Measuring Economic Policy Uncertainty

Scott R. Baker,[a] Nicholas Bloom,[b] and Steven J. Davis[c]

3rd February 2012

Abstract: Many commentators argue that uncertainty about taxes, government spending and other policy matters deepened the recession of 2007-2009 and slowed the recovery. To investigate this issue we develop a new index of policy-related economic uncertainty and estimate its dynamic relationship to output, investment and employment. Our index averages several components that reflect the frequency of news media references to economic policy uncertainty, the number of federal tax code provisions set to expire in future years, and the extent of forecaster disagreement over future inflation and federal government purchases. The index spikes near consequential presidential elections and after major events such as the Gulf wars and the 9/11 attack. Index values are very high in recent years with clear jumps around the Lehman bankruptcy and TARP legislation, the 2010 midterm elections, the Eurozone crisis and the U.S. debt-ceiling dispute. VAR estimates show that an increase in policy uncertainty equal to the actual change between 2006 and 2011 foreshadows large and persistent declines in aggregate outcomes, with peak declines of 3.2% in real GDP, 16% in private investment and 2.3 million in aggregate employment.

[a] Stanford; srbaker@stanford.edu
[b] Stanford, Centre for Economic Performance, CEPR and NBER; nbloom@stanford.edu
[c] University of Chicago Booth School of Business, NBER and AEI;
steven.davis@chicagobooth.edu

1. INTRODUCTION

A rapidly growing literature considers the effects of uncertainty on economic activity. Many measures of uncertainty rise in recessions and fall in recoveries, suggesting that uncertainty could play an important role in driving business cycles.[1] More generally, the uncertainties arising after major economic and political shocks, like the 9/11 attacks, the Cuban Missile Crisis and the Gulf Wars appear to generate short sharp recessions and recoveries (Bloom, 2009).

One intuition behind the depressing effect of uncertainty goes back at least to Bernanke (1983). As he points out, when investment projects are expensive to cancel or workers are costly to hire and fire, high uncertainty gives firms an incentive to delay investment and employment decisions. If every firm waits to invest or hire, the economy contracts, generating a recession. Of course, once uncertainty falls back down, firms start hiring and investing again to address pent-up demand. Other reasons for a depressing effect of uncertainty include pushing up the cost of finance (e.g., Gilchrist et al. (2010), Fernandez-Villaverde et al. (2011) and Pastor and Veronesi (2011a)), increasing managerial risk-aversion (Panousi and Papanikolaou, 2011), and an intensification of agency problems that reduces the value of new and existing employment, business and financial relationships (e.g. DeMarzo and Sannikov (2006) and Narita (2011)).

Recently, many commentators have argued that policy-related uncertainty has been a key factor slowing the recovery from the recession of 2007-2009. The claim is that businesses and households are uncertain about future taxes, spending levels, regulations, health-care reform, and interest rates. In turn, this uncertainty leads them to postpone spending on investment and consumption goods and to slow hiring, impeding the recovery.

We seek to investigate to what extent this claim is true. To do so, we take two steps. First, we construct a new measure of economic policy uncertainty and examine its

---

[1] See, for example, evidence of counter-cyclical volatility in macro stock returns in Schwert (1989); in firm-level stock returns in Campbell et al. (2001), Bloom, Bond and Van Reenen (2007) and Bekaert et al. (2010); in plant, firm, industry and aggregate output and productivity in Bloom, Floetotto and Jaimovich (2009); and in price changes in Berger and Vavra (2010). Alexopolous and Cohen (2011) find that the frequency of the word "uncertainty" close to the word "economy" in news articles rises steeply in recessions. Some papers find little impact of uncertainty on economic activity – for example, Bachman et al. (2010), Bachman and Bayer (2011) and Knotek and Khan (2011).

evolution since 1985.[2] Figure 1 plots our index of policy-related economic uncertainty. We build the index from components that measure three aspects of economic policy uncertainty: (i) the frequency of references to economic uncertainty and policy in a set of 10 leading newspapers; (ii) the number of federal tax code provisions set to expire in future years; and (iii) the extent of disagreement among economic forecasters over future federal government purchases and the future CPI price level. The resulting index of policy-related uncertainty looks sensible, with spikes around consequential presidential elections and major political shocks like the Gulf Wars and 9/11. Recently, it rose to historic highs after the Lehman bankruptcy and TARP legislation, the 2010 midterm elections, the Eurozone crisis and the U.S. debt-ceiling dispute.

Second, we estimate the dynamic response to policy-related uncertainty shocks on economic activity in simple vector autoregressive (VAR) models. The VAR results suggest that an increase in policy uncertainty equivalent to the actual increase from 2006 to 2011 is followed by a decline of about 3.2% in real GDP and 16% in private sector investment and an employment drop of around 2.3 million persons. Peak estimated responses occur 9 to 24 months later, depending on outcome measure and specification. A causal interpretation of these results requires strong identifying assumptions that may or may not hold. At a minimum, however, the VAR results show that increases in our policy-related economic uncertainty index foreshadow declines in output, investment and employment.

Recent works by Bonn and Pfeifer (2011), Fernandez-Villaverde at al. (2011), and Pastor and Veronesi (2011a,b) also consider the effects of policy-related uncertainty on economic outcomes, but their methods differ greatly from ours. Gomes et al. (2008) show that delayed resolution of political uncertainty about future social security benefit levels and tax rates lowers welfare in a lifecycle model. In earlier work, Rodrik (1991) shows how policy uncertainty can act as a tax on investment and cause firms to forego investments until its resolution. Hassett and Metcalf (1999) analyze the effects of uncertainty about tax credits for new investments. They show that this type of policy uncertainty lowers average government tax collections, because firms time investments to exploit randomness in tax rates. The timing effect also acts as an implicit subsidy that

---

[2] Our data are available on www.policyuncertainty.com

increases the average level of investment. Working in the opposite direction, uncertainty about tax rates raises the value of waiting to invest. The net effect on average investment levels depends on the details of the stochastic process for investment tax credits.

There is a large literature on the broader relationship between uncertainty and investment outcomes. Dixit and Pindyck (1994) offer a thorough overview of the literature, with Bhagat and Obreja (2011) and Chen et al. (2011) offering recent contributions and discussions of the latest empirical work. Two recent studies examine the relationship between election uncertainty and corporate investment outcomes. Using firm-level data for 48 countries from 1980 to 2005, Julio and Yook (2010) find that corporate investment falls by an average of nearly 5 percent in the year leading up to national elections relative to other years, controlling for growth opportunities and economic conditions. Using a similar empirical design, Durnev (2010) finds that the sensitivity of corporate investment to the firm's own stock price is 40 percent lower in election years than other years. Firms with larger election-year drops in the sensitivity of investment to stock prices experience substantially slower growth in the following two years.

Our paper proceeds as follows. Section 2 describes in more detail the data we use to construct our policy-related uncertainty indices. Section 3 identifies specific policy areas that underlie policy uncertainty levels and movements over time. Section 4 reports estimates for the dynamic responses of aggregate economic outcomes to policy-related uncertainty shocks. Section 5 considers several proof-of-concept tests for our policy-related uncertainty indexes and comparisons to other uncertainty measures. Section 6 concludes and lays out some directions for future research.

2. MEASURING ECONOMIC POLICY UNCERTAINTY

To measure policy-related economic uncertainty, we construct an index from three types of underlying components. One component quantifies newspaper coverage of policy-related economic uncertainty. A second component reflects the number of federal tax code provisions set to expire in future years. The third component uses disagreement among economic forecasters as a proxy for uncertainty.

News coverage about policy-related economic uncertainty

Our first component is an index of search results from 10 large newspapers. The newspapers included in our index are USA Today, the Miami Herald, the Chicago Tribune, the Washington Post, the Los Angeles Times, the Boston Globe, the San Francisco Chronicle, the Dallas Morning News, the New York Times, and the Wall Street Journal. To construct the index, we perform month-by-month searches of each paper, starting in January of 1985, for terms related to economic and policy uncertainty. In particular, we search for articles containing the term 'uncertainty' or 'uncertain', the terms 'economic' or 'economy' and one or more of the following terms: 'policy', 'tax', 'spending', 'regulation', 'federal reserve', 'budget', or 'deficit'. In other words, to meet our criteria for inclusion the article must include terms in all three categories pertaining to uncertainty, the economy and policy. Our goal is to select articles in US news sources that discuss something about economic uncertainty and that also discuss policy in that regard. We count the number of articles that satisfy our search criteria each month, giving us a monthly series.

One difficulty with a straight news search index is changing volumes of news produced by each paper, as well as differing amounts that are catalogued online. So, to construct our index, we normalize the raw counts by the number of news articles in the same newspapers that contain the term 'today'. We use 'today' as an indicator of an article that is likely to be news focused. We then calculate a backwards-looking 36-month moving average to smooth this series at a monthly level and to remove high-frequency noise.[3] For each paper, we then divide the policy-related uncertainty counts described above by the smoothed value of the 'today' series. Finally, we sum each paper's series and normalize the series to an average value of 100 from 1985-2009.

Figure 2 shows our 10-Paper News index of policy-related economic uncertainty. There are clear spikes corresponding to Black Monday, the first and second Gulf Wars, the 1992 presidential election, 9/11, the 2009 stimulus debate, the Lehman Brothers

---

[3] We have experimented with two-sided Hodrick-Prescott filters and obtained very similar results.

bankruptcy and TARP bailout, intensification of the European debt crisis, the 2010 midterm elections, and the recent debt-ceiling dispute, among other events.[4]

<u>Tax Code Expiration Data</u>

The second component of our index draws on reports by the Congressional Budget Office (CBO) that compile lists of temporary federal tax code provisions. Temporary tax measures are a source of uncertainty for businesses and households because Congress often extends them at the last minute, undermining stability in and certainty about the tax code. An important recent example involves the Bush-era income tax cuts originally set to expire at the end of 2010. Democrats and Republicans staked out opposing positions about whether to reverse these tax cuts and, if so, for which taxpayers. Rather than resolving the uncertainty in advance, Congress waited until December 2010 before deciding to extend the cuts for all taxpayers. However, Congress extended the tax cuts for two years only, setting the stage for another major political battle in 2012 and additional uncertainty over future tax rates.

Temporary tax code provisions also lead to murkier outlooks for federal spending and borrowing and to discrepancies between the tax revenue projections of the CBO and the Office of Management and Budget (OMB). The CBO uses 'current law' as a baseline taking into account all scheduled tax expirations, while the OMB uses 'current policy' as a baseline under its assessment of which temporary provisions are likely to be extended. The CBO also produces alternative projections based on its judgments about 'current policy'.

The CBO reports contain data on scheduled expirations of federal tax code provisions in the contemporaneous calendar year and each of the following 10 years. The CBO document briefly describes the tax code provision and identifies the scheduled expiration month, typically but not always December. We apply a simple weighting to these data in January of each year, multiplying expirations by $0.5^{((T+1)/12)}$ for T equal

---

[4] Some notable political events do not generate high levels of economic policy uncertainty according to our news-based index. For instance, we find no large spike around the time of the federal government shutdowns from November 1995 to January 1996. While we found more than 8,000 articles mentioning these government shutdowns, less than 25% also mention the economy, less than 2% mention uncertainty, and only 1% mentions both. We take this finding to mean that, while some events are politically tumultuous, they do not necessarily raise economic policy uncertainty.

to the number of months in the future when the tax code provision expires. This weighting formula corresponds to an annual discount rate of 100 percent. We then sum the discounted number of tax code expirations to obtain an index value for each January, which we then hold constant during the calendar year.[5] We utilize a high discount rate because many expiring tax code provisions are regularly renewed, and are unlikely to be a major source of uncertainty until the expiration date looms near.

Figure 3 plots the discounted sum of expiring tax provisions. Here we see a generally increasing series. This pattern reflects a secular increase in the number of tax provisions involving temporary measures subject to continual renewal, debate and uncertainty.

Economic Forecaster Disagreement

The third component of our policy-related uncertainty index draws on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters. This quarterly survey covers a wide range of macroeconomic variables. Each quarter, every forecaster receives a form in which to fill out values corresponding to forecasts for a variety of variables in each of the next five quarters, as well as annualized values for the following 2 years.[6] We utilize the individual-level data for three of the forecast variables, the consumer price index (CPI), purchase of goods and services by state and local governments, and purchases of goods and services by the federal government. For each series, we look at the quarterly forecasts for one year in the future. We chose these variables because they are directly influenced by monetary policy and fiscal policy actions. We treat the dispersion in the forecasts of these variables as proxies for uncertainty about monetary policy and about government purchases of goods and services at the federal level. This approach builds on a long literature using disagreement among forecasters as a proxy for economic uncertainty.[7]

---

[5] Currently, we are seeking to gather data that will enable us to construct a true monthly index for future tax code expirations.

[6] A sample form for Q1 2010 can be seen at http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/form-examples/SpfForm-10Q1.pdf

[7] See, for example, Zarnowitz and Lambros (1987), Bomberger (1996), Giordani and Soderlind (2004) and Boero, Smith and Wallis (2008). These papers find a significant correlation between disagreement among forecasters over future outcomes such as inflation and other measures of uncertainty. However, there is

6

For inflation, we look at the individual forecasts for the quarterly inflation rates four quarters in the future as measured by the CPI. To construct the dispersion component, we then take the interquartile range of each set of inflation rate forecasts in each quarter. We use the raw interquartile range because we believe that the absolute level of the CPI is the important factor, not only the uncertainty relative to a mean CPI level.

For both federal and state/local government purchases, we divide the interquartile range of four-quarter-ahead forecasts by the median four-quarter-ahead forecast and multiply that quantity by a 5-year backward-looking moving average for the ratio of nominal purchases, either federal or state/local, to nominal GDP. We hold the values of the forecaster disagreement measures constant within each calendar quarter. Finally, we sum the two indices, weighted by their nominal sizes, to construct a single federal/state/local index. Here, we look at the interquartile range scaled by the ratio of government purchases to the economy, as when government purchases increase as a share of economic activity, this implies the possibility of larger effects of uncertainty about government purchases.

Figure 4a shows the dispersion in forecasts for federal purchases four quarters in the future. Noteworthy jumps occur around the passage of the Balanced Budget Act in 1985, a contentious budget battle in 1987, the 1992 presidential election, 9/11, and the stimulus spending debates from 2008 to 2010. Figure 4b shows the dispersion in forecasts for state and local purchases. Here we see many of the same spikes, with an additional spike around the 2nd Gulf War and the economic recovery from the 2000-2001 recession. Figure 5 shows the dispersion in CPI forecasts, with larger spikes coming in both earlier and in later years following federal budgetary indecision, major actions by the Federal Reserve, and recent stimulus measures by the federal government.

Constructing our overall policy-related economic uncertainty index

To construct our overall index of policy-related economy uncertainty, we first normalize each component by its own standard deviation prior to August 2011. We then

---

disagreement over the strength and the interpretation of the link between forecaster disagreement and uncertainty about future outcomes. See, for example, Rich and Tracy (2010), who claim a very weak link for inflation.

compute the average value of the components, using weights of 1/2 on our broad news-based policy uncertainty index and 1/6 on each of our other three measures (the tax expirations index, the CPI forecast disagreement measure, and the federal/state/local purchases disagreement measure). These weights roughly reflect the distribution of specific sources of policy-related uncertainty, as measured in Table 1 below, giving more weight to indices with a broader coverage. To deal with missing values, we set the pre-1992 tax expiration index to its 1992 value. Finally, we normalize our overall index to have a value of 100 from 1985 to 2009, the first 25 years of the period covered by our data.

In addition to our preferred weighting, we also calculate policy-related economic uncertainty indices using two other weighting methodologies. First, we equally weight the news-based measure, the combination of the forecast disagreement measures, and the tax expiration measure. The result series, shown in Figure A4, is very similar to our preferred measure. Second, we perform a principle component analysis on our four series to obtain weights for each component. This approach yields weights of 0.35 on our news-based index, 0.37 on our tax expirations index, 0.24 on the CPI forecast disagreement measure, and 0.04 on our federal expenditure disagreement measure. We again find a similar final index, plotted in Figure A5. Our preferred index has correlations of 0.980 and 0.964 with the equally weighted and principle components weighted indices, respectively. All three versions of the overall index yield very similar results in the VAR-based discussed in Section 4 below.

Figure 1 displays our preferred version of our Policy-Related Economic Uncertainty index. We find spikes in uncertainty corresponding to several well-known prominent events and a substantially higher level of uncertainty since the onset of the Great Recession in 2007. In particular, we find spikes associated with consequential presidential elections, wars, 9/11, contentious budget battles, and a number of spikes during and after the Great Recession. The average index value is 109 in 2006 (the last year before the current crisis) and 233 in the first eight months of 2011, a difference of 124. We use this increase in the average index value when quantifying the responses of output, investment and employment to policy uncertainty shocks.

We plan to update our Policy-Related Economic Uncertainty Index on a roughly quarterly basis as new data become available.

<u>Google News Policy-related Economic Uncertainty</u>

While we use our 10-paper news data as a component and input into our main policy-related economic uncertainty index, we also utilize the Google News service for additional in-depth analysis, due to its greater flexibility, range, and volume. For our primary index, we feel these benefits are outweighed by the greater stability and transparency of our 10-paper news-based measure. For example, with Google News, the number of results returned for recent months is extremely unstable, making it difficult to measure the most recent two to three months with any accuracy.

The Google News service, however, allows us to exploit the large volume of results to investigate specific sources of policy uncertainty and to perform various other checks on the validity of the news-based strategy in general. For the Google News-based measure, we perform the same searches as with each of our 10 newspapers, looking at articles that meet three criteria (an economic term, an uncertainty term, and a policy-related term). For Google News, it is even more important to scale by the number of articles containing the word 'today', as the volume of articles with this term rise from approximately 50,000 in 1985 to over 400,000 at the end of 2011.

Figure 2b shows both the 10-Paper News Index and the Google News Index. We find largely similar trends, with the main difference being the Google News Index exhibiting larger swings from low- to high-uncertainty periods. Despite these larger swings, we see the same broad patterns, with relatively low uncertainty in the mid- to late-1990s and the mid-2000s, with high levels from 2000-2003 and 2007-2011. Moreover, most of the spikes occur in the same places (elections, wars, 9/11, recent economic turmoil, debt ceiling debate, etc…).

For these reasons, our headline index's news-based component will be derived from our 10-paper news-based measure, while most of the ancillary analysis in sections 3-5 will be conducted using an analogous Google News measure.

3. SPECIFIC SOURCES OF POLICY UNCERTAINTY

To quantify the specific policy areas that contribute to policy uncertainty and drive changes in its level and composition over time, we construct a categorical breakdown of our news-based policy uncertainty index utilizing Google News. We construct a number of category-specific news-based indexes following the same approach as before. In addition to requiring an article to satisfy all the search criteria for our main policy uncertainty index, we now require it to also mention category-specific terms such as "interest rate" or "inflation" for our Monetary Policy category or "taxes" for our Taxes category.

Table 1 reports the results for twelve categories of policy uncertainty. The second row reports average values of our Google News Index of Economic Policy Uncertainty in each indicated period (scaling by the smoothed series for 'today'), expressed as a percentage of the average index value for the entire sample period from 1985:1 to 2011:10. For example, the value of 33.9 for Economic Policy Uncertainty from 1985:1 to 1990:6 says that the value of the index in that period is 33.9% of its average value over the full sample period. The top row reports the value of our Google News Index of Overall Economic Uncertainty, also expressed as a percentage of the average value of our Google news Index of Economic Policy Uncertainty. Entries in Rows 1 to 12 report the values for specific policy categories. For example, the value of 145.3 for "Monetary Policy" from 2010:1 to 2011:10 says that the number of scaled references to monetary policy uncertainty in this period is 145 percent of the average number of scaled references to ALL forms of policy-related uncertainty during the full 1985:1 to 2011:10 period.

Not surprisingly, Table 1 shows that national security matters loom large around Gulf War I and after 9/11. The extraordinary levels of policy uncertainty in 2010 and 2011 are dominated instead by concerns related to Monetary Policy and Taxes. Fiscal Policy more generally, Health Care, Labor Regulation, National Security and Sovereign Debt & Currency matters are important contributing factors. Based on our current set of category-specific search criteria, concerns related to Entitlement Programs, Financial Regulation, Energy & Environment, Trade Policy, Competition Policy and Legal Policy have been modest sources of economic policy uncertainty in recent years and earlier. It is possible that our findings in this regard reflect inadequacies in our current set of

category-specific search criteria. We welcome suggestions for improvements in this regard.

4. THE ECONOMIC IMPACT OF POLICY UNCERTAINTY

Does policy uncertainty drive overall economic uncertainty?

One obvious impact of policy uncertainty is to increase overall economic uncertainty. As discussed in the introduction, there is a sizable literature on the economic effects of uncertainty. An interesting question is to what extent economic uncertainty reflects policy uncertainty. Perhaps most economic uncertainty is due to things not directly related to policy – for example, uncertainty over rates of technological growth, consumer demand or commodity prices. Alternatively, perhaps economic uncertainty is mostly driven by uncertainty over factors directly determined by policy, such as taxes and government regulation. Yet another possibility is that the same factors that give rise to economic uncertainty also present new and difficult questions for policymakers, generating an increase in policy uncertainty at the same time.

To help throw some light on these alternatives, Figure 6 plots our Google News Index of Economic Policy Uncertainty and a broader Google News-based measure of economic uncertainty. The broader measure is the count of articles containing just the search terms "uncertain" or "uncertainty" and "economic" or "economy" scaled by a smoothed version of 'today'. Recall that our narrower Google News Index of Economic Policy Uncertainty includes only those articles that also contain one or more of the following terms: 'policy', 'tax', 'spending', 'regulation', 'federal reserve', 'budget', or 'deficit'

Prior to 2001, Figure 6 shows several large jumps in economic uncertainty that involve rather modest changes in economic policy uncertainty. Examples include the 1987 stock market crash and recession jitters in the second half of the 1980s, the dissolution of the Soviet Union, and the 1997 Asian Financial Crisis. Since September 2001, however, there is a closer correspondence between large jumps in overall economic uncertainty and large jumps in policy-related economic uncertainty. Figure 7 makes this point in a more systematic way. The figure shows a scatter plot of the log economic uncertainty index against the log policy uncertainty index and linear regression fits for

three periods – 1985 to 1989, 1990 to August 2001 and September 2001 to August 2011. The regression R-squared values are 0.53 in the first period, 0.68 in the second period, and 0.88 in the period since 9/11. In other words, policy uncertainty accounts for a large share of the high-frequency variation in overall economic uncertainty since 9/11 and a substantially larger share in the past ten years than in the two earlier periods.[8]

We can also calculate the ratio of news articles that meet our criteria for policy-related economic uncertainty to those that meet our criteria for the broader index of economic uncertainty. The bottom row in Table 1 reports this ratio for various periods, and the top row reports the index for overall level of economic uncertainty. Policy uncertainty accounts for a relatively small share of overall uncertainty in the 1990s, when overall economic uncertainty is also low. For example, in the period from January 1992 to August 2001, when overall economic uncertainty was about half its average value in our sample period, 44 of 100 new articles about economic uncertainty include one or more of our policy terms. Since September 2001 the overall level of economic uncertainty is much higher, and the ratio of policy to overall uncertainty is also high. In the period from January 2010 to October 2011, overall economic uncertainty about 3 times its average value in our sample period and 65 out of 100 articles about economic uncertainty are also about policy.

In summary, Figures 6 and 7 and Table 1 make three points. First, according to our news-based approach, economic uncertainty is considerably higher in the past 10 years than in the previous 15 years. Second, policy-related uncertainty increased more sharply than overall uncertainty. As a result, it accounts for a larger share of economic uncertainty in the past decade – around 60% since 9/11 and over 65% in the 2010-2011 period. Third, policy uncertainty accounts for 8% of the high-frequency movements in economic uncertainty since 9/11, a much larger share than in earlier periods. These results imply that policy-related concerns are an increasingly important aspect of overall economic uncertainty, and that they account for most of the movements in overall economic uncertainty in recent years.

---

[8] Although hard to see in the scatterplot, several data points from the 1990 to August 2001 period lay along or very close to the post 9/11 regression line. They are October 1990 (two months after the Iraqi invasion of Kuwait), January 1991 (start of Allied Operation Desert Storm to expel Iraq from Kuwait), September-October 1992 (leading up to the presidential election of Bill Clinton in early November 1992), November 2000 (presidential election of George W Bush), and February-May 2001.

The Dynamic Response of Aggregate Activity to Economic Policy Uncertainty

We are also interested in how aggregate output, employment and private investment respond to movements in policy-related uncertainty. Here we adopt a simple empirical approach to this question, using Vector Auto Regressions (VAR) and simple identifying assumptions to estimate the effects of policy uncertainty on aggregate outcomes. We fit a VAR and recover orthogonal shocks using a Cholesky decomposition with the following ordering: our policy uncertainty index, the log of the S&P 500 index to control for broader economic conditions, the federal funds rate to control for interest rates, log employment, and log real industrial production. In our baseline specification, we run the VAR on monthly data with six monthly lags, and a monthly time trend.

This approach identifies dynamic relationships among the variables using our Cholesky ordering and differences in the timing of movements in the variables. So, for example, it could be that policy uncertainty causes recessions, or that policy uncertainty is a forward-looking variable that rises in advance of anticipated recessions. With these caveats in mind, our VAR-based results provide evidence at least of important co-movements between our index of policy-related uncertainty and economic activity, with some suggestive evidence on causation.

Looking at Figure 8, we see that a 112 point rise in policy uncertainty (the rise in our policy uncertainty index from 2006 to 2011) is followed by a persistent fall in real industrial production with a peak negative impact of about -4.0% at 14 months. Similarly, there is a persistent fall in aggregate employment following a policy uncertainty shocks, with a peak response of 2.3 million jobs after 20 months. These dynamic responses are substantial, lending support to recent concerns about the potentially damaging economic consequences of policy uncertainty.

The estimated effects of political uncertainty on output and employment are robust to several modifications to the VAR specification, Cholesky ordering, and policy uncertainty measure. Figure 9 shows the results of a sensitivity analysis for the industrial production response to policy uncertainty shocks. We consider three months and nine months of lags rather than six months, reverse the Cholesky ordering used to construct orthogonal shocks, use a version of the policy uncertainty index that weights all

components equally, consider a bivariate VAR with policy uncertainty and industrial production only, and add the VIX index as the first measure in the VAR to control for overall economic uncertainty. Robustness results for employment look similar, with estimated falls of around 2 to 3 million jobs following a policy uncertainty shock across all the specifications estimated in Figure 9.

Figure 10 considers a VAR-based estimated effect of policy uncertainty shocks on real GDP and investment using quarterly data from the national income accounts. Using the same size shock as before, we find a peak estimated effect on GDP of 3.2% after four quarters. We find a much larger effect on private investment, with a peak decline of 16% after three quarters. Although based on a different empirical approach, our investment results are very much in line with the estimated effects of election uncertainty in Julio and Yook (2010) and Durnev (2010). Consumption (not shown in the figures) also drops in a similar fashion to GDP, with durable consumption showing a slightly larger drop and recovery than non-durable consumption.

Policy uncertainty or economic confidence?

Another question is to what extent our estimated impact of uncertainty reflects the response of economic activity to an increase in uncertainty (a mean preserving increase in the variance of policy) versus the response to increased uncertainty alongside bad news. This is important as periods of increased economic policy uncertainty also tend to be periods of bad economic news. So our changes in "uncertainty" could be reflecting changes in "confidence", a term which often implies both mean and variance effects.

To control for this we first include the level of the S&P500 stock-market index in all our VAR estimations. Given stock-markets are forward looking this should hopefully reflect future expectations of business conditions. But as a second robustness test we also try including the index of consumer confidence from the Michigan Consumer Sentiment Index.[9] In Figure 11 we show the VAR estimates after including this consumer

---

[9] This index is constructed through phone surveys of consumers and seeks to determine how consumers view the short-term economy, the long-term economy, and their own financial situation. It takes the difference between the percent answering positively and that answering negatively for each of 5 questions, then averages these differences and normalizes by the base period (December 1968) total. This has a correlation with our uncertainty index of -0.742. We chose the Michigan index as the more commonly used consumer confidence index, but other indices give similar results as they are highly correlated with the

confidence index as the second measure after uncertainty (in the top panel) and as the first measure before uncertainty (in the bottom panel). In both cases the estimated impact is lower, suggesting that consumer confidence does proxy for part of the predictive power of our economic policy uncertainty measure. But, nevertheless we still get a drop and recovery in production after an economic policy uncertainty shock, suggesting this has significant additional predictive power over and above consumer confidence.

For readers interested in investigating the data further, we place the full data set for Figure 1 (updated monthly) on the web at www.policyuncertainty.com.

5. HOW GOOD ARE THE NEWS SEARCHES?

Our index relies critically on the ability of our news searches to capture movements in economy policy uncertainty. To help assess our measurement approach, we also use Google News to perform some proof-of-concept tests. In these proof-of-concept tests we modify our approach to Google News indexes to consider various types of uncertainty and check whether the series respond to known sources of uncertainty.

For our first proof-of-concept test, we compare a modified version of our Google News uncertainty index to a widely used measure of financial uncertainty. Specifically, we search for articles containing the terms 'uncertain' or 'uncertainty' and 'economic' or 'economy', as in our primary Google News-based index of overall economic uncertainty, but now require the additional terms 'stock prices', 'equity prices', or 'stock market'. We then compare our series with monthly mean values of the VIX index. The VIX, commonly called the 'fear index', gives one measurement of the volatility of the S&P 500 stock market index. The VIX is constructed from the prices of a variety of options on the S&P, with the stated intent of measuring the implied volatility of the S&P Index over the next month. Thus, it is often taken as a forward-looking measure of uncertainty in equity returns, predicting the likelihood of large swings in equity prices. Figure 12 shows

Michigan Index – for example, the Bloomberg Confidence index has a correlation of 0.943 with the Michigan index and the Conference Board Confidence index has a correlation of 0.912 with the Michigan index.

that our Google News-based index of stock market uncertainty and the VIX measure of uncertainty about stock prices are reassuringly similar.

A second test involves examining trends in news media mentions of competition with Japan and China. We do this because most economists would agree that U.S. economic competition with China has risen over time relative to competition with Japan. We perform searches for articles containing 'Economic', 'Competition', and either 'China' or 'Japan' and normalize the counts by the smoothed number of articles containing 'today'. Figure 13 displays the results. We see a gradually declining trend for competition with Japan, while media reference to economic competition with China rise rapidly, passing the Japan references decisively during the early 2000s. This pattern mirrors our perception of reality and trends in public sentiment, with economic competition from China becoming a major concern for many, rather than the fear of economic competition with Japan that held sway in earlier years.

Finally, Fernandéz-Villaverde et al. (2011) conduct an exercise to measure uncertainty regarding economic decision-making in regards to consumption taxes, capital taxes, labor taxes, and government spending. They proceed with a different methodology than ours, using sequential Monte Carlo methods to estimate a time series of fiscal volatility shocks for each instrument. Comparing their findings to our own Economic Policy Uncertainty Index, we find correlations of 0.44, 0.31, and 0.67 with their indices for fiscal volatilities of capital taxes, labor taxes, and government expenditures. All correlations are highly significant at a 1% level. We find no correlation with their fiscal volatility index for consumption taxes. The strong correlations between our policy uncertainty index and three of the four indexes developed by Fernandez-Villaverde et al. are also reassuring.

Born and Pfeifer (2011) also use structural estimation with Sequential Monte Carlo Methods to estimate policy-related uncertainty. Using different fiscal rules than Fernandéz-Villaverde et al., they estimate uncertainty about labor and capital tax rates as well as government spending directly from aggregate time series. Comparing their results to our own Economic Policy Uncertainty Index, we find correlations of 0.51 and 0.35 with their indices for fiscal volatilities of capital taxes and labor taxes (significant at the 1% level), but no significant correlation with government expenditures and monetary

16

policy. However, we also find a correlation of 0.43 with their measure of TFP uncertainty, which again overall is reassuring about the validity of our measure of economic policy uncertainty.

6. DETERMINANTS OF LARGE STOCK MARKET MOVEMENTS

A further test of the recent impact of policy decisions on real economic variables can be conducted using the stock market. Here, we look at the determinants of large stock market movements since 1980. We do this by examining the New York Times on the day after any movement of the S&P 500 index of greater than 2.5% up or down. Overall, since 1980, there have been 290 such large movements, with 120 of them in just the last 4 years alone. From the New York Times, we generally find a single article explaining the previous day's large stock market movements which gives a reason for the movement in the title or first paragraph. We then allocate each reason to broad categories such as macroeconomic news such as unemployment figures or GDP growth data, earnings or profit reports, or policy-related reasons such as government announcements about new laws, regulations, or financial policy. Also included in the policy-related category are Federal Reserve actions which are not simply interest rate changes.

We find (see Table 2) that the most common thing moving stock-markets prior to 2007 was macroeconomic news, accounting for 31% of major stock market jumps between 1980 and 2007. The second most common category was policy, which accounted for 14% of the jumps in the stock-market over this period, with earnings coming in third accounting for 12% of the large stock-market jumps.

In recent years, however, we see a dramatic increase in the proportion of large stock movements driven by policy news or policy changes. Moreover, this does not seem to simply be a symptom of the recession. Looking at the other recessions in our sample, we see no jump in policy-related stock movements, with the large movements being driven primarily by macroeconomic data or, in the case of the 1990-1991 recession, by news of the first Gulf War. Plotting these numbers over time (Figure 14), you can see a tremendous surge in absolute numbers of large movements since 2007. Furthermore, the increase in policy-related movements, including European and domestic policy-related

events, is also apparent. The recent experience stands in stark contrast to the mid-1990s and the mid-2000s, where there were several years in a row without a single large stock movement of greater than 2.5% and even longer periods without a large movement driven by policy.

7. CONCLUSION

Policy-related economic uncertainty has become the subject of contentious debate since the recession of 2007-2009 and the most recent presidential and congressional elections. Many commentators argue that uncertainty over future policies regarding taxation and spending, health-care reform, and regulations prolonged the recession and hindered a strong recovery. Despite the debate, there exists no standard measure of this type of uncertainty. We hope to provide an objective measure through the construction of an index based on a variety of policy-related uncertainty indicators. Our index captures forecaster disagreement over the future path of consumer price inflation and federal government purchases, the number of tax code provisions set to expire in coming years, and the frequency of news articles about policy-related economic uncertainty.

Our policy uncertainty index surges around major federal elections, 9/11, the Gulf Wars, the Lehman bankruptcy and TARP bailout, debates over the stimulus package, and the debt ceiling dispute. We see higher 'base' levels of our index since 2005 as well as larger spikes, and even higher levels since 2008. We also find that our news-based index of policy-related economic uncertain accounts for a larger share of the high-frequency variation in overall economic uncertainty in the past 10 years, as compared to the previous 15 years.

Finally, we conduct a VAR analysis using our new policy-related uncertainty index to investigate its role as one potential driver of real economic variables such as employment and GDP. Using Cholesky orderings to construct orthogonal shocks, we find that a policy uncertainty shock equal in size to actual increase in the index value from 2006 to 2011 foreshadows drops in private investment of 16 percent within 3 quarters, industrial production drops of 4 percent after 16 months, and aggregate employment reductions of 2.3 million within two years. These findings reinforce concerns that policy-

18

related uncertainty played a role in the slow growth and fitful recovery of recent years, and they invite further research into the effects of policy-related uncertainty on economic performance.

APPENDIX: Old Policy-Uncertainty Index Construction

Prior to January 16, 2012, our index of economic policy uncertainty was constructed of slightly different components:

1. Instead of a 10-paper newspaper index, we utilized the Google News values, as described above.

2. We utilized data from the Joint Committee on Taxation, instead of the CBO, to construct the tax expirations index. This data was similar to that of the CBO but went back only to 1998 rather than 1992. Furthermore, the JCT data did not have any information about estimated costs associated with the various tax expirations.

3. We solely used forecaster disagreement indices regarding the CPI and federal purchases of goods and services, rather than also including disagreement about forecasts of state and local government purchases.

APPENDIX: Additional News-Search Proof-of-Concept

We also look at an energy uncertainty index, measuring the frequency of the words 'uncertain', 'politics' or 'policy', and 'energy', and find the spikes match key energy related shocks as shown in Figure A1. We do a similar exercise for the term 'middle east' and 'terror', again finding spikes in these indices that match known important terrorist events and major shocks in the Middle East. See Figures A2 and A3. In summary, our Google News indexes appear to provide a useful approach to quantifying various types of economic and political uncertainty.

REFERENCES:

Alexopoulos, M. and J. Cohen, 2009. "Nothing to Fear but Fear itself? Exploring the effect of economic uncertainty", Manuscript, University of Toronto working paper.

Bachmann, Rüdiger, and Christian Bayer (2011). "Uncertainty Business Cycles— Really?" unpublished manuscript.

Bachmann, Rüdiger, Steffen Elstener, and Eric Sims (2010). "Uncertainty and Economic Activity: Evidence from Business Survey Data," unpublished manuscript.

Bekaert, Geert, Robert Hodrick and Xiaoyan Zhang, 2010. "Aggregate Idiosyncratic Uncertainty," NBER Working Paper No. 16058.

Berger, D., and J. Vavra (2010): "Dynamics of the U.S. Price Distribution," Yale mimeo

Bernanke, B. (1983): "Irreversibility, Uncertainty and Cyclical Investment," *Quarterly Journal of Economics*, 98, pp. 85–106.

Bhagat, Sanjai and Iulian Obreja, 2011. "Employment, Corporate Investment and Cash Flow Uncertainty," working paper, September.

Bloom, Nick. (2009): "The Impact of Uncertainty Shocks," *Econometrica,* 77, pp. 623-685.

Bloom, Nick, S. Bond, and J. Van Reenen (2007): "Uncertainty and Investment Dynamics," Review of Economic Studies, 74, pp. 391–415.

Bloom, N. M. Floetotto, and N. Jaimovich (2009): "Really Uncertain Business Cycles," Mimeo, Stanford.

Boero, Gianna, Jeremy Smith, and Kenneth F. Wallis, "Uncertainty and Disagreement in Economic Prediction: The Bank of England Survey of External Forecasters," Economic Journal 118 (2008), 1107–1127.

Born, Benjamin and Pfeifer, Johannes, "Policy risk and the business cycle", University of Bonn mimeo, 2011.

Bomberger, W. A. (1996), "Disagreement as a Measure of Uncertainty", Journal of Money, Credit and Banking, 28(3), 381-392.

Born, Benjamin and Johannes Pfeifer, 2011. "Policy Risk and the Business Cycle," University of Bonn.

Campbell, J., Lettau, M., Malkiel B. and Xu, Y. (2001), "Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk", Journal of Finance, 56(1), 1-43.

Chen, Jinzhu, Prakash Kannan, Prakash Loungani and Bharat Trehan, 2011. "New Evidence on Cyclical and Structural Sources of Unemployment," IMF Working Paper, May.

DeMarzo, Peter M. and Uuliy Sannikov, 2006, "Optimal Security Design and Dynamic Capital Structure in a Continuous-Time Agency Model," *Journal of Finance,* 61, no 6 (December), 2681-2724.

Dixit, A. and R. Pindyck (1994): *Investment Under Uncertainty*. Princeton, NJ: Princeton University Press.

Durnev, Art, 2010. "The Real Effects of Political Uncertainty: Elections and Investment Sensitivity to Stock Prices," working paper, McGill University, September.

Fernandez-Villaverde, Jesus, Guerron-Quintana, Pablo, Kuester, Keith and Juan Rubio-Ramirez (2011), "Fiscal volatility shocks and economic activity", University of Pennsylvania mimeo.

Gilchrist, Simon, Jae W. Sim and Egon Zakrajsek, 2010, "Uncertainty, Financial Friction and Investment Dynamics,

Giordani, P. and Soderlind, P. (2003). Inflation forecast uncertainty. European Economic Review, 47, 1037-1059.

Gomes, Francisco J., Laurence J. Kotlikoff and Luis M. Viceira, 2008. "The Excess Burden of Government Indecision," working paper, London Business School.

Hassett, Kevin A. and Gilbert E. Metcalf, 1999. "Investment with Uncertain Tax Policy: Does Random Tax Policy Discourage Investment?" *Economic Journal,* 109, no. 457 (July), 372-393.

Joint Committee on Taxation, 2011. *List of Expiring Tax Proficions, 2010-2020* (JCX-2-11), January 21, and similar documents for earlier years. Available at www.jct.gov.

Julio, Brandon and Youngsung Yook, 2010. "Political Uncertainty and Corporate Investment Cycles," *Journal of Finance,* forthcoming.

Knotek, E and Khan, S. (2011), "How do households respond to uncertainty shocks?", *Kansas City Federal Reserve Board Economic Revivew*, Second Quarter.

Narita, Futoshi, 2011. "Hiddent Actions, Risk-Taking, and Uncertainty Shocks," University of Minnesota, February.

Panousi, Vasia and Papanikolaou, Dimitris (2011), "Investment, idiosyncratic risk and ownership", forthcoming *Journal of Finance*.

Pastor, Lubos and Veronesi, Pietro, (2011a), "Uncertainty about government policy and stock prices", forthcoming *Journal of Finance.*

Pastor, Lubos and Veronesi, Pietro, (2011b), "Political Uncertainty and Risk Premia," working paper, University of Chicago, September.

Rich, Robert and Tracy, Joseph. (2010), "The relationship among expected inflation, disagreement, and uncertainty: evidence from matched point and density forecasts", Review of Economic Studies, 92(1), 200-207.

Rodrik, Dani, 1991. "Policy Uncertainty and Private Investment," *Journal of Development Economics,* 36, 229-242.

Schwert, G. W. (1989): "Why Does Stock Market Volatility Change Over Time?" Journal of Finance 44, 1115-1153.

Zarnowitz, Victor, and Louis A. Lambros, "Consensus and Uncertainty in Economic Prediction," Journal of Political Economy 95 (1987), 591–621.

Table 1: The Intensity and Composition of Policy-Related Economic Uncertainty by Time Period.

Time period	1985:1-1990:6	1990:7-1991:12	1992:1-2001:8	2001:9-2007:6	2007:7-2008:8	2008:9-2009:12	2010:1-2011:10	1985:1-2011:8
	Mid 1980s to Gulf War I	Gulf War I	1990s boom until 9/11	9/11 attacks and 2000s expansion	Beginning of Credit Crunch	Lehman collapse to 'recovery' start	Start of 'recovery' onwards	Overall Average
Overall Economic Uncertainty	54.1	217.4	82.4	245.7	299.7	438.6	574.4	181.6
Overall Economic Policy Uncertainty	33.9	57.8	36.1	137.1	182.2	244.0	381.7	100.0
1. Monetary policy	17.5	22.2	16.0	19.3	106.2	80.5	145.3	33.7
2. Taxes, spending & fiscal policy	17.4	26.2	19.4	37.8	54.8	105.1	158.8	39.1
2a. Fiscal Policy	4.1	3.9	3.8	4.5	5.8	14.6	43.8	7.5
2b. Taxes	15.5	23.4	17.8	34.0	47.6	73.0	112.6	32.0
2c. Government spending	4.0	6.0	4.5	4.0	3.2	7.0	9.4	4.8
3. Entitlement programs	3.3	4.7	5.9	6.5	4.5	7.0	11.4	5.8
4. Health care	3.7	7.2	9.3	11.1	9.3	14.6	17.9	9.3
5. Financial regulation	0.7	1.3	0.5	0.6	1.5	6.0	6.7	1.4
6. Labor regulation	2.2	2.8	3.2	4.3	3.3	4.1	5.0	3.4
7. Energy & environmental	3.8	6.6	4.9	6.9	8.2	12.4	12.5	6.3
8. National security	16.5	44.4	17.4	54.4	21.0	34.6	26.9	28.4
9. Sovereign debt & currency	1.8	1.4	3.0	4.5	6.3	7.7	30.9	5.4
10. Trade policy	3.0	4.2	4.8	5.3	4.3	4.5	3.9	4.4
11. Competition policy	3.1	3.8	3.5	6.2	5.9	7.0	8.1	4.6
12. Legal policy	0.8	0.7	0.9	1.9	0.8	0.8	1.0	1.1
Sum of Rows 1 to 12	73.7	125.6	88.9	158.6	226.1	284.3	428.3	
Ratio of Policy Uncertainty To Overall Economic Uncertainty	0.63	0.27	0.44	0.56	0.61	0.56	0.66	

Notes to Table 1:

1. The second row reports average values of our Google News Index of Economic Policy Uncertainty in each indicated period (scaling by the smoothed series for 'today'), expressed as a percentage of the average index value for the entire sample period from 1985:1 to 2011:8. For example, the value of 36.9 for Economic Policy Uncertainty from 1985:1 to 1990:6 says that the value of the index in that period is 36.9% of its average value over the full sample period.

2. The top row reports the value of our Google News Index of Overall Economic Uncertainty, also expressed as a percentage of the average value of the news-based policy uncertainty index.

3. Entries in Rows 1 to 12 index report analogous values for narrower policy categories based on news article references to specific policy-related terms. For example, the value of 145.3 for "Monetary Policy" from 2010:1 to 2011:7 says that the number of scaled references to monetary policy uncertainty in this period is 145 percent of the average number of scaled references to ALL forms of policy-related uncertainty during the 1985:1 to 2011:8 sample period.

4. The categories in Rows 1 through 12 are not mutually exclusive in two respects. First, a given news article may discuss multiple distinct sources of uncertainty such as monetary policy and entitlement reforms. Second, some of the category boundaries overlap. For example, Medicaid is an entitlement program and a major part of the U.S. health care system. Google queries run September 24-25, 2011.

Specific search terms by row:

- Row 1: "monetary policy" OR "interest rates" OR "Fed funds rate" OR "inflation";
- Row 2 is a composite of all Row 2a-2c terms. Row 2a: "fiscal policy" OR "fiscal stimulus" OR "stimulus debate" OR "budget deficits" OR "government debt" OR "balanced budget" OR "debt ceiling"; Row 2b: "taxes" OR "taxation" OR "tax"; Row 2c: "government spending" OR "budget battle" OR "balanced budget";
- Row 3: "entitlement programs" OR "government entitlements" OR "Social Security" OR "Medicaid" OR "Medicare" OR "government welfare" OR "unemployment insurance";
- Row 4: "health care" OR "Medicaid" OR "Medicare" OR "health insurance" OR "Obamacare" OR "medical tort reform" OR "prescription drugs" OR "drug policy" OR "Food and Drug Administration";
- Row 5: "financial regulation" OR "banking regulation" OR "financial services regulation" OR "Glass-Steagall" OR "TARP" OR "executive compensation regulation" OR "bank regulation" OR "Dodd-Frank" OR "consumer financial protection bureau" OR "commodity futures trading commission" OR "house financial services committee" OR "Basel ii" OR "capital requirement" OR "Volcker rule";
- Row 6: "labor market regulation" OR "union rights" OR "collective bargaining" OR "card check" OR "National Labor Relations Board" OR "discrimination" OR "minimum wage" OR "living wage" OR "right to work" OR "closed shop" OR "wage and hour" OR "workers compensation" OR "advance notice requirement" OR "advance warning" OR "worker protection" OR "affirmative action" OR "disability act" OR "maternity leave" OR "at-will employment" OR "overtime regulation" OR "overtime requirements" OR "overtime rights";
- Row 7: "energy policy" OR "energy regulation" OR "energy taxes" OR "carbon taxes" OR "cap and trade" OR "cap and tax" OR "drilling restrictions" OR "offshore drilling" OR "pollution controls" OR "environmental restrictions" OR "environmental regulations" OR "Clean Air Act" OR "Clean Water Act" OR "Environmental Protection Agency";
- Row 8: "national security" OR "war" OR "military conflict" OR "terrorism" OR "terror" OR "9/11" OR "defense spending" OR "military spending";
- Row 9: "sovereign debt" OR "currency crisis" OR "Euro crisis" OR "Asian financial crisis" OR "Russian financial crisis" OR "exchange rate";

- Row 10: "trade policy" OR "import tariffs" OR "import duty" OR "import barrier" OR "export subsidy" OR "WTO" OR "trade treaty" OR "trade agreement" OR "trade act" OR "world trade organization" OR "Doha round" OR "Uruguay round" OR "GATT" OR "agriculture subsidies" OR "dumping" OR "anti-dumping";
- Row 11: "competition policy" OR "antitrust" OR "merger policy" OR "monopoly" OR "patent" OR "copyright" OR "Federal Trade Commission" OR "unfair business practices" OR "competition regulator" OR "cartel" OR "competition law" OR "price fixing" OR "consumer protection"";
- Row 12: "legal policy" OR "class action" OR "healthcare lawsuits" OR "frivolous lawsuits" OR "tort reform" OR "tort policy" OR "class action system" OR "punitive damages" OR "medical malpractice". Having assuredly forgotten some aspects of these components, we welcome suggestions to improve these search terms.

The authors welcome suggestions for improving the foregoing category-specific search terms.

Table 2: Determinants of Large Stock Market Movement, 1980-2011

Pre- and Post-Great Recession	Policy-Related	Macroeconomic	Earnings	War/Terror	Interest Rates	Oil	Other	Unknown	Other	Total Events
1980-2007	14%	31%	12%	11%	9%	2%	22%	3%	17%	170
2008-2011	39%	35%	12%	0%	3%	2%	11%	1%	8%	120
Recessions										
1981-1982	20%	50%	0%	0%	10%	0%	20%	10%	10%	10
1990-1991	0%	9%	9%	73%	9%	0%	0%	0%	0%	11
2001	0%	36%	21%	14%	14%	0%	14%	0%	14.3%	14

Notes: Source is the New York Times from the day after each large stock market movement. Large stock market movement is a move of more than 2.5%.

Figure 1: Index of Economic Policy Uncertainty
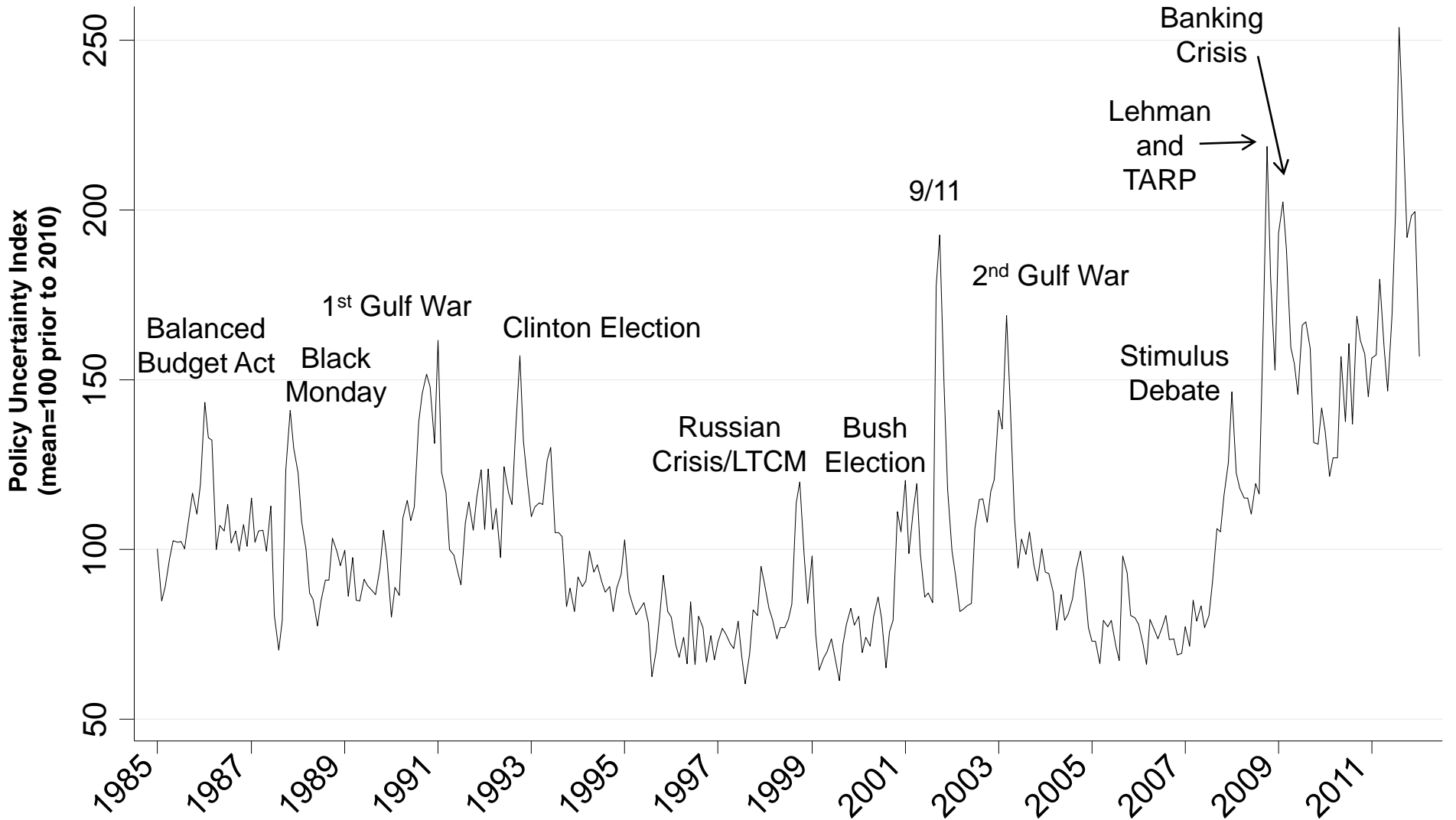
Debt
Ceiling;
Euro Debt

Obama
Election,
Banking
Crisis

Lehman
and
TARP

9/11

2nd Gulf War

1st Gulf War

Clinton Election

Balanced
Budget Act

Black
Monday

Stimulus
Debate

Russian
Crisis/LTCM

Bush
Election

Policy Uncertainty Index (mean=100 prior to 2010)

250
200
150
100
50

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

Notes: Index of Policy-Related Economic Uncertainty composed of 4 series: monthly news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed number of articles containing 'today'); the number of tax laws expiring in coming years, and a composite of IQ ranges for quarterly forecasts of federal, state, and local government expenditures and 1-year CPI from the Phil. Fed Survey of Forecasters. Weights: 1/2 News-based, 1/6 tax expirations, 1/6 CPI disagreement, 1/6 expenditures disagreement after each index normalized to have a standard-deviation of 1. News query run Jan 16, 2011. Index normalized mean 100 from 1985-2009. Data at www.policyuncertainty.com

Figure 1b: Old Index of Economic Policy Uncertainty
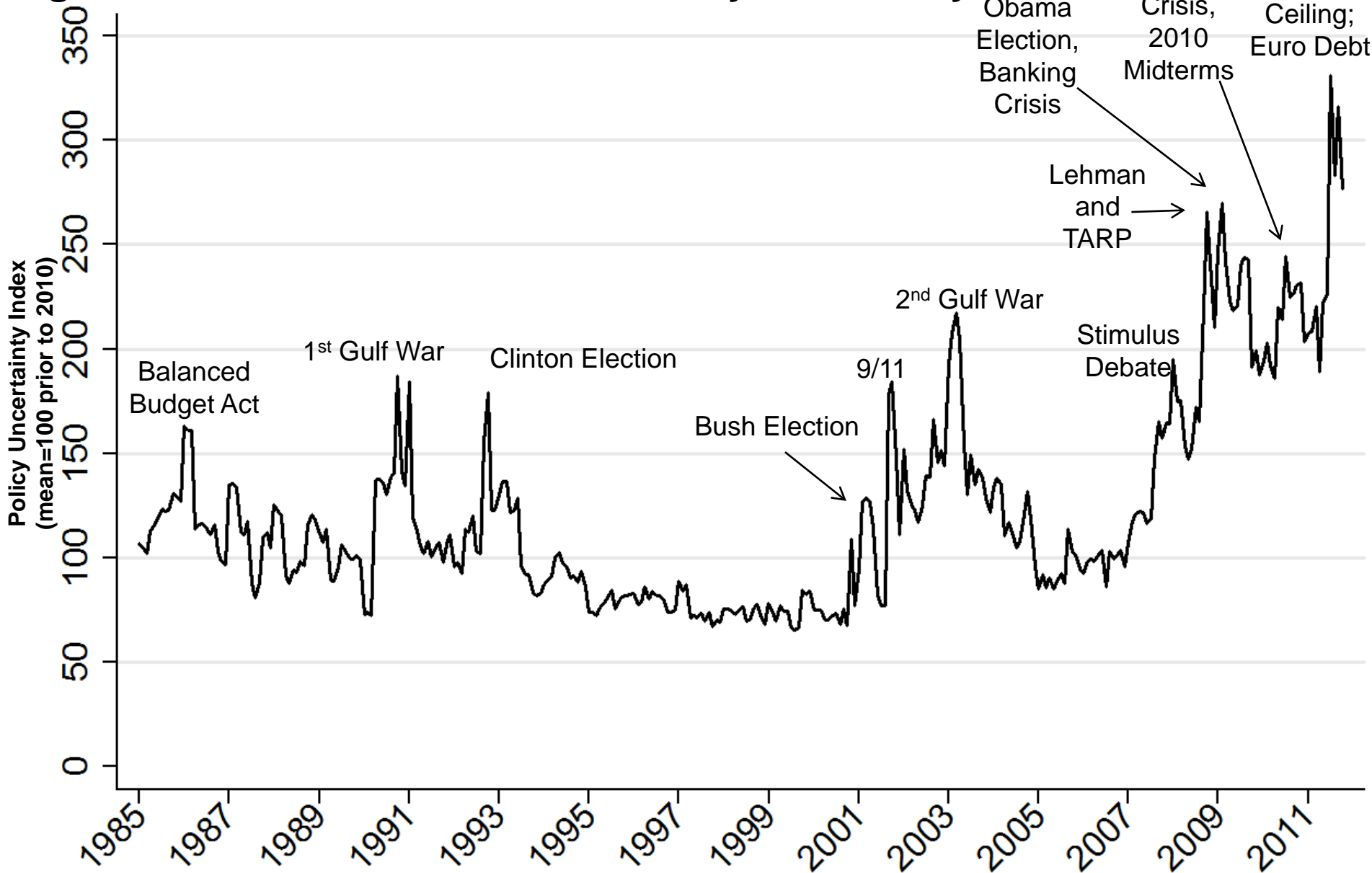
Notes: Index of Policy-Related Economic Uncertainty composed of 4 series: monthly news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed number of articles containing 'today'); the number of tax laws expiring in coming years, and a composite of IQ ranges for quarterly forecasts of federal government expenditures and 1-year CPI from the Phil. Fed Survey of Forecasters. Weights: 1/2 Google News, 1/6 tax expirations, 1/6 CPI disagreement, 1/6 Fed. expenditures disagreement after each index normalized to have a standard-deviation of 1. Google query run August 11, 2011, updated Sept 25 and Nov 8. Index normalized mean 100 from 1985-2009.

Figure 2: News-Based Policy Uncertainty Index
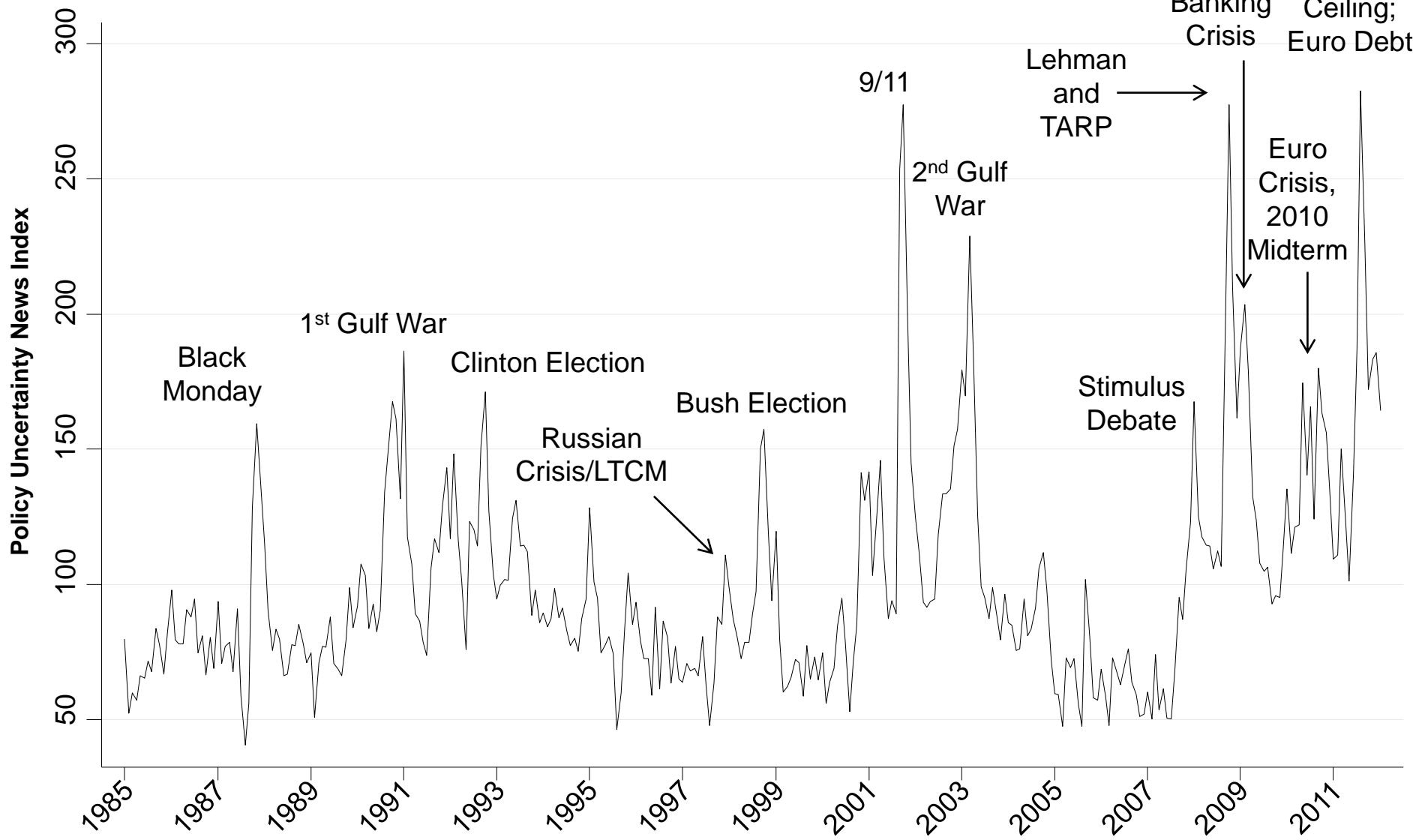
Notes: News-Based Policy Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty, economic or economy, as well as policy relevant terms (scaled by the smoothed number of articles containing 'today'). Policy relevant terms include: 'policy', 'tax', 'spending', 'regulation', 'federal reserve', 'budget', and 'deficit'. Series is normalized to mean 100 from 1985-2009. Index covers Jan 1985-Dec 2011. Query run Jan 16, 2012. Papers include USA Today, Miami Herald, Chicago Tribune, Washington Post, LA Times, Boston Globe, SF Chronicle, Dallas Morning News, NY Times, and the Wall Street Journal.

Figure 2b: News-Based Policy Uncertainty Index Comparison
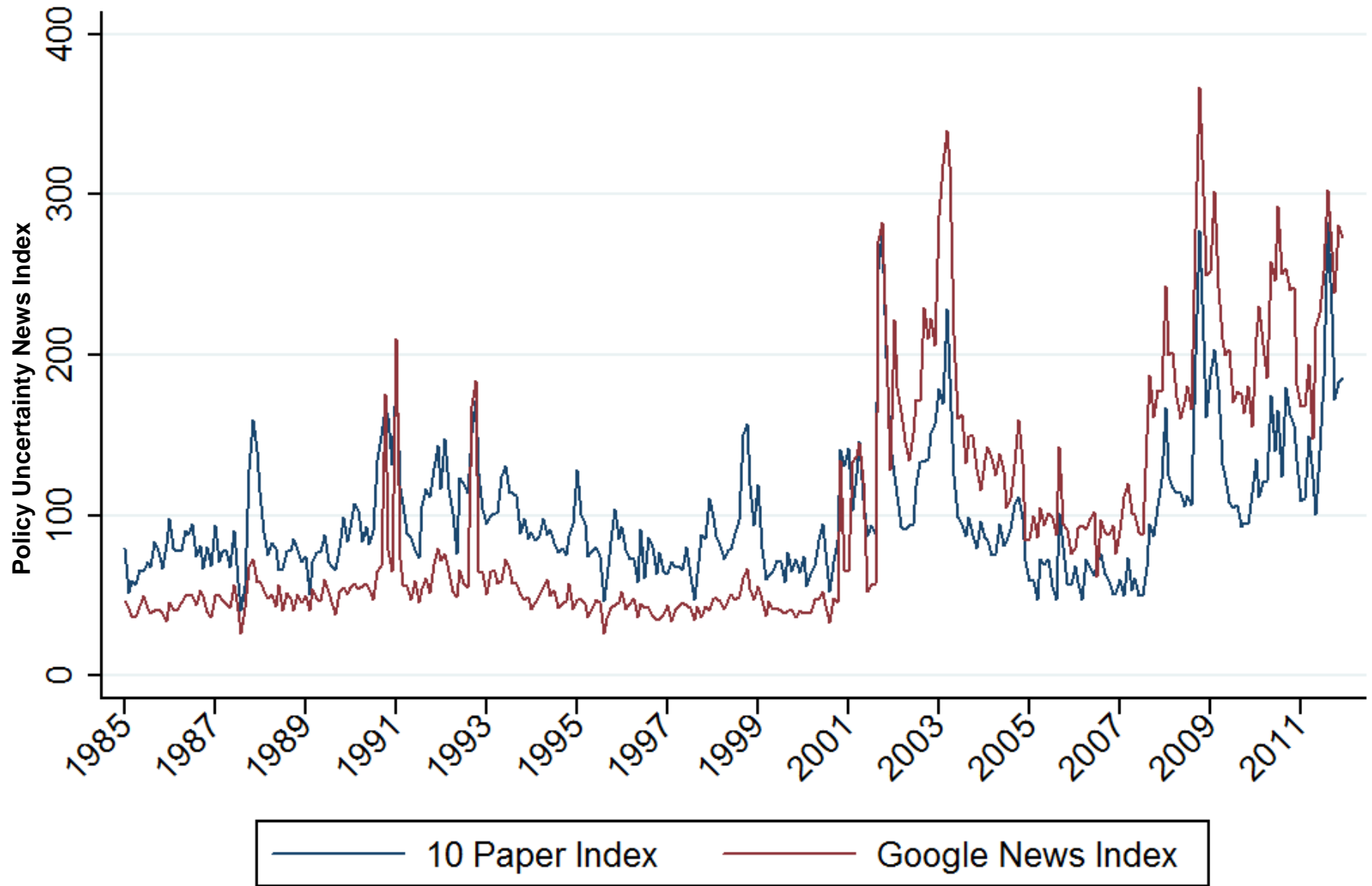
Notes: Comparison of 10-paper news index and Google News Policy Uncertainty Index. Each uses identical search terms. Google News Index utilizes the Google News Archive Search. Both cover Jan 1985-Dec 2011. Google query Run August 11, 2011 and updated Sept 25, 2011 and Jan 16, 2011. 10-paper Index composed of USA Today, Miami Herald, Chicago Tribune, Washington Post, LA Times, Boston Globe, SF Chronicle, Dallas Morning News, NY Times, and the Wall Street Journal.

Figure 3: Tax Legislation Expiration Index
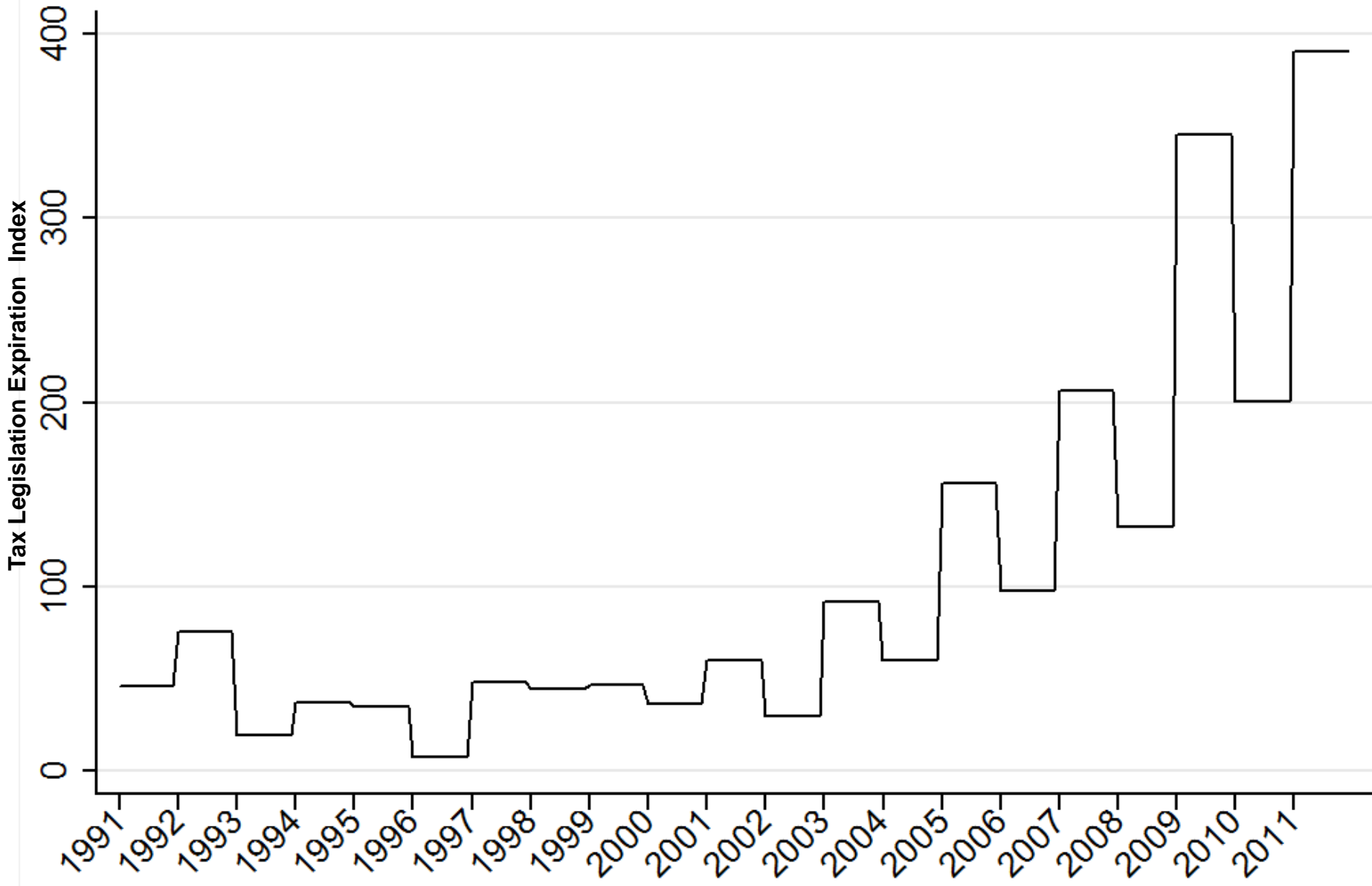
Notes: Utilizes List of Tax Expirations from the Congressional Budget Office. Each year's forecast is a 10-year horizon of expiring tax laws. Future months expirations are weighted by $0.5^{((T+1)/12)}$ where T is the number of months in the future the tax is expiring.

Figure 4a: Federal Expenditures Forecast Interquartile Range Index
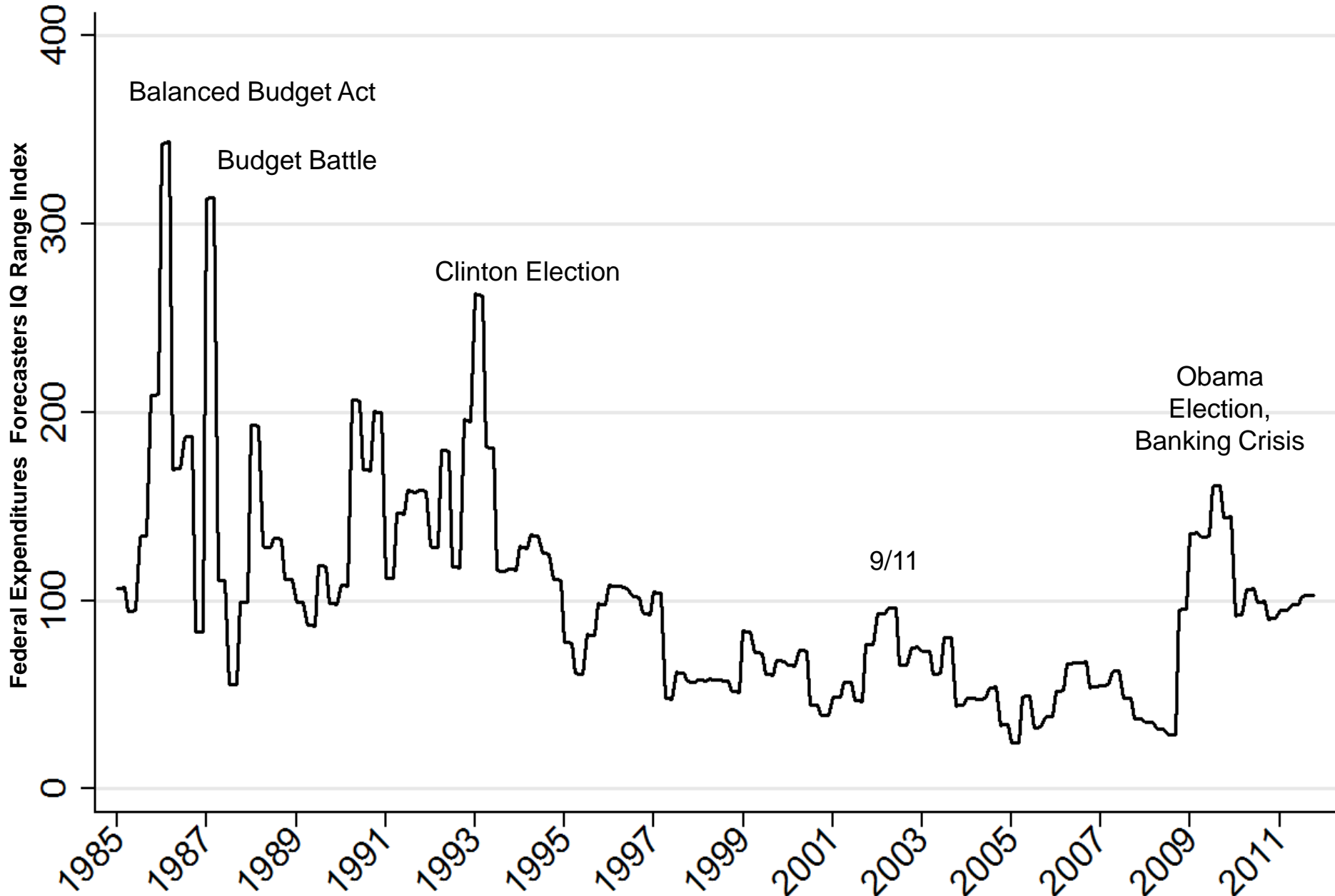
Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year ahead forecasts (which are made every quarter) of total federal government expenditures relative to the mean forecast. Normalized to a mean 100 from 1985-2009.

Figure 4b: State and Local Expenditures Forecast Interquartile Range Index
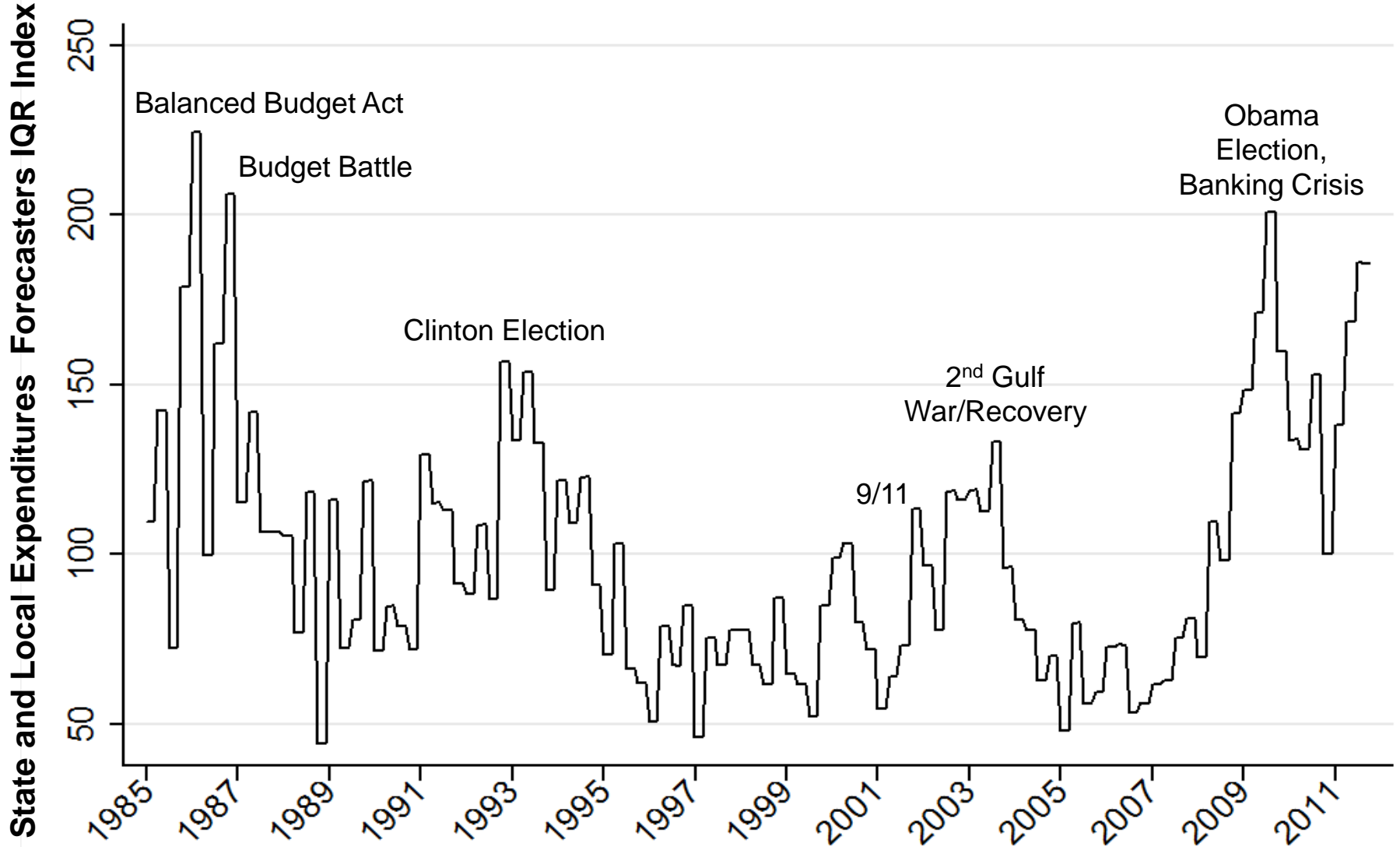
State and Local Expenditures Forecasters IQR Index (y-axis)

Labels within chart:
- Balanced Budget Act
- Budget Battle
- Clinton Election
- 9/11
- 2nd Gulf War/Recovery
- Obama Election, Banking Crisis

Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year ahead forecasts (made every quarter) of total state and local government expenditures relative to the mean forecast. Normalized to a mean 100 from 1985-2009.

Figure 5: CPI Forecasters Interquartile Range Index
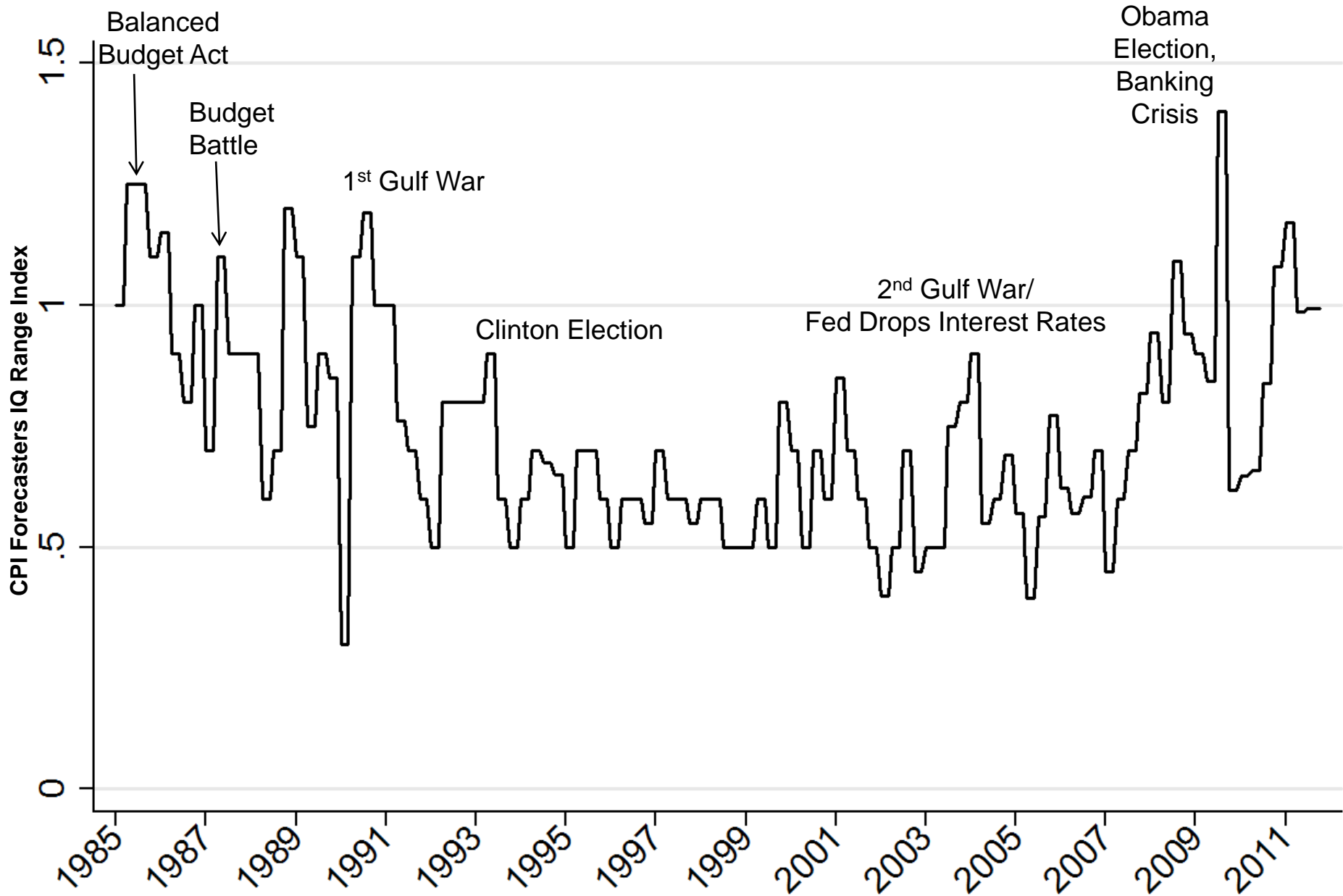
Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Displays the Interquartile (IQ) range of the 1-year –ahead forecasts of CPI (which are made every quarter).

Figure 6: Overall and Policy-Related Economic Uncertainty
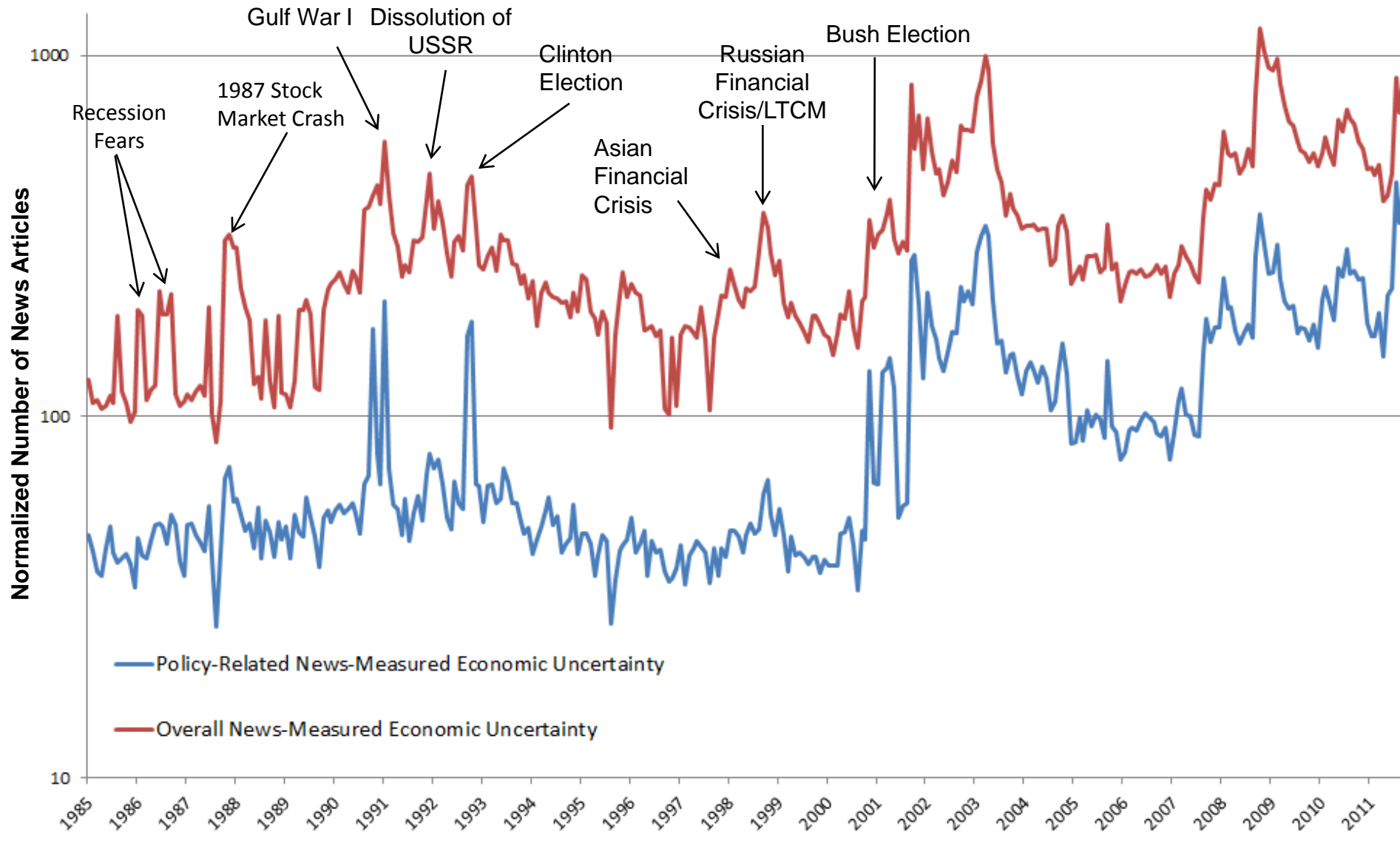
Notes: Overall News-Based Economic Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as economic or economy (scaled by the smoothed number containing 'today'). Policy Index set such that monthly average value is 100. Index covers January 1985-November 2011. Axis shown as a log scale.

Figure 7: Relationship of News-Based Index of Overall Economic Uncertainty to News-Based Index of Policy-Related Economic Uncertainty

R-Squared: 0.68
Slope: 0.79 (0.05)

R-Squared: 0.88
Slope: 0.98 (0.03)

R-Squared: 0.53
Slope: 1.50 (0.19)

log(Economic Uncertainty)

log(Policy Uncertainty)

× 1985-1989   ● 1990 to August 2001
▲ September 2001 Onwards
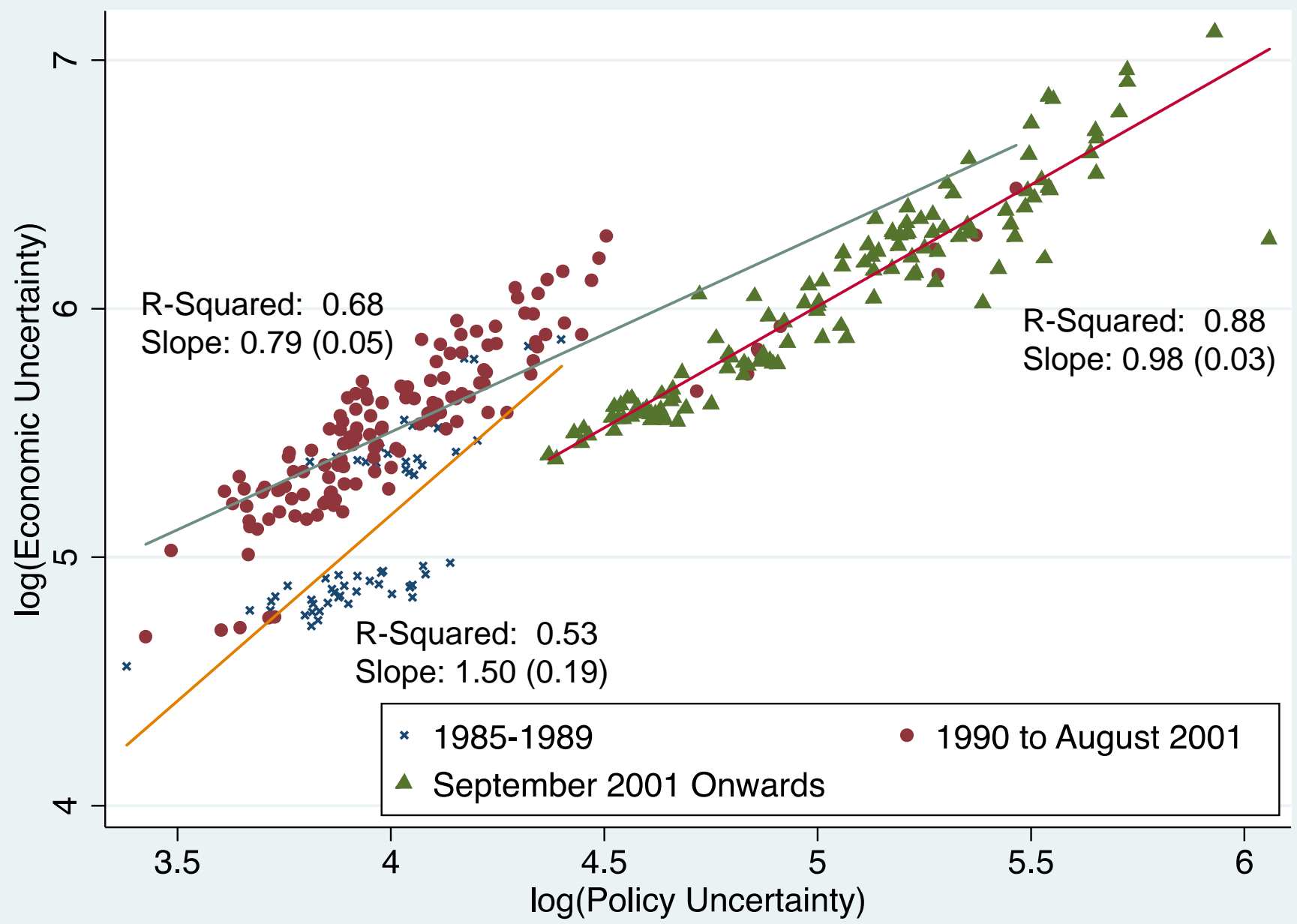
Figure 8: Estimated Industrial Production after a Policy Uncertainty Shock
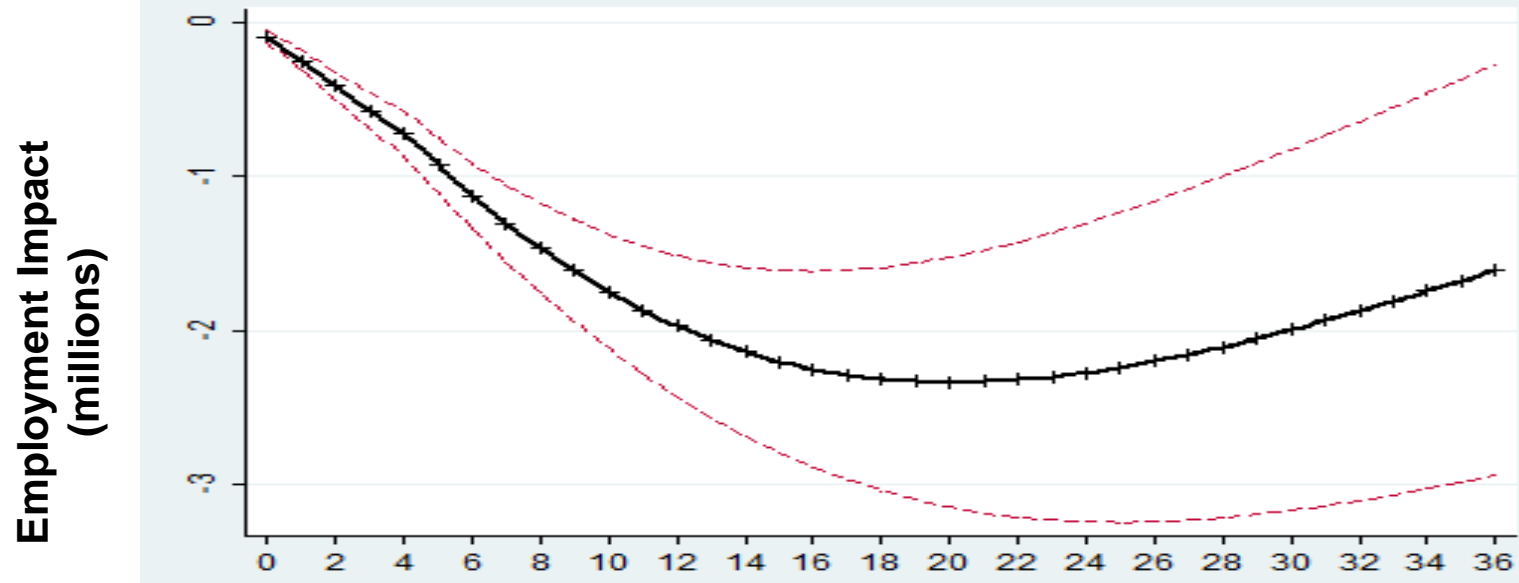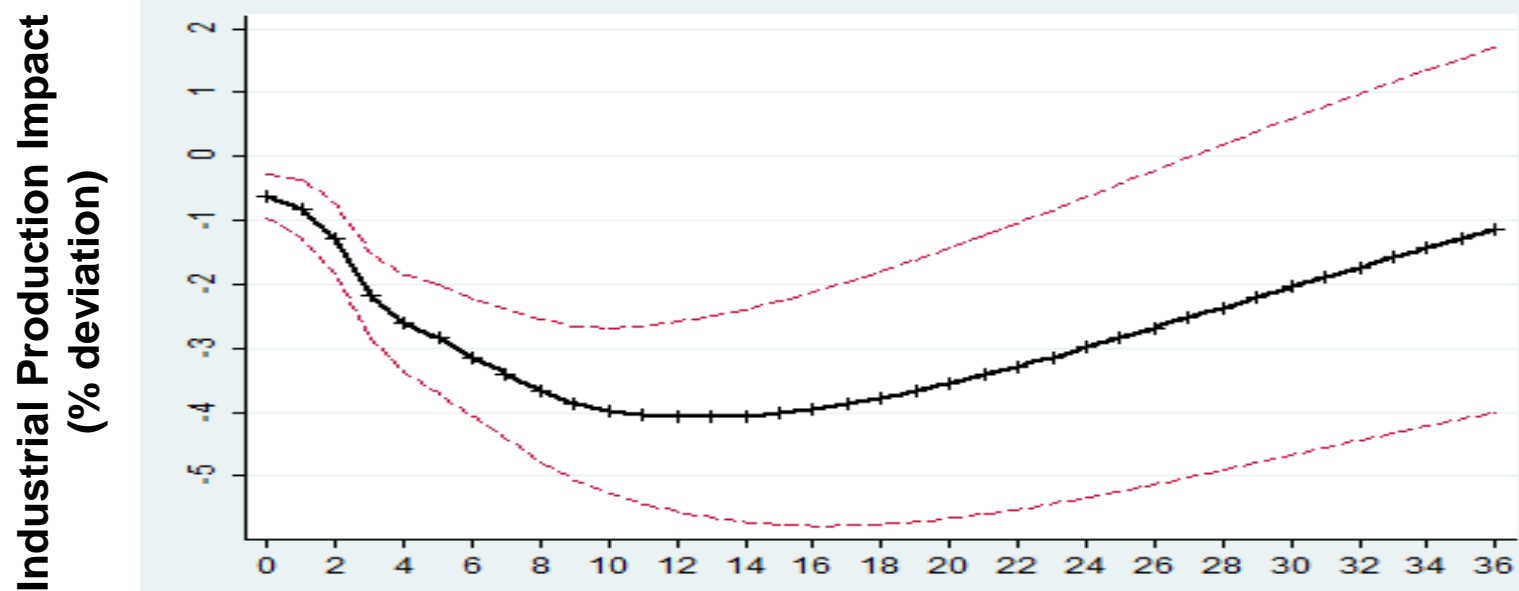

Notes: This shows the impulse response function for Industrial Production and employment to an 112 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) to 2011. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the one-standard-error bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend. Data from 1985 to 2011.

Months after the economics policy uncertainty shock

Figure 9: Robustness of Estimates to Different VAR Specifications
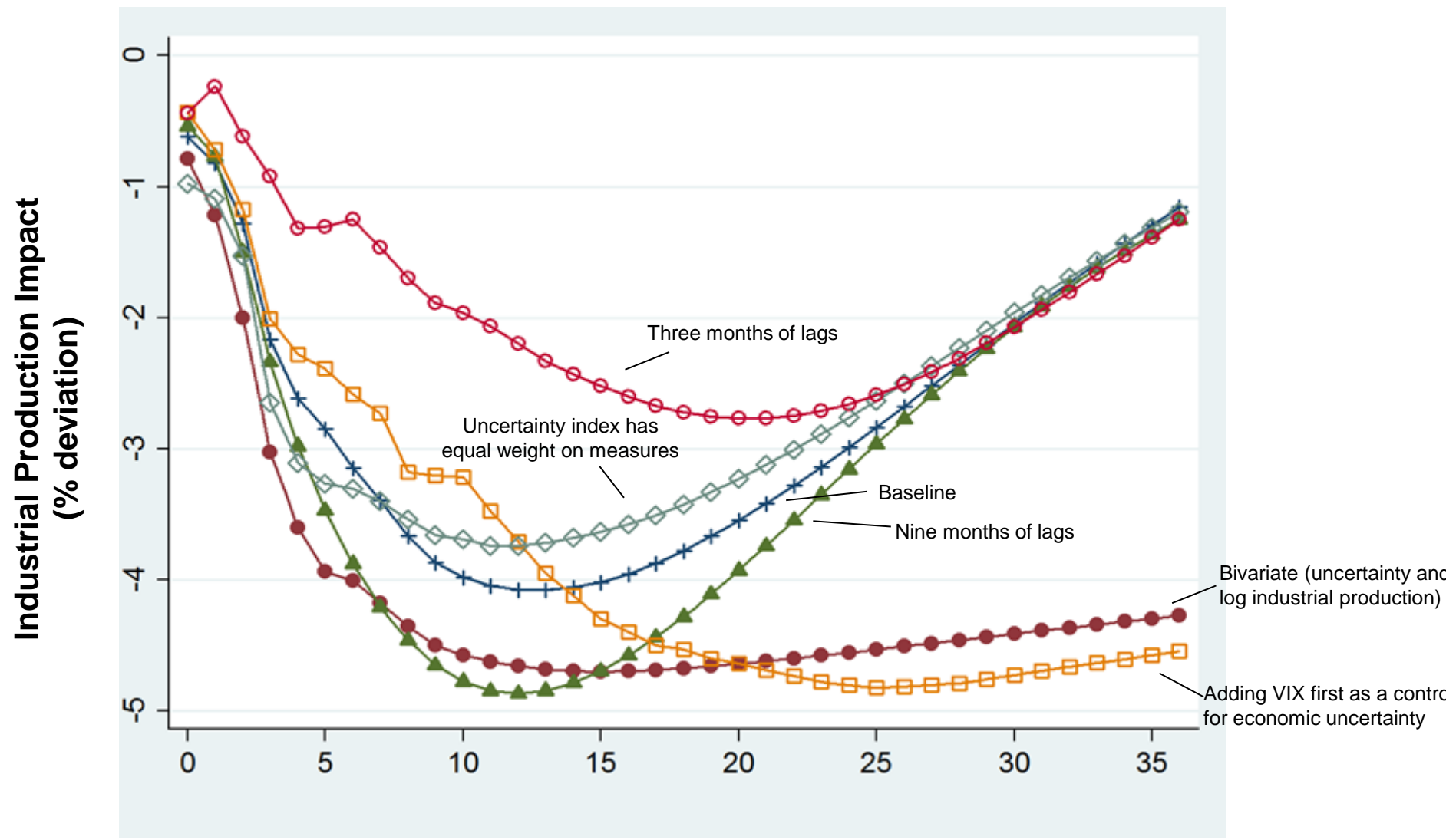
Months after the policy uncertainty shock

Notes: This shows the impulse response function for GDP and employment to an 112 unit increase in the policy-related uncertainty index. Estimated using a monthly Cholesky Vector Auto Regression (VAR) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend unless otherwise specified. Data from 1985 to 2011.

Figure 10: Quarterly VAR estimates for GDP and investment
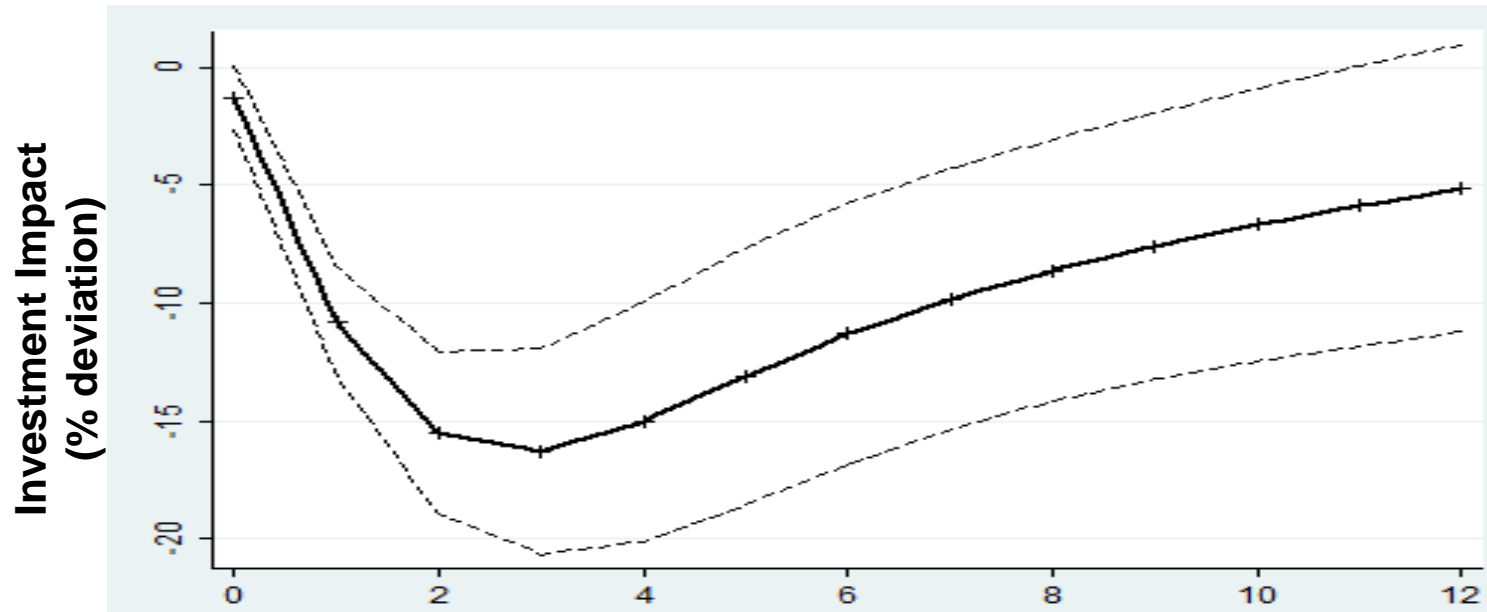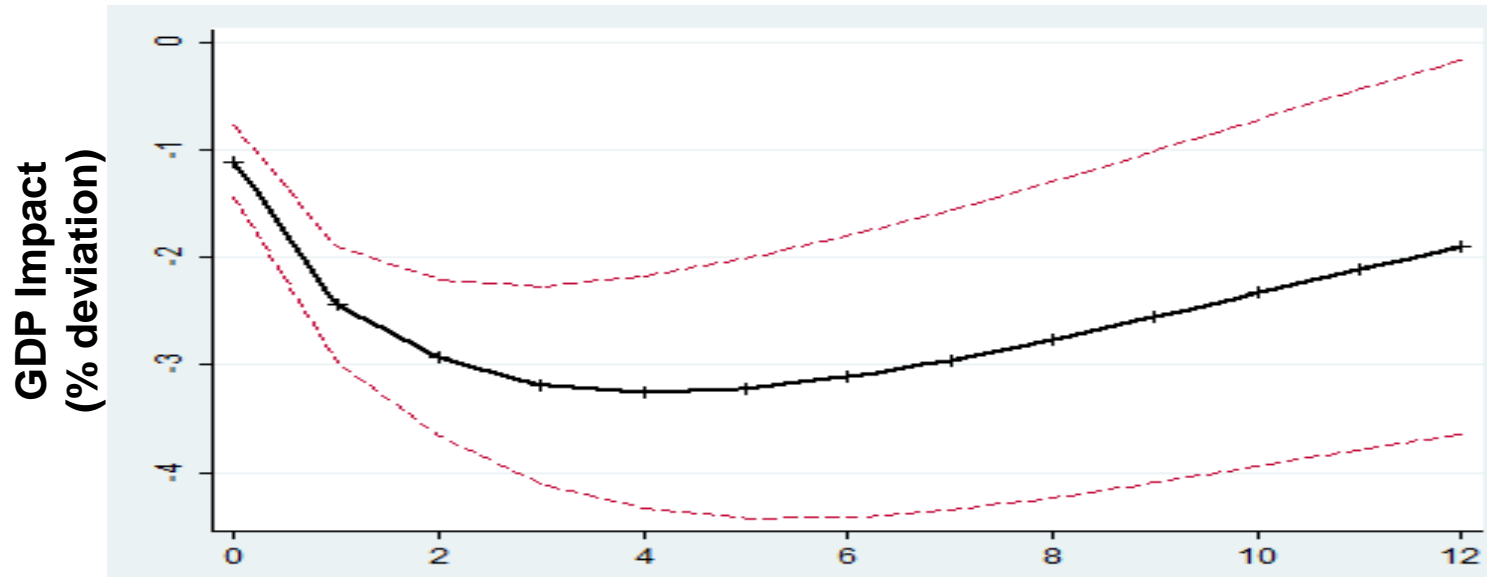
Notes: Shows the impulse response function to an 112 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) until 2011. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the one-standard-error bands. VAR is estimated using a quarterly Cholesky VAR: the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log investment, log consumption and log GDP. Data from 1985 to 2011.

Figure 11: Estimates after including controls for consumer confidence
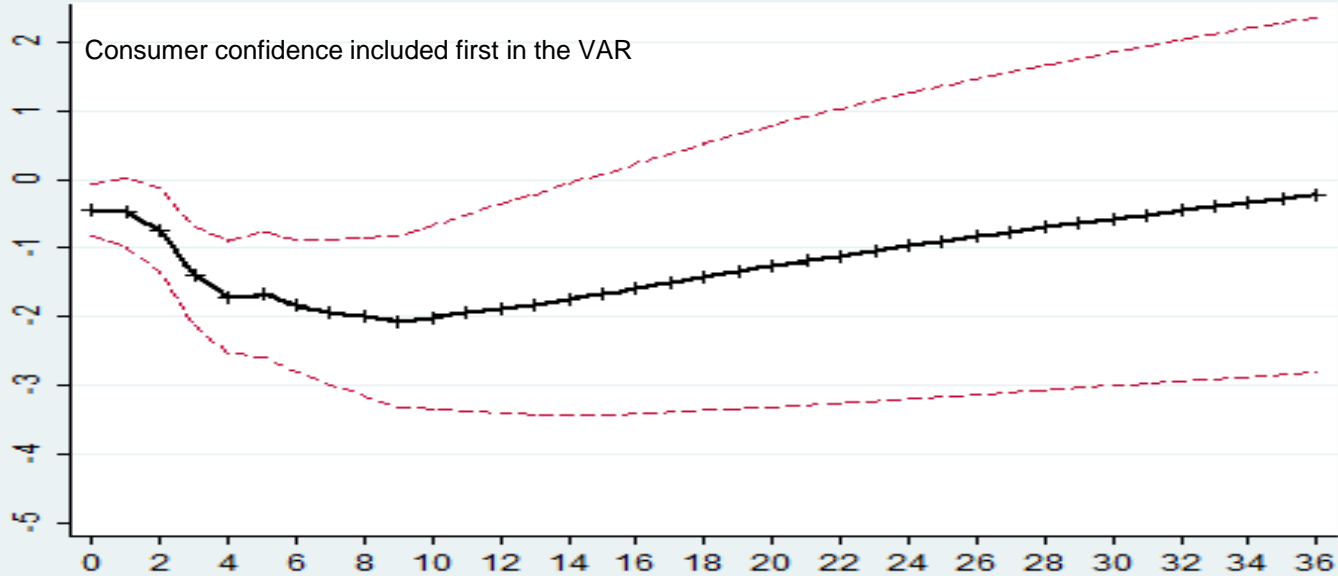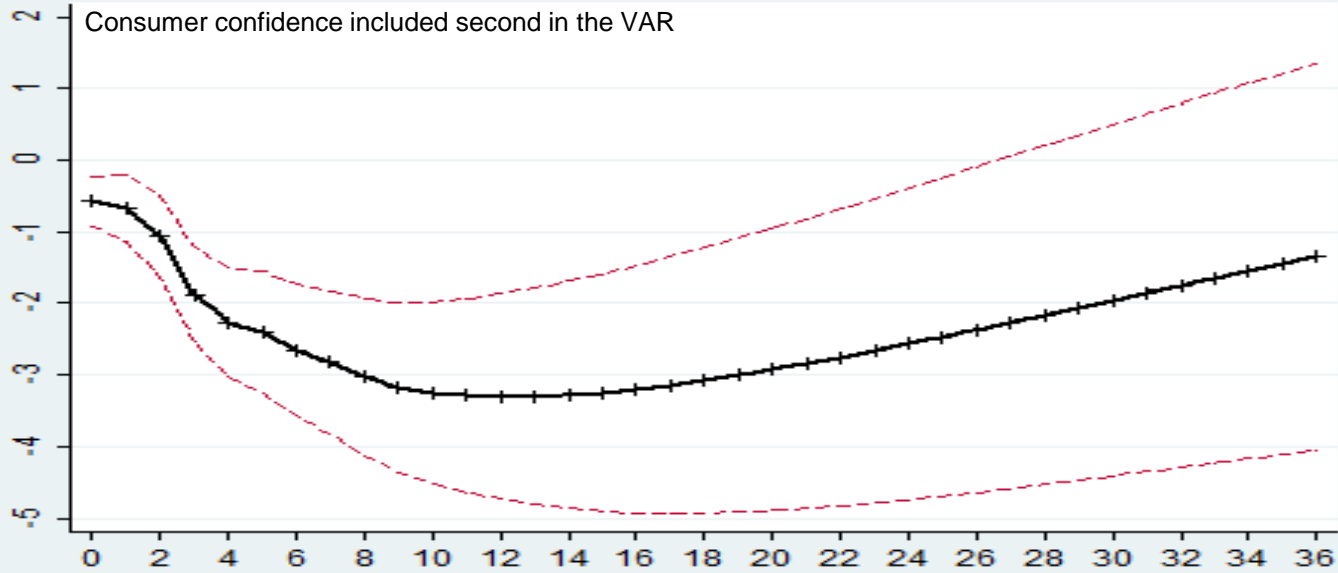
Notes: This shows the impulse response function for Industrial Production and employment to an 112 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) until 2011. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the one-standard-error bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) of the uncertainty index, log(S&P 500 index), federal reserve funds rate, log employment, log industrial production and time trend. Data from 1985 to 2011. Top panel includes the Michigan Consumer confidence index included as the second variable after our uncertainty index, and the bottom panel includes the Michigan Consumer Confidence index included as the first variable.

Figure 12: News-Based Equity Market Uncertainty Index
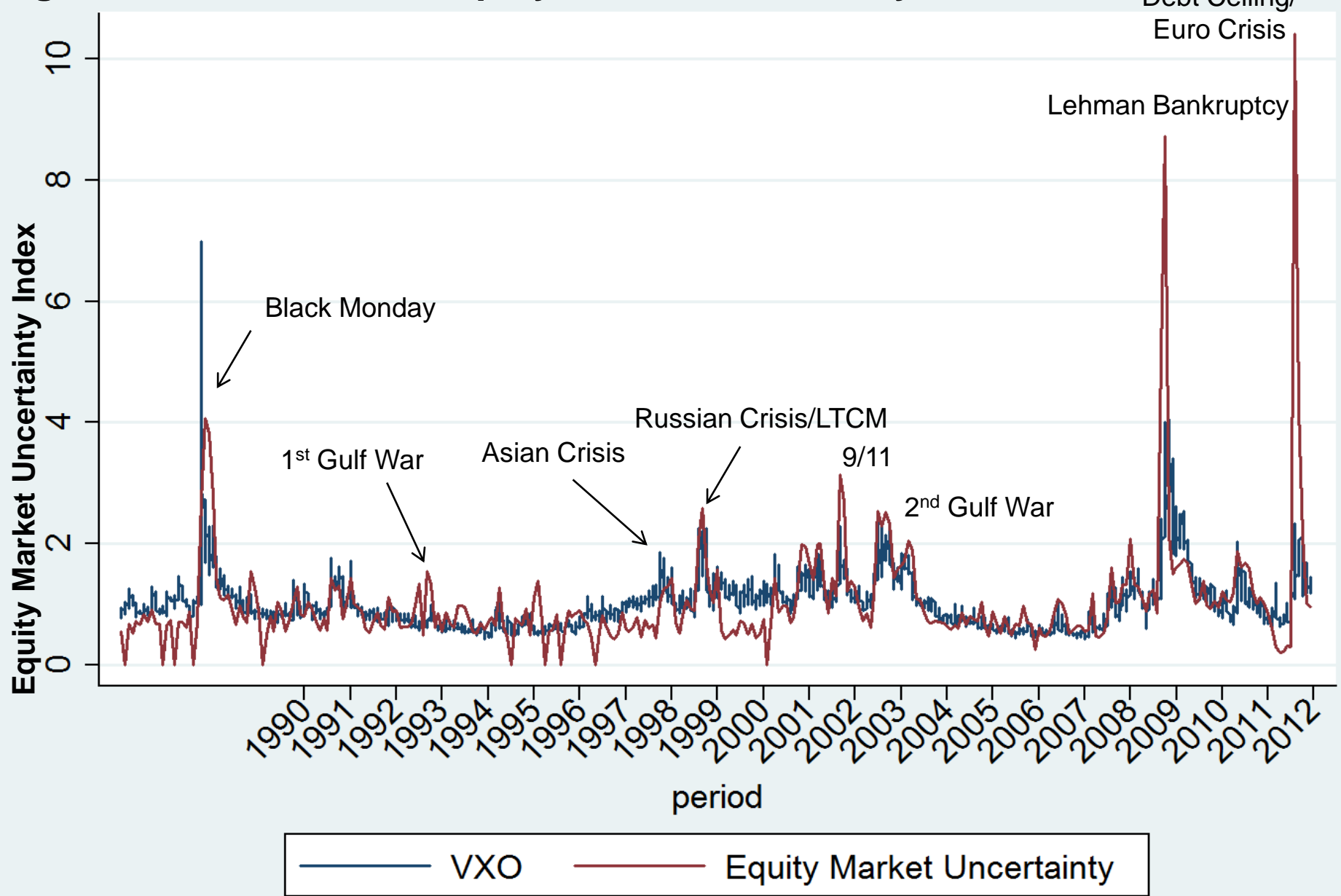
Notes: News-Based Financial Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty, economic or economy, as well as terms relevant to equity markets (normalized by the number of articles containing 'today'). These terms include 'stock prices', 'equity prices', or 'stock market'. Daily VXO data is scaled so both series have equal means. Google query run Dec 6, 2011. Data January 1985-Nov 2011.

Figure 13: News-Based China and Japan Competition Indexes
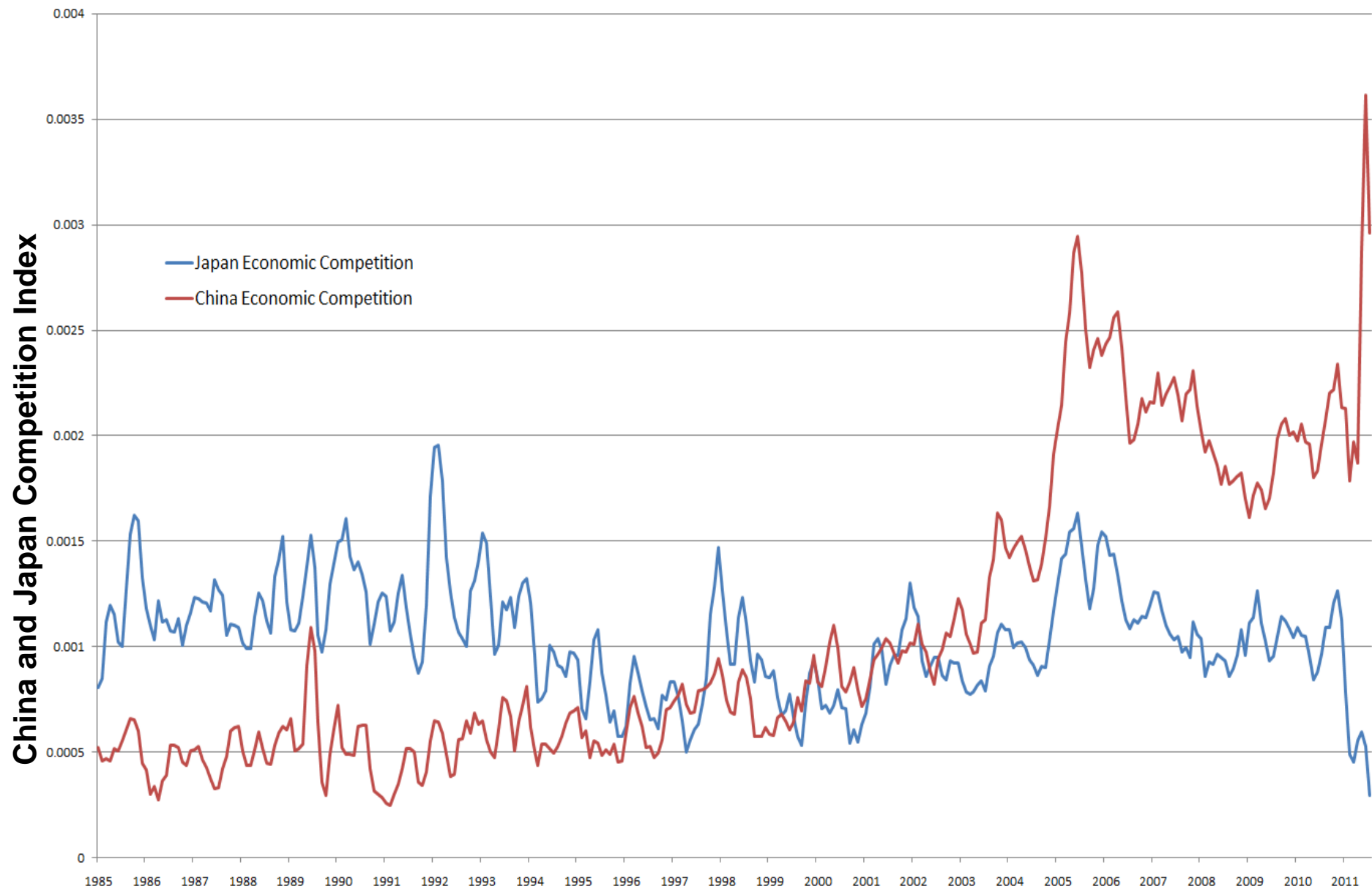
Notes: News-Based China and Japan Competition Index composed of monthly number of news articles containing competition and economy and Japan or China (scaled by the smoothed number of articles containing 'today'). Query run August 26, 2011. Index covers Jan 1985-Aug 2011.

Figure 14: Determinants of Large Stock Market Swings
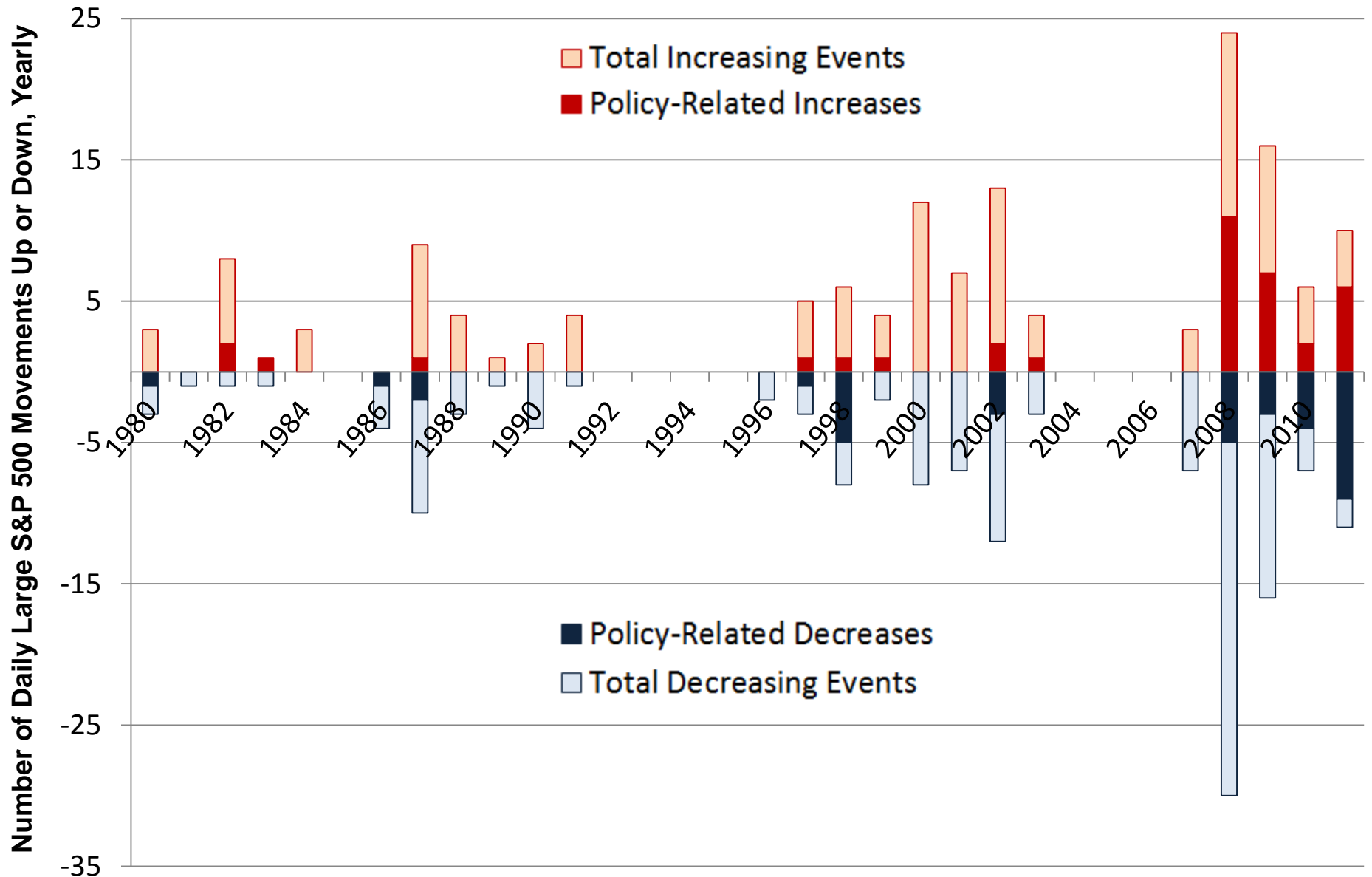
Notes: Number of movements in the S&P 500 Index greater than 2.5%, up or down. Determination of cause of large movement made from examination of New York Times coverage of the event on the following day.

Appendix Figure A1: News-Based Energy Uncertainty Index
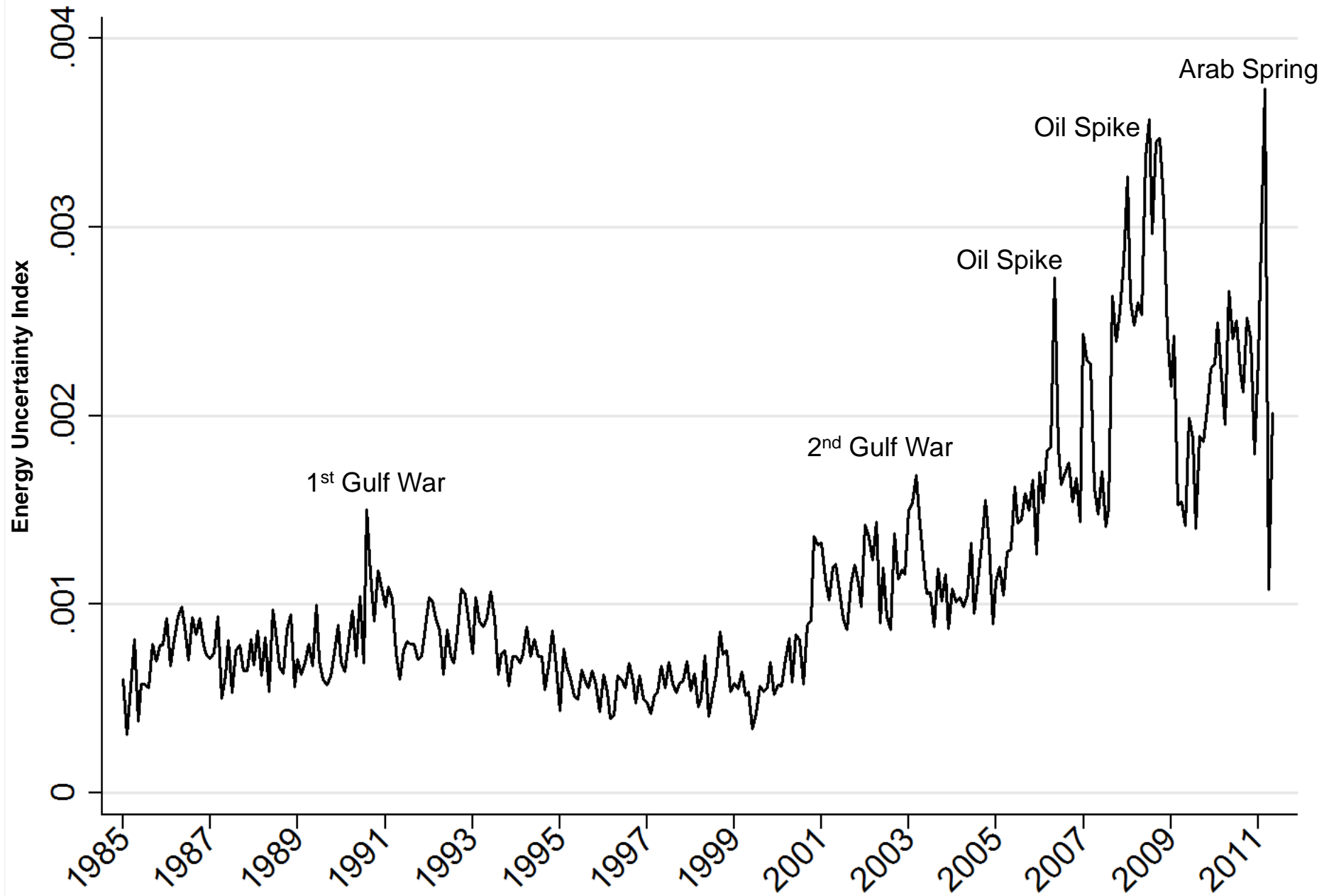
Notes: Energy Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'energy' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

Appendix Figure A2: News-Based War and Terror Uncertainty Index
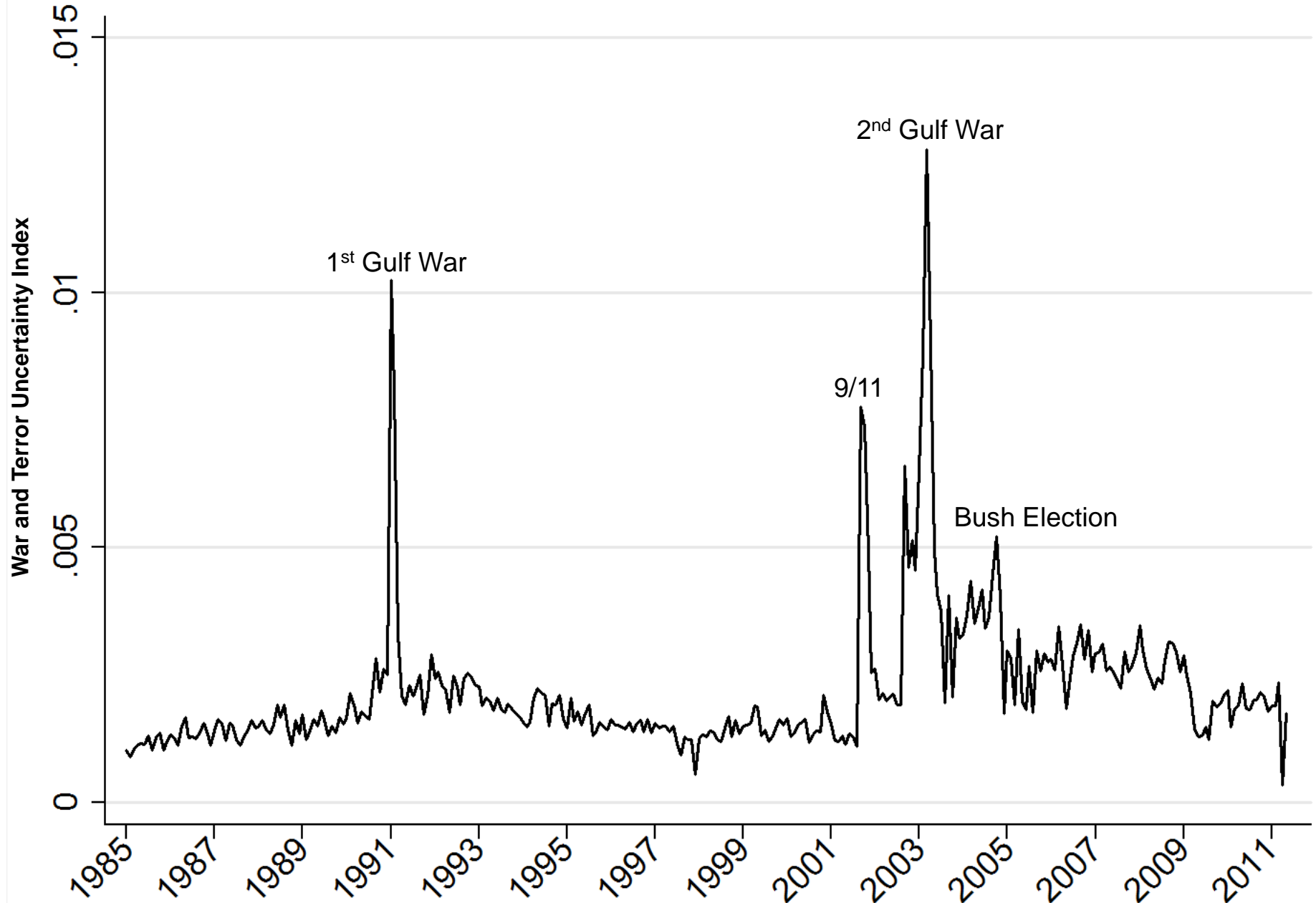
Notes: News-Based War and Terror Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'war' or 'terror' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

# Appendix Figure A3: News-Based Middle East Uncertainty Index
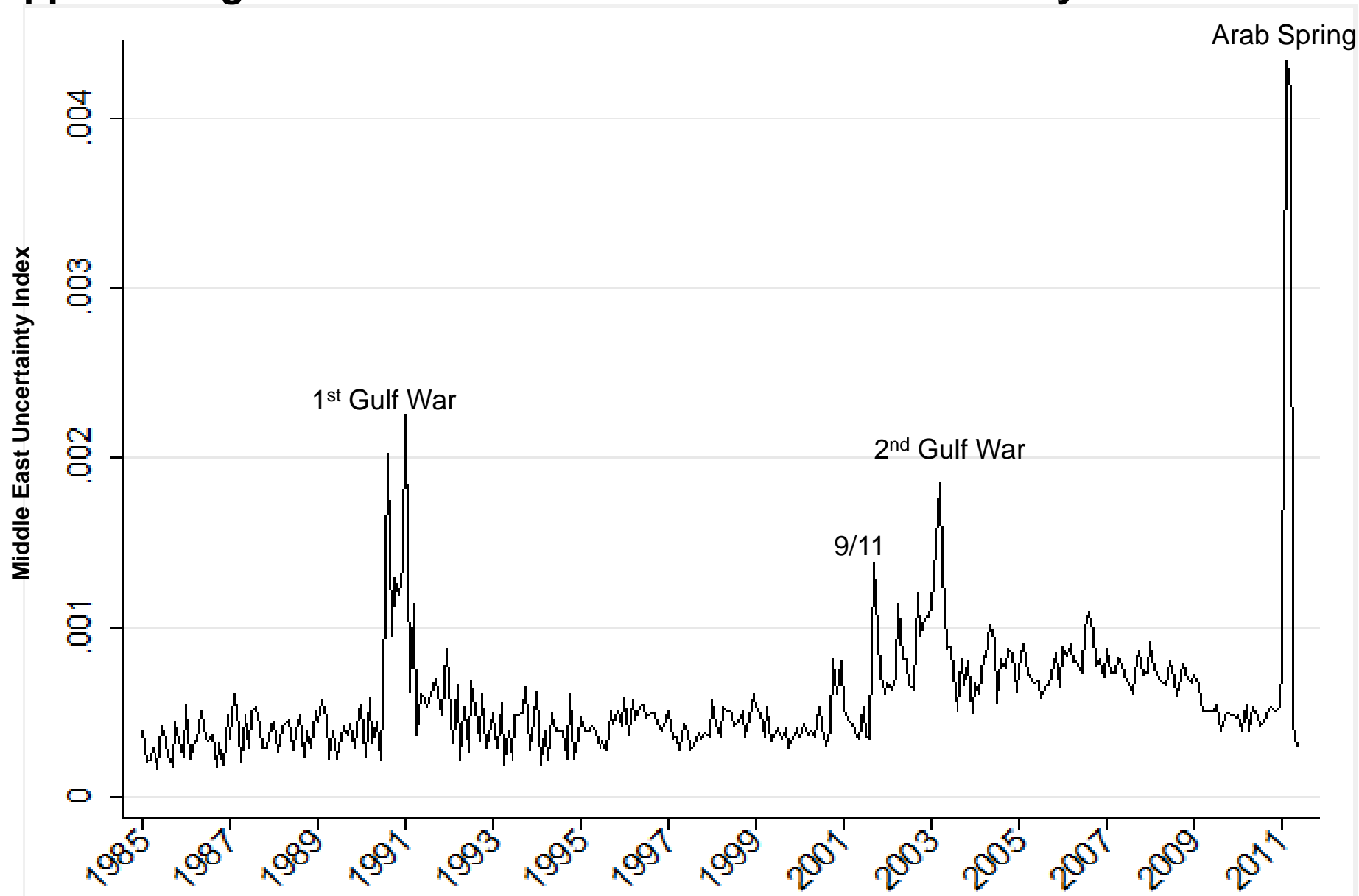
Notes: News-Based Middle East Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'Middle East' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

Appendix Figure A4: Equal Weighted Index of Economic Policy Uncertainty
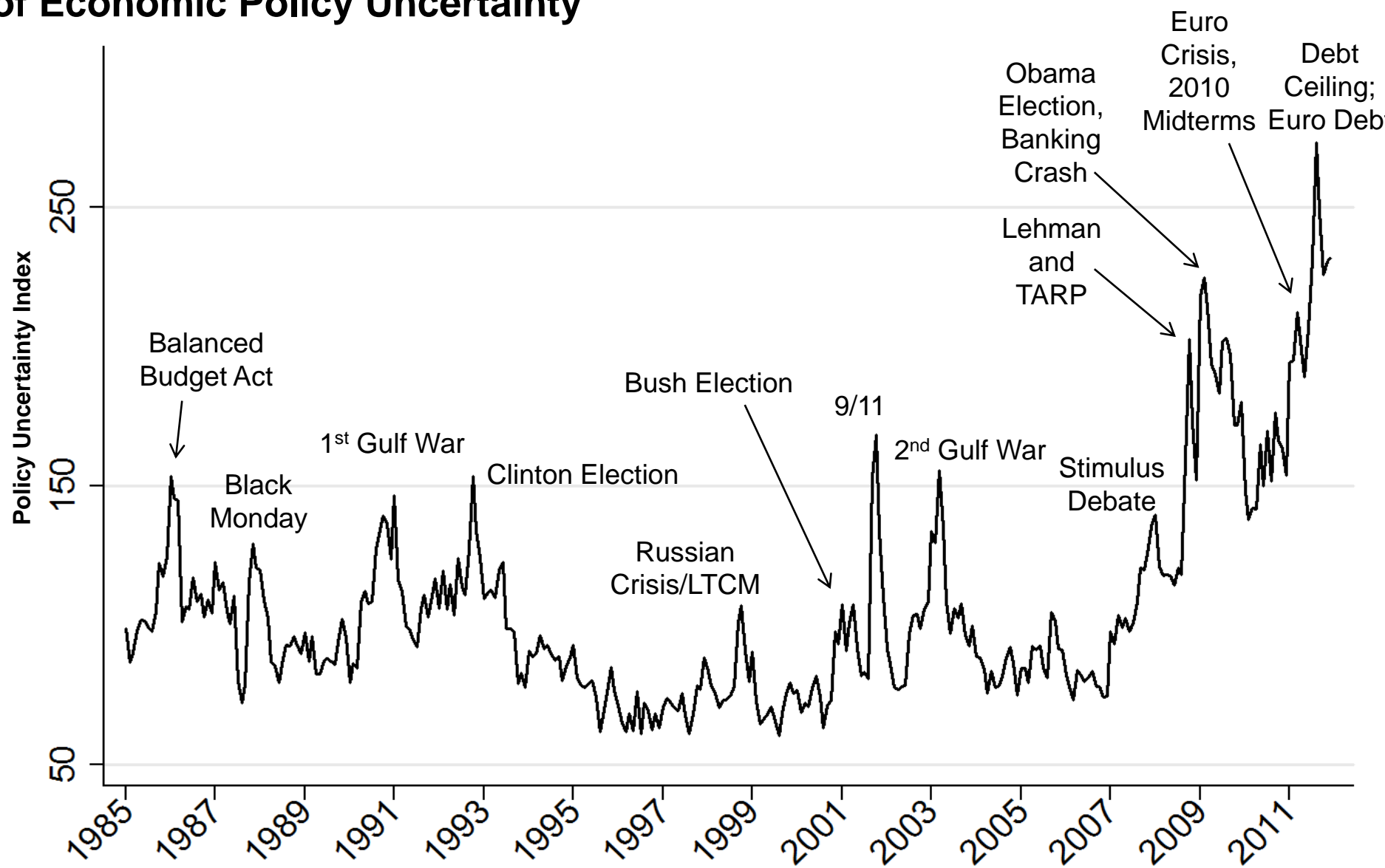
Appendix Figure A5: Principal Component Weighted Index of Economic Policy Uncertainty
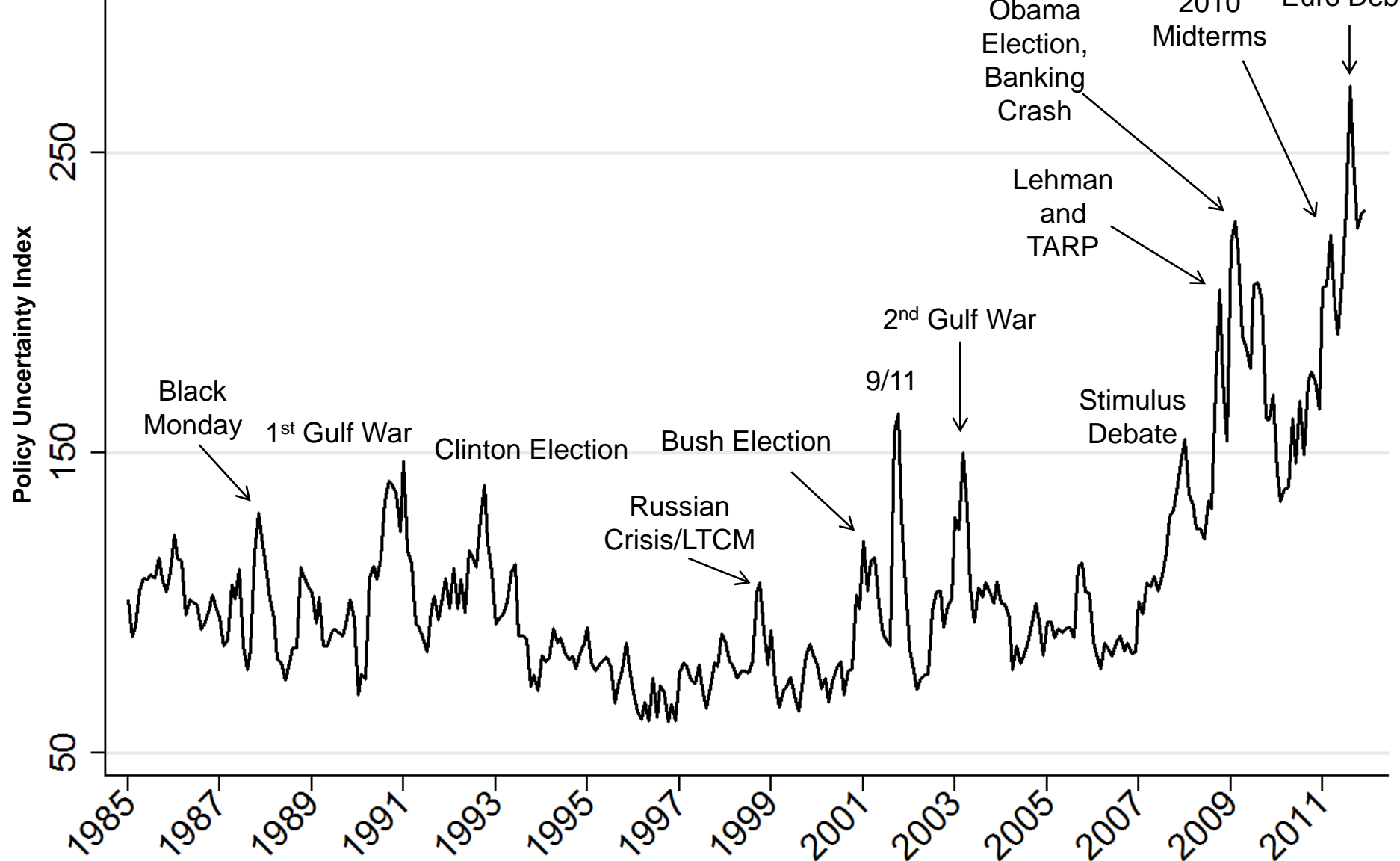
Notes: Index of Policy-Related Economic Uncertainty composed of 4 series: monthly news articles containing uncertain or uncertainty from 10 leading papers, economic or economy, and policy relevant terms (scaled by the smoothed number of articles containing 'today'); the number of tax laws expiring in coming years, and a composite of IQ ranges for quarterly forecasts of federal, state, and local government expenditures and 1-year CPI from the Phil. Fed Survey of Forecasters. Weights: .35 News, .37 tax expirations, .24 CPI disagreement, .04 Fed. expenditures after each index normalized to have a standard-deviation of 1. News query run Jan 16, 2012. Index normalized mean 100 from 1985-2009.