Measuring Economic Policy Uncertainty

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Nick Bloom (Stanford & NBER)
Steve Davis (Chicago Booth & NBER)

Princeton, February 2012
Policy uncertainty has recently been argued to be a key factor in delaying the current recovery.

Global Recession Risk Rises

IMF Lowers Growth Forecasts, Warns New Downturn Would Be Tougher to Tame

"Risks for a serious global slowdown are alarmingly high," said the IMF’s World Economic Outlook report, which was released here Tuesday ahead of the fund’s annual fall meeting. It was its bleakest assessment of global growth prospects since the 2009 recession.

The fund expects the world economy to expand just 3.3% this year and 3.6% in 2013, as growth slows in nearly every major nation and political uncertainties threaten recoveries in the U.S. and euro zone. That is a revision downward of 0.2 percentage point for 2012 and 0.3 percentage point for 2013 from its July forecast. Under the IMF’s definition, global gross domestic product doesn’t have to shrink for the world to be in recession.

"No significant improvements appear in the offing," the IMF said. The global economy grew 3.8% in 2011 and 5.1% in 2010.

The IMF noted the absence of a simple unified message for how to avert the risks it sees. "Global growth is threatened by uncertainty," the IMF said. "Inflationary and deflationary pressures are persisting, although the relative balance tends to vary across economies. And global and financial vulnerabilities are on the rise."
But not everyone agrees: Krugman strongly disagrees.
As the presidential campaign winds down, some economists have been playing down the role of economic and political uncertainty in hamstringing the U.S. economic recovery.

Now, the New York Times’ liberal firebrand Paul Krugman is out with a new column delineating the role that uncertainty has played in U.S. economic activity. And he’s joined the chorus of economists downplaying the importance of uncertainty in the ongoing economic debate.

Of course Fox disagrees with Krugman’s disagreement.
The paper tries to investigate this methodically

1) Measuring policy uncertainty

2) Evaluating our measure of policy uncertainty

3) Estimating the impact of policy uncertainty on the recovery
The paper tries to investigate this methodically

1) Measuring policy uncertainty

2) Evaluating our measure of policy uncertainty

3) Estimating the impact of policy uncertainty on the recovery
Our US Economic Policy Uncertainty index has 4 components – how we make the data “sausage”:

- News-based index (weight=1/2)

- Forecaster disagreement about government purchases of goods and services (weight=1/6)

- Forecaster disagreement about inflation (weight=1/6)

- Scheduled tax code expirations (weight=1/6)

Normalize each component to have unit standard deviation, then compute weighted sum to get overall index.
Our US Economic Policy Uncertainty index has 4 components – how we make the data “sausage”:

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Normalize each component to have unit standard deviation, then compute weighted sum to get overall index.
Constructing our US News-Based EPU Index

- For 10 major US papers get monthly counts of articles with:
  - {economic or economy}, and
  - {uncertain or uncertainty}, and
  - {regulation or deficit or federal reserve or congress or legislation or white house}

- Divide the count for each month by the count of all articles

- Normalize each to SD=1, then sum all 10 papers to get the U.S. monthly index
Our US Economic Policy Uncertainty index has 4 components – how we make the data “sausage”:

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

Normalize each component to have unit standard deviation, then compute weighted sum to get overall index.
State and Local Govt Purchase Forecasts, IQ Range
Q1 1985 - Q4 2012

Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year ahead forecasts (made every quarter) of total state and local government purchases relative to five year backward moving average GDP. Normalized to a mean 100 from 1985-2009. Spans about 45 forecasters per year.
CPI forecasts, IQ range
Q1 1985 - Q4 2012

Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year ahead forecasts (made every quarter) of consumer price level. Normalized to a mean 100 index prior 1985-2009. Spans about 45 forecasters per year.
Our US Economic Policy Uncertainty index has 4 components – how we make the data “sausage”:

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

Normalize each component to have unit standard deviation, then compute weighted sum to get overall index.
Combine the yearly CBO tax code expiration figures into an index by discounting by 50% per year the amount of tax code scheduled to expire in future years.

Source: Congressional Budget Office. Utilizes list of scheduled future tax code expirations and their estimated dollar value. Expirations are discounted by 50% per year.
Our US Economic Policy Uncertainty index has 4 components – how we make the data “sausage”:

- News-based index (weight=1/2)

- Forecaster disagreement about government purchases of goods and services (weight=1/6)

- Forecaster disagreement about inflation (weight=1/6)

- Scheduled tax code expired (weight=1/6)

Normalize each component to standard deviation=1, then compute weighted sum to get overall index.
Our main index of US policy uncertainty
January 1985 - December 2012

Policy Uncertainty Index

1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011

1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011

Debt Ceiling Dispute; Euro Debt
Obama Election
Ongoing Banking Crisis
Lehman and TARP
Large interest rate cuts, Stimulus

Fiscal Cliff
2010 Midterm Elections

Source: Data at www.policyuncertainty.com. Data normalized to 100 prior to 2010.
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

Source: [www.policyuncertainty.com](http://www.policyuncertainty.com). Data until October 2012.
US index is more similar to 10 year implied S&P500 stock market volatility (correlation 0.73)

Notes: Data from “The buzz: Links between policy uncertainty and equity volatility”, by Krag Gregory and Jose Rangel, Goldman Sachs, November 12, 2012.
European Economic Policy Uncertainty Index

What seems to be driving **US** policy uncertainty? It seems to be mainly fiscal policy and health care.

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<td>17</td>
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<td>53.4</td>
<td>17.9</td>
<td>54.5</td>
<td>25.3</td>
<td>15.8</td>
<td>21.2</td>
<td>19.3</td>
<td>24.4</td>
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<td>11.4</td>
<td>18.6</td>
<td>8.8</td>
<td>8.2</td>
<td>15.2</td>
<td>23.4</td>
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<td><strong>Regulation</strong></td>
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<td>19.5</td>
<td>11.1</td>
<td>15.4</td>
<td>29.1</td>
<td>30.4</td>
<td>17.2</td>
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<td>6.3</td>
<td>2.6</td>
<td>1.7</td>
<td>2</td>
<td>1.4</td>
<td>2.3</td>
<td>3.9</td>
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<tr>
<td><strong>Sovereign debt, currency</strong></td>
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<td>0.6</td>
<td>2.3</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>4.5</td>
<td>1.7</td>
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<tr>
<td><strong>Overall Economic Uncertainty</strong></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>
</tr>
</tbody>
</table>

Note: Analysis uses Newsbank coverage of around 1000 US national and local newspapers.
The paper tries to investigate this methodically

1) Measuring economic policy uncertainty

2) Evaluating our policy uncertainty

3) The impact of policy uncertainty on the recovery
Two Measurement Concerns with News Indices

**Suitability:** Does a count of news articles about uncertainty provide a good indicator for actual economic uncertainty?

**Accuracy:** Do specific text-string searches accurately identify the set of articles that discuss economic policy uncertainty?
Suitability test: news based indices for tracking equity market uncertainty seem to work quite well.

Notes: News-Based Financial Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty, economic or economy, and ‘stock prices’, ‘equity prices’, or ‘stock market’. Daily VXO data is scaled so both series have equal means. Data to October 2012.
Suitability test: news based indices for tracking unemployment also seem to work quite 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.
Accuracy test: performing human audits

We had 6 undergraduates read 3,500 newspaper articles using a 29-page audit guide to code articles if they discuss “economic uncertainty”=0/1 and “economic policy uncertainty”=0/1.

Audit Methodology: Main Steps

1. Download all NY Times, LA Times, and SF Chronicle articles from 1985 to 2012 that pass our Economic Uncertainty (EPU) test.
2. Assign 84 of the sampled articles for each paper to Kyle and 84 to Sophie. Call these subsamples Sub(Name, Paper).
3. For each article, assign it to a topic.
4. Review the articles using the audit guide.
5. In summary, review the articles for the articles.
6. Lastly, review the articles.

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.
Evaluation results from the human audit helped refine our search, and confirmed our EPU measure is well correlated with true policy uncertainty.

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

Optimal set, correlation of 0.65 with true policy uncertainty.

Finally, also checked for political bias – some, but quantitatively very small (explains <2% of movement)

Papers sorted politically using the media slant measure from Gentzkow and Shapiro (2010).
The paper tries to investigate this methodically

1) Measuring economic policy uncertainty

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The economics literature has multiple channels for uncertainty to matter, but the most important seems to be real options (caution) effects.

Dave Cote, chairman and CEO of Honeywell, a Fortune 500 firm that employs 130,000 people worldwide stated "Right now we're holding back on all but the most necessary external hiring. And on capital expenditures, if I can make the decision now or six months from now, I'll make the decision six months from now and see what develops".

November 5th 2012
Lots of survey evidence pointing to uncertainty as a problem – Chamber of Commerce

United States Chamber of Commerce
Q2 Small Business Study
July 16, 2012
Survey Dates: July 2, 2012 – July 9, 2012

**Flat Economic Growth and Uncertainty Continue to Limit Hiring**

Eight-out-of-ten small businesses continue to think the national economy is off on the wrong track and more than half (53%) of small businesses surveyed cite economic uncertainty as their top concern. Only 14% say the national economy is on the right track.

Forty-five percent of small business owners surveyed are not sure if their business’s best days are ahead of or behind them. In addition, only 34% of small business owners say the business climate over the next two years is likely to greatly or somewhat improve.
Lots of survey evidence pointing to uncertainty as a problem – Global CEO survey

15th Annual Global CEO Survey 2012
Confidence disrupted\(^{p5}\)/Balancing global and local\(^{p9}\)/Risk resilience\(^{p16}\)/The talent challenge\(^{p20}\)/What’s next\(^{p27}\)/CEO interviews\(^{p30}\)

Figure 10: Global economic uncertainty remains the top threat to growth prospects
Q: How concerned are you about the following potential threats to your business growth prospects?

<table>
<thead>
<tr>
<th>North America</th>
<th>Western Europe</th>
<th>Asia Pacific</th>
<th>Latin America</th>
<th>CEE</th>
<th>Middle East/Africa</th>
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<tr>
<td>Uncertain or volatile economic growth</td>
<td>Uncertain or volatile economic growth</td>
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<td>Uncertain or volatile economic growth</td>
<td>Uncertain or volatile economic growth</td>
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</table>

- Public deficits
- Over-regulation
- Unstable capital markets
- Availability of key skills
- Shift in consumers
- Increasing tax burden
- Exchange rate volatility
- Inability to finance growth
- Protectionism

- Increasing tax burden
- Availability of key skills
- Shift in consumers
- Uncertain or volatile economic growth
- Exchange rate volatility
- Energy costs
- Inadequacy of basic infrastructure
- Availability of key skills
- Shift in consumers
- Unstable capital markets
- Bribery and corruption
- Inflation

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- Inadequacy of basic infrastructure
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- Shift in consumers
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- Bribery and corruption
- Inflation
Lots of survey evidence pointing to uncertainty as a problem – National Association of Business Economists

NABE Policy Survey:
Tighten Macroeconomic Policies Later Rather than Sooner

The National Association for Business Economics (NABE) recently surveyed its members on a number of policy issues. Results of the survey show that generally, there is not much support among the economists surveyed for policy tightening over the next 12 months. A majority of respondents would prefer that both monetary and fiscal policies become more stimulative or remain unchanged in 2013. Only one-third of the respondents feel that both monetary and fiscal policies should, respectively, become more restrictive next year. However, support among the panel rises for policy tightening in the longer run, with more than one-half of the business economists surveyed indicating that they feel fiscal policy should become more restrictive in 2014.

Consistent with findings of the March 2012 NABE Economic Policy Survey, there is overwhelming support among NABE members for a balanced approach to eventual fiscal tightening. Although respondents’ views seem to tilt in the direction of favoring spending cuts, roughly 90 percent of panelists would prefer some combination of spending cuts and tax increases in order to reduce the federal government budget deficit. Only a small minority (less than 15 percent) of survey participants think that the payroll tax should be permanently extended at its current rate, but higher percentages—between 35 percent and 45 percent—favor permanent extension of current tax rates on income, dividends, and capital gains. The vast majority of panelists feel that uncertainty about fiscal policy is holding back the pace of economic recovery.

Most respondents consider current monetary policy to be “about right” and three-quarters of the respondents believe that short-term interest rates will remain unchanged over the next 12 months.
Lots of survey evidence pointing to uncertainty as a problem – FOMC Beige Book

Correlation with our EPU index = 0.84

Note: Plots the frequency of the word “uncertain” in each quarter of the Federal Open Market Committees’ (FOMC) Beige Book. Data from 1983Q4 (when the Beige book started) to 2013Q1. 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.
Figure 8: VAR Estimated Industrial Production and Employment changes after a Policy Uncertainty Shock

Notes:
This shows the impulse response function for Industrial Production and employment to an increase in the policy-related uncertainty index, equal to the rise in the increase from 2006 (the year before the current crisis) until 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) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend. Data from 1985 to 2011.
Figure 9: Robustness to Different VAR Specifications

This shows the impulse response function for GDP and employment to an 124 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.
To conclude, our view - based on data, surveys and discussion - is that from 2008-2010 policy uncertainty was an effect of low growth, but from 2011 onwards is starting to cause low growth.
It also seems to be driving a lot of the volatility in asset markets (Pastor and Veronesi, 2012).

The Buzz: Links between policy uncertainty and equity volatility

Uncertain times...
Many investors argue that recent equity volatility levels are as much about policy uncertainty as economics or corporate earnings. That may even more true post last week’s US election as investors re-focus on the impending fiscal cliff, capital gains and dividend taxes.

S&P 500 implied volatility shows a strong correlation to policy uncertainty
We explore the links between equity volatility and a new measure for economic policy uncertainty suggested by Nicholas Bloom from Stanford University and his coauthors. Our results show a strong positive correlation between policy uncertainty and the level of S&P 500 variance across maturities:

- Correlations to policy uncertainty range from 0.62 for 1m variance to 0.86 for 10y variance.
- One clear take-away is that the back-end of the S&P curve is about 40% more correlated to policy uncertainty than the front.

Policy uncertainty helps explain sticky levels of 1y+ variance
Our results show that policy uncertainty statistically explains a good deal of the stickiness at the back-end of the S&P 500 term structure. Regressions of 3m to 10y variance levels on the level of 1m variance underestimate current levels of implied volatility by 3-5 vol points. Adding policy uncertainty into the regression pushes predicted levels to within a vol point of actual levels across terms.

The policy uncertainty gap
Rolling regressions, show that policy uncertainty added little explanatory power for estimating the level of implied volatility from 2006-2009. Beginning in late-2009, early 2010, a large "policy gap" began to be priced. In 2012 the policy gap has been slowly closing. A resolution of the fiscal cliff could go a long way to closing the rest of the policy gap and reducing 1y+ S&P 500 variance levels.

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Recently extending the news data back to 1900 and see intriguingly a rise since the 1960s (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.
One reason for rising policy uncertainty appears to be a rising Government share of the economy (Jan 1948 – 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 Jan 1900-Dec 2011. Government expenditure is total federal, state, and local expenditures over GDP, annually.
Conclude, and note monthly & daily data is on-line.
Back-up
Why is policy uncertainty so high - one possible reason is rising political polarization

SOURCE: Carroll et al., 2008.
And one possible reason for rising political polarization is rising residential polarization
Figure 11: Including controls for consumer confidence

Notes: This shows the impulse response function for Industrial Production and employment to an 124 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) until the first 8 months of 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) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend. Data from 1985 to 2011. Top panel includes the Michigan Consumer confidence index included as the second variable after our uncertainty index, and the bottom panel includes the Michigan Consumer Confidence index included as the first variable.
Notes: News-Based War and Terror Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term ‘war’ or ‘terror’ (scaled by the smoothed number of articles containing ‘today’). Google query run June 15, 2011. Index covers January 1985-May 2011.
Policy uncertainty also seems to make stock markets more risky (as stocks move together more)

Panel A. Political Uncertainty vs Stock Correlation

- Recession
- Political uncertainty
- Stock correlation

Policy uncertainty also seems correlated with risk: e.g. EU index vs Spanish-German bond spread

Source: Scott Baker, Nicholas Bloom and Steven J. Davis, www.PolicyUncertainty.com
Comparison Newsbank (daily data summed to the monthly level) with our 10 paper series
The Beige Book Policy Uncertainty also focuses on Fiscal Uncertainty from 2010 onwards

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<td>0.1</td>
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<td>category mention counted once)</td>
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<td>13.5</td>
<td>10.2</td>
<td>15.3</td>
<td>6.9</td>
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Source: Baker, Bloom and Davis analysis of FOMC Beige Books
Appendix Figure A2: Long-run implied volatility has remained high (like EPU) since 2008 while short-run implied volatility has fallen.

Notes: Data from “The buzz: Links between policy uncertainty and equity volatility”, by Krag Gregory and Jose Rangel, Goldman Sachs, November 12, 2012.
Find count (and ratio) of policy jumps is clearly correlated with our economic policy uncertainty index and the share of policy moves is 0.66.
Policy Uncertainty was high in the Great Depression
Other more sophisticated VAR estimations reveal a similar picture

“The main contributions to the decline in output and employment during the recession are estimated to come from financial and uncertainty shocks”

Stock and Watson, Brookings Paper, March 2012