



EFFECTS OF *BANCO DE LA REPUBLICA*'S COMMUNICATION ON THE YIELD CURVE

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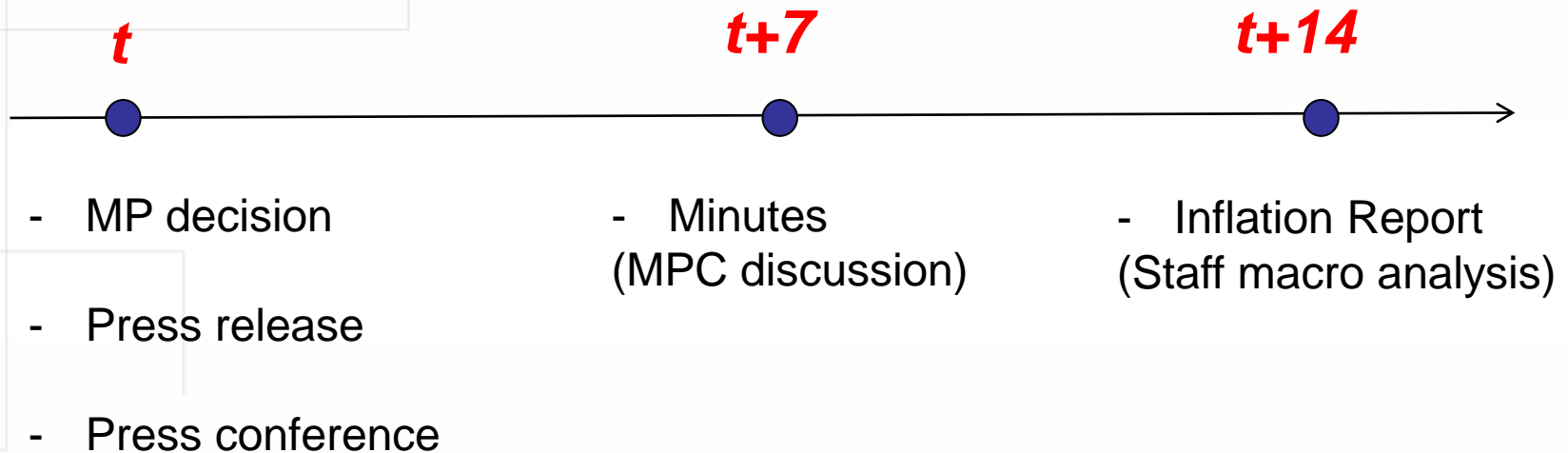
MAIN RESULTS

- Numeric information (i.e. output and inflation forecasts) contained in the BR's inflation reports has no effect on the market interest rates.
- There is not robust evidence of the effect of narrative info (contained in IRs) on the market interest rates.
- There is robust evidence of the effect of narrative information, contained in the minutes (of the monetary policy meetings) on the market interest rates.



MAIN RESULTS

- Explanation (hypothesis):



MOTIVATION

- Communication has become an essential instrument in the conduct of monetary policy.
- Communication outlets: press conferences, minutes, reports, speeches of the members of the MPC...
- Communication strategy requires assessment.
- We study the effect on the yield curve of the delivery of info through two outlets: Minutes and Inflation Reports.



DATA

- Interest rates (yield curve):
 - Daily data from 01/05/2011 to 31/12/2018 (89 Minutes and 32 Inflation Reports)
 - Zero coupon yields (Nelson-Siegel method) for four maturities: 1y spot, 3y forward, 5y forward, 5y ahead 5y forward.
- Numeric Information (IRs only, fan charts):
 - 12 data series (2 variables x 2 forecast horizons x 3 types of info).
 - Variables: inflation and output growth
 - Forecast horizons: 4 and 8 quarters.



DATA

- **Numeric Information:**
 - Types: Mode, Dispersion, Asymmetry.
 - Surprises (difference wrt market expectations / previous value).
- **Narrative Information (IRs and Minutes):**
 - We use Latent Dirichlet Allocation (LDA): a Bayesian tool in which each document is modelled as a combination of an underlying set of topics.
 - Based on a coherence measurement (Röder et al., 2015) we select eight as the optimal number of topics.



DATA

- Narrative Information :

- We label topics considering both frequency & exclusiveness:

Topic	2	8	5	3	7	1	6	4
Label	Domestic demand and economic sectors	Macroeconomic projections	Inflation, food and regulated items	Balance of trade and commodities	External conditions	Interest rates and monetary policy	Credit	Inflation target and expectations
Average Weight	22.5%	15.8%	14.9%	12.0%	10.2%	9.1%	7.9%	7.6%

- We analyse Minutes and IRs separately, so that we can estimate a topic distribution for each outlet. Then we extract 16 variables for each outlet, topic weights and their first differences.



METHODOLOGY

- We follow Hansen et al. (2019, JME).
- Event study: interest rate changes on days of publication of either minutes or inflation reports are systematically caused by the news contained in such a publication.
- We filter out variation in narrative info that is captured by numeric info and international volatility:

$$Nar_{t,j}^{rep} = \eta_{0,j} + \eta_{1,j}Num_t + \eta_{2,j}VIX_t + v_{t,j}^{rep} \quad (1)$$

$$Nar_{t,j}^{min} = \mu_{0,j} + \mu_{1,j}VIX_t + v_{t,j}^{min} \quad (2)$$

for $j= 1, 2, \dots 16$



METHODOLOGY

- Risk of overfitting: too few data for the number of regressors. We use elastic net regression to simplify the model (penalises variables according to the magnitude of their estimated coefficients). Specifically, to select the three most relevant narrative shocks (v_t^*).
- We estimate the explanatory power of both numeric info and the selected narrative shocks for each of the four market interest rates:

$$|\Delta y_t^{rep}| = \gamma_{0,y} + \gamma_{1,y} Num_t + \gamma_{2,y} VIX_t + \gamma_{3,y} v_t^{*rep} + \epsilon_{t,y}^{rep} \quad (3)$$

$$|\Delta y_t^{min}| = \delta_{0,y} + \delta_{1,y} VIX_t + \delta_{2,y} v_t^{*min} + \epsilon_{t,y}^{min} \quad (4)$$

for $y = i_1, f_3, f_5$ and $5f_5$

$|\Delta y_t|$ is the absolute value of the daily change in the market interest rate y , observed on the day of the report / minute publication (t).



RESULTS

- Selected narrative shocks:

Table 1: Inflation reports, selected narrative shocks for each maturity

$ \Delta i_1 $		$ \Delta f_3 $		$ \Delta f_5 $		$ \Delta_{5f_5} $	
Topic	%	Topic	%	Topic	%	Topic	%
L5	99,7	D2	98,7	D2	99,3	L3	99,8
D8	99,1	L4	85,8	L3	98,1	D6	99,4
L1	98,6	D4	82,3	D6	98,0	L5	98,3

Table 2: Minutes, selected narrative shocks for each maturity

$ \Delta i_1 $		$ \Delta f_3 $		$ \Delta f_5 $		$ \Delta_{5f_5} $	
Topic	%	Topic	%	Topic	%	Topic	%
L3	42,8	D7	74,4	L2	64,2	L2	76,2
D8	38,8	L2	30,0	D7	56,6	L4	37,6
L4	36,8	L4	27,8	L4	53,0	L5	37,0

- Topic 1: Interest rates and monetary policy
- Topic 2: Domestic demand and economic sectors
- Topic 3: Balance of trade and commodities
- Topic 4: Inflation target and expectations
- Topic 5: Inflation, food and regulated items
- Topic 6: Credit
- Topic 7: External conditions
- Topic 8: Macroeconomic projections



RESULTS

- (IR) we examine the explanatory power of num. variables (divided into 2 groups: EXP and UNC) and three selected narrative shocks.

Table 5: Inflation Reports, effect of numeric information and selected narrative shocks on market interest rates

		<u>Exp</u>	<u>p-value</u>	<u>Add Unc</u>	<u>p-value</u>	<u>Add SNS</u>	<u>p-value</u>
Δi_1	R ²	0,183	0,398	0,365	0,732	0,805	0,016
	<u>Additional R²</u>			0,182	0,785	0,440	0,001
	<u>Partial R²</u>			0,223		0,693	
Δf_3	R ²	0,185	0,390	0,363	0,737	0,633	0,273
	<u>Additional R²</u>			0,178	0,796	0,270	0,060
	<u>Partial R²</u>			0,218		0,423	
Δf_5	R ²	0,158	0,498	0,329	0,819	0,774	0,034
	<u>Additional R²</u>			0,171	0,832	0,445	0,002
	<u>Partial R²</u>			0,203		0,664	
$\Delta_5 f_5$	R ²	0,114	0,686	0,286	0,898	0,559	0,486
	<u>Additional R²</u>			0,171	0,853	0,273	0,090
	<u>Partial R²</u>			0,193		0,382	



RESULTS

- (Minutes) we examine the explanatory power of the three selected narrative shocks.

Table 6: Minutes, effect of the VIX index and selected narrative shocks on market interest rates

		<u>VIX</u>	<u>p-value</u>	<u>Add SNS</u>	<u>p-value</u>
$ \Delta i_1 $	R ²	0,000	0,853	0,111	0,041
	<u>Additional R²</u>			0,110	0,020
	<u>Partial R²</u>			0,110	
$ \Delta f_3 $	R ²	0,008	0,397	0,111	0,040
	<u>Additional R²</u>			0,103	0,026
	<u>Partial R²</u>			0,104	
$ \Delta f_5 $	R ²	0,000	0,922	0,136	0,014
	<u>Additional R²</u>			0,136	0,006
	<u>Partial R²</u>			0,136	
$ \Delta_5 f_5 $	R ²	0,000	0,895	0,112	0,039
	<u>Additional R²</u>			0,112	0,018
	<u>Partial R²</u>			0,112	

