Policy uncertainty: trying to estimate the uncertainty impact of Brexit

Scott Baker (Northwestern), Nick Bloom (Stanford) and Steve Davis (Chicago)

September 2\textsuperscript{nd} 2016
1) Measuring policy uncertainty

2) Evaluating our measure

3) Estimating the uncertainty impact of Brexit
Our proxy for Economic Policy Uncertainty (EPU) comes from computer searches of newspapers

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

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

- Normalize and sum 10 papers to get the U.S monthly index
US News-based economic policy uncertainty index

Can focus on narrower areas or economic policy uncertainty, e.g.: Defense and Healthcare

UK Policy Uncertainty Index – striking Brexit spike

News EPU index vs the Bank Uncertainty Index

Correlation=0.458 (p-value 0.001)

Source: Data to July 2016. Thanks to Phil Bunn for BoE data
UK Policy Uncertainty since 1885 – even against this Brexit looks like a large uncertainty shock

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 the Guardian and the Times
UK Daily EPU: large Brexit shock in EPU news index but no stock-market volatility shock

European Economic Policy Uncertainty Index

1) Measuring policy uncertainty

2) Evaluating our policy uncertainty measure

3) Estimating the uncertainty impact of Brexit
A) Evaluation of Policy Uncertainty Index: Market Use

Market use suggests some information in our EPU data

I) Numerous users including: Goldman Sachs, Citibank, JP Morgan, Blackrock, Wells Fargo, IMF, Fed, ECB etc

II) This has led Bloomberg, FRED, Reuters and Haver to stream our data for their financial and policy users
B) Evaluation: comparison to stock volatility (e.g. VIX)

Notes: The figure shows the U.S. EPU Index from Figure 1 and the monthly average of daily values for the 30-day VIX.
C) Running Detailed Human Audits

10 undergraduates read ≈ 10,000 newspaper articles to date using a 63-page audit guide to code articles if they discuss “economic uncertainty” and “economic policy uncertainty”.

---

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 mentioning the policy itself or the study that mentions the policy is not coded as EPU = 1. For example, "Smith & Jones (2019) mention the proposal for a new tax band on financial transactions." No, no EPU = 1.

---

Audit Methodology: Main Steps

1. Download all NY Times, LA Times, and SF Chronicle articles from 1985 to 2012 that pass our Economic Policy Uncertainty (EPU) filter.

2. Assign 84 of the sampled articles for each paper to Kyle and 84 to Sophie. Call these subsamples Sub(Name, Paper), where Name = [first name] and Paper = [paper identifier].

3. Draw a stratified random sample of 17 articles from each sub-sample.

4. Review the annotated articles.

5. In summary, roughly 17 articles per paper were reviewed.

---

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), where Name = [first name] and Paper = [paper identifier].

4. Review the annotated articles.

5. In summary, roughly 17 articles per paper were reviewed.

---

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.
Find humans and computers give similar results in large samples (in fact both make mistakes)

Correlation = 0.76
1) Measuring policy uncertainty

2) Evaluating our measure

3) Estimating the uncertainty impact of Brexit
Best guess using VARs based on the Baker, Bloom and Davis (2016) numbers

• BBD (2016) estimated impact of Great Recession (GR) shock

• GR raised global EPU by \( \approx 100 \) points (2011-12 vs 2005-06)

• Brexit raised UK EPU probably by \( \approx 800 \) points at maximum, but probably \( \approx 200 \) points on average (Q3 2016 to Q2 2017)?

• Both shocks have possibly similar persistence, but Brexit is national (GR was global) so maybe scale down Brexit impact?

• So our guess is uncertainty impact Brexit \( \approx \) GR impact, but very hard to tell – large, unprecedented uncertainty shock
Industrial Production, (%)

Notes:
- Plots the impulse response function for Industrial Production and employment to an increase in the policy-related uncertainty index from the 2005-2006 average value to the 2011-2012 average value. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the 90% confidence bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) with 3 lags on the EPU index, log(S&P 500 index), unemployment rate, and log industrial production, plus a full set of country, year and month fixed-effects. Country data weighted by the number of newspapers used to make the EPU series. Fit to monthly data from 1985M1 to 2012M12 where available. Estimated on data from Canada, China, France, Germany, India, Italy, Japan, Korea, Russia, Spain, UK and the USA.

Unemployment Impact, (%)

Assuming Brexit similar impact predicts drop of up to ≈1% (vs trend) in Q42016 & Q1 2017

12 country VAR for Great Recession (from BBD 2016)
UK VAR for Great Recession – but small sample so large standard errors, so I prefer 12 country sample

Assuming Brexit similar impact predicts drop of up to 2% (vs trend) in Q42016 & Q1 2017

Notes: Plots the impulse response function for Industrial Production and employment to an increase in the policy-related uncertainty index from the 2005-2006 average value to the 2011-2012 average value. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the 90% confidence bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) with 3 lags on the EPU index, log(S&P 500 index), unemployment rate, and log industrial production, plus a full set of country, year and month fixed-effects. Country data weighted by the number of newspapers used to make the EPU series. Fit to monthly data from 1985M1 to 2012M12 where available. Estimated on data from the UK only.
Assuming Brexit similar impact predicts GDP drop of $\approx 1\%$ (vs trend) in Q42016 & Q1 2017

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). Fit to data from 195 to 2014.
Investment is the part of GDP that reacts by far the most - I think because investment is dominated by larger firms, which are forward looking.

**Notes:** VAR-estimated impulse response functions for GDP, Consumption 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. Fit to data from 195 to 2014.
Conclusions

- Policy uncertainty rose dramatically globally after Brexit, particularly in the UK

- Estimating the impact is frankly very hard! For the UK maybe a 1% hit to GDP (would be bigger except offsetting exchange rate and interest rate movements)

- Likely to be spread out over the next year, with initial impact in production side of economy followed by household side
Prior Q&A

Q1) What are the best uncertainty measures to look at?
A) Given implied volatility did not rise post Brexit, we are less keen on this. News feels attractive as focused on current beliefs.

Q2) Will uncertainty metrics (news, IVI etc) capture uncertainty around Brexit?
A) Probably not – this is a unique event and these are only rough measures. News at least has the ability to search by word.

Q3) How should uncertainty metrics evolve over next few years?
A) Hard to tell – except for the Great Recession, prior uncertainty shocks have been very quick, but Brexit likely to persist, I fear.
Prior Q&A

Q4) How quickly will Brexit uncertainty show in the data?
A) Firms likely to respond far faster (although exchange rate drop at same time). Consumers probably only respond when employment and wages respond, so with 1 or 2 quarters lag

Q5) How does Brexit interact with credit (is it a credit shock)?
A) Credit conditions likely to worsen as the left tail of outcomes have grown. Recently working on “The uncertainty-finance multiplier” & seems real and financial frictions amplify each other

Q6) Will uncertainty impact supply side (e.g. via productivity)
A) Probably, but evidence limited. Uncertainty likely to particularly reduce most irreversible investment – R&D, training, management reorganizations – which will would cut TFP growth
Q7) What channels will Brexit work through – e.g. housing?
A) My guess is that commercial property will be hit (firms are forward looking) but private housing hit only once the economy starts to drop (consumers less forward looking). Also vary heavily by sector because of large exchange rate cut.

Q8) Is the uncertainty impact different from the direct impact?
A) Historically all uncertainty shocks if the data are bad news, so have a direct and an uncertainty component. In the case of Brexit I would think the uncertainty component is particularly large early on (not much has happened) and direct effects larger later.