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The Role of Media for Consumers' Inflation Expectation Formation

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Motivation I

- Inflation expectations are one of the main determinants of future inflation rates.
- Still very little is known about consumers' expectation formation process
- We focus on aspects of information acquisition:
  - As generating inflation forecasts is very costly the public will rely on common sources which are cheap and readily available.
  - Media should play a important role as it caters news and stories about various economic topics.

Motivation II

- Information acquisition
  - Information is sticky (Mankiw and Reis, 2002),
  - Convex cost function, people update only occasionally (Sims, 2003; Reis, 2006)
  - Implications of information restriction on Business Cycles (Veldkamp and Wolfers, 2007)
- Effect of Media
  - Media can lead to recessions (Zullow, 1991)
  - Media pressure on Bundesbank decisions (Maier and Sturm, 2002)
  - Media judgement on EZB decisions (Berger et al., 2007)
  - Media and elections (DellaVigna and Kaplan, 2007)
  - Media and consumer sentiment (Doms and Morin, 2004)
  - Media and inflation expectations (Carroll, 2003)

Motivation III

- Studies closely related:
  - Carroll (2003) shows that more news reporting provides information to consumers, makes them more attentive and triggers the updating of their **inflation** expectations bringing people closer to the rational forecast.
  - Media reporting helps acquiring information
    - By reducing costs
    - By increasing the likelihood of absorbing new information
  - and improves the forecast of the public.
  - Media Bias?
    - Hamilton (2004), rent seeking
      - For instance report more on bad news (Shah et al., 1999; Groeling and Kernell, 1998)

Hypotheses

- Two transmission channels of media to consumers' expectations
- Channel 1: the **volume channel**:
  - More news reporting provides information to consumers, makes them more attentive and triggers the updating of their expectations (Carroll, 2003).
  - Media provide news relatively cheap, which are costly to obtain for a single consumer (Kwiek, 2006).
    - **Hypothesis 1: *more media reporting brings consumers' forecasts closer to the rational forecast*.**

Hypotheses

- Also the specific content of the reports is of major importance.
- Channel 2: the **tone channel**:
  - **Hypothesis 2a:** ***the tone of the report brings consumers' forecasts closer to the rational forecast*****.**

  - Is the content of media really the “rational forecast”? Media companies have incentives increase their profits by catering to the prejudice of the reader (Hamilton, 2004) OR
  - may be biased by a certain slant in the ownership structure (Gentzkow and Shapiro, 2006).
  - In media and political science research it is a common finding that media transmit biased news to their consumers (e.g. Hetherington, 1996).
    - **Hypothesis 2b:** ***the content and tone of media reporting impairs the accuracy of consumers' forecasts.***

Data

- Need data on inflation expectations
  - Survey data EU
- Need data on news on inflation
  - Database provided by a media research institute

Data – Media

- Media Tenor AG, Bonn analyzes leading newspaper as well as TV broadcasts:
  - Daily Press: Frankfurter Allgemeine Zeitung, Welt, Süddeutsche Zeitung, Frankfurter Rundschau, Tageszeitung, Bild, Neue Züricher Zeitung, Berliner, Volksstimmer, Sächsische, Westdeutsche Allgemeine Zeitung, Kölner Stadt-Anzeiger, Rheinischer Merkur
  - Daily TV-News: ARD Tagesschau, Tagesthemen, ZDF Heute, Heute Journal, RTL Aktuell, SAT.1 18:30, ProSieben Nachrichten
  - Weekly Press: Spiegel, Focus, Die Woche, Wochenpost, Welt am Sonntag, Bild am Sonntag, Die Zeit.

Data – Media

- Information Coded:
  - News articles and media releases on a monthly frequency for the period 1/1998-12/2006 in Germany covering statements dealing with “inflation” which are at least five lines long in case of printed media and last at least five seconds on TV broadcasts.
  - Measure News Volume: Amount of Articles (*Volume*)
  - Measure News Tone: Positive, Negative, Neutral, unclear statement: *Tone=(Pos-Neg)/volume*
  - Time dimension past (*Past*), present (*Pres*) or future (*Fut*) inflation.

Data – Consumers' and Economists' Expectations

- Monthly European Commission Survey: **German consumers** are surveyed whether they expect prices to rise, fall or remain unchanged in the upcoming 12 months (expected inflation).
- We also employ disaggregated data based on socio-economic characteristics like age, income, education and gender.
  - Income level is divided into 4 quartiles
  - Age is separated into four groups: 16-29, 30-49, 50-64 and 65+,
  - Education is allocated into three groups: primary education, secondary education and further education.
- Inflation expectations for Germany from **professional forecasters** are constructed from Consensus Economics forecasts.
- In that survey, several professional economists are asked about the inflation prospects of the contemporary and upcoming year.

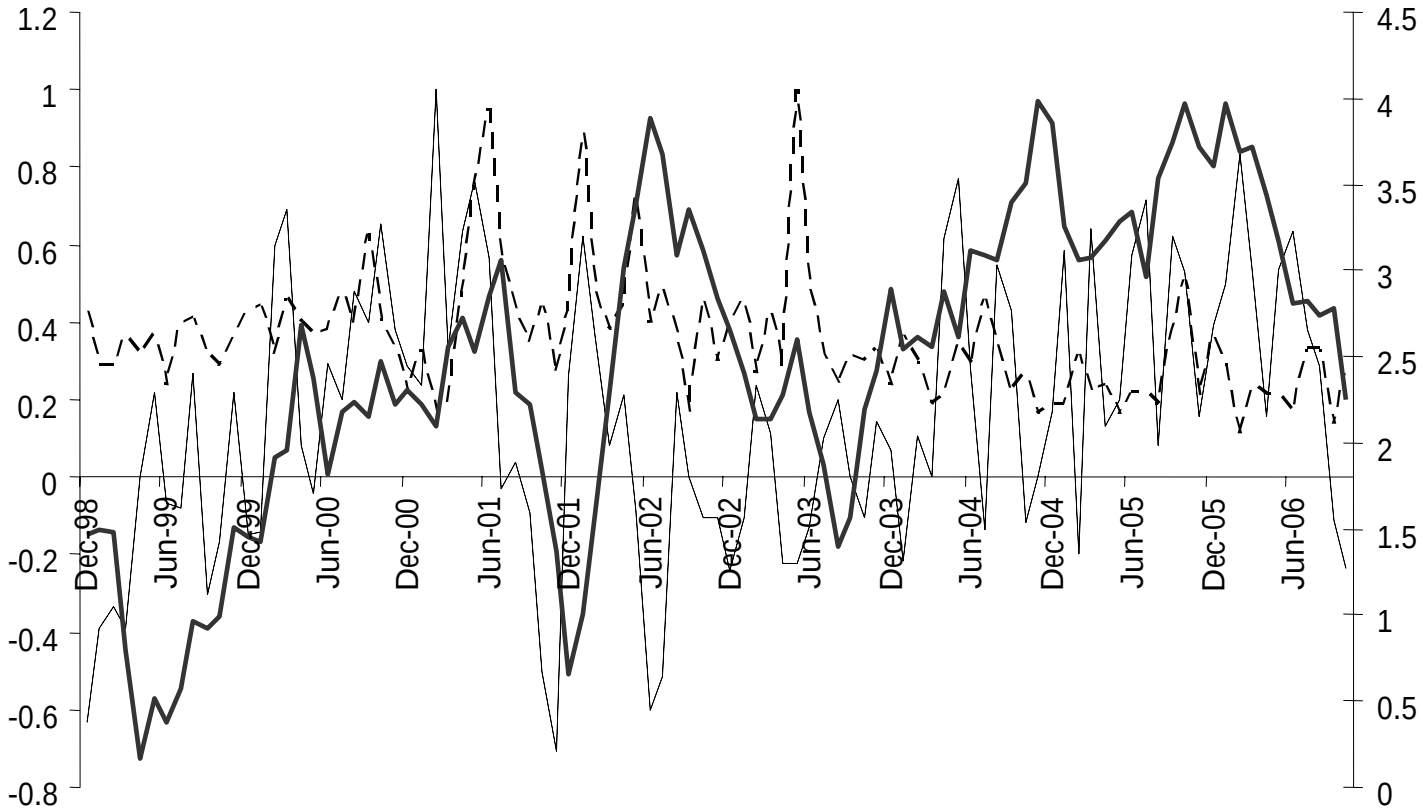
Data – Construction Dependent Variable

- Dependent Variable:
  - To measure the deviation of consumers from an optimal forecast we calculate the **absolute value of the gap** of the difference between the consumers survey (C_t) inflation expectations and those of the consensus economics professional forecasters (P_t) as

$$absGapExp = |C_t - P_t|.$$

- Explanatory variables:
  - Media data: *Volume, Tone, Past, Present, Future, Teuro, EuroCashchangeover*.

Data - Graph


1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Dec-98
Jun-99
Dec-99
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
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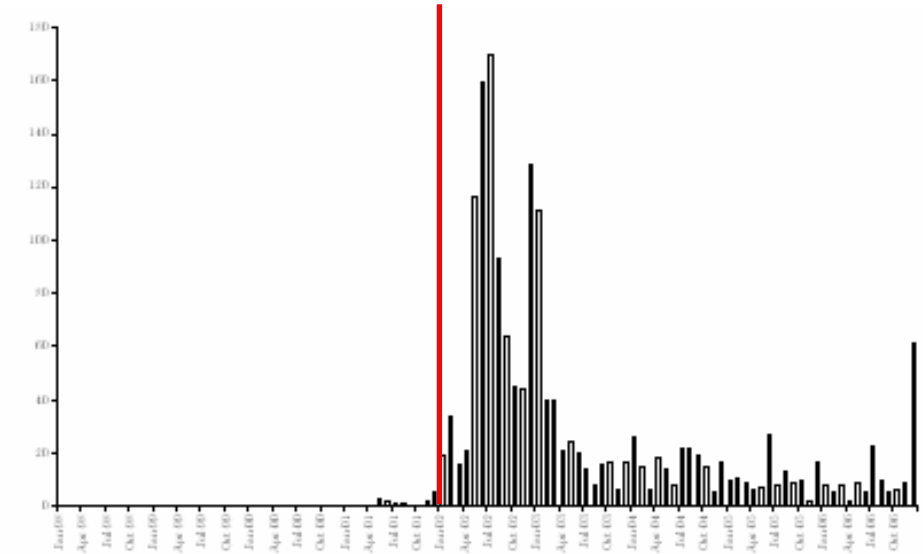
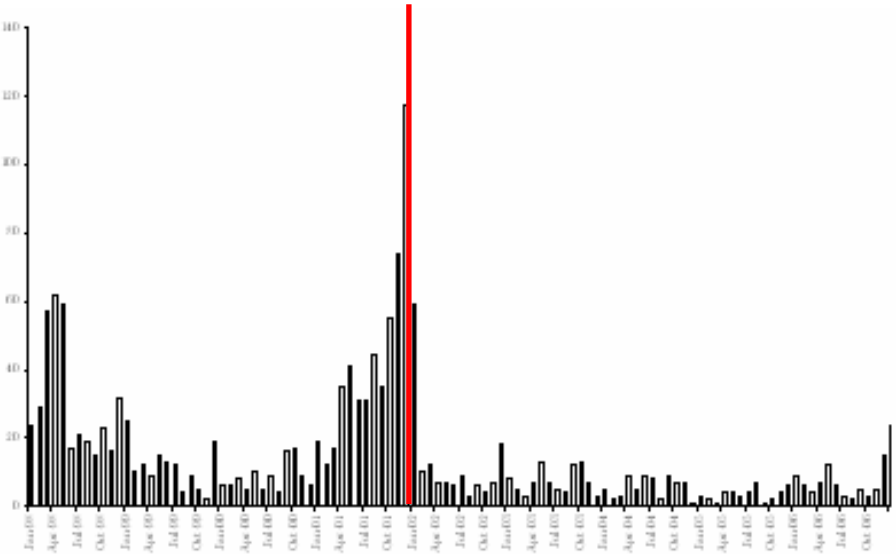
Jun-05
Dec-05
Jun-06

Reports on “Teuro“ and “EuroCashchangeover“

Teuro



EuroCashchangeover



Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	Observations
absGapExpFemale	2.53	0.92	0.27	4.04	94
absGapExpMale	2.42	0.92	0.21	3.93	94
absGapExp65+	2.35	0.91	0.16	3.92	94
absGapExp50-64	2.40	0.88	0.19	4.02	94
absGapExp30-49	2.55	0.96	0.27	4.16	94
absGapExp16-29	2.65	0.92	0.27	4.48	94
absGapExpEdFurth	2.71	0.83	0.58	4.11	94
absGapExpEdSec	2.52	0.88	0.28	4.11	94
absGapExpEdPrim	2.42	0.99	0.00	4.22	94
absGapExpInc4Q	2.50	0.96	0.11	4.12	94
absGapExpInc3Q	2.30	0.91	0.13	3.91	94
absGapExpInc2Q	2.48	0.85	0.34	4.17	94
absGapExpInc1Q	2.26	0.86	0.24	3.88	94
absGapExp	2.47	0.92	0.17	3.98	94
Tone	0.16	0.36	-0.71	1.00	94
Volume	0.36	0.16	0.10	1.00	94
VolumeNeut	0.21	0.12	0.00	1.00	94
ToneFor	0.17	0.32	0.71	0.91	69
TonePast	0.18	0.53	-1.00	1.00	69
Exp Prof	1.47	0.60	0.10	2.80	94
ExpConsumer	23.4	12.2	5.20	46.5	94
ToneNeg	0.20	0.17	0.00	0.76	94
TonePos	0.36	0.22	0.02	1.00	94
Vol Teuro	0.10	0.19	0.00	1.00	94
Vol EuroCashChangeover	0.11	0.14	0.01	1.00	94

Estimation Equations

- Baseline estimation equation (Hypothesis 1):

$$absGapExp_t = \alpha + \beta Volume_{t-1} + \varepsilon_t$$

- Second equation (Hypothesis 2):

$$absGapExp_t = \alpha + \beta Volume_{t-1} + \gamma Tone_{t-1} + \varepsilon_t$$

Results

Volume
Tone
Teuro
ToneFor
TonePast
TonePos
ToneNeg
VolumeNeut
EuroCashChangeover
Constant
Obs

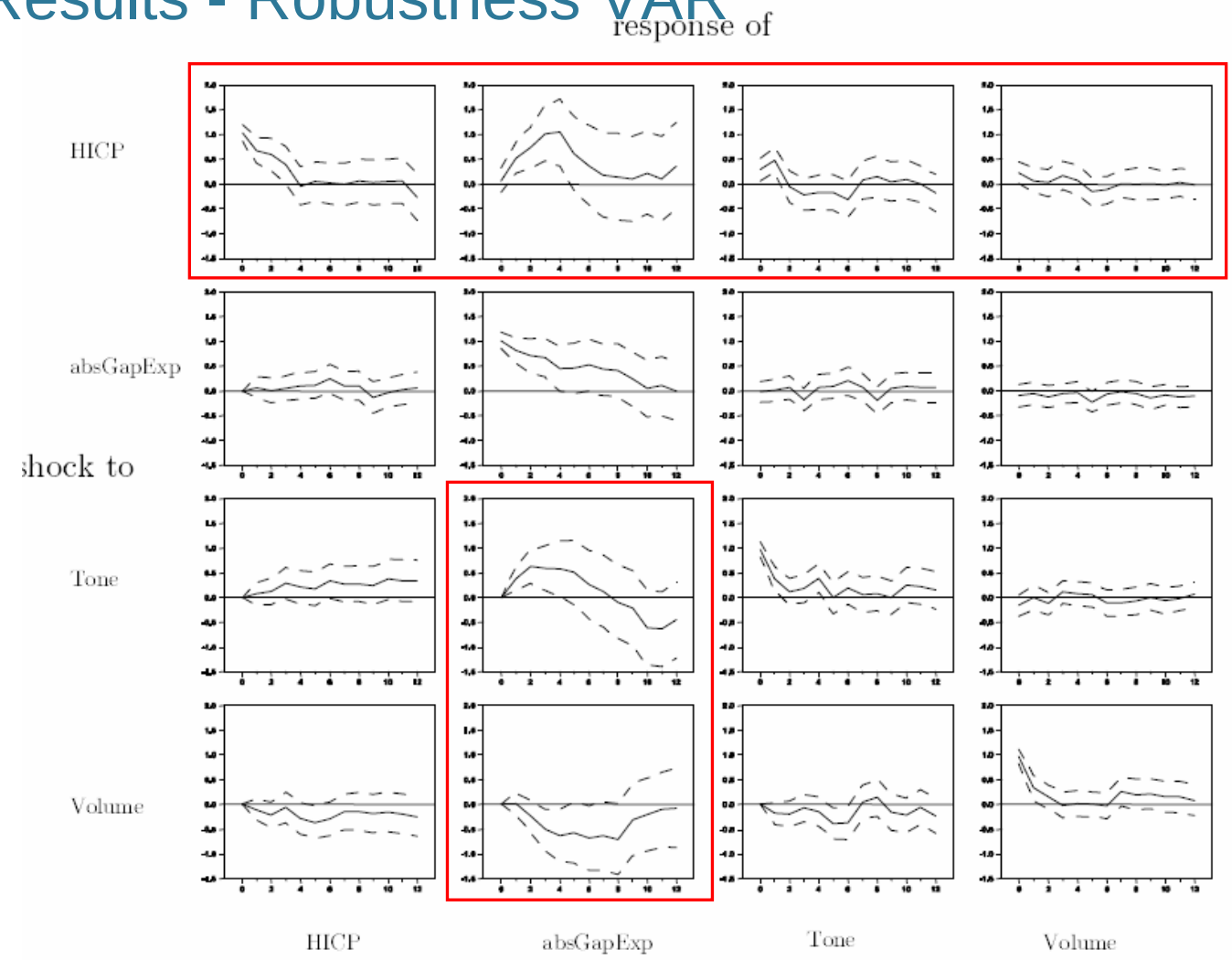
Socioeconomic Factors

- Socioeconomic factors matter
  - Bryan and Venkatu (2001)
    - Low educated and young people overestimate inflation
  - Inuoe et al. (2006)
    - Level of education
- Aucremanne et al. (2007)
  - Fairly similar response during cash changeover

Results - Socioeconomic Characteristics

	Gender		Age				Education			Income				
	female	male	65+	50–64	30–49	16–29	further	secondary	primary	4Q	3Q	2Q	1Q	average
Volume	-1.008*	-0.945*	-0.895	-0.796	-1.101**	-0.872	-0.643	-0.851*	-1.086*	-0.874	-0.805	-0.504	-0.863*	-0.955*
	(0.526)	(0.546)	(0.598)	(0.557)	(0.538)	(0.546)	(0.508)	(0.469)	(0.637)	(0.580)	(0.604)	(0.532)	(0.492)	(0.540)
TonePos	0.939*	0.910*	1.169**	0.669	1.032**	0.827*	0.965*	0.737	1.121**	1.023**	0.776	0.883*	0.861*	0.896*
	(0.497)	(0.504)	(0.561)	(0.503)	(0.519)	(0.476)	(0.502)	(0.463)	(0.552)	(0.498)	(0.557)	(0.471)	(0.480)	(0.500)
ToneNeg	-1.696***	-1.633***	-1.315**	-1.665***	-1.713***	-1.859***	-1.064*	-1.734***	-1.678***	-1.623***	-1.587**	-1.292**	-1.400**	-1.691***
	(0.528)	(0.543)	(0.627)	(0.505)	(0.569)	(0.486)	(0.588)	(0.491)	(0.580)	(0.523)	(0.609)	(0.608)	(0.536)	(0.534)
Teuro	2.184***	2.125***	1.947***	1.930***	2.180***	2.273***	1.977***	2.119***	2.194***	2.466***	1.909***	1.983***	1.897***	2.148***
	(0.524)	(0.552)	(0.562)	(0.524)	(0.556)	(0.534)	(0.509)	(0.537)	(0.555)	(0.544)	(0.623)	(0.481)	(0.558)	(0.539)
Constant	2.678***	2.549***	2.323***	2.590***	2.697***	2.816***	2.612***	2.694***	2.529***	2.525***	2.437***	2.402***	2.355***	2.614***
	(0.426)	(0.433)	(0.482)	(0.431)	(0.445)	(0.390)	(0.422)	(0.398)	(0.479)	(0.432)	(0.483)	(0.421)	(0.429)	(0.431)
Obs	94	94	94	94	94	94	94	94	94	94	94	94	94	94

Results - Robustness VAR



Conclusion

- Both the quantity and quality of news reports influence consumers' inflation expectations
- A higher intensity of reporting makes consumers more likely to pick up news on inflation, induces an updating of their expectations and brings them closer to the full information rational forecast.
- Also the quality of reporting matters. Media reports often contain an opinion or tone, which then is taken up by consumers. These reports induce a media bias.
- The "Teuro" debate has significantly increased the gap.

- ➢ Media can have the power to bias consumers' expectations.
- ➢ Meaningful effect on the real economy????