Does the Phillips curve hold for consumer survey data?

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Business and consumer surveys and short-term forecast

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Outline of the presentation

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- *Data description*
- *Comparison of soft and hard data*
- *Hard data and the Phillips curve*
- *Consumers' expectations and the Philipps curve*
- *Theory-consistency according to consumers' categories*
- *Conclusions*

Background

- *Check whether consumers' expectations reflect economic concepts*
- *Past studies: whether US consumers form macroeconomic expectations consistent with 3 different economic concepts:*
  - The Philipp curve
  - The Taylor Rule
  - Income Fisher Equation

→ Do the same for the EU and the euro area, but only for the Philipp curve

The data

- *Consumers' inflation expectations:*

  ***Q6:** By comparison with the past 12 months, how do you expect that consumer prices will develop in the next 12 months? They will…*

++	*increase more rapidly*
+	*increase at the same rate*
=	*increase at a slower rate*
-	*stay about the same*
--	*fall*
N	*don't know.*

The data

- *Consumers' unemployment expectations:*

  ***Q7:** How do you expect the number of people unemployed in this country to change over the next 12 months? The number will…*

++	*increase sharply*
+	*increase slightly*
=	*remain the same*
-	*fall slightly*
--	*fall sharply*
N	*don't know.*

The data

- *Period: from January 1999 to May 2015*
- *EU, euro area and 7 largest EU Member States (namely Germany, France, Italy, Spain, Poland, the Netherlands and the UK)*
- *Four respondents' categories (sex, age, education and income)*
- *Hard data:*
  - **The all-items HICP monthly data seasonally adjusted index (2005 = 100)**
  - **The total seasonally adjusted monthly average percentage unemployment rate**

The data

Periods of recessions and expansions:

Recessions

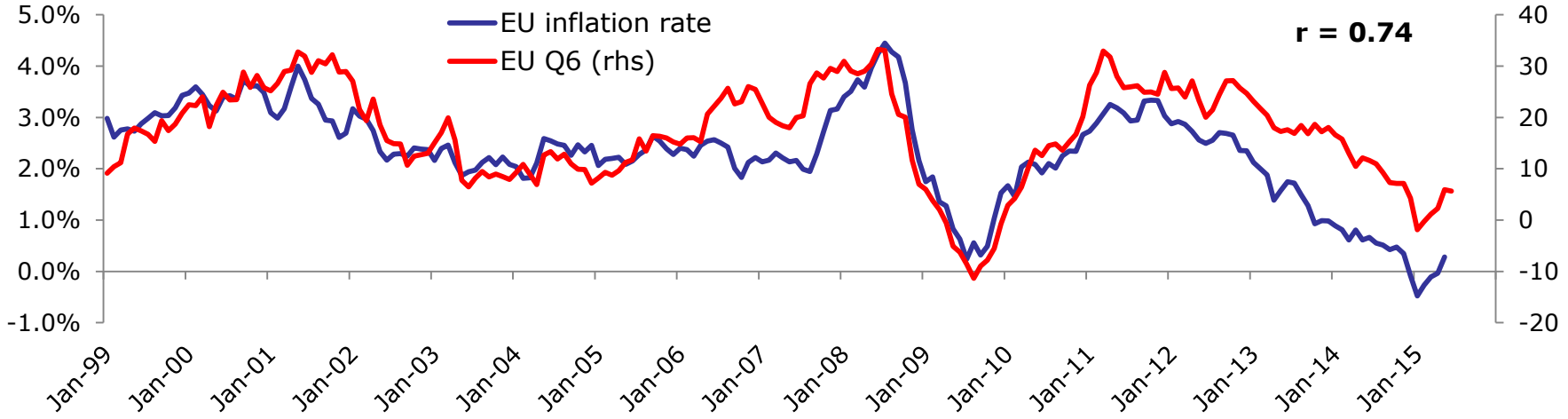
- **July 2000 – April 2003**
- **January 2008 – June 2009**
- **June 2011 – June 2014**

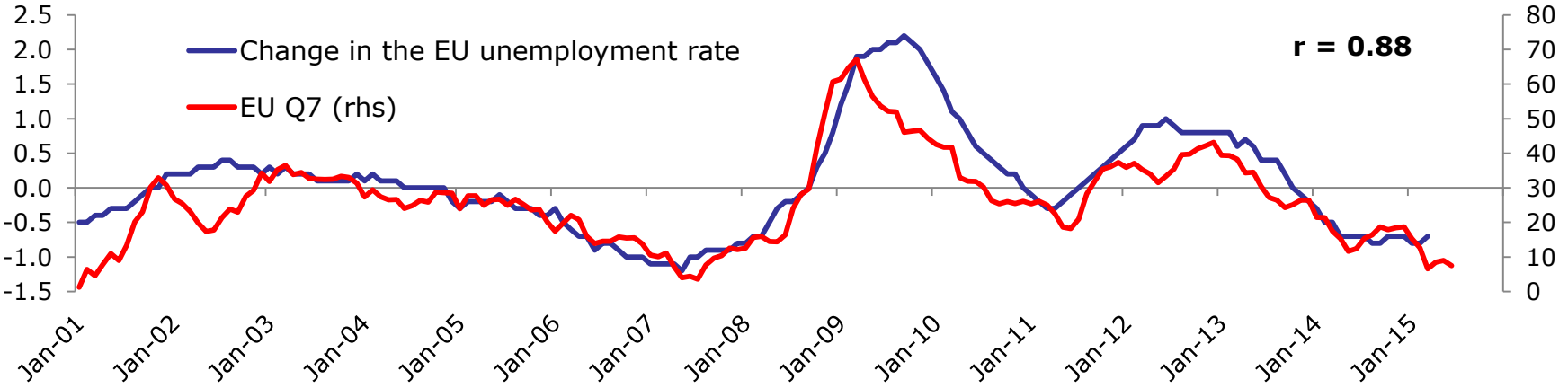
Expansions

- **May 2003 – December 2007**
- **July 2009 – May 2011**

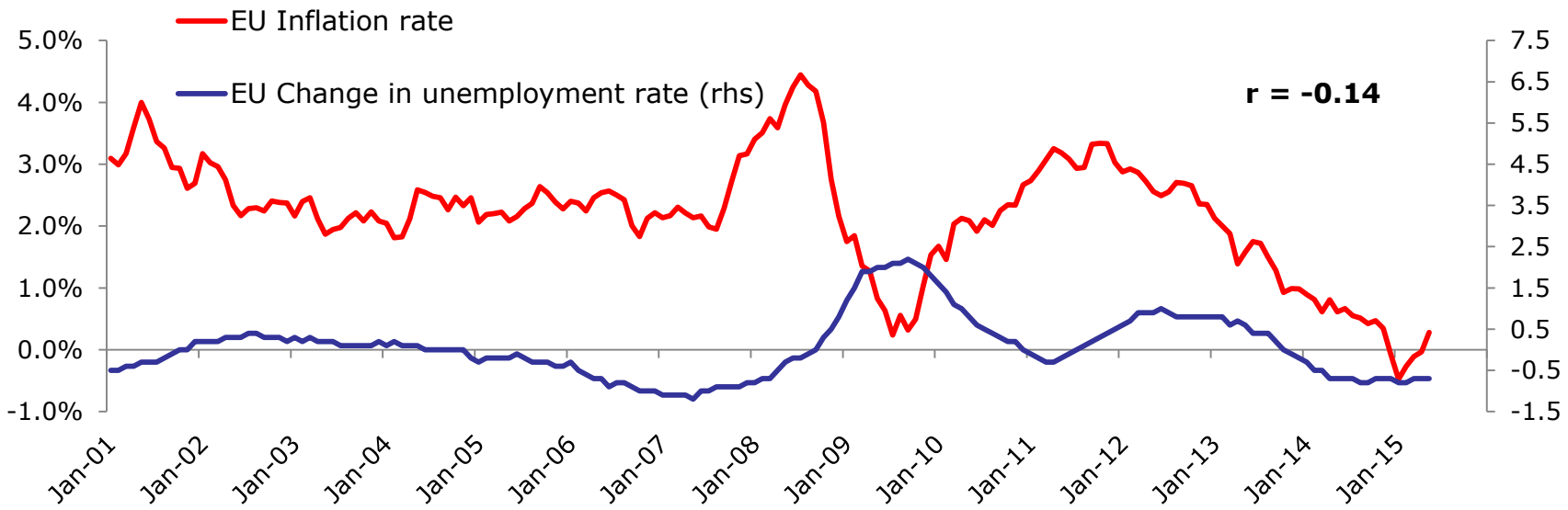
Source: Centre for Economic Policy Research (CEPR), Euro Area Business Cycle Dating Committee

Comparison of soft and hard data





Hard data and the Phillips curve



Weak correlation over the period January 2001 to March 2015

But

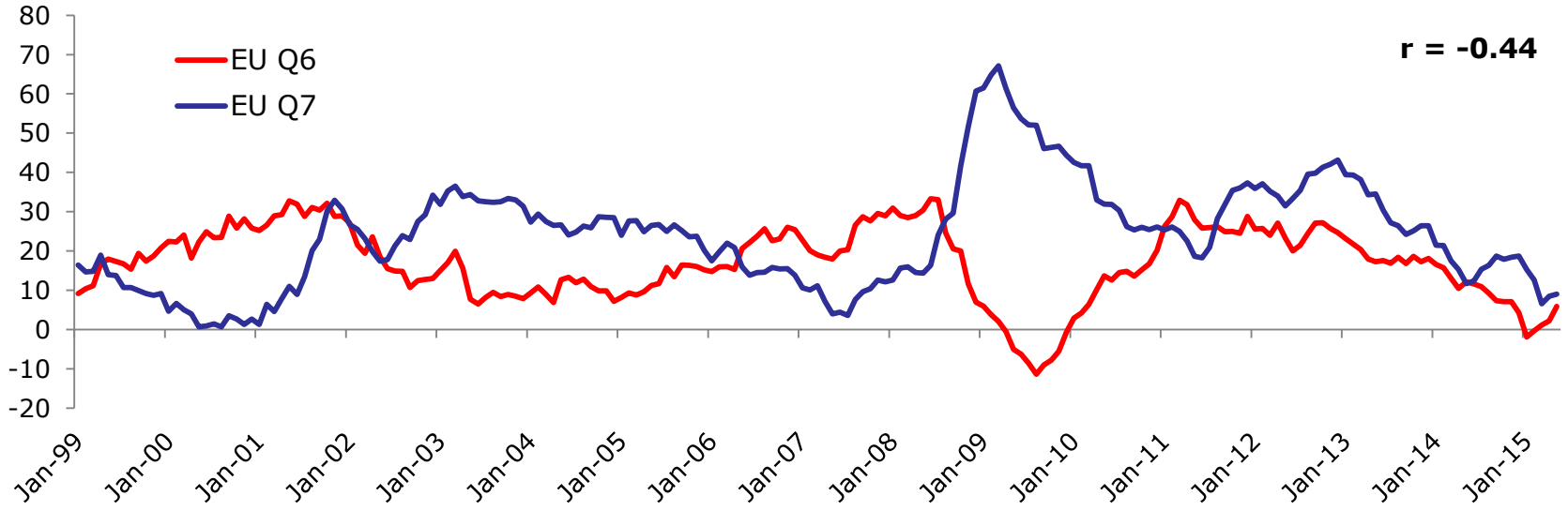
The inverse relationship is apparent in some shorter periods…

Hard data and the Phillips curve

Correlation coefficients for the inflation rate and the change in the rate of unemployment

Country	Period					
	1999:01 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	**-0.14**	**-0.79**	**-0.19**	**-0.91**	**-0.95**	**0.64**
EA	**-0.21**	**-0.29**	**-0.03**	**-0.94**	**-0.97**	**0.55**
Germany	**-0.35**	**-0.52**	**-0.40**	**-0.90**	**-0.88**	**-0.75**
France	**-0.38**	**0.09**	**0.50**	**-0.94**	**-0.90**	**0.15**
Italy	**-0.03**	**0.30**	**0.39**	**0.03**	**-0.80**	**0.45**
Spain	**-0.18**	**0.29**	**-0.26**	**-0.91**	**-0.95**	**0.79**
Poland	**0.54**	**0.61**	**0.07**	**-0.42**	**-0.11**	**0.55**
United Kingdom	**0.40**	**0.29**	**0.60**	**-0.21**	**-0.84**	**0.88**
Netherlands	**-0.05**	**-0.48**	**0.07**	**-0.50**	**-0.88**	**0.02**

Consumers' expectations and the Philipps curve



As for the hard data, correlation changes depending on the period taken into consideration…

Consumers' expectations and the Philipps curve

Correlation coefficients for consumers' expectations - Q6 and Q7

Country	Period					
	1999:1 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	-0.44	-0.46	-0.84	-0.93	-0.94	0.71
EA	-0.53	-0.50	-0.85	-0.92	-0.92	0.51
Germany	-0.53	-0.35	-0.65	-0.93	-0.85	0.28
France	0.02	0.06	-0.56	-0.89	-0.88	0.22
Italy	-0.16	-0.51	0.09	-0.80	0.22	0.74
Spain	0.00	0.68	0.12	0.03	-0.76	0.68
Poland	0.14	N/A	0.14	-0.38	-0.09	0.37
United Kingdom	-0.09	-0.45	0.53	-0.78	0.27	-0.07
Netherlands	-0.57	-0.64	-0.88	-0.96	-0.96	-0.01

Hard versus soft data

- *Full sample period: soft data indicate better theory consistency than hard data;*

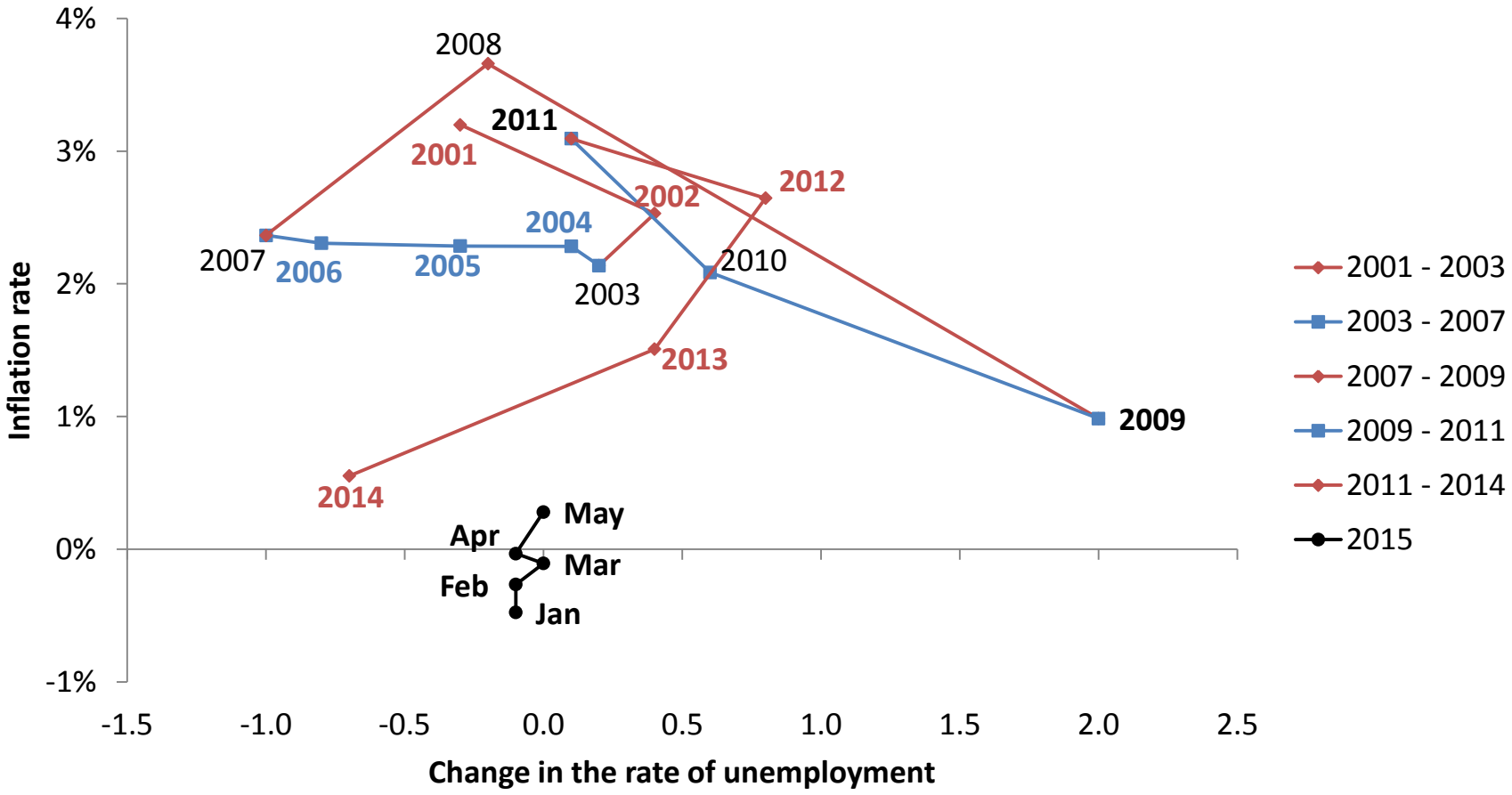
But things change slightly when unemployment rate is considered instead of the change in the unemployment rate!

- *Expansion and recessions: soft data indicate better theory consistency than hard data;*

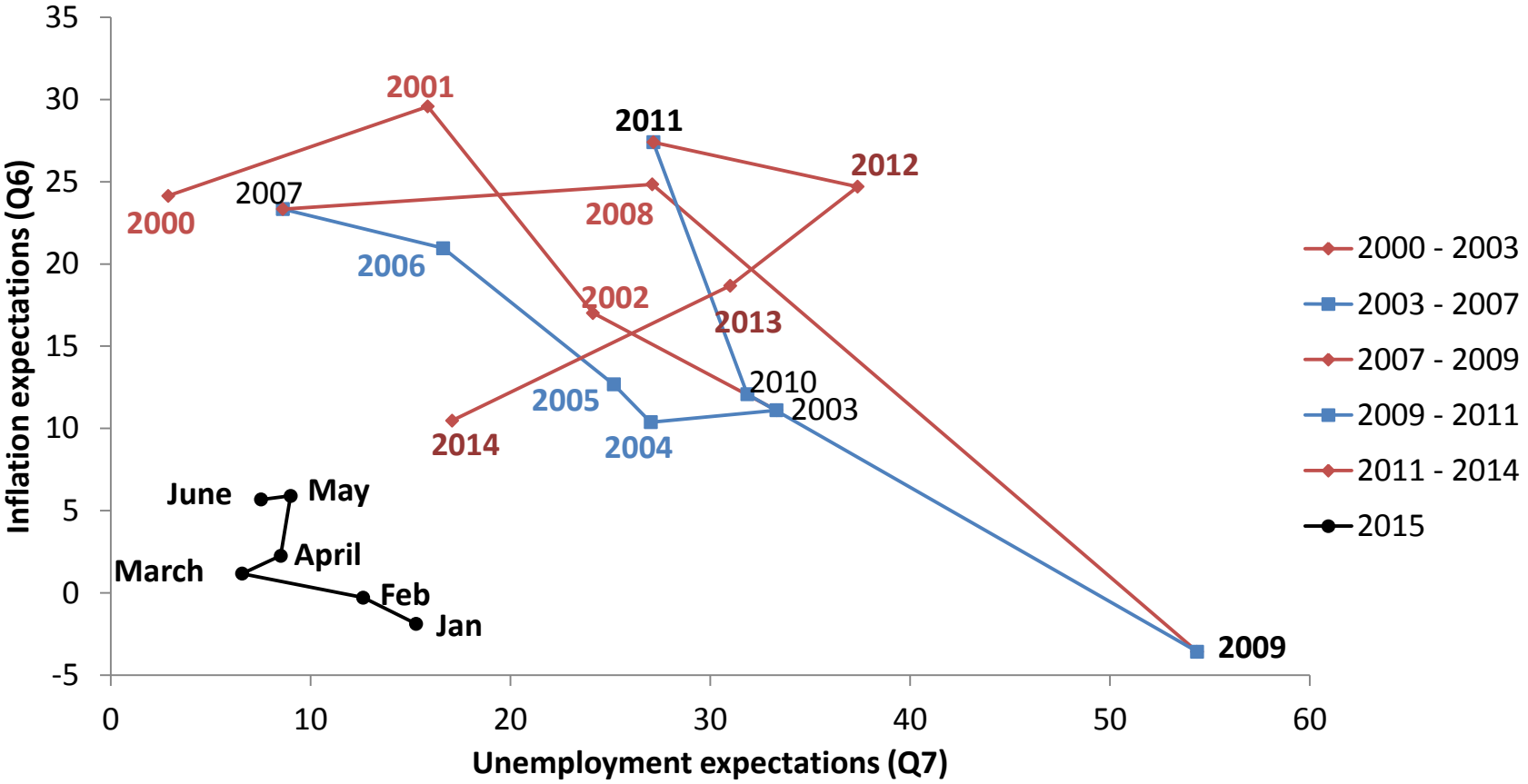
Thanks to stronger negative correlation in the periods July 2000 to April 2003 and May 2003 to December 2007.

- *At MS level; difference between hard and soft data is not as pronounced as at aggregate level.*

EU Phillips curve (hard data)



EU Phillips curve (soft data)



Preliminary econometric evidence

Does the cyclical position affect inflation expectations in a theory-consistent way?

Simple model of inflation expectation formation to check consistency with the Phillips-curve framework

$$E_t(\pi_{t+1}) = \beta_0 + \beta_1 E_{t-1}(\pi_{t+1}) + \beta_2 X_t + \varepsilon_t$$

$E_t(\pi_t+1)$ (Q6) depend on inflation expectations of the previous period, $E_{t-1}(\pi_{t+1})$ (Q6) as well as the state of the cycle X_t , which can be proxied by unemployment expectations $E_t(u_{t+1})$ (Q7)

Formation of inflation expectations - euro area

dependent variable: EAQ6								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
sample	1985M01-2015M06	1993M10-2015M06	1999M01-2015M06	1999M01-2008M06	2008M07-2015M06	expansions (1993-2015)	recessions (1993-2015)	1993M10-2015M06
EAQ6 1st lag	0.97***	0.94***	0.93***	0.89***	0.94***	0.94***	0.96***	0.97***
EAQ7	-0.03***	-0.05***	-0.06***	-0.08***	-0.05**	-0.02	-0.06**	
EAQ4								0.06***
c	1.26***	2.07***	2.49***	3.57***	1.94**	1.75***	1.63	1.34***
R^2 adj.	0.94	0.94	0.93	0.91	0.94	0.93	0.92	0.93
DW	1.77	1.72	1.69	2.01	1.27	1.71	1.96	1.72

Results show that:

- *Unemployment enters with the expected sign*
- *the relationship is stable over time*
  - Truncating the sample to the time after the start of EMU does not alter the results
  - There is not a large difference for the period before and after the start of the Great Recession
  - Some indication that the impact of unemployment expectations on price expectations holds more strongly in recession periods than in expansion phases.
- *expected sign and stable relationships also for the large euro-area Member States, except for Italy*

Theory-consistency according to consumer categories

Correlation coefficients for consumers' expectations – by gender

Region	Category	Period					
		1999:01 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	**Male**	**-0.47**	-0.48	-0.81	-0.94	-0.94	0.72
	Female	**-0.41**	-0.35	-0.82	-0.90	-0.95	0.76
EA	**Male**	**-0.55**	-0.49	-0.76	-0.93	-0.92	0.55
	Female	**-0.49**	-0.43	-0.77	-0.88	-0.95	0.60

Theory-consistency according to consumer categories

Correlation coefficients for consumers' expectations – by age

Region	Category	Period					
		1999:01 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	**AG1**	**-0.53**	-0.49	-0.80	-0.93	-0.88	0.66
	AG2	**-0.47**	-0.43	-0.79	-0.93	-0.95	0.71
	AG3	**-0.39**	-0.36	-0.78	-0.93	-0.95	0.72
	AG4	**-0.37**	-0.33	-0.75	-0.92	-0.94	0.77
EA	**AG1**	**-0.55**	-0.49	-0.80	-0.94	-0.87	0.43
	AG2	**-0.54**	-0.48	-0.80	-0.91	-0.94	0.51
	AG3	**-0.50**	-0.44	-0.79	-0.90	-0.94	0.55
	AG4	**-0.47**	-0.41	-0.79	-0.89	-0.93	0.66

Theory-consistency according to consumer categories

Correlation coefficients for consumers' expectations – by education

Region	Category	Period					
		1999:01 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	ED1	**-0.41**	-0.40	-0.72	-0.91	-0.94	0.74
	ED2	**-0.43**	-0.42	-0.79	-0.93	-0.95	0.73
	ED3	**-0.44**	-0.39	-0.82	-0.93	-0.95	0.70
EA	ED1	**-0.50**	-0.48	-0.75	-0.89	-0.93	0.61
	ED2	**-0.52**	-0.47	-0.79	-0.91	-0.93	0.58
	ED3	**-0.50**	-0.40	-0.82	-0.91	-0.93	0.50

Theory-consistency according to consumers' categories

Correlation coefficients for consumers' expectations – by income

Region	Category	Period					
		1999:01 - 2015:05	2000:07 - 2003:04	2003:05 - 2007:12	2008:01 - 2009:06	2009:07 - 2011:05	2011:06 - 2014:06
EU	**RE1**	**-0.40**	-0.29	-0.74	-0.91	-0.94	0.75
	RE2	**-0.42**	-0.38	-0.77	-0.90	-0.96	0.78
	RE3	**-0.44**	-0.41	-0.75	-0.92	-0.93	0.72
	RE4	**-0.49**	-0.47	-0.80	-0.95	-0.94	0.66
EA	**RE1**	**-0.49**	-0.39	-0.77	-0.89	-0.92	0.60
	RE2	**-0.51**	-0.44	-0.79	-0.88	-0.96	0.61
	RE3	**-0.52**	-0.47	-0.75	-0.91	-0.93	0.56
	RE4	**-0.55**	-0.46	-0.81	-0.92	-0.93	0.50

Conclusions

- *The analysis confirms the presence of an inverse relationship between consumers' expectations for both the EU and the euro area.*
- *However, the correlation coefficients are not always strong.*
- *At MS level, the results are mixed.*
- *When sub-periods are considered, the strength of the correlation coefficients varies significantly.*

Thanks for your attention!

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