Economic Policy Uncertainty and the Credit Channel: Aggregate and Bank Level Evidence over Several Decades

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– Elections, Policymaking and Economic Uncertainty –

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Introduction

Data

Empirical Specifications

Results

Economic Policy Uncertainty and Bank Credit Standards

Conclusion
Motivation

“Expectations of large and increasing deficits in the future could inhibit current household and business spending for example, by reducing confidence in the longer-term prospects for the economy or by increasing uncertainty about future tax burdens and government spending and thus restrain the recovery.”

– Ben S. Bernanke, October 4, 2010
Motivation

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– Ben S. Bernanke, October 4, 2010

“The restraining effects of [fiscal] policy uncertainties are repeated frequently and with great vehemence. In my opinion, a first priority is that government authorities bring clarity to matters central to business planning.”
– Dennis P. Lockhart, November 11, 2010
Motivation

Questions

▶ Does economic policy uncertainty effect aggregate lending?
▶ How does it effect credit growth of individual banks?
▶ Can we say something about macroeconomic impact?

Results

▶ EPU negatively related to total & C&I loans at aggregate level
▶ EPU negatively related to total and all bank loan subcategories at the individual bank level
▶ Macroeconomic effects:
  ▶ VARs: heightened EPU in recent cycle (4 stdev shock) could have lowered GDP by 1pp via all channels.
  ▶ EPU’s impact on credit standards using Bassett et al.’s VAR results ⇒ 0.5pp on GDP
Comparatively Weak Credit Recovery Since Downturn...

Total Real U.S. Bank Loans per Capita Indexed to Cycle Peak

- Average for 5 prior peaks
- 2007-09 Recession

Range around 5 prior business cycle peaks
Regulatory Burden on Financial Industry Has Increased

number of pages per filing

Note: Grey bars indicate recessions. Maximum number of report pages for domestic banks only.
1959q4 - 1983q4: Forms FFIEC 010, FFIEC 011, FFIEC 012, FFIEC 013, FFIEC 015, and temporary reporting supplements
1984q1 - 2000q4: Forms FFIEC 031, FFIEC 032, FFIEC 032, FFIEC 033, FFIEC 034
2001q1 - present: Forms FFIEC 031 and FFIEC 041
Sources: FFIEC Call Reports, Federal Reserve Bank of Dallas.
Recent Developments in Economic Policy Uncertainty

![Chart showing economic policy uncertainty with peaks in 2012-2015 related to Fiscal Cliff and Government Shutdown.](chart.png)
Policy Uncertainty Tends to Shift Up Near Recessions

The graph illustrates the index of policy uncertainty, with the x-axis representing quarters relative to the peak (t=0) and the y-axis representing the index values. The shaded area represents the range of 5 prior business cycles, while the black line indicates the average for 5 prior peaks. The red line emphasizes the 2007-09 recession, showing a notable shift in policy uncertainty. The pattern observed suggests that policy uncertainty tends to increase near recessions.
1. Credit Channel
   - Bernanke and Lown (1991, Brookings)
   - Kashyap and Stein (2000, AER)
   - Kishan and Opiela (2000, JMCB)
   - Ashcraft (2006, JMCB)
   - Jiminez, Ongena et al. (2014, ECTA)
   - Jiminez, Ongena et al. (2013, AER)

2. Economic (Policy) Uncertainty – Measurement
   - Baker, Bloom, and Davis (2013, WP)
   - Jurado, Ludvigson, and Ng (2015, AER)

3. Economic (Policy) Uncertainty – Effects
   - Bloom, Bond, and Van Reenen (2007, RES)
   - Bloom (2009, ECTA)
Introduction

Data
- Time-Series \( T \)
- Cross-Section \( T \times N \)

Empirical Specifications

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Data: Time-Series [T]

T time-series coverage 1961 Q4 – 2014 Q3

- Quarterly aggregate credit growth (H.8 table of BoG)
- Real GDP growth rate
- Real federal funds rate accounting for the zero lower bound (via Xia and Wu, 2014)
- Economic Policy Uncertainty (EPU) measured by Baker, Bloom, and Davis (2015, NBER)
- Focus here on “news” component, due to sample period availability
Data: From Time-Series \([T]\) to Cross-Section \([T \times N]\)

Median of cross-sectional distribution of commercial bank credit growth

![Graph showing the median of cross-sectional distribution of commercial bank credit growth from 1960 to 2010. The graph displays a line chart with data points indicating changes in credit growth over time.]
Data: From Time-Series [T] to Cross-Section [T \times N]

Median and interquartile range of cross-sectional distribution of commercial bank credit growth
Data: From Time-Series \([T]\) to Cross-Section \([T \times N]\)

Cross-sectional distribution (10th to 90th percentile) of commercial bank credit growth
Data: Cross-Section \([T \times N]\)

- \(T\) Covers the exactly same time span as the time-series data
  1961 Q4 – 2014 Q3

- \(N\) Balance sheet data from all U.S. commercial banks

- 1 dependent variable (total loan growth at the bank level),
  
  LHS1: Loans \(\Rightarrow\) “Total Loans minus Allowances for Loan Losses”

- dynamic panel that involves 4 bank level controls

  RHS1: Assets \(\Rightarrow\) “Total Assets”

  RHS2: Capitalization \(\Rightarrow\) “Equity Issued plus Cumulated Value of Retained Earnings”

  RHS3: Cash \(\Rightarrow\) “Cash & Due”

  RHS4: Securities \(\Rightarrow\) “Total Investment Securities” & “Assets Held in Trading Accounts”
Bank level controls limited by consistent availability for full sample

- 4 bank level controls:
  1. Bank size
  2. Capitalization
  3. Cash
  4. Securities

- Demeaned by
  1. Quarterly mean (ratios)
  2. Quarterly median (size)

- Normalized by
  1. Quarterly standard deviation (ratios)
  2. Quarterly percentile (size)
Introduction

Data

Empirical Specifications
  Time-Series $T$
  Cross-Section $T \times N$

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Specification: Time-Series [T]

ARDL model:

\[ \Delta \ln L_t = \alpha + \sum_{\ell=1}^{k} \rho_{\ell} \cdot \Delta \ln L_t + \sum_{\ell=1}^{k} \beta_{\ell} \cdot M_t + \sum_{\ell=1}^{k} \gamma_{\ell} \cdot EPU_{t-\ell} + \varepsilon_t \]

where

- \( \Delta \ln L_t \) ... quarter-over-quarter real per capita growth in credit
- \( M_t \) ... are macroeconomic and regulatory controls
- \( EPU_t \) ... is Economic Policy Uncertainty (EPU) constructed by Baker, Bloom, and Davis (2015, NBER WP)

Expectations

- \( \gamma_{\ell} < 0 \Rightarrow \) a negative impact of greater EPU
Specification: Cross-Section [T x N]

For the cross-section, we estimate the specification (summing 1 to 4 lags):

\[
\Delta \ln L_{i,t} = \alpha + \sum_{\ell=1}^{4} \rho_{\ell} \cdot \Delta \ln L_{i,t-\ell} + \sum_{\ell=1}^{4} \left( \mu_{1,\ell} \cdot \Delta y_{t-\ell} + \mu_{2,\ell} \cdot \Delta FFR^\text{real}_{t-\ell} + \mu_{3,\ell} \cdot \text{EPU}_{t-\ell} \right) \\
+ \delta_{1} \cdot \text{assets}_{i,t-1} + \delta_{2} \cdot \text{equity}_{i,t-1} + \delta_{3} \cdot \text{cash}_{i,t-1} + \delta_{4} \cdot \text{securities}_{i,t-1} \\
+ \sum_{\ell=1}^{4} \tau_{1,\ell} \cdot \text{assets}_{i,t-1} \cdot \text{EPU}_{t-\ell} + \sum_{\ell=1}^{4} \tau_{2,\ell} \cdot \text{equity}_{i,t-\ell} \cdot \text{EPU}_{t-\ell} \\
+ \sum_{\ell=1}^{4} \tau_{3,\ell} \cdot \text{cash}_{i,t-1} \cdot \text{EPU}_{t-\ell} + \sum_{\ell=1}^{4} \tau_{4,\ell} \cdot \text{securities}_{i,t-\ell} \cdot \text{EPU}_{t-\ell} \\
+ \text{other controls} + \varepsilon_{i,t}
\]

where

- \( \Delta \ln L_{t} \) ... quarter-over-quarter bank level growth in credit of bank \( i \) in quarter \( t \)
- \( \Delta y_{t} \) ... real annualized quarter-over-quarter GDP growth
- \( \Delta FFR^\text{real}_{t} \) ... quarterly change in the real federal funds rate
  (using Xia and Wu, 2014, shadow rate for the zero lower bound period)
- \( \text{cash}_{i,t}, \text{equity}_{i,t} \) etc. ... are normalized bank-level characteristics

Expectations

- \( \sum_{\ell=1}^{4} \mu_{3,\ell} < 0 \Rightarrow \) a negative impact of greater EPU
- agnostic on \( \tau_{i} \)
Introduction

Data

Empirical Specifications

**Results**

- Time-Series \( T \)
- Cross-Section \( T \times N \)

Economic Policy Uncertainty and Bank Credit Standards

Conclusion
Results: Time-Series [T]

\[ \Delta \ln L_t = \alpha + \sum_{\ell=1}^{n} \rho_\ell \cdot \Delta L_{t-\ell} + \sum_{\ell=1}^{n} \beta_\ell \cdot M_{t-\ell} + \sum_{\ell=1}^{n} \gamma_\ell \cdot EPU_{t-\ell} + \varepsilon \]

Table: Effects of Economic Policy Uncertainty on Real Overall Bank Loan Growth (quarterly, aggregate results)

<table>
<thead>
<tr>
<th>Controls</th>
<th>No Controls</th>
<th>Non-regulatory controls (GDP growth, ( \Delta ) real fed funds rate)</th>
<th>Non-regulatory and regulatory controls without consumer sentiment</th>
<th>Non-regulatory and regulatory controls and consumer sentiment expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPU (sum of coefficients on EPU lags, (standard errors), [lags in quarters])</td>
<td>-32.68***</td>
<td>-24.65**</td>
<td>-38.30***</td>
<td>-40.04***</td>
</tr>
<tr>
<td></td>
<td>(13.68)</td>
<td>(13.74)</td>
<td>(12.27)</td>
<td>(13.68)</td>
</tr>
<tr>
<td></td>
<td>(5 lags)</td>
<td>(5 lags)</td>
<td>(3 lags)</td>
<td>(5 lags)</td>
</tr>
</tbody>
</table>

***, **, * denote significance at the 99, 95, and 90 percent confidence levels. Sample period is 1960 Q3 to 2014 Q1.

Following the literature on the lending channel, the baseline specification for total bank loans (aggregated over all banks) is:
Results: Time-Series [T]

Primary findings

- Negative effects of economic policy uncertainty on aggregate credit growth
  - ... unconditional,
  - ... conditional on activity and policy,
  - ... conditional additionally on credit controls and Reg Q, and
  - ... conditional additionally on consumer sentiment.
## Results: Cross-Section [T x N]

### Table: Effects of Economic Policy Uncertainty on Real Disaggregated Bank Loan Growth (1961 Q4 – 2014 Q3)

<table>
<thead>
<tr>
<th>Controls</th>
<th>Model 1: No controls</th>
<th>Model 2: Non-regulatory controls (GDP growth, Δ real fed funds rate)</th>
<th>Model 3: Non-regulatory controls (GDP growth, Δ real fed funds rate), interactions</th>
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<th>Model 7: Non-regulatory controls &amp; regulatory controls and consumer sentiment expectations</th>
<th>Model 8: Non-regulatory controls and consumer sentiment expectations, interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPU_t_1</td>
<td>-42.58*** (0.50)</td>
<td>-41.05*** (0.53)</td>
<td>-28.90*** (0.63)</td>
<td>-27.72*** (0.54)</td>
<td>-26.66*** (0.55)</td>
<td>-25.66*** (0.55)</td>
<td>-31.89*** (0.64)</td>
<td>-31.71*** (0.65)</td>
</tr>
<tr>
<td>EPU_t_1 + Assets_i,t_1</td>
<td>-20.85*** (1.35)</td>
<td>-18.71*** (1.32)</td>
<td>-17.36*** (1.31)</td>
<td>-17.36*** (1.31)</td>
<td>-18.09*** (1.31)</td>
<td>-18.09*** (1.31)</td>
<td>-18.09*** (1.31)</td>
<td></td>
</tr>
<tr>
<td>EPU_t_1 + Equity_i,t_1</td>
<td>7.28*** (0.48)</td>
<td>6.81*** (0.19)</td>
<td>6.35*** (0.46)</td>
<td>6.35*** (0.46)</td>
<td>6.26*** (0.46)</td>
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<td></td>
</tr>
<tr>
<td>EPU_t_1 + Cash_i,t_1</td>
<td>2.56*** (0.42)</td>
<td>2.50*** (0.41)</td>
<td>2.51*** (0.41)</td>
<td>2.51*** (0.41)</td>
<td>2.41*** (0.40)</td>
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<tr>
<td>EPU_t_1 + Securities_i,t_1</td>
<td>0.08 (0.17)</td>
<td>-0.09 (0.17)</td>
<td>-0.31 (0.18)</td>
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<td></td>
</tr>
<tr>
<td>Δy_t_1</td>
<td>0.78*** (0.01)</td>
<td>0.80*** (0.01)</td>
<td>0.59*** (0.01)</td>
<td>0.62*** (0.01)</td>
<td>0.66*** (0.01)</td>
<td>0.69*** (0.01)</td>
<td>0.75*** (0.01)</td>
<td></td>
</tr>
<tr>
<td>ΔFFR_real_t_1</td>
<td>-2.90*** (0.02)</td>
<td>-2.94*** (0.02)</td>
<td>-2.21*** (0.03)</td>
<td>-2.30*** (0.03)</td>
<td>-2.16*** (0.03)</td>
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<td>RegQ_t_1</td>
<td>-0.70*** (0.18)</td>
<td>-0.34*** (0.18)</td>
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<td>CCtrl_s,t_1</td>
<td>-1.15*** (0.03)</td>
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<td>ConfExp_t_1</td>
<td>0.02*** (0.00)</td>
<td>0.04*** (0.00)</td>
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<td>R-squared</td>
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<td>0.340</td>
<td>0.363</td>
<td>0.360</td>
<td>0.367</td>
<td>0.364</td>
<td>0.362</td>
<td>0.365</td>
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Coefficients are multiplied by 1000. Bank loan growth is annualized quarter-over-quarter percentage growth rates. *** denotes significance at the 99% level and standard errors are in parentheses. Differences in the numbers of observations across the models partly reflect the inclusion of time series controls and individual bank characteristics affect the number of unusual outliers screened out by the DFIT procedure used to limit the influence of outliers.
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<td>0.02*** (0.00)</td>
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<td>0.02*** (0.00)</td>
<td>0.02*** (0.00)</td>
<td>0.04*** (0.00)</td>
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Results: Cross-Section \([T \times N]\)

Primary finding

- Negative effects for representative bank
  - ... at the median of the size distribution,
  - ... with an average capitalization ratio,
  - ... with an average cash ratio, and
  - ... with an average securities ratio.

... with some cross-sectional heterogeneity ...

1. Negative effects amplified for bigger banks
2. Negative effects muted for better capitalized banks
3. Negative effects muted for banks with more cash
Gauge effects given asset concentration in large banks

- Consider effect on representative bank \((-31.71) \times \) rise in EPU post 2007 Q1 \((\approx 80)\) yields about 2.6 percentage point loan contraction

- Banking assets are concentrated in a few, large institutions (see Fernholz and Koch, 2016, for dynamic power laws in banking assets)

- Large institutions are more affected, about 1/3 stronger response for the top size percentile

- Implied overall effect given that banking assets are concentrated in the top bank size percentile yields 3.3 percentage point contraction

Estimated Effects of High levels of Economic Policy Uncertainty on Real Bank Loan Growth Since the Onset of the Great Recession

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Average extent that EPU exceeded its 2007 Q2 level over specified time period (index points)</th>
<th>Estimated effect EPU on bank loan growth (SAAR) median bank response (model 8) (percentage points) †</th>
<th>Estimated effect EPU on bank loan growth (SAAR) using 50% weight on largest banks, 50% on median bank (percentage points) ‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007 Q1 – 2011 Q4</td>
<td>81.0</td>
<td>-2.6</td>
<td>-3.3</td>
</tr>
<tr>
<td>2007 Q1 – 2012 Q4</td>
<td>83.1</td>
<td>-2.6</td>
<td>-3.4</td>
</tr>
<tr>
<td>2007 Q1 – 2013 Q4</td>
<td>80.7</td>
<td>-2.6</td>
<td>-3.3</td>
</tr>
</tbody>
</table>

† Equals row 1 multiplied by .03171 (non-interacted EPU coefficient/100 from model 8 in Table 2).
‡ Equals row 1 multiplied by .04075 (non-interacted EPU coefficient/100 plus one-half times the coefficient/100 on EPU interacted with assets from model 8 in Table 2).
Robustness

Results robust to using an alternative measure of uncertainty and whether or not the Dodd-Frank implementation is included

- **Aggregate level**
  - Robust to whether or not the Dodd-Frank Act is included (pre- and post-2010)
  - Commercial & industrial (C&I) loans primary drivers
  - Effects also from Jurado-Ludvigson-Ng uncertainty measure

- **Bank level**
  - Total and C&I loans, same checks as in the aggregate level
    - Pre- and post-2010 (DFA)
    - Jurado-Ludvigson-Ng uncertainty measure
  - Results robust to both
## Robustness: Aggregate Level

<table>
<thead>
<tr>
<th>Controls</th>
<th>BakerBloomDavis Historical EPU 1961Q4 - 2010Q4</th>
<th>BakerBloomDavis Historical EPU 1961Q4 - 2014Q3</th>
<th>JuradoLudvigsonNg Macro 12-Month 1961Q4 - 2014Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Loans</strong></td>
<td>-2.42* (1.31)</td>
<td>-2.16* (1.20)</td>
<td>-13.65* (7.18)</td>
</tr>
<tr>
<td></td>
<td>(sum of coefficients on uncertainty lags, (standard errors), (lags in quarters))</td>
<td>(2 lags)</td>
<td>(6 lags)</td>
</tr>
<tr>
<td><strong>C&amp;I Loans</strong></td>
<td>-7.97*** (1.84)</td>
<td>-6.35*** (1.70)</td>
<td>-21.63** (9.20)</td>
</tr>
<tr>
<td></td>
<td>(sum of coefficients on uncertainty lags, (standard errors), (lags in quarters))</td>
<td>(3 lags)</td>
<td>(6 lags)</td>
</tr>
<tr>
<td><strong>Real Estate Loans</strong></td>
<td>0.82 (1.40)</td>
<td>0.41 (1.29)</td>
<td>-1.08 (6.48)</td>
</tr>
<tr>
<td></td>
<td>(sum of coefficients on uncertainty lags, (standard errors), (lags in quarters))</td>
<td>(2 lags)</td>
<td>(2 lags)</td>
</tr>
<tr>
<td><strong>Consumer Loans</strong></td>
<td>1.59 (1.37)</td>
<td>1.50 (1.26)</td>
<td>-14.21* (7.39)</td>
</tr>
<tr>
<td></td>
<td>(sum of coefficients on uncertainty lags, (standard errors), (lags in quarters))</td>
<td>(1 lag)</td>
<td>(1 lag)</td>
</tr>
</tbody>
</table>

Notes: Coefficients are multiplied by 100. Loans are adjusted for changes in reporting and deflated using the GDP deflator. Lags are selected based on the Akaike’s information criterion. ***, **, * denote significance at the 99, 95, and 90 percent confidence levels. Controls include lagged loan growth, macroeconomic, and regulatory variables.
## Robustness: Bank Level

<table>
<thead>
<tr>
<th>Controls</th>
<th>Total Loans, BBD Historical EPU 1961Q4 - 2010Q4</th>
<th>Total Loans, BBD Historical EPU 1961Q4 - 2014Q3</th>
<th>Total Loans, JLN C&amp;I, BBD Historical EPU 1961Q4 - 2014Q3</th>
<th>C&amp;I, BBD Historical EPU 1961Q4 - 2014Q3</th>
<th>C&amp;I, JLN Macro 12-Month Historical EPU 1961Q4 - 2014Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Uncertainty&lt;sub&gt;t-ℓ&lt;/sub&gt;</strong></td>
<td>-3.18*** (0.07)</td>
<td>-3.17*** (0.07)</td>
<td>-7.07*** (0.30)</td>
<td>-8.90*** (0.24)</td>
<td>-8.78*** (0.24)</td>
</tr>
<tr>
<td>× Assets&lt;sub&gt;i,t-ℓ&lt;/sub&gt;</td>
<td>-2.15*** (0.15)</td>
<td>-1.88*** (0.13)</td>
<td>-17.78*** (0.66)</td>
<td>-2.43*** (0.44)</td>
<td>-1.62*** (0.42)</td>
</tr>
<tr>
<td><strong>Uncertainty&lt;sub&gt;t-ℓ&lt;/sub&gt;</strong></td>
<td>0.61*** (0.06)</td>
<td>0.63*** (0.05)</td>
<td>1.63*** (0.25)</td>
<td>1.77*** (0.17)</td>
<td>1.83*** (0.16)</td>
</tr>
<tr>
<td>× Equity&lt;sub&gt;i,t-ℓ&lt;/sub&gt;</td>
<td>0.36*** (0.05)</td>
<td>0.25*** (0.04)</td>
<td>2.43*** (0.21)</td>
<td>0.90*** (0.14)</td>
<td>0.76*** (0.14)</td>
</tr>
<tr>
<td>× Cash&lt;sub&gt;i,t-ℓ&lt;/sub&gt;</td>
<td>0.06 (0.05)</td>
<td>-0.08* (0.04)</td>
<td>0.35* (0.20)</td>
<td>-0.10 (0.14)</td>
<td>-0.01 (0.13)</td>
</tr>
<tr>
<td><strong>Uncertainty&lt;sub&gt;t-ℓ&lt;/sub&gt;</strong></td>
<td>0.36*** (0.05)</td>
<td>0.25*** (0.04)</td>
<td>2.43*** (0.21)</td>
<td>0.90*** (0.14)</td>
<td>0.76*** (0.14)</td>
</tr>
<tr>
<td>× Securities&lt;sub&gt;i,t-ℓ&lt;/sub&gt;</td>
<td>0.06 (0.05)</td>
<td>-0.08* (0.04)</td>
<td>0.35* (0.20)</td>
<td>-0.10 (0.14)</td>
<td>-0.01 (0.13)</td>
</tr>
</tbody>
</table>

| Observations              | 1,124,428                                        | 1,185,912                                        | 1,187,343                                       | 843,709                          | 857,940                                       |
| R²                        | 0.364                                             | 0.363                                             | 0.362                                           | 0.180                            | 0.178                                          |

Notes: Lag length set to 4. Coefficients of uncertainty and bank-level characteristics interacted with uncertainty are multiplied by 100. All coefficients are the sum of all four lags. Bank loan growth is annualized quarter-over-quarter percentage growth rates. ***, **, * denote significance at the 99, 95, and 90 percent level and standard errors are in parentheses. Differences in the numbers of observations across the models partly reflect the inclusion of time series controls and individual bank characteristics affect the number of unusual outliers screened out by the DFIT procedure used to limit the influence of outliers.
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Economic Policy Uncertainty and Bank Credit Standards

- Can we gauge aggregate effects?
- We first estimate a simple VAR.
- Also, second, indirectly building on existing literature
- Build on a paper by Bassett, Chosak, Driscoll, and Zakrajsek (2014, JME)

⇒ one s.d. ↑ to credit standards → ↓ 0.8 ppt GDP after ten quarters.
VAR Evidence: 1s.d. EPU Increase

EPU (detrended) Shock (1965 Q1 - 2015 Q2)

Price Level
Output
Credit
Fed Funds

EPU (detrended)

orthogonalized irf
90% CI
VAR Evidence: 80 Points ($\approx 4s.d.$) EPU Increase

EPU (detrended) Shock (1965 Q1 - 2015 Q2)

- Price Level
- Output
- Credit
- Fed Funds
- EPU (detrended)

orthogonalized irf
90% CI
Economic Policy Uncertainty and Bank Credit Standards

Bassett et al. model a diffusion index (DI) based on the bank panel underlying the senior loan officers opinion survey (SLOOS).

We related their index to EPU.

\[
DI_t = \beta_0 + \beta_1 \cdot \Delta FFR_{t}^{real} + \beta_2 \cdot \Delta_2 LEI_t + \beta_3 \cdot CPTR_t \\
+ \beta_4 \cdot \Delta 4DEL_t + \beta_5 \cdot \Delta_2 MFore_{t-1} + \beta_6 \cdot EPU_t + \varepsilon_t
\]

where

- \(DI_t\) ... Bassett et al. (2014) diffusion index
- \(\Delta FFR_{t}^{real}\) ... quarterly change in the real federal funds rate
- \(\Delta_2 LEI_t\) ... two-quarter change in leading economic indicators
- \(\Delta_2 MFore_{t-1}\) ... quarter-over-quarter bank level growth in credit of bank \(i\) in quarter \(t\)
- CPTR\(_t\) ... spread between 3-month financial commercial paper and T-bill rates
- \(\Delta 4DEL_t\) ... year-over-year change in delinquency rates
- \(\Delta_2 MFore_t\) ... two-quarter change in the home mortgage foreclosure rate
- EPU\(_t\) ... Economic Policy Uncertainty
Economic Policy Uncertainty and Bank Credit Standards

\[ DI_t = \beta_0 + \beta_1 \cdot \Delta \text{FFR}_{t, \text{real}} + \beta_2 \cdot \Delta_2 \text{LEI}_t + \beta_3 \cdot \text{CPTR}_t \]
\[ + \beta_4 \cdot \Delta 4 \text{DEL}_t + \beta_5 \cdot \Delta_2 \text{MFore}_{t-1} + \beta_6 \cdot \text{EPU}_t + \epsilon_t \]  

(specification)

Expectations

\[ \frac{\partial DI_t}{\partial \text{FFR}_{t, \text{real}}} = \beta_1 > 0 \Rightarrow \text{credit standards tighten with increases in fed funds rate} \]

\[ \frac{\partial DI_t}{\partial \Delta_2 \text{LEI}_t} = \beta_2 < 0 \Rightarrow \text{positive LEI ease credit standards} \]

\[ \frac{\partial DI_t}{\partial \text{CPTR}_t} = \beta_3 > 0 \Rightarrow \text{financial system stress tightens credit standards} \]

\[ \frac{\partial DI_t}{\partial \Delta 4 \text{DEL}_t} = \beta_4 > 0 \Rightarrow \text{default (all loans) raises credit standards} \]

\[ \frac{\partial DI_t}{\partial \Delta_2 \text{MFore}_{t-1}} = \beta_5 > 0 \Rightarrow \text{default (mortgages) tightens credit conditions} \]

\[ \frac{\partial DI_t}{\partial \text{EPU}_t} = \beta_6 > 0 \Rightarrow \text{uncertainty about economic policy tightens credit standards} \]
Economic Policy Uncertainty and Bank Credit Standards

\[ DI_t = \beta_0 + \beta_1 \cdot \Delta \text{FFR}_{t}^{\text{real}} + \beta_2 \cdot \Delta_2 \text{LEI}_t + \beta_3 \cdot \text{CPTR}_t \]  
\[ + \beta_4 \cdot \Delta 4 \text{DEL}_t + \beta_5 \cdot \Delta_2 \text{MFore}_{t-1} + \beta_6 \cdot \text{EPU}_t + \varepsilon_t \]  

(specification)

Expectations

\[ \frac{\partial DI_t}{\partial \Delta \text{FFR}_{t}^{\text{real}}} = \beta_1 > 0 \implies \text{credit standards tighten with increases in fed funds rate} \]

\[ \frac{\partial DI_t}{\partial \Delta_2 \text{LEI}_t} = \beta_2 < 0 \implies \text{positive LEI ease credit standards} \]

\[ \frac{\partial DI_t}{\partial \text{CPTR}_t} = \beta_3 > 0 \implies \text{financial system stress tightens credit standards} \]

\[ \frac{\partial DI_t}{\partial \Delta 4 \text{DEL}_t} = \beta_4 > 0 \implies \text{default (all loans) raises credit standards} \]

\[ \frac{\partial DI_t}{\partial \Delta_2 \text{MFore}_{t-1}} = \beta_5 > 0 \implies \text{default (mortgages) tightens credit conditions} \]

\[ \frac{\partial DI_t}{\partial \text{EPU}_t} = \beta_6 > 0 \implies \text{uncertainty about economic policy tightens credit standards} \]

\[ DI_t = -0.040 + 0.035 \cdot \Delta \text{FFR}_{t}^{\text{real}} - 0.793^{**} \cdot \Delta_2 \text{LEI}_t + 0.138^{**} \cdot \text{CPTR}_t \]  
\[ + 0.099^{**} \cdot \Delta 4 \text{DEL}_t + 0.218^{*} \cdot \Delta_2 \text{MFore}_{t-1} + 0.655^{*} \cdot \text{EPU}_t \]  

(estimate)
Overall effects:
→ “back-of-the-envelop” (based on Bassett et al., 2014, JME)
→ 80 points rise in EPU between 2007 and 2010
→ 0.0524 rise in level of credit standards ≈ 2/3 of s.d. shocks to DI_t
⇒ 0.5 percentage points real GDP ↓ cumulative after 10 quarters
Economic Policy Uncertainty and Bank Credit Standards

Overall effects:

→ “back-of-the-envelop” (based on Bassett et al., 2014, JME)
→ 80 points rise in EPU between 2007 and 2010
→ 0.0524 rise in level of credit standards $\approx 2/3$ of s.d. shocks to $D_t$

$\Rightarrow$ 0.5 percentage points real GDP ↓ cumulative after 10 quarters

Sources: Bassett, et al. (2014) and authors’ calculations. The adjusted index equals the index of credit standards minus the product of the estimated coefficient on EPU in eq. (4) and the level of EPU minus its 1991-2007q2 average. The green line being below the black line reflects that had EPU not been above its pre-crisis average, credit standards would not have been as tight during the sluggish economic recovery from the Great Recession.
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Conclusion

Findings

▶ Higher EPU associated with slower aggregate and bank-level total loan growth, significant for C&I at aggregate level, significant for major loan types at individual bank level

▶ Higher bank capital and cash holdings associated with smaller-sized negative EPU effects on loan growth

▶ VARs: in recent cycle, GDP restrained by 1pp, back to envelope calculation suggests 0.5pp via a bank credit (standards) channel

Policy Implications

▶ Nonsystematic policy changes could have uncertainty effects, partly via bank lending. DFA may have had transitional effects on uncertainty— that might abate as system adjusts.

▶ Regulation and policy making need to be more predictable ⇒ via “rule-like” behavior
Thank you.