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

Michael D. Bordo[*]   John V. Duca[†]   Christoffer Koch[‡]

[*]Rutgers University, Hoover Institute and NBER

[†]Federal Reserve Bank of Dallas and SMU

[‡]Federal Reserve Bank of Dallas

– Elections, Policymaking and Economic Uncertainty –

Washington DC

September 13, 2016

10:00am – 11:00am

RUTGERS
250

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

- "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

- "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 $\Rightarrow$ 0.5pp on GDP

RUTGERS
250

Comparatively Weak Credit Recovery Since Downturn ...

Total Real U.S. Bank Loans per Capita Indexed to Cycle Peak
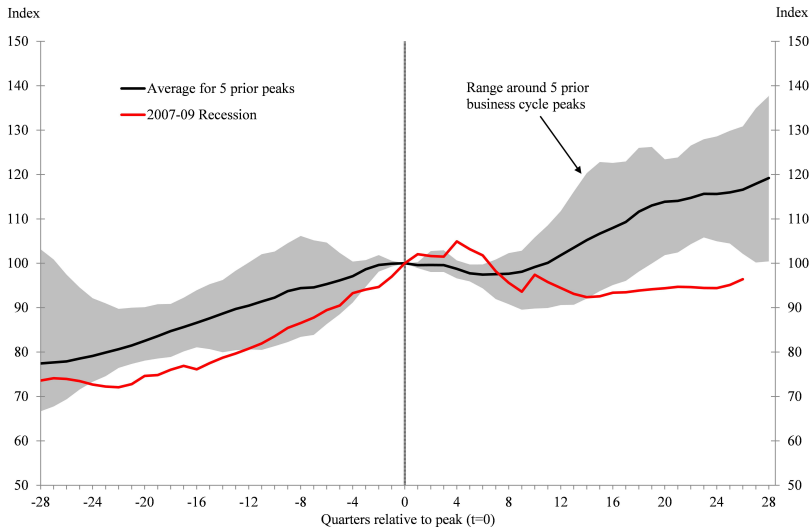
Regulatory Burden on Financial Industry Has Increased

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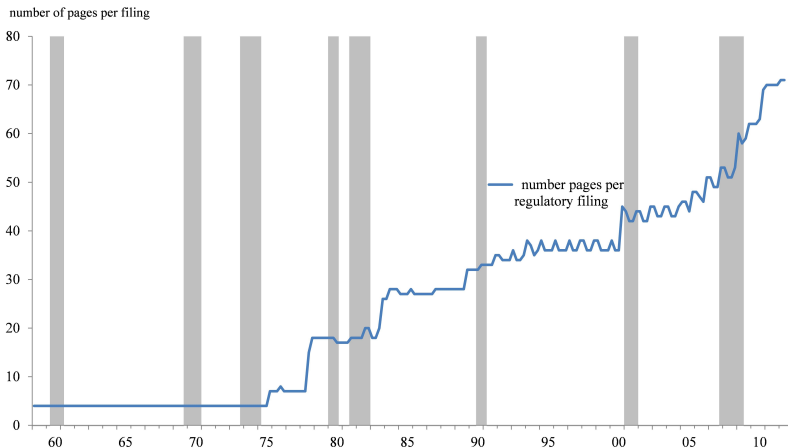
Note: Grey bars indicate recessions. Maximum number of report pages for domestic banks only.
    1959q4 - 1983q4: Forms FFIEC 010, FFIEC 011, FFIEC 012, FFIEC 013, FFIEC 015, and temporary reporting supplements
    1984q1 - 2000q4: Forms FFIEC 031, FFIEC 032, FFIEC 032, FFIEC 033, FFIEC 034
    2001q1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

Recent Developments in Economic Policy Uncertainty
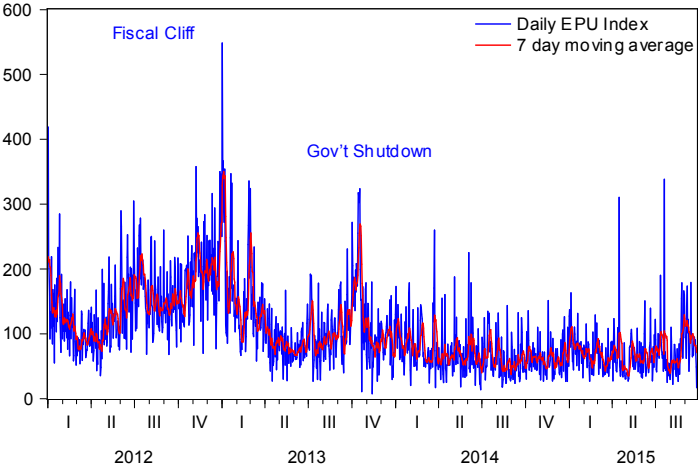
Policy Uncertainty Tends to Shift Up Near Recessions
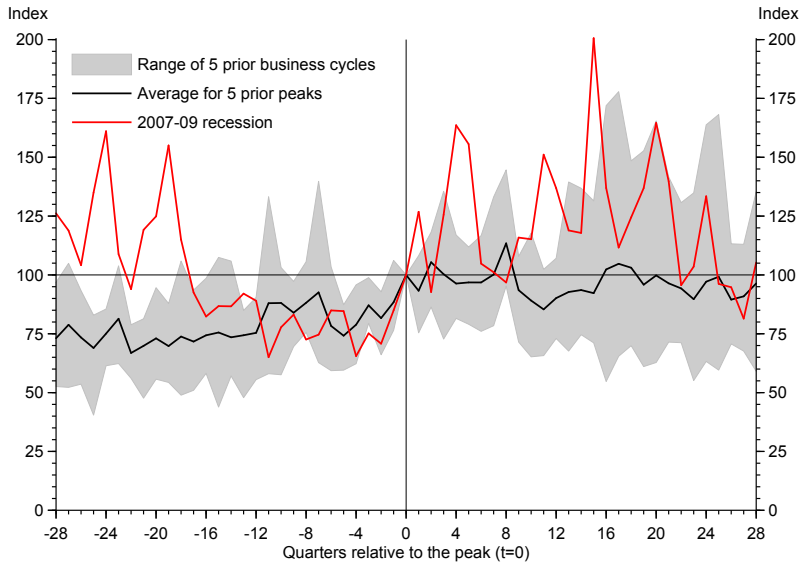
Literature

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)
   - Benati (2013), Creal and Wu (2013), Davig and Foerster (2013), Leduc and Liu (2012), Rossini (2013)

RUTGERS
250

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×N]

Median of cross-sectional distribution
of commercial bank credit growth
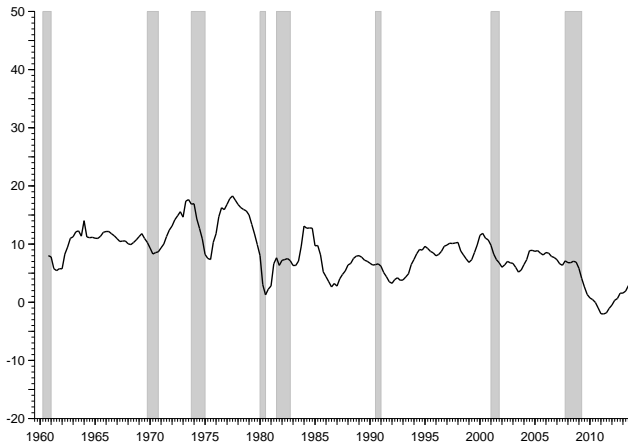
Data: From Time-Series [T] to Cross-Section [T×N]

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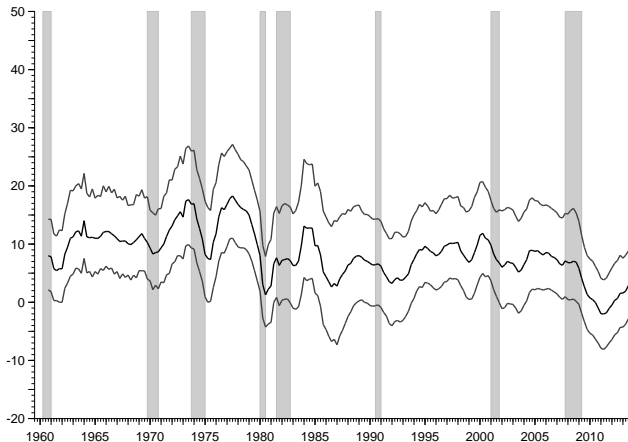
Data: From Time-Series [T] to Cross-Section [T×N]

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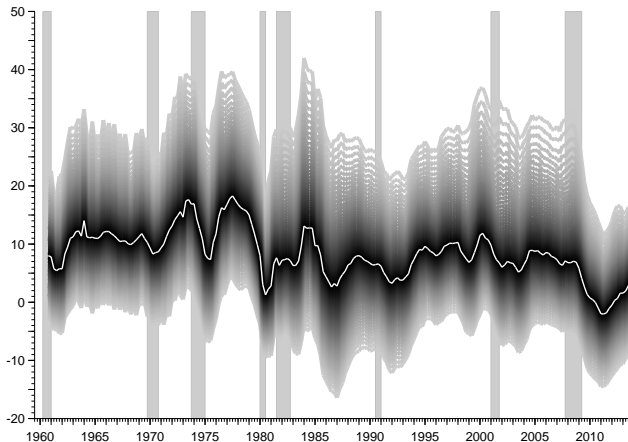
Data: Cross-Section [T×N]

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 ⇒ "Total Loans minus Allowances for Loan Losses"

▶ dynamic panel that involves 4 bank level controls

RHS1: Assets ⇒ "Total Assets"

RHS2: Capitalization ⇒ "Equity Issued plus
Cumulated Value of Retained Earnings"

RHS3: Cash ⇒ "Cash & Due"

RHS4: Securities ⇒ "Total Investment Securities" &
"Assets Held in Trading Accounts"

RUTGERS
250

Data: Cross-Section [T×N] – Normalization

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)

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×N]

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

$$\Delta \ln L_{i,t} = \alpha + \sum_{\ell=1}^{4} \rho_\ell \cdot \Delta \ln L_{i,t-\ell} + \sum_{\ell=1}^{4} \left(\mu_{1,\ell} \cdot \Delta y_{t-\ell} + \mu_{2,\ell} \cdot \Delta \text{FFR}_{t-\ell}^{real} + \mu_{3,\ell} \cdot EPU_{t-\ell} \right)$$

$$+ \delta_1 \cdot \text{assets}_{i,t-1} + \delta_2 \cdot \text{equity}_{i,t-1} + \delta_3 \cdot \text{cash}_{i,t-1} + \delta_4 \cdot \text{securities}_{i,t-1}$$

$$+ \sum_{\ell=1}^{4} \tau_{1,\ell} \cdot \text{assets}_{i,t-1} \cdot EPU_{t-\ell} + \sum_{\ell=1}^{4} \tau_{2,\ell} \cdot \text{equity}_{i,t-\ell} \cdot EPU_{t-\ell}$$

$$+ \sum_{\ell=1}^{4} \tau_{3,\ell} \cdot \text{cash}_{i,t-1} \cdot EPU_{t-\ell} + \sum_{\ell=1}^{4} \tau_{4,\ell} \cdot \text{securities}_{i,t-\ell} \cdot EPU_{t-\ell}$$

$$+ \text{ other controls} + \varepsilon_{i,t}$$

where

- $\Delta \ln L_t$ ... quarter-over-quarter bank level growth in credit of bank i in quarter t
- Δy_t ... real annualized quarter-over-quarter GDP growth
- $\Delta \text{FFR}_t^{real}$ ... 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 τ_i

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)

Controls	No Controls	Non-regulatory controls (GDP growth, Δ real fed funds rate)	Non-regulatory and regulatory controls without consumer sentiment	Non-regulatory and regulatory controls and consumer sentiment expectations
EPU (sum of coefficients on EPU lags, (standard errors), [lags in quarters])	-32.68*** (13.68) (5 lags)	-24.65** (13.74) (5 lags)	-38.30*** (12.27) (3 lags)	-40.04*** (13.68) (5 lags)

*** , **, * 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×N]

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

Controls	Model 1: No controls	Model 2: No controls inter-actions	Model 3: Non-regulatory controls (GDP growth, Δ real fed funds rate)	Model 4: Non-regulatory controls (GDP growth, Δ real fed funds rate), interactions	Model 5: Non-regulatory & regulatory controls	Model 6: Non-regulatory & regulatory controls, interactions	Model 7: Non-regulatory controls & regulatory controls and consumer sentiment expectations	Model 8: Non-regulatory controls and consumer sentiment expectations, interactions
EPU_{t-1}	-42.58*** (0.50)	-41.05*** (0.53)	-28.90*** (0.63)	-27.72*** (0.54)	-26.66*** (0.55)	-25.66*** (0.55)	-31.89*** (0.64)	-31.71*** (0.65)
EPU_{t-1} $+Assets_{i,t-1}$		-20.85*** (1.35)		-18.71*** (1.32)		-17.36*** (1.31)		-18.09*** (1.31)
EPU_{t-1} $+Equity_{i,t-1}$		7.28*** (0.48)		6.81*** (0.19)		6.35*** (0.46)		6.26*** (0.46)
EPU_{t-1} $+Cash_{i,t-1}$		2.56*** (0.42)		2.50*** (0.41)		2.51*** (0.41)		2.41*** (0.40)
EPU_{t-1} $+Securities_{i,t-1}$		0.08 (0.17)		-0.09 (0.17)		-0.31 (0.18)		-0.44 (0.18)
Δy_{t-1}			0.78*** (0.01)	0.80*** (0.01)	0.59*** (0.01)	0.62*** (0.01)	0.66*** (0.01)	0.69*** (0.01)
ΔFFR_{t-1}^{real}			-2.90*** (0.02)	-2.94*** (0.02)	-2.21*** (0.03)	-2.30*** (0.03)	-2.16*** (0.03)	-2.31*** (0.03)
$RegQ_{t-1}$					-0.70*** (0.18)	-0.34*** (0.18)	-1.26*** (0.18)	-0.38*** (0.18)
$CCtrls_{t-1}$					-1.15*** (0.03)	-1.12*** (0.12)	-1.29*** (0.03)	-1.37*** (0.03)
$ConfExp_{t-1}$							0.02*** (0.00)	0.04*** (0.00)
Observations	1,175,589	1,183,401	1,177,323	1,181,559	1,180,002	1,181,558	1,181,761	1,181,952
R-squared	0.343	0.340	0.363	0.364	0.367	0.364	0.362	0.365

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.

Results: Cross-Section [T×N]

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

Controls	Model 1: No controls	Model 2: No controls inter-actions	Model 3: Non-regulatory controls (GDP growth, Δ real fed funds rate)	Model 4: Non-regulatory controls (GDP growth, Δ real fed funds rate), interactions	Model 5: Non-regulatory & regulatory controls	Model 6: Non-regulatory & regulatory controls, interactions	Model 7: Non-regulatory controls & regulatory controls consumer sentiment expectations	Model 8: Non-regulatory controls and consumer sentiment expectations, interactions
EPU_{t-1}	-42.58*** (0.50)	-41.05*** (0.53)	-28.90*** (0.63)	-27.72*** (0.54)	-26.66*** (0.55)	-25.66*** (0.55)	-31.89*** (0.64)	-31.71*** (0.65)
EPU_{t-1} + $Assets_{i,t-1}$		-20.85*** (1.35)		-18.71*** (1.32)		-17.36*** (1.31)		-18.09*** (1.31)
EPU_{t-1} + $Equity_{i,t-1}$		7.28*** (0.48)		6.81*** (0.19)		6.35*** (0.46)		6.26*** (0.46)
EPU_{t-1} + $Cash_{i,t-1}$		2.56*** (0.42)		2.50*** (0.41)		2.51*** (0.41)		2.41*** (0.40)
EPU_{t-1} + $Securities_{i,t-1}$		0.08 (0.17)		-0.09 (0.17)		-0.31 (0.18)		-0.44 (0.18)
Δy_{t-1}			0.78*** (0.01)	0.80*** (0.01)	0.59*** (0.01)	0.62*** (0.01)	0.66*** (0.01)	0.69*** (0.01)
ΔFFR^{real}_{t-1}			-2.90*** (0.02)	-2.94*** (0.02)	-2.21*** (0.03)	-2.30*** (0.03)	-2.16*** (0.03)	-2.31*** (0.03)
$RegQ_{t-1}$					-0.70*** (0.18)	-0.34*** (0.18)	-1.26*** (0.18)	-0.38*** (0.18)
$CCtrls_{t-1}$					-1.15*** (0.03)	-1.12*** (0.12)	-1.29*** (0.03)	-1.37*** (0.03)
$ConfExp_{t-1}$							0.02*** (0.00)	0.04*** (0.00)
Observations	1,175,589	1,183,401	1,177,323	1,181,559	1,180,002	1,181,558	1,181,761	1,181,952
R-squared	0.343	0.340	0.363	0.360	0.367	0.364	0.362	0.365

Coefficients are multiplied by 100. 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.

Results: Cross-Section [T×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

RUTGERS
250

Results: Cross-Section – Back-of-the-Envelop Calculation

Gauge effects given asset concentration in large banks

- ▶ Consider effect on representative bank (-31.71) × rise in EPU post 2007 Q1 (≈ 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

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

† 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).

RUTGERS
250

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

RUTGERS
250

Robustness: Aggregate Level

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

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.

RUTGERS
250

Robustness: Bank Level

Controls	Total Loans, BBD Historical EPU 1961Q4 - 2010Q4	Total Loans, BBD Historical EPU 1961Q4 - 2014Q3	Total Loans, JLN Macro 12-Month 1961Q4 - 2014Q3	C&I, BBD Historical EPU 1961Q4 - 2010Q4	C&I, BBD Historical EPU 1961Q4 - 2014Q3	C&I, JLN Macro 12-Month 1961Q4 - 2014Q3
$Uncertainty_{t-\ell}$	-3.18***	-3.17***	-7.07***	-8.90***	-8.78***	-11.26***
	(0.07)	(0.07)	(0.30)	(0.24)	(0.24)	(0.87)
$Uncertainty_{t-\ell}$ $\times Assets_{i,t-\ell}$	-2.15***	-1.88***	-17.78***	-2.43***	-1.62***	-9.19***
	(0.15)	(0.13)	(0.66)	(0.44)	(0.42)	(1.93)
$Uncertainty_{t-\ell}$ $\times Equity_{i,t-\ell}$	0.61***	0.63***	1.63***	1.77***	1.83***	2.19***
	(0.06)	(0.05)	(0.25)	(0.17)	(0.16)	(0.72)
$Uncertainty_{t-\ell}$ $\times Cash_{i,t-\ell}$	0.36***	0.25***	2.43***	0.90***	0.76***	4.10***
	(0.05)	(0.04)	(0.21)	(0.14)	(0.14)	(0.61)
$Uncertainty_{t-\ell}$ $\times Securities_{i,t-\ell}$	0.06	-0.08*	0.35*	-0.10	-0.01	-2.34***
	(0.05)	(0.04)	(0.20)	(0.14)	(0.13)	(0.60)
Observations	1,124,428	1,185,912	1,187,343	843,709	857,940	861,762
R^2	0.364	0.363	0.362	0.180	0.178	0.174

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.
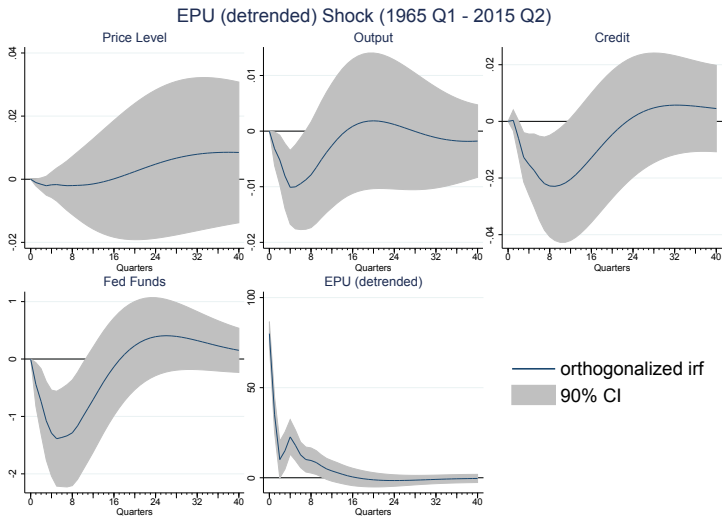
Economic Policy Uncertainty and Bank Credit Standards

- ▶ 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: 1$s.d.$ EPU Increase

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

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

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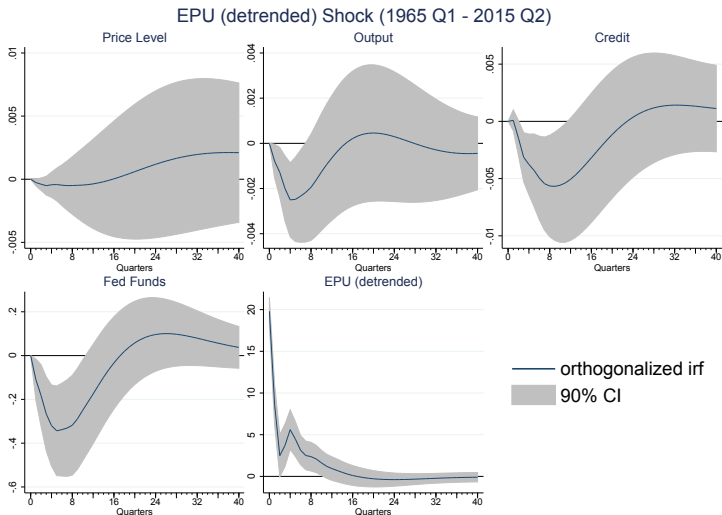
VAR Evidence: 80 Points ($\approx 4s.d.$) EPU Increase

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

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
- ΔFFR_t^{real} ... quarterly change in the real federal funds rate
- $\Delta_2 LEI_t$ ... two-quarter change in leading economic indicators 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

$$DI_t = \beta_0 + \beta_1 \cdot \Delta FFR_t^{real} + \beta_2 \cdot \Delta_2 LEI_t + \beta_3 \cdot CPTR_t \qquad \text{(specification)}$$
$$+ \beta_4 \cdot \Delta 4DEL_t + \beta_5 \cdot \Delta_2 MFore_{t-1} + \beta_6 \cdot EPU_t + \varepsilon_t$$

Expectations

- $\frac{\partial DI_t}{\partial \Delta FFR_t^{real}} = \beta_1 > 0 \Rightarrow$ credit standards tighten with increases in fed funds rate

- $\frac{\partial DI_t}{\partial \Delta_2 LEI_t} = \beta_2 < 0 \Rightarrow$ positive LEI ease credit standards

- $\frac{\partial DI_t}{\partial CPTR_t} = \beta_3 > 0 \Rightarrow$ financial system stress tightens credit standards

- $\frac{\partial DI_t}{\partial \Delta 4DEL_t} = \beta_4 > 0 \Rightarrow$ default (all loans) raises credit standards

- $\frac{\partial DI_t}{\partial \Delta_2 MFore_{t-1}} = \beta_5 > 0 \Rightarrow$ default (mortgages) tightens credit conditions

- $\frac{\partial DI_t}{\partial EPU_t} = \beta_6 > 0 \Rightarrow$ uncertainty about economic policy tightens credit standards

RUTGERS
250

Economic Policy Uncertainty and Bank Credit Standards

$$\mathrm{DI}_t = \beta_0 + \beta_1 \cdot \Delta\mathrm{FFR}_t^{real} + \beta_2 \cdot \Delta_2\mathrm{LEI}_t + \beta_3 \cdot \mathrm{CPTR}_t \qquad \text{(specification)}$$
$$+ \beta_4 \cdot \Delta4\mathrm{DEL}_t + \beta_5 \cdot \Delta_2\mathrm{MFore}_{t-1} + \beta_6 \cdot \mathrm{EPU}_t + \varepsilon_t$$
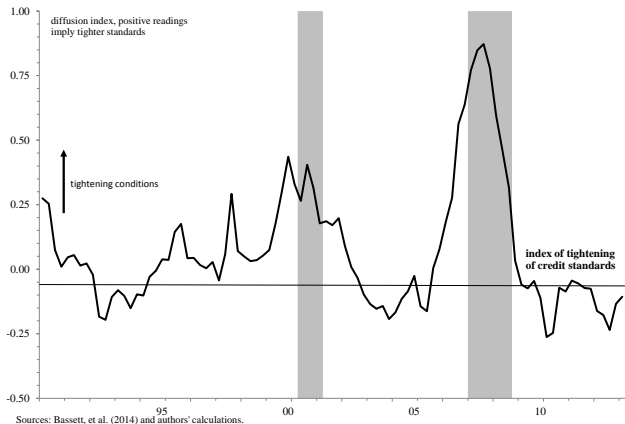
Expectations

- $\frac{\partial \mathrm{DI}_t}{\partial \Delta\mathrm{FFR}_t^{real}} = \beta_1 > 0 \Rightarrow$ credit standards tighten with increases in fed funds rate

- $\frac{\partial \mathrm{DI}_t}{\partial \Delta_2\mathrm{LEI}_t} = \beta_2 < 0 \Rightarrow$ positive LEI ease credit standards

- $\frac{\partial \mathrm{DI}_t}{\partial \mathrm{CPTR}_t} = \beta_3 > 0 \Rightarrow$ financial system stress tightens credit standards

- $\frac{\partial \mathrm{DI}_t}{\partial \Delta4\mathrm{DEL}_t} = \beta_4 > 0 \Rightarrow$ default (all loans) raises credit standards

- $\frac{\partial \mathrm{DI}_t}{\partial \Delta_2\mathrm{MFore}_{t-1}} = \beta_5 > 0 \Rightarrow$ default (mortgages) tightens credit conditions

- $\frac{\partial \mathrm{DI}_t}{\partial \mathrm{EPU}_t} = \beta_6 > 0 \Rightarrow$ uncertainty about economic policy tightens credit standards

$$\mathrm{DI}_t = \underset{(0.57)}{-0.040} + \underset{(1.42)}{0.035} \cdot \Delta\mathrm{FFR}_t^{real} - \underset{(3.06)}{0.793^{\star\star}} \cdot \Delta_2\mathrm{LEI}_t + \underset{(2.76)}{0.138^{\star\star}} \cdot \mathrm{CPTR}_t \quad \text{(estimate)}$$

$$+ \underset{(3.21)}{0.099^{\star\star}} \cdot \Delta4\mathrm{DEL}_t + \underset{(2.64)}{0.218^{\star}} \cdot \Delta_2\mathrm{MFore}_{t-1} + \underset{(2.02)}{0.655^{\star}} \cdot \mathrm{EPU}_t$$

RUTGERS
250

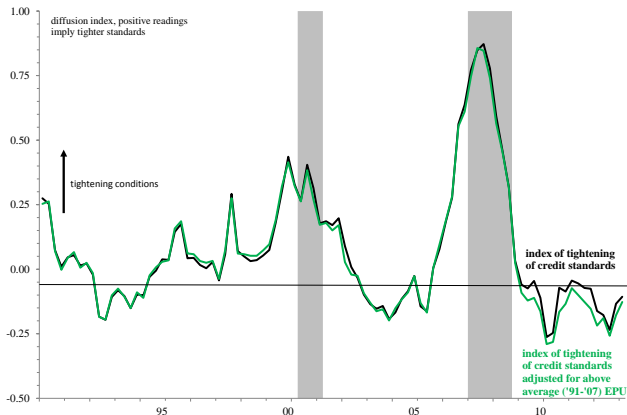# Economic Policy Uncertainty and Bank Credit Standards

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 DI_t
⇒ 0.5 percentage points real GDP ↓ cumulative after 10 quarters

Sources: Bassett, et al. (2014) and authors' calculations.

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 ≈ 2/3 of s.d. shocks to DI_t
⇒ 0.5 percentage points real GDP ↓ cumulative after 10 quarters

diffusion index, positive readings imply tighter standards

tightening conditions

index of tightening of credit standards

index of tightening of credit standards adjusted for above average ('91-'07) EPU

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.

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.