Sentiment and Uncertainty about Regulation

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Motivation

"Owners … saw the drive-through window as an opportunity for disabled patients and frequent customers. They invested $100,000 last summer on an intercom system, high-resolution cameras and secure garage doors. But without **a change in statewide regulations**, the drive-through couldn't legally open." (The Washington Post, Apr. 30, 2020)

"U.S. stocks surged Thursday, on track to extend their sharpest weekly rally since April, as investors cheered the prospect of **curbs on new regulations** and diminished chances of higher taxes under a split Congress." (Wall Street Journal, Nov. 5, 2020)

Preview

- We construct news-based measures of sentiment and uncertainty about regulation in the U.S. from 1985 to 2020, both in aggregate and for 15 regulatory policy areas.

- We examine the responses of macroeconomic indicators to sentiment and uncertainty shocks about regulation.

Key Findings:

- A negative shock to sentiment about regulation is associated with large, persistent drops in future output and employment.

- A regulatory uncertainty shock reduces output and employment temporarily.

- Economic outcomes are particularly sensitive to sentiment and uncertainty around certain regulatory policy areas.

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Literature

- Economic sentiment
  - Survey-based measures (Carroll et al., 1994; Benhabib and Spiegel, 2019)
  - News-based measures (Shapiro et al., 2020; Kalamara et al. 2020)

- Policy uncertainty
  - Economic policy uncertainty (EPU) index (Baker et al., 2016)

- Economic effects of regulation
  - Cumulative volume or restriction of regulation (Coffey et al., 2020; Dawson and Seater, 2013)

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Newspaper Data

Initial corpus: 822,737 news articles that contain the keyword "regulat*" or "deregulat*"

(Seven U.S. newspapers, Jan 1985 – Aug 2020, from ProQuest TDM Studio)

	All articles	Unique articles	Regulatory articles	First regulatory article	Last regulatory article
Wall Street Journal	251,983	242,084	163,788	1985-01-02	2020-08-31
New York Times	125,270	117,441	72,852	1985-01-01	2020-08-31
Los Angeles Times	121,406	120,802	73,568	1985-01-01	2020-08-31
The Washington Post	116,772	109,216	67,448	1987-01-01	2020-08-31
Chicago Tribune	90,023	89,600	51,740	1985-01-01	2020-08-31
Boston Globe	78,922	72,456	43,445	1985-01-01	2020-08-30
USA Today	38,361	36,917	20,577	1987-04-01	2020-08-31
Total	822,737	788,516	493,418	-	-

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Regulation-Related News

"Mr. Shad asserted that he doesn't see enough evidence of fraud or other abuses by financial planners to justify additional federal **regulation**."

(Wall Street Journal, 1986-6-12)

False Positive

"Western led 35-33 at halftime, but the Warriors fought back to take a 57-49 lead on two David Boone free throws with 8:11 left in **regulation**."

(Chicago Tribune,1987-1-13)

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A Dictionary of Regulatory Noun Chunks

❶ Identify noun chunks from unique titles of all rules considered by federal agencies from 1995 to 2019 (Unified Agenda data)

Test Procedures for the Analysis of Trace Metals Under the Clean Water Act

⬇

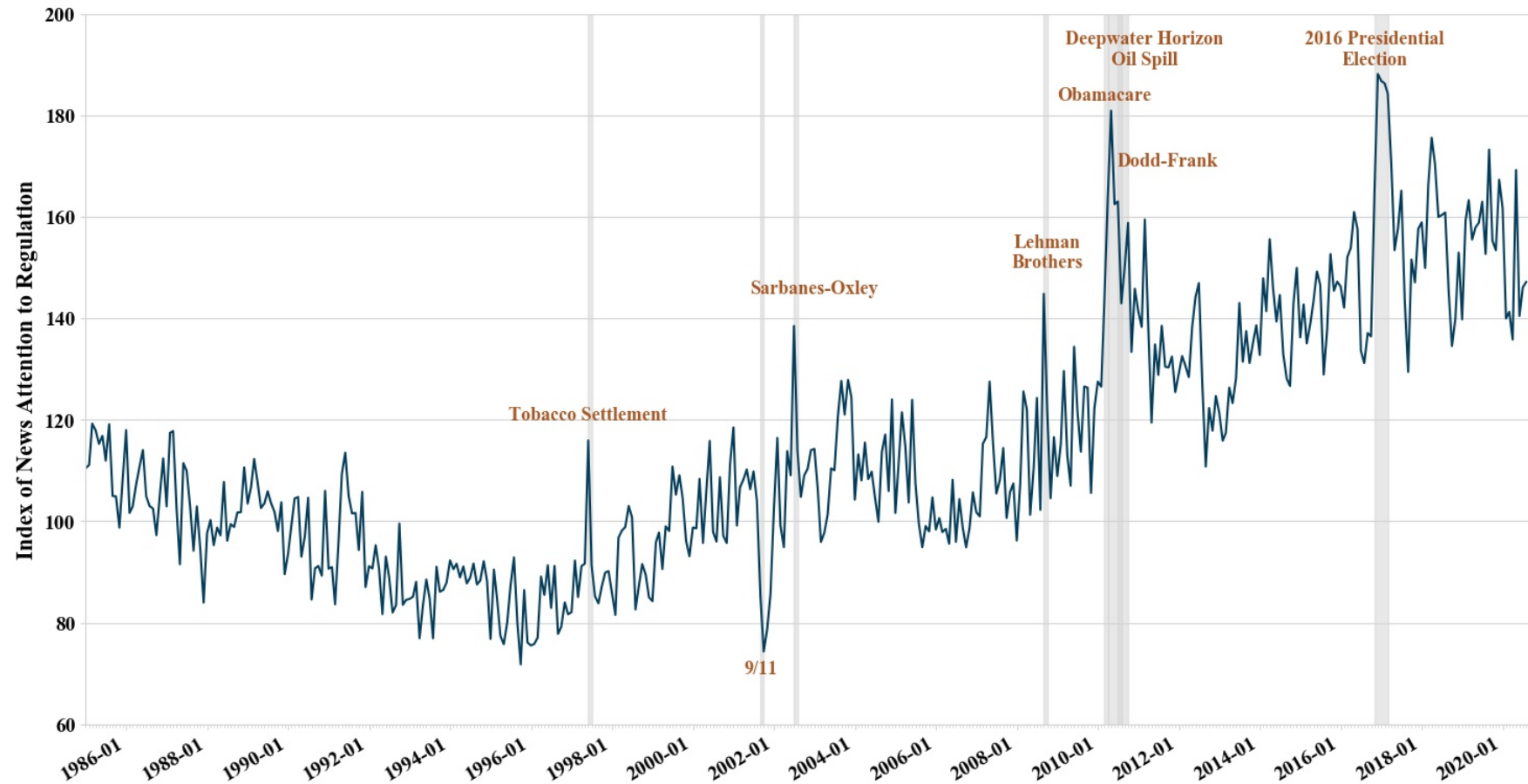["test procedure", ~~"analysis"~~, "trace metal", "clean water act"]

❷ Match noun chunks in the news corpus

A Regulatory Section:

"Researchers developing vaccines for horses have some advantages over their counterparts looking for a vaccine for humans. Animal drugs face lower regulatory barriers. And the horse vaccine benefited from shortcuts that couldn't be allowed in human research." (WSJ, 2003-8-29)

❸ Conduct human checking and correction
↪ 10,645 regulatory noun chunks
↪ 493,418 news articles with regulatory sections

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Increasing News Attention to Regulation

Notes: The index is constructed by standardizing the monthly counts of regulation-related news articles scaled by the monthly counts of all news articles in each newspaper and normalizing the time series to a mean of 100 from January 1985 to December 2009. The index is calculated using data from seven U.S. newspapers including Boston Globe, Chicago Tribune, Los Angeles Times, New York Times, USA Today, Wall Street Journal, and the Washington Post. Data for the Washington Post are available from January 1987, and data for USA Today are available from April 1987.

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Lexicon-based Sentiment Analysis

- Assessing sentiment (with negation)
  - Loughran and McDonald (LM) dictionary
  - Harvard General Inquirer (GI) dictionary
  - Lexicoder Sentiment Dictionary (LSD)

$$SentimentScore = \frac{PositiveWordCount - NegativeWordCount}{TotalWordCount} * 100$$

- Assessing uncertainty
  - Loughran and McDonald (LM) dictionary

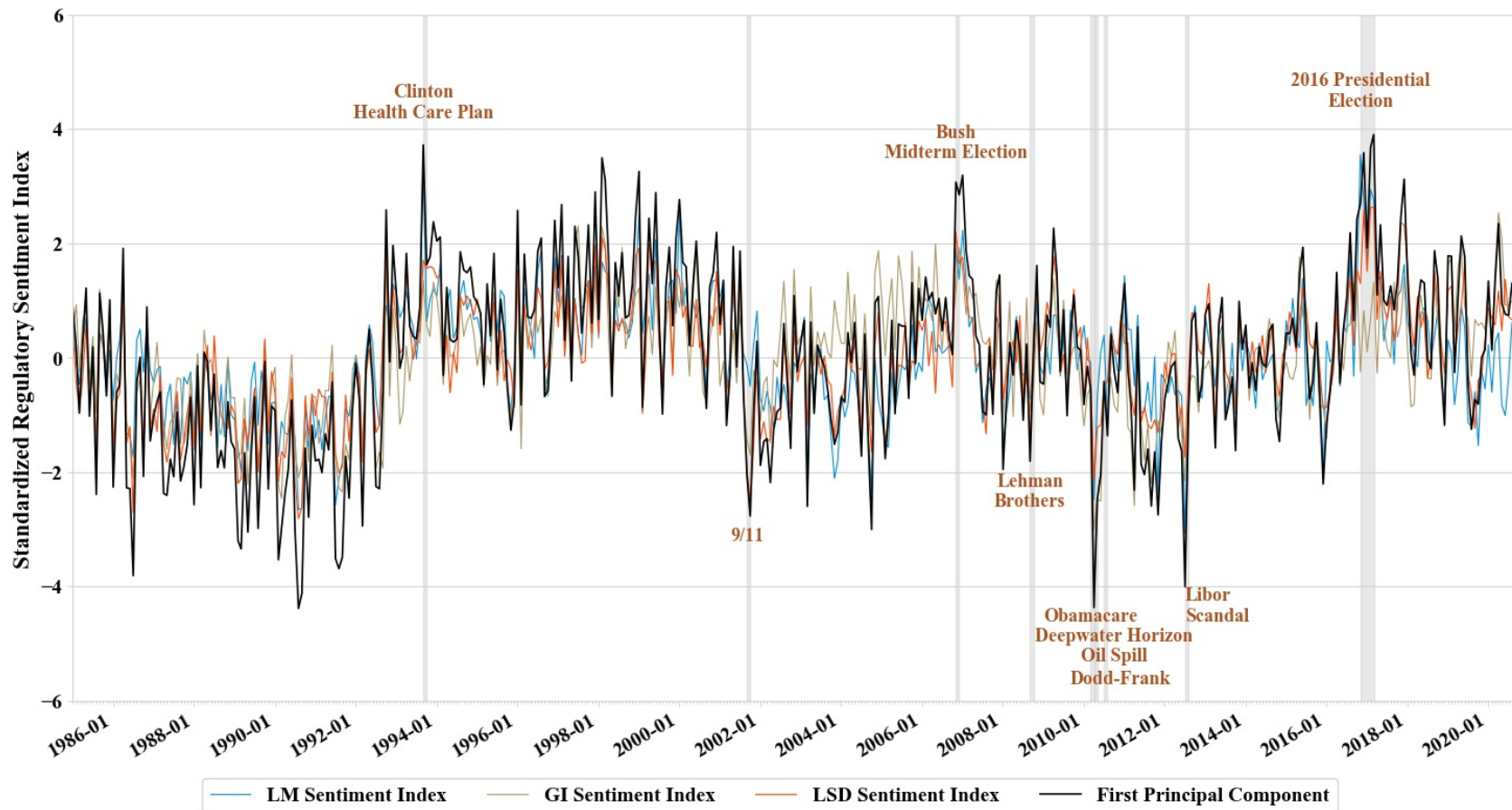$$UncertaintyScore = \frac{UncertaintyWordCount}{TotalWordCount} * 100$$

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Compute Indexes

Following Shapiro et al. (2020):
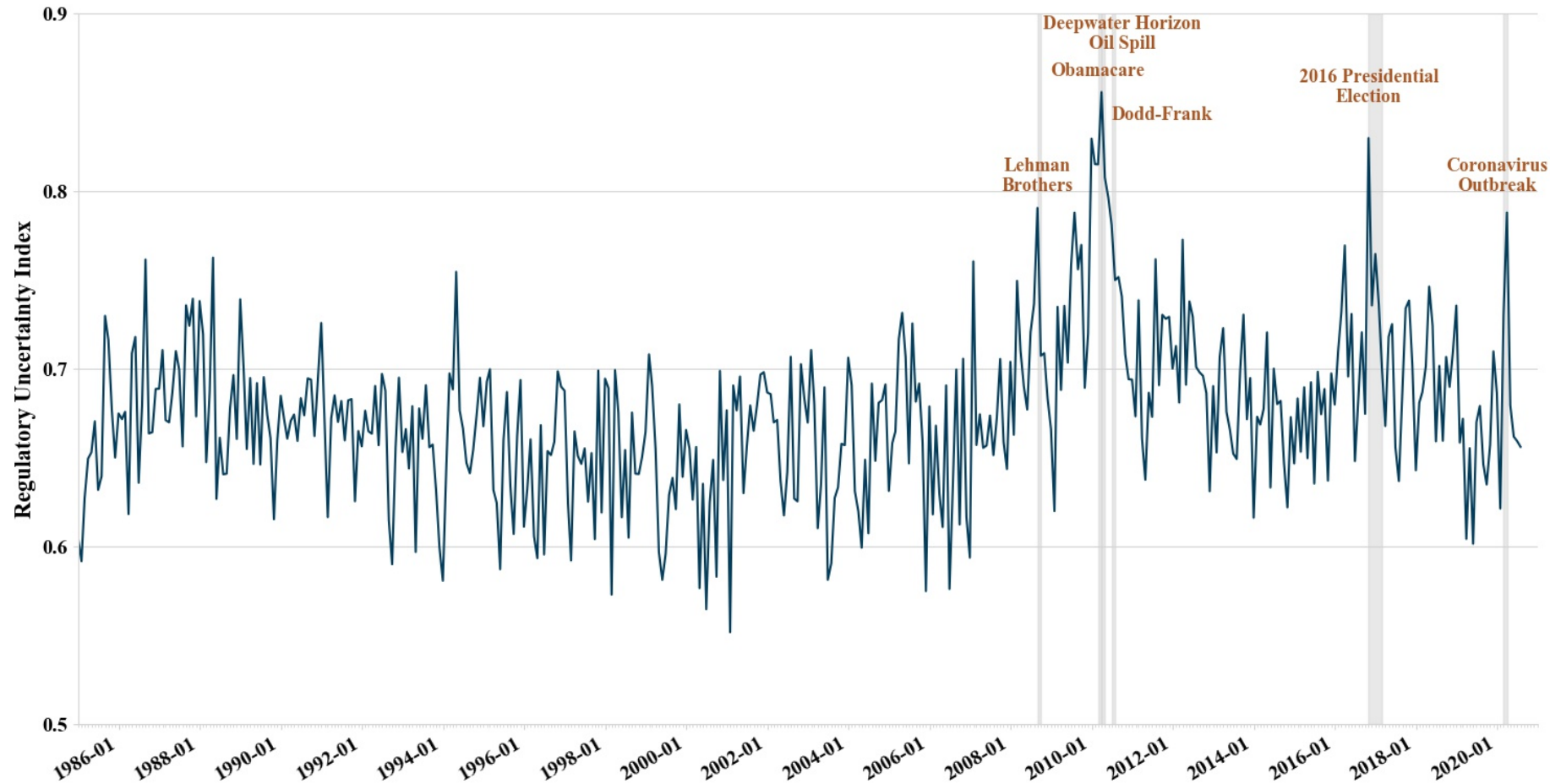
$$s_j = u_{t(j)} + v_{i(j)} + \epsilon_j,$$

where s_j is the estimated sentiment or uncertainty score for article j, $u_{t(j)}$ is a year-month fixed effect, and $v_{i(j)}$ is a newspaper fixed effect.

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Regulatory Sentiment Index

Notes: The figure plots three sentiment indexes estimated using the Loughran and McDonald (LM) dictionary, the General Inquirer (GI) dictionary, and the Lexicoder Sentiment Dictionary (LSD), respectively, and the first principal component of the three indexes. All indexes are normalized to have mean equal to zero and standard deviation equal to one.

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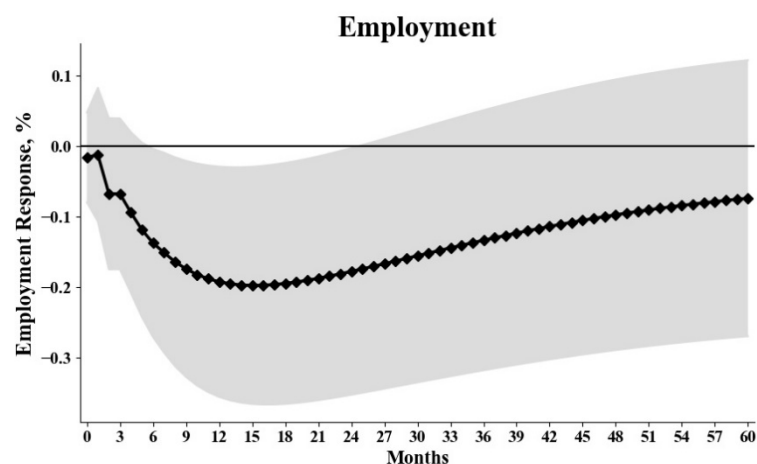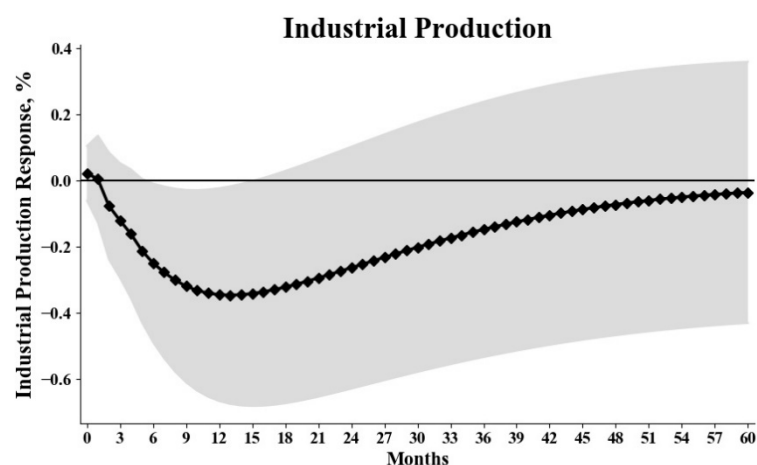THE GEORGE WASHINGTON UNIVERSITY

Regulatory Uncertainty Index

Notes: The figure plots the regulatory uncertainty index estimated using the uncertainty category of the Loughran and McDonald (LM) dictionary.

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VAR

Monthly VAR of Baker et al. (2016):

- A one-standard-deviation negative sentiment shock or a one-standard-deviation upward uncertainty shock

- Orthogonalized by using the Cholesky decomposition with the following ordering of variables: our regulatory sentiment or uncertainty index, the log of S&P500 index, the federal funds rate, log employment, and log industrial production.

- Three lags of all variables

- Robustness checks:
  - reverse ordering
  - bivariate VAR
  - add time trends
  - add news sentiment index of Shapiro et al. (2020)
  - add the EPU index of Baker et al. (2016)
  - drop S&P
  - add VIX
  - bivariate VAR with reverse ordering
  - add the Michigan Consumer Sentiment Index

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Impulse Responses to Regulatory Sentiment Shocks

Industrial Production

Employment

Impulse Responses to Regulatory Uncertainty Shocks

Industrial Production
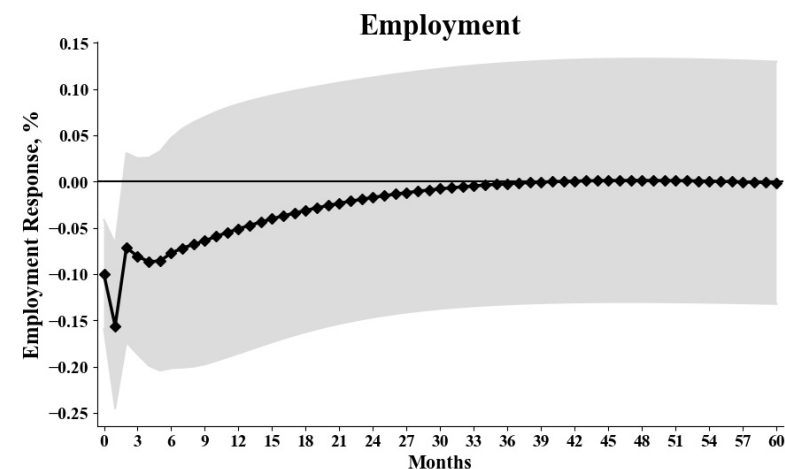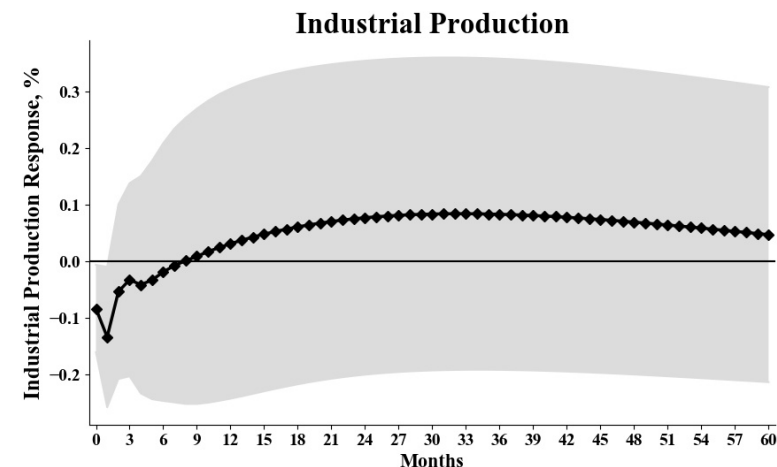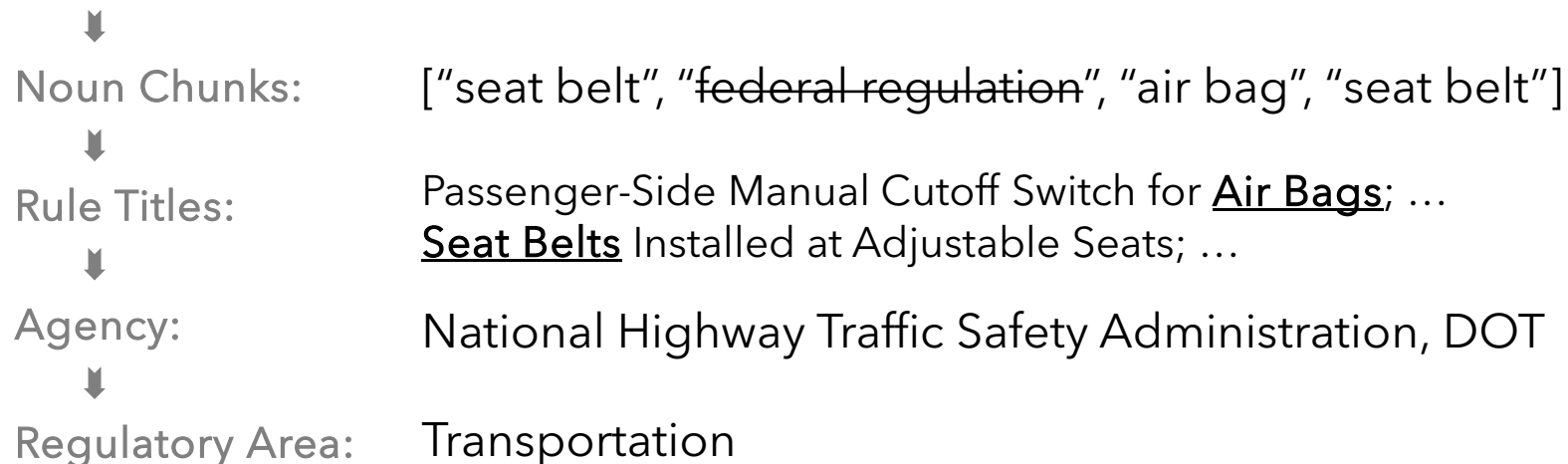

Employment

Notes: The figures plot VAR-estimated impulse response functions for industrial production and employment to a one-standard-deviation negative shock to sentiment about regulation or to a one-standard-deviation upward shock to uncertainty about regulation. The gray areas are 90% confidence bands.

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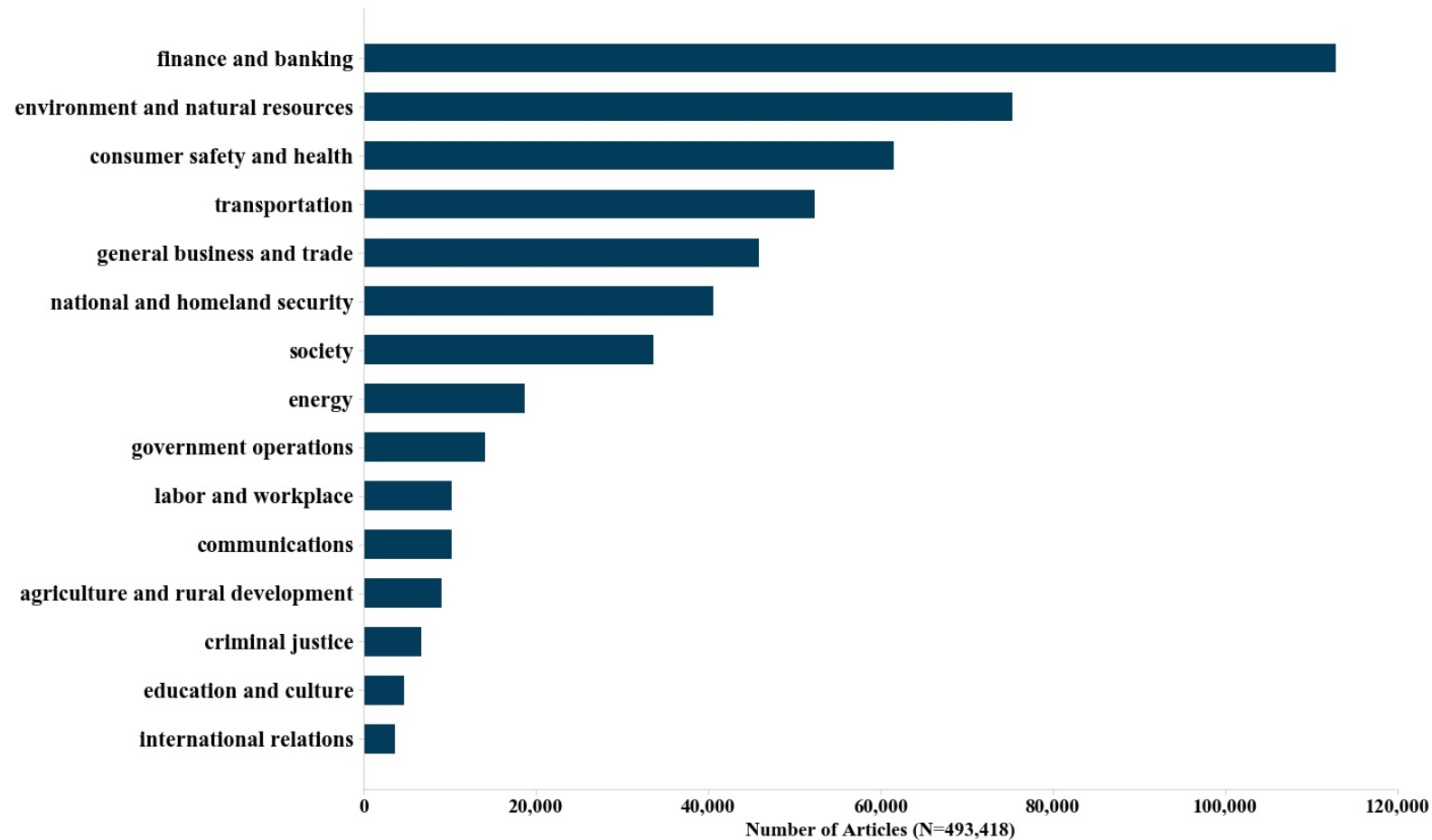zxie@gwu.edu
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Categorizing News Content
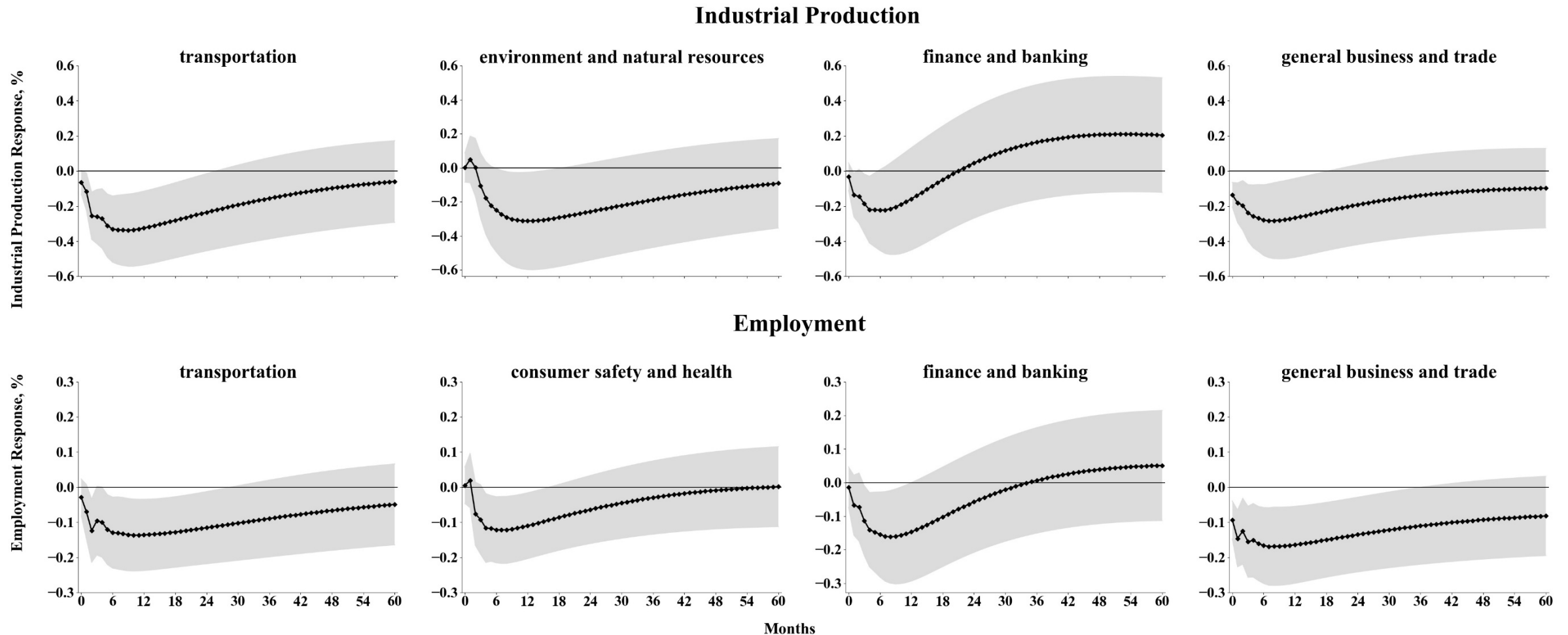
A regulatory section:

"Automobile manufacturers are financing a multimillion dollar lobbying campaign aimed at persuading state legislatures to require motorists to buckle up their <u>seat belts</u>, a move designed to kill a <u>federal regulation</u> requiring the industry to equip vehicles with more expensive <u>air bags</u> by 1989. Last year, legislatures in New York, New Jersey and Illinois adopted mandatory <u>seat belt</u> laws and legislation already has been led on Beacon Hill to bring about the same end." (Boston Globe, 1985-1-30)

Noun Chunks: ["seat belt", ~~"federal regulation"~~, "air bag", "seat belt"]

Rule Titles: Passenger-Side Manual Cutoff Switch for <u>Air Bags</u>; …
<u>Seat Belts</u> Installed at Adjustable Seats; …

Agency: National Highway Traffic Safety Administration, DOT

Regulatory Area: Transportation

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Frequencies of Articles by Regulatory Area

Number of Articles (N=493,418)

Impulse Responses to Regulatory Sentiment Shocks

Industrial Production

Employment

Notes: The figures plot VAR-estimated impulse responses of industrial production and employment to a one-standard-deviation negative sentiment shock for each regulatory policy area. The gray areas are 90% confidence bands.

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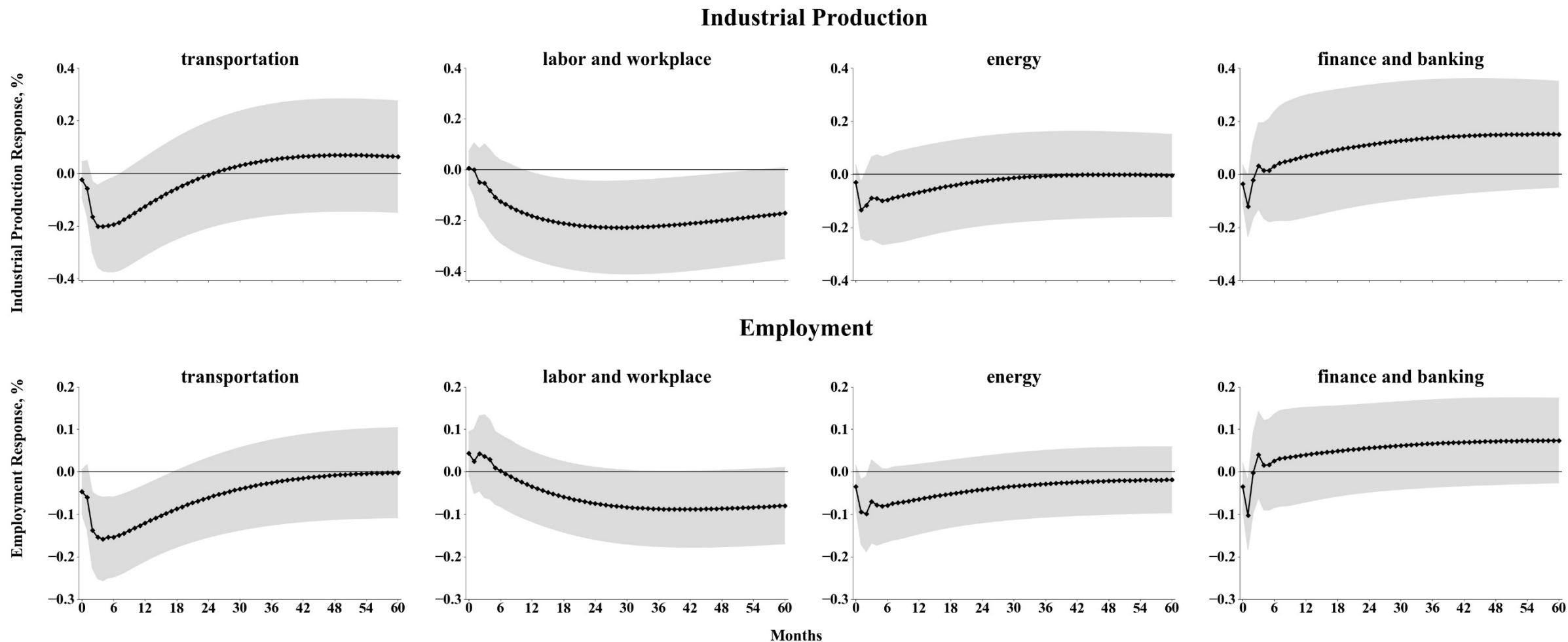zxie@gwu.edu
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Impulse Responses to Regulatory Uncertainty Shocks

Notes: The figures plot VAR-estimated impulse responses of industrial production and employment to a one-standard-deviation upward uncertainty shock for each regulatory policy area. The gray areas are 90% confidence bands.

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Conclusion

- We constructed news-based measures of sentiment and uncertainty about regulation.
- Negative news about regulation may lead to persistent drops in future output and employment, while increased regulatory uncertainty overall has transitory effects.
- Economic outcomes are particularly sensitive to sentiment and uncertainty around certain regulatory policy areas:
    - Sentiment around transportation & general business and trade
    - Uncertainty around transportation & labor and workplace

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