Measuring Economic Policy Uncertainty

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Research with Scott Baker and Nick Bloom of Stanford University

Conference on the Causes and Consequences of Economic Uncertainty
Federal Reserve Bank of Dallas
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Our Initial Goal: Assess the Policy Uncertainty View

Policy Uncertainty View

1. Policy-related economic uncertainty is at historically high levels in recent years in the United States and in Europe.

2. High levels of policy uncertainty cause businesses and households to cutback or defer spending, investment and hiring – undermining macroeconomic performance and slowing recovery from recent financial crises.
Broadening Our Goals

1. Construct new measures of economic policy uncertainty (EPU) for many countries. Thus far:
   – Monthly indexes for USA, Canada, UK, Germany, France, Italy, Spain, China, India and Japan.
   – Daily measure for USA

2. Develop methods to evaluate and refine our EPU indexes, especially the news-based component

3. Assess the effects of policy uncertainty on macroeconomic performance

4. Future work: Study economic, political and social forces that underlie policy uncertainty
What Do We Want our Measures to Capture?

All of the following:

• Uncertainty about *who* will make economic policy decisions – e.g., who will win the next elections?

• Uncertainty about *what* economic policy actions decision makers will undertake, and *when*.

• Uncertainty about the economic *effects* of policy actions – past, present and future actions

• Economic uncertainty induced by policy inaction

• Economic uncertainty related to national security concerns and other policy matters that are not mainly economic in character
Our Index of Policy-Related Economic Uncertainty

Components:

– Scheduled tax code expirations (1/6)
– Forecaster disagreement about government purchases of goods and services (1/6)
– Forecaster disagreement about inflation (1/6)
– Newspaper-based index (1/2 weight)

Normalize each component to have unit standard deviation, then compute weighted sum to get overall index.
Figure 3: Federal Tax Code Expirations Index, 1991-2013

Notes: Based on Congressional Budget Office data on projected revenue effects of federal tax code provisions set to expire in the current calendar year and next ten years. For a given year, the index value is calculated as the discounted sum of projected revenue effects associated with expiring tax code provisions, using a discount factor of $0.5^T$ applied to future revenue effects for $T=0,1,\ldots,10$ years. Index normalized to a mean of 100 before 2010.
Figure 3: Federal Tax Code Expirations Index, 1991-2013

Undiscounted projected 10-year revenue impact of scheduled tax code expirations:
- Before 2003 < $250 billion
- 2009-2012: $3-5 trillion

2013: Huge drop due to “Fiscal Cliff” resolution

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Figure 4: Interquartile Range of Four-Quarter-Ahead CPI Inflation Forecasts, Percentage-Point Spread, Q1 1985 to Q4 2012

Notes: From the Federal Reserve Bank of Philadelphia Survey of Professional Forecasters (made every quarter; offset one month due to release dates such that Q4 covers Nov-Jan. Displays the Interquartile (IQ) range of the quarterly 1-year-ahead forecasts of CPI.
IQR of Government Purchases Forecasts, % of GDP

Notes: Based on data from the Federal Reserve Bank of Philadelphia Survey of Professional Forecasters. We compute the interquartile range (IQR) of 1-year ahead forecasts of government purchases of goods and services and scale the IQR by the median forecast. We carry out these calculations separately for federal purchases and state & local purchases, then aggregate using the purchases share of nominal GDP for each level of government. See the main text for additional details.
Constructing Our Newspaper-Based Index of EPU for the U.S.

• Search digital archives of 10 major newspapers for articles with terms related to EPU

• For each newspaper:
  – Get monthly EPU article counts
  – Scale by count of all articles in same month
  – Normalize scaled count so that SD=1 for 1985-2010
  → Newspaper-level EPU Index

• Sum across the newspaper-level indexes by month to get the U.S. news-based EPU index
Constructing Our Newspaper-Based EPU Index for the U.S.

Text String Search Criteria:
EU: {economic OR economy} AND {uncertain OR uncertainty}
EPU: ... AND {regulation OR deficit OR “federal reserve” OR congress OR legislation OR “white house”}
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Later, if time allows: How did we select the “policy” terms for our EPU search filter?
Constructing Our Newspaper-Based EPU Index for the U.S.

Newspapers:
- Boston Globe
- Chicago Tribune
- Dallas Morning News
- Los Angeles Times
- Miami Herald
- New York Times
- SF Chronicle
- USA Today
- Wall Street Journal
- Washington Post

Note: We use Access World News Newsbank Service when constructing a daily EPU Index, because the daily index requires a higher density of news sources.
US Newspaper-Based Economic Policy Uncertainty Index:
January 1985 to September 2013

Our main index of US economic policy uncertainty
January 1985-September 2013

Source: Data at www.policyuncertainty.com. Data normalized to 100 prior to 2010.
Notes: Index composed of a News-Based Index (0.5 weight), and country-level components measuring forecaster disagreement about inflation rates and federal government budget balance (each 0.25 weight). News-Based component composed of the monthly number of news articles containing uncertain or uncertainty, economic or economy, as well as policy relevant terms (scaled by the smoothed number of articles containing 'today'). Policy relevant terms include: 'policy', 'tax', 'spending', 'regulation', 'central bank', 'budget', and 'deficit'. Series is normalized to mean 100 from 1997-2010. Index covers Jan 1997 – June 2013. Papers include El Pais, El Mundo, Corriere della Sera, La Repubblica, Le Monde, Le Figaro, Financial Times, The Times, Handelsblatt, FAZ. All searches done in the native language of the paper in question.
Two Measurement Concerns

**Suitability:** Whether an accurate count for news articles about a particular type of uncertainty provides a good indicator for that type of uncertainty.

**Accuracy:** Whether specific text-string search criteria accurately identify the set of articles that discuss a certain type of uncertainty, e.g., policy-related economic uncertainty.
Assessing Suitability Concern

Idea: Apply news-based approach to a concept of uncertainty for which we have external, market-based evidence.

Implementation: Compare VIX measure of uncertainty about future equity returns to a news-based index of equity market uncertainty, with search terms as follows:

{economic OR economy} AND
{uncertain OR uncertainty} AND
{“stock price” OR “equity price” OR “stock market”}
Figure 7: News-based index of equity market uncertainty compared to market-based VIX, January 1990 to December 2012

Notes: The news-based index of equity market uncertainty is based on the count of articles that reference ‘economy’ or ‘economic’, and ‘uncertain’ or ‘uncertainty” and one of ‘stock price’, ‘equity price’, or ‘stock market’ in 10 major U.S. newspapers, scaled by the number of articles in each month and paper. The news-based index and the VIX are normalized to a mean of 100 over the period.
Assessing Accuracy Concern

Working under our direction, several RA’s read 4,000+ newspaper articles, following a 50-page audit guide to code articles: “economic uncertainty”=0/1, “economic policy uncertainty”=0/1, and more ...

Audit Methodology: Main Steps

1. Download all NY Times, LA Times, and SF Chronicle articles from 1985 to 2012 that pass our Economic Uncertainty (economic) test.
   - The paper methodology section
2. Draw new samples of 17 z values for August 30
   - Assign 84 of the sampled articles for each paper to Kyle and 84 to Sophie. Call these subsamples Sub(Name, Paper), where
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4. For each sample...
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5. In summary, the paper reviews...

Auditing the Sampled Articles, 2

3. If yes to 2, then identify the policy category (checking all that apply):
   - Monetary policy
   - Fiscal policy
   - Taxes
   - Labor regulations
   - Legal policy
   - Competition policy
   - Government spending
   - Health care programs and regulations
   - National security and terrorism
   - Trade policy
   - Energy & environmental regulation, natural resources and commodities
   - Entitlement programs, social safety net, welfare programs
   - Financial regulation (including banking and equity markets)
   - Political conflict and leadership changes
   - Sovereign debt, exchange rate policy, foreign reserves
   - Other policy matters (specify)
4. Code other aspects of policy uncertainty treated in the article: direction of change, nature of policy uncertainty (is it about who, actions, or effects?), and whether it discusses policy concerns in the United States or foreign countries.

FAQ

4. Given that the outcome of government policy is always uncertain, at some level, does any mention of a new or proposed policy constitute EPU=1?

No. An article mentions the policy, etc... For example, does mention of a new or proposed policy constitute EPU=1?

True Positive 2

August 30 Sampling Details, 2

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Figure 8: Human Readings and Automated Computer Methods Yield Similar News-Based EPU Indexes, 1985Q1 to 2012Q2

Note: Based on random samples of 45 articles per quarter (fewer prior to 1993). For these articles, we calculate quarterly EPU rates based on human readings (red line) and based on automated computer methods (blue line).
Other Audit Results

• Correlation of news-based EPU error rate and real GDP growth rate = -0.02 (quarterly data)
• Correlation of news-based EPU error rate and “true” EPU = 0.004 (quarterly data)
• Only 2% of EPU=1 articles are mainly about low or declining uncertainty.
• Among EPU=1 articles in the Audit Sample:
  – 69% discuss uncertainty about *what* or *when*
  – 40% discuss uncertainty about *effects*
  – 21% discuss uncertainty about *who* – nearly doubles in presidential election years
Selecting a Preferred Term Set


• + 14,000 combinations that replace terms like “policy” and “government” with multi-word terms like “government policy”

• Interpreting the human coding as truth, select the term set that minimizes the sum of false positive and false negative error rates
Error rates for 28,000 permutations of 14 policy terms in a human audit sample of 3,500 randomly selected articles.

Permutations of 14 policy terms: regulation, budget, deficit, tax, federal reserve, government, congress, senate, president, legislation, government spending, federal spending, etc.

Our preferred policy term set: 
{congress, deficit, “federal reserve”, legislation, regulation, “white house”}

False positives and false negatives expressed as a fraction of true EPU – i.e., as a fraction of false negatives + true positives.
A Different Text Source: The “Beige Books” Produced for the FOMC
Figure 9: The frequency of “uncertainty” and policy-related “uncertainty” discussions in FOMC Beige Books rose sharply after 2008

Note: Plots the frequency of the word “uncertain” in each quarter of the Federal Open Market Committees’ (FOMC) Beige Book. The Beige Book is an overview of economic conditions of about 15,000 words in length prepared two weeks before each FOMC meeting. The count of “Policy Uncertainty” uses a human audit to attribute each mention of the word uncertain to a policy context (e.g. uncertainty about fiscal policy) or a non-policy context (e.g. uncertainty about GDP growth). See the paper for full details.
Evidence about Sources of Policy Uncertainty
What drives recent rise in U.S. economic policy uncertainty?

<table>
<thead>
<tr>
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Note: Analysis uses Newsbank coverage of around 1000 US national and local newspapers. See Table 1 in the Baker, Bloom and Davis (2013) for a more detailed analysis.
What drives recent rise in U.S. economic policy uncertainty? Newspaper articles point mainly to concerns about fiscal and healthcare policies.

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Beige Books Tell a Similar Story …

Counts By Category and Selected Time Period, 1983Q3 to 2013Q1

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<tr>
<td>1990 Q4 - 1991 Q1 Gulf War I</td>
<td>11</td>
<td>8.8</td>
<td>7.7</td>
<td>13.5</td>
<td>5.2</td>
<td>10.2</td>
<td>15.8</td>
<td>5.5</td>
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<tr>
<td>1993 Q2 - 1993 Q3 Clinton Tax Reforms</td>
<td>5.5</td>
<td>6.3</td>
<td>1.2</td>
<td>4.8</td>
<td>2.8</td>
<td>0.8</td>
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<tr>
<td>2001 Q4 - 2002 Q2 9/11 Attacks</td>
<td>1</td>
<td>5.5</td>
<td>1.5</td>
<td>0</td>
<td>0</td>
<td>0.4</td>
<td>3.3</td>
<td>1.0</td>
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<td>2002 Q4 - 2003 Q2 Gulf War II</td>
<td>0.5</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0.2</td>
<td>1.2</td>
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<td>2004 Q2 - 2004 Q4 Bush/Kerry Election</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>2008 Q3 - 2009 Q4 Lehman's and recession</td>
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<td>0.8</td>
<td>0.1</td>
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<tr>
<td>2010 Q1 - 2013 Q1 Debt-ceiling crisis</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>1983 Q3 – 2013 Q1 Overall Average</td>
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<td>9.3</td>
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<td>3.0</td>
<td>0.8</td>
<td>10.0</td>
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| Economic Policy Uncertainty | 5.5 | 6.3 | 1.2 | 4.8 | 2.8 | 0.8 | 6.8 | 1.7 |
| All Fiscal Matters | 1 | 5.5 | 1.5 | 0 | 0 | 0.4 | 3.3 | 1.0 |
| Taxes Only | 0 | 3.3 | 0.2 | 0 | 0 | 0.3 | 1.4 | 0.4 |
| Spending Only | 0.5 | 1 | 1 | 0 | 0 | 0.2 | 1.2 | 0.3 |
| Monetary Policy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Health Care | 0 | 2 | 0 | 0 | 0 | 0.2 | 0.5 | 0.1 |
| National Security and War | 5.3 | 0.3 | 0 | 2 | 0 | 0 | 0.1 | 0.2 |
| Financial Regulation | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 1.2 |
| Sovereign debt, currency crisis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 |
| U.S. Elections and Leadership Changes | 0 | 0 | 0 | 0.2 | 2.2 | 0 | 0.9 | 0.2 |
| Other Specified Policy Matters | 0 | 0.5 | 0.7 | 0 | 0.2 | 0 | 0.5 | 0.2 |
| Politics, Unspecified | 0.5 | 1 | 0 | 3 | 0.7 | 0 | 1.6 | 0.3 |
| Sum of Policy & Politics Categories | 6.8 | 9.3 | 2.2 | 5.2 | 3.0 | 0.8 | 10.0 | 2.5 |
And NEVER Breathe a Word about about Monetary Policy Uncertainty!

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<td>11</td>
<td>8.8</td>
<td>7.7</td>
<td>13.5</td>
<td>5.2</td>
<td>10.2</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0.2</td>
<td>0.5</td>
<td>0.1</td>
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<tr>
<td>National Security and War</td>
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<td>0.3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0.1</td>
<td>0.2</td>
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<tr>
<td>Financial Regulation</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.2</td>
<td>1.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Sovereign debt, currency crisis</td>
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<td>0</td>
<td>0</td>
<td>0.8</td>
<td>0.1</td>
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<tr>
<td>U.S. Elections and Leadership Changes</td>
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<td>0</td>
<td>0</td>
<td>0.2</td>
<td>2.2</td>
<td>0</td>
<td>0.9</td>
<td>0.2</td>
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<td>Other Specified Policy Matters</td>
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<td>0.7</td>
<td>0</td>
<td>0.2</td>
<td>0</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Politics, Unspecified</td>
<td>0.5</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0.7</td>
<td>0</td>
<td>1.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Sum of Policy &amp; Politics Categories</td>
<td>6.8</td>
<td>9.3</td>
<td>2.2</td>
<td>5.2</td>
<td>3.0</td>
<td>0.8</td>
<td>10.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>
U.S. Economic Policy Uncertainty: A Longer Term Perspective
Figure 14: The policy uncertainty news index extended back to 1900

Notes: Index of Policy-Related Economic Uncertainty composed of quarterly news articles containing uncertain or uncertainty, economic or economy or business or commerce, and policy relevant terms (scaled by count of all articles) in 6 newspapers (WP, BG, LAT, NYT, WSJ and CHT). Data normalized to 100 from 1900-2011.
My Coauthors Prefer to Scale the Long-Span Series by # of Articles on Economic Matters, Yielding …

(Jan 1900 – Dec 2012)

Notes: Index of Policy-Related Economic Uncertainty composed of quarterly news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed total number of articles) in 5 newspapers (WP, BG, LAT, WSJ and CHT). Data normalized to 100 from 1900-2011.
Notes: Index of Policy-Related Economic Uncertainty composed of quarterly news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed total number of articles) in 6 newspapers (WP, BG, LAT, NYT, WSJ and CHT). Data normalized to 100 from Jan 1900-Dec 2011. Government expenditure is total federal, state, and local expenditures over GDP, annually.
How Could Policy Uncertainty Hold Back the Economy?

Potential Mechanisms (Not an Exhaustive List)

1. More precautionary savings and deleveraging by households

2. When investment and hiring decisions are costly to reverse, greater uncertainty depresses and delays investment and hiring (Bernanke, 1983)


4. Higher markups, intensifying monopoly distortions (Fernandez-Villaverde et al., 2011)

5. Managerial risk aversion (Panousi and Panikolaou, 2011)

6. Intensification of agency problems, reducing the value of new and existing employment, business and financial relationships (Narita, 2011)
Assessing the Effects of EPU: Summary of our Work

1. **Micro approach**: Exploit differences in exposure to government contracts to estimate the effects of EPU on firm-level investment and hiring (working through one specific channel).

1. **Macro approach**: Include our EPU measure in an otherwise standard VAR model of aggregate dynamics. Estimate the effects of EPU shocks on aggregate output, investment and employment.
Micro evidence: exploiting differences in exposure to government contract awards

**Table 4: The Ten Highest Contract Intensities by SIC Code**

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industry Description</th>
<th>Contract Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>376</td>
<td>Guided Missiles And Space Vehicles And Parts</td>
<td>0.767</td>
</tr>
<tr>
<td>379</td>
<td>Miscellaneous Transportation Equipment</td>
<td>0.472</td>
</tr>
<tr>
<td>800</td>
<td>Health services</td>
<td>0.438</td>
</tr>
<tr>
<td>348</td>
<td>Ordnance And Accessories, Except Vehicles And Guided Missiles</td>
<td>0.384</td>
</tr>
<tr>
<td>381</td>
<td>Search, Detection, Navigation, Guidance &amp; Aeronautical Systems</td>
<td>0.261</td>
</tr>
<tr>
<td>871</td>
<td>Engineering Services</td>
<td>0.224</td>
</tr>
<tr>
<td>160</td>
<td>Heavy Construction Other Than Building Construction Contractors</td>
<td>0.152</td>
</tr>
<tr>
<td>372</td>
<td>Aircraft And Parts</td>
<td>0.147</td>
</tr>
<tr>
<td>162</td>
<td>Water, Sewer, Pipeline, &amp; Communications &amp; Power Line Construction</td>
<td>0.138</td>
</tr>
<tr>
<td>278</td>
<td>Blankbooks, Looseleaf Binders, And Bookbinding</td>
<td>0.110</td>
</tr>
</tbody>
</table>

**Source:** Federal Registry of Contracts (1999 to 2013)
Cross-Firm Effects of EPU Changes on Investment Rates and Employment Growth

Table 5: Cross-Firm Effects of Policy Uncertainty

| Dependent Variable | (1) Investment ($I_t/K_{t-1}$) | (2) Investment ($I_t/K_{t-1}$) | (3) Investment ($I_t/K_{t-1}$) | (4) Investment ($I_t/K_{t-1}$) | (5) Investment ($I_t/K_{t-1}$) | (6) $\Delta\text{Log(Emp)}$ | (7) $\Delta\text{Log(Emp)}$
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta\text{Log(EPU)}\times\text{SIC Intensity}$</td>
<td>-0.0578*** (0.008)</td>
<td>-0.064*** (0.008)</td>
<td>-0.065*** (0.008)</td>
<td>-0.056*** (0.012)</td>
<td>-0.009 (0.008)</td>
<td>-0.019** (0.009)</td>
<td></td>
</tr>
<tr>
<td>$\Delta\text{Forecast Fed Exp/GDP}\times\text{SIC Intensity}$</td>
<td>2.103*** (0.607)</td>
<td>2.004*** (0.678)</td>
<td></td>
<td>2.394*** (0.633)</td>
<td>2.989*** (0.612)</td>
<td>1.208*** (0.362)</td>
<td>0.441 (0.423)</td>
</tr>
<tr>
<td>$\Delta\text{Federal Exp/GDP}\times\text{SIC Intensity}$</td>
<td></td>
<td></td>
<td>2.269 (3.639)</td>
<td>1.961 (3.270)</td>
<td>1.507 (3.344)</td>
<td>3.886*** (1.311)</td>
<td></td>
</tr>
<tr>
<td>$\Delta\text{VIX}\times\text{SIC Intensity}$</td>
<td></td>
<td></td>
<td></td>
<td>-0.034*** (0.004)</td>
<td>-0.011 (0.007)</td>
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</tbody>
</table>

<table>
<thead>
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<th>Periodicity</th>
<th>Quarterly</th>
<th>Quarterly</th>
<th>Quarterly</th>
<th>Quarterly</th>
<th>Quarterly</th>
<th>Yearly</th>
<th>Yearly</th>
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<tr>
<td>Firm and Time Fixed-Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Observations</td>
<td>717,104</td>
<td>717,104</td>
<td>717,104</td>
<td>717,104</td>
<td>717,104</td>
<td>184,804</td>
<td>184,804</td>
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<tr>
<td>Number of Firms</td>
<td>22,638</td>
<td>22,638</td>
<td>22,638</td>
<td>22,638</td>
<td>22,638</td>
<td>21,667</td>
<td>21,667</td>
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<tr>
<td>Number of SIC codes</td>
<td>440</td>
<td>440</td>
<td>440</td>
<td>440</td>
<td>440</td>
<td>440</td>
<td>440</td>
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</table>

Notes: All columns include a full set of firm and time fixed effects (year by quarter in columns 1 to 5, and yearly in columns 6 and 7). For columns 1-5, independent variables are lagged by one quarter. Standard errors clustered at the 4-digit SIC code level.

Using annual firm-level data from 2000.
Key variable of interest is the interaction between aggregate EPU change and firm-level exposure to government contract awards.

Firm-level exposure measures are time invariant. We calculate exposure as weighted SIC-level government contract intensity, with weights given by firm’s own industry distribution of sales.

Table 5: Cross-Firm Effects of Policy Uncertainty

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Investment ($I_t/K_{t-1}$)</th>
<th>(2) Investment ($I_t/K_{t-1}$)</th>
<th>(3) Investment ($I_t/K_{t-1}$)</th>
<th>(4) Investment ($I_t/K_{t-1}$)</th>
<th>(5) Investment ($I_t/K_{t-1}$)</th>
<th>(6) $\Delta\text{log(Emp)}$</th>
<th>(7) $\Delta\text{log(Emp)}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\Delta\text{log(EPU)} \times \text{SIC Intensity}$</td>
<td>-0.0578*** (0.008)</td>
<td>-0.064*** (0.008)</td>
<td>-0.065*** (0.008)</td>
<td>-0.056*** (0.012)</td>
<td>-0.009 (0.008)</td>
<td>-0.019** (0.009)</td>
<td></td>
</tr>
<tr>
<td>$\Delta\text{Forecast Fed Exp/GDP} \times \text{SIC}$</td>
<td>2.103*** (0.607)</td>
<td>2.004*** (0.678)</td>
<td>2.394*** (0.633)</td>
<td>2.989*** (0.612)</td>
<td>1.208*** (0.362)</td>
<td>0.441 (0.423)</td>
<td></td>
</tr>
<tr>
<td>$\Delta\text{Federal Exp/GDP} \times \text{SIC}$</td>
<td>2.269 (3.639)</td>
<td>1.961 (3.270)</td>
<td>1.507 (3.344)</td>
<td>3.886*** (1.311)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\Delta\text{VIX} \times \text{SIC Intensity}$</td>
<td></td>
<td></td>
<td>-0.034*** (0.004)</td>
<td>-0.011 (0.007)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: All columns include a full set of firm and time fixed effects (year by quarter in columns 1 to 5, and yearly in columns 6 and 7). For columns 1-5, independent variables are lagged by one quarter. Standard errors clustered at the 4-digit SIC code level.
Controls include interactions of firm-level exposure with current change and forecasted future change in government purchases.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
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<tbody>
<tr>
<td>ΔLog(EPU)×SIC Intensity</td>
<td>-0.0578***</td>
<td>-0.064***</td>
<td>-0.065***</td>
<td>-0.056***</td>
<td>-0.009</td>
<td>-0.019**</td>
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<tr>
<td></td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.008)</td>
<td>(0.012)</td>
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<td>(0.009)</td>
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<tr>
<td>ΔForecast Fed Exp/GDP×SIC Intensity</td>
<td>2.103***</td>
<td>2.004***</td>
<td>2.394***</td>
<td>2.989***</td>
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<td>(0.607)</td>
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<td>(0.633)</td>
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<td>ΔFederal Exp/GDP×SIC Intensity</td>
<td>2.269</td>
<td>1.961</td>
<td>1.507</td>
<td>3.886***</td>
<td>3.886***</td>
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<td>(1.311)</td>
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<tr>
<td>ΔVIX×SIC Intensity</td>
<td>-0.034***</td>
<td>-0.011</td>
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<td></td>
<td>(0.004)</td>
<td>(0.007)</td>
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<td></td>
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Periodicity: Quarterly, Quarterly, Quarterly, Quarterly, Yearly, Yearly
Firm and Time Fixed-Effects: Yes, Yes, Yes, Yes, Yes, Yes
Observations: 717,104, 717,104, 717,104, 717,104, 184,804, 184,804
Number of Firms: 22,638, 22,638, 22,638, 22,638, 21,667, 21,667
Number of SIC codes: 440, 440, 440, 440, 440, 440

Notes: All columns include a full set of firm and time fixed effects (year by quarter in columns 1 to 5, and yearly in columns 6 and 7). For columns 1-5, independent variables are lagged by one quarter. Standard errors clustered at the 4-digit SIC code level.

And interaction with change in VIX, plus firm and time fixed effects.
Magnitude of Firm-Level Effects

- For a firm with average investment rate and average contract exposure, doubling EPU results in estimated investment fall of only 0.08 percentage points (~1.2% fall).
- For firms in the 90th percentile of exposure rates, the impact is much larger, with predicted investment drops of 0.8-5.0 percentage points, depending on specification and baseline investment.
Figure 12: Estimated Industrial Production and Employment after a Policy Uncertainty Shock

Notes: This shows the impulse response function for Industrial Production and employment to an 102 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) to 2011. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the one-standard-error bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) on the EPU index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and linear time trend. Fit to data from 1985 to 2011.
Figure 13: Robustness of Estimates to Different VAR Specifications

Notes: This shows the impulse response function for GDP and employment to an 102 unit increase in the policy-related uncertainty index. Estimated using a monthly Cholesky Vector Auto Regression (VAR) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend unless otherwise specified. Data from 1985 to 2011.
Assessing the Effects of EPU: Selected Other Work

1. **Geography of Great Recession**: Shoag and Veuger (2013) find larger unemployment rate rises from 2006 to 2009 in states with (a) greater increases in state-level uncertainty and (b) institutions less well suited for mediating the effects of a general rise in uncertainty.

2. **International Spillovers**: The IMF’s World Economic Outlook (2013) finds that increases in U.S. and European EPU reduce growth in other regions of the world, with bigger spillover effects from U.S. EPU.

Summary

- **Factual Claim:** U.S. EPU levels are at historically high levels from 2008-2012.
- **Methodology:** New methods to construct, evaluate and refine measures of economic uncertainty based on frequency counts of newspaper articles.
- **Data Products:** New monthly indices of EPU for U.S., China, Germany, Japan, Spain, France, Italy, U.K., India, and Canada. A new daily EPU index for the United States.
Summary

- **Evidence of EPU Effects:**
  - Firm-level regressions: high levels of EPU reduce investment rates and employment growth at firms with high exposure to government contract awards.
  - Simple VAR models: increases in EPU foreshadow declines in output, investment and employment.

- **Correlates of Rising EPU:** Secular growth in U.S. EPU tracks the expansion of government spending relative to GDP.
More on Economic Policy Uncertainty

Data available at: www.policyuncertainty.com
End of Slides for Prepared Remarks
References


• International Monetary Fund, 2013. World Economic Outlook: Hopes, Realities, Risks, April.


Why Measure Policy Uncertainty?

We need sensible measures to:

• Evaluate claim that policy uncertainty is at historically high levels
• Assess the effects of policy uncertainty on economic performance
• Test theories and quantify mechanisms that relate policy uncertainty to performance
• Understand what drives policy uncertainty
Political Slant in Newspaper Coverage of Economic Policy Uncertainty
Figure 9: Political slant plays little role in time-series behavior of news-based EPU index

Source: Papers sorted into 5 most ‘Republican’ and 5 most ‘Democratic’ groups using the media slant measure from Gentzkow and Shapiro (2010).
Economic Policy Uncertainty Indexes for Other Countries
India Policy Uncertainty Index
January 2003 to June 2013

Using a 50% weight on six major Indian newspapers and a 50% weight on forecaster disagreement measures. Constructed in collaboration with Sanjai Bhagat, Pulak Ghosh and Srivivasan Rangan. Downloaded from www.PolicyUncertainty.com on 7 July 2013
UK Economic Policy Uncertainty Index

Canadian Economic Policy Uncertainty Index

Source: [www.policyuncertainty.com](http://www.policyuncertainty.com). Created with help from Dorinda So from the Institute for Competitiveness & Prosperity [www.competeprosper.ca](http://www.competeprosper.ca)
Policy News and Stock Market Jumps
Yearly Count of Daily Stock Market Jumps
United States, 1885-2012, Jump Threshold = 2.5%

The dark shading reports jumps triggered by policy according to next-day articles in the New York Times and Wall Street Journal.

More on the Audit and Another Suitability Check
Running the Newspaper Article Audit

1. Design, evaluate, and refine audit template

2. Define the Audit Universe: All articles coded EU=1 by automated search

3. Sample Audit Universe and manually read articles
   - Randomly sample 3 articles per month for 5 of the newspapers; 45 articles per quarter

4. Code each article: EU, EPU, type of EPU, etc.

5. Compare manually read ‘truth’ to results from automated search with various permutations of policy terms
Suitability check: news based indices for tracking unemployment also seem to work well

Correlation=0.72

Notes: Index of Unemployment News composed of quarterly news articles containing terms like ‘unemployment’, ‘layoffs’, or ‘job loss’ (scaled by the smoothed total number of articles) in 5 newspapers (WP, BG, LAT, WSJ and CHT). Data normalized to 100 from Jan 1900-Dec 2011. Unemployment data is overall seasonally adjusted unemployment rate taken from the BLS.
Political Polarization and Policy Gridlock
Political Polarization in the U.S. Congress Has Greatly Intensified in Recent Decades

More (effective) gerrymandering might be part of the explanation, but …

SOURCE: Carroll et al., 2008.
The U.S. Has Become More Politically Segregated With Respect to Where People Choose to Live
More on the Sources and Composition of U.S. Economic Policy Uncertainty
Drilling into the news articles about EPU, we find:

• Big role for uncertainty related to national security issues around the time of Gulf War I and in the wake of 9-11.

• Uncertainty related to taxes and government spending policies are the biggest factors responsible for historically high levels of policy uncertainty in 2010-2012

• Although less pronounced, we also find elevated levels of uncertainty in 2010-2012 in several other policy categories: entitlement programs, healthcare, and regulation.

• Many of the same categories are elevated in 2008-09.
Fiscal policy matters and health care are the most important sources of policy uncertainty in 2010-2012, according to our news-based analysis.

<table>
<thead>
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<tr>
<td>Economic Policy Uncertainty</td>
<td>109</td>
<td>141.2</td>
<td>87.7</td>
<td>127.8</td>
<td>71</td>
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<td>27.6</td>
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<td>Government spending</td>
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<td>18.3</td>
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<td>17.9</td>
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<td>15.8</td>
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<tr>
<td>Entitlement programs</td>
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<td>18.6</td>
<td>8.8</td>
<td>8.2</td>
<td>15.2</td>
<td>23.4</td>
<td>11.8</td>
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<td>19.5</td>
<td>11.1</td>
<td>15.4</td>
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<tr>
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<td>1.4</td>
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<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
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<tr>
<td>Overall Economic Uncertainty</td>
<td>217.1</td>
<td>348</td>
<td>185</td>
<td>325.3</td>
<td>159</td>
<td>183.8</td>
<td>369</td>
<td>262.8</td>
<td>219.3</td>
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</tbody>
</table>

Note: This analysis uses Newsbank data to obtain a greater density of news articles.
Note: This chart is a quarterly version of Table 1 in “Measuring Economic Policy Uncertainty” by Baker, Bloom and Davis. It shows the 5 most important sources of economic policy uncertainty based on frequency counts of newspaper articles.
This chart reports frequency counts of articles containing “debt ceiling” or “government shutdown”, expressed as a fraction of all articles in U.S. newspapers covered by Access World News Newsbank Service (1000+ newspapers).
More Checks and Comparisons
Somewhat Different Experiences in Great Depression and Great Recession

Notes: Index of Policy-Related Economic Uncertainty composed of quarterly news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed total number of articles) in 5 newspapers (WP, BG, LAT, WSJ and CHT). Data normalized to 100 from 1900-2011.
Comparison Newsbank (daily data summed to the monthly level) with our 10 paper series
Different weighting schemes give similar results

- Baseline (main) Economic Policy Uncertainty Index
- Equal-Weighted Index (1/4 each on z-scores)
- Principal Component Factor Index
US index is similar to the VIX index of 1 month implied S&P500 stock market volatility, but not the same

Correlation VIX and Policy Uncertainty is 0.55

Uncertainty and the Geography of the Great Recession

1h. Uncertainty Index and Unemployment