Polarized Expectations

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SEM

Motivation

- Fundamental relationship between economic decisions and agents' expectations
- Workhorse approach: full-information rational expectations (FIRE)
  - Useful theoretical benchmark, but requires strong assumptions
  - Survey-based measures of beliefs systematically deviate from FIRE

This Paper:

- Political affiliation is a key driver of household expectations and actions

Five Facts About Polarized Expectations

FACT 1: Household beliefs exhibit dimensionality reduction

- Using survey data, we show that household beliefs can be largely summarized by a single factor
- Essentially, households fall on a spectrum of optimism to pessimism (“sentiment”)

Five Facts About Polarized Expectations

FACT 1: Household beliefs exhibit dimensionality reduction

FACT 2: Substantial heterogeneity, correlated with political ideology

- Building on our factor analysis, we show that there is a high degree of heterogeneity across households
- While aggregate sentiment fluctuates with the business cycle, there is a wide dispersion of optimistic and pessimistic households at any point in time
- Utilizing political affiliation in surveys, we show that this heterogeneity correlates with political ideology
  - Democrats tend to be optimistic when Republicans are pessimistic, and vice versa

Five Facts About Polarized Expectations

FACT 1: Household beliefs exhibit dimensionality reduction

FACT 2: Substantial heterogeneity, correlated with political ideology

FACT 3: Beliefs are highly stable, but switch following changes in the White House

- Analyzing sentiment persistence within households, we find a high degree of stability
- One striking exception: strong switching behavior following presidential elections when the White House changes parties
  - Optimists become pessimistic, and pessimists become optimistic
  - This switching occurs at virtually no other time (eg., midterm elections, major macro events, presidential elections without a change of party)

Five Facts About Polarized Expectations

FACT 1: Household beliefs exhibit dimensionality reduction

FACT 2: Substantial heterogeneity, correlated with political ideology

FACT 3: Beliefs are highly stable, but switch following changes in the White House

FACT 4: Switching magnitude is increasing over time

- Over time, the magnitude of switching behavior has increased
- Comparing the change in autocorrelation of sentiment following White House changes, we find a monotonic increase since 1980

Five Facts About Polarized Expectations

FACT 1: Household beliefs exhibit dimensionality reduction

FACT 2: Substantial heterogeneity, correlated with political ideology

FACT 3: Beliefs are highly stable, but switch following changes in the White House

FACT 4: Switching magnitude is increasing over time

FACT 5: Consumption follows the same switching behavior

- Following the 2016 election, zip codes with a higher fraction of Trump votes had higher consumption (using high-frequency disaggregated consumption data)
- Following the 2020 election, Democrats increased their planned consumption relative to Republicans

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Implications for expectation formation:

- Political affiliation and polarization is crucial for understanding the dynamics and dispersion of household beliefs and actions
- Consensus forecasts do not reflect beliefs of most households at any given time
- No “off-the-shelf” macro theories of expectation formation can rationalize all facts

Related Literature

- Deviations from FIRE
  - Croushore (1993, 1997), Coibion and Gorodnichenko (2015), ...
- Polarization and Expectations:
  - Bartels (2002), Gerber and Huber (2009), Benhabib and Spiegel (2019), Coibion et. al. (2020), ...
- Polarization and Actions:
  - Gillitzer and Prasad (2018), Mian et. al. (2021), Meeuwis et. al. (2022)

Survey Expectations

Data: Michigan Survey of Consumers (MSC)

Michigan Survey of Consumers

- 1978-present, monthly, consumer survey of ≈ 500
- Rotating panel (up to 2x)

Questions

- Includes forward- and backward-looking questions
- Includes aggregate and personal belief questions
- Sporadic questions regarding political party affiliation
- Majority of questions in the MSC are simple, qualitative questions. Example:
  - "How about a year from now, do you expect that in the country as a whole business conditions will be better, or worse than they are at present, or just about the same?"

Comparison: Survey of Professional Forecasters

- Quantitative forecasts from professionals (quarterly survey since 1960s)

MSC Factor Analysis

- Conduct a factor analysis
  - Categorical responses: multiple correspondence analysis (MCA)
- Included questions:
  - Aggregate: business conditions have/will improve, state of the economy in next 1/5 years, unemployment/inflation/interest rates up/down, government policy
  - Personal: financial conditions have/will improve, family income up/down
  - Note: inflation and income questions are quantitative, and are binned for the MCA

MSC MCA Loadings, First Component

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.17		0.09		-1.17
Economy Better/Worse (Next Year)	1.34		-0.01		-2.03
Economy Good/Bad (Next Year)	1.31	0.73	0.10	-0.74	-1.47
Economy Good/Bad (Next 5 Years)	1.39	1.00	0.17	-0.77	-1.41
Unemployment Up/Down (Next Year)	-1.50		0.38		1.49
Prices Up/Down (Next Year)	-1.06	-0.36	0.12	0.62	0.63
Interest Rates Up/Down (Next Year)	-0.17		0.25		0.05
Government Policy Good/Bad	1.48		0.20		-1.47
Personal Finances Better/Worse (Last Year)	0.84		-0.17		-1.14
Personal Finances Better/Worse (Next Year)	0.98		-0.22		-2.16
Family Income Up/Down (Next Year)	0.84	0.61	0.16	-0.65	-1.51
Real Income Up/Down (Next Year)	1.33		0.35		-1.18

Notes: column (1) is the MCA loading for responses associated with “up”/“better”/“good”; (5) is associated with “down”/“worse”/“bad”; columns (2) through (4) are intermediate or neutral responses.

- Monotonic loadings for first component (“sentiment”) across responses

MSC MCA Results: Fraction Explained

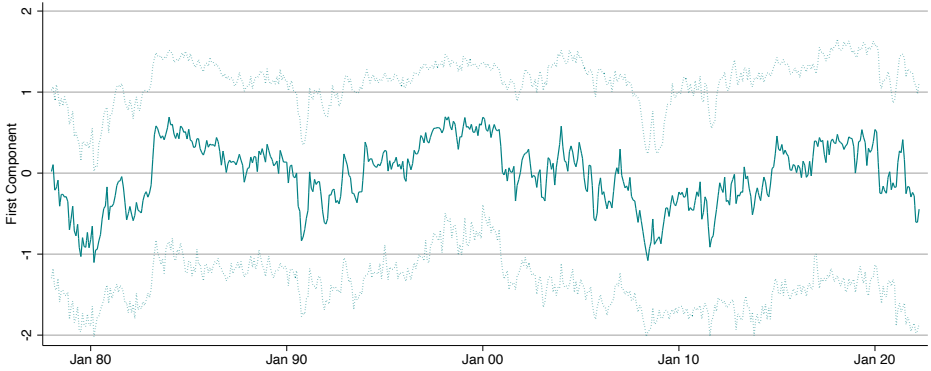
	Baseline	Aggregate			Personal		Backward
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% Explained (Dim 1)	80.97	87.13	94.24	75.96	80.68	77.20	85.07
% Explained (Dim 2)	6.29	3.52	2.76	4.52	14.21	14.36	14.93
Baseline Correlation		0.923	0.916	0.916	0.657	0.695	0.673
Observations	207,327	233,678	254,685	129,906	260,460	130,321	297,967
Start Date	1978	1978	1978	1990	1978	1990	1978

Notes: (2) aggregate questions only; (3) does not include price/rate questions; (4) includes price/rate as well as 5-year price/gas price questions; (5) personal questions only; (6) adds home price question; (7) backward-looking questions only.

- First component explains a huge fraction of responses $\implies$ dimension reduction

subgroups

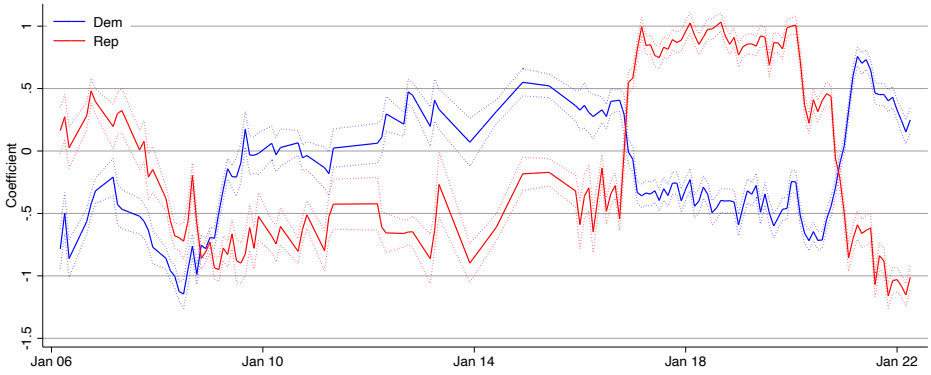
MCA Results: Sentiment Distribution Across Time



Notes: time series of the first component $f_{i,t}$ from the baseline MCA. The solid line is the median value of sentiment, while the dotted lines are the 90-10 percent distribution.

- Wide dispersion of beliefs across households at any given time

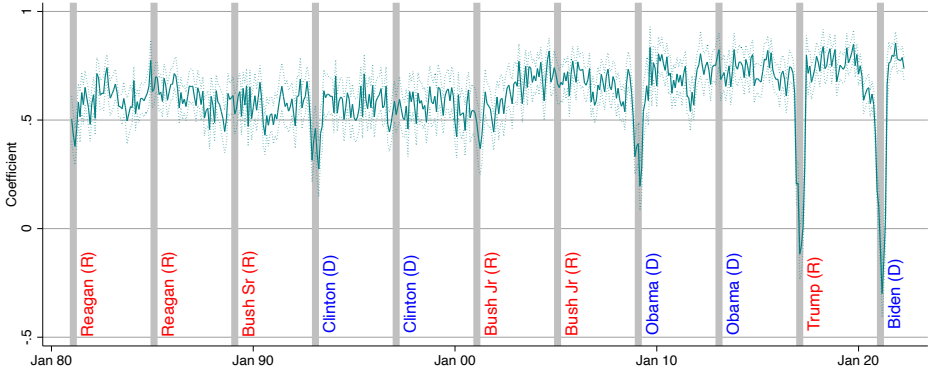
Sentiment Distribution by Political Affiliation



Notes: results of a rolling regression of $f_{i,t}$ on political affiliation dummy variables, where $f_{i,t}$ is the first component from the baseline MCA. Dotted lines represent 90% confidence intervals.

- Sentiment correlated with political affiliation
  - Democratic consumers tend to be optimistic when Republican consumers are pessimistic, and vice versa personal only backward only R2

Sentiment Persistence



Notes: results of a rolling regression $f_{i,t} = \alpha_t + \beta_t f_{i,t-6} + \varepsilon_{i,t}$, where $f_{i,t}$ is the first component from the baseline MCA. Dotted lines represent 90% confidence intervals.

- Sentiment is highly persistent, except following changes in the White House
- Switching behavior is increasing over time personal only backward only

Comparison to Professional Forecasters

In comparison to households, professional forecasters...

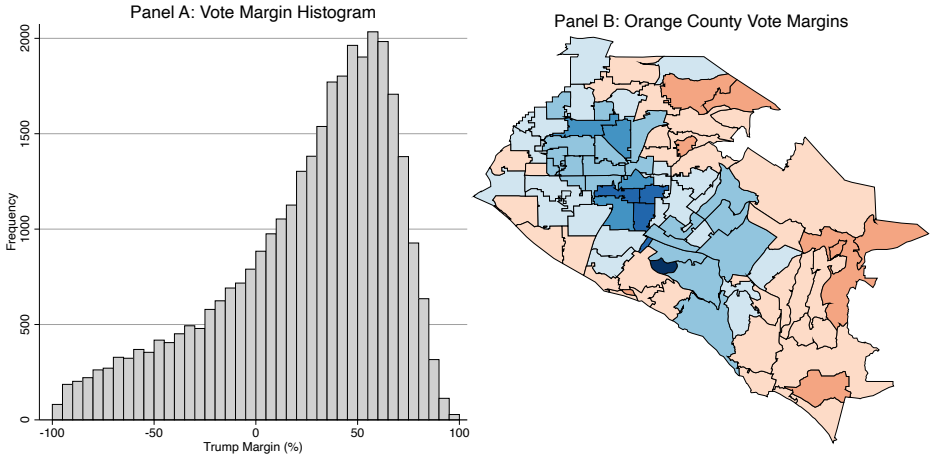
- Have a higher dimension factor structure of expectations factors
- Have a less dispersed first component time series
- Have a less persistent first component persistence
- Do not exhibit a change in persistence when the White House switches party persistence

Case Study: 2016 Election

Data: Nielsen Home Scanner

- Large panel data of household consumption
  - 60,000 households; participating households scan their purchases
  - Consumption identified at the UPC level (mostly non-durable)
- Aggregate to total spending at the zip code, weekly data
- Combine with 2016 voting data at the zip code level
  - Voting data is reported at the precinct level (raw data and shapefiles from US Election Project)

2016 Zip Code Voting Data



Notes: histogram of the Trump vote margin across all zip codes (Panel A) and a heatmap of Trump/Clinton vote margins across Orange County (Clinton won Orange country by 8.6%).

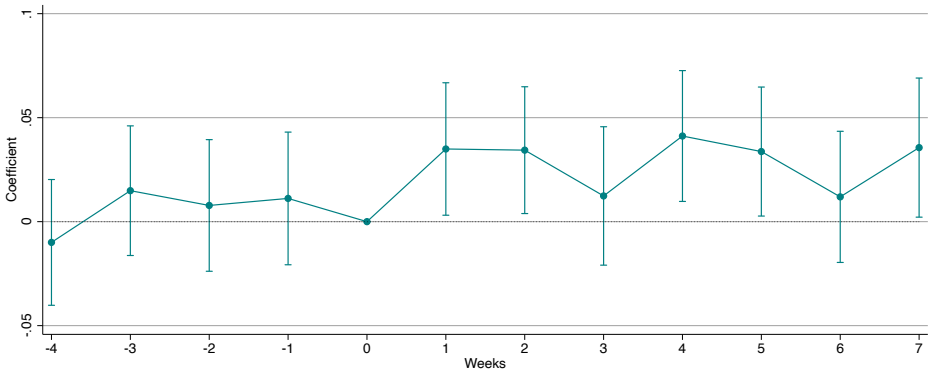
Event Study Design: 2016 Election

- Event study design:

$$c_{z,t} = \alpha_z + \gamma_t + \sum_{k=-T}^{T} \beta_k v_z^{16} \cdot \mathbf{I}_{t=t^*+k} + \varepsilon_{z,t}$$

  - $c_{z,t}$: (log) consumption in zip code z during week t
  - v_z^{16}: Trump's vote margin in zip code z: $-1 \leq v_z^{16} \leq 1$
  - 1ppt increase in a zip code's Trump vote share margin $\implies \hat{\beta}_k$ percent change in consumption k weeks after the election
  - Baseline: 47 states and DC, only include zip codes with 100 or more votes

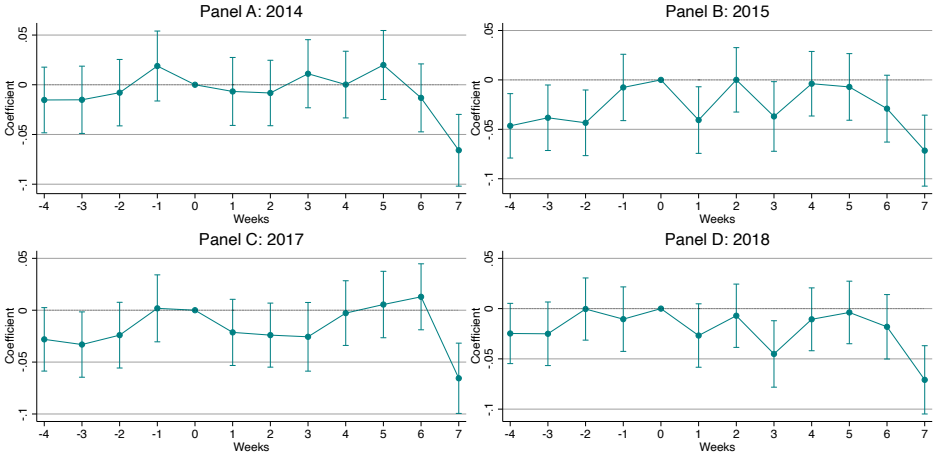
2016 Event Study of Consumption Responses



Notes: results of the 2016 event study across all zip codes with at least 100 votes. Vertical lines represent 90% confidence intervals.

- Polarized response of actual consumption to election results, although estimates are noisy

Placebo Event Study of Consumption Responses



Notes: results of placebo event studies for the years 2014, 2015, 2017, and 2018. Vertical lines represent 90% confidence intervals.

Case Study: 2020 Election

2020 Election Survey

- Survey from Coibion, Gorodnichenko, and Weber (2020) of households regarding macroeconomic expectations and consumption attitudes (and political affiliation)
- Survey in the field during the 2020 election: high frequency survey data
  - Allows us to trace out how beliefs, consumption attitudes, and actual consumption changed in the days before and after the election
  - Households only surveyed once (repeated cross section)

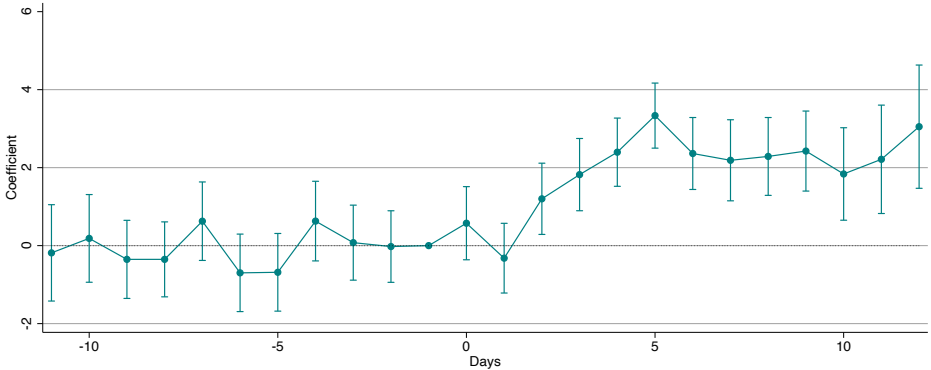
Event Study Design 2020 Election

- Event study design:

$$y_{i,t} = \alpha_{p_i} + \gamma_t + \sum_{k=-T}^{T} \beta_k \cdot \mathbb{I}_{t=t^*+k} \cdot \mathbb{I}_{p_i=R} + \varepsilon_{i,t}$$

  - $y_{i,t}$: response of household i during day t
  - p_i: political affiliation of household i (Democratic or Republican households only)
  - $\hat{\beta}_k$: differential response of Republican relative to Democratic households t days following the election

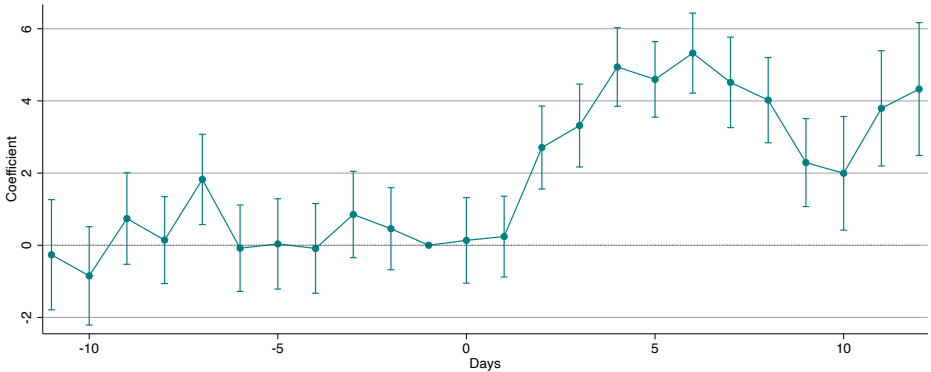
2020 Event Study of Inflation Expectations



Notes: results of the 2020 event study for inflation expectations; responses are in percentage points. Vertical lines represent 90% confidence intervals.

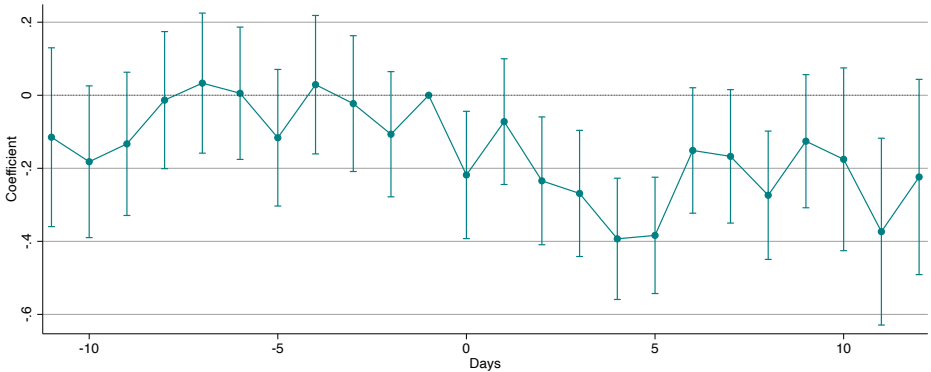
- Strong and (almost) immediate reaction following the election, but not in the lead-up (media election calls occurred on days 3-4)

2020 Event Study of Unemployment Expectations



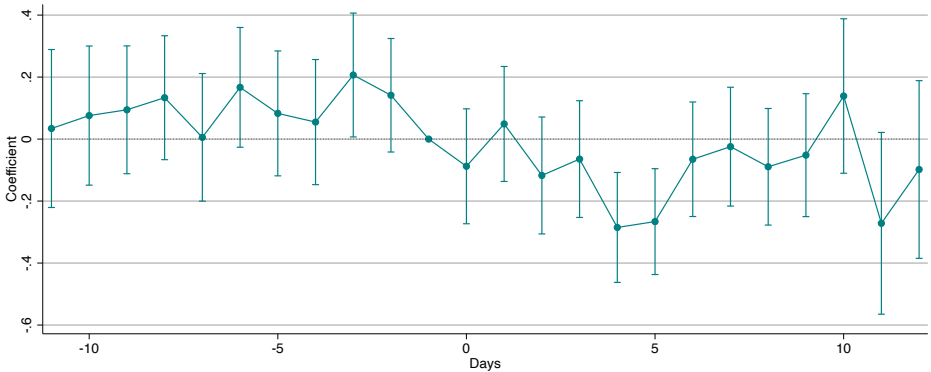
Notes: results of the 2020 event study for unemployment expectations; responses are in percentage points. Vertical lines represent 90% confidence intervals.

2020 Event Study of Appliance Purchase Attitudes



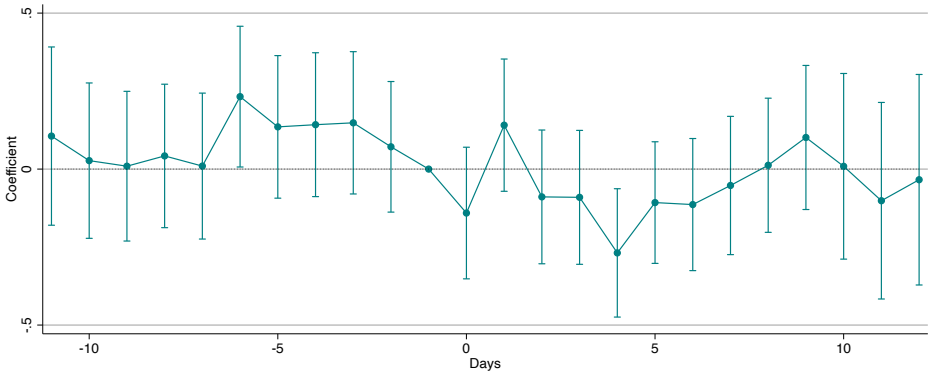
Notes: results of the 2020 event study for appliance purchase attitudes; responses range from 1 (very bad time to buy) to 5 (very good time to buy). Vertical lines represent 90% confidence intervals.

2020 Event Study of Car Purchase Attitudes



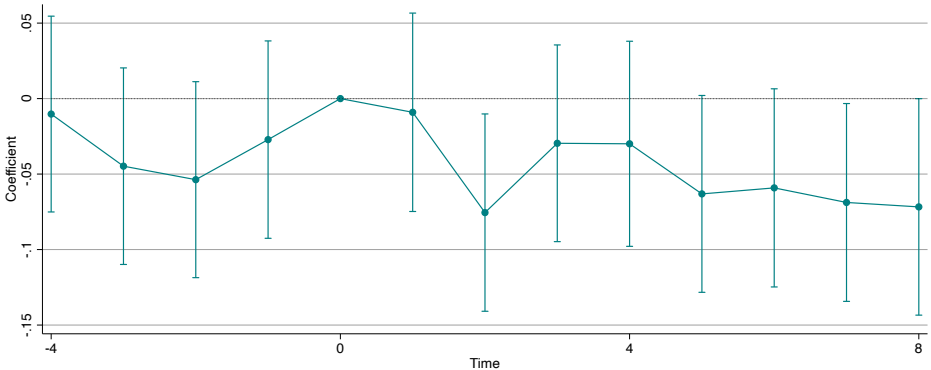
Notes: Notes: results of the 2020 event study for car purchase attitudes; responses range from 1 (very bad time to buy) to 5 (very good time to buy). Vertical lines represent 90% confidence intervals.

2020 Event Study of House Purchase Attitudes



Notes: Notes: results of the 2020 event study for house purchase attitudes; responses range from 1 (very bad time to buy) to 5 (very good time to buy). Vertical lines represent 90% confidence intervals.

2020 Event Study of Consumption



Notes: results of the 2020 event study for weekly log consumption. Vertical lines represent 90% confidence intervals.

Implications for Existing Theory

Implications for Existing Theory

Challenge: simultaneously explain:

- Household expectations and consumption fall along party lines
- Strong reaction to changes in the White House
- Weak/no reaction to outcomes of Congressional elections
- Weak/no reaction to outcomes of Presidential elections without a change of party
- Weak/no reaction in the lead-up to a Presidential election

Models that do not work:

- FIRE
- Models with consistent under/over-reaction (sticky information, rational inattention, diagnostic expectations)
- Agree to disagree models
- Robustness or minimax models
- Cheerleading models

APPENDIX

MSC MCA Results: By Subgroups

	Baseline	By Income		By Education		By Pol. Affil.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% Explained (Dim 1)	80.97	79.16	79.74	81.64	79.25	76.09	87.59
% Explained (Dim 2)	6.29	7.78	6.34	6.09	6.92	6.85	4.05
Baseline Correlation		0.999	0.999	1.000	1.000	0.998	0.999
Observations	207,327	24,182	49,764	123,304	84,023	21,679	20,287
Start Date	1978	1979	1979	1978	1978	2006	2006

Notes: (2) bottom quintile income consumers; (3) top quintile income consumers; (4) consumers without college education; (5) consumers with college education; (6) Democratic consumers; (7) Republican consumers.

- Estimates highly similar across subgroups $\implies$ mapping from sentiment to beliefs is relatively homogeneous
  - Loadings: income education political affiliation

back

MSC MCA Loadings, Low Income

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.36		0.17		-1.09
Economy Better/Worse (Next Year)	1.52		0.01		-1.99
Economy Good/Bad (Next Year)	1.49	0.92	0.30	-0.58	-1.30
Economy Good/Bad (Next 5 Years)	1.66	1.31	0.40	-0.41	-1.19
Unemployment Up/Down (Last Year)	-1.38		0.49		1.50
Prices Up/Down (Next Year)	-0.84	-0.25	-0.04	0.55	0.92
Interest Rates Up/Down (Next Year)	-0.30		0.45		0.19
Government Policy Good/Bad	1.68		0.33		-1.35
Personal Finances Better/Worse (Last Year)	1.01		0.16		-0.83
Personal Finances Better/Worse (Next Year)	0.99		-0.07		-1.99
Family Income Up/Down (Next Year)	1.00	0.58	0.26	-0.41	-1.32
Real Income Up/Down (Next Year)	1.44		0.54		-0.89

back

MSC MCA Loadings, High Income

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.07		0.12		-1.27
Economy Better/Worse (Next Year)	1.16		0.02		-2.17
Economy Good/Bad (Next Year)	1.20	0.60	0.06	-0.87	-1.65
Economy Good/Bad (Next 5 Years)	1.22	0.82	-0.00	-1.04	-1.60
Unemployment Up/Down (Last Year)	-1.63		0.36		1.39
Prices Up/Down (Next Year)	-1.22	-0.46	0.17	0.64	0.36
Interest Rates Up/Down (Next Year)	-0.07		0.16		-0.10
Government Policy Good/Bad	1.25		0.12		-1.60
Personal Finances Better/Worse (Last Year)	0.68		-0.36		-1.34
Personal Finances Better/Worse (Next Year)	0.93		-0.31		-2.33
Family Income Up/Down (Next Year)	0.73	0.51	0.01	-0.75	-1.60
Real Income Up/Down (Next Year)	1.07		0.10		-1.53

back

MSC MCA Loadings, No College

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.22		0.11		-1.15
Economy Better/Worse (Next Year)	1.41		-0.01		-2.06
Economy Good/Bad (Next Year)	1.34	0.74	0.08	-0.74	-1.43
Economy Good/Bad (Next 5 Years)	1.46	1.04	0.25	-0.68	-1.33
Unemployment Up/Down (Last Year)	-1.47		0.43		1.52
Prices Up/Down (Next Year)	-0.93	-0.30	0.07	0.56	0.73
Interest Rates Up/Down (Next Year)	-0.22		0.29		0.14
Government Policy Good/Bad	1.57		0.24		-1.44
Personal Finances Better/Worse (Last Year)	0.89		-0.09		-1.06
Personal Finances Better/Worse (Next Year)	0.99		-0.17		-2.13
Family Income Up/Down (Next Year)	0.86	0.61	0.25	-0.58	-1.47
Real Income Up/Down (Next Year)	1.44		0.45		-1.08

back

MSC MCA Loadings, College

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.09		0.07		-1.21
Economy Better/Worse (Next Year)	1.24		0.03		-2.04
Economy Good/Bad (Next Year)	1.28	0.68	0.06	-0.81	-1.53
Economy Good/Bad (Next 5 Years)	1.30	0.89	0.03	-0.92	-1.53
Unemployment Up/Down (Last Year)	-1.57		0.34		1.42
Prices Up/Down (Next Year)	-1.25	-0.45	0.11	0.64	0.53
Interest Rates Up/Down (Next Year)	-0.10		0.18		-0.06
Government Policy Good/Bad	1.34		0.18		-1.54
Personal Finances Better/Worse (Last Year)	0.75		-0.28		-1.23
Personal Finances Better/Worse (Next Year)	0.95		-0.27		-2.24
Family Income Up/Down (Next Year)	0.78	0.58	0.05	-0.71	-1.56
Real Income Up/Down (Next Year)	1.13		0.25		-1.32

back

MSC MCA Loadings, Democratic

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.34		-0.07		-1.01
Economy Better/Worse (Next Year)	1.43		0.01		-1.77
Economy Good/Bad (Next Year)	1.60	1.11	0.40	-0.69	-1.22
Economy Good/Bad (Next 5 Years)	1.62	1.22	0.10	-0.79	-1.20
Unemployment Up/Down (Last Year)	-1.52		0.23		1.67
Prices Up/Down (Next Year)	-1.11	-0.54	-0.02	0.70	0.65
Interest Rates Up/Down (Next Year)	-0.05		0.29		-0.53
Government Policy Good/Bad	1.61		0.32		-1.26
Personal Finances Better/Worse (Last Year)	0.80		-0.15		-0.97
Personal Finances Better/Worse (Next Year)	0.99		-0.14		-2.03
Family Income Up/Down (Next Year)	0.88	0.78	0.24	-0.49	-1.35
Real Income Up/Down (Next Year)	1.19		0.40		-0.99

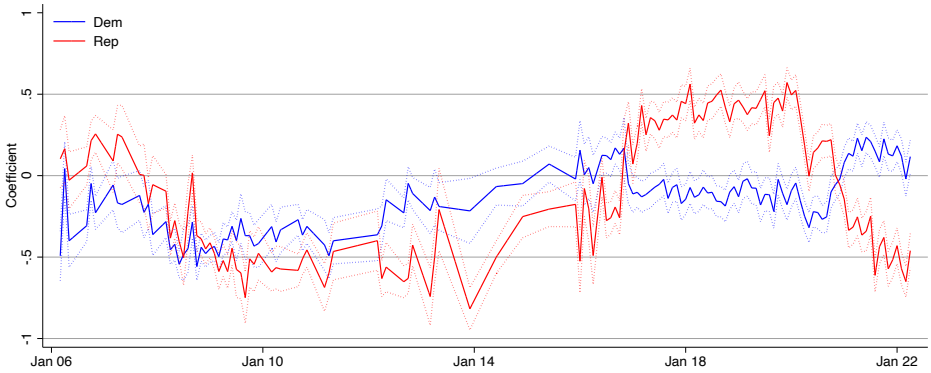
back

MSC MCA Loadings, Republican

	Responses				
	(1)	(2)	(3)	(4)	(5)
Economy Better/Worse (Last Year)	1.07		0.02		-1.13
Economy Better/Worse (Next Year)	1.18		-0.17		-1.90
Economy Good/Bad (Next Year)	1.18	0.69	-0.09	-0.74	-1.46
Economy Good/Bad (Next 5 Years)	1.17	0.78	-0.03	-0.93	-1.51
Unemployment Up/Down (Last Year)	-1.60		0.03		1.21
Prices Up/Down (Next Year)	-1.47	-0.67	0.05	0.83	0.69
Interest Rates Up/Down (Next Year)	-0.11		0.19		-0.05
Government Policy Good/Bad	1.30		0.16		-1.39
Personal Finances Better/Worse (Last Year)	0.85		-0.27		-1.32
Personal Finances Better/Worse (Next Year)	1.05		-0.23		-2.14
Family Income Up/Down (Next Year)	0.84	0.77	0.30	-0.54	-1.41
Real Income Up/Down (Next Year)	1.20		0.34		-1.12

back

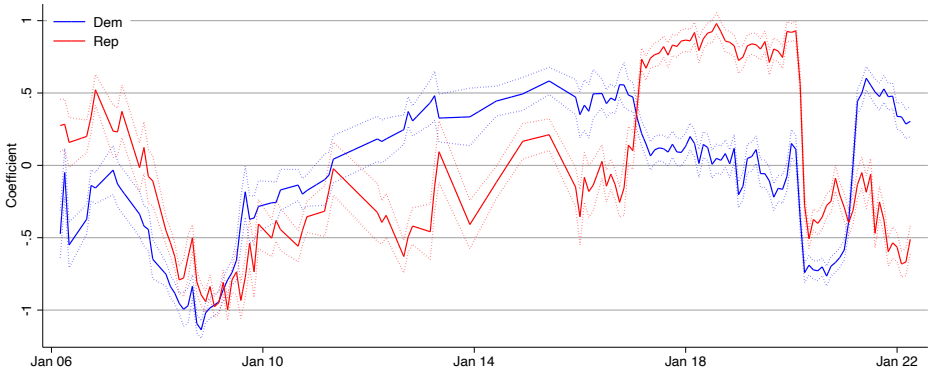
Sentiment Distribution by Political Affiliation (Personal Only)



Notes: results of a rolling regression of $\tilde{f}_{i,t}$ on political affiliation dummy variables, where $\tilde{f}_{i,t}$ is the first component from the MCA with only personal responses. Dotted lines represent 90% confidence intervals.

back

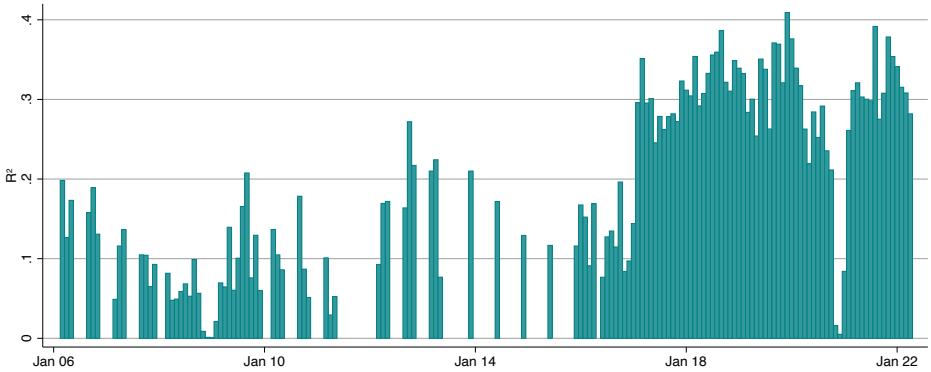
Sentiment Distribution by Political Affiliation (Backward Only)



Notes: results of a rolling regression of $\tilde{f}_{i,t}$ on political affiliation dummy variables, where $\tilde{f}_{i,t}$ is the first component from the MCA with only backward-looking responses. Dotted lines represent 90% confidence intervals.

back

Sentiment and Political Affiliation Explanatory Power



Notes: R^2 from a rolling regression of $f_{i,t}$ on political affiliation dummy variables, where $f_{i,t}$ is the first component from the baseline MCA.

- Political affiliation typically explains a large fraction of sentiment across households

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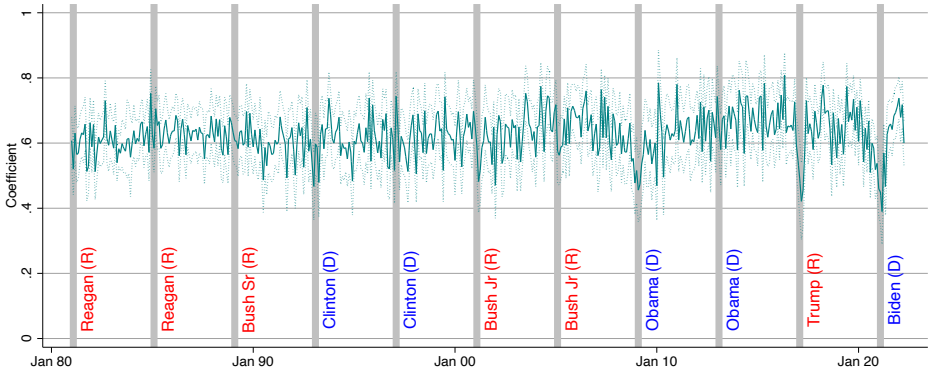
Sentiment Persistence (Personal Only)



Notes: results of a rolling regression $\tilde{f}_{i,t} = \alpha_t + \beta_t \tilde{f}_{i,t-6} + \varepsilon_{i,t}$, where $\tilde{f}_{i,t}$ is the first component from the MCA with only personal responses. Dotted lines represent 90% confidence intervals.

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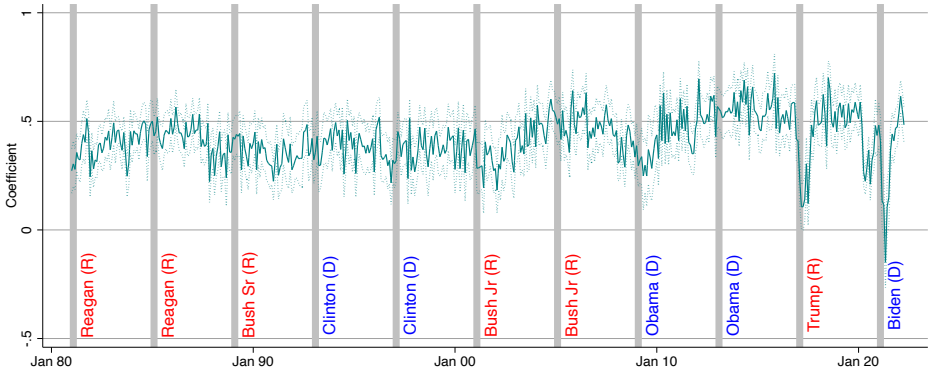
Sentiment Persistence (Backward Only)



Notes: results of a rolling regression $\tilde{f}_{i,t} = \alpha_t + \beta_t \tilde{f}_{i,t-6} + \varepsilon_{i,t}$, where $\tilde{f}_{i,t}$ is the first component from the MCA with only backward-looking responses. Dotted lines represent 90% confidence intervals.

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Comparison: SPF PCA Loadings and Fraction Explained

	Dim 1	Dim 2	Dim 3	Dim 4
Nominal Growth (Current Quarter)	0.398	0.019	0.105	-0.257
Nominal Growth (Next Year)	0.325	0.338	0.138	0.039
Inflation (Current Quarter)	0.134	0.498	0.187	-0.143
Inflation (Next Year)	0.148	0.512	0.193	-0.100
Corporate Profit Growth (Current Quarter)	0.247	-0.082	0.031	0.457
Corporate Profit Growth (Next Year)	0.205	0.127	-0.089	0.671
Unemployment Change (Current Quarter)	-0.358	0.157	0.022	0.322
Unemployment Change (Next Year)	-0.368	0.119	0.083	0.047
Industrial Production Growth (Current Quarter)	0.369	-0.179	0.073	-0.116
Industrial Production Growth (Next Year)	0.332	-0.016	-0.062	0.272
Housing Starts Growth (Current Quarter)	0.242	-0.109	-0.480	-0.200
Housing Starts Growth (Next Year)	0.070	0.069	-0.658	-0.014
T-Bill Rate Change (Current Quarter)	0.102	-0.371	0.348	-0.017
T-Bill Rate Change (Next Year)	0.098	-0.356	0.298	0.094
% Explained	34.113	18.979	11.494	9.618

- In contrast, higher dimension factor structure of forecaster expectations
  - Also holds for “pseudo-MCA” (binning responses)

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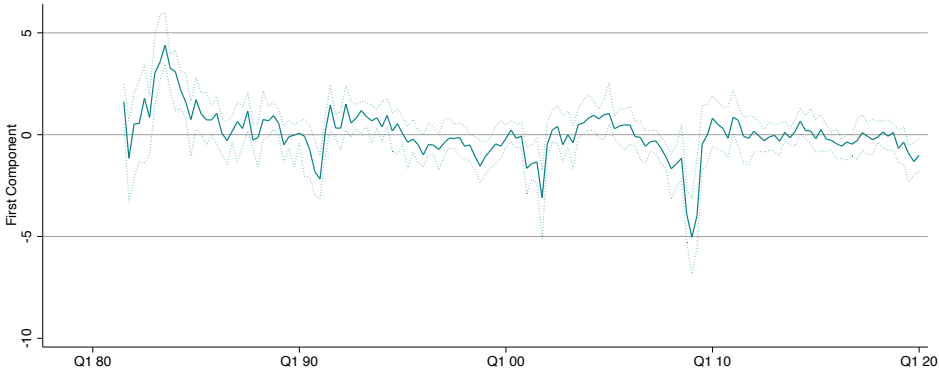
Comparison: SPF First Component Distribution Across Time



Notes: time series of the first component $f_{i,t}$ from the SPF PCA. The solid line is the median value, while the dotted lines are the 90-10 percent distribution.

- In contrast, first component of forecasters' beliefs is less dispersed than households

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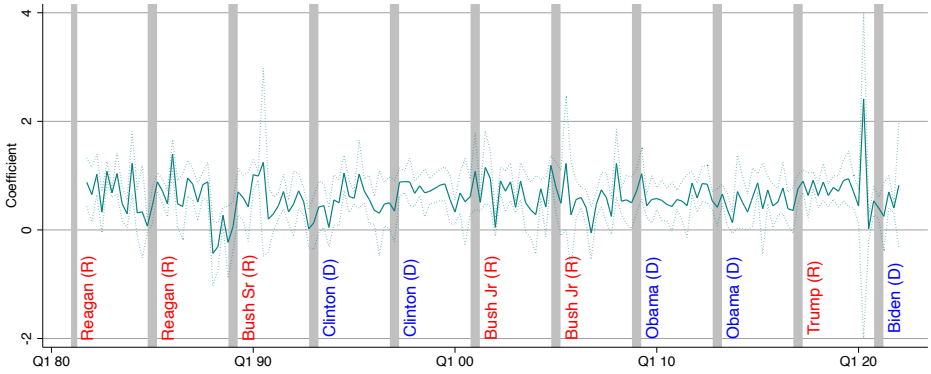
Comparison: SPF Persistence, First Component



Notes: results of a rolling regression $f_{i,t} = \alpha_t + \beta_t f_{i,t-1} + \varepsilon_{i,t}$, where $f_{i,t}$ is the first component from the SPF PCA. Dotted lines represent 90% confidence intervals.

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