Policy Uncertainty and Economic Performance

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Based on Research with
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*Economic Policy Lunch Talk*
*Hoover Institution, Stanford University*

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Questions

1. Does economic policy uncertainty matter for economic performance?
   - United States, 2008-2013
   - Serial Eurozone Crises, ongoing
   - Russia, recent international conflicts

2. How can we measure EPU?

3. How can we assess its role in economic performance?
How Might Policy-Related Uncertainty Hold Back the Economy?

1. Greater EPU can deter/delay investment and hiring when they are costly to reverse
2. Greater EPU can raise the cost of debt and equity finance, discouraging investment
3. Greater EPU can lead households to behave more cautiously and reduce spending
4. When managers are risk averse, greater EPU can also lead businesses to behave more cautiously

Not an exhaustive list. Recent work considers other channels through which EPU hampers economic performance – e.g., by intensifying monopoly pricing distortions in DSGE models (Fernandez-Villaverde et al., 2015).
Today’s Talk

1. Quantify EPU based on newspaper coverage.
2. Evaluate our approach from several directions and cross-check against other measures and methods.
3. Use our measures to assess the effects of EPU:
   - Firm-level panel regressions (reasonable identification, but relatively narrow focus)
   - U.S. and 12-country panel VARs (weaker identification, but clear evidence that positive EPU innovations foreshadow deteriorations in economic performance)

Many other recent papers study the economic effects of policy-related uncertainty, much of it making use of our data.
What Do We Want our Measure 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 economic policy uncertainty index is based on computer-automated newspaper searches

• For 10 major US papers, get monthly counts of articles that contain at least one word from each of three term sets:
  
  **E:** \{economic or economy\}
  **P:** \{regulation or deficit or federal reserve or congress or legislation or white house\}
  **U:** \{uncertain or uncertainty\}

  Include “the Fed”, “regulatory” and other variants.

• Divide the EPU count for each paper and month by the count of all articles in the same paper and month

• Normalize each paper’s scaled count to unit St. Dev., then sum over the 10 papers by month to get the U.S monthly index
Constructing our US Newspaper-Based EPU Index

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.
Which policy categories most account for high U.S. EPU in 2008-2012? Newspaper articles point to concerns about fiscal and healthcare policies.

<table>
<thead>
<tr>
<th>Category</th>
<th>1985-2007</th>
<th>2008-2012</th>
<th>Change</th>
</tr>
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<tr>
<td>Taxes</td>
<td>35.2</td>
<td>61.1</td>
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<td>Health care</td>
<td>12.7</td>
<td>33.3</td>
<td>20.6</td>
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<td>Regulation</td>
<td>14.9</td>
<td>28.4</td>
<td>13.6</td>
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<tr>
<td>Social Security</td>
<td>10.3</td>
<td>19.4</td>
<td>9.1</td>
</tr>
<tr>
<td>Government spending</td>
<td>15.0</td>
<td>23.9</td>
<td>8.9</td>
</tr>
<tr>
<td>Sovereign debt, currency crisis</td>
<td>1.4</td>
<td>2.8</td>
<td>1.4</td>
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<tr>
<td>Monetary policy</td>
<td>29.0</td>
<td>27.6</td>
<td>-1.5</td>
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<tr>
<td>National security</td>
<td>25.3</td>
<td>19.9</td>
<td>-5.4</td>
</tr>
</tbody>
</table>

Table construction: First, look at EPU articles and count those that contain category-specific terms. Second, express the category counts as a percent of the average EPU article count from 1985 to 2012. We use Newsbank’s coverage of about 1,000 US newspapers for this exercise. See Table 1 in Baker, Bloom and Davis (2015) for a more detailed analysis.
Healthcare Policy Uncertainty Index, 1985 to 2014, Quarterly

Notes: The index reflects the frequency of newspaper articles about economic policy uncertainty and healthcare policy matters, as indicated by terms like “healthcare,” “hospital,” “health insurance,” and “Medicare.” Data are from Baker, Bloom and Davis (2015) and are available and updated monthly at www.PolicyUncertainty.com. Normalized to a mean of 100 from 1985 to 2009.
Notes: The index reflects the frequency of newspaper articles about economic policy uncertainty and financial regulatory matters, as indicated by terms like “bank(ing) supervision,” “Glass-Steagall,” and “Dodd-Frank.” Data are from Baker, Bloom and Davis (2015) and are available and updated monthly at www.PolicyUncertainty.com. Normalized to a mean of 100 from 1985 to 2009.
Figure A3: EPU Index for France, January 1987 to July 2015

Notes: Index reflects scaled monthly counts of articles containing ‘uncertain’ or ‘uncertainty’, ‘economic’ or ‘economy’, and one or more policy-relevant terms: ‘tax’, ‘policy’, ‘regulation’, ‘spending’, ‘deficit’, ‘budget’, or ‘central bank’. The series is normalized to mean 100 from 1997 to 2009 and based on the following newspapers: Le Monde and Le Figaro.
Figure A8: EPU Index for South Korea, January 1995 to December 2014

Notes: Index reflects scaled monthly counts of articles in six South Korean newspapers containing ‘uncertain’ or ‘uncertainty’, ‘economic’ or ‘economy’ or ‘commerce’, and one or more of the policy terms specified for South Korea in Appendix A. The series is normalized to mean 100 from 1995 to 2014.
Orange Revolution in Ukraine
Duma elections and protests against election fraud
Kiev Euromaidan
Crimea annexation

First Chechen War
Second Chechen War
Kizlyar hostage crisis; PM Chubais resigns
Acting PM Gaidar resigns
Russian military exits Chechnya
Russian financial crisis
Putin becomes PM
Parliament dismissed in Ukraine
Timoshenko resigns
Terror attack in Nalchik
Lehman Brothers Failure
Putin election
Taper Tantrum
Putin election
Terror attacks in Nalchik & Stavropol
Medveded election
Russian EPU Index, October 1992 to August 2014

Figure 2: Historical U.S. EPU Index, Jan. 1900 to Dec. 2012

Notes: Index reflects scaled monthly counts of articles in 6 major newspapers (Washington Post, Boston Globe, LA Times, NY Times, Wall Street Journal, and Chicago Tribune) that contain the same triple as in Figure 1, except the E term set includes “business”, “commerce” and “industry” and the P term set includes “tariffs” and “war”. Data normalized to 100 from 1900-2011.
Figure A11: UK Historical EPU Index, January 1900 to December 2008

Why Has US Policy Uncertainty Risen Since 1960?†

By Scott R. Baker, Nicholas Bloom, Brandice Canes-Wrone, Steven J. Davis, and Jonathan Rodden* 

We consider two classes of explanations for the rise in policy-related economic uncertainty in the United States since 1960. The first stresses growth in government spending, taxes, and regulation. A second stresses increased political polarization and its implications for the policy-making process and policy choices.

I. Rising Policy Uncertainty

There appears to be a strong upward drift in policy-related uncertainty after 1960. As evidence, Figure 1 plots a newspaper-based index of economic policy uncertainty (EPU) for the United States, showing a secular rise over the last
Evaluating Our Measurement Approach
A) **Market Tests**

Market use suggests information value of our data:

I) Many policy organizations and financial institutions use our data, including Goldman Sachs, Citibank, JP Morgan, Wells Fargo, IMF, various central banks, and more. (see [www.policyuncertainty.com](http://www.policyuncertainty.com)).

II) Blackrock has its own in-house team that has picked up on our work and adopted methods similar to ours.

III) Bloomberg, FRED, Reuters and Haver stream our data for their business clients and other users.
B) Large-Scale Human Audit Study

Teams of RAs read 12,000 randomly selected newspaper articles to code them as to “economic uncertainty”, “economic policy uncertainty” and more according to a 65-page audit guide.

Economic Policy Uncertainty

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) filter.
2. Draw 1000 articles.
3. Assign all articles per paper.
4. For each paper, randomly select 17 z values.
5. In sum, 84 articles per paper.

August 30 Sampling Details, 2

3. Assign 84 of the sampled articles for each paper to Kyle and 84 to Sophie. Call these subsamples Sub(Name,Paper).

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 with the policy mentioned at all gets just 5.

True Positive 2

Our Love Affair With Malls Is on the Rocks

"There are days now when I make $100 and think I had a good day," says Mark Glass, 53, of Dallas, who is in the mall all day, even other times, since.

False Positive 5

Code as EPU = 1, because the article discusses uncertainty as

False Negative 4

Canada Is Expected to Join U.S.-Mexico Trade Talks

"Canada quickly expressed interest in having a role in the new talks, but its status was left unclear amid uncertainty about how its inclusion might affect the United States-Mexico talks, which were considered a high priority by both countries."

President Salinas has sought to build a free-trade pact quickly to encourage the economic growth that has become a hallmark of his administration. President Bush has also made an accord a central economic objective and has sought to complete it before it could become embroiled in the politics of the 2000 presidential election year.

"You'd be an idiot going to have a "non-tax" in this," which

"A woman just in heels is gone. 5000 in sales, no lesson learned"
Audit Process Overview

1. The authors first read and discussed a few hundred randomly selected “EU” articles to develop a coding template, training process, and draft audit guide.

2. Pilot study of 2,000 EU articles by authors and RAs to improve training process, refine coding template, expand and improve audit guide, and refine sampling methods.

3. Main audit study of EU articles (basis for analysis):
   - Training and review process for all auditors
   - 65-page audit guide (available on the web)
   - Audit team meetings every week or two over 18 months to address questions, review “hard calls,” maintain esprit de corps, and monitor performance
   - Auditors read and coded 12,000+ articles
   - Randomized article selection, order of presentation to auditors, assignment to multiple auditors
How We Use the Audit Study Results

1. Identify candidate “P” terms:
   – When auditor codes EPU=1, he or she also records policy terms that appear in article’s discussion of EPU.
   – Candidates: 15 frequently appearing P terms

2. Consider ~32,000 term-set permutations involving 4 or more candidate P terms. Choose the P term set that minimizes the sum of false positive and false negative error rates relative to the human EPU classifications.
   – This optimization yields our baseline P term set.
   – We do not use time-series variation to select P term set.
   – To our surprise, we were unable to develop simple compound text filters (e.g., {government AND tax}) that improve on our baseline term set.

3. Time-series comparisons of humans and computers (next 2 slides) and additional empirical results (following slide)
Figure 5: Human and Computer EPU Indices, 1985 to 2012, Quarterly

Notes: Index comparison from 1985 Q1 to 2012 Q1 based on 3,723 articles (4,388 audits) in the Chicago Tribune, Dallas Morning News, LA Times, Miami Herald, NY Times, San Francisco Chronicle, Washington Post and Wall Street Journal. Series are plotted quarterly to reduce sampling variability, with an average of 33 articles per quarter. Each series is normalized to 100 from 1985-2009. See text for additional discussion of the audit process and this comparison.
Figure C1: Human and Computer EPU Indices, 1900-2010, Annual

Notes: Index comparison from 1900 to 2010 based on 11,841 articles (15,156 audits) in the Chicago Tribune, Dallas Morning News, LA Times, Miami Herald, NY Times, San Francisco Chronicle, Washington Post and Wall Street Journal. Series plotted yearly to reduce sampling variability, with an average of 107 articles per year. Each series normalized to 100 from 1900 to 2010.
Other Selected Results from the Audit Study

- Only 5% of articles with $EPU^H = 1$ mainly discuss actual or prospective declines in policy uncertainty.
- 10% of $EPU^H = 1$ articles discuss uncertainty about who will make economic policy decisions, 68% discuss uncertainty about what policies will be undertaken or when, and 47% discuss uncertainty about the effects of past, present or future policy actions.
- The who share of $EPU^H = 1$ triples in presidential election years as compared to other years → the nature of policy uncertainty shifts substantially over the election cycle.
- 32% of $EPU^H = 1$ articles mention policy matters in other countries, often alongside domestic policy concerns.
C. Political Slant? Compare 5 most Republican and 5 most Democrat papers – they look very similar.

Papers sorted into 5 most ‘Republican’ or ‘Democratic’ groups using the media slant measure from Gentzkow & Shapiro (2010).
D) Policy Uncertainty Measures Based on Textual Analysis of the Fed’s Beige Books and Section 1A (Risk Factors) of Firms’ 10K Filings

Notes: The left scale shows frequency counts per Beige Book (normalized by word count) of “uncertainty” and references to policy uncertainty. The right scale reports the percentage of sentences in Section 1A (Risk Factors) of annual 10-K filings that contain one or more of the policy terms listed in Appendix C. The correlation between the Beige Book Normalized Policy Uncertainty Count and the EPU index is 0.54.
Assessing the Effects of Economic Policy Uncertainty

- Firm-level panel regressions
- Country-level VARs and panel VARs
Exploit differences across firms in share of revenues from sales to the federal government.


- Guided Missiles and Space Vehicles: 78%
- Health Services: 44%
- Ordnance and Accessories: 39%
- Search, Detection, Navigation,… Aeronautical Systems: 27%
- Engineering Services: 21%
- Aircrafts and Parts: 20%
- Ship and Boat Building and Repairs: 15%
- Books, Loose Leaf Binders, and Bookbinding: 10%
- Heavy Construction: 9%

Direct sales to federal government account for small share of revenues in most other industries.
Measuring Firm-Level Policy Exposure Intensity

Main Approach: First, compute revenue share of government purchases at SIC3 level from 2000-2013. Second, compute firm-level exposure as revenue-weighted mean of its industry exposures using Compustat line of business data. Time-averaged measures, constant at the firm level.

- Similar results when computing firm-level exposure directly, letting firm-level exposure vary by year, using IO matrix.

Two Alternative Approaches:

1. Measure exposure by slope coefficient in regression of firm's daily stock returns on daily EPU index from 1985-1995, which pre-dates the regression sample period.

2. Quantify policy risk exposure using textual analysis of 10-K filings. Specifically, compute each firm's 2006-2013 average share of sentences in Section 1A (Risk Factors) that reference policy matters.
Firm-level panel regressions for option-implied 30-day stock-price volatility, basic specification

\[ Y_{it} = F_i + P_t + \alpha \exp_i^{*}(G/Y)_t + \beta \exp_i^{*}\text{EPU}_t + \varepsilon_{i,t} \]

Stock-price volatility at firm-quarter level, average of daily values

Firm fixed effects
Period fixed effects

We weight observations by firm-level sales in all regressions.

Firm policy exposure \times government purchases share of GDP (another 1\text{st} moment firm-level control variable)
Firm policy exposure \times EPU Index (2\text{nd} moment interaction effect of interest)

i=firm, t=quarter, 1996-2012 sample period, clustering by i when estimating standard errors
<table>
<thead>
<tr>
<th>Dep Var: Log(30-day implied vol)</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(EPU)</td>
<td>0.432***</td>
<td>0.044***</td>
<td>-0.752***</td>
<td>0.545***</td>
<td>0.082</td>
<td>0.734***</td>
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<tr>
<td>(0.010)</td>
<td>(0.013)</td>
<td>(0.027)</td>
<td>(0.202)</td>
<td>(0.117)</td>
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<tr>
<td>Log(EPU)×Intensity</td>
<td>0.215**</td>
<td>0.228**</td>
<td>0.545***</td>
<td>0.082</td>
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<td>(0.069)</td>
<td>(0.100)</td>
<td>(0.202)</td>
<td>(0.117)</td>
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<tr>
<td>Log(VIX)</td>
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<td>0.228**</td>
<td>0.545***</td>
<td>0.082</td>
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<td>(0.016)</td>
<td>(0.100)</td>
<td>(0.202)</td>
<td>(0.117)</td>
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<td>Log(VIX)×Intensity</td>
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<td>-0.020</td>
<td>-0.301**</td>
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<td>(0.117)</td>
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<td>Log(EU)</td>
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<tr>
<td>Log(EU)×Intensity</td>
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<td>-29.70**</td>
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<td>-29.93*</td>
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<td>Healthcare EPU*Health Firm</td>
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</table>

Notes: The sample contains 136,742 observations on 5,624 firms from 1996 to 2012. The dependent variable is the 30-day implied stock price volatility.

Column 2: Basic specification  
Column 4: Horse race between EPU*Exposure and VIX*Exposure  
Column 6: Horse race between EPU*Exposure and EU*Exposure  
Column 7: Includes category-specific EPU indices
Robustness Checks on Results for Firm-Level Stock-Price Volatility

Table 3: Robustness Checks for Firm-Level Effects of Policy Uncertainty on Option-Implied Stock Price Volatility

<table>
<thead>
<tr>
<th>Specification</th>
<th>(1) Realized Volatility</th>
<th>(2) 182-day Implied Volatility</th>
<th>(3) Add Purchase Forecast</th>
<th>(4) Add 12 qtrs Future Purchases</th>
<th>(5) Firm-level Intensity</th>
<th>(6) Belo et al. (2013) Intensity</th>
<th>(7) Beta Intensity</th>
<th>(8) 10-K Risk Measure</th>
<th>(9) $500m+ Sales Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(EPU)×Intensity</td>
<td>0.346***</td>
<td>0.178***</td>
<td>0.175***</td>
<td>0.258***</td>
<td>0.192***</td>
<td>0.456***</td>
<td>0.283**</td>
<td>0.378*</td>
<td>0.237***</td>
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<td></td>
<td>(0.089)</td>
<td>(0.073)</td>
<td>(0.070)</td>
<td>(0.086)</td>
<td>(0.045)</td>
<td>(0.101)</td>
<td>(0.118)</td>
<td>(0.217)</td>
<td>(0.071)</td>
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<tr>
<td>(Federal Purchases/GDP)×Intensity</td>
<td>-23.72</td>
<td>-27.47***</td>
<td>-58.28***</td>
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<td>(16.74)</td>
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<td>(14.97)</td>
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<td>(Forecasted Federal Purchases/GDP)×Intensity</td>
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Firm and Time Effects
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<td>133,465</td>
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<td>112,123</td>
<td>3,817</td>
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<td>42,785</td>
<td>1,070</td>
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Notes: The sample period is 1996 to 2012. The dependent variable is the 30-day implied volatility for the firm, averaged over all days in the quarter, except that column (1) uses the realized daily volatility over the quarter, and column (2) uses the average 182-day implied volatility. See the notes to Table 2 for additional variable definitions. Standard errors based on clustering at the firm level.

Columns 1 and 2: Use alternative stock-price volatility measures
Columns 3 and 4: Add controls for future government purchases (interacted)
Columns 5 and 6: Use variants on main firm-level exposure measure
Columns 7 and 8: Use alternative firm-level exposure measures
Column 9: Restrict attention to larger firms
Quantifying EPU effects on firm-level stock-price volatility for firms with heavy exposure to government purchases (e.g., health, defense & construction)

Consider EPU increase from 2005/6 to 2011/12 (84 log points) for a firm with government policy exposure intensity of 0.25.

- Using Column (2) in Table 2, the estimated effect on firm-level stock-price volatility is \((84)(0.25)(0.215) = 4.5\) log points. More precisely, the effect is 4.5 log points more than the baseline for a firm with zero exposure to govt. purchases.
- Bigger effects when using category-specific EPU indices.

**Summarizing:** We find statistically significant evidence of modest (differential) effects of EPU on firm-level stock-price volatility across a wide range of alternative specifications and using a variety of firm-level exposure measures. EPU greatly outperforms VIX and EU in these respects.
Quantifying EPU effects on stock-price volatility using Column (7) in Table 2 and 2005/06 to 2011/12 Changes

Overall EPU Change from 2005/06 to 2011/12 = 84 log points
Coefficient on overall EPU interacted with Govt. Purchase share = .082
Combined Effect in (4) = (84)(G share)(.082) + [Category EPU Change from (2)][Coeff. From (3)]

<table>
<thead>
<tr>
<th>Industry</th>
<th>(1) Govt. Purchases Share of Revenues</th>
<th>(2) Category EPU Log Point Change</th>
<th>(3) Coefficient On Category EPU</th>
<th>(4) Combined Effects of EPU Changes from 2005/06 to 2011/12 on Firm-Level Stock-Price Volatility in log points</th>
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<tr>
<td>Health</td>
<td>0.44</td>
<td>146.2</td>
<td>0.071</td>
<td>13.4</td>
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<td>Missiles, Spacecraft</td>
<td>0.78</td>
<td>35.0</td>
<td>0.048</td>
<td>7.1</td>
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<td>Ordnance, Accessories</td>
<td>0.39</td>
<td>35.0</td>
<td>0.048</td>
<td>4.4</td>
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<tr>
<td>Aircraft, Parts</td>
<td>0.20</td>
<td>35.0</td>
<td>0.048</td>
<td>3.1</td>
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<tr>
<td>Engineering Services</td>
<td>0.21</td>
<td>35.0</td>
<td>0.048</td>
<td>3.1</td>
</tr>
<tr>
<td>Heavy Construction</td>
<td>0.09</td>
<td>0</td>
<td>0</td>
<td>0.6</td>
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<tr>
<td>Finance</td>
<td>0</td>
<td>160.6</td>
<td>0.144</td>
<td>23.1</td>
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</table>
Similar approach to firm-level panel regressions for investment rates (I/K) and employment growth rates

**Next Slide:** Sample period runs from 1985 to 2012. All specs include a full set of firm and time effects. \( \frac{I}{K} \) is the investment rate defined as \( \frac{\text{CapEx}_t}{(\text{Net Plant, Property and Equipment})_{t-1}} \). \( \Delta \text{Emp} \) is the employment growth rate measured as \( \frac{(\text{emp}_t - \text{emp}_{t-1})}{(0.5 \times \text{emp}_t + 0.5 \times \text{emp}_{t-1})} \), and \( \Delta \text{Rev} \) is the corresponding revenue growth rate. \( \Delta (\text{Federal Purchases/GDP}) \times \text{Intensity} \) is the change in (Federal Purchases/GDP) from NIPA tables in the next quarter in quarterly specifications and in the next year in annual specifications, multiplied by firm-level policy exposure intensity variable. \( \Delta (\text{Forecast Federal Purchases/GDP}) \times \text{Intensity} \) instead uses the mean forecasted change in (Federal Purchases/GDP), drawing on NIPA data for current values and forecast data for future values. For presentation purposes, we scale the point estimates and standard errors by 100 for the variables involving category-specific EPU terms. Standard errors based on clustering at the firm level.
## Firm-Level Panel Regressions for (I/K) and Employment Growth Rates

Table 4: Cross-Firm Effects of Policy Uncertainty on Investment Rates and Employment Growth Rates

<table>
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<tr>
<th>Dependent Variable:</th>
<th>(1) I/K</th>
<th>(2) I/K</th>
<th>(3) I/K</th>
<th>(4) I/K</th>
<th>(5) ΔEmp</th>
<th>(6) ΔEmp</th>
<th>(7) ΔEmp</th>
<th>(8) ΔEmp</th>
<th>(9) ΔRev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(EPU)×Intensity</td>
<td>-0.032*** (0.010)</td>
<td>-0.032*** (0.010)</td>
<td>-0.024** (0.011)</td>
<td>-0.031*** (0.010)</td>
<td>-0.213** (0.084)</td>
<td>-0.227** (0.089)</td>
<td>-0.220** (0.118)</td>
<td>-0.207** (0.084)</td>
<td>-0.128 (0.096)</td>
</tr>
<tr>
<td>Δ(Federal Purchases/GDP)×Intensity</td>
<td>8.20*** (2.86)</td>
<td>8.04*** (2.86)</td>
<td>12.12*** (3.18)</td>
<td>8.23*** (2.87)</td>
<td>10.79 (7.41)</td>
<td>15.60*** (8.04)</td>
<td>3.19 (12.56)</td>
<td>11.58 (7.58)</td>
<td>20.39** (9.43)</td>
</tr>
<tr>
<td>Δ(Forecasted Federal Purchases/GDP)×Intensity</td>
<td>1.01 (0.828)</td>
<td>-4.65*** (2.89)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defense EPU × Defense Firm</td>
<td>0.094 (0.314)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-2.53 (1.60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthcare EPU × Health Firm</td>
<td>-0.422* (0.231)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.16 (1.42)</td>
<td></td>
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<tr>
<td>Financial Regulation EPU × Finance Firm</td>
<td>-0.270*** (0.076)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.636* (0.353)</td>
<td></td>
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<td></td>
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</tbody>
</table>

Periodicity
- Quarterly: Yes, No
- Yearly: No

3 Years Fed Exp leads
- No
- Yes

Observations
- 709,120
- 411,832
- 709,120
- 162,006
- 162,006
- 108,718
- 162,006
- 151,653

Number of Firms
- 22,358
- 14,190
- 22,358
- 17,151
- 17,151
- 13,018
- 17,151
- 15,929

---

Full set of firm and time effects in all columns.
Columns 1 and 5: Basic specs for (I/K) and employment growth, respectively.
Columns 2 and 6: Adding controls for future government purchases (interacted).
Columns 3 and 7: Using average (G/Y) during next 12 quarters (interacted).
Columns 4 and 8: Adding category-specific EPU measures.
Column (9): Using revenue growth rate as dependent variable and basic spec.
These estimation results imply sizable investment and large employment growth effects in sectors with heavy exposure to government spending (e.g., healthcare, defense & construction).

Consider EPU increase from 2005/6 to 2011/12 (84 log points) for firm with government policy exposure intensity of 0.25.

- The estimated quarterly investment rate effect implied by Column (2) is \((84)(.25)(-.032) = - 0.67\) percentage points. By way of comparison, the average firm-level investment rate is 6.6 percentage points.

- Similarly, the estimated annual employment growth rate effect implied by Column (5) is \((84)(.25)(-.213) = - 4.5\) percentage points.
Figure 8: Industrial Production and Employment Responses to EPU Shock, VAR Fit to Monthly U.S. Data from January 1985 to December 2012

Notes: VAR-estimated impulse response functions for industrial production and employment to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value, with 90 percent confidence bands. Identification based on three lags and a Cholesky decomposition with the following ordering: EPU index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production.
Figure 9: U.S. Industrial Production Response to an EPU Shock, Alternative Samples, Specifications and Identification Assumptions

Notes: The baseline case involves the same sample period, VAR specification and identification as in Figure 8. The other cases depart from the baseline as indicated. We place EU and VIX after EPU in the ordering. For the “1920-1984” response function, we use monthly data from 1920 to 1984 on log industrial production and EPU in a bivariate VAR with EPU ordered first.
Figure C6: GDP and Investment Responses to EPU Shock, VAR Fit to Quarterly U.S. Data from Q1 1985 to Q4 2012

Notes: VAR-estimated impulse response functions for GDP and Gross Fixed investment to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value, with 90 percent confidence bands. Identification based on three lags and a Cholesky decomposition with the following ordering: EPU index, log(S&P 500 index), federal reserve funds rate, log gross investment, log gross domestic product).
Figure C7: Adding the Michigan Consumer Sentiment Index to VARs Fit to Monthly U.S. Data from January 1985 to December 2012

Notes: VAR-estimated impulse response functions for industrial production to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value. Identification based on three lags and a Cholesky decomposition. In the baseline, the VAR has the following ordering: EPU index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production. In the “Michigan First” specification the Michigan consumer sentiment index is added first, and in the “Michigan Second” it is added after the EPU index.
Figure 10: Responses to an EPU Shock in a Twelve-Country Panel VAR

Notes: Panel-VAR estimated impulse response functions for industrial production and unemployment to an EPU innovation equal to the increase in the average US EPU value from 2005-2006 to 2011-2012, with 90% confidence bands. Identification based on three lags and a Cholesky decomposition with the following ordering: EPU index, log(stock market index), unemployment rate, and log industrial production. We use own-country data and a full set of country fixed-effects in the panel VAR. Country-level data are weighted by the square root of the number of newspapers used in the EPU index. Fit to monthly data for Canada, China, France, Germany, India, Italy, Japan, Korea, Russia, Spain, UK and the US from January 1985 to December 2012, where available.
Figure C8: Robustness of Twelve-Country Panel VAR Response Functions

Notes: The baseline case involves the same sample period, countries, VAR specification and identification as in Figure 10. The other cases depart from the baseline as indicated. We place realized stock volatility after EPU in the ordering.
Some Conclusions

1. Policy uncertainty fluctuates in response to major economic shocks; policy disputes, elections and other political factors; and other shocks (e.g., war and terrorist attacks). A mix of domestic and foreign disturbances.

2. U.S. policy uncertainty has risen a lot since the 1960s, perhaps due to political polarization & larger government

3. Econometric evidence indicates that:
   • EPU raises stock-price volatility and reduces hiring & investment in sectors with high exposure to government purchases: e.g., defense, healthcare & construction
   • Positive EPU innovations foreshadow lower investment, output and employment in U.S. and 12-country panel VARs

4. Newspapers (and other text sources) offer a powerful means of creating new economic data and testing hypotheses.

- Monthly EPU indices for 13 countries, including all G10 economies, with more countries in the works. Regular updates in the first few days of each month.
- Historical EPU indices back to 1900 for the United States and United Kingdom
- Daily EPU index for the United States back to 1985, with daily updates
- 12 category-specific EPU indices back to 1985 for the United States
- Special U.S. tabulations for “government shutdown” and “debt ceiling”
- Daily newspaper-based index of equity market uncertainty back to 1985
- **Coming soon:** Immigration Economic Policy Uncertainty indices for Germany, U.K., U.S. and perhaps other countries
Additional Slides
Figure 5: 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

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. This chart is reproduced from earlier drafts of Baker, Bloom and Davis (2015).
Figure 6: U.S. EPU Compared to 30-Day VIX, January 1990 to July 2015

Corr(VIX, EPU Index) = 0.58

Notes: The figure shows the U.S. EPU Index from Figure 1 and the monthly average of daily values for the 30-day VIX.
Figure C2: Newspaper-based index of equity market uncertainty compared to market-based VIX, January 1990 to December 2014

Corr(VIX, Equity Market Uncertainty Index) = 0.733

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.
Figure 2. An Upward Drift in Policy-Related Economic Uncertainty

Source: Baker et al. (2014). Data are annual averages of monthly values from 1949 to 2012.
UK government share of GDP is roughly flat since the 1950s (unlike the US, where it has roughly doubled)

Source: OBR
Figure 1: *Code of Federal Regulations* Page Count, 1949-2014

**Source:** Figure 14 in Crews (2015) for data from 2001 to 2014, spliced to data for earlier years from Dawson and Seater (2013), who consider a somewhat narrower set of regulation “titles”.

175,000 Pages = 130 King James Bibles!
Beige Book also highlights fiscal policy concerns

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<th></th>
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<th></th>
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</thead>
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<td>Overall Economic Uncertainty</td>
<td>11</td>
<td>8.8</td>
<td>7.7</td>
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<td>10.2</td>
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<td>5.5</td>
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<td>4.8</td>
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<td>Sum of Policy &amp; Politics Categories</td>
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<td>10.0</td>
<td>2.5</td>
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</table>
Figure C5: What triggers large daily stock market moves? 1900-2012

Correlation of number of policy-triggered jumps per year with EPU index is 0.78

- Non-Policy increases
- Policy increases
- Policy decreases
- Non-Policy decreases

Based on human readings of next-day news articles about large S&P Index moves in the New York Times and the Wall Street Journal. Jump threshold: +/- 2.5%

Reproduced from “What Triggers Large Stock Market Jumps?” by Scott Baker, Nick Bloom & Steven Davis