Central Bank Communication with Non-Experts – A Road to Nowhere?

Michael Ehrmann and Alena Wabitsch

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The views expressed here are our own and do not necessarily reflect those of the ECB or the Eurosystem

Introduction

- Intensified central bank communication with non-expert audiences

- "Central banks will keep trying to communicate with the general public, as they should. But for the most part, they will fail." (Blinder 2018)

- The challenges of communicating with non-experts

    – Not necessarily in reach

    – Less knowledge about central banks

    – Response not as fast and visible as for experts

    – "3 E's of central bank communication with the public": explanation, engagement and education (Haldane et al. 2020)

Introduction

- Evidence from focus groups, targeted surveys or lab experiments

  - Simple and relatable messages (e.g., Bholat et al. 2019; Coibion et al. 2019; Kryvtsov and Petersen 2019)

  - Upside: controlled experiments allow causal interpretation

  - Downside: Non-experts are engineered to be "in reach"

- Surveys before and after communications

  - Little effect, especially on expectations: Lamla and Vinogradov 2019, 2021; De Fiore, Lombardi and Schuffels 2021)

  - Monetary policy surprises affect economic confidence instantaneously (Lewis et al. 2019)

Introduction

- Our alternative: Twitter-traffic about the ECB

  - Real-life data (reception of central bank signals not engineered)

  - High frequency (identification)

  - Continuous (many events)

  - Many individuals, experts and non-experts

  - Caveats

    - Need to differentiate experts from non-experts

   - Twitter users not representative of general public

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Data

Data

- Collect tweets from Twitter's Advanced Search
  - Henrique Jefferson's Python package GetOldTweets
  - Posted between 2012 and 2018, still online and publicly available
  - In English and German
  - Containing at least one of "ecb", "european central bank", "draghi" in the text, hashtag or username
  - Cleaning procedure, e.g. drop tweets unrelated to the European Central Bank (e.g. English Cricket Board)
  - >3.5 mio tweets, >2 mio retweets (>100k tweets, >50k retweets in German)

Data

Related tweets

Unrelated tweets

Data

Panel A: Twitter volume

Legend:
- Tweets in English
- Tweets in German
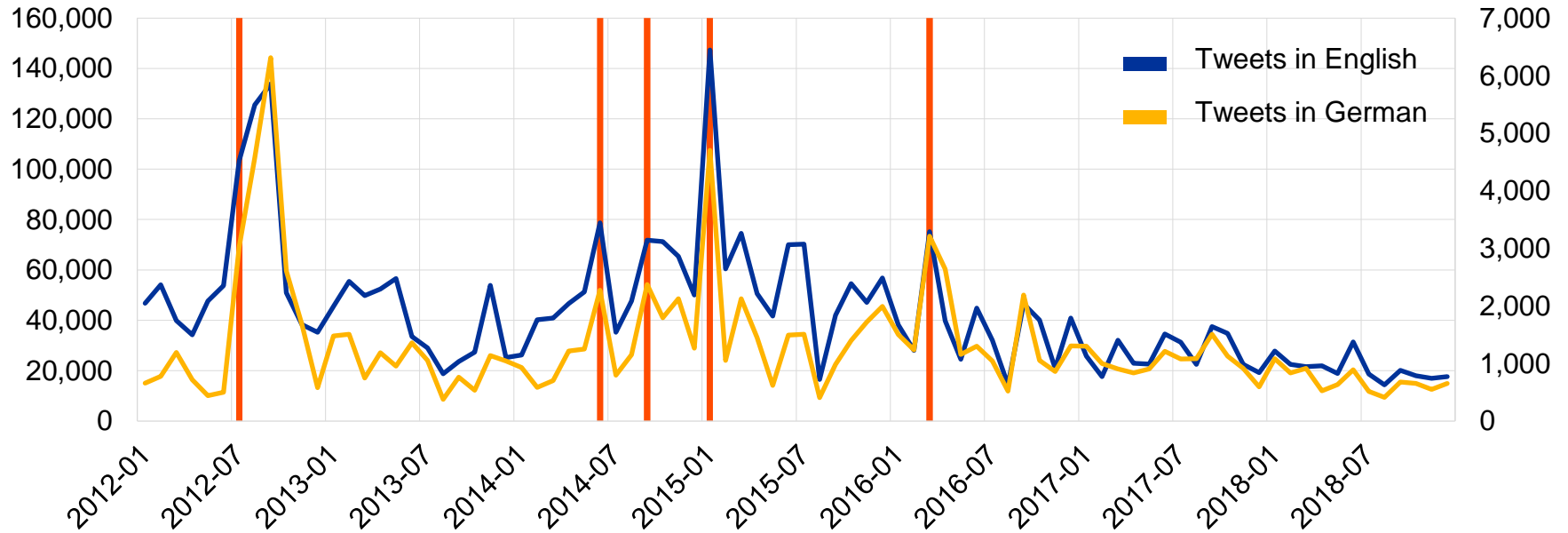
Data

- Content of tweets
  - Dictionary approach; take account of combinations, co-occurrence of words, negation, qualifications ("very" good)
  - Favourableness
    - -1 to 1; higher value reflects a more positive sentiment
    - "Awful" or "dreadful" (-1), "exceptional" or "marvelous" (1), "challenging" (0.5), "inconvenient" (-0.6)
  - Absolute favourableness
    - 0 to 1; higher value reflects stronger sentiment
    - "Awful", "dreadful", "exceptional", "marvelous" (1); "consistent" or "basic" (0)
  - Subjectivity
    - 0 to 1; higher value indicates less factual (more subjective) statements
    - "Nasty" or "terrible" (1), "actual" or "contemporary" (0)

Data

- Account information
  - Date of account creation, number of followers, number of overall tweets issued by the account since its creation
  - English sample: 287,648 accounts; German sample: 16,336

Panel A: English sample

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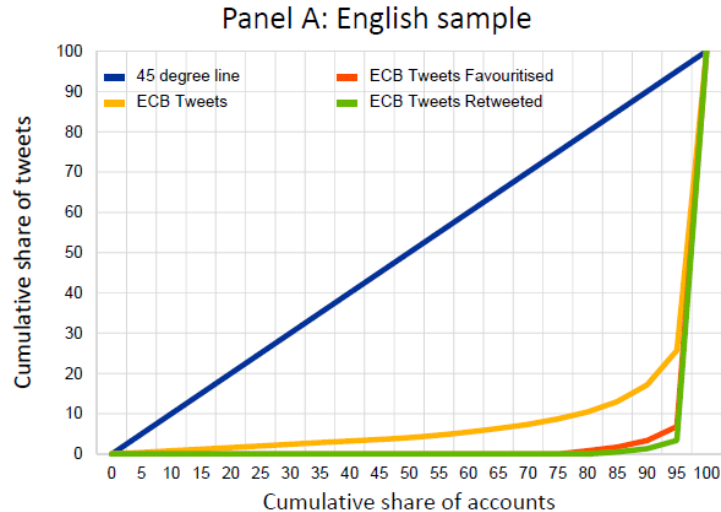
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Differentiating experts from non-experts

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Differentiating experts from non-experts

- Experts (0.5% of accounts, issuing 25% of tweets)
  - Required to be "regulars", at least for the press conference

$$expert_i^{bm} = \begin{cases} 1 \ if \ PC\_activity_i \geq 0.5 \\ 0 \ else \end{cases}$$

- Non-experts (25% of accounts, issuing 4% of tweets)
  - Irregular, and tweet about many things, i.e. low ECB centricity

$$nonexpert_i^{bm} = \begin{cases} 1 \ if \ PC\_activity_i < 0.5 \ \& \ centricity_i < P25(centricity) \\ 0 \ else \end{cases}$$

- Note we do not classify a large part of accounts "in between"

Differentiating experts from non-experts

	English sample		German sample	
	Experts	*Non-experts*	*Experts*	*Non-experts*
Account characteristics				
Number of accounts	1,282	69,031	23	3,921
Average weekend activity	0.0716	0.1835 ***	0.0755	0.2024 *
Subjectivity				
Average	0.2369	0.2760 ***	0.0347	0.1389 *
Standard deviation of account-specific average	0.0867	0.2782 ***	0.0591	0.2679 ***
Favourableness				
Average	0.0402	0.0548 **	0.0018	0.0539
Standard deviation of account-specific average	0.0461	0.2292 ***	0.0321	0.1878 ***
Absolute favourableness				
Average	0.0993	0.1420 ***	0.0184	0.0788
Standard deviation of account-specific average	0.0424	0.1953 ***	0.0341	0.1793 ***

*/**/*** denote 10%/5%/1% significance

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Determinants of Retweets and Likes

Determinants of Retweets and Likes

- Out of 3.6 mio tweets in English <500k got retweeted or liked
  - 50% of retweeted tweets are liked; 50% of liked tweets are retweeted

- H0: Higher likelihood for more subjective tweets, negative and strong views
  - Mullainathan and Shleifer 2005, Berger et al. 2013, Naveed et al. 2011

- Two types of estimates
  - Likelihood of retweets/likes: probit; marginal effects
  - Number of retweets/likes conditional on being retweeted/liked

Determinants of Retweets and Likes

- Mixed picture re. negativity bias

- Stronger and more subjective views travel further

	English sample			
	Retweet		*Like*	
	Probit	*OLS*	*Probit*	*OLS*
Negative sentiment	0.001	-0.008**	0.002***	-0.021***
Abs(favourableness)	0.030***	0.049***	0.049***	0.118***
Subjectivity	0.014***	-0.000	0.026***	0.004
Observations	3,610,722	463,973	3,610,722	417,903
R-squared		0.113		0.124

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Twitter Behaviour around ECB Communications

Twitter Behaviour around ECB Communications

- Daily data (2,537 observations)

- Twitter traffic
  - (log) number of tweets
  - Herfindahl-Hirschman indicator

- Tone of tweets
  - Subjectivity, favourableness and absolute favourableness
    - Daily average
    - Standard deviation across tweets

- Separately for
  - All accounts; experts; non-experts

Twitter Behaviour around ECB Communications

$$x_t = \alpha_{dow} + \alpha_{moy} + \alpha_{hol} + \alpha_t t + \alpha_{t^2} t^2 + \beta_{c,l}^e C_{t,l}^e + \varepsilon_t$$

- OLS, robust standard errors

- Allow for lags of communication events, plus leads for press conference
  - Effects only on same day
  - Exception 1: press conference (5 leads and 4 lags)
  - Exception 2: "Whatever it takes" (15 lags)

Twitter Behaviour around ECB Communications

	Log number of tweets
	All
Panel A: Contemporaneous response	
Press Conference	2.475***
Whatever it takes	2.020***
Economic Bulletin	0.233***
Accounts	0.608***
Speeches by others	0.270***
Speeches by president	0.434***
Tweet	0.191***
Panel B: Overall response	
Press Conference	**5.965**
Whatever it takes	**24.800**
Observations	2,537
R-squared	0.630
Mean(dependent var)	6.742
Stdev(dependent var)	0.899

- Simultaneous reaction to all events; response to speeches by ECB president 60% higher than to speeches by other EB members

Twitter Behaviour around ECB Communications

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	All
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Stdev(dependent var)	0.899

- Press conference and "Whatever it takes" have large overall effects

Twitter Behaviour around ECB Communications

	Log number of tweets		
	All	**Non-experts**	**Experts**
Panel A: Contemporaneous response			
Press Conference	2.475***	2.059***	2.847***
Whatever it takes	2.020***	1.883***	1.740***
Economic Bulletin	0.233***	0.142	0.362***
Accounts	0.608***	0.324***	0.986***
Speeches by others	0.270***	0.080	0.450***
Speeches by president	0.434***	0.385***	0.499***
Tweet	0.191***	0.157***	0.274***
Panel B: Overall response			
Press Conference	**5.965**	**4.169**	**7.494**
Whatever it takes	**24.800**	**20.901**	**22.446**
Observations	2,537	2,537	2,537
R-squared	0.630	0.365	0.717
Mean(dependent var)	6.742	3.606	5.135
Stdev(dependent var)	0.899	0.823	1.168

- Non-experts generally less responsive; exception: "Whatever it takes"

Twitter Behaviour around ECB Communications

	Log number of tweets				Concentration index		
	All	Non-experts	Experts		All	Non-experts	Experts
Panel A: Contemporaneous response							
Press Conference	2.475***	2.059***	2.847***		-0.004***	-0.037***	-0.022***
Whatever it takes	2.020***	1.883***	1.740***		-0.002***	-0.016***	-0.012***
Economic Bulletin	0.233***	0.142	0.362***		-0.001	-0.006*	-0.006**
Accounts	0.608***	0.324***	0.986***		-0.002***	-0.016***	-0.016***
Speeches by others	0.270***	0.080	0.450***		-0.001***	-0.004**	-0.014***
Speeches by president	0.434***	0.385***	0.499***		-0.001***	-0.012***	-0.001
Tweet	0.191***	0.157***	0.274***		-0.001**	-0.006**	-0.012***
Panel B: Overall response							
Press Conference	**5.965**	**4.169**	**7.494**		**-0.020**	**-0.125**	**-0.205**
Whatever it takes	**24.800**	**20.901**	**22.446**		**-0.059**	**-0.433**	**-0.527**
Observations	2,537	2,537	2,537		2,537	2,537	2,537
R-squared	0.630	0.365	0.717		0.257	0.241	0.395
Mean(dependent var)	6.742	3.606	5.135		0.005	0.043	0.037
Stdev(dependent var)	0.899	0.823	1.168		0.006	0.035	0.061

- Events reduce concentration, in particular "Whatever it takes"

Twitter Behaviour around ECB Communications

- Tone of tweets
  - Subjectivity: more factual, in particular non-experts (narrower distribution, lower mean)
  - Favourableness: spectrum of views narrows
  - Absolute favourableness: moderation of views

- Any difference for tweets in German? (e.g., more controversial or subjective)
  - Most results go through
  - Whatever it takes
    - Stronger response of traffic, in particular for non-experts
    - More negative
    - Controversial discussion, spectrum of views opens up considerably

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Summary and conclusions

Summary and conclusions

- Key findings

  - Non-experts express stronger and more subjective opinions, larger variety of views

  - Retweets/likes of ECB-related tweets increase with language strength and subjectivity

  - Twitter traffic responds to ECB communications

    - Information transmission (one-day effects, mostly experts, convergence of views, reduced subjectivity)

    - Platform for controversial discussions (several days, non-expert involvement, divergent views)
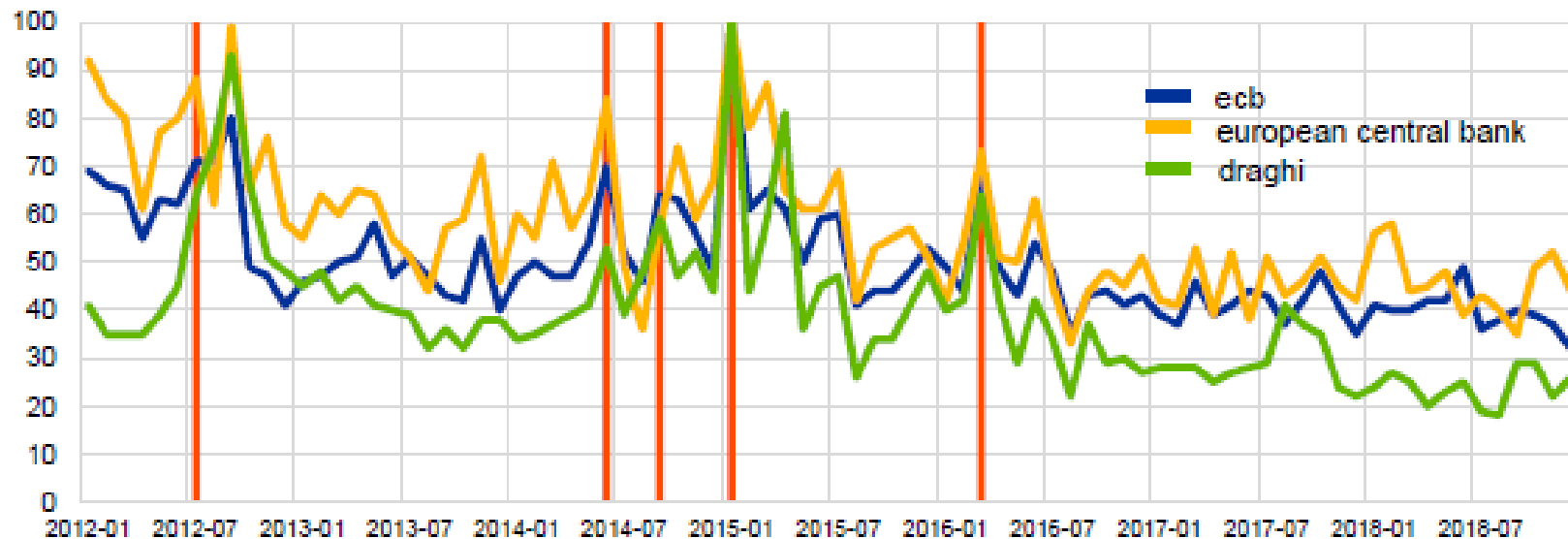
Summary and conclusions

- Policy implications

  – Central bank communication manages to reach out to non-experts

  – Strong and more subjective views likely to be reposted more often

  – Central banks can make discussions in social media somewhat more factual and moderate

- Caveat

  – Open issue whether communication to non-experts succeeds in

    - Fostering trust

    - Making central banks accountable

    - Influencing expectations or behaviour

Thank you! Questions?

Data

Panel B: Google searches

Data

Panel C: Newspaper articles

Volume of related articles (standardised)