

Politics vs. the Economy: When Policy Uncertainty Curbs Economic Growth

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Based on Research with
Scott Baker & Nick Bloom

*Research Institute of Industrial Economics
Stockholm, 16 December 2015*

Does policy uncertainty curb economic growth?

Recent Episodes

- United States, policy conflicts and political polarization, 2008-2013
- Sovereign debt and financial crises in the Eurozone area
- Russia, military and geopolitical conflicts
- Recent flood of migrants into Europe from the Middle East and North Africa

How Might Policy-Related Uncertainty Hold Back the Economy?

- Greater economic policy uncertainty (EPU) can deter/delay investment and hiring when they are costly to reverse
- Greater EPU can raise the cost of debt and equity finance, discouraging investment
- Greater EPU can lead households to behave more cautiously and reduce spending
- When managers are risk averse, greater EPU can also lead businesses to behave more cautiously

Not an exhaustive list.

Today's Talk

1. Quantify economic policy uncertainty (EPU) based on newspaper coverage.
2. Evaluate our approach and cross-check against other measures and methods.
3. Look at the relationship of immigration fears to policy uncertainty
4. Summarize our evidence on policy uncertainty and economic performance
5. Conclusions

What Do Our Measures Seek 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 Indices rely on computer-automated newspaper searches

How it works for the United States:

- 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}

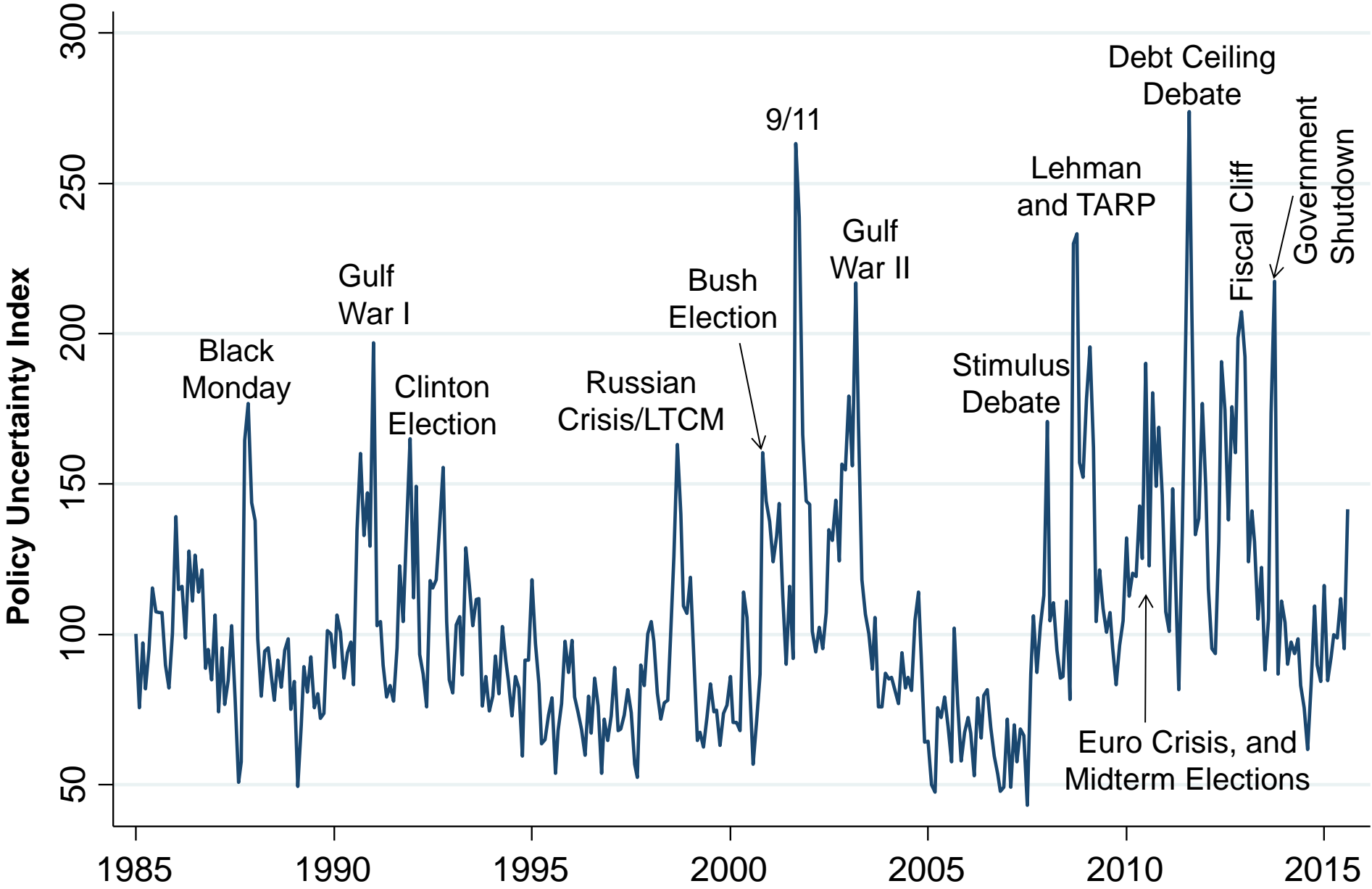
U: {uncertain or uncertainty}

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



U.S. Newspaper-based EPU Index, 1985 to Sep. 2015



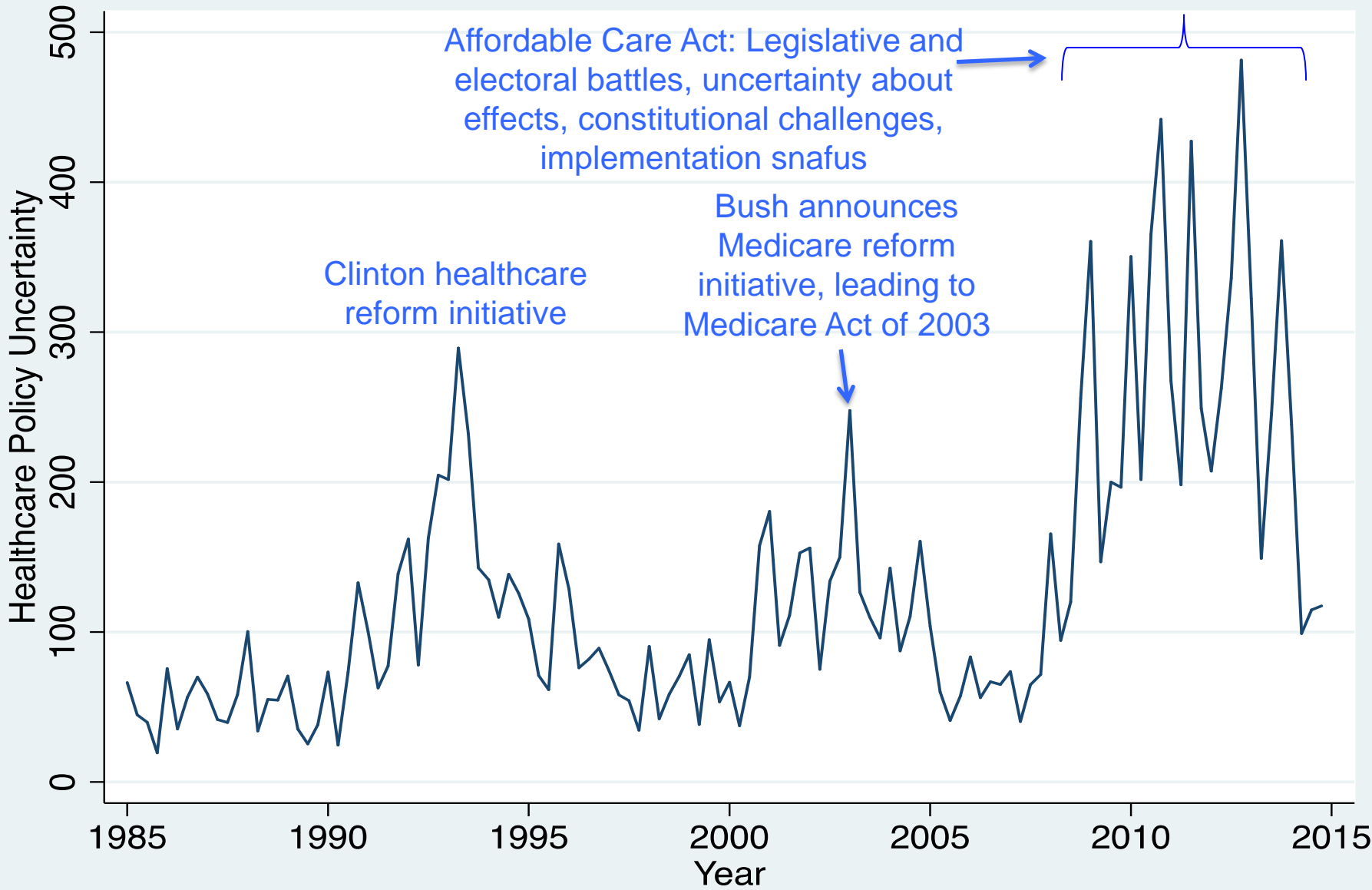
Source: "Measuring Economic Policy Uncertainty" by Scott R. Baker, Nicholas Bloom and Steven J. Davis, all data at www.policyuncertainty.com. Data normalized to 100 prior to 2010.

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

	1985-2007	2008-2012	Change
Taxes	35.2	61.1	25.9
Health care	12.7	33.3	20.6
Regulation	14.9	28.4	13.6
Social Security	10.3	19.4	9.1
Government spending	15.0	23.9	8.9
Sovereign debt, currency crisis	1.4	2.8	1.4
Monetary policy	29.0	27.6	-1.5
National security	25.3	19.9	-5.4

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.

Figure 3: Healthcare Policy Uncertainty Index, 1985 to 2014, Quarterly



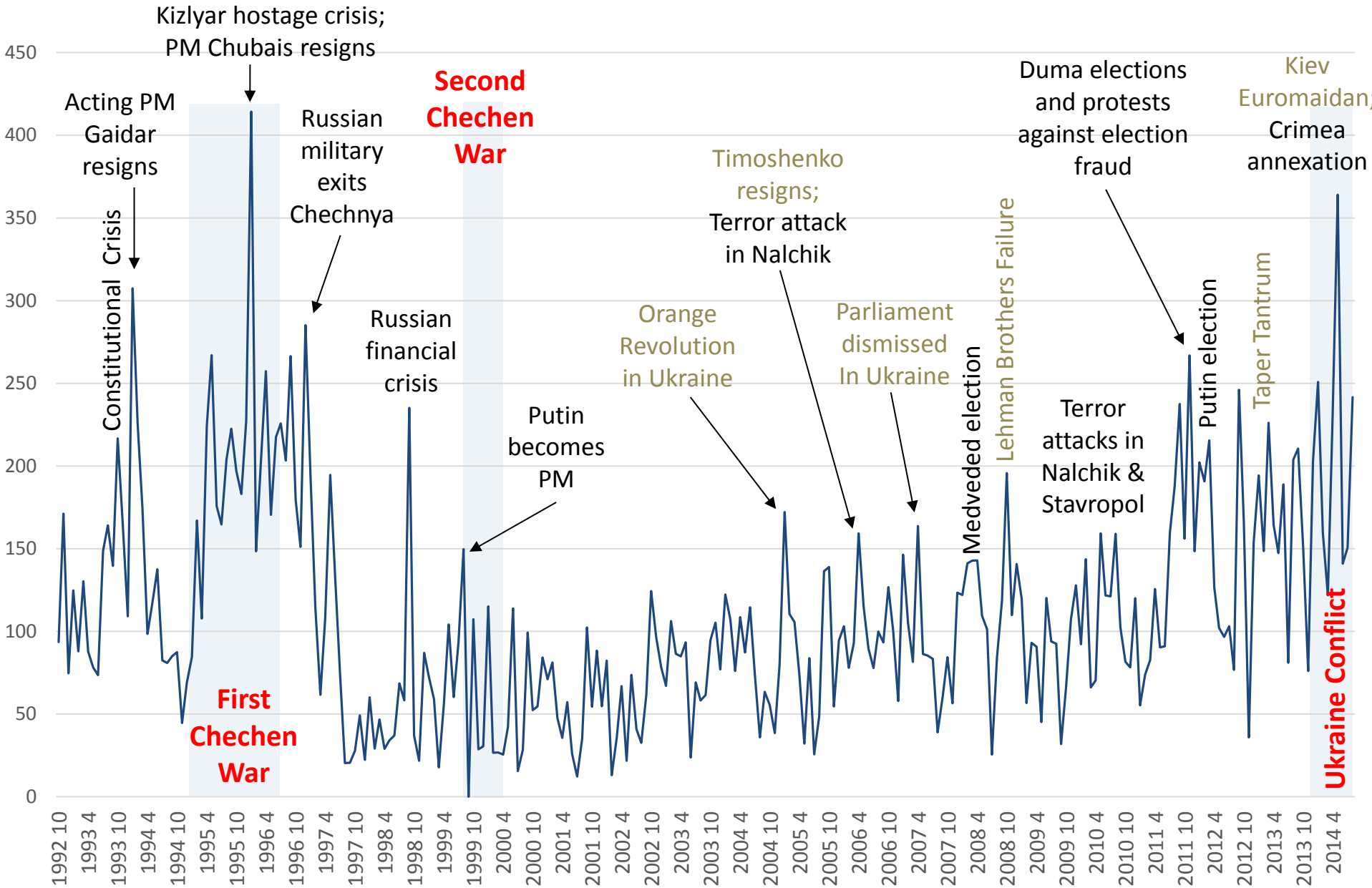
Clinton healthcare reform initiative

Bush announces Medicare reform initiative, leading to Medicare Act of 2003

Affordable Care Act: Legislative and electoral battles, uncertainty about effects, constitutional challenges, implementation snafus

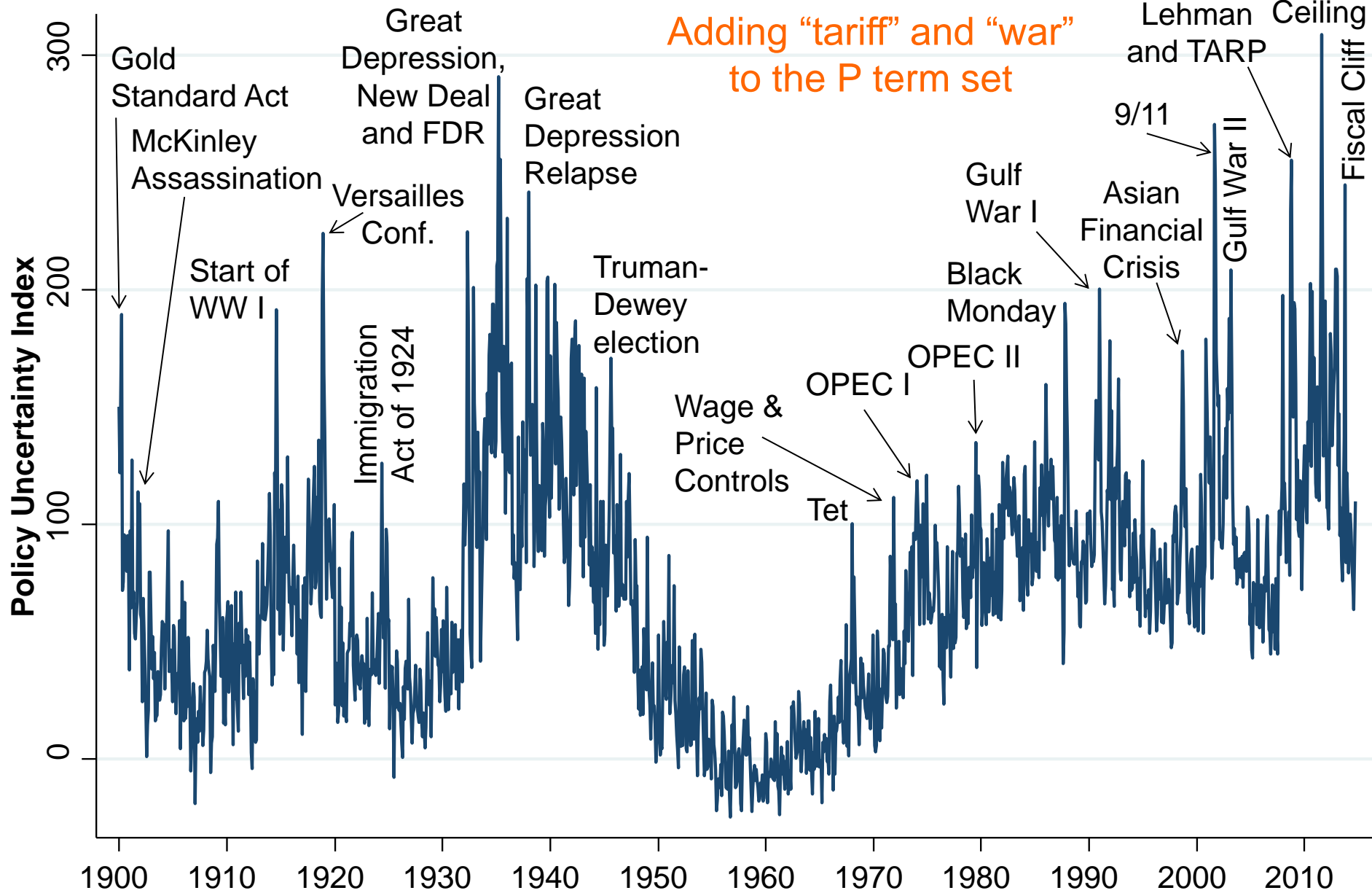
Notes: The index reflects the frequency of newspaper articles about economic policy uncertainty *and* healthcare policy matters, as indicated by terms like “healthcare,” “hospital,” “health insurance,” and “Medicare.” Data are from Baker, Bloom and Davis (2015) and are available and updated monthly at www.PolicyUncertainty.com. Normalized to a mean of 100 from 1985 to 2009.

EPU Index for Russia, October 1992 to August 2014



Source: www.policyuncertainty.com. Data from Kommersant daily newspaper (1992-2014)

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



Adding "tariff" and "war" to the P term set

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.

Evaluating Our Measurement Approach

A) Market-Use Test

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

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Audit Methodology: Main Steps

1. Download all NY Times, LA Times, and SF Chronicle articles from 1985 to 2012 that pass our Economic

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
4. For each of the 172 subsamples, get reviewed by the audit methodology.
5. In summary, per paper.
6. Lastly, reviewed

Auditing the Sampled Articles, 2

3. If yes to 2, then identify the policy category (checking all that apply):
 - Monetary policy
 - Labor regulations
 - Government spending
 - National security and terrorism
 - 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 mentioning the policy etc... For mention under c

True Positive 2

ATHENS — In the year since Greece received its first financial bailout, many things have changed. The country has reduced its budget deficit by 5 percent of gross domestic product. Workers have been hit by wage freezes and pension cuts, prompting a growing popular outcry. The state has revealed for the first time how many people it employs, and tax collectors can now cross-reference swimming pool permits with property records to determine wealth and

LINKEDIN
EMAIL
PRINT
SINGLE PAGE
REPRINTS

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

False Positive 5

Our Love Affair With Malls Is on the Rocks

"There are days now when I make \$160 and think I had a good day," says Mark Classen, co-owner of Just Does! Gourmet, a store in the mall that sells, among other items, signs

Code as EPU = 0, because the article does not mention any aspects of uncertainty

False Negative 4

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

By MARY A. URLIO, Special to The New York Times
Published: January 20, 1991

After months of high-level talks, the United States, Mexico and Canada have reached agreement to include Canada in negotiations toward a continentwide North American free-trade zone, diplomats and trade officials said today.

"The agreement, which could be announced as early as this week, would make Canada a direct participant in talks that have been under discussion by the United States and Mexico since the middle of last year.

The negotiations envisioned in the agreement would seek to bind the three countries' economies in a common market that would include more than 350 million people and would be larger than the European Community. Such a huge unhindered market would encompass interests as diverse as the machine shops of northern Mexico, the financial district of New York and the farmlands of western Canada.

"Everything is ready," one diplomat said, describing preparations for the three-way talks. "It's just a matter of making the formal announcement."

Speculation about the possibility of continentwide free-trade negotiations has been strong since last year, when President Carlos Salinas de Gortari formally requested free-trade talks with the United States.

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-Mexican talks, which were considered a high priority by both countries.

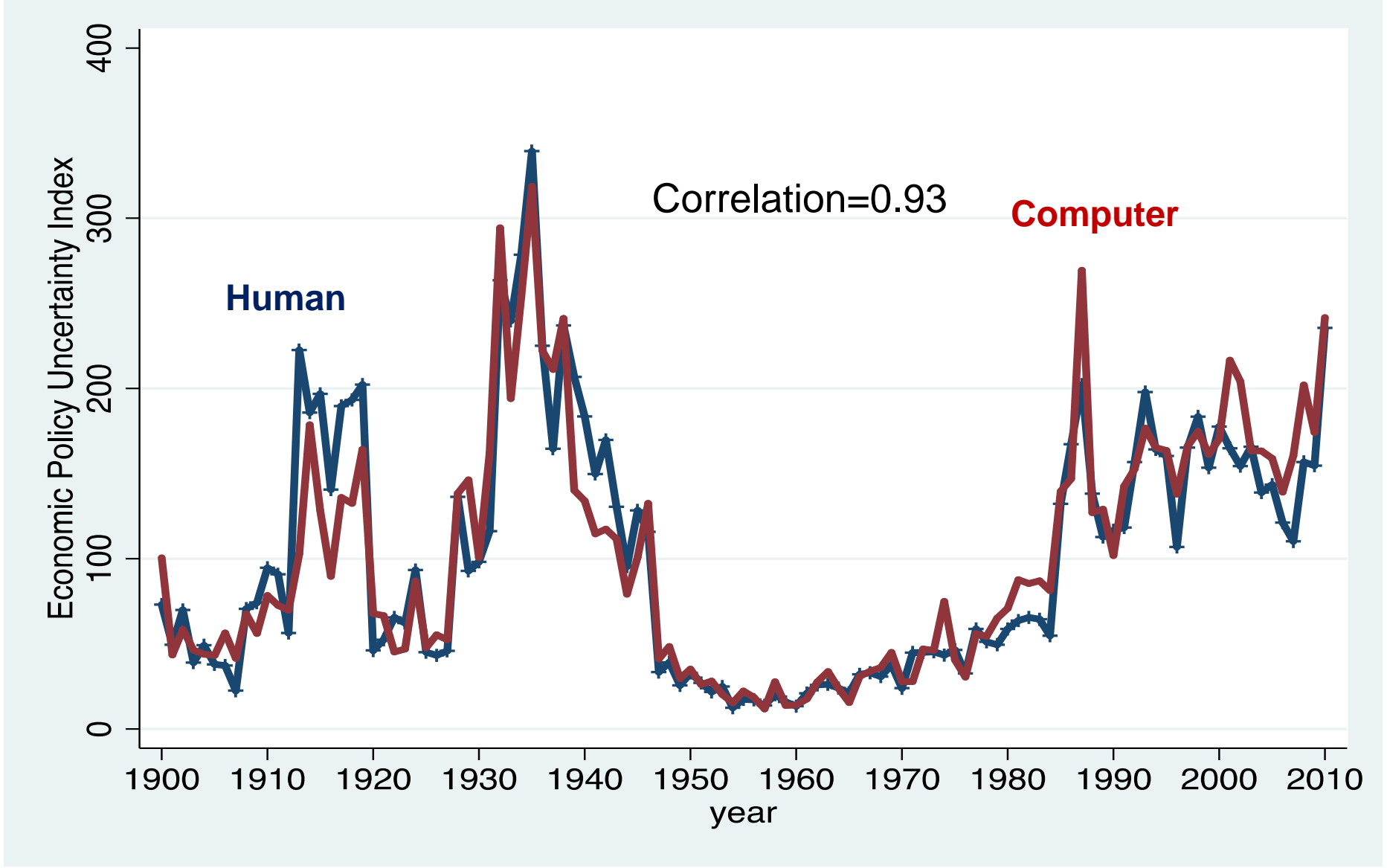
President Salinas has sought to conclude a free-trade pact quickly to accelerate the economic growth that has become a hallmark and a crucial test of his administration. President Bush has also made an accord a central economic objective and has sought to complete it before it could become embroiled in the politics of the 1992 Presidential election year.

Code as EPU = 1, because the article mentions uncertainty over the trade policy in North America. The automated search incorrectly codes the article as EPU = 0, because it never mentions any of the terms in the "policy" part of our search filter.

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)

Human and Computer EPU Indices, 1900-2010, Annual

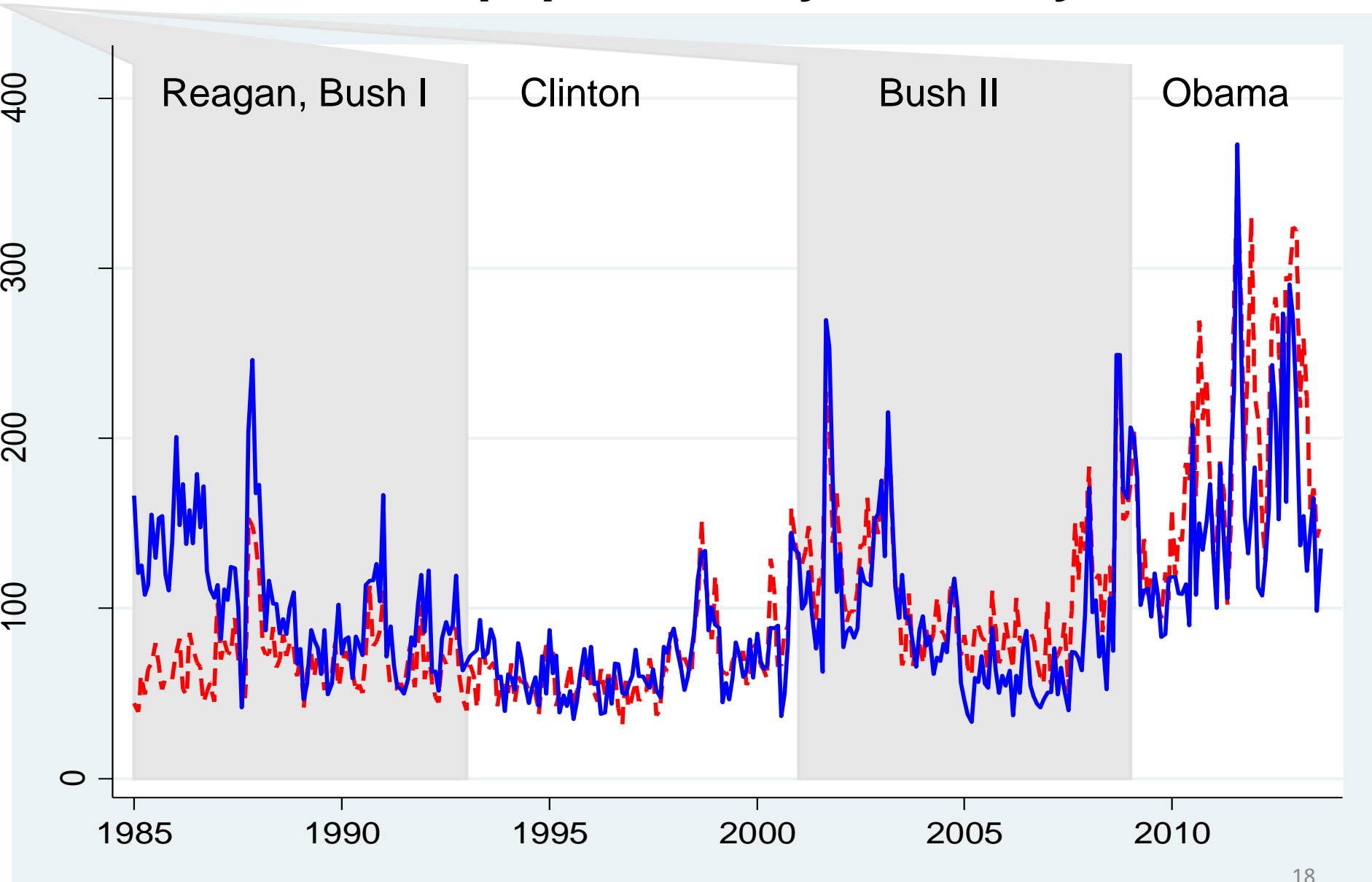


Notes: Index comparison from 1900 to 2010 based on 11,841 articles (15,156 audits) in the Chicago Tribune, Dallas Morning News, LA Times, Miami Herald, NY Times, San Francisco Chronicle, Washington Post and Wall Street Journal. Series plotted yearly to reduce sampling variability, with an average of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

Other Selected Results from the Audit Study

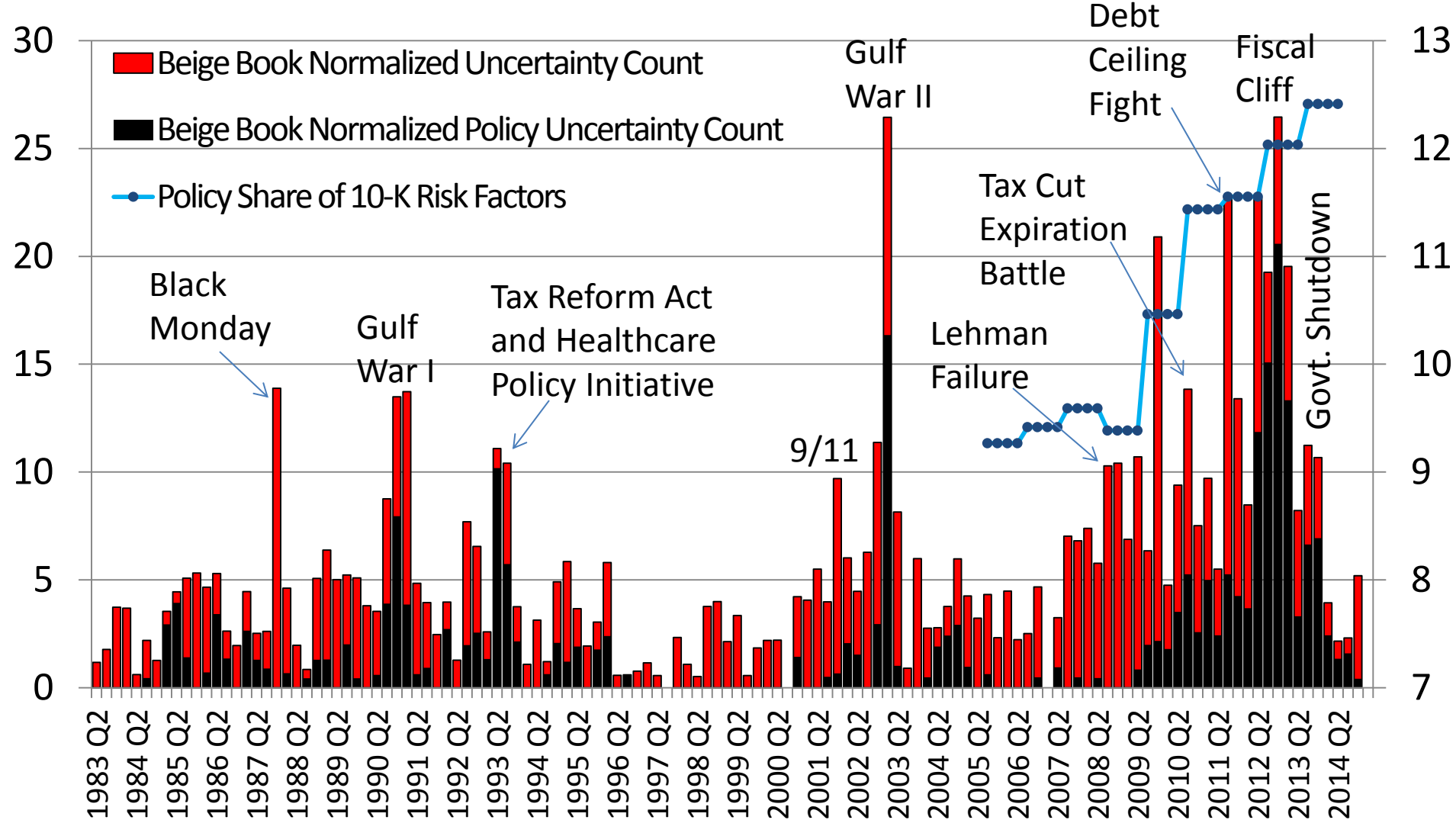
- Only 5% of articles with $EPU^H = 1$ mainly discuss actual or prospective declines in policy uncertainty.
- 10% of $EPU^H = 1$ articles discuss uncertainty about **who** will make economic policy decisions, 68% discuss uncertainty about **what** policies will be undertaken or **when**, and 47% discuss 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.

Immigration Fears and Policy Uncertainty

Constructing Migration-Related Indices

Five term sets

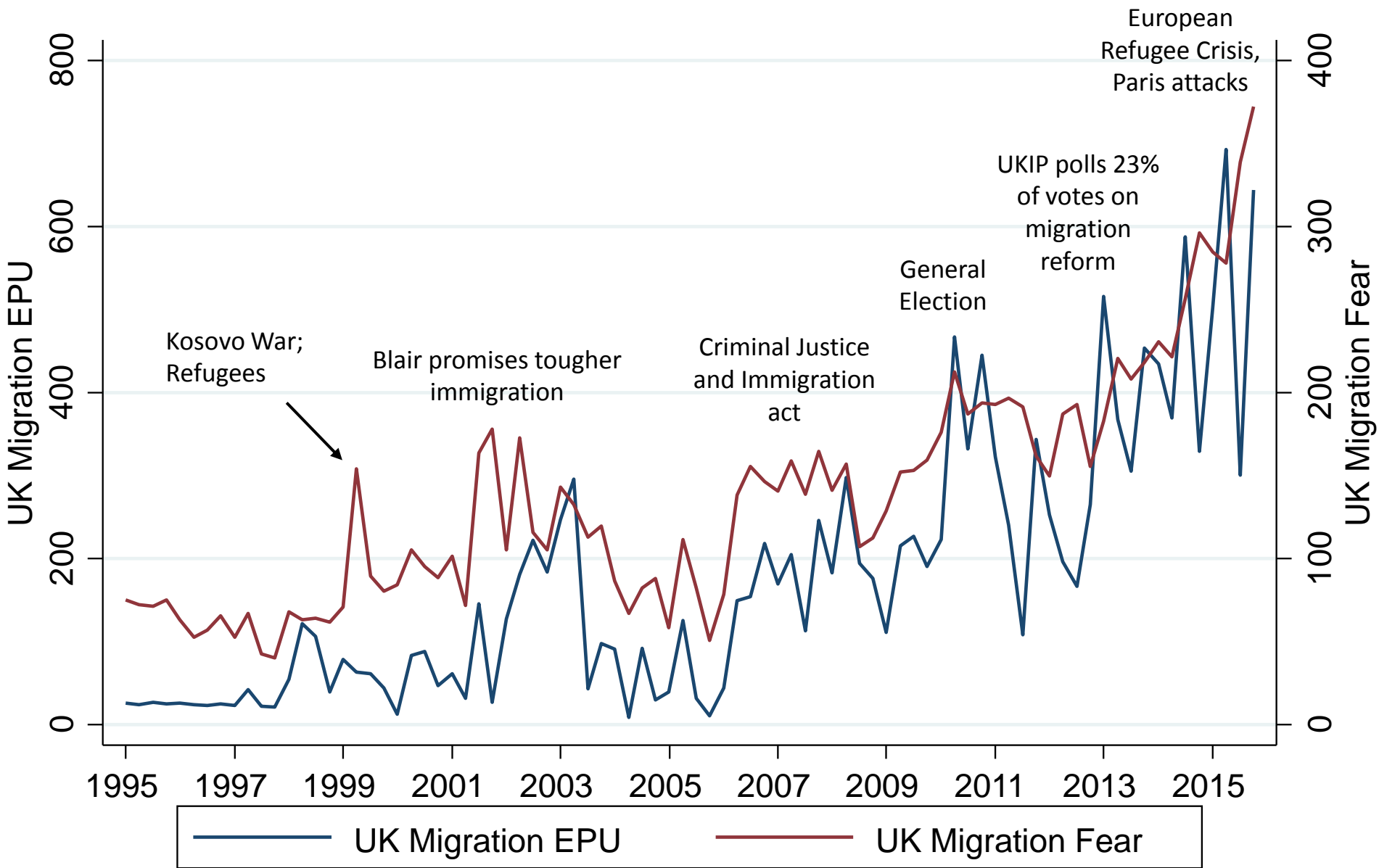
E, P and U, as before, plus:

F(ear): {anxiety, panic, bomb, fear, crime, terror, worry, concern, violent }

M(igration): {"border control", Schengen, "open borders", migrant, migration, asylum, refugee, immigrant, immigration, assimilation, "human trafficking" }

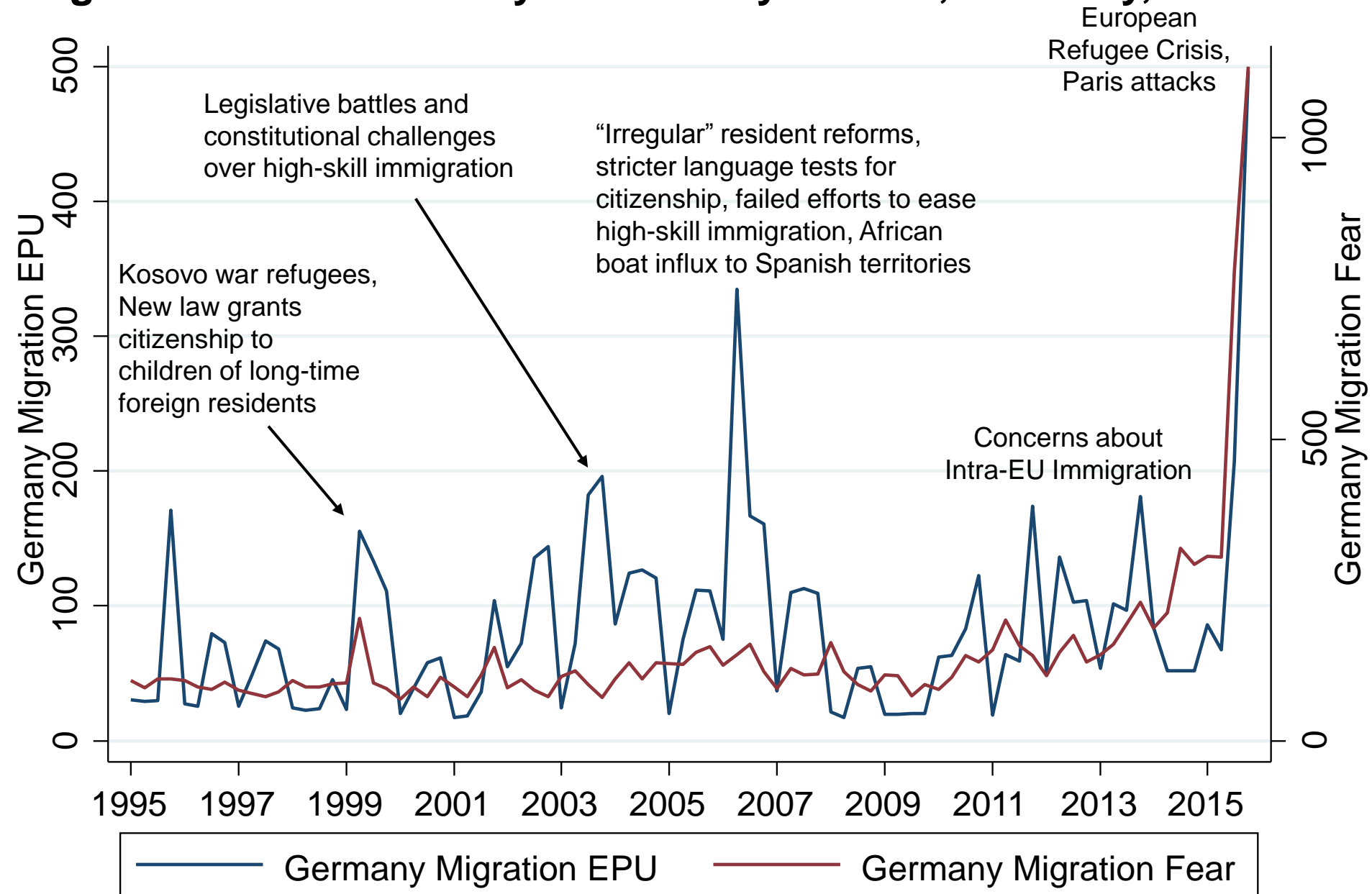
- To construct a Migration Fear Index, count articles that contain at least one term from each of **M** and **F**.
- To construct a Migration Policy Uncertainty Index, count articles that contain at least one term from each of **M**, **E**, **P** and **U**.
- Scale the counts and normalize in the same way as before.
- We have constructed Migration Fear and Policy Uncertainty Indices for France, Germany, the U.K. and the U.S.

Migration Fear and Policy Uncertainty Indices, United Kingdom, 1995-2015



Notes: The Migration Policy Uncertainty Index reflects scaled quarterly counts of articles in the Financial Times and the Times of London that satisfy the M, E, P and U criteria. Similarly, the Migration Fear Index reflects scaled quarterly counts that satisfy the M and F criteria. We obtain article counts on 30 November 2015 and normalize each index to 100 from 1995 to 2011.

Migration Fear and Policy Uncertainty Indices, Germany, 1995-2015



Notes: The Migration Policy Uncertainty Index reflects scaled quarterly counts of articles in Frankfurter Allgemeine Zeitung and Handelsblatt that satisfy the M, E, P and U criteria. Similarly, the Migration Fear Index reflects scaled quarterly counts that satisfy the M and F criteria. We obtain article counts on 30 November 2015 and normalize each index to 100 from 1995 to 2011.

What Do The Migration Indices Tell Us?

- European countries show unprecedented levels of migration-related worries in recent months.
- The United States shows a much more modest elevation of migration-related fears in late 2015, despite much attention to immigration and border control issues among U.S. presidential candidates.
- Since 2005, migration-related fears have trended upward strongly in the United Kingdom (alongside rising levels of actual migration)
- Migration related fears rose in France around 2005, while migration-related fears in Germany do not show persistent upward movements until 2014.

What Do The Migration Indices Tell Us?

- The data strongly suggest that migration-related fears can spillover into policy uncertainty.
- The “spillover” effect illustrates a broader pattern that we see in our measures of overall economic policy uncertainty for a dozen countries:
 - Large unforeseen shocks can present policy makers with extraordinary challenges.
 - Questions about how policy makers will respond and what will be the consequences then become an important source of economic uncertainty.

What Do The Migration Indices Tell Us?

- The Schengen zone arrangements do not seem well-equipped to handle Europe's huge recent immigration flows, contributing to the high levels of migration-related fears and policy uncertainty.
- This experience and serial Eurozone crises in recent years illustrate how the institutional setting and policy-making environment can influence the extent to which negative shocks and developments lead to bad outcomes, difficult policy challenges, and high levels of policy uncertainty.

Assessing the Effects of Economic Policy Uncertainty

- Country-level time-series evidence
- Firm-level panel regressions

Country-Level Time-Series Evidence

- BBD (2015a) fit standard time-series statistical models to data for 12 countries with EPU indices.
- EPU “shocks” foreshadow deteriorations in macroeconomic performance, as reflected by investment, employment and output measures.
- The effects are material, but moderate, in size.
- The right interpretation of these statistical results is unclear. Two possibilities:
 - Higher EPU causes the negative statistical effects
 - EPU shocks coincide with other negative developments that are not (fully) captured by the other variables in our statistical model, and the other developments cause the deterioration.

Firm-Level Regressions

- Micro data offer more scope to control for confounding factors and to identify causal effects.
- But, depending on the nature of the micro data, they may capture only a limited range of possible channels through which EPU affects performance.
- We use firm-level micro data to investigate the effects of EPU on firm-level stock-price volatility, investment rates and employment growth rates.
- Our approach exploits large differences across firms in exposure to policy factors (government spending and regulations). We investigate whether firms with greater exposure see larger responses to movements in our EPU index.

Exploiting differences across firms in share of revenues from sales to the federal government.

Use Federal Registry of Contracts data from 2000-2013 matched to Compustat firms (using Compustat parent + D&B subsidiary names). Add government share of healthcare spending.

- 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 a small share of revenues in most other industries.

Summary of Firm-Level Regression Results

- High EPU raises firm-level stock-price volatility in sectors with heavy reliance on government spending (e.g., healthcare, defense-related industries, infrastructure investments) and high exposure to regulation (e.g., healthcare, financial services).
- High EPU lowers firm-level investment rates and employment growth rates in sectors with heavy reliance on government spending.
- These effects on firm-level stock-price volatility, investment rates, and employment growth rates are sizable in sectors with high exposure to policy.

Four 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. The institutional setting and policy-making environment strongly influences whether unforeseen shocks and developments trigger high levels of policy uncertainty.
3. Econometric evidence indicates that:
 - Positive EPU innovations foreshadow lower investment, output and employment at the national level.
 - EPU raises firm-level stock-price volatility and reduces hiring & investment in sectors with high exposure to policy
4. Textual analysis of newspapers offers a powerful means of creating new economic data and testing hypotheses.

Our Data Are Online at www.PolicyUncertainty.com



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Data

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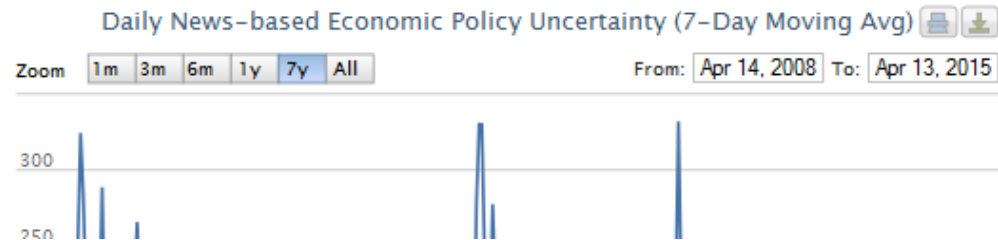
[European Monthly Index](#)

[Canadian Monthly Index](#)

[Chinese Monthly Index](#)

Economic Policy Uncertainty Index

We develop indices of economic policy uncertainty for the world's major economies.



- 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
- Migration-related Fear and Policy Uncertainty Indices for France, Germany, the U.K., and the U.S.

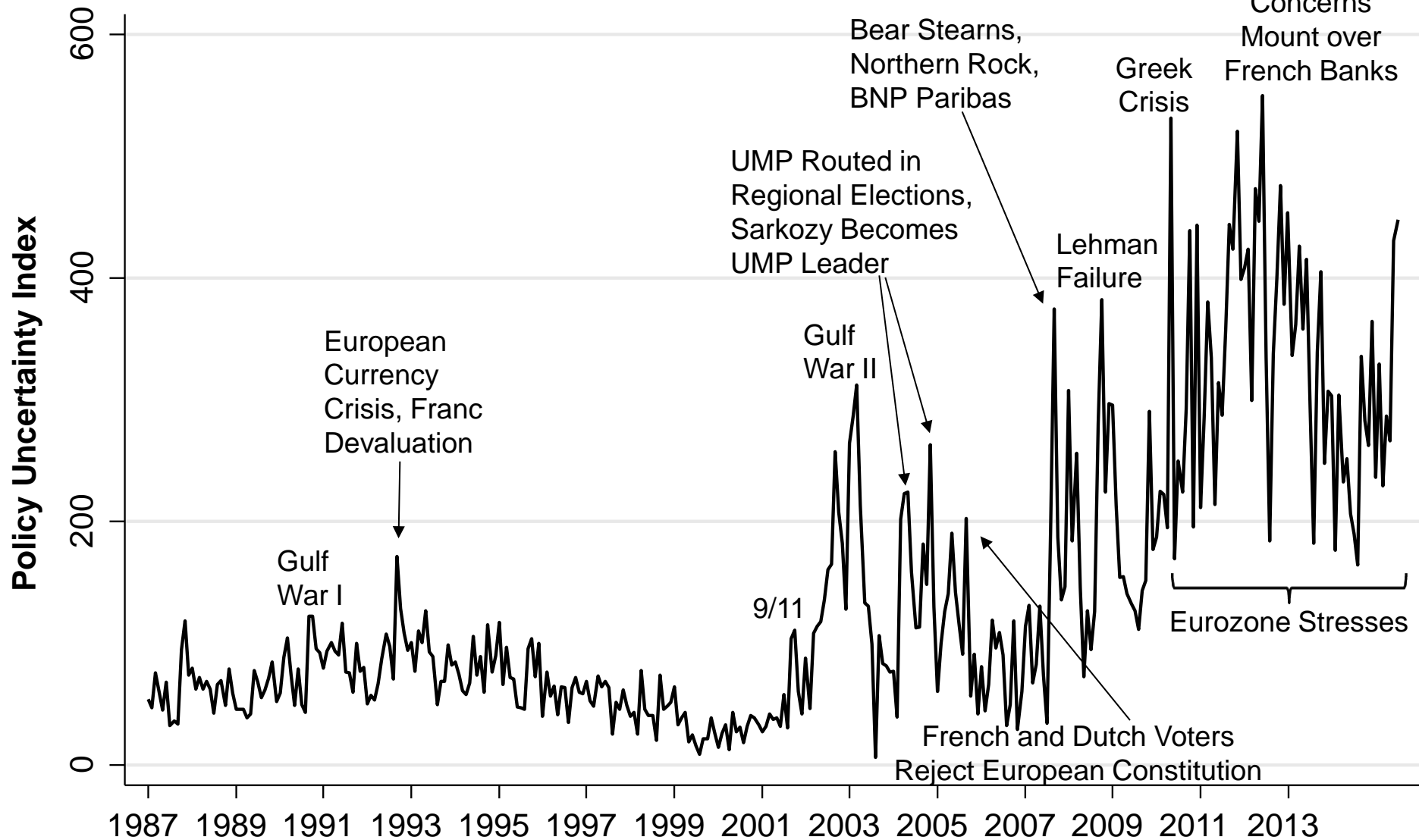
**Additional Slides –
Not for Prepared Remarks**

Sources for this Presentation

- Baker, Bloom, Canes-Wrone, Davis and Rodden, 2014. “Why Has U.S. Policy Uncertainty Risen Since 1960?” *American Economic Review Papers & Proceedings*, May 2014.
- Baker, Bloom and Davis, 2012. “Has Economic Policy Uncertainty Hampered the Recovery?” in *Government Policies and the Delayed Economic Recovery*, edited by Lee Ohanian, John B. Taylor and Ian Wright, Hoover Institution Press.
- Baker, Bloom and Davis, 2015a. Measuring Economic Policy Uncertainty,” NBER Working Paper No. 21633.
- Baker, Bloom and Davis, 2015b. “Immigration Fears and Policy Uncertainty,” with Scott Baker and Nicholas Bloom, *VoxEU*, forthcoming.
- Davis, “Regulatory Complexity and Policy Uncertainty: Headwinds of Our Own Making,” 2015.

These papers and more available at <http://www.policyuncertainty.com/research.html>.

EPU Index for France, January 1987 to July 2015

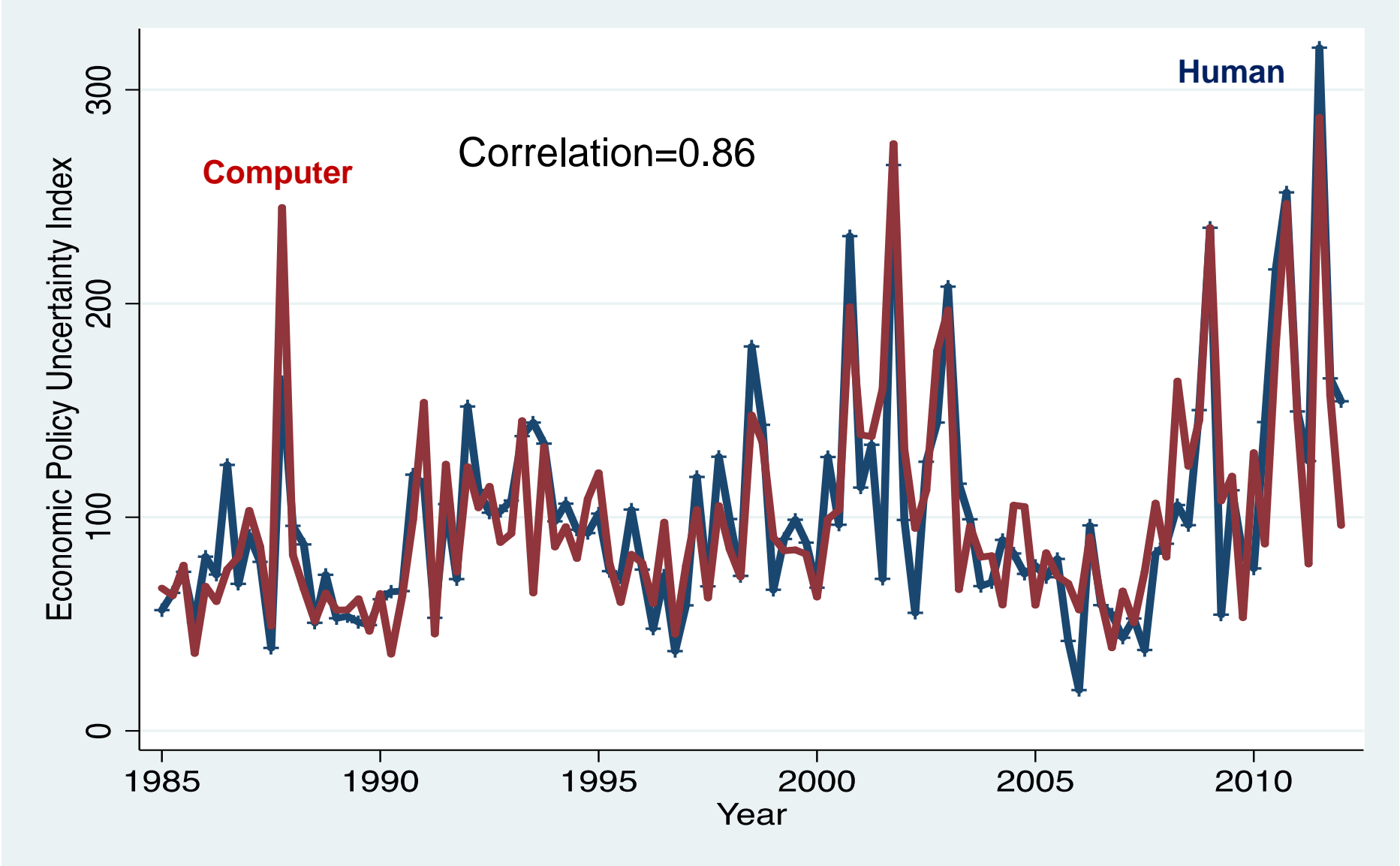


Notes: Index reflects scaled monthly counts of articles containing 'uncertain' or 'uncertainty', 'economic' or 'economy', and one or more policy-relevant terms: 'tax', 'policy', 'regulation', 'spending', 'deficit', 'budget', or 'central bank'. The series is normalized to mean 100 from 1997 to 2009 and based on the following newspapers: Le Monde and Le Figaro.

Audit Process Overview

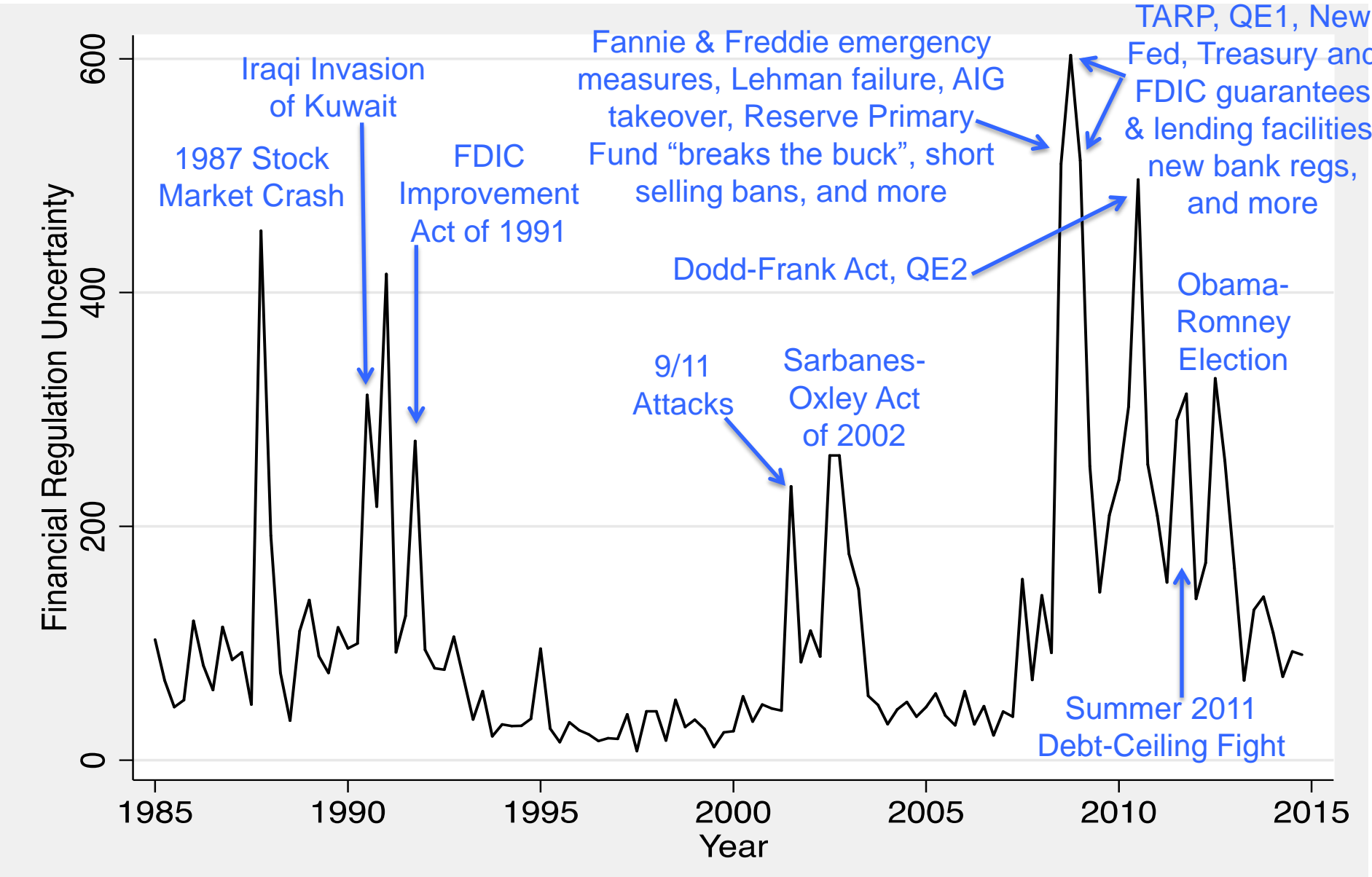
1. The authors first read and discussed a few hundred randomly selected “EU” articles to develop a coding template, training process, and draft audit guide.
2. Pilot study of 2,000 EU articles by authors and RAs to improve training process, refine coding template, expand and improve audit guide, and 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

Human and Computer EPU Indices, 1985 to 2012, Quarterly



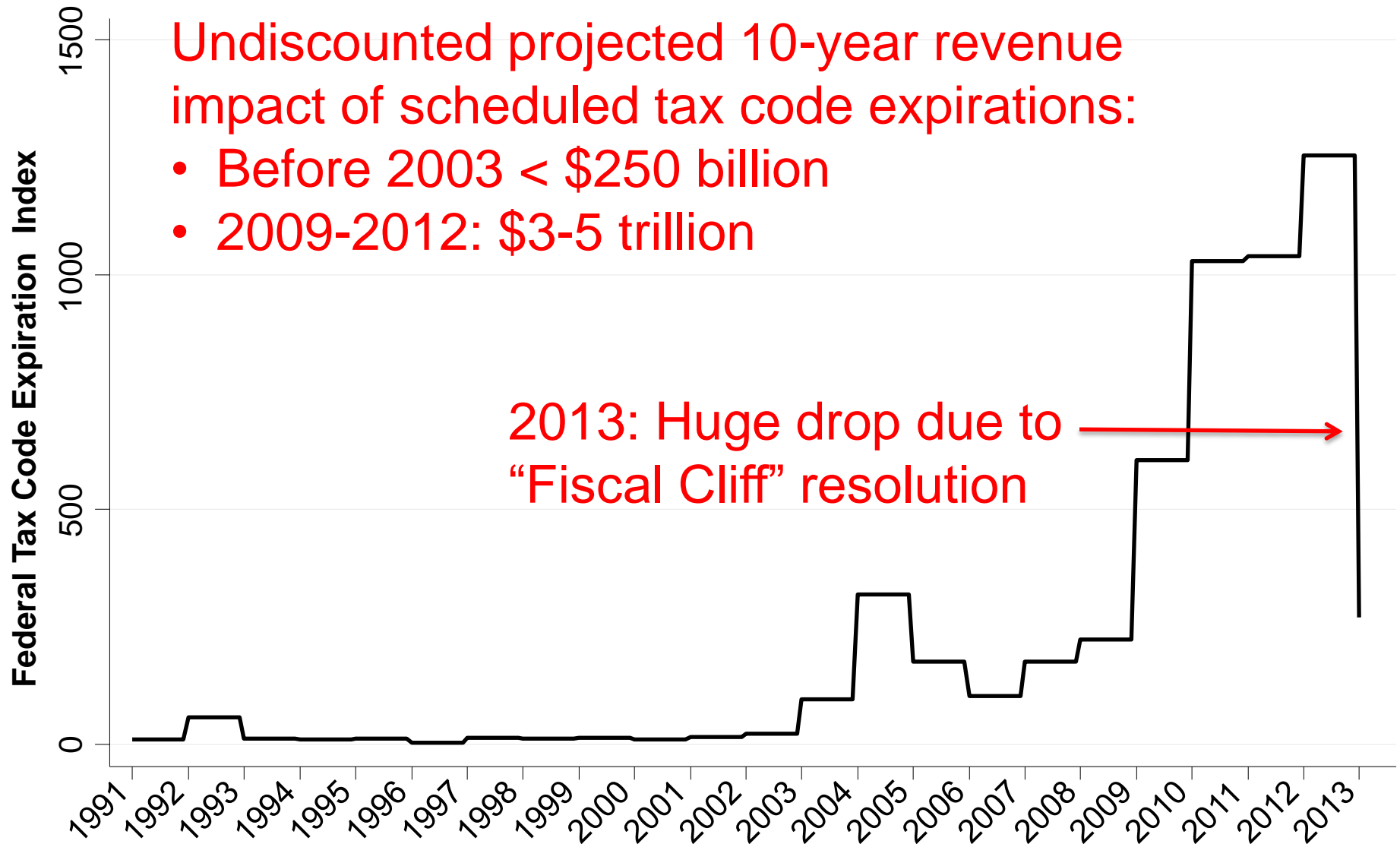
Notes: Index comparison from 1985 Q1 to 2012 Q1 based on 3,723 articles (4,388 audits) in the Chicago Tribune, Dallas Morning News, LA Times, Miami Herald, NY Times, San Francisco Chronicle, Washington Post and Wall Street Journal. Series are plotted quarterly to reduce sampling variability, with an 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 4: Financial Regulation Uncertainty Index, 1985 to 2014, Quarterly



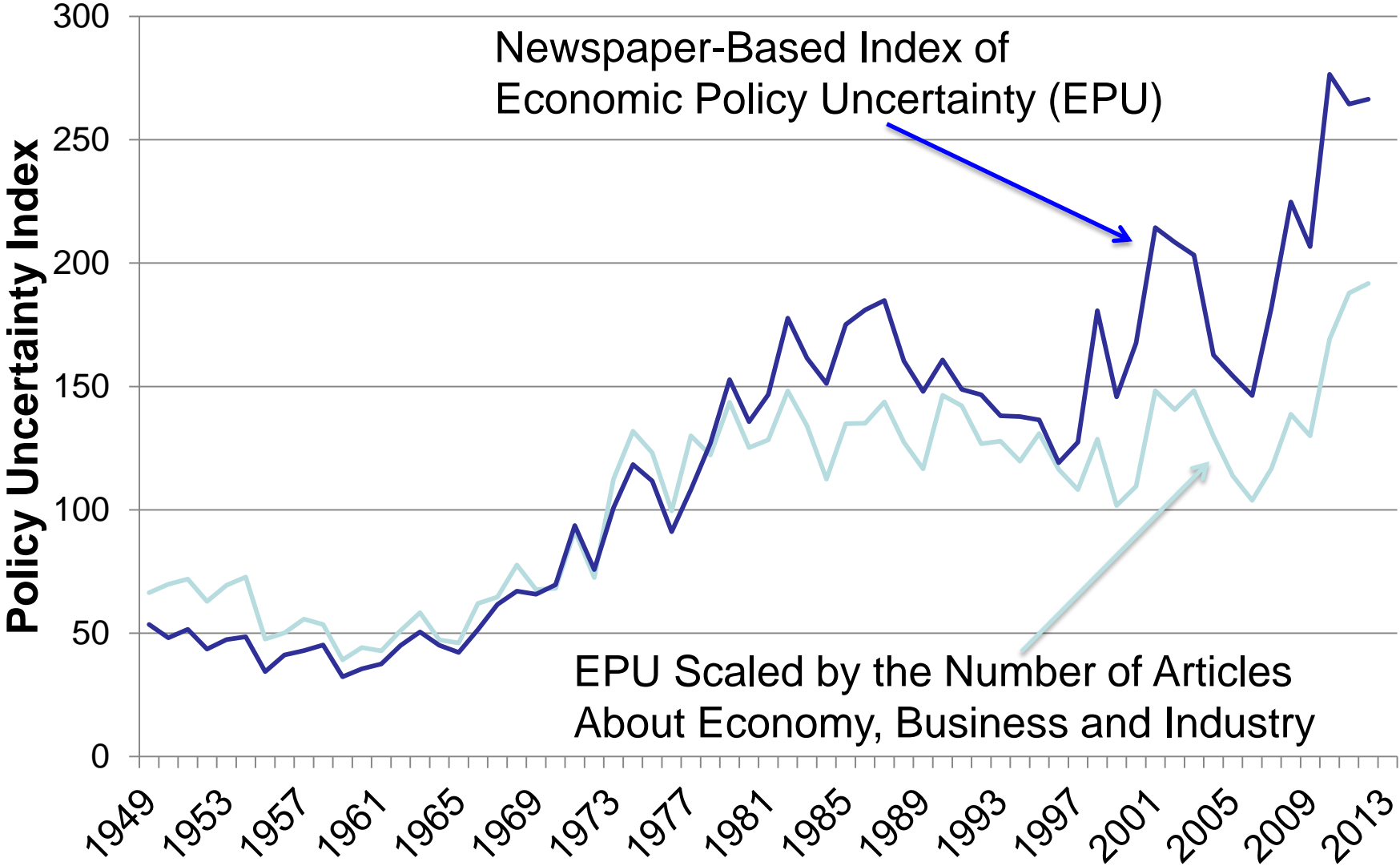
Notes: The index reflects the frequency of newspaper articles about economic policy uncertainty *and* financial regulatory matters, as indicated by terms like "bank(ing) supervision," "Glass-Steagall," and "Dodd-Frank." Data are from Baker, Bloom and Davis (2015) and are available and updated monthly at www.PolicyUncertainty.com. Normalized to a mean of 100 from 1985 to 2009.

Figure 5: Federal Tax Code Expirations Index, 1991-2013



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 $T=0,1,\dots,10$ years. Index normalized to a mean of 100 before 2010. This chart is reproduced from earlier drafts of Baker, Bloom and Davis (2015).

Figure 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.

Why the big run-up in U.S. EPU? Unclear, but see our work with political scientists Jonathan Rodden and Brandice Canes-Wrone and slides at back.

American Economic Review: Papers & Proceedings 2014, 104(5): 1–7
<http://dx.doi.org/10.1257/aer.104.5.1>

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

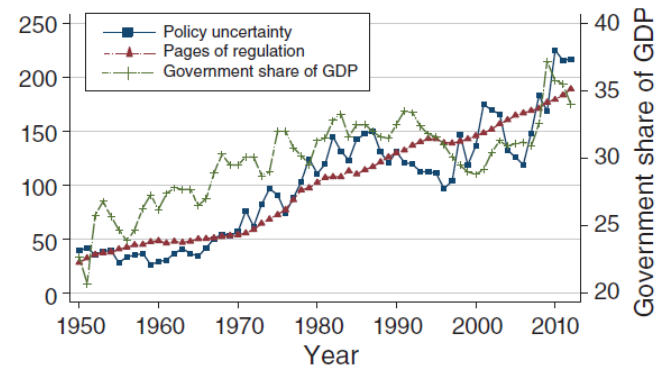
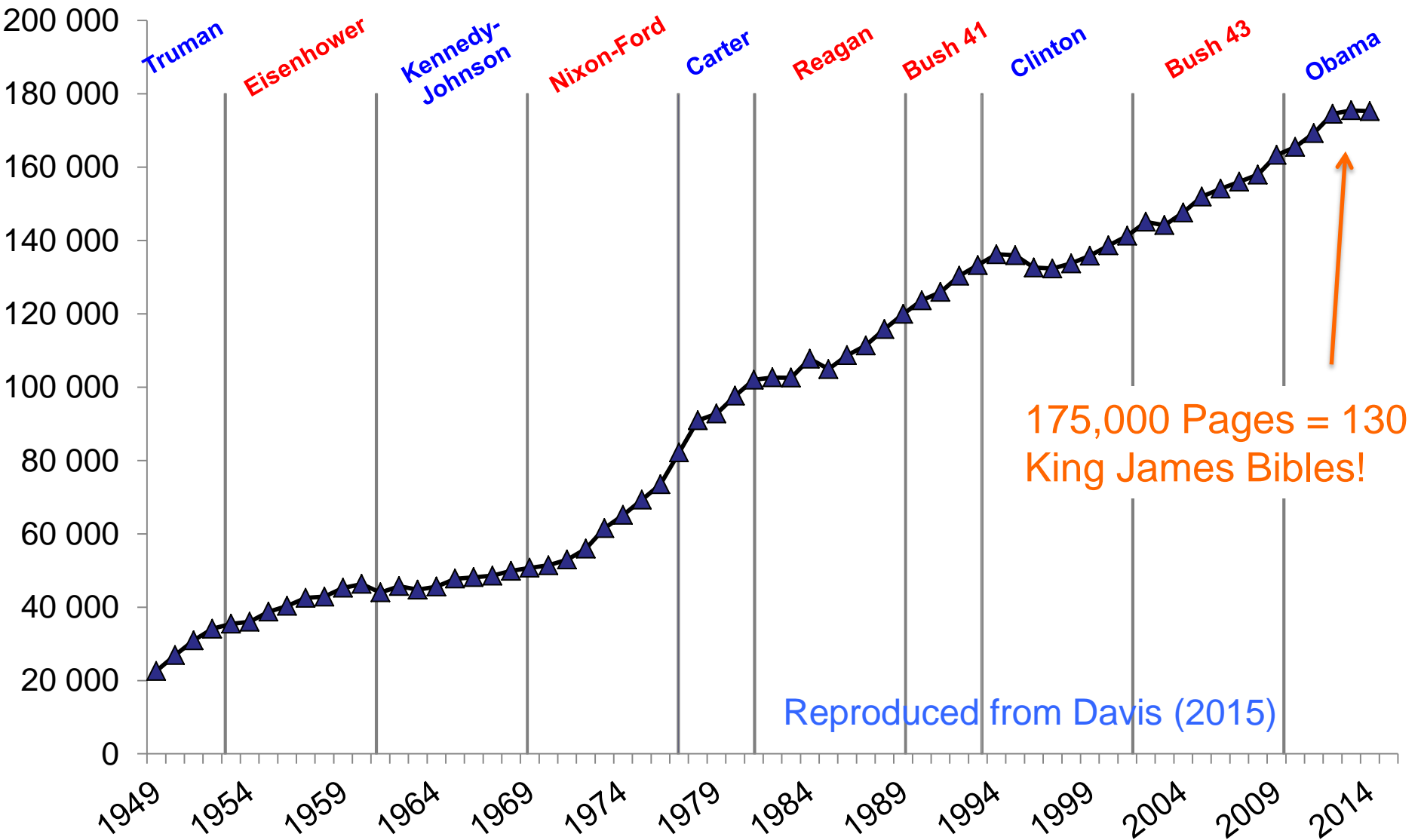


FIGURE 1. US ECONOMIC POLICY UNCERTAINTY AND GOVERNMENT ACTIVITY

Notes: US Economic Policy Uncertainty Index from Baker, Bloom, and Davis (2013); total government spending (fed-

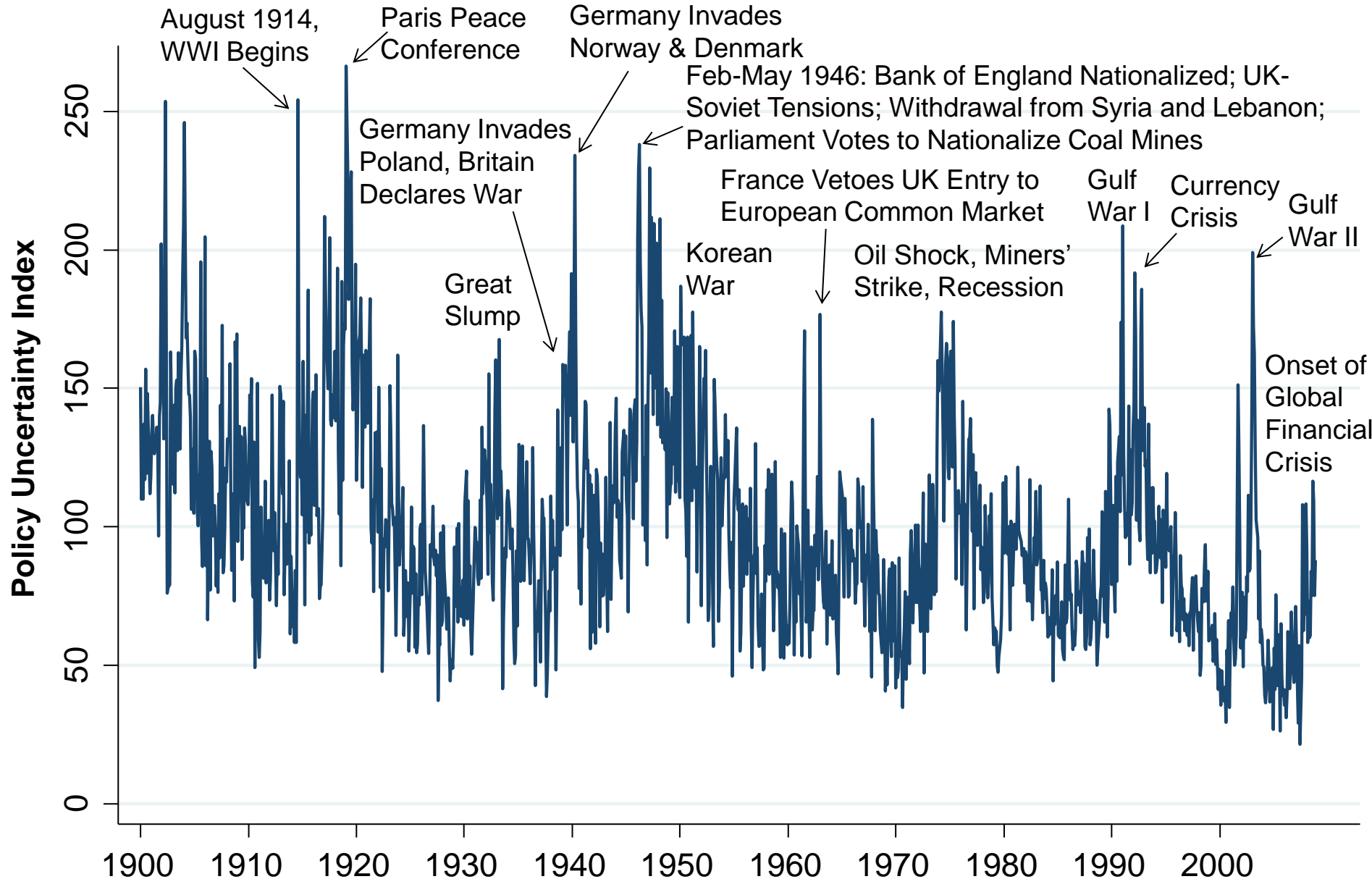
Figure 1: *Code of Federal Regulations* Page Count, 1949-2014



Reproduced from Davis (2015)

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”.

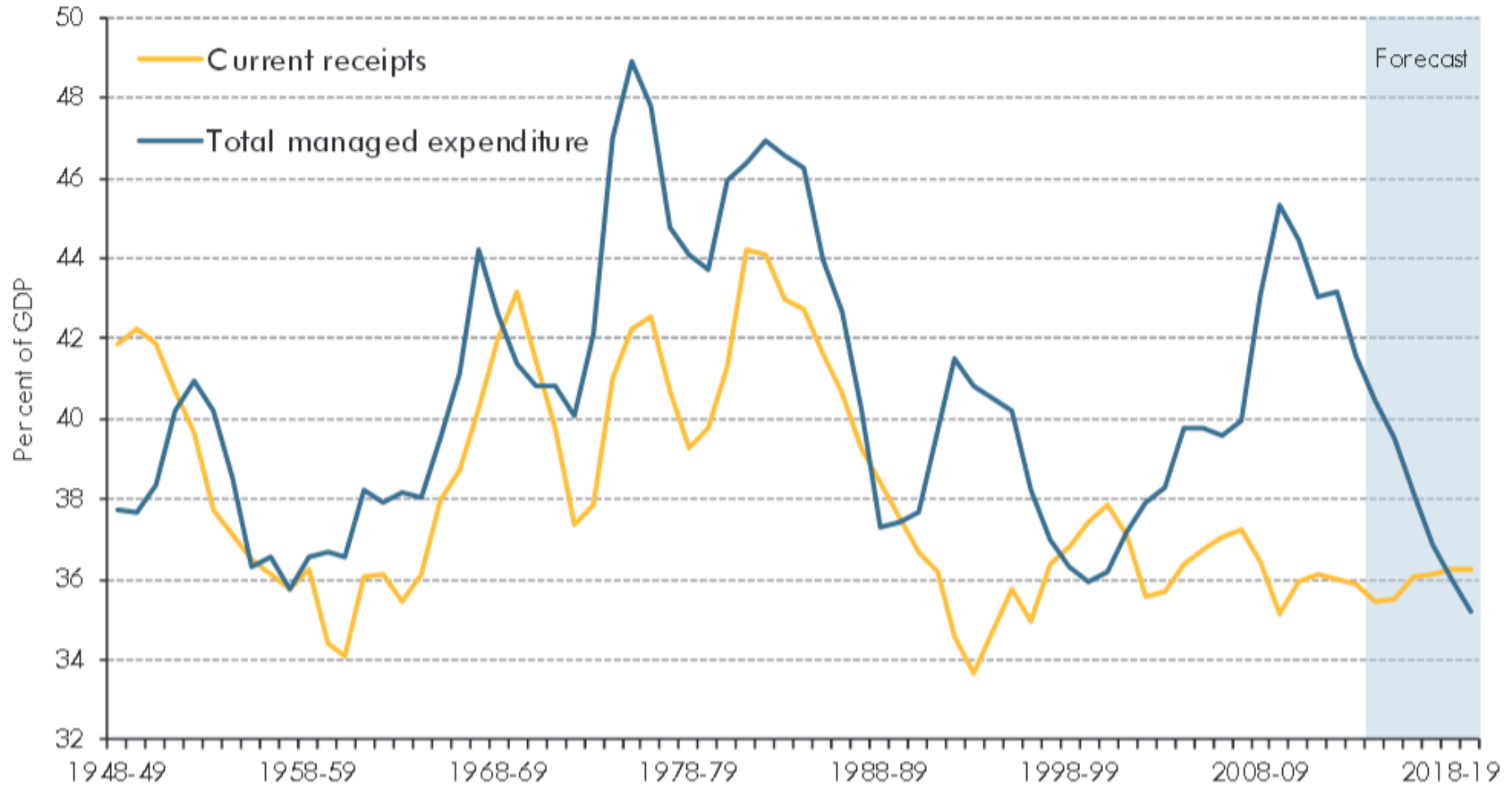
UK Historical EPU Index, January 1900 to December 2008



Notes: Index reflects scaled monthly counts of articles containing 'uncertain' or 'uncertainty'; 'economic', 'economy', 'business', 'industry', 'commerce', or commercial; and one or more of 'tax', 'policy', 'regulation', 'spending', 'deficit', 'budget', 'Bank of England', 'war', or 'tariff'. The series is normalized to mean 100 from 1900 to 2008 and based on The Times of London and The Guardian.

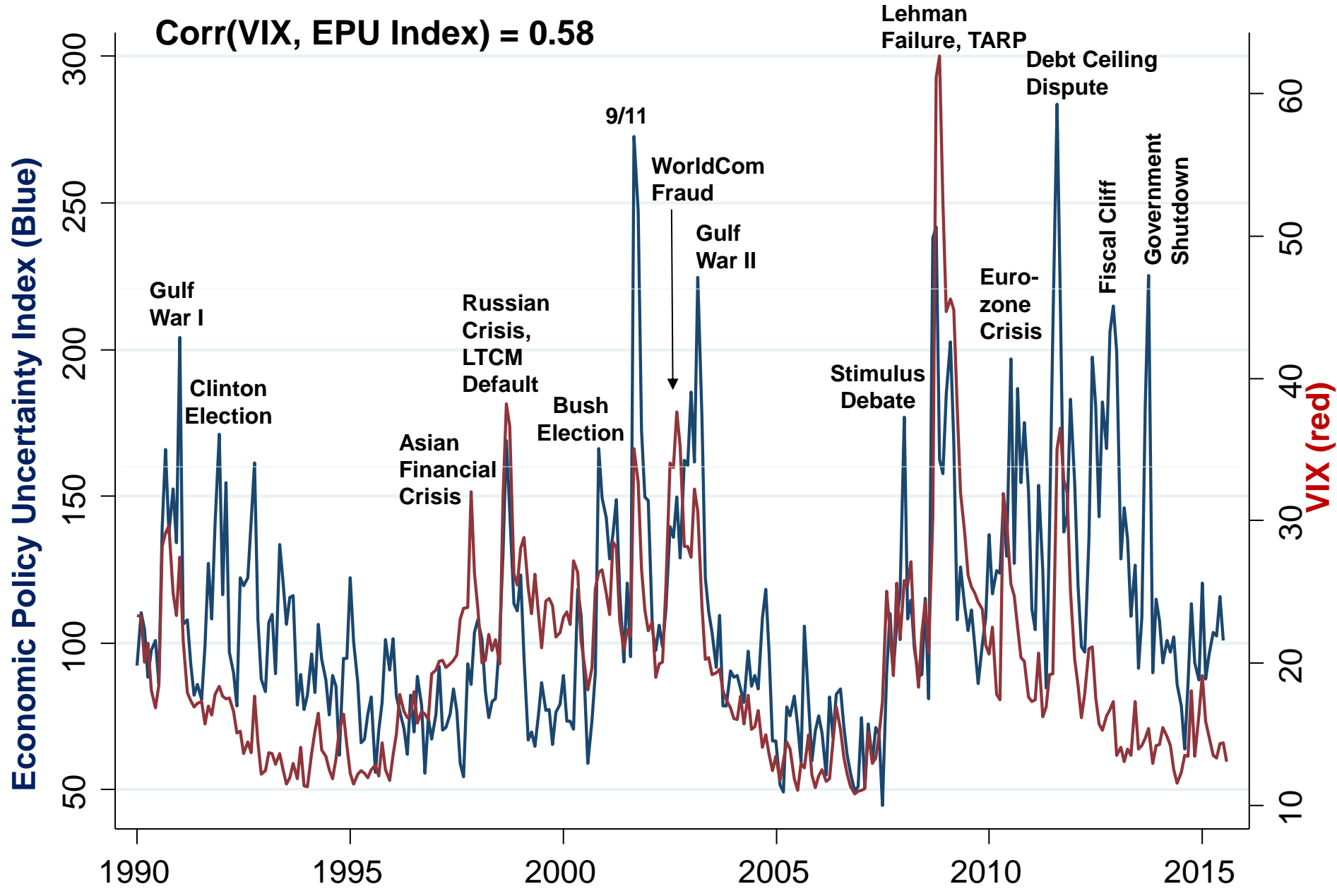
UK government share of GDP is roughly flat since the 1950s (unlike the US, where it has roughly doubled)

Chart 1.1: Total public sector spending and receipts



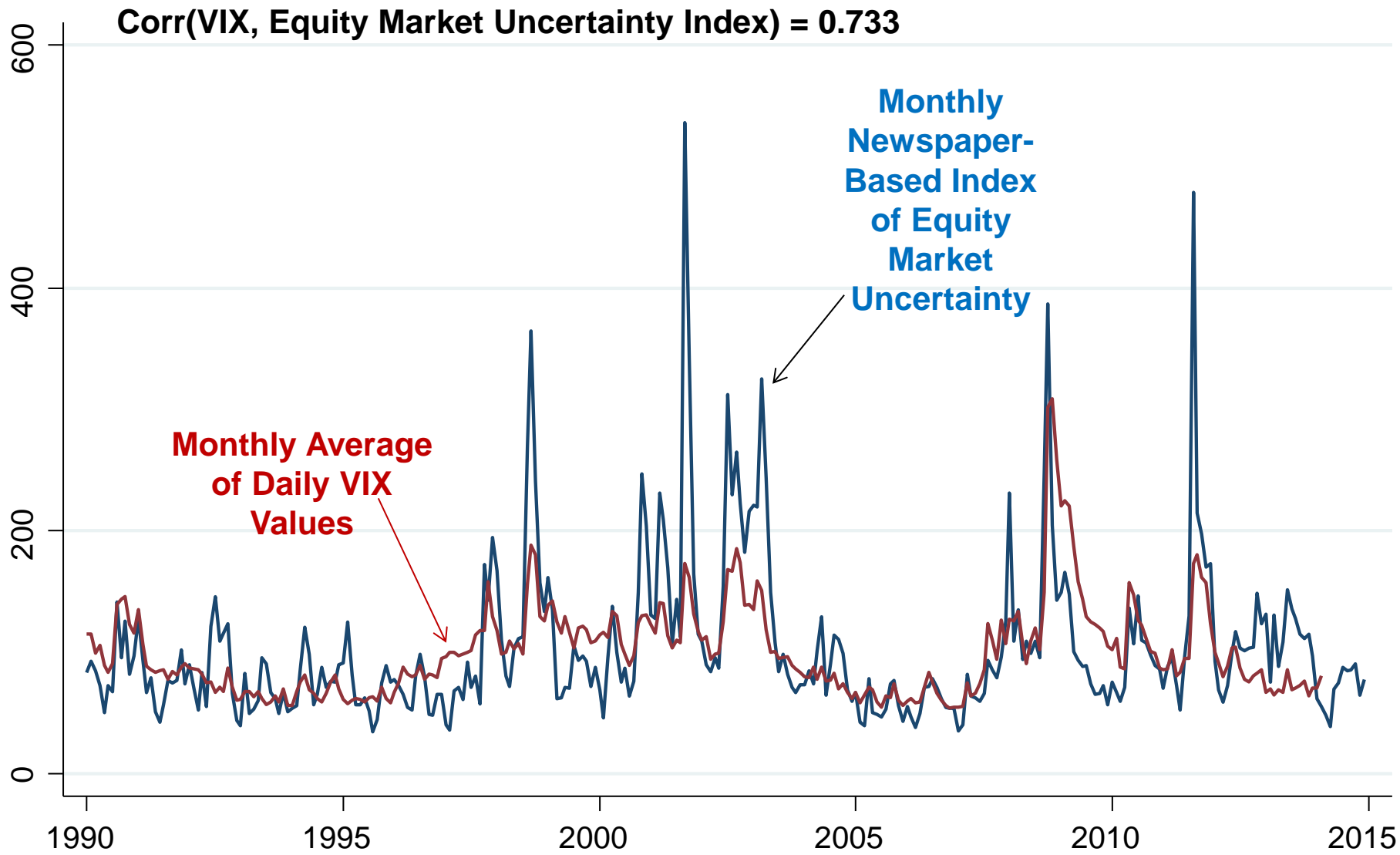
Source: ONS, OBR

Figure 6: U.S. EPU Compared to 30-Day VIX, January 1990 to July 2015



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



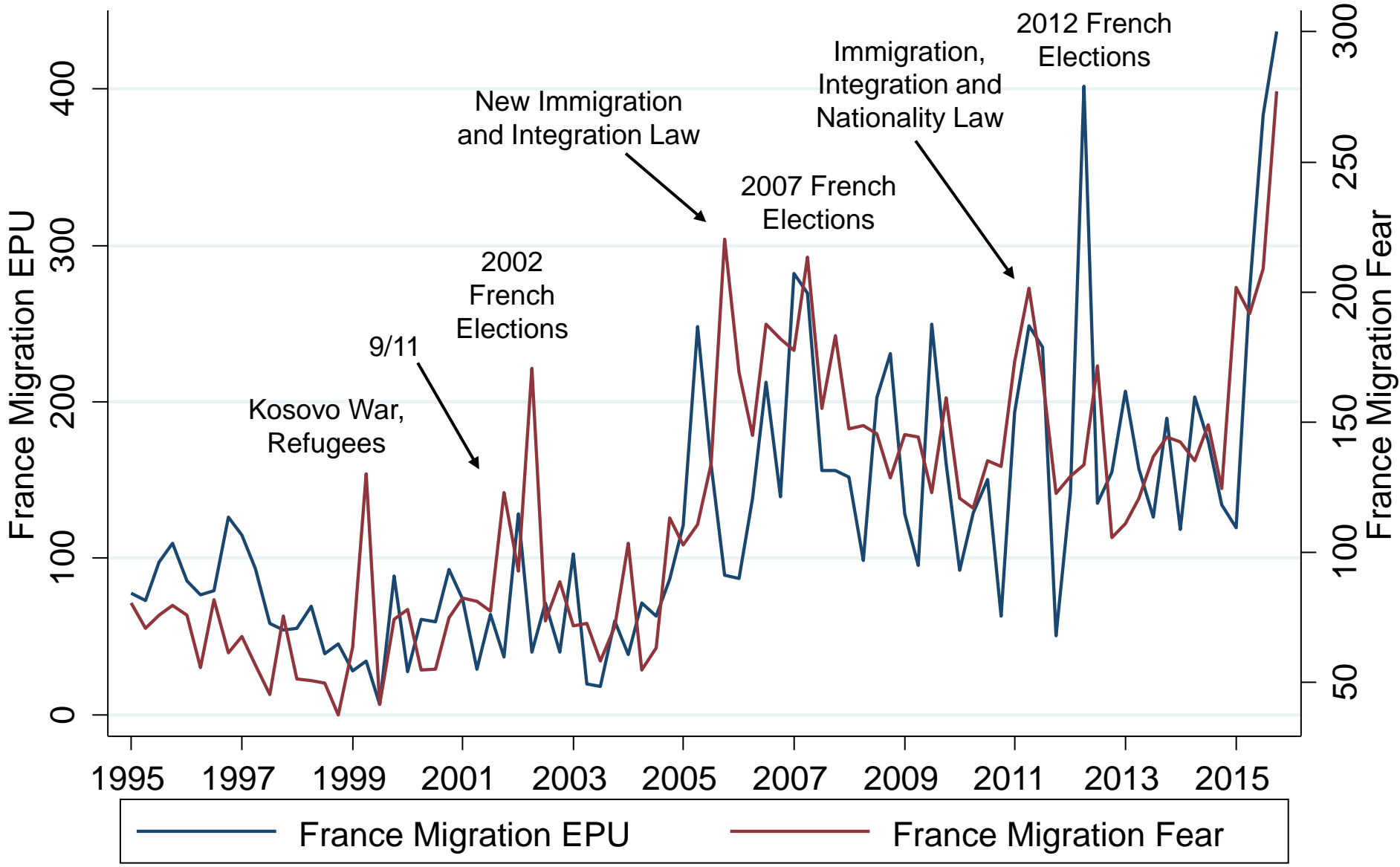
Notes: The news-based index of equity market uncertainty is based on the count of articles that reference 'economy' or 'economic', and 'uncertain' or 'uncertainty' and one of 'stock price', 'equity price', or 'stock market' in 10 major U.S. newspapers, scaled by the number of articles in each month and paper. The news-based index and the VIX are normalized to a mean of 100 over the period.

Beige Book also highlights fiscal policy concerns

	1990 Q4 - 1991 Q1 Gulf War I	1993 Q2 - 1993 Q3 Clinton Tax Reforms	2001 Q4 - 2002 Q2 9/11 Attacks	2002 Q4 - 2003 Q2 Gulf War II	2004 Q2 - 2004 Q4 Bush/Kerry Election	2008 Q3 - 2009 Q4 Lehman's and recession	2010 Q1 - 2013 Q1 Debt-ceiling crisis	1983 Q3 - 2013 Q1 Overall Average
Overall Economic Uncertainty	11	8.8	7.7	13.5	5.2	10.2	15.8	5.5
Economic Policy Uncertainty	5.5	6.3	1.2	4.8	2.8	0.8	6.8	1.7
All Fiscal Matters	1	5.5	1.5	0	0	0.4	3.3	1.0
Taxes Only	0	3.3	0.2	0	0	0.3	1.4	0.4
Spending Only	0.5	1	1	0	0	0.2	1.2	0.3
Monetary Policy	0	0	0	0	0	0	0	0
Health Care	0	2	0	0	0	0.2	0.5	0.1
National Security and War	5.3	0.3	0	2	0	0	0.1	0.2
Financial Regulation	0	0	0	0	0	0.2	1.2	0.2
Sovereign debt, currency crisis	0	0	0	0	0	0	0.8	0.1
U.S. Elections and Leadership Changes	0	0	0	0.2	2.2	0	0.9	0.2
Other Specified Policy Matters	0	0.5	0.7	0	0.2	0	0.5	0.2
Politics, Unspecified	0.5	1	0	3	0.7	0	1.6	0.3
Sum of Policy & Politics Categories	6.8	9.3	2.2	5.2	3.0	0.8	10.0	2.5

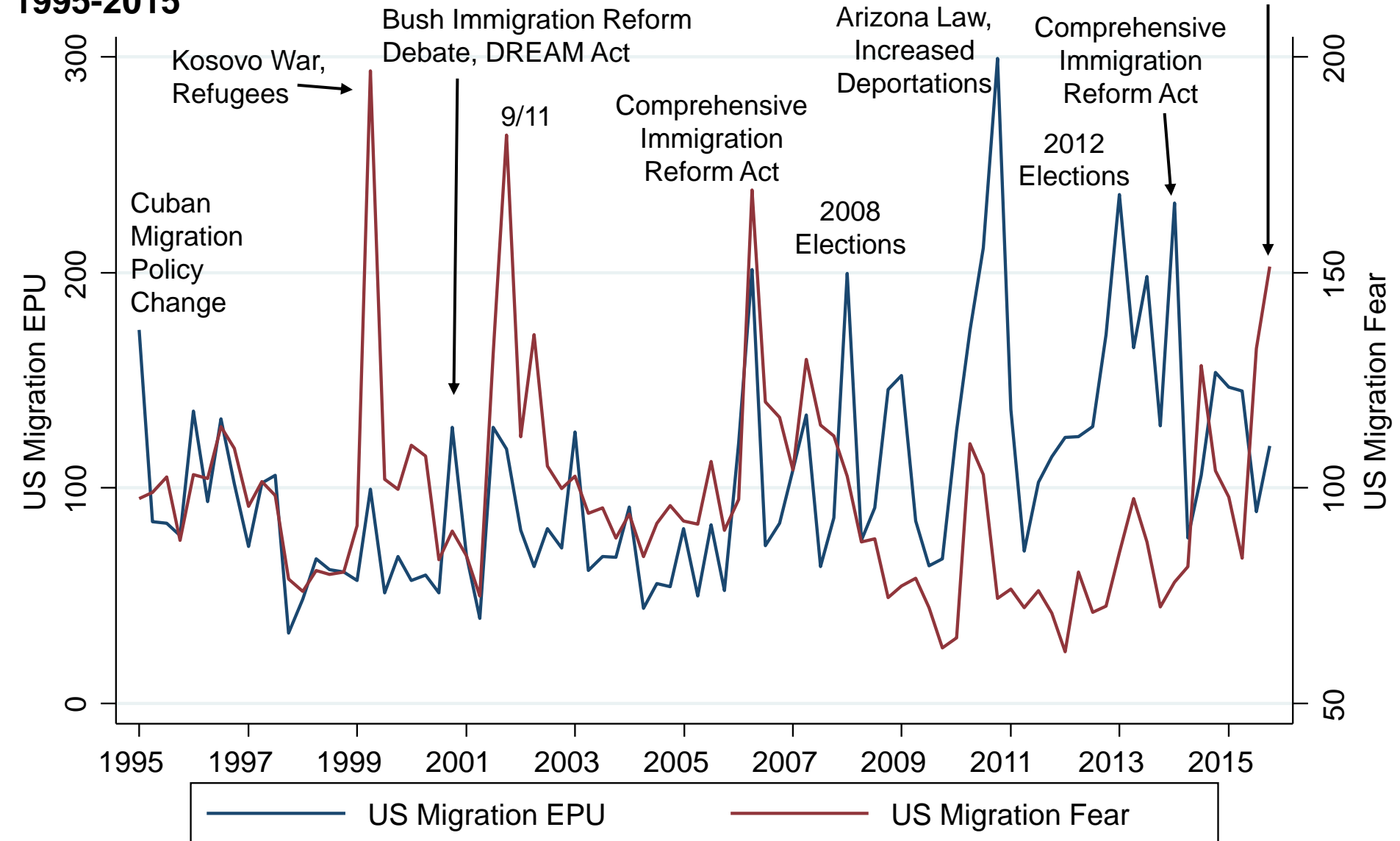
Migration Fear and Policy Uncertainty Indices, France, 1995-2015

European
Refugee Crisis,
Paris attacks



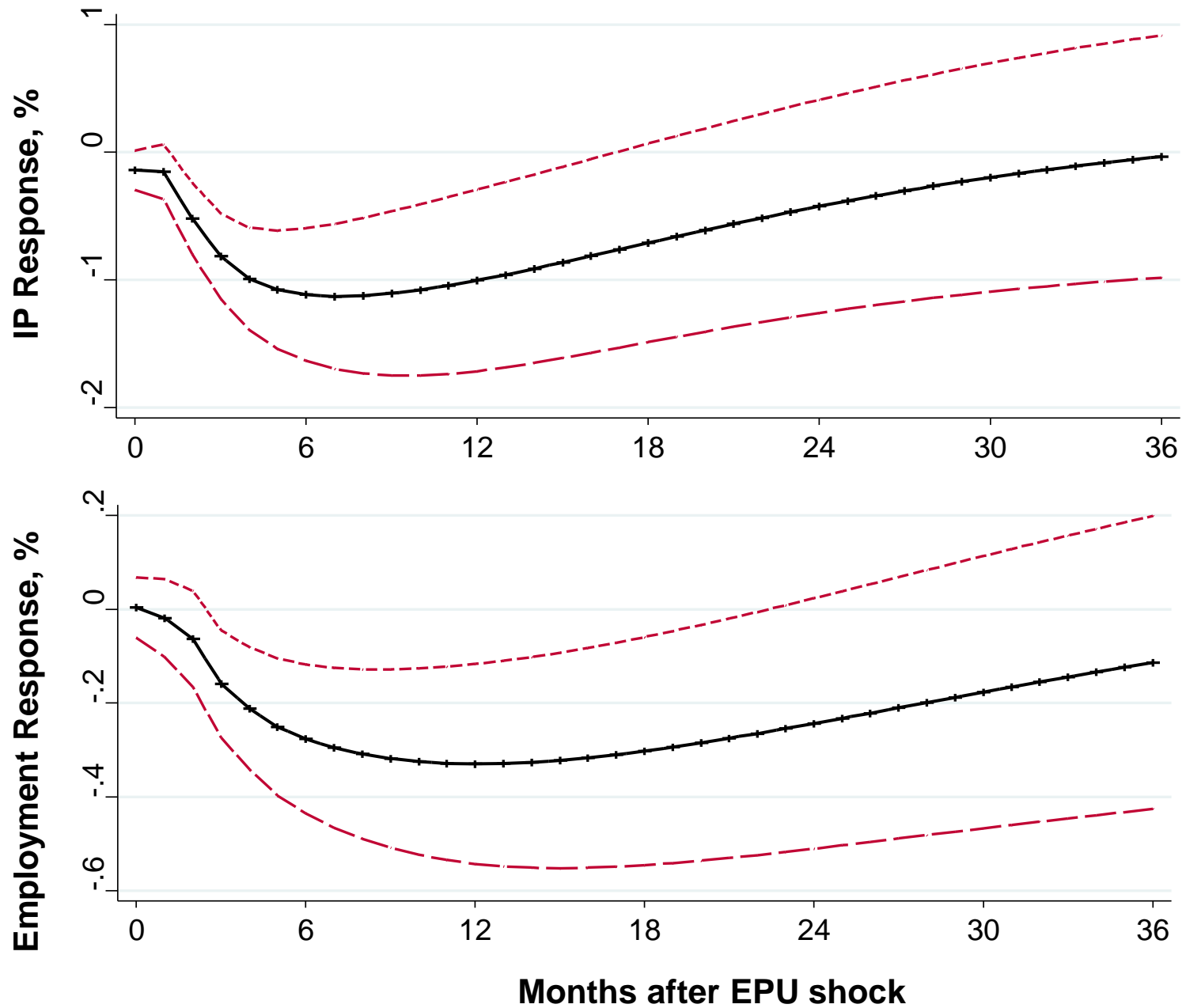
Notes: The Migration Policy Uncertainty Index reflects scaled quarterly counts of articles in Le Monde that satisfy the M, E, P and U criteria specified in the text. Similarly, the Migration Fear Index reflects scaled quarterly counts that satisfy the M and F criteria. We obtain article counts on 30 November 2015 and normalize each index to 100 from 1995 to 2011.

Migration Fear and Policy Uncertainty Indices, United States, 1995-2015



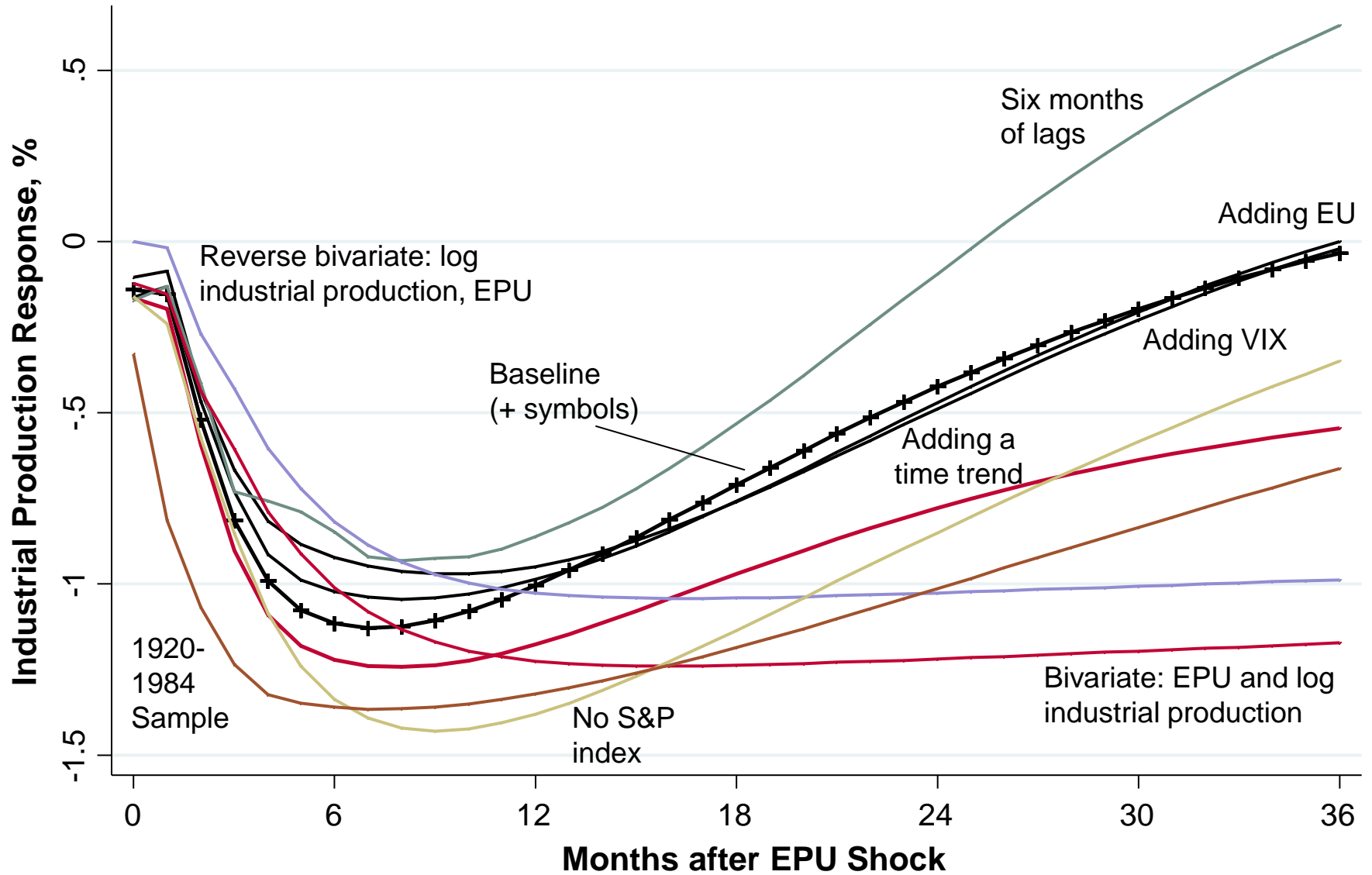
Notes: The Migration Policy Uncertainty Index reflects scaled quarterly counts of articles in US newspapers indexed by the Access World News Newsbank database that satisfy the M, E, P and U criteria specified in the text. Similarly, the Migration Fear Index reflects scaled quarterly counts that satisfy the M and F criteria. We obtain article counts on 30 November 2015 and normalize each index to 100 from 1995 to 2011.

Figure 8: Industrial Production and Employment Responses to EPU Shock, VAR Fit to Monthly U.S. Data from January 1985 to December 2012



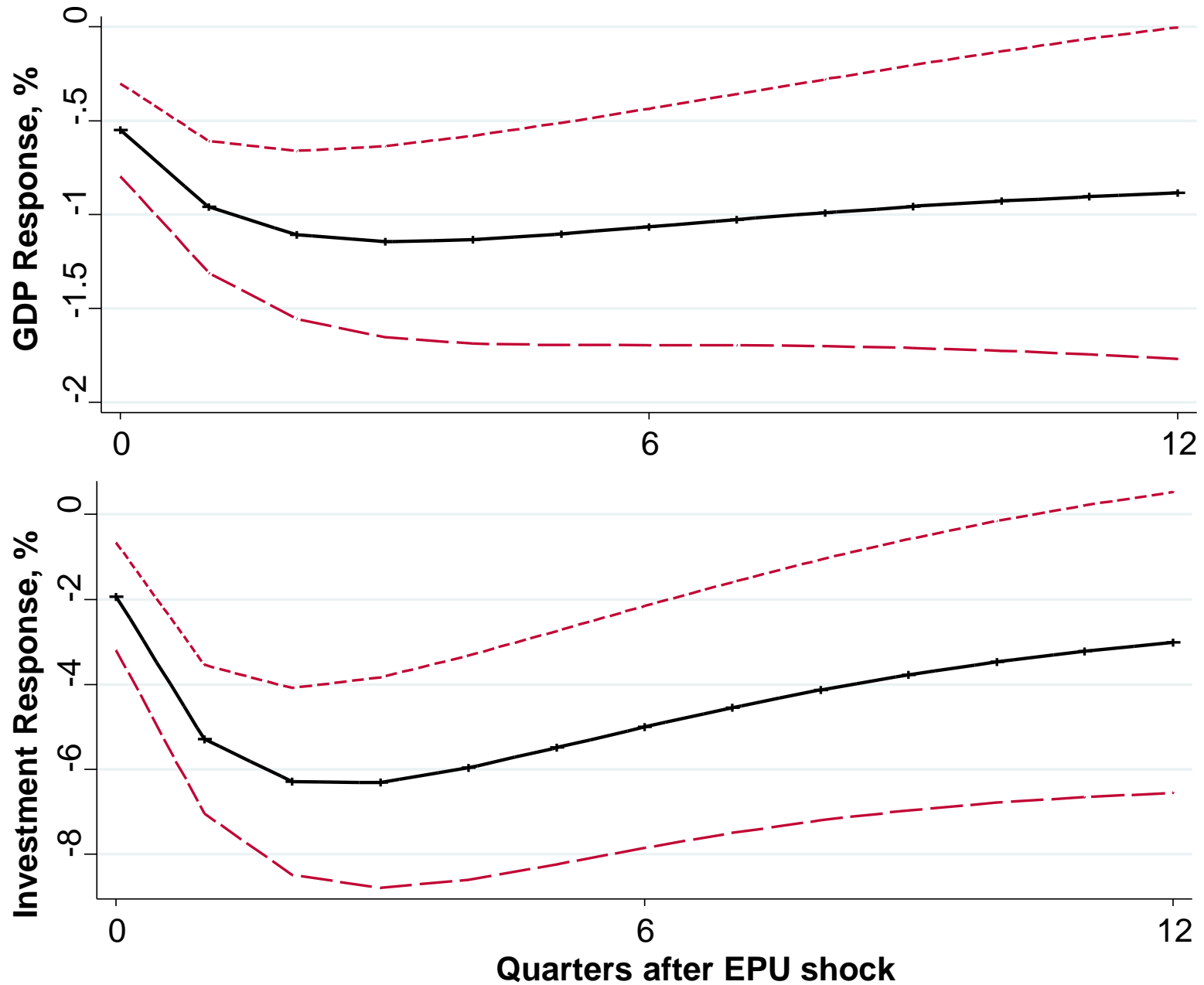
Notes: VAR-estimated impulse response functions for industrial production and employment to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value, with 90 percent confidence bands. Identification based on three lags and a Cholesky decomposition with 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



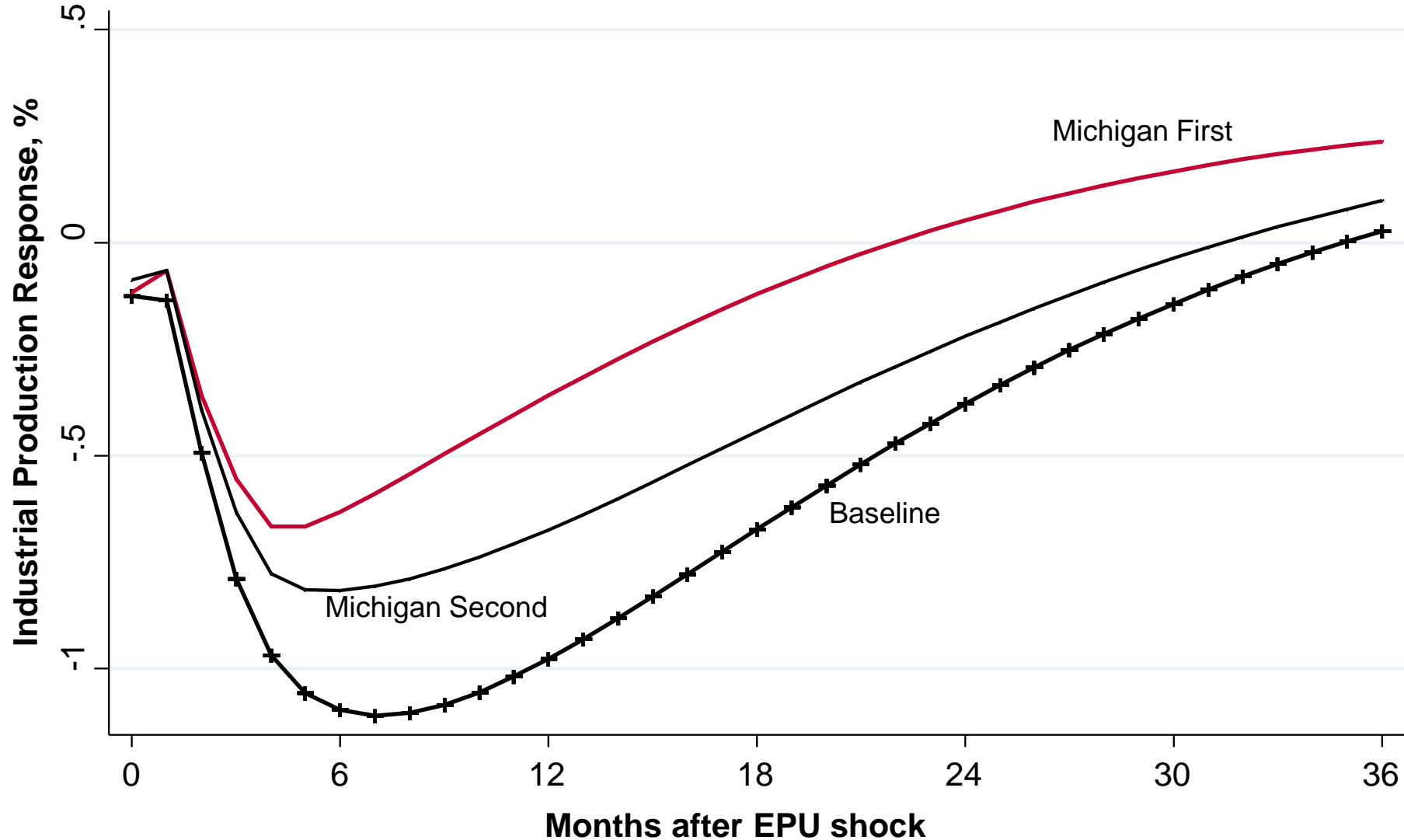
Notes: The baseline case involves the same sample period, VAR specification and identification as in Figure 8. The other cases depart from the baseline as indicated. We place EU and VIX after EPU in the ordering. For the “1920-1984” response function, we use monthly data from 1920 to 1984 on log industrial 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



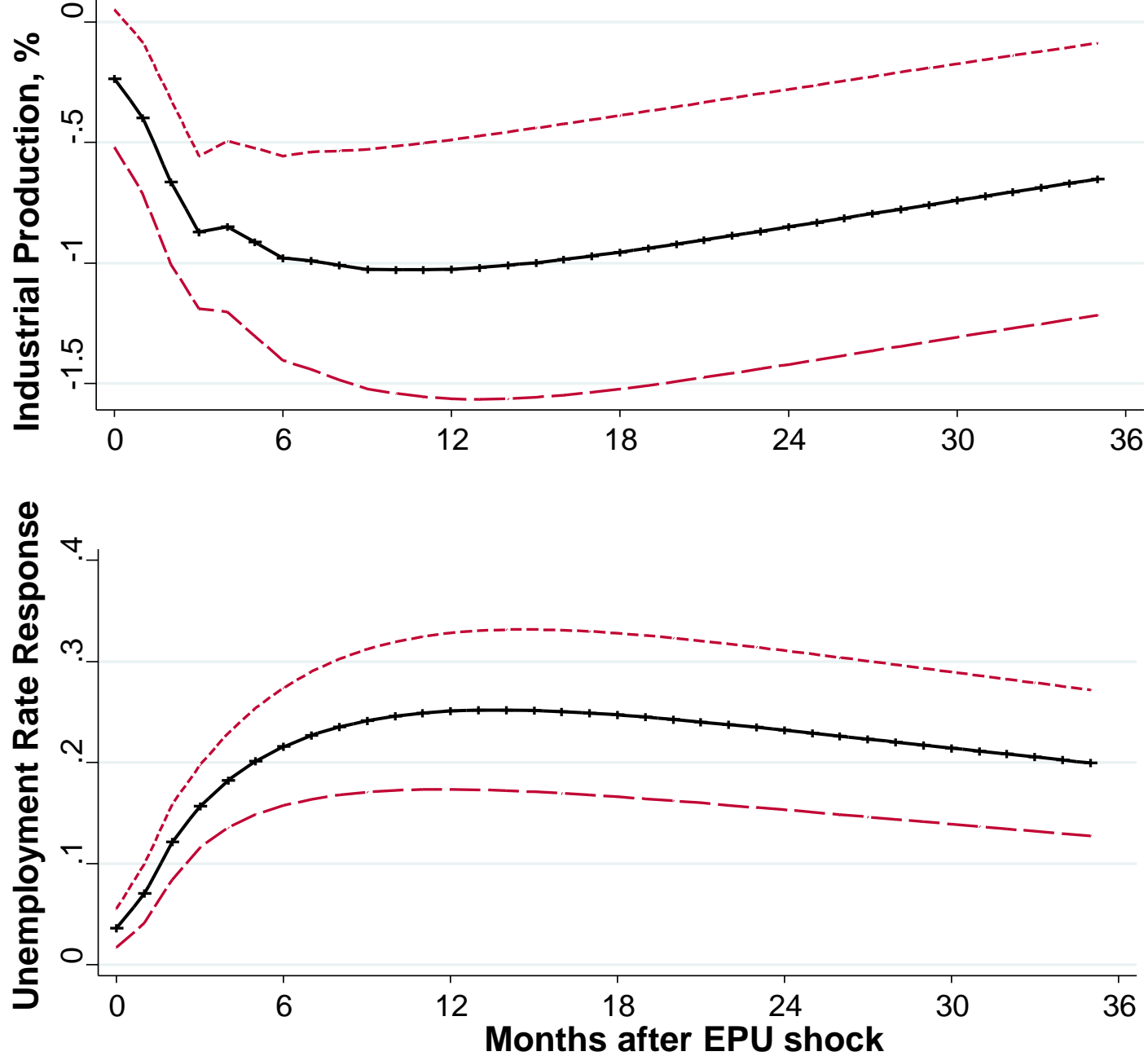
Notes: VAR-estimated impulse response functions for GDP and Gross Fixed investment to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value, with 90 percent confidence bands. Identification based on three lags and a Cholesky decomposition with the 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



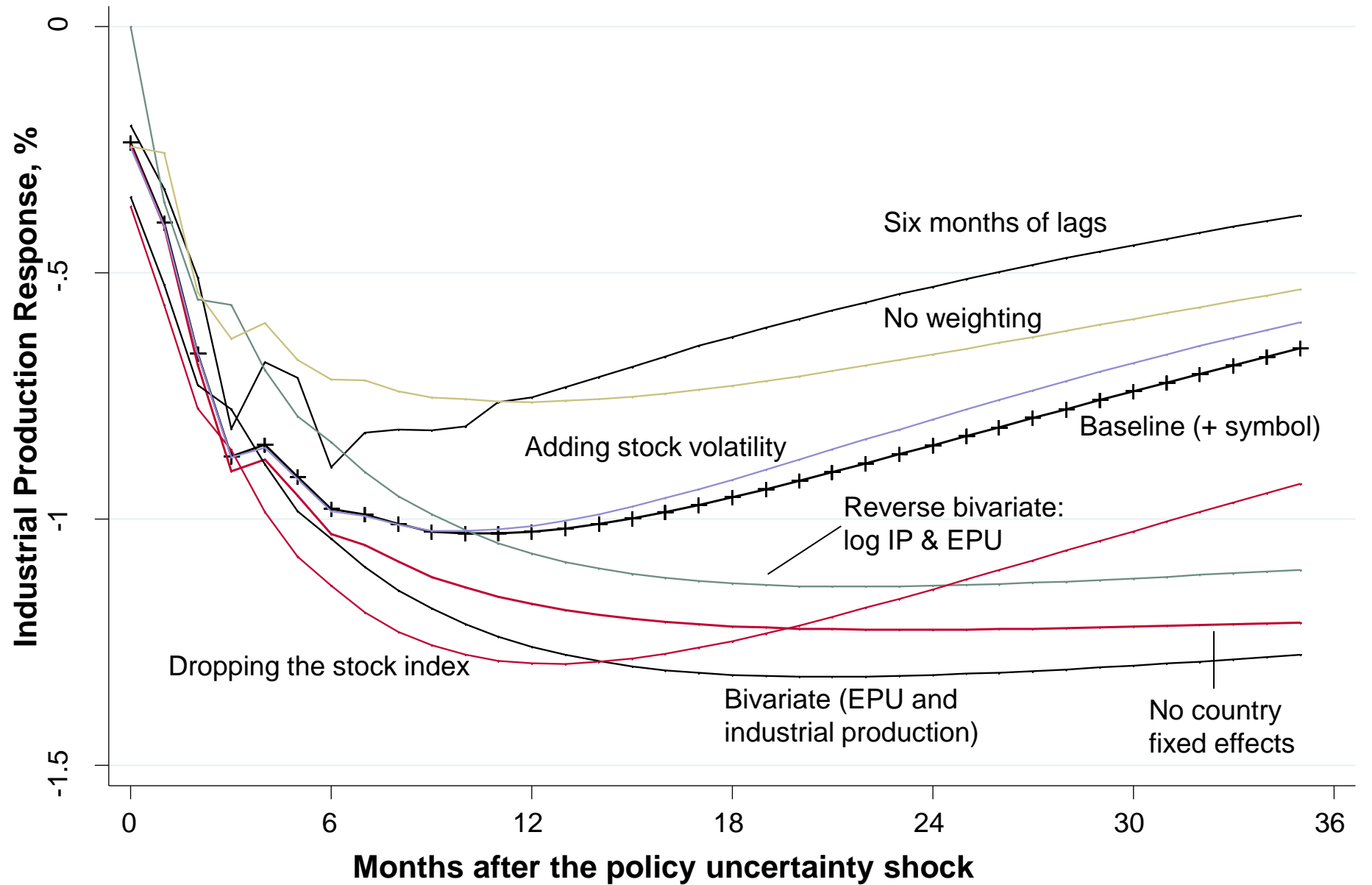
Notes: VAR-estimated impulse response functions for industrial production to an EPU innovation equal to the increase in the EPU index from its 2005-2006 to its 2011-2012 average value. Identification based on three lags and a Cholesky decomposition. In the baseline, the VAR has the following ordering: 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.

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

Firm
fixed
effects

Period
fixed
effects

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

$$Y_{it} = F_i + P_t + \alpha * \underbrace{\text{Exp}_i * (G/Y)_t}_{\text{Firm policy exposure} \times \text{government purchases share of GDP (another 1st moment firm-level control variable)}} + \beta * \underbrace{\text{Exp}_i * \text{EPU}_t}_{\text{Firm policy exposure} \times \text{EPU Index (2nd moment interaction effect of interest)}} + \varepsilon_{i,t}$$

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

↑
Firm policy exposure ×
government purchases
share of GDP (another 1st
moment firm-level control
variable)

↑
Firm policy exposure
× EPU Index
(2nd moment interaction
effect of interest)

i=firm, t=quarter, 1996-2012 sample period, clustering by i when
estimating standard errors

Dep Var: Log(30-day implied vol)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(EPU)	0.432*** (0.010)		-0.044*** (0.013)		-0.752*** (0.027)		
Log(EPU)×Intensity		0.215** (0.069)		0.228** (0.100)		0.545*** (0.202)	0.082 (0.117)
Log(VIX)			0.734*** (0.016)				
Log(VIX)×Intensity				-0.020 (0.117)			
Log(EU)					1.080*** (0.027)		
Log(EU)×Intensity						-0.301** (0.177)	
Federal Purchases/GDP	-19.30*** (1.50)		-7.75*** (1.49)		-17.40*** (1.49)		
(Federal Purchases/GDP)× Intensity		-29.45* (12.72)		-29.70** (12.36)		-29.93* (12.66)	-31.08 (13.24)
Defense EPU*Defense Firm							0.048*** (0.012)
Healthcare EPU*Health Firm							0.071* (0.043)
Financial Regulation EPU*Finance Firm							0.144*** (0.030)
Firm and Time Effects	No	Yes	No	Yes	No	Yes	Yes

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

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

Specification	(1) Realized Volatility	(2) 182-day Implied Volatility	(3) Add Purchase Forecast	(4) Add 12 qtrs Future Purchases	(5) Firm- level Intensity	(6) Belo et al. (2013) Intensity	(7) Beta Intensity	(8) 10-K Risk Measure	(9) \$500m+ Sales Firms
Log(EPU)×Intensity	0.346*** (0.089)	0.178*** (0.073)	0.175*** (0.070)	0.258*** (0.086)	0.192*** (0.045)	0.456*** (0.101)	0.283** (0.118)	0.378* (0.217)	0.237*** (0.071)
(Federal Purchases/ GDP)×Intensity	-23.72 (14.71)	-27.47*** (11.77)	-58.28*** (15.35)	-7.05 (16.74)	-14.20 (10.03)	-13.60 (27.64)	6.157 (14.97)	27.16 (64.17)	-31.03 (12.40)
(Forecasted Federal Purchases/GDP)×Intensity			32.61*** (6.27)						
Firm and Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	136,742	136,742	136,742	73,822	136,742	134,544	133,465	112,123	42,785
Number of Firms	5,624	5,624	5,624	3,189	5,624	5,537	5,489	3,817	1,070

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 w/ 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 $(84)(.25)(.215) = 4.5$ 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)]

Industry	(1) Govt. Purchases Share of Revenues	(2) Category EPU Log Point Change	(3) Coefficient On Category EPU	(4) Combined Effects of EPU Changes from 2005/06 to 2011/12 on Firm-Level Stock-Price Volatility in log points
Health	0.44	146.2	0.071	13.4
Missiles, Spacecraft	0.78	35.0	0.048	7.1
Ordnance, Accessories	0.39	35.0	0.048	4.4
Aircraft, Parts	0.20	35.0	0.048	3.1
Engineering Services	0.21	35.0	0.048	3.1
Heavy Construction	0.09	0	0	0.6
Finance	0	160.6	0.144	23.1

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. **I/K** is the investment rate defined as $\text{CapEx}_t / (\text{Net Plant, Property and Equipment})_{t-1}$. **ΔEmp** is the employment growth rate measured as $(\text{emp}_t - \text{emp}_{t-1}) / (0.5 \times \text{emp}_t + 0.5 \times \text{emp}_{t-1})$, and **ΔRev** 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

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	I/K	I/K	I/K	I/K	ΔEmp	ΔEmp	ΔEmp	ΔEmp	ΔRev
Log(EPU)×Intensity	-0.032*** (0.010)	-0.032*** (0.010)	-0.024** (0.011)	-0.031*** (0.010)	-0.213** (0.084)	-0.227** (0.089)	-0.220** (0.118)	-0.207** (0.084)	-0.128 (0.096)
Δ(Federal Purchases/GDP)×Intensity	8.20*** (2.86)	8.04*** (2.86)	12.12*** (3.18)	8.23*** (2.87)	10.79 (7.41)	15.60*** (8.04)	3.19 (12.56)	11.58 (7.58)	20.39** (9.43)
Δ(Forecasted Federal Purchases/GDP)×Intensity		1.01 (0.828)				-4.65*** (2.89)			
Defense EPU × Defense Firm				0.094 (0.314)				-2.53 (1.60)	
Healthcare EPU × Health Firm				-0.422* (0.231)				1.16 (1.42)	
Financial Regulation EPU × Finance Firm				-0.270*** (0.076)				0.636* (0.353)	
Periodicity	Quarterly	Quarterly	Quarterly	Quarterly	Yearly	Yearly	Yearly	Yearly	Yearly
3 Years Fed Exp leads	No	No	Yes	No	No	No	Yes	No	No
Observations	709,120	709,120	411,832	709,120	162,006	162,006	108,718	162,006	151,653
Number of Firms	22,358	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.