Narrative dei Media e Fecondità

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Fertility and Media Narratives of the Economy: Evidence From Italian News Coverage

Raffaele Guetto, Maria Francesca Morabito, Matthias Vollbracht, and Daniele Vignoli

Introduction

- A **widespread decline** in fertility levels of European countries during the last decade.

- It cannot be explained solely by **"traditional" fertility predictors** (Alderotti et al. 2021; Comolli 2017; Comolli et al. 2021; Comolli and Vignoli 2021; Goldstein et al. 2013; Matysiak et al. 2021).

- **Economic uncertainty** expanded owing to the increasing speed of technological change, financial flows across the globe, and labor market deregulation reforms (Vignoli et al. 2020a; 2020b).

Our central thesis

- Individuals make decisions

  ✓ influenced by **socially-constructed narratives of the future** (Vignoli et al. 2020a, 2020b)
  ✓ by projecting themselves in an actionable future (Beckert 2016; Mische 2009).

- **Media-conveyed narratives** may become increasingly crucial for shaping individuals' fertility behavior, **over and above** the role of objective economic constraints.

Background: The Agenda Setting Theory

Communication scholars have investigated the impact of media on the public's perceived reality (Lippman 1922; Noelle-Neumann 1980).

Agenda-setting theory (McCombs and Shaw 1972)

- ✓ **selection** function of the media
- ✓ **salience** of the coverage
- ✓ **attributes** and **perspectives** - *Framing theory* (De Vreese 2009; Goffman 1974; Entman 1991)

Media effects are typically **reinforced under uncertain conditions** (Berger and Calabrese 1975).

Background: Media & Fertility

- **Negative effects** of the diffusion of mass media on fertility in poor countries (Billari et al. 2020; Jensen and Oster 2009; La Ferrara et al. 2012; Westoff and Bankole 1997).

- Basten (2010): **lack of studies** about mass media and family formation in low-fertility countries.

- Schneider (2015) documented that **press coverage of the economy** in the US explains fertility decisions net of objective economic constraints.

- **Media-conveyed narratives** of the pandemic (Guetto et al. 2022) and economic uncertainty (Vignoli et al. 2022) have a causal impact on fertility intentions in **Italy** (and Norway).

Question 1 Is the **volume of economic news** items associated with **fertility behavior**, controlling for individuals' employment conditions and aggregate measures of economic conjuncture?

Question 2a Does the association between economic news and fertility outcomes change on the basis of the **tone of the news items** reported?

Question 2b If so, are fertility behaviors more sensitive to **positive or negative changes** in the news' tone?

Data

Economic media news

MediaTenor International

Monthly **news on the state of the economy** reported in the evening edition of *TG1*.

To each news is assigned a tone.

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2015

The average of the values observed in the previous 12 months was assigned to each month (**monthly moving averages**)

State of the economy

Eurostat and *OECD* websites

Growth rate of real GDP, Female unemployment rate, and Inflation rate

The average of the values observed in the previous 12 months was assigned to each month (**monthly moving averages**)

Individual data

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Family and Social Subjects (FSS)

Person-months: 644,038

Women: 12,521

Conceptions: 2,987

January 2007 – August 2015

Models

Linear Probability Models (LPMs) with Fixed Effects (FE)

* Also, EHA on parity specific fertility

$$P(Y_{it} = 1) = \delta + \alpha_i + \boldsymbol{\beta X}_{it} + \boldsymbol{\gamma Z}_t + t + \varepsilon_{it}$$

- Dependent variable
  - *Conception* [dummy indicating the month of conception of <u>**each child**</u> (1 for conception, 0 otherwise)]

- Independent Variables
  - Individual: *Age, Student, Employment, Level of Education, Union*
  - Macro: ***Media coverage variables***, *Unemployment rate, GDP, Inflation rate*

1st ◆

2nd ◆ *Percentage, Pos / pos + neg*
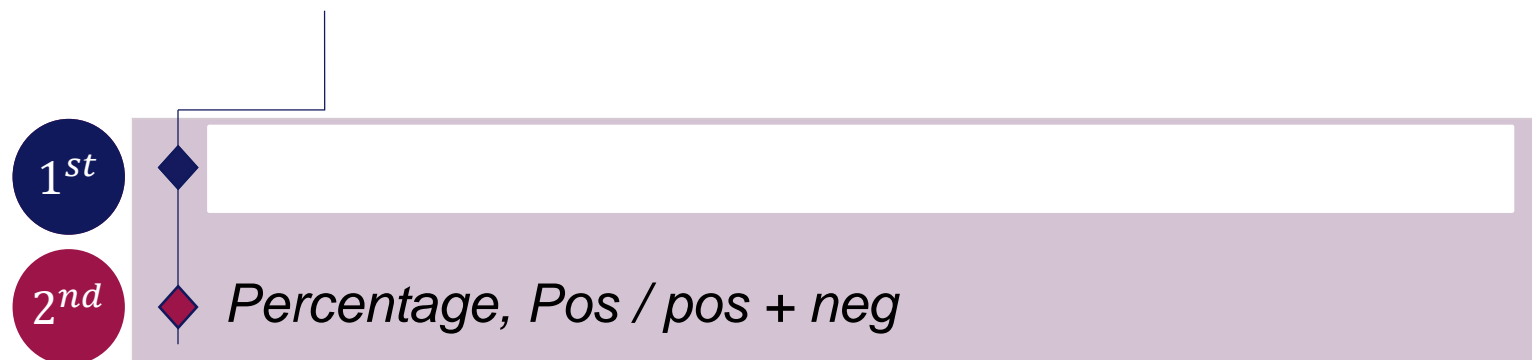
Economic Coverage in Media News

1-SD Increase in:

Percentage Variation of the Monthly Probability of Conception

Fig. 1 Percentage variation of the monthly probability of conception (compared with the mean risk in the sample) associated with comparable changes in the news coverage of the economy and macroeconomic variables.
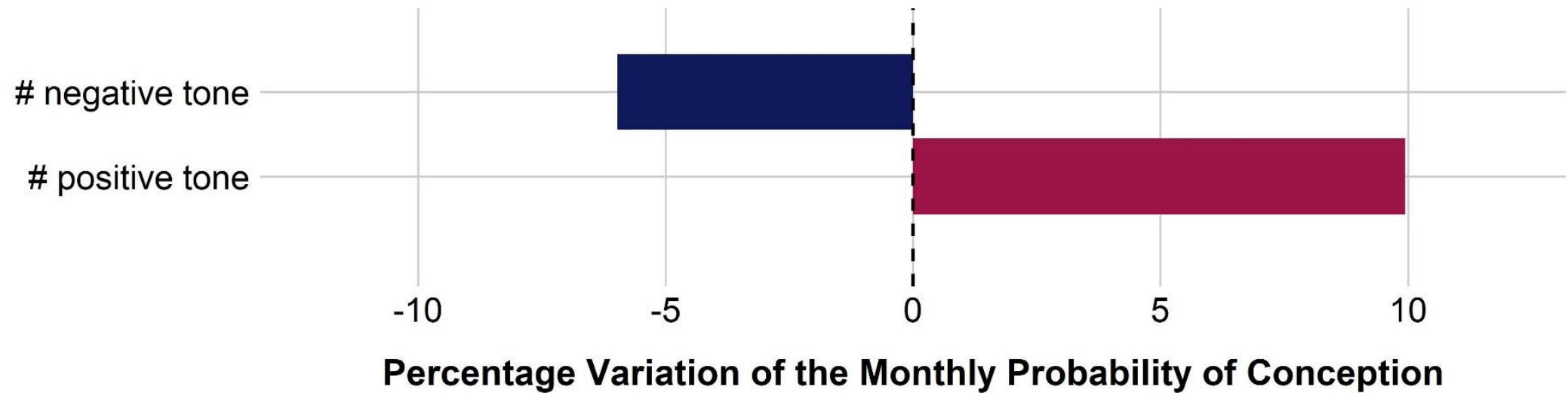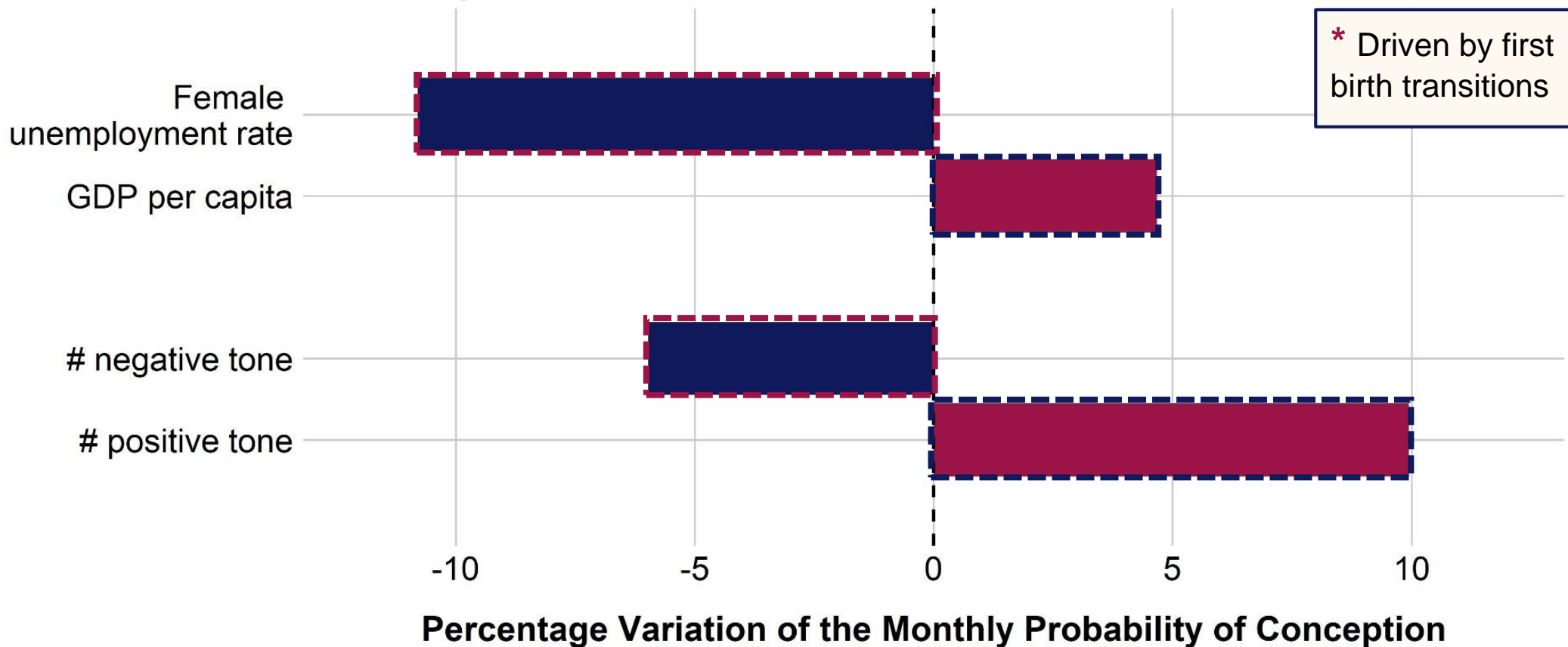
Fig. 1 Percentage variation of the monthly probability of conception (compared with the mean risk in the sample) associated with comparable changes in the news coverage of the economy and macroeconomic variables.

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Models

Linear Probability Models (LPMs) with Fixed Effects (FE)

$$P(Y_{it} = 1) = \delta + \alpha_i + \boldsymbol{\beta X}_{it} + \boldsymbol{\gamma Z}_t + t + \varepsilon_{it}$$

- Dependent variable

  - *Conception* [dummy indicating the month of conception of **each child** (1 for conception, 0 otherwise)]

- Independent Variables

  - Individual: *Age, Student, Employment, Level of Education, Union*

  - Macro: ***Media coverage variables****, Unemployment rate, GDP, Inflation rate*

1st ◆ *# Negative Tone, # Positive Tone, # No Clear Tone*

2nd ◆ *Percentage, Pos / pos + neg*

11

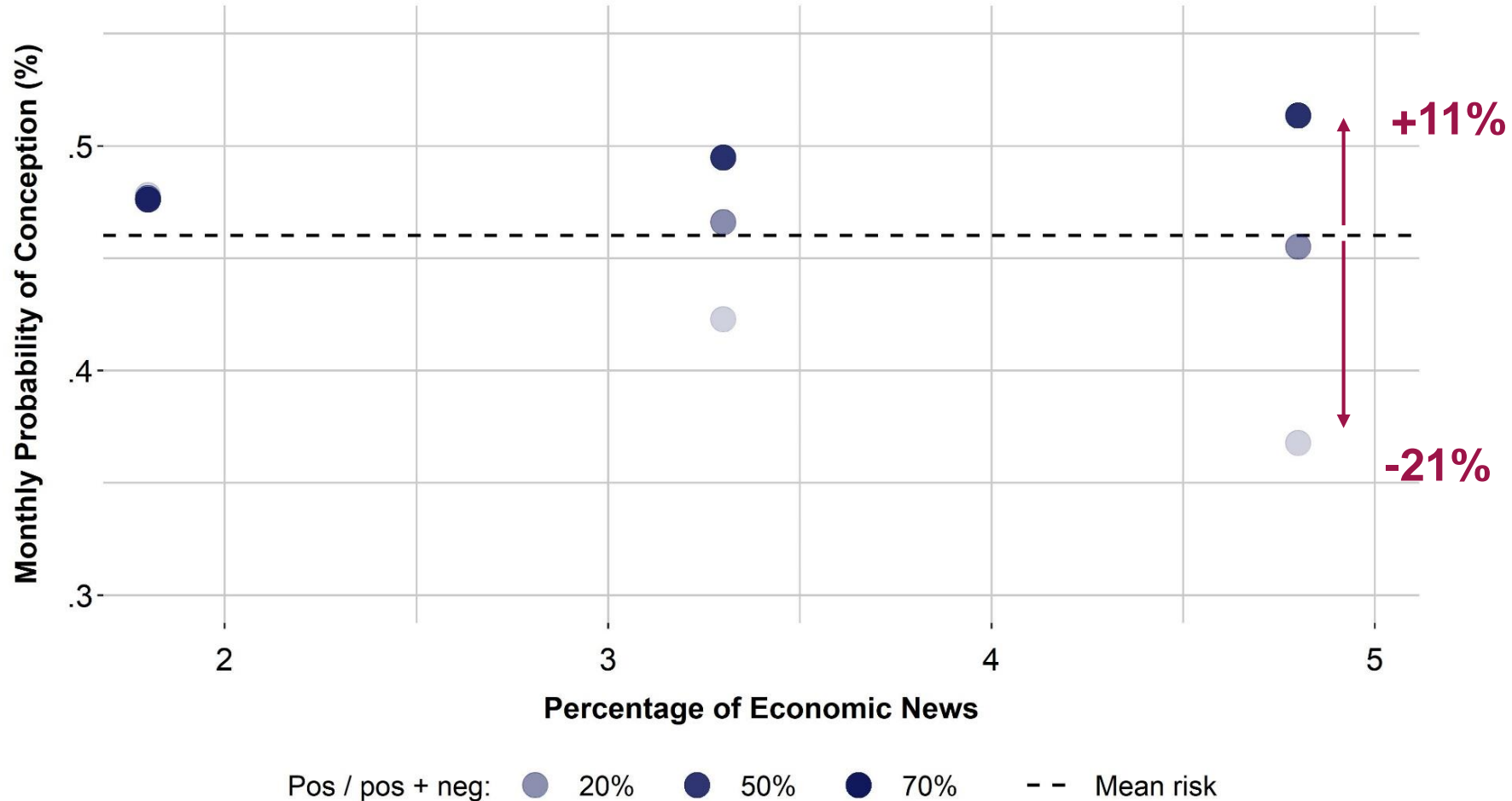# The «Relative» Coverage and Tone of Economic News

Fig. 2 Predicted probability of conception at different levels of the *Percentage* of economic news items and *Pos / pos + neg* (the percentage of positive news items among positive and negative economic news items).

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Take-home messages!

- An increase in **negative** items is negatively associated with fertility, while an increase in **positive** items is positively **(and more strongly)** associated with fertility.

- These associations are **substantially relevant** and **comparable** to those of the **national economic conjuncture**.

- The association between the **"relative" coverage** of economic news and fertility changes based on the **"relative" tone** of the news coverage.

This is the **first micro-level study** addressing the role of **economic news** for **fertility behavior** net of objective indicators of micro and macroeconomic conditions.

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Want to know more?
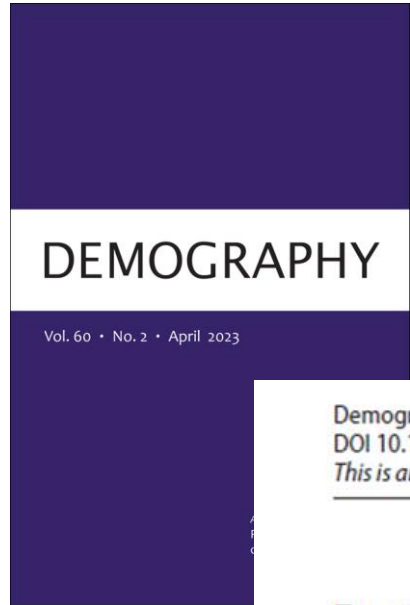
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Additional materials

Analytical sample

Tab. 1 Descriptive statistics.

| Variable	Mean/%	Monthly Risk of Conception (%)
Conception	0.46	—
Age	29.45	—
Age Class		
15–24	28.37	0.23
25–34	40.55	0.72
35–40	31.08	0.35
Student		
No	80.56	0.55
Yes	19.44	0.10
Employment		
Not employed	49.55	0.40
Permanent employed	32.72	0.55
Temporary employed	10.07	0.44
Self-employed	7.66	0.56
Level of Education		
Lower-secondary or less	25.17	0.52
Upper-secondary	49.17	0.43
Tertiary education	25.66	0.47
Union		
Not in union	50.04	0.11
Cohabitation	9.21	0.86
Marriage	40.75	0.80
Number of Observations	644,038	
Number of Individuals	12,521	

The coverage of economic news
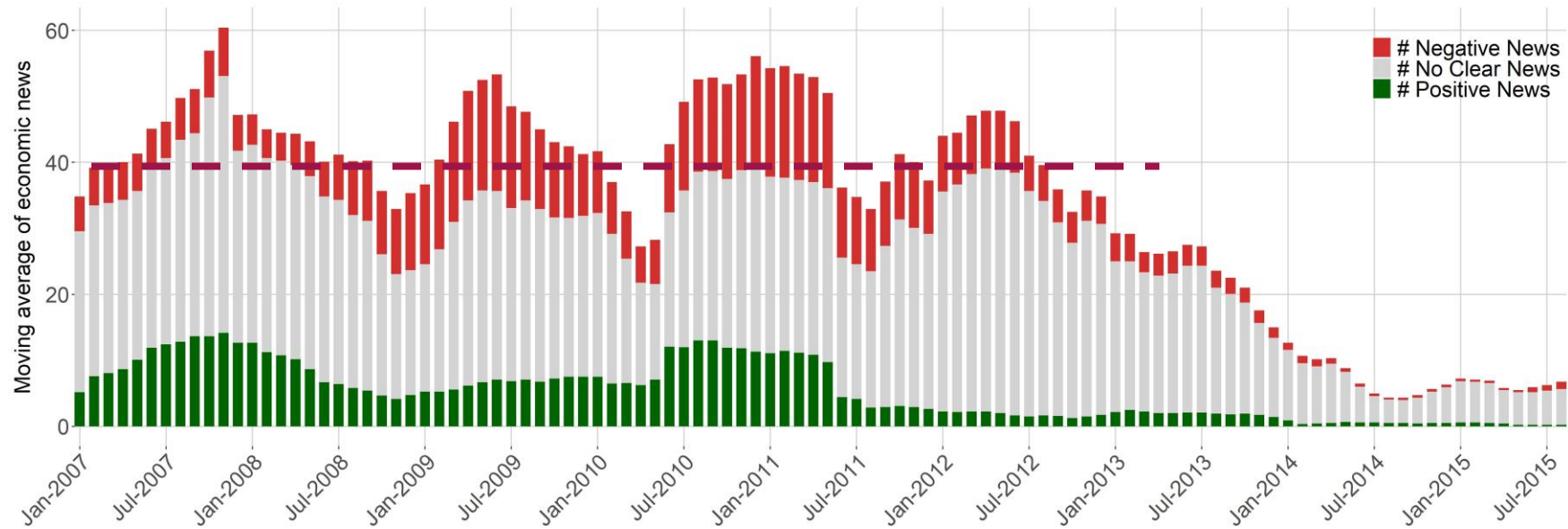
Fig. 1 Moving averages of the monthly number of economic news reported by *TG1* during the previous 12 months, Jan 2007–Aug 2015.

Responsiveness of economic news to economic events (1/2)

- The media coverage of the economy is **not always consistent** with contemporary economic conditions (Bennett 1988; Goidel and Langley 1995; Fogarty 2005).

- The media give prominence to **bad economic events** (Goidel and Langley 1995; Shah et al. 1999; Hester and Gibson 2003; Fogarty 2005; Hagen 2005; Soroka 2006; Soroka 2012; Van Dalen et al. 2015).

- A few exceptional studies documented a fairly correspondence between economic reality and economic news (Behr and Iyengar 1985; Casey and Owen 2013).

- The **volume** and the **tone** of economic news influence the public **beyond the information** they report (Doms and Morin 2004).

- Economic information reported by media

  - relate more to **future economic trends** of the economy (Soroka et al. 2015).

  - impact especially on people's **forward-looking judgments** (Soroka et al. 2015; Damstra and Boukes 2018).

Responsiveness of economic news to economic events (2/2)
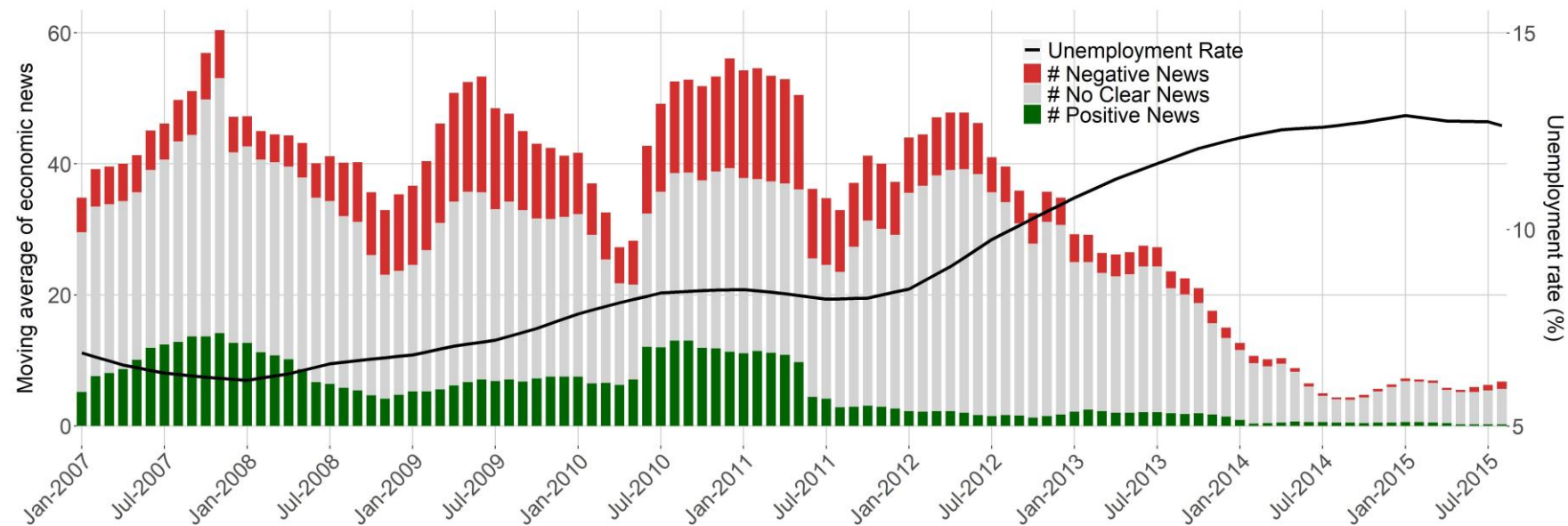
Fig. 2 Moving averages of the monthly number of economic news reported by *TG1* and of the quarterly unemployment rate in Italy during the previous 12 months, Jan 2007–Aug 2015.

- **Media relevance** of a topic may not overlap with its **actual relevance** (e.g., *unemployment rate vs economic news*).

The drop in the media coverage of economy after the GR
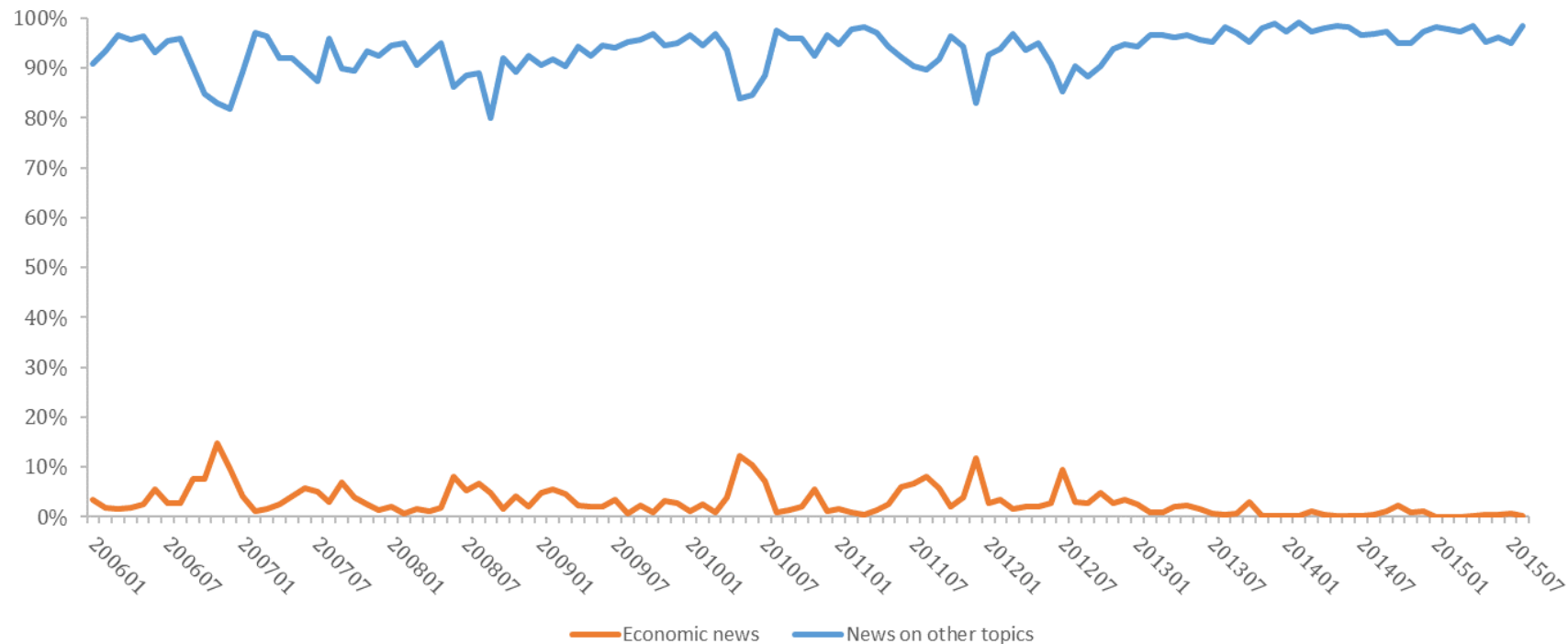
Fig. 3 Comparison between the incidence of economic news and that of other reports (Jan 2006 – Aug 2015).

- Economy has represented a **hot topic** for media narratives approximately until 2013.

- The drop of economic news (even in relative terms) may be due to a **replacement effect**.

Universality of the media

- RAI is the **Italian Public Service Media** (PSM), of which RAI 1 is the main channel.

- **Universality** is one of the PSM's fundamental principles (Born and Prosser 2001).

- PSM schedule contents in order to

    - be accessible to **all of the citizens** in the community

    - appeal to individuals of different ages, genders, levels of education, and so on.

- We consider news reported by a **"universal media"** which reaches a large swathe of Italian society.

CambieRai (ISTAT 2016)

- **69.7%** of respondents update their information by watching television newscasts–jointly or not with online sources

Information updating by sources

- **exclusively internet and social networks**: common among **young people**

- **TV+internet**: **all age groups**

Participants who watch Rai news programs every day:

- 58.6% among under 24

- 48.6% among those aged 25-35

- 51.4% among those aged 35-44

Why did we prefer LPM to logit?

- Use of **Fixed Effect (FE)**: Hausman test results.

- Use of the **panel approach**: the time window of the analysis is relatively short.

- Use of **Linear Probability Models** (LPMs):

  - The relationship between log odds and probability **is not far from linearity** (von Hippel 2015).

  - With **logit FE**, the estimates would rely only on the observations of women who had conceived at least one child, in this case **2,425 women** (rather than 12,521).
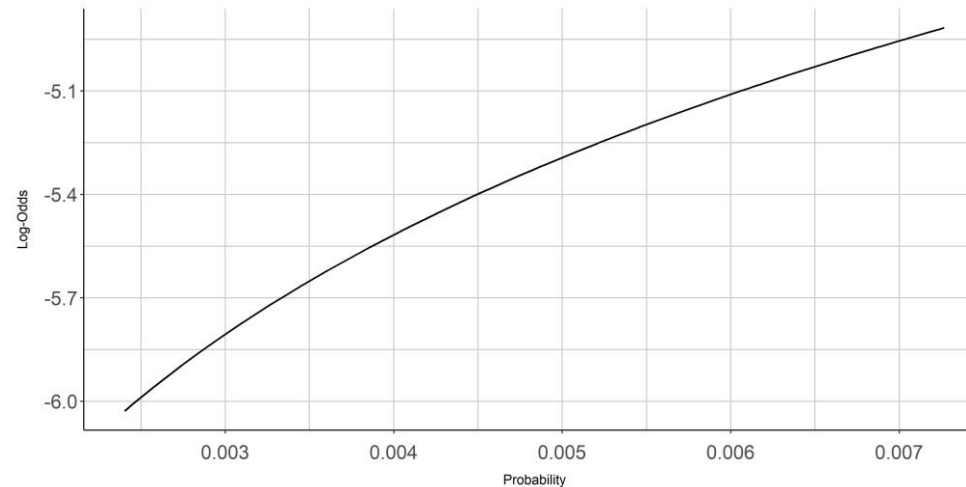

Fig. 4 Log-odds vs probability in the range of the observed monthly risk of conception (0.24% - 0.73%).

The complete models

Tab. 2 Linear probability models predicting the probability of conception.

Variable	Model 1	Model 2	Variable	Model 1	Model 2
Constant	0.00394***	−0.00172***	Macroeconomic Controls		
	(0.00023)	(0.00039)	Female unemployment rate	−0.00088***	−0.00048*
Individual Controls				(0.00024)	(0.00024)
Age	0.01696***	0.00988*	GDP per capita	0.00019†	0.00022*
	(0.00413)	(0.00411)		(0.00011)	(0.00011)
Age²	−0.01616***	−0.00901**	Inflation rate	0.00110	0.00096
	(0.00312)	(0.00310)		(0.00075)	(0.00075)
Employment (ref. = not employed)			Time Trend Control: Month	−0.00182†	−0.00243*
Permanent employed	0.00165***	0.00208***		(0.00104)	(0.00103)
	(0.00047)	(0.00047)	News Coverage		
Temporary employed	0.00130**	0.00188***	# negative tone	−0.00023*	−0.00025**
	(0.00044)	(0.00044)		(0.00010)	(0.00010)
Self-employed	0.00224**	0.00210**	# positive tone	0.00039*	0.00040*
	(0.00083)	(0.00080)		(0.00018)	(0.00018)
Student	−0.00020	−0.00013	# unclear tone	−0.00016	−0.00017
	(0.00043)	(0.00041)		(0.00012)	(0.00012)
Level of education × age (ref. = lower-secondary or less)			Number of Observations	644,038	
Upper-secondary	0.00280	0.00638†	Number of Individuals	12,521	
	(0.00380)	(0.00374)			
Tertiary education	0.00116	0.00637			
	(0.00403)	(0.00394)			
Level of education × age² (ref. = lower-secondary or less)					
Upper-secondary	−0.00161	−0.00522			
	(0.00343)	(0.00340)			
Tertiary education	0.00211	−0.00388			
	(0.00380)	(0.00373)			
Union (ref. = not in coresidential union)					
Cohabitation		0.00698***			
		(0.00069)			
Marriage		0.01176***			
		(0.00071)			

Notes: Robust standard errors are shown in parentheses. Estimates refer to standardized variables.

$†p<.10; *p<.05; **p<.01; ***p<.001$

Notes: Robust standard errors are shown in parentheses. Estimates refer to standardized variables.

$†p<.10; *p<.05; **p<.01; ***p<.001$

Parity-specific fertility

Tab. 3 Average marginal effects of news coverage variables on the transitions to first and second child from discrete-time logit models.

Variable	First-Order Births	Second-Order Births
# Negative Tone	−0.00005*	−0.00010
	(0.00003)	(0.00008)
# Positive Tone	0.00009†	0.00021
	(0.00005)	(0.00015)
# Unclear Tone	−0.00004†	0.00004
	(0.00002)	(0.00006)
Number of Observations	365,119	110,310
Number of Individuals	7,342	3,521
Number of Conception Events	1,486	1,119

Notes: Robust standard errors are shown in parentheses. Estimates refer to standardized variables. Models control for all variables included in Model 2 in Table 2.

†$p<.10$; *$p<.05$

Heterogeneity in media effects – Previous evidence

- The salience of positive economic news has a significant positive association with the prospective economic evaluations exclusively among **highly educated individuals** (Krause 1997).

- A higher salience of a political issue in the media has a larger positive effect on the knowledge of **highly educated** individuals rather than that of low educated (Jerit et al. 2006).

- Although no characteristic pattern emerged, some above-average associations of positive and/or negative economic news with economic perceptions are traced among **younger** employees, and **low and medium paid employees**, and **highly educated** employees (Garz 2012).

Heterogeneity in media effects

- Findings are almost exclusively driven by women **aged 25–34**, the age group in which (first) childbirths are mostly concentrated.

- Associations are statistically and substantially significant only for women with **upper-secondary education**, a group that constitutes almost half of our sample.

- They are greater among **cohabiting women** than among married women. This may be explained by the fact that selection into cohabitation among women in Italy is driven by economic uncertainty (Vignoli et al. 2016).

- **No heterogeneity** is detected in the associations between news coverage variables and fertility **by employment status**.

- **No substantial differences by gender**: we replicate our analyses on a panel of 12,348 male respondents included in the FSS surveys (2,619 conception events out of 633,394 observations).

Robustness checks

- The pattern of results is confirmed:

  - applying **logit FE models** instead of LPMs.

    Tab. 4 Linear Probability Models predicting the probability of conception with the inclusion of fixed and random effects.

Variable	Coefficient			
	Fixed effects-Italy	*Random effects-Italy*	*Fixed effects-Germany*	*Random effects-Germany*
# Negative News	−0.00025***	−0.00021**	−0.00032***	−0.00027**
	(0.00010)	(0.00009)	(0.00011)	(0.00011)
# Positive News	0.00040**	0.00038**	−0.00002	−0.00001
	(0.00018)	(0.00018)	(0.00010)	(0.00009)
Observations	644,038		734,640	
Individuals	12,521		11,105	

    Notes: Robust standard errors are in parenthesis. Estimates refer to standardized variables.

    Models include all controls.

    **p<.05; ***p<.01

  - including: **year fixed effects**; yearly and monthly fixed effects; year fixed effects and a linear trend of the months.

- Almost the same considerations on the media coverage effects can be drawn running models in which **observations in the pregnancy months are excluded**.

The "relative" coverage and tone

Tab. 6 Linear probability model predicting the probability of conception.

Variable	Coefficient
Percentage	-0.00071*
	(0.00031)
Pos/pos + neg	0.00024*
	(0.00012)
Percentage × pos/pos + neg	$0.00065^{\dagger}$
	(0.00033)
Number of Observations	644,038
Number of Individuals	12,251

Notes: *Percentage* is centered on its mean. Robust standard errors are shown in parentheses. Estimates refer to standardized variables. Models control for all variables included in Model 2 in Table 2.

$^{\dagger}p<.10$; $^{*}p<.05$

Associations by subperiod

Tab. 7 Estimates from linear probability model predicting the probability of conception including interactions between the numbers of economic news and subperiod dummy variables.

Variable	Coefficient			
	Downs	Ups	Sharp decline	Low coverage
# Negative tone	0.00025	-0.00035*	-0.00343	0.00208
	(0.00031)	(0.00014)	(0.00433)	(0.00438)
# Positive tone	-0.00012	0.00038*	0.00357	-0.00208
	(0.00049)	(0.00019)	(0.00460)	(0.00477)
Number of Observations		644,038		
Number of Individuals		12,521		

Notes: The subperiods identified by the dummies *Downs*, *Ups*, *Sharp decline* and *Low coverage* are graphically shown in Figure A1 of this Appendix and described in the related notes. Robust standard errors are shown in parentheses. Estimates refer to standardized variables. The model controls for all variables included in Model 2 in Table 2.
*$p<.05$

Economic News & Macroeconomic Indicators (1/4)

Tab. 8 Linear probability models predicting the probability of conception including interactions between the numbers of economic news and the female unemployment rate.

Period	Variable	Coefficient
2007-2015	Female unemployment rate	-0.00029
		(0.00028)
	# Negative tone	-0.00057**
		(0.00019)
	# Positive tone	0.00072*
		(0.00030)
	# Unclear tone	-0.00003
		(0.00022)
	# Negative tone × fem unemp	0.00052*
		(0.000022)
	# Positive tone × fem unemp	-0.00045†
		(0.00025)
	# Unclear tone × fem unemp	-0.00030
		(0.00024)
Number of Observations		644,038
Number of Individuals		12,521

Notes: Robust standard errors are shown in parentheses. Estimates refer to standardized variables. Models control for all variables included in Model 2 in Table 2. Given the sharp increase of the unemployment rate and the heavy decrease in the economic news coverage after 2012, we performed the analysis also by excluding the period 2013–2015.
†*p*<.10; *p*<.05; **p*<.01

Period	Variable	Coefficient
2007-2012	Female unemployment rate	-0.00054
		(0.00059)
	# Negative tone	-0.00062**
		(0.00022)
	# Positive tone	0.00079**
		(0.00028)
	# Unclear tone	-0.00026
		(0.00021)
	# Negative tone × fem unemp	0.00060*
		(0.00029)
	# Positive tone × fem unemp	-0.00063*
		(0.00026)
	# Unclear tone × fem unemp	0.00020
		(0.00048)
Number of Observations		516,002
Number of Individuals		12,521

Notes: Robust standard errors are shown in parentheses. Estimates refer to standardized variables. Models control for all variables included in Model 2 in Table 2. Given the sharp increase of the unemployment rate and the heavy decrease in the economic news coverage after 2012, we performed the analysis also by excluding the period 2013–2015.
†*p*<.10; *p*<.05; **p*<.01

Economic News & Macroeconomic Indicators (2/4)

Tab. 9 Linear probability models predicting the probability of conception including interactions between the numbers of economic news and the female unemployment rate.

Variable	Coefficient	
EU unemployment	−0.00011	
	(0.00046)	
Global unemployment		0.00012
		(0.00013)
# Negative News	−0.00024**	−0.00027**
	(0.00011)	(0.00011)
# Positive News	0.00040**	0.00040**
	(0 .00018)	(0.00018)
# Unclear News	−0.00013	−0.00011
	(0 .00015)	(0.00013)
Person-months	644,038	
Individuals	12,251	

Note: Robust standard errors are in parenthesis. Models include all controls listed in **Table**

3.1 (Model B) expect for the *Female Unemployment rate* at national level.

**p<.05

Economic News & Macroeconomic Indicators (3/4)

Tab. 10 Linear Probability Models predicting the probability of conception and including further macro-economic indicators.

Variable	Coefficient
CCI	0.00005
	(0.00029)
"Spread" GT	−0.00015
	(0.00016)
Bond	0.00061**
	(0.00027)
Unemployment rate	−0.00050**
	(0.00024)
% Temporary	0.00021
	(0.00021)
Part-time	0.00135
	(0.00129)
GDP growth rate	0.00032*
	(0.00017)
Inflation rate	−0.00168
	(0.00207)
# Negative News	−0.00025*
	(0.00014)
# Positive News	0.00057**
	(0.00027)
# Unclear News	−0.00043*
	(0.00025)
Person-months	644,038
Individuals	12,521

Note: Robust standard errors are in parenthesis. Models include all controls listed in **Table**

3.1 (Model B) except for the *GDP per capita* given the inclusion of the *GDP growth rate*.

*p<.10; **p<.05

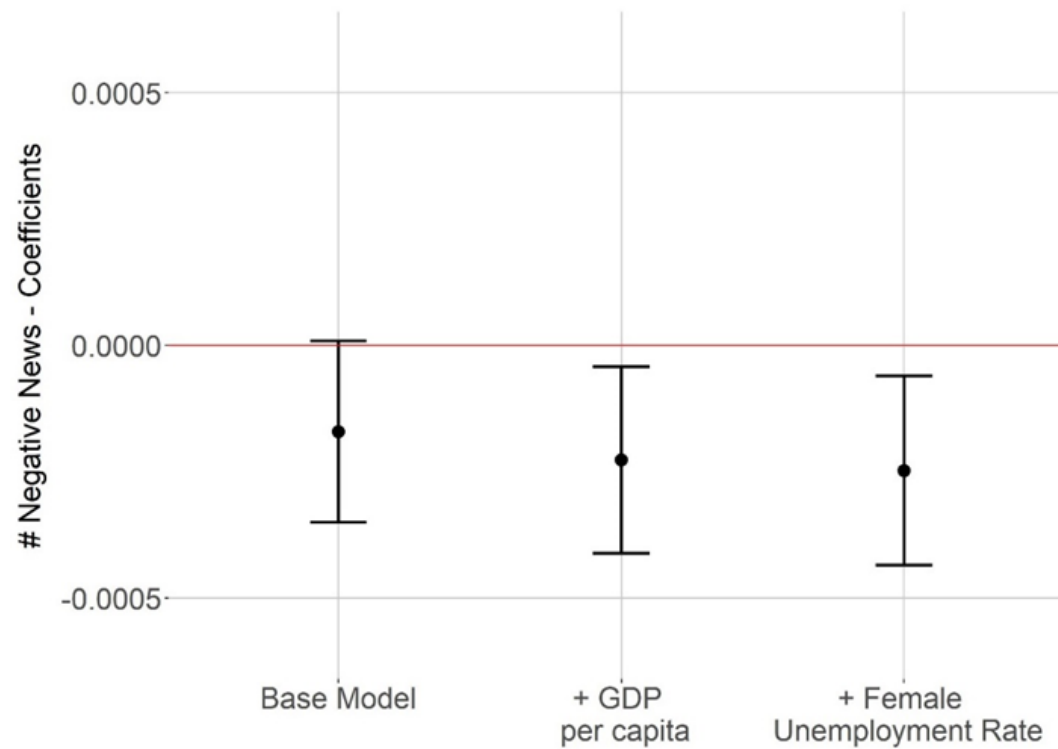# Economic News & Macroeconomic Indicators (4/4)

Fig. 5 Confidence intervals of the number of negative economic news reported by *TG1* from LPMs predicting the probability of conception.
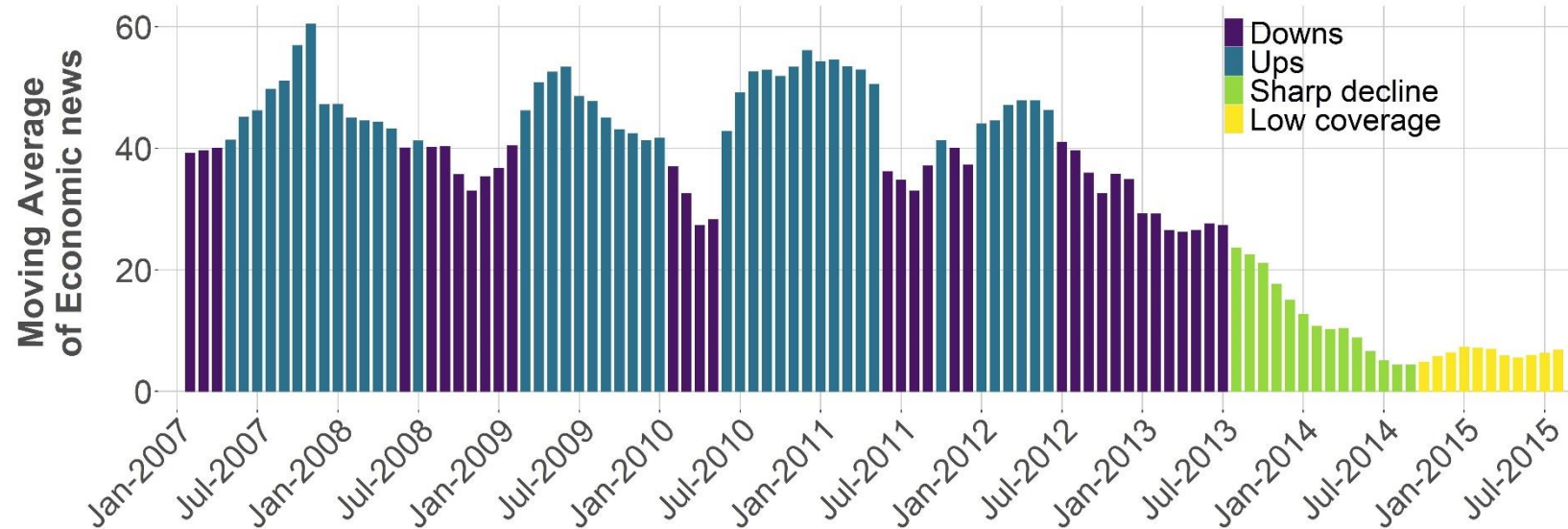
Economic News Over Time

Fig. 6 Moving averages of the monthly number of economic news reported by TG1 during the previous 12 months, Jan 2007–Aug 2015, split in subperiods.

Notes: during "Ups," the number of economic items (reported on average in the previous 12 months) was equal or over the average of the period Jan 2007-Jul 2013 (around 41), while in the months of "Downs" it was below. Months between August 2013 and September 2014 identified a period of "Sharp decline." Final months were characterized by a "Low coverage."
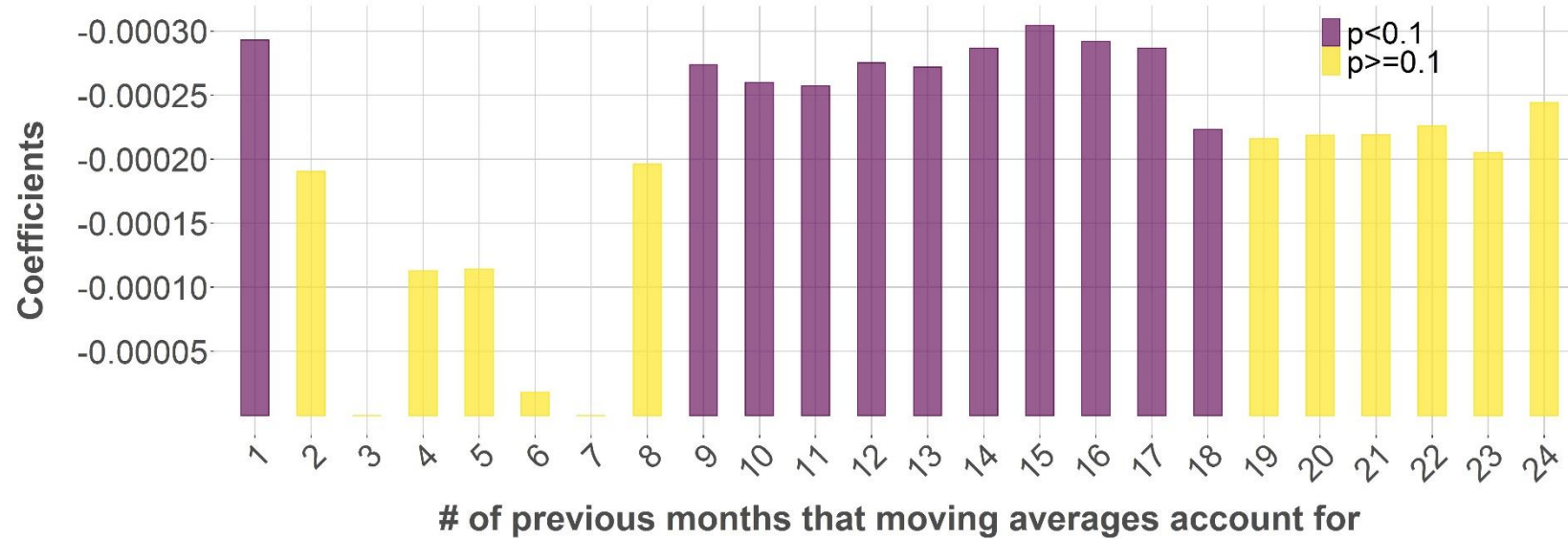
Coefficients Over Time

Fig. 7 Estimated coefficients of the (standardized) variable indicating the monthly number of negative economic news reported by TG1 in the previous n months (with n from 1 to 24), Jan 2008–Aug 2015.

Note: Models control for all correlates.