

Discussion of “The Long-Run Information Effect of  
Central Bank Communication”  
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The views expressed in this presentation are those of the author and do not necessarily represent the views of the Federal Reserve Bank of Boston or the Federal Reserve System.

## Main Question and Motivation

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- ▶ Push towards more central bank transparency and recent experience at the effective lower bound has brought central bank communication to the forefront as a policy tool
- ▶ The transmission of communication to long-term interest rates is particularly important at the ELB
- ▶ Ongoing debate around whether the transmission is through expected future short rates or term premia (parallels debate about QE effects)

## Debate in the Recent Literature

- ▶ Transmission through expected future interest rates
  - ▶ Nakamura & Steinsson (2018): FOMC announcements affect expected future real rates through a signaling/information channel
  - ▶ Carvalho et al. (2016): Communication surprises in FOMC statements (on a hawkish/dovish scale) affect long-term rates through expected future real rates

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- ▶ Transmission through term premia
  - ▶ Hanson & Stein (2015): FOMC announcements affect TP through reach-for-yield behavior of investors
  - ▶ Bundick et al. (2017): Uncertainty surprises linked to MP communication move TP
  - ▶ Gertler & Karadi (2015) and Swanson (2017): Forward guidance moves credit spreads
  - ▶ Stavrageva & Tang (2018): UMP easings during the Global Recession raised excess returns and investor risk aversion, consistent with signaling/information channel

## Advantages of This Paper

- ▶ Directly measures communication in a more nuanced way
  - ▶ Not linked to asset price responses
  - ▶ Not on a pre-defined scale
- ▶ Communication isolated from policy action by looking at the Bank of England's Inflation Report, published at least a week after the policy meeting

## Method and Key Results

### **Construction of narrative signals**

- ▶ LDA estimation of topics from text of Bank of England's Inflation Report
- ▶ Bootstrapped elastic net regression (combines ridge and LASSO methods) to find top four topics in explaining variation in interest rates

## Method and Key Results

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**Key result: Evidence of an effect of the narrative within central bank communications on long-term interest rates through term premia.**

- ▶ Effect of the narrative beyond that of quantitative forecasts
- ▶ Different from effect on short-term interest rates
- ▶ For long-term rates, main effect of communication is from narratives about risks and uncertainty working through term premia

Top Topics



## Comments

1. Transmission of expectations and term premia signals
2. Do term premia signals capture elements of TP other than uncertainty?
3. Data issues

## Expectations vs Term Premia Signals

**Table 13:** Full Matrix of Partial  $R^2$  from Placebo Regressions including Components of the Asset Response

Asset News	Narrative Shocks					
	Overall	$i_{0:12;t}$ EXP	TP	Overall	$f_{60:120;t}$ EXP	TP
$i_{0:12;t}$	0.29***	0.31***	0.11	0.01	0.06	0.04
EXP( $i_{0:12;t}$ )	0.30***	0.32***	0.08	0.01	0.06	0.04
TP( $i_{0:12;t}$ )	0.17*	0.10	0.36***	0.06	0.13	0.04
$f_{60:120;t}$	0.12	0.17	0.08	0.37***	0.04	0.23*
EXP( $f_{60:120;t}$ )	0.22***	0.14*	0.16	0.09	0.22***	0.05
TP( $f_{60:120;t}$ )	0.14	0.12	0.04	0.40***	0.11*	0.36***

Note: This is an excerpt of Table 13 from the paper.

- ▶ Lack of explanatory power of TP signals for one-year rate suggests that TP signals capture a dimension of communication different from measures derived from rate futures up to 1 year ahead, as widely used in previous work.
  - ▶ Something like Swanson (2018) LSAP factor (based on up to 10y yield) might be closer.

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  - ▶ Something like Swanson (2018) LSAP factor (based on up to 10y yield) might be closer.
- ▶ Following exercises use signals that occur at least twice as key EXP or TP signals for each of the four interest rates considered in the paper: (EXP) D24, D25, and L25; (TP) D13, D17, and D18.

## Are EXP signals capturing expectations?

(Thanks to Michael for sending me the data to play with!)

- ▶ EXP signals predict longer-run abs changes in actual future short rates.

Dependent variable:  $|i_{0:3,t+h} - i_{0:3,t-1}|$

Days Ahead		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
90	$R^2$	0.090	0.291	0.539	0.561	0.571
	Partial $R^2$		0.222	0.349	0.048	0.070
	F-test p-value		0.078	0.030	0.529	0.380
180	$R^2$	0.048	0.220	0.467	0.503	0.527
	Partial $R^2$		0.181	0.316	0.068	0.113
	F-test p-value		0.073	0.009	0.193	0.072
360	$R^2$	0.028	0.271	0.582	0.652	0.620
	Partial $R^2$		0.250	0.427	0.166	0.091
	F-test p-value		0.028	0.015	0.175	0.086
720	$R^2$	0.001	0.268	0.477	0.579	0.513
	Partial $R^2$		0.268	0.285	0.194	0.069
	F-test p-value		0.139	0.156	0.044	0.124
1080	$R^2$	0.006	0.314	0.641	0.681	0.667
	Partial $R^2$		0.310	0.477	0.111	0.073
	F-test p-value		0.001	0.000	0.041	0.018

## What kind of expectations?

- ▶ EXP signals correlate with abs changes in inflation and short rate survey fcsts.

Dependent variables: Absolute 1-month change in mean Consensus forecasts

Variable		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
$ \Delta GDP_{0Y,mean} $	$R^2$	0.049	0.236	0.457	0.471	0.509
	Partial $R^2$		0.196	0.290	0.025	0.096
	F-test p-value		0.229	0.006	0.702	0.219
$ \Delta GDP_{1Y,mean} $	$R^2$	0.309	0.436	0.528	0.546	0.553
	Partial $R^2$		0.183	0.163	0.038	0.052
	F-test p-value		0.127	0.021	0.417	0.401
$ \Delta Infl_{0Y,mean} $	$R^2$	0.010	0.110	0.261	0.353	0.291
	Partial $R^2$		0.101	0.169	0.125	0.040
	F-test p-value		0.143	0.015	0.369	0.460
$ \Delta Infl_{1Y,mean} $	$R^2$	0.316	0.503	0.668	0.736	0.695
	Partial $R^2$		0.274	0.333	0.203	0.080
	F-test p-value		0.578	0.124	0.028	0.062
$ \Delta i_{3M,mean} $	$R^2$	0.343	0.550	0.653	0.717	0.663
	Partial $R^2$		0.315	0.229	0.186	0.031
	F-test p-value		0.106	0.174	0.066	0.490
$ \Delta i_{12M,mean} $	$R^2$	0.327	0.501	0.604	0.656	0.643
	Partial $R^2$		0.259	0.207	0.130	0.097
	F-test p-value		0.111	0.028	0.095	0.362

## Are TP signals capturing uncertainty?

- ▶ TP signals correlate with short run abs changes in news-based policy uncertainty.

Dependent variable:  $|EPU_{t+h}^{UK} - EPU_{t-1}^{UK}|$

Days Ahead		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
0	$R^2$	0.085	0.176	0.276	0.311	0.482
	Partial $R^2$		0.099	0.122	0.047	0.285
	F-test p-value		0.188	0.623	0.433	0.000
7	$R^2$	0.057	0.206	0.286	0.355	0.401
	Partial $R^2$		0.158	0.100	0.097	0.161
	F-test p-value		0.179	0.674	0.189	0.010
14	$R^2$	0.051	0.187	0.286	0.340	0.305
	Partial $R^2$		0.143	0.122	0.076	0.027
	F-test p-value		0.332	0.030	0.262	0.801
30	$R^2$	0.059	0.353	0.393	0.402	0.466
	Partial $R^2$		0.312	0.062	0.016	0.120
	F-test p-value		0.003	0.913	0.893	0.103
60	$R^2$	0.007	0.093	0.165	0.202	0.222
	Partial $R^2$		0.086	0.080	0.045	0.069
	F-test p-value		0.360	0.833	0.517	0.468

Note: Shortened sample of Feb 2001 to May 2015 due to EPU availability. Data from policyuncertainty.com.

## Are TP signals capturing uncertainty?

- ▶ TP signals correlate with future realized volatility of one-day short-rate changes.

Dependent variable: Sample s.d. of  $\Delta i_{0:3,t+i}$  for  $i \in [1, h]$

Days Ahead		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
90	$R^2$	0.039	0.252	0.503	0.542	0.517
	Partial $R^2$		0.221	0.335	0.078	0.028
	F-test p-value		0.043	0.040	0.227	0.477
180	$R^2$	0.024	0.292	0.594	0.654	0.637
	Partial $R^2$		0.274	0.427	0.148	0.107
	F-test p-value		0.026	0.007	0.074	0.008
360	$R^2$	0.015	0.403	0.720	0.773	0.742
	Partial $R^2$		0.394	0.531	0.189	0.079
	F-test p-value		0.001	0.000	0.086	0.064
720	$R^2$	0.002	0.419	0.716	0.771	0.740
	Partial $R^2$		0.418	0.511	0.194	0.086
	F-test p-value		0.002	0.001	0.016	0.050
1080	$R^2$	0.035	0.445	0.734	0.762	0.746
	Partial $R^2$		0.425	0.521	0.105	0.044
	F-test p-value		0.000	0.000	0.152	0.345

## What kind of uncertainty?

- ▶ TP signals do not correlate strongly with forecast dispersion of particular economic variables. Uncertainty more about policy preferences/targets?

### Dependent variables: Absolute 1-month change in forecast dispersion

Horizon		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
$ \Delta GDP_{0Y,iqr} $	$R^2$	0.003	0.069	0.221	0.231	0.265
	Partial $R^2$		0.066	0.163	0.013	0.057
	F-test p-value		0.277	0.473	0.875	0.448
$ \Delta GDP_{1Y,iqr} $	$R^2$	0.065	0.272	0.337	0.353	0.342
	Partial $R^2$		0.221	0.089	0.023	0.007
	F-test p-value		0.023	0.438	0.498	0.956
$ \Delta Infl_{0Y,iqr} $	$R^2$	0.008	0.037	0.228	0.354	0.273
	Partial $R^2$		0.028	0.198	0.164	0.059
	F-test p-value		0.625	0.314	0.679	0.654
$ \Delta Infl_{1Y,iqr} $	$R^2$	0.354	0.622	0.694	0.707	0.716
	Partial $R^2$		0.415	0.190	0.043	0.071
	F-test p-value		0.000	0.329	0.466	0.339
$ \Delta i_{3M,iqr} $	$R^2$	0.000	0.046	0.113	0.154	0.204
	Partial $R^2$		0.046	0.070	0.046	0.102
	F-test p-value		0.534	0.680	0.595	0.096
$ \Delta i_{12M,iqr} $	$R^2$	0.077	0.110	0.267	0.351	0.283
	Partial $R^2$		0.036	0.177	0.115	0.021
	F-test p-value		0.812	0.118	0.011	0.824



## Do TP signals capture other aspects of long-term interest rates?

- ▶ TP signals also correlate with some longer-term expectations.

Dependent variables: Absolute 6-month change in Consensus long-run forecasts

Horizon		VIX only	VIX & $q_t^{EXP}$	VIX, $q_t^{EXP}$ , & $q_t^{UNC}$	VIX, $q_t$ , & EXP Signals	VIX, $q_t$ , & TP Signals
$ \Delta GDP_{2Y} $	$R^2$	0.157	0.362	0.482	0.561	0.661
	Partial $R^2$		0.244	0.188	0.153	0.346
	F-test p-value		0.599	0.766	0.439	0.038
$ \Delta GDP_{3Y} $	$R^2$	0.109	0.346	0.650	0.696	0.727
	Partial $R^2$		0.266	0.465	0.131	0.220
	F-test p-value		0.067	0.014	0.374	0.087
$ \Delta Infl_{2Y} $	$R^2$	0.026	0.435	0.739	0.970	0.998
	Partial $R^2$		0.420	0.539	0.884	0.993
	F-test p-value		0.026	0.053	0.146	0.005
$ \Delta Infl_{5Y} $	$R^2$	0.021	0.646	0.929	0.987	0.996
	Partial $R^2$		0.639	0.799	0.818	0.937
	F-test p-value		0.002	0.003	0.155	0.056
$ \Delta i_{4Y}^{US} $	$R^2$	0.001	0.239	0.702	0.703	0.878
	Partial $R^2$		0.238	0.608	0.006	0.591
	F-test p-value		0.032	0.002	0.995	0.002
$ \Delta i_{5Y}^{US} $	$R^2$	0.021	0.191	0.495	0.563	0.743
	Partial $R^2$		0.174	0.376	0.135	0.491
	F-test p-value		0.071	0.001	0.614	0.081

## Empirical Concerns and Extensions

- ▶ A better way to construct narrative surprises?
  - ▶ Narrative signals are “purged” of variation correlated with numerical variables from same IR
  - ▶ What about investors’ expectations for the text of the report?
  - ▶ Also clean out variation correlated with narrative signals from the preceding IR, minutes from the same meeting, or media reports in anticipation of the IR release?
- ▶ Controlling for news from events on the same day
  - ▶ 50 out of 70 IR release dates in the sample overlap with the release of the UK Labour Market Report, often just one hour before the IR.

## Empirical Concerns and Extensions

- ▶ Interactions between narrative signals and numerical information?
  - ▶ Narrative might direct attention to certain parts of the numerical forecast creating an interaction effect.
  - ▶ Tang (2019): Relationship between labor topic intensity in FOMC statements/minutes and the response of long-term interest rates to labor market macro news surprises.
- ▶ Can more be done with the text to measure the type of uncertainty or expectations that these narrative signals are referring to?

## Policy Implications

- ▶ This paper finds narrative signals that drive *absolute changes* in long-term interest rates.
- ▶ Next step to get closer to policy implications requires finding narrative signals that can reliably move long-term interest rates in a particular direction.

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- ▶ *Should* words matter?
  - ▶ Another interpretation: Scope for improving/expanding quantitative communications.

## Conclusion

- ▶ Very interesting and thought-provoking paper
- ▶ Contributes novel data and techniques to our understanding of MP effects on long rates
- ▶ Opens exciting avenues for future research and more ways to tailor central bank communication toward specific credit policy goals

## Extra Slides

## Top Expectations and Term Premium Topics

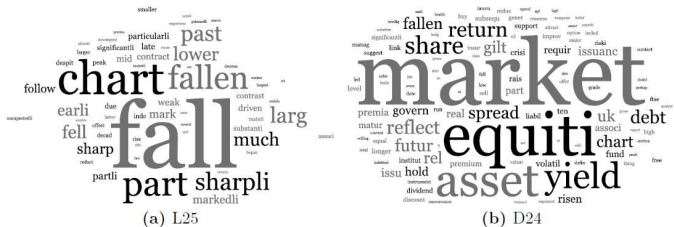


Figure 8: Key Topics for Market Reaction to Narrative: 1-Year Spot Rate

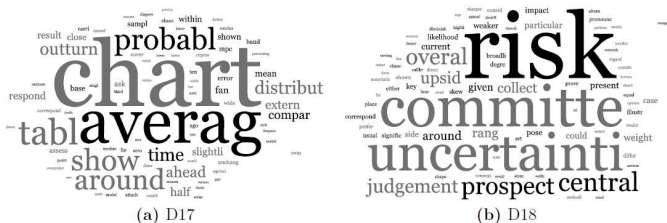


Figure 9: Key Topics for Market Reaction to Narrative: 5-Year, 5-Year Forward Rate