

# Fed Inflation Pressure and Expectations: Evidence from Speeches by FOMC Members

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**The use of surveys for monetary and economic policy**

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*"I think monetary policy is 98% talk and 2% action, and communication is a big part."*

- Ben Bernanke, former Fed Chair

Central Bank communication essential for policy making:

- increased demand of transparency from public
- larger set of tools
- useful to steer or anchor expectations
- crucial at the ZLB

# Motivation

Some skepticism about effectiveness of central banks' communication:

*“Central banks will keep trying to communicate with the general public, as they should. But for the most part, they will fail.”*

*“Many economic models presume that central bank communication is aimed at wage-setters, price-setters, consumers, or investors—maybe all of them. But are they listening?”*

- Alan Blinder (2018), former Fed Vice Chair

## Research Question

**Are Fed speeches steering inflation expectations?**

## Are Fed speeches steering inflation expectations?

- Which **expectations**?
  - **Households**: basis for consumption and savings decisions (Coibion, Gorodnichenko, and Weber, 2022)
  - **Professional Forecasters**: used to estimate the slope of the Phillips Curve (Ball and Sandeep, 2018) , to increase the accuracy of empirical forecasting models (Gergely and Odendahl, 2021) and fit of structural models (Del Negro et al., 2015)
  - **Market investors**: affect asset prices, e.g. stock prices and interest rates (Bernanke and Kuttner, 2005)

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  - Market investors: affect asset prices, e.g. stock prices and interest rates (Bernanke and Kuttner, 2005)
- Why analyze **speeches** rather than minutes or statements?
  - real-time publicly accessible information
  - longer time series than statements (January 2000) or SEP (October 2007)
  - different speakers: diversity of opinions (cross-section and time series)
  - variety of topics and heterogeneous environments

# Contribution and Preview of Results

1. Construct inflation pressure index from Fed speeches
  - new monthly index based on 4400 speeches from 1995M1 to 2023M2
2. Estimate impact of index on agents' forecasts
  - households (MSC), professionals (SPF) and market based (MKT)

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  - (soft) communication efforts effective after the Great Financial Crisis
  - agents expecting inflation higher than median are more affected by inflation pressure
  - larger effects in bad times (recessions) compared to good times
  - long run forecasts are significantly less affected

# Related Literature

## Role of central bank communication

- Impact on financial market instruments

Gürkaynak et al. (2005), Boukus and Rosenberg (2006), Blinder et al. (2008),  
Carvalho et al. (2016)

- Information conveyed through language

Lucca and Trebbi (2009), Bholat et al. (2015), Hansen and McMahon (2016), Shiller  
(2017), Haldane and McMahon (2018), Gardner, Scotti, and Vega (2022) , Shapiro  
and Wilson (2022)

## Managing expectations

Pedemonte (2019), Coibion et al. (2021), Coibion, Gorodnichenko, and Weber (2022),  
D'Acunto et al. (2022), Kumar, Coibion, Afrouzi, and Gorodnichenko (2015),  
McMahon and Rholes (2022)

## Fed speeches

Neuhierl and Weber (2019), Ehrmann, Tietz, and Visser (2021), Malmendier, Nagel,  
and Yan (2021), Istrefi, Odendahl, and Sestieri (2021), Ahrens and McMahon (2021)

## **Data: Fed Inflation Pressure and Inflation Forecasts**

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# Who speaks within the Fed?

- The Federal Open Market Committee (FOMC) consists of 12 members
  - the seven members of the Board of Governors (Chair+Vice Chair+5 governors)
  - the president of the Federal Reserve Bank of New York
  - four of the remaining eleven regional Reserve Bank presidents
- The FOMC holds eight regularly scheduled meetings during the year
  - Chair releases statement immediately after
  - minutes released with a 3 week lag
- All members speak publicly all year round (except for blackout periods-2 weeks around FOMC meetings)

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## We focus on:

- Speeches by 7 members of Board of Governors and 12 regional Fed presidents
- Speeches from 1995 until today ( $\approx$  4400 speeches)
  - collected from the federal reserves web pages, the regional Fed's online archives including the FOMC Speak repository from St. Louis Fed.



# Constructing daily inflation pressure (I)

- Split all the speeches into sentences
- Identify a sentence as being about inflation if it contains one of the terms: **inflation**, **price**, or **cost**
- Total of 82,099 sentences
- Score each sentence using dictionary  
we adapt the dictionary proposed in Gardner, Scotti, and Vega (2022)
- Aggregate the index at daily, monthly, quarterly frequency

## Costructing daily inflation pressure (II)

We score the sentences about inflation based on modifier words:

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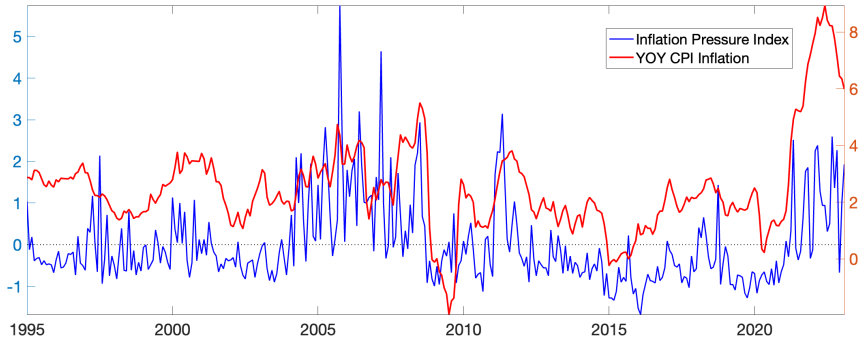
Identifiers	Additive Modifiers (+1)	Subtractive Modifiers (-1)
inflation, price, cost	elevat, expand, foster, height, high, increas, persist, pressure, moderate, rise, risk remain, rising, rose, risen, solid, sustain, strong, strength, upward, up, upside risk	below, damp, ease, easing, declin, diminish, down, low, modest, moderated, muted, reduction, restrain, set back, slow, soft, subdued, weak

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# Identifiers and Modifiers: Example Sentences

Date	Speaker	Inflation Pressure	Example sentences
2004-10-29	Total	-5	
	R. Ferguson	-5	<i>That should gradually return the economy to full utilization of its resources, while inflation remains subdued.</i>
2005-10-18	Total	94	
	J. Yellen	27	<i>And a key question is whether higher energy prices also will elevate core inflation.</i>
	A. Greenspan	20	<i>Additionally, the longer-term crude price has presumably been driven up by renewed fears of supply disruptions in the middle east and elsewhere.</i>
2015-11-12	Total	-14	
	W. Dudley	-13	<i>It is possible that factors such as very low headline inflation and weak productivity growth are holding down what workers receive in compensation.</i>
	J. Bullard	-4	<i>In that case, policymakers may wish to lower the inflation target to remain more consistent with the actual inflation outcomes.</i>

# Inflation Pressure Index



correlations

# Inflation forecasts and timing assumptions

## Michigan Survey of Consumers (MSC): monthly frequency

- Median of 12 months ahead inflation forecasts
- Inflation Pressure: Previous month

## Survey of professional forecasters (SPF): quarterly frequency

- Median of implied 1 year ahead CPI forecast
- Inflation Pressure: First month of the quarter when the SPF is released

## Market expectations (MKT): monthly frequency

- Market based one year expected inflation constructed by Haubrich, Pennacchi, and Ritchken (2012, FRB of Cleveland)
- Inflation Pressure: Previous month

# Methodology

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# Analysis: Two Step Procedure

## Second Step: OLS

$$\underbrace{E_t \pi_{t+h}}_{\text{MSC, SPF or MKT}} = \alpha + \beta \underbrace{s_{t-1}}_{\text{inflation pressure}} + \gamma' \overbrace{X_{t-1}}^{\text{selected in first step}} + u_t$$

Timing:

- MSC or MKT:  $s_{t-1}$  is the inflation pressure of the previous month
- SPF:  $s_{t-1}$  is the inflation pressure of the first month of the quarter

# Analysis: Two Step Procedure

## First step: Least absolute shrinkage and selection operator (LASSO)

- select among  $\approx 120$  macro-financial variables from FRED data set by McCracken and Ng (2016)
- target 10% of sample size to use as controls in second step

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- Control for FOMC projections from SEP

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**Rationale:** Belloni and Chernozhukov (2013)

- smaller bias compared to one step LASSO regression even when OLS post-LASSO model is misspecified

## Regression results

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# LASSO: controls

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<b>MSC</b>	PPI by Commodity: Final Demand: Finished Goods
	CPI: Commodities
	PCE: Durable goods
	Manufacturers' Unfilled Orders: Durable Goods

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<b>SPF</b>	Capacity Utilization: Manufacturing
	CPI : All Items Less Food

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<b>MKT</b>	CPI: All Items Less Food
	Civilian Labor Force Level
	New Privately-Owned Housing Units Started: Total Units in the Midwest
	New Privately-Owned Housing Units Authorized in Permit-Issuing Places: Total Units in the Midwest

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**Table 1:** Variables selected from the LASSO estimation.

# Results: Michigan Survey of Consumers

## Second Step: OLS

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.14***	0.15**	0.07**	0.13**	0.30***	0.22**
SEP		0.18		-0.14		0.50**
R-Squared	0.64	0.72	0.42	0.53	0.74	0.76
Observations	337	84	155	24	182	60
Tuning Parameter	0.005	0.005	0.005	0.005	0.005	0.005

**Table 2:** The dependent variable is the twelve month ahead expectations (median) from the MCS. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

- $1\sigma$   $\uparrow$  Fed inflation pressure: households expect 0.22pp  $\uparrow$  inflation next 12 months
- 1pp  $\uparrow$  SEP: households expect 0.50pp  $\uparrow$  inflation next 12 months

# Results: Survey of Professional Forecasters

## Second Step: OLS

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.05**	0.06***	0.01	0.02	0.11***	0.06**
SEP		0.18***		0.15		0.20***
R-Squared	0.79	0.87	0.70	0.61	0.88	0.91
Observations	113	79	52	23	61	56
Tuning Parameter	0.01	0.01	0.01	0.01	0.01	0.01

**Table 3:** The dependent variable is the one year ahead expectations (median) of CPI all items inflation from the SPF. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively.

Tuning parameter is the regularization parameter in the LASSO regression.

# Results: Market-based expectations

## Second Step: OLS

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta s_{t-1} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.09***	0.19***	-0.06*	-0.07	0.17***	0.14**
FOMC Projections		0.52***		0.47***		0.60***
R-Squared	0.58	0.73	0.29	0.69	0.55	0.73
Observations	337	84	155	24	182	60
Tuning Parameter	0.003	0.003	0.003	0.003	0.003	0.003

**Table 4:** The dependent variable is the market based one year expected inflation constructed by Haubrich, Pennacchi, and Ritchken (2012, FRB of Cleveland). ‘\*’, ‘\*\*’ and ‘\*\*\*’ indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

# Takeaway

- we find that Fed speeches steer inflation expectations of
  - households
  - professional forecasters
  - markets
- higher Fed inflation pressure implies higher agents' inflation expectations
- more effective starting from the Great Financial Crisis
- even after controlling for
  - “quantitative” information provided by the Fed in the projections
  - lagged CPI, among other macro variables



Baseline results are robust to:

- using **mean** forecast rather than median forecast
- taking out **outliers** (5% of the sample)
- using **3 principal components** instead of LASSO
- including **two lags** of the inflation pressure and controls
- using **forecast revisions** instead of forecast levels
- alternative household expectations **NY Fed SCE**

Additionally, we look at:

- different “types” of forecasters
- state dependency
- long run forecasts
- building different indexes for different speakers: troika versus non-troika

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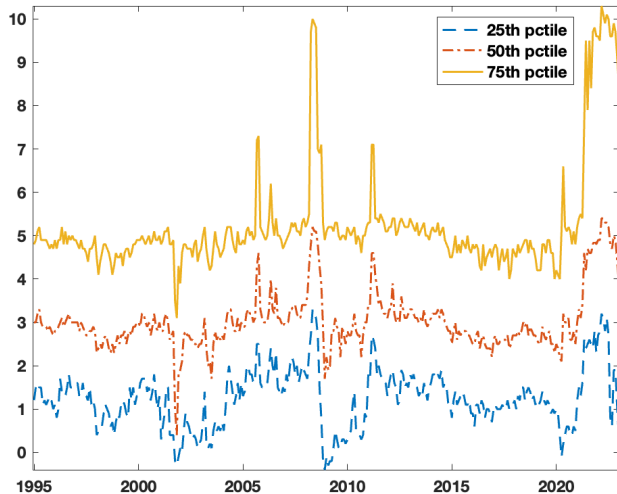
# Percentiles analysis

Are some agents more affected than others?

→ analysis by respondent type:

- types are those in specific percentiles of the time  $t$  survey forecast distribution
  - follows Bianchi, Ludvigson and Ma (2022)
- does not assume types are invariant over time, not about optimistic vs pessimistic

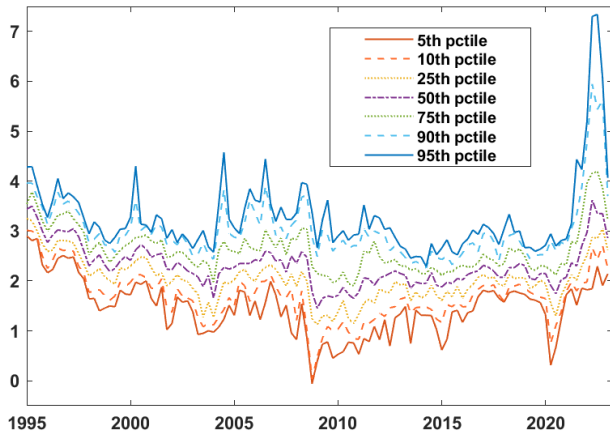
# Percentile Types: MSC



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Pctile		1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
25th							
	Inflation Pressure	0.18***	0.20**	0.17***	0.32***	0.19***	0.15
	SEP		0.25		-0.08		0.70**
50th							
	Inflation Pressure	0.14***	0.15**	0.07**	0.13**	0.30***	0.22**
	SEP		0.18		-0.14		0.50**
75th							
	Inflation Pressure	0.13***	0.13	0.01	0.08*	0.53***	0.36*
	SEP		0.48*		-0.23**		0.86*
	Observations	337	84	155	24	182	60

# Percentile Types: SPF



# Percentile Types: SPF

Pctile		1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
10th	Inflation Pressure SEP	0.01	0.01 0.04	-0.03	0.03 0.55***	0.15**	-0.11* 0.53***
25th	Inflation Pressure SEP	0.03	0.03* 0.12**	-0.02	0.02 0.47***	0.11***	0.02 0.27***
50th	Inflation Pressure SEP	0.05**	0.06*** 0.18***	0.01	0.02 0.15	0.11***	0.06** 0.20***
75th	Inflation Pressure SEP	0.05**	0.07*** 0.21***	-0.01	0.04 0.40***	0.13***	0.08** 0.27***
90th	Inflation Pressure SEP	0.14***	0.14*** 0.07	0.09*	0.16*** 0.33***	0.17***	0.14* 0.26



Additionally, we look at:

- different “types” of forecasters
- [state dependency](#)
- long run forecasts
- building different indexes for different speakers: troika versus non-troika

Are the effects different in [different phases of the business cycle](#)?

We look at:

- NBER recession dates
- CBO output gap
- Output growth  
defined as year over year growth rate of real GDP below or above 3% average

# State dependence: MSC

	NBER		CBO Output Gap		Output Growth	
	Recession	Expansion	Negative	Positive	Below Average	Above Average
Inflation Pressure	0.64***	0.10***	0.21***	0.01	0.19**	-0.01
R-Squared	0.61	0.74	0.67	0.66	0.56	0.86
Observations	31	306	247	90	220	117
Tuning Parameter	0.005	0.005	0.005	0.005	0.005	0.005

**Table 5:** Recessions defined as: NBER recession dates; CBO estimates of the output gap; year over year growth rate of Real Gross Domestic Product below 3%. ‘\*’, ‘\*\*’ and ‘\*\*\*’ indicate significance levels at the 10, 5 and 1 percent respectively.

# State dependence: SPF

	NBER		CBO Output Gap		Output Growth	
	Recession	Expansion	Negative	Positive	Below Average	Above Average
Inflation Pressure	0.18*	0.03*	0.10***	0.03	0.04*	0.06
R-Squared	0.61	0.80	0.83	0.19	0.82	0.67
Observations	11	102	83	30	74	39
Tuning Parameter	0.01	0.01	0.01	0.01	0.01	0.01

**Table 6:** Recessions defined as: NBER recession dates; CBO estimates of the output Gap; year over year growth rate of Real Gross Domestic Product below 3%. ‘\*’, ‘\*\*’ and ‘\*\*\*’ indicate significance levels at the 10, 5 and 1 percent respectively.

# State dependence: MKT

	NBER		CBO Output Gap		Output Growth	
	Recession	Expansion	Negative	Positive	Below Average	Above Average
Inflation Pressure	0.56***	0.07**	0.12**	-0.01	0.15***	-0.05
R-Squared	0.73	0.55	0.53	0.28	0.59	0.47
Observations	31	306	247	90	220	117
Tuning Parameter	0.003	0.003	0.003	0.003	0.003	0.003

**Table 7:** Recessions defined as: NBER recession dates; CBO estimates of the output Gap; year over year growth rate of Real Gross Domestic Product below 3%. ‘\*’, ‘\*\*’ and ‘\*\*\*’ indicate significance levels at the 10, 5 and 1 percent respectively.

# State dependence

Are the effects different in [different phases of the business cycle](#)?

We look at:

- NBER recession dates
- CBO output gap
- Output growth  
defined as year over year growth rate of real GDP below or above 3% average

[Takeaway](#): effects are significantly larger in bad times compared to good times

Additionally, we look at:

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- building different indexes for different speakers: troika versus non-troika

Are long-run forecasts affected by Fed inflation pressure?

We use data from:

Michigan Survey of Consumers: 5 year ahead inflation

Survey of Professional Forecasters: 10 year ahead CPI

Market based: 5 year ahead



# Long Run Forecasts: MSC

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.05***	0.08***	-0.01	-0.03	0.08***	0.06
SEP		-0.03		0.06		-0.01
R-Squared	0.16	0.23	0.43	0.28	0.32	0.31
Observations	337	84	155	24	182	60
Tuning Parameter	0.006	0.006	0.006	0.006	0.006	0.006

**Table 8:** The dependent variable is the five year ahead expectations (median) of inflation from the MSC. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

# Long Run Forecasts: SPF

	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.04***	0.05***	0.01	0.02	0.10***	0.06**
SEP		0.13***		0.02		0.14***
R-Squared	0.70	0.65	0.88	0.79	0.48	0.60
Observations	113	79	52	23	61	56
Tuning Parameter	0.01	0.01	0.01	0.01	0.01	0.01

**Table 9:** The dependent variable is the ten year ahead expectations (median) of CPI all items inflation from the SPF. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

# Long Run Forecasts: MKT

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.06*	0.20***	-0.08***	-0.19**	0.05**	0.02
SEP		0.07		0.33*		0.34**
R-Squared	0.29	0.34	0.55	0.59	0.42	0.54
Observations	337	84	155	24	182	60
Tuning Parameter	0.004	0.004	0.004	0.004	0.004	0.004

**Table 10:** The dependent variable is the market based five year expected inflation constructed by Haubrich, Pennacchi, and Ritchken (2012, FRB of Cleveland). ‘\*’, ‘\*\*’ and ‘\*\*\*’ indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

Are long-run forecasts affected by Fed inflation pressure?

We use data from:

Michigan Survey of Consumers: 5 year ahead inflation

Survey of Professional Forecasters: 10 year ahead CPI

Market based: 5 year ahead

**Takeaway:** long-run forecasts are significantly less affected than short-run

→ Good news? We like these to be well anchored

Additionally, we look at:

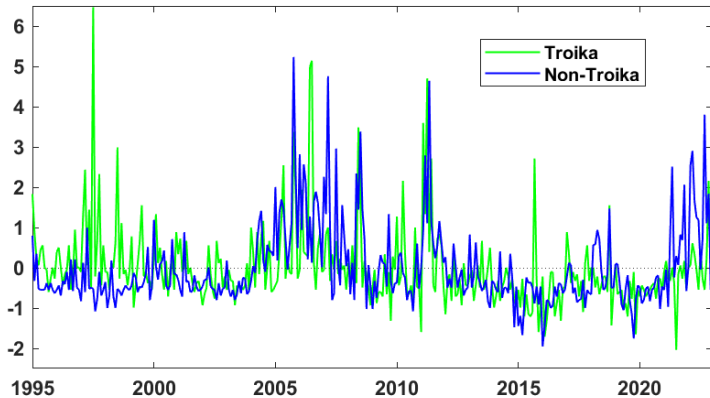
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# Are some speakers more influential than others?

Build different inflation pressure index by speaker:

- Troika (Chair+Vice Chair+NY Fed President) versus non-Troika (other speakers)
- Troika considered the most important figures in the Fed System

# Troika versus Non Troika: indexes



**Figure 1:** Inflation pressure index for Troika (Chair+Vice Chair+NY Fed President) and Non-Troika (all other speakers). The contemporaneous correlation between indices is 0.32.

# Troika vs. Non-Troika: MSC

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Troika Infl. Pressure	0.03	0.03	0.01	0.01	0.08**	0.09
Non-Troika Infl. Pressure	0.12***	0.08	0.08**	0.16**	0.18***	0.04
SEP		0.21		-0.15		0.63**
R-Squared	0.64	0.70	0.42	0.53	0.72	0.74
Observations	337	84	155	24	182	60
Tuning Parameter	0.005	0.005	0.005	0.005	0.005	0.005

**Table 11:** The dependent variable is the one year ahead expectations (median) of inflation from the MSC. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.



## Troika vs. Non-Troika: SPF

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Troika Infl. Press.	0.05***	0.06**	0.03	0.02	0.06**	0.05**
Non-Troika Infl. Press.	0.02	0.03	-0.01	0.01	0.07**	0.02
SEP		0.16***		0.14		0.20***
R-Squared	0.79	0.87	0.70	0.58	0.88	0.87
Observations	113	79	52	23	61	56
Tuning Parameter	0.01	0.01	0.01	0.01	0.01	0.01

**Table 12:** The dependent variable is the one year ahead expectations (median) of CPI all items inflation from the SPF. '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

# Troika vs. Non-Troika: MKT

$$\text{Model 1: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + u_t$$

$$\text{Model 2: } E_t \pi_{t+h} = \alpha + \beta_1 s_{t-1}^{\text{troika}} + \beta_2 s_{t-1}^{\text{non-troika}} + \gamma' X_{t-1} + \delta \text{ SEP} + u_t$$

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Troika Infl. Pressure	0.11***	0.10***	0.03	-0.02	0.08*	0.07*
Non-Troika Infl. Pressure	0.03	0.11**	-0.09**	-0.21**	0.11**	0.08
SEP		0.51***		0.36**		0.62***
R-Squared	0.59	0.74	0.30	0.74	0.55	0.73
Observations	337	84	155	24	182	60
Tuning Parameter	0.003	0.003	0.003	0.003	0.003	0.003

**Table 13:** The dependent variable is the market based one year expected inflation constructed by Haubrich, Pennacchi, and Ritchken (2012, FRB of Cleveland). '\*', '\*\*' and '\*\*\*' indicate significance levels at the 10, 5 and 1 percent respectively. Tuning parameter is the regularization parameter in the LASSO regression.

# Conclusion

- We construct a Fed inflation pressure index
  - identify the “soft” information in Fed communication
- Economic agents are listening
  - Fed communication reaches both experts and non-experts
  - speeches affect inflation expectations
  - quantitative information (SEP) is also useful
- Communication strategies have improved over time
  - larger effectiveness after the Great Financial Crisis
- Heterogeneity across speakers and agent “types”
  - Troika affect professionals, non-Troika affect households and markets
  - agents expecting inflation higher than median are more affected by inflation pressure
  - we don't make claims about the accuracy of the forecasts RMSE

# Implications

- Lessons for policy-makers
  - switch to transparency pays off: expectations are now affected by Fed communication
  - central banks can rely on speeches as well as SEP to manage expectations
  - speakers matter
- Communication has stronger effects in bad times compared to good times

Thank you

# What does inflation pressure capture?

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	Correlations: Monthly Variables					
	Troika	Non-Troika	CPI: All Items	PCE	Oil Prices	SEP
Overall	0.63	0.90	0.51	0.53	0.40	0.56
Troika	1	0.32	0.23	0.22	0.20	0.25
Non-Troika		1	0.48	0.50	0.36	0.51
CPI-All Items			1	0.98	0.66	0.86
PCE				1	0.69	0.82
Oil Prices						0.52

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**Table 14:** Contemporaneous correlation for monthly indices and variables: 1995M1-2023M1. Troika: Chair of the Board of Governors, Vice and the President of the New York Fed), Non-Troika: regional Fed presidents excluding the New York Fed president.

# Robustness: Mean

## Michigan Consumer Survey

	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.14***	0.18*	-0.00	0.21**	0.39***	0.31**
SEP		0.40**		0.05		0.91**
R-Squared	0.72	0.73	0.55	0.58	0.79	0.78
Observations	337	84	155	24	182	60
Tuning Parameter	0.006	0.006	0.006	0.006	0.006	0.006

## Survey of Professional Forecasters

	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
Inflation Pressure	0.06***	0.07***	0.02	0.05	0.12***	0.06**
SEP		0.20***		0.15		0.23***
R-Squared	0.80	0.88	0.70	0.66	0.87	0.90
Observations	113	79	52	23	61	56
Tuning Parameter	0.01	0.01	0.01	0.01	0.01	0.01

# Robustness: Outliers

Michigan Consumer Survey						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.16***	0.12*	0.13***	0.17**	0.35***	0.31**
SEP		0.12		-0.11		0.47*
R-Squared	0.61	0.65	0.43	0.58	0.70	0.70
Observations	320	79	147	23	173	57

Survey of Professional Forecasters						
	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
Inflation Pressure	0.06**	0.10***	0.02	0.08	0.13***	0.09**
SEP		0.17***		0.14		0.21***
R-Squared	0.80	0.88	0.70	0.64	0.88	0.92
Observations	106	74	49	21	58	53

Market based						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.10**	0.21***	-0.15***	-0.04	0.21***	0.16*
SEP		0.56***		0.49***		0.60***
R-Squared	0.58	0.71	0.31	0.68	0.51	0.65
Observations	320	79	147	23	173	57



# Robustness: Principal Components

## First step: Least absolute shrinkage and selection operator (LASSO)

- select among  $\approx 120$  macro-financial variables from FRED data set by McCracken and Ng (2016)
- target 10% of sample size to use as controls in second step

## Second Step: OLS

$$\underbrace{E_t \pi_{t+h}}_{\text{MSC, SPF or MKT}} = \alpha + \beta \underbrace{s_{t-1}}_{\text{inflation pressure}} + \gamma' \overbrace{PC_{t-1}^{1,2,3}}^{\text{selected in first step}} + u_t$$

Timing:

- MSC or MKT:  $s_{t-1}$  is the inflation pressure of the previous month
- SPF:  $s_{t-1}$  is the inflation pressure of the first month of the quarter
- Control for FOMC projections from SEP

# Robustness: Principal Components

Michigan Consumer Survey						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.12***	0.11*	0.06*	0.09	0.34***	0.27***
SEP		0.42***		-0.16		0.51
R-Squared	0.54	0.62	0.46	0.52	0.70	0.73
Observations	337	84	155	24	182	60

Survey of Professional Forecasters						
	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
Inflation Pressure	0.05	0.07***	-0.11***	-0.01	0.13***	0.04
SEP		0.45***		0.30**		0.53***
R-Squared	0.49	0.80	0.42	0.47	0.65	0.90
Observations	113	79	52	23	61	56

Market based						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.06*	0.20***	-0.06**	-0.21**	0.14***	0.10
SEP		0.43***		0.28		0.71***
R-Squared	0.49	0.64	0.52	0.67	0.54	0.73
Observations	337	84	155	24	182	60

# Robustness: Additional Lags

Michigan Consumer Survey						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.12***	0.12*	0.06*	0.13*	0.26***	0.19*
SEP		0.22		-0.10		0.53*
R-Squared	0.65	0.71	0.45	0.47	0.74	0.75
Observations	336	84	154	24	182	60

Survey of Professional Forecasters						
	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
Inflation Pressure	0.06***	0.07***	0.01	0.05*	0.12***	0.06*
SEP		0.20***		0.18		0.24***
R-Squared	0.80	0.88	0.70	0.69	0.87	0.90
Observations	112	79	51	23	60	55

Market based						
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
Inflation Pressure	0.05	0.14***	-0.06*	-0.03	0.11**	0.10
SEP		0.56***		0.44**		0.61***
R-Squared	0.59	0.78	0.30	0.63	0.58	0.77
Observations	336	84	154	24	182	60

# Robustness: Revisions

	Michigan Consumer Survey					
	1995:m1-2023:m2		1995:m1-2007:m12		2008:m1-2023:m2	
$\Delta$ Inflation Pressure	0.01	0.03	-0.02	–	0.07**	0.06**
$\Delta$ SEP		0.11		–		-0.06*
Observations	336	48	154	–	182	179
Tuning Parameter	0.005	0.005	0.005	–	0.005	0.005

	Survey of Professional Forecasters					
	1995:Q1-2023:Q1		1995:Q1-2007:Q4		2008:Q1-2023:Q1	
$\Delta$ Inflation Pressure	0.05***	0.05***	0.01	–	0.09***	0.09***
$\Delta$ SEP		0.08		–		0.07
Observations	112	79	51	–	60	56
Tuning Parameter	0.01	0.01	0.01	–	0.01	0.01

# Robustness: New York Fed SCE

	One Year Ahead		Three Years Ahead	
	Model 1	Model 2	Model 1	Model 2
Inflation Pressure	0.18***	0.22**	0.07***	0.20***
SEP		0.18		-0.11
R-Squared	0.91	0.93	0.78	0.81
Observations	117	38	117	38
Tuning Parameter	0.01	0.01	0.01	0.01

# Are expectations accurate?

Sample	MSC			SPF		
	25th	50th	75th	25th	50th	75th
<b>1995-2023</b>	2.18	1.79	3.16	1.67	1.61	1.60
<b>1995-2007</b>	1.81	1.02	2.39	0.96	0.89	0.91
<b>2008-2023</b>	2.47	2.26	3.73	2.06	2.01	2.00

**Table 15:** Root Mean Squared Error (RMSE) for CPI all items inflation from the MSC and SPF.