

# Solving the Wage Puzzle: Does the “Non-Employment Index” Explain European Wage Dynamics Since the Crisis?

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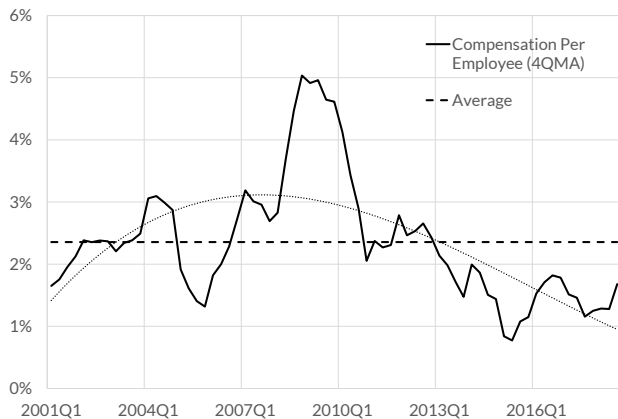
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# Introduction

Protracted period of low compensation growth in the euro area since 2013



Low wage growth despite:

- Labour market tightening considerably.
- Robust output expansion.

Similar developments seen in US and UK (Yellen, 2015; Haldane, 2018; Bell & Blanchflower, 2018).

# Introduction

## Puzzling:

- Philips Curve predicts falling unemployment should lead to greater wage growth
- Persistent negative forecast errors by ECB, OECD and Survey of Professional Forecasters (SPF)

## Important for policymakers:

- Understanding wage dynamics crucial for monetary policy
- Labour an important factor in determining prices
- Wage setting block central to New Keynesian models used by Central Banks (Gali, 2011)

# Previous Literature

## Explanations

- Philips Curve could be time-varying (Lopez-Villavicencio and Mignon, 2015; Kumar and Orrenius, 2016; Bonam et al., 2018)
- Natural rate hypothesis could be invalid (Blanchard, 2018)
- Low productivity growth (Bank of England, 2017)

## Measurement of slack may be inaccurate

- May need to take into account broader measures (Coure, 2017; Bank of England 2016)
- Underemployment may be a factor (Bulligan et al., 2017; Bell and Blanchflower, 2018; Hong et al., 2018; Haldane, 2018)

# From Unemployment to Non-Employment

We go a step further

- Hornstein, Kudlyak and Lange (2014) propose a Non-Employment Index for the US
- Adapted for EA Labour Force Survey in Byrne & Conefrey (2017)
- **Non-Employment Index** (NEI) is a weighted average of all non-employed individuals as a share of the total working age population (15-74) in a country
- Non-employed persons are broken into groups within the Labour Force Survey based on their self-reported reason for not seeking work
- NEI weights account for persistent differences in each groups likelihood of transitioning back into employment

# What we do

- We construct a new measure of labour market slack for Euro-area countries which takes account of different cohorts' attachment to the labour force
- Using in-sample conditional forecasts from a series of Bayesian VARs, we show that the NEI is a better predictor of wage dynamics during the period 2013-2017 than traditional measures of slack both in terms of point estimates and forecast certainty
- We show that, at least in countries worst hit by the european sovereign debt crisis, the missing wage growth is less puzzling when the philips curve is respecified to account for this additional pool of non-employed workers

# Roadmap

- Introduction, Motivation and Previous Literature
- Calculating the Non-Employment Index
- Cross Country Heterogeneity: NEI Decompositions
- Empirical Strategy
- Results
- Conclude



Two primary sources of data:

- Eurostat Labour Force Survey Panel Data
- ECB Expert Group on Low Wages: NCBs calculated labour market flows

# Calculating the Non-Employment Index

Three ingredients:

- Stocks of individuals in each cohort. (Source: Eurostat)
- Transitions to employment of individuals in each cohort  $j$  in each quarter  $t$  (Source: WEG Colleagues, Eurostat)
- Average Transition Probability

## Calculating the Non-Employment Index (Continued)

- Weights for cohort  $j$  are given by that group's average transition probability to employment over sample relative to the group with the highest transition probability
- Example: *Seeking but not immediately available* have a transition probability over the sample of 10.98 per cent in Ireland. Receive a weight of  $\frac{10.98}{16.3} = 0.67$

$$\sum_{j=1}^5 \theta_j \frac{Pop_j}{Pop}$$

# Calculating the Non-Employment Index (Continued)

Table: Average Transition Probabilities (Ireland)

	Average Transition Probability
Short Term Unemployed (<1 Year)	16.3%
Long Term Unemployed (>1 year)	6.6%
Seeking but not immediately Available	10.98%
Available Not Seeking, Discouraged	3.11%
Available Not Seeking, others	8.02%
Not Seeking - In Education	8.7%
Passive Job Seekers	9.6%
Not Seeking, Illness	2.1%
Not Seeking, other reasons	3.7%
Does not want Job	3.4%
Part-time Underemployed	3.7%

Source: CSO and Authors' calculations

Note: Transition probability of "Part-Time Underemployed" reflects transitions to full time employment.

# Calculating the Non-Employment Index (Continued)

**Table:** Selected Average Transition Probabilities (Italy and Spain)

	Italy	Spain
Short Term Unemployed (<1 Year)	19.6%	22.8%
Long Term Unemployed (>1 year)	10.3%	9.3%
Available Not Seeking	12.8%	5.2%
Seeking Not Immediately Available	7.5%	8.7%
Others	3.4%	2.7%

Source: Banca D'Italia, Banco De Espana and Eurostat.

# Main Estimating Equation

Use a simple two-variable VAR with one measure of wage inflation and one measure of economic slack.

$$\begin{pmatrix} x_{it} \\ wg_{it} \end{pmatrix} = C + B_1 \begin{pmatrix} x_{it-1} \\ wg_{it-1} \end{pmatrix} + \dots + B_p \begin{pmatrix} x_{it-p} \\ wg_{it-p} \end{pmatrix} + \varepsilon_{it}, \quad \varepsilon_{it} \sim N(0, \Omega).$$

Where  $x_{it}$  and  $wg_{it}$  are slack and wage measures, respectively

- Model estimated from 2005 to 2012Q4.
- Conditional forecasts of wage growth from the period 2013Q1 to 2017Q4 (Waggoner & Zha, 1998).
- Minnesota type prior (Blake & Mumtaz, 2012).

# Results: Root Mean Squared Forecast Errors

## Hourly Earnings

	URate (SA)	Output Gap	NEI	U6	UGap
Crisis Countries	2.690	2.115	1.743	1.792	2.117
Overall	2.696	2.186	1.751	1.866	2.218

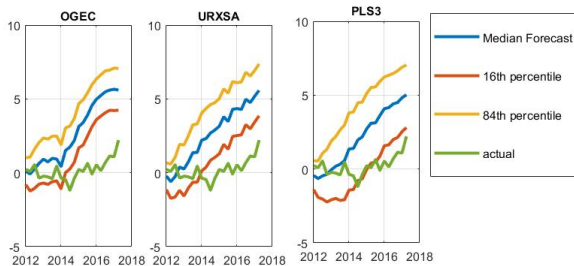
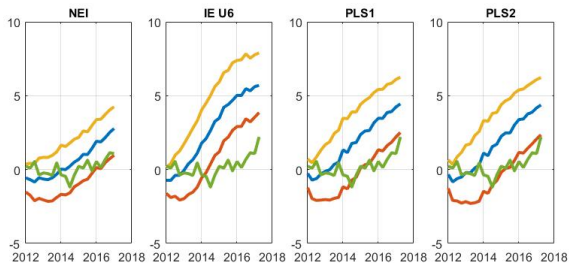
## Compensation Per Employee

	URate (SA)	Output Gap	NEI	U6	UGap
Crisis Countries	1.858	1.573	1.848	1.776	1.745
Overall	1.867	1.538	1.405	1.590	1.398

## Unit Labour Costs

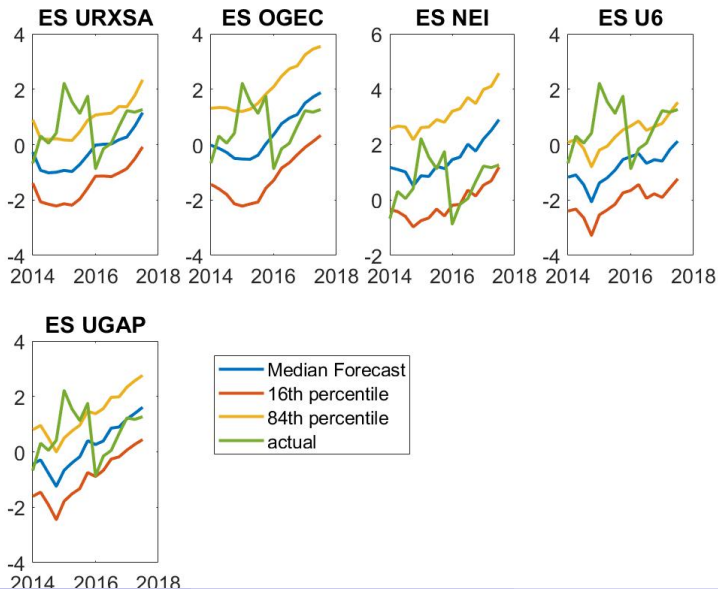
	URate (SA)	Output Gap	NEI	U6	UGap
Crisis Countries	3.684	3.887	3.503	5.464	4.133
Overall	2.778	2.815	2.733	3.976	3.147

# Improvement in Forecast Certainty:Ireland

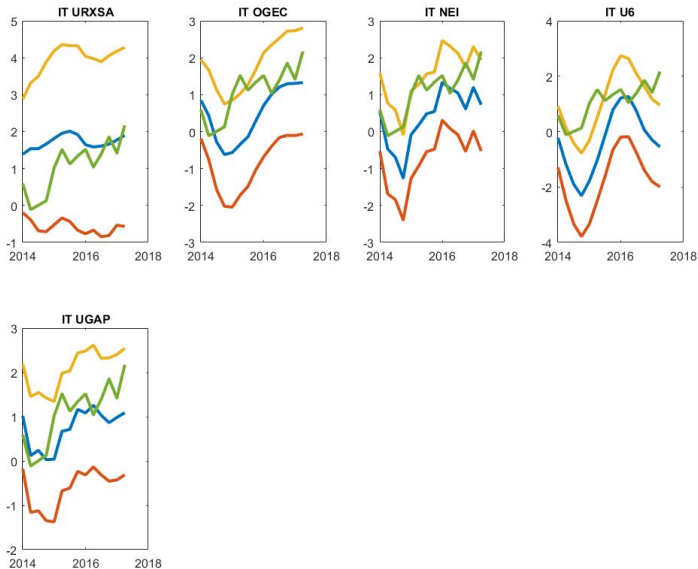




# Improvement in Forecast Certainty:Wage Bands Spain



# Improvement in Forecast Certainty:Wage Bands Italy



# Summary of Results

- NEI is a better predictor of wage dynamics during the period 2013-2017 than traditional measures of slack
  - Point estimates and forecast certainty

Conditional Mean Log Score:

Table: Forecast Performance

	RMSE	Cond Mean Log score
NEI	0.97135734	-1.6232842
U6	3.31929497	-2.7025598
PLS1	2.03126384	-2.1835126
PLS2	1.93342905	-2.153409
PLS3	2.35892631	-2.3250974
OGEC	2.99671904	-3.1569719
URATE	2.94553213	-2.7409013
UGAP	3.15639189	-3.2194193

# Next Steps

- All countries conditional mean log score
- Estimate a non-employment gap for each country
- Investigate whether nonemployed transition probabilities differ by demographic characteristics (age, education, etc) potentially yielding more accurate estimate of labour force attachment.

# Thank You!