0.16**	0.44	0.52
bg	0	0	na	0.05	0.00	0.01
cy	-0.33	-0.35	na	0	0.04	0.05
cz	-1.63**	-1.6**	na	0.03	0.35	0.35
de	-0.66*	-0.92**	na	0.15*	0.08	0.13
dk	-0.55***	-0.53**	na	0.01	0.17	0.17
ee	-1.15***	-1.55***	na	0.42*	0.55	0.70
el	-0.23	-0.14	na	0.01	0.01	0.09
es	-0.31**	-0.37**	na	0.71***	0.14	0.23
fi	-1.3***	-1.42***	na	0.22**	0.36	0.41
fr	-0.2	-0.15	na	0.3**	0.65	0.67
hr	-0.12	0	na	0.62***	0.20	0.45
hu	-0.93**	-1.32***	na	0.38***	0.28	0.56
ie	na	na	na	na	na	na
it	-1.13**	-1.08**	na	0.41***	0.12	0.28
lt	-1***	-1.29***	na	0.63***	0.45	0.73
lu	-0.61*	-0.59*	na	0	1.00	1.00
lv	-1.58***	-1.64***	na	0.54**	0.57	0.74
mt	0	0	na	0.45	0.00	0.00
nl	-0.64***	-0.69***	na	0.27***	0.30	0.41
pl	-0.96***	-0.93***	na	0.01	0.32	0.38
pt	-1.27**	-1.29**	na	0.19	0.13	0.22
ro	-11.53***	-11.38***	na	0.13	0.49	0.50
se	-0.82**	-0.82**	na	0.01	0.16	0.16
si	-0.41	-0.04	na	0.25**	0.50	0.58
sk	-0.71**	-0.72**	na	0.23*	0.43	0.46
uk	-1.07**	-1.18**	na	0.11	0.05	0.10

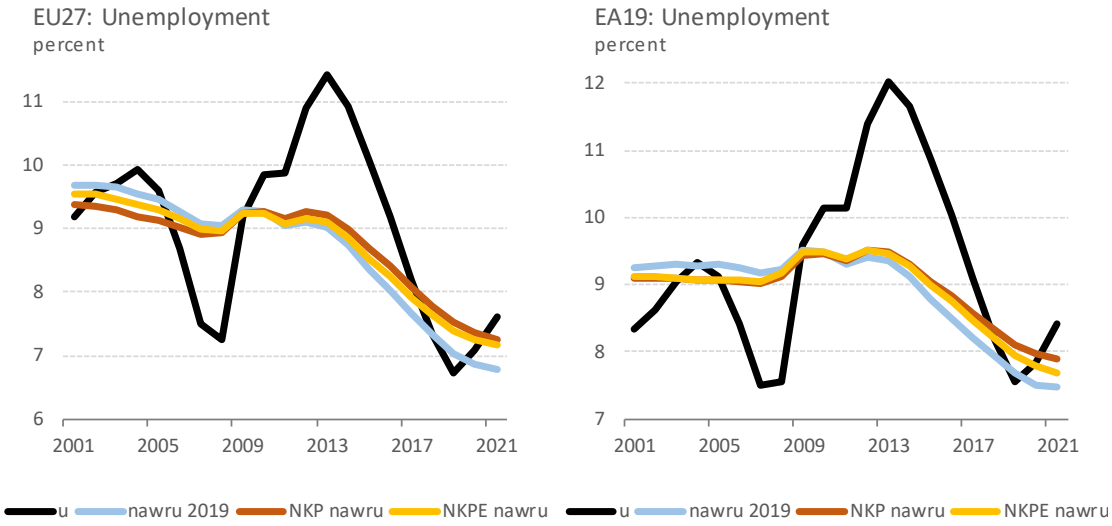
*** denotes 1% significance

** 5 % significance

* 10 % significance

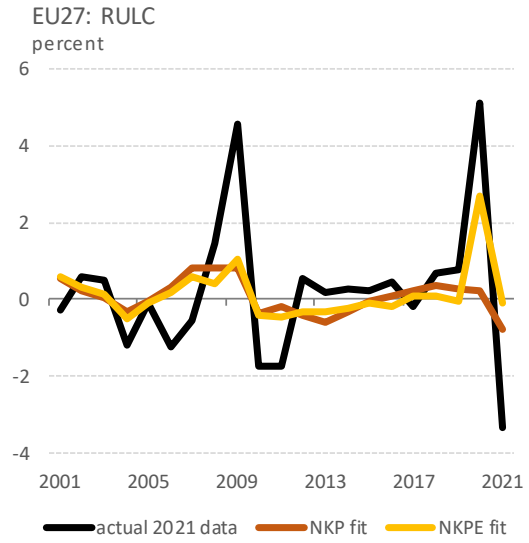
$\Delta \hat{e}_t^{inv}$ is measured as the inverse of the HP filtered annual hours worked per worker

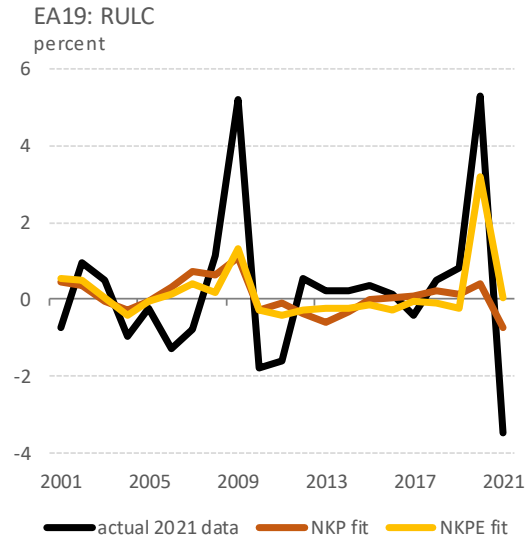
NKPE for EU Member States, cont



NAWRU denotes the natural rate of unemployment.

NAWRU estimates based on latest data are compared to estimates done in 2019 Autumn.





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A firm-level EU-BCS based pan-EU labour hoarding indicator

- merging two questions in the monthly EU Business Surveys (BCS): *demand expectations* and the *employment expectations* - a pattern whereby (expected) output is falling and (expected) employment is not falling as much used as an indirect measure of labour hoarding. (four pilot institutes – CZ, DE, FR, IT).

Selected available EU-BCS questions (monthly):[4]

EMPLOYMENT:

- Q7 [industry] / Q5 [services - M] / Q5 [retail trade - M] / Q4 [construction]: ***"How do you expect your firm's total employment to change over the next 3 months?"*** [increase; remain unchanged; decrease]

DEMAND:

- Q5 [industry]: ***"How do you expect your production to develop over the next 3 months?*** [increase; remain unchanged; decrease]"

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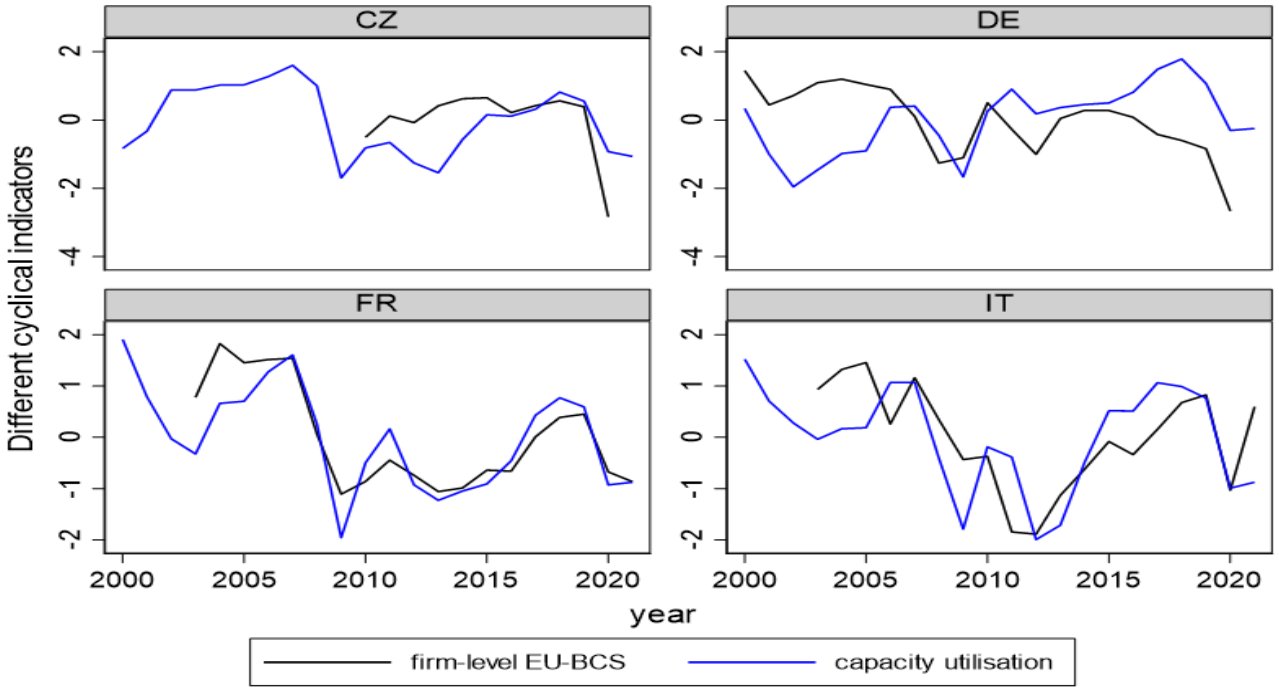
Comparison with capacity utilisation

- Insufficient demand-based indicator describes a cyclical pattern – especially FR and IT (DE: weak post-GFC recovery in LH – not reflecting construction boom possibly)
- explanatory power of the firm-level EU-BCS labour hoarding indicator beyond capacity utilization for cyclical TFP needs to be further assessed



Note: series are standardised, X13-ARIMA seasonally adjusted, aggregated to annual level and to total economy level (weighted by employment)

Explanatory power for TFP

- Regression analysis overall shows explanatory power of LH for TFP even when controlling for CUBS

Table 5: Explanatory power of the resource utilisation indices (capacity utilisation and labour hoarding)

	CZ			DE			FR		
depedent variable	TFP	TFP	TFP	TFP	TFP	TFP	TFP	TFP	TFP
CUBS	47.375***		20.98	22.497***		24.055***	19.400***		6.352
	(13.553)		(22.634)	(5.873)		(7.200)	(4.675)		(8.919)
Labour Hoarding		-121.297***	-95.574**		-37.892***	-25.436**		-25.143***	-17.052
		(14.439)	(30.444)		(10.632)	(9.782)		(7.842)	(15.589)
R-sq	0.415	0.684	0.681	0.464	0.219	0.629	0.412	0.343	0.331
N observations	25	11	11	36	21	21	36	30	30

	IT			ALL (Fixed Effect)		
depedent variable	TFP	TFP	TFP	TFP	TFP	TFP
CUBS	17.159***		-5.536	23.944**		16.465*
	(5.161)		(6.188)	(5.010)		(6.960)
Labour Hoarding		-51.721***	-59.680***		-40.538**	-24.999*
		(9.333)	(12.767)		(12.585)	(11.986)
R-sq	0.289	0.677	0.674	0.353	0.359	0.421
N observations	36	18	18	133	80	80

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$, standard errors.

5. Conclusion

- The problem of “spurious” cyclical productivity biases Phillips curve estimates.
- The paper proposes a New Keynesian version with unemployment and labour effort.
- The preliminary results suggest that the inclusion of labour effort in the Phillips curve corrects for the “spurious” cyclical productivity.
- Better labour hoarding indicators are needed.

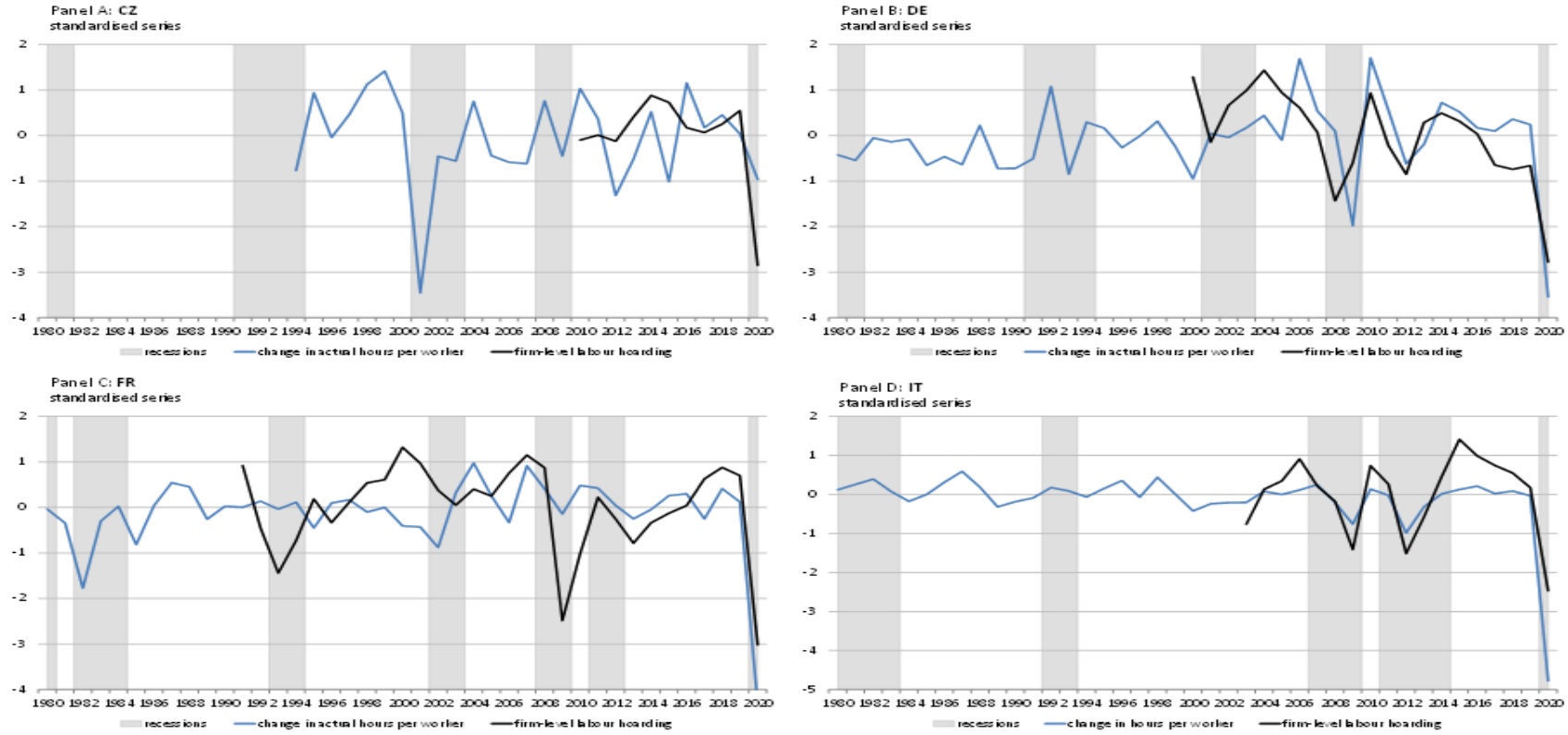
Thank you!

Spare slides

Comparison with hours worked

- both labour hoarding indicators to predict recessions (grey bars)
- For majority of recessions, the firm-level indicator deviates from its sample mean by more than the change in actual hours worked per employee => provides superior information on the cyclical patterns.

Figure 2: Comparison between the firm level labour hoarding and changes in actual hours worked



Comparison with direct indicators

- Indices capture perception that in recessions a large number of firms is willing to keep employees underutilised despite associated costs.
- Indicators highly correlated (correlation coefficient FR 0.7 and highly significant; DE less correlated due to the leading properties of the indirect labour hoarding measure). High correlation reassuring.

Country	Question	Name	Formulation of the question	Possible answers		
	Quarterly question					
Germany	Q1	HOARD_DE	We consider our number of employees with respect to the expected sales development of product XY during the next 12 months to be	relatively high [1]	sufficient [0]	low[-1]
France	Q2	HOARD_FR	"Your enterprise is now working at ... % of its available capacity. ("available capacity" means the productive capacity that would be obtained by hiring additional labour if needed)"	%		

Figure 3: Comparison between the indirect and the direct measures of firm level labour hoarding