Measuring Economic Policy Uncertainty

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Abstract: Many commentators argue that uncertainty about taxes and spending and other policy choices 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 impact on aggregate output and employment. Our index is an average of several components that reflect the frequency of news media references to policy-related economic uncertainty, the number of tax code provisions set to expire in future years, and the extent of forecaster disagreement over future federal government expenditures and inflation outcomes. The index spikes around presidential elections and major events such as the Gulf wars and the 9/11 attack. Index values are high in recent years and show clear jumps associated with the Lehman bankruptcy, the 2010 midterm elections, the Euro crisis and the U.S. debt-ceiling dispute. VAR estimates imply that higher policy uncertainty leads to persistent negative effects on aggregate output and employment. Greater policy uncertainty in 2011, relative to 2006 levels, lower GDP by about 1.4 percent and employment by about 2.5 million according to these VAR estimates.

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1. INTRODUCTION

A rapidly growing literature centers on the impact 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 this depressing effect of uncertainty on the economy goes back at least to Bernanke (1983). Bernanke points out that when it is expensive for firms to make a mistake – because investment projects are expensive to cancel or workers are costly to hire and fire – firms will wait when uncertainty is high. 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 (2011)), 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 (DeMarzo and Sannikov (2006) and Narita (2011)).

Recently, many commentators have argued that policy-related uncertainty has been a key factor in slowing the recovery from the recession of 2007-2009. The claim is that firms and consumers are uncertain over future tax and spending, regulations, health-care reform

[1] See, for example, evidence of counter-cyclical volatility in: macro stock returns in Schwert (1989); in firm-level stock returns in Cambell 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).

and interest rates. This uncertainty leads them to postpone spending on investment and consumption goods, impeding the usual recovery from recessions.

In this paper we seek to investigate to what extent this is true. To do so, we take two steps. First, we construct a new measure of economic policy uncertainty, and examine its evolution since 1985.[2] Figure 1 plots our index of economic policy uncertainty. We build the index from components that measure three aspects of economic policy uncertainty: (i) the frequency of references to policy-related economic uncertainty in the Google-media catalog; (ii) the number of tax measures set to expire in future years; and (iii) the extent of disagreement among economic forecasters over future federal government expenditures and the future CPI price level. The resulting index of policy-related uncertainty looks sensible, with spikes around presidential elections and major political shocks like the Gulf Wars and 9/11. Recently, it has risen to historic highs after the Lehman bankruptcy, the 2010 midterm elections, the Euro crisis and the U.S. debt-ceiling dispute.

Second, we estimate the impact of policy-related uncertainty shocks on economic activity using our index in a vector autoregressive (VAR) model. We find that a policy uncertainty increase equal to the rise from 2006 to 2011 generates declines in real GDP of about 1.4% and of employment of around 2.5 million, with peak effects occurring after one to two years. Bonn and Pfeifer (2011), Fernandez-Villaverde at al. (2011), and Pastor and Veronesi (2011) also consider the potential impact of policy-related uncertainty on economic activity, but their methods differ greatly from our approach.

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 our estimates for the impact of policy uncertainty on economic outcomes. Section 5 considers several proof-of-concept tests for our policy-related uncertainty indexes and comparisons to other

[2] Note that all our data is available on www.stanford.edu/~nbloom/policyuncertainty.zip

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 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 constructed from an index of Google News searches. To construct the index, we perform month-by-month searches of Google News, 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. We restrict the searches to Google News sources defined as being within the United States.[3] 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 of using a straight news search index is the ever increasing volume of news available online. The volume of news articles covered by Google News rises by over 600% from 1985 to 2011, a huge increase over time. So to construct our index we normalize the raw counts by the number of news articles in the same Google News

[3] These are mainly US newspapers but also include some US hosted domains of foreign news sources, like the BBC and the Times of London.

sources that contain the term 'today'. We use the term 'today' as an indicator of an article that is likely to be news focused. This approach yields a normalizing series that rises from approximately 50,000 articles in 1985 to over 300,000 articles in July of 2011.[4] We then employ a Hodrick-Prescott filter to smooth this series at a monthly level (smoothing parameter of 129,600, as is standard for a monthly series) to remove high-frequency variation.. Finally, we calculate our Google News index of policy-related economic uncertainty by dividing the policy-related uncertainty counts described above by the smoothed value of the 'today' series.

Figure 2 shows our Google News index of policy-related economic uncertainty. Here we see clear spikes corresponding to the first and second Gulf Wars, the 1992 presidential election, 9/11, the 2009 stimulus debate, the Lehman Brothers bankruptcy and TARP bailout, intensification of the European debt crisis, the 2010 midterm elections, and the recent debt-ceiling dispute, among other events.

The Appendix shows several other Google news search indices, which provide additional evidence that these types of news searches yield sensible quantitative indicators of political and economic uncertainty. For example, searches for uncertainty and energy spike after events like the Gulf Wars, the Arab Spring and oil price spikes.

Tax Expiration Data

The second component of our index draws on reports by the Joint Committee on Taxation (JCT) with data on the number of federal tax provisions set to expire in the current and next 10 years.[5] Temporary tax measures are a source of uncertainty for businesses and households because Congress often extends such measures 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 adopted opposing positions about whether to reverse these

[4] For July 2011, we calculate this normalized value based on only the first 15 days of the month, as Google News exhibits volatile behavior in the days nearest the current date.
[5] Joint Committee on Taxation, U.S. Congress, 2011. List of Expiring Federal Tax Provisions, 2010-2020, JCX-2-11, and similar documents in earlier years. Available at www.jct.gov.

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 taxpayer uncertainty.

Such temporary taxes also lead to murkier views of federal spending and borrowing and discrepancies between the tax revenue projections of the Congressional Budget Office (CBO) and the Office of Management and Budget (OMB). The CBO uses 'current law' as a baseline (taking into account all tax expirations) while the OMB uses 'current policy' as a baseline, thus basing projections on policies likely to be extended, despite any current expiration date. The CBO also produces alternative projections based on its judgments about 'current policy'.

Each year, the JCT provides data on these expirations for the current calendar year and each of the following 10 years. The JCT identifies the month of expiration (typically but not always December). As the JCT notes, for the "purposes of compiling this list, the staff of the Joint Committee on Taxation considers a provision to be expiring if, at a statutorily specified date, the provision expires completely or reverts to the law in effect before the present-law version of the provision." We apply a simple weighting to these data in January of each year, multiplying expirations by 0.5^((T+1)/12) for T equal 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.[6]. For the purposes of inclusion in our final index, we perform a linear interpolation to fill in the non-January values. 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.

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

Figure 3 portrays 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 comes from 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 a number of 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.[7] We utilize the individual-level data for two of the forecast variables, the consumer price index (CPI) and expenditures by the federal government 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 spending at the federal level. This approach builds on a long literature using disagreement among forecasters as a proxy for economic uncertainty.[8]

For both series, we use the forecasts for 4 quarters in the future. For each quarter's set of forecasts, we calculate the interquartile range. In the case of future government expenditures, we divide the interquartile range of forecasts by the mean forecast to obtain a scaled measure of forecaster disagreement. Due to the quarterly nature of this data source, we perform linear interpolation to fill in the missing values.

Figure 4 shows the dispersion in forecasts for federal spending four quarters in the future. Relevant spikes include the passage of the Balanced Budget Act in 1985, a contentious

[7] 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

[8] 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 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.

budget battle in 1987, the 1992 presidential election, 9/11, and the stimulus spending debates in from 2008 to 2010. 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.

Generating our overall policy-related economic uncertainty index

To generate our overall index of policy-related economy uncertainty, we first divide each of our series by its own standard deviation, and then set each of the four component series to have mean 100. In constructing the overall index we give weights of 0.6 on our news-based index, 0.1 on our tax expirations index, 0.15 on CPI forecast disagreement measure, and 0.15 on our federal expenditure disagreement measure. These weights roughly reflect the distribution of specific sources of policy-related uncertainty, as measured in Table 1 below. We give more weight to indices with broader coverage and less weight to those with narrower coverage. We use a linear spline to create monthly series for the forecaster disagreement and tax expiration components. To deal with missing values, we set the pre-1998 tax expiration index to its 1998 value, and we set the July 2011 value of the forecaster disagreement index to its June 2011 value.

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 two forecast disagreement measures, and the tax expiration measure. The result is seen in Figure A4, and is very similar to our preferred measure. Second, we perform a principle component analysis on our four series and use these weights to construct an alternate index. This yields weights of 0.38 on our news-based index, 0.39 on our tax expirations index, 0.22 on CPI forecast disagreement measure, and 0.02 on our federal expenditure disagreement measure. We again find a similar final index, seen in Figure A5. Our preferred index has correlations of 0.965 and 0.958 with the equally weighted and principle components weighted indices, respectively.

Figure 1 displays our resulting 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 93 in 2006 (the last year before the current crisis) and 178 in the first six months of 2011, a difference of 85. We use this jump in the average index value to quantify the impact of the recent surge in policy uncertainty on output and employment.

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. We construct a number of category-specific news-based indexes following the 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 contains 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 2011:7. 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. 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. 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 2011:7 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 full 1985:1 to 2011:7 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 also 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 entirely possible that our findings in this regard reflect some 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 negative impact of economic uncertainty on growth. An interesting question is to what extent economic uncertainty this reflects policy uncertainty. Perhaps most economic uncertainty is about 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 measure of economic policy uncertainty and a more general Google News measure of *economic*

uncertainty. The broader economic uncertainty 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', while our narrower *policy-related* economic uncertainty includes only those articles that also contain one or more of the policy terms listed above, e.g., "tax" or "spending" or "regulation".

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, the dissolution of the Soviet Union, and the 1997 Asian Financial Crisis. Since 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 scatterplot 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 July 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.[9]

Returning to Figure 6, 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. This is about 1/2 early in our sample period, when the levels of both policy uncertainty and overall economic uncertainty were relatively low. This means that about one in three of our economic uncertainty articles also discussed policy. This ratio fell to about 1/3 throughout most of the 1990s, but turned sharply upward in 2000 and again in 2008, reaching arounover 60%. Remarkably, by July 2001, news articles about economic policy uncertainty account for 80% of all news articles about economic uncertainty.

[9] 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.

In summary, Figures 6 and 7 make three points. First, according to our news-based approach, overall economic uncertainty is considerably higher in the past 10 years than in the previous 15 years covered by our sample period. (See Table 1 as well.) Second, policy-related uncertainty has increased more rapidly than overall uncertainty. As a result, it accounts for a larger share of economic uncertainty in the past decade, more than 50% since 2005 and peaking at an astonishing 80% in July 2011 during the debt-ceiling debate. Third, policy uncertainty accounts for most of the high-frequency movements in economic uncertainty since 9/11, and a considerably larger share than in earlier periods. These results imply that policy-related concerns are an increasingly important aspect of overall economic uncertainty, and that by July 2011 they appear to be the major driving force behind movements in overall economic uncertainty.

Vector Auto Regression Estimates of the Impact of Economic Policy Uncertainty

We are also interested in the impact of policy-related uncertainty on aggregate economic activity. Here we adopt a simple empirical approach to this issue, using Vector Auto Regressions (VAR) and simple identify assumptions to estimate the impact of policy uncertainty on aggregate output and employment. We estimate the empirical relationships among a series of current and lagged variables to investigate which variables appear to drive other variables, as indicated by changes in driving variables followed in time by changes in other variables they potentially influence.

We take a simple approach, running a monthly Cholesky Orthogonalized VAR on our policy uncertainty index, the S&P 500 (a control for broader economic conditions), the federal funds rate (a control for interest rates), log employment and log real GDP. The VAR is run on monthly data with three lags, and a monthly time trend.

Of course, this approaches identifies relationships between variables from our Cholesky ordering and differences in the timing of changes in each variable. 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, the VAR estimates 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 an 85 point rise in policy uncertainty (the rise in our policy uncertainty index from 2006 to the first six months of 2011) is followed by a persistent fall in real GDP with a peak negative impact of about -1.4% at 15 months. Similarly, it also followed by a persistent fall in employment, with a peak effect of about 2.5 million at 18 months. These appear to be substantial effects, lending support to recent concerns over the damage of policy uncertainty on economic activity.

These effects of political uncertainty on growth and employment appear to be robust to controlling for other related factors. For example, if we add controls for broad economic uncertainty using the index in Figure 6 or from Bloom et al. (2009), we find that the impact of political uncertainty still yields a drop in real GDP of almost 1%. Similarly, using our Google News-based index of policy uncertainty, or changing the functional form by using the log of the uncertainty index (to get proportional increases) again leads to significant negative impacts on GDP and employment. For readers interested in investigating the data and relationships further, we place the full data set for Figures 1 to 5 plus Stata files to recreate Figures 6, 7 and 8 on the web at www.stanford.edu/~nbloom/policyuncertainty.zip.

5. HOW GOOD ARE THE NEWS SEARCHES?

Our index relies critically on the ability of Google News searches to proxy for changes in economy policy uncertainty. To investigate this we also use Google News to perform a number of 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 is commonly known as the 'fear index', as it 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 to give a forecast of the next month's implied volatility of the S&P Index. Thus, it is often taken as a forward-looking measure of uncertainty, predicting the likelihood of large swings in equity prices. We find in Figure 9 that our Google News-based search for uncertainty about equity prices and the stock market and the VIX measure of uncertainty about stock prices are reassuringly similar.

A second test involves examining trends in media citations regarding competition with Japan and China. We do this because most economists would agree that competition from China has been increasing over time relative to competition from Japan. We perform searches for articles containing 'Economic', 'Competition', and either 'China' or 'Japan'. We then normalize by the smoothed number of articles containing the word 'today'. Results are displayed in Figure 10. We can 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 2000's. This pattern mirrors our perception of 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, Fernandez-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 our own, employing a dynamic stochastic general equilibrium (DSGE) framework in order to generate a time series of fiscal volatility shocks for each instrument. They then carry

these indices forward to estimate the harm done to growth by policy uncertainty, finding significant negative effects. 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. using a completely different approach is again reassuring that we are picking up trends in economic policy uncertainty.

6. 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 have argued that uncertainty over future policies regarding taxation and spending, health-care reform, and financial regulation 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 composed of a variety of policy-related uncertainty indicators. In our index, we include measures of forecaster disagreement over the future path of consumer price inflation and federal government expenditures, the number of tax code provisions set to expire in the coming years, and a measure of the frequency of media mentions of policy-related economic uncertainty.

We find that our index displays spikes around a number of major events such as federal elections, 9/11, the Gulf Wars, the Lehman bankruptcy, and 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. We find that the rise in our index that occurred between 2006 (prior to the onset of the financial crisis) and the first six months of 2011 lowered real GDP by an estimated 1.4% and reduced employment by 2.5 million within one to two years. This finding gives some credence to concerns that policy-related uncertainty played a role in the slow growth and fitful recovery of recent years, and invites further research into the effects of policy-related uncertainty on economic performance.

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.

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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	2010:1-2011:7	1985:1-2011:7
	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	57.7	228.5	91.3	259.0	338.0	497.0	442.7	181.0
Overall Economic Policy Uncertainty	36.9	62.1	38.7	143.9	205.4	276.8	340.9	100.0
1. Monetary policy	18.8	23.8	17.2	22.1	119.9	94.6	145.3	35.0
2. Taxes, spending & fiscal policy	18.3	27.7	20.7	40.5	61.6	119.4	165.0	40.3
2a. Fiscal Policy	4.3	4.1	4.1	4.8	6.5	16.7	32.2	6.7
2b. Taxes	16.4	24.9	19.0	36.7	53.6	86.0	118.5	33.5
2c. Government spending	4.1	6.4	4.8	4.3	3.4	8.2	14.1	5.3
3. Entitlement programs	3.4	5.0	6.2	6.9	5.1	7.9	13.8	6.2
4. Health care	3.8	7.7	9.8	11.9	10.6	17.0	21.4	10.0
5. Financial regulation	0.7	1.4	0.6	0.6	1.8	7.1	8.7	1.5
6. Labor regulation	13.3	20.1	15.5	19.9	19.1	42.2	28.5	18.5
7. Energy & environmental	4.0	7.1	5.1	7.3	9.2	13.8	14.4	6.7
8. National security	17.3	47.3	18.4	58.5	26.3	39.3	31.7	30.8
9. Sovereign debt & currency	2.0	1.5	3.2	4.7	6.9	8.9	28.3	5.1
10. Trade policy	3.1	4.4	5.1	5.7	4.7	4.8	4.3	4.7
11. Competition policy	3.3	3.8	3.7	6.5	6.6	8.1	9.2	4.9
12. Legal policy	0.8	0.7	0.9	2.0	0.9	1.1	1.2	1.2
Sum of Rows 1 to 12	89.0	150.5	98.9	186.8	272.5	364.1	471.8	164.9
Ratio of Policy Uncertainty To Overall Economic Uncertainty	0.64	0.27	0.42	0.56	0.61	0.56	0.77	0.55

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 2011:7. 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 2011:7 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 August 28-29, 2011.

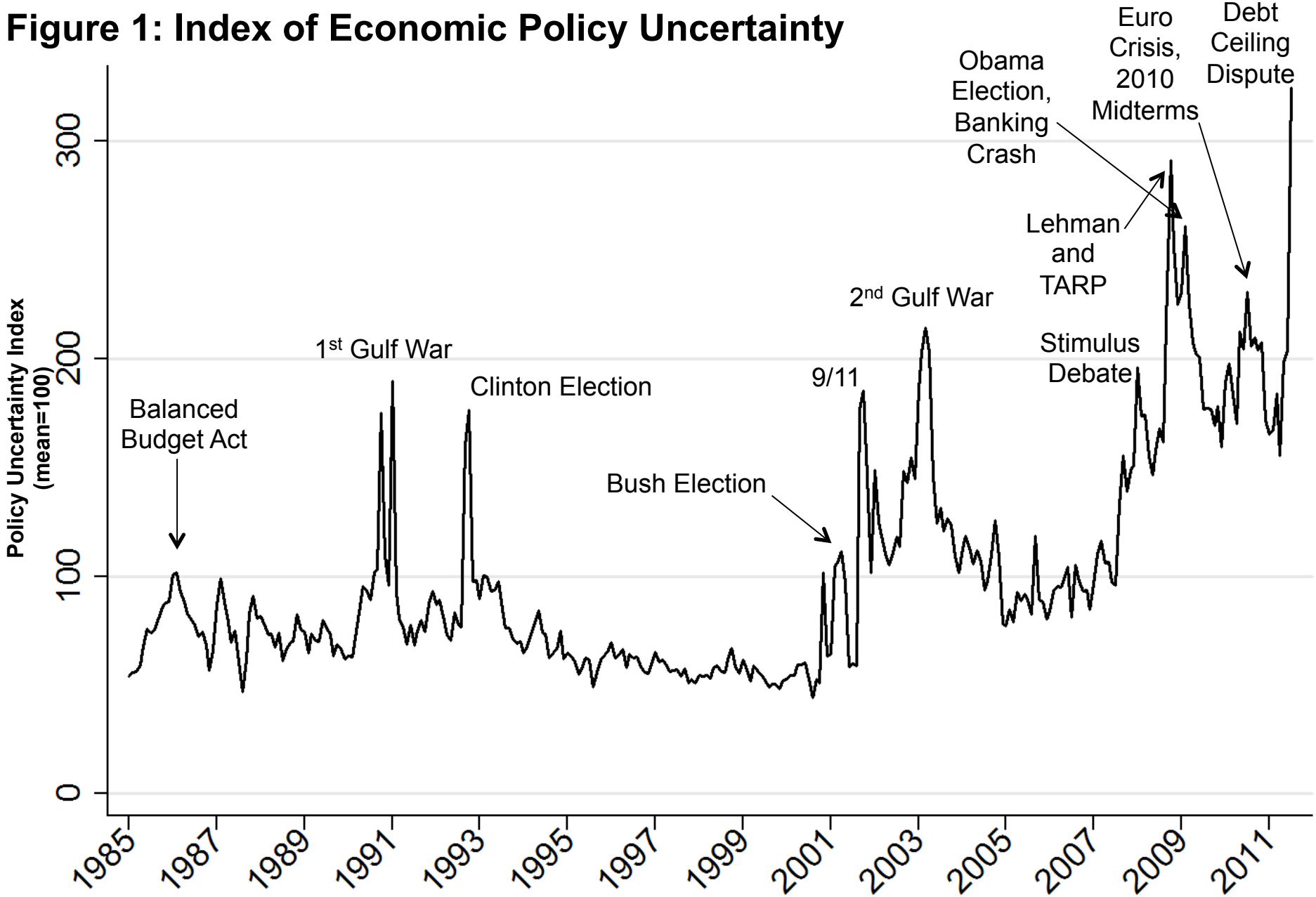
Specific search terms by row:

- 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.

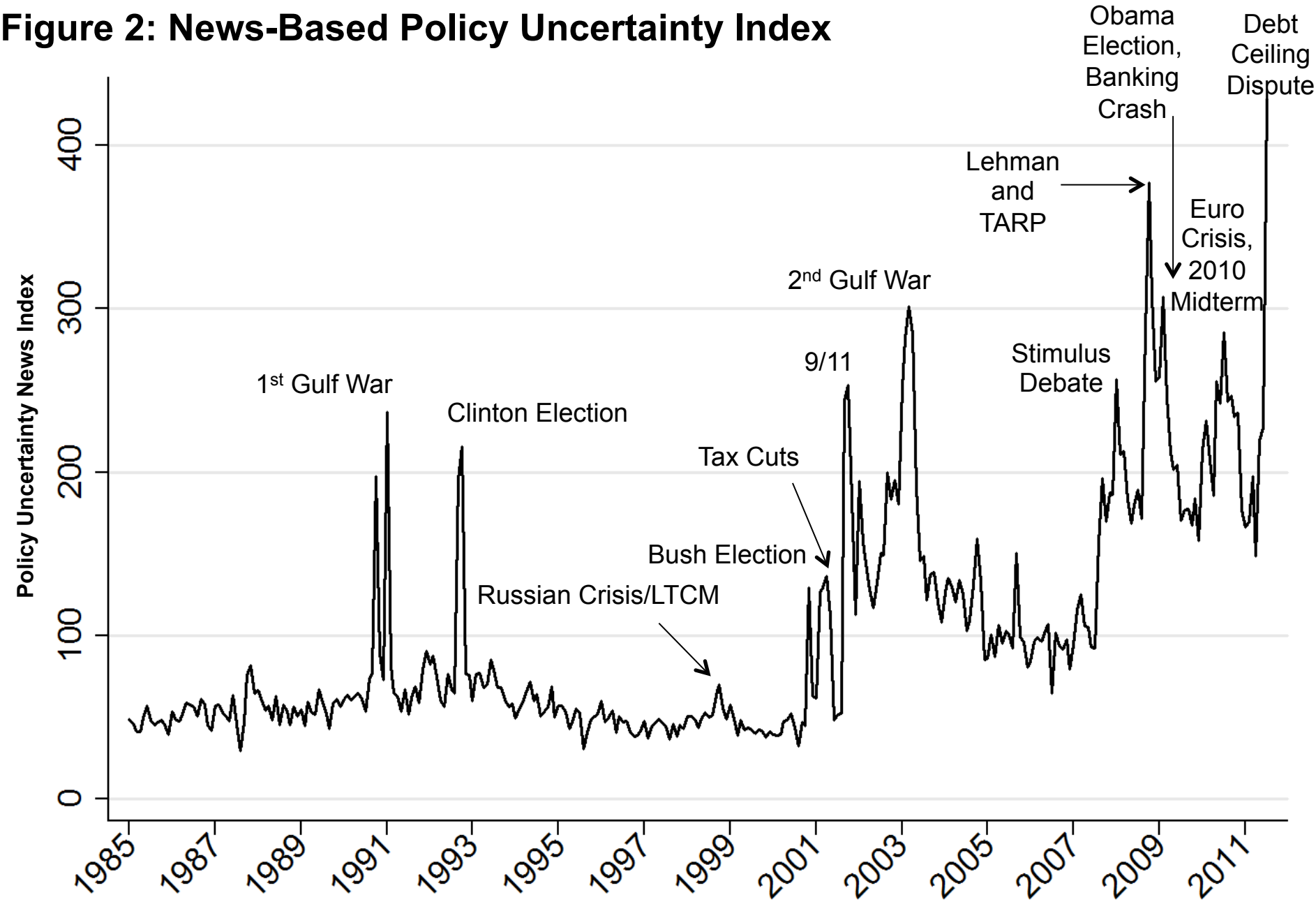
The authors welcome suggestions for improving the foregoing category-specific search terms.

Figure 1: Index of Economic Policy Uncertainty



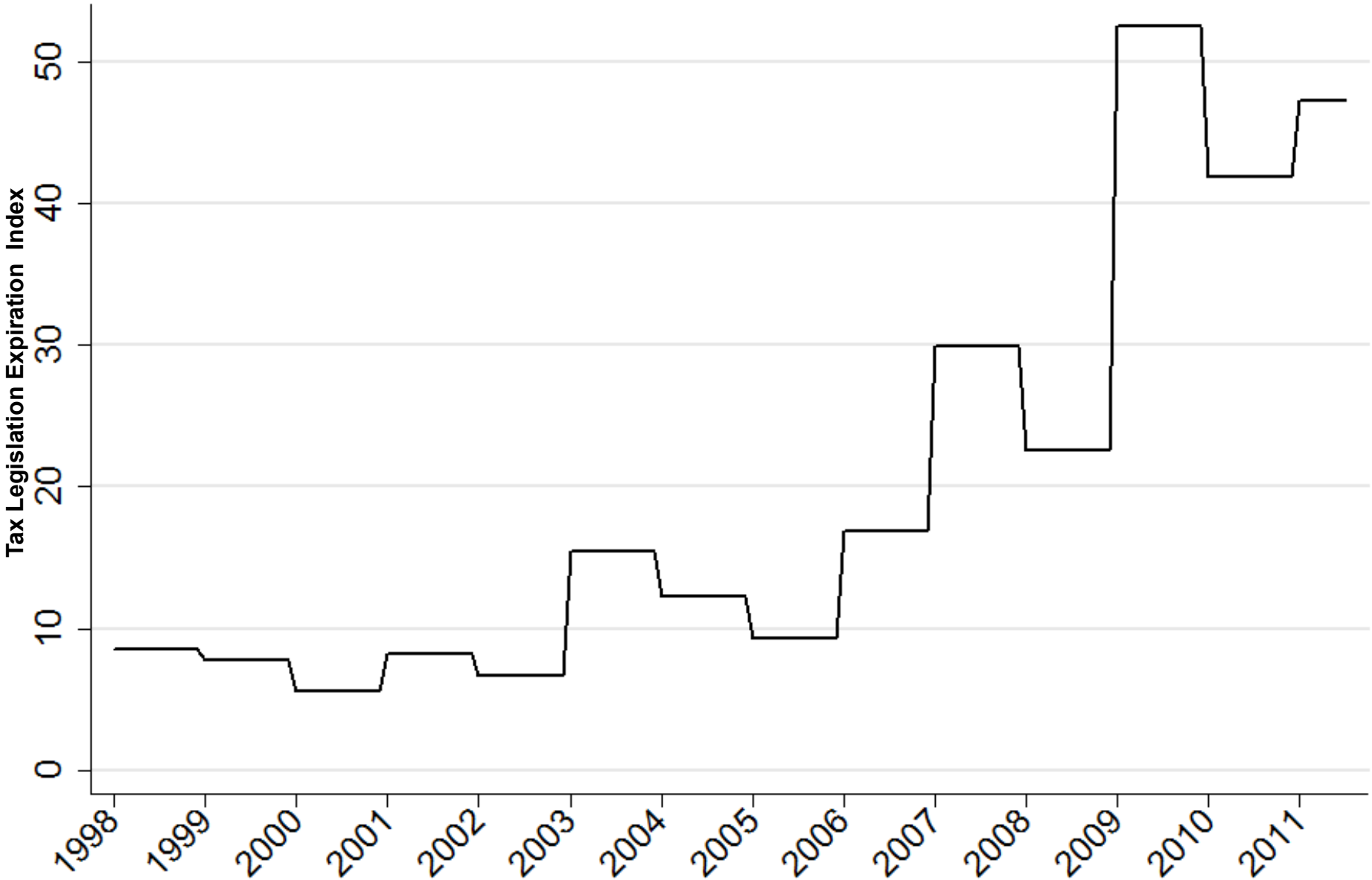
Notes: Index of Policy-Related Economic Uncertainty composed of 4 series: monthly number of news articles containing uncertain or uncertainty, economic or economy, and policy relevant terms (scaled by the smoothed number of articles containing 'today'); the number of tax laws expiring in coming years, and a composite of interquartile ranges for quarterly forecasts of federal government expenditures and 1-year CPI from the Philadelphia Fed Survey of Forecasters. Weights: .6 Google News, .1 tax expirations, .15 CPI disagreement, .15 Federal expenditures disagreement. Google query run August 11, 2011. Components are normalized to mean 100 then averaged. Index covers January 1985-July 2011.

Figure 2: News-Based Policy Uncertainty Index



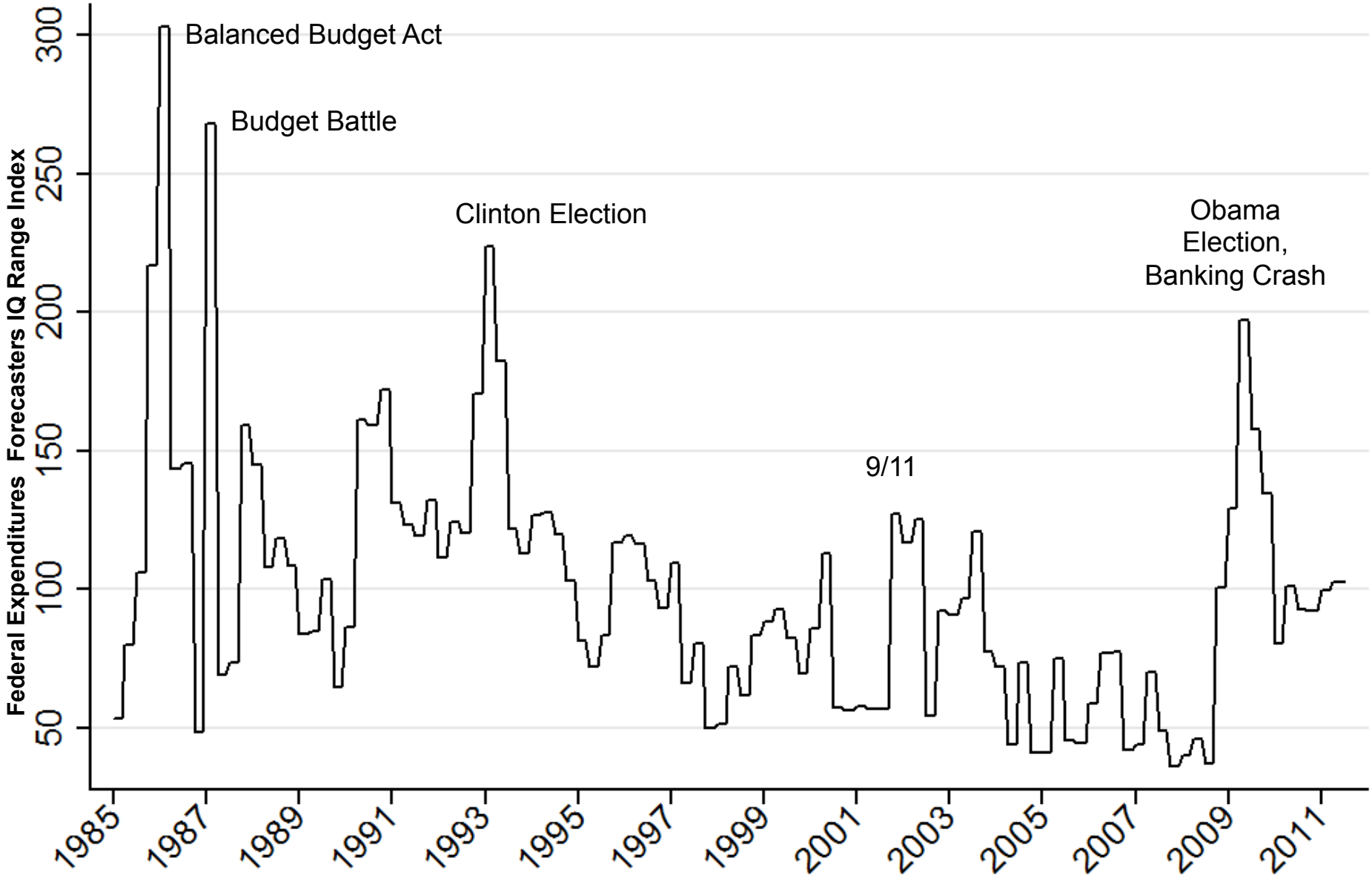
Notes: News-Based Policy Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty, economic or economy, as well as policy relevant terms (scaled by the smoothed number of articles containing 'today'). Policy relevant terms include: 'policy', 'tax', 'spending', 'regulation', 'federal reserve', 'budget', and 'deficit'. Series is normalized to mean 100. Index covers January 1985-July 2011. Query Run August 11, 2011.

Figure 3: Tax Legislation Expiration Index



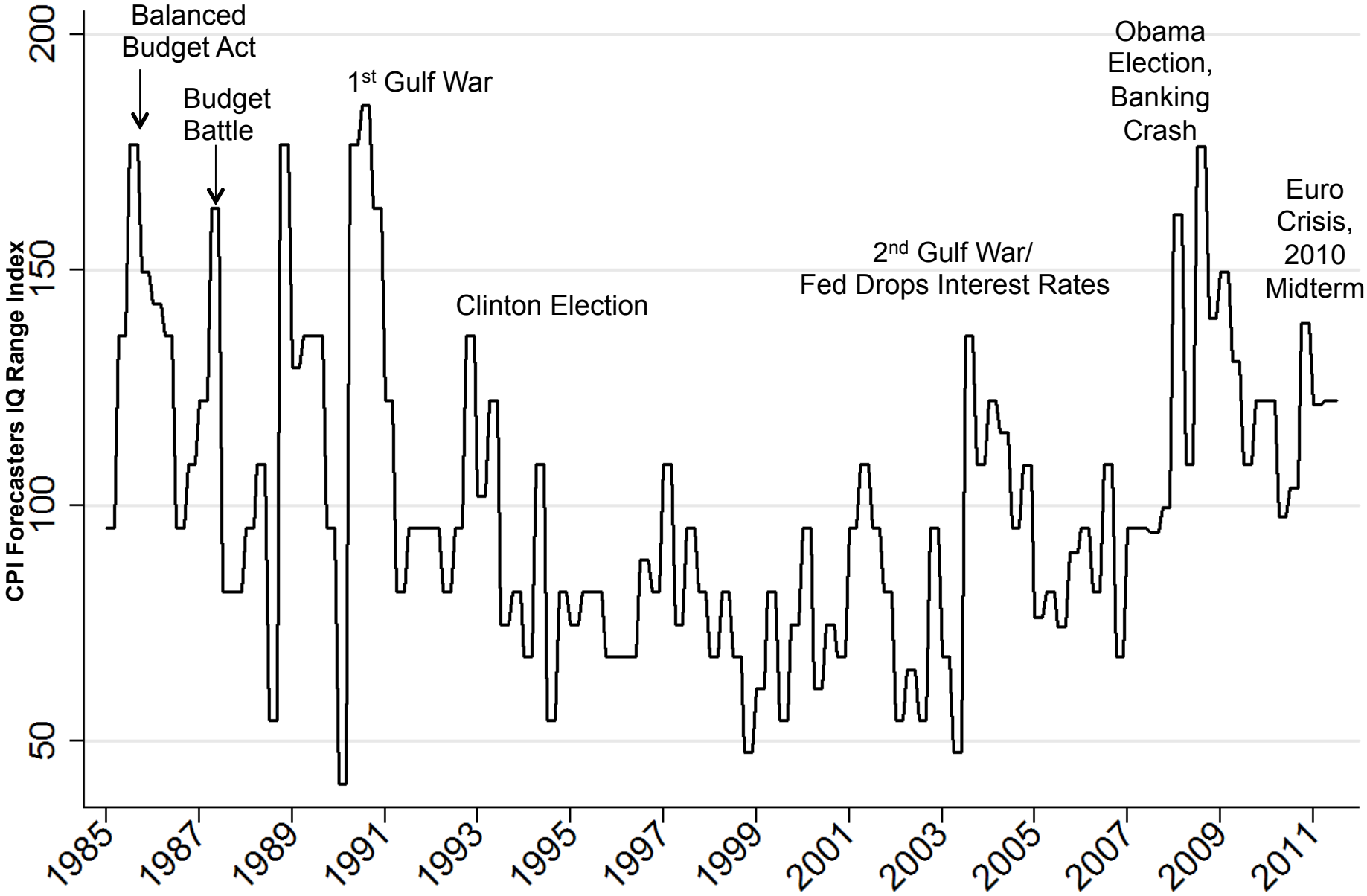
Notes: Utilizes List of Tax Expirations from the Joint Committee on Taxation. Each year's forecast is a 10-year horizon of expiring tax laws. Future months expirations are weighted by 0.5^((T+1)/12) where T is the number of months in the future the tax is expiring.

Figure 4: Federal Expenditures Forecast Interquartile Range Index



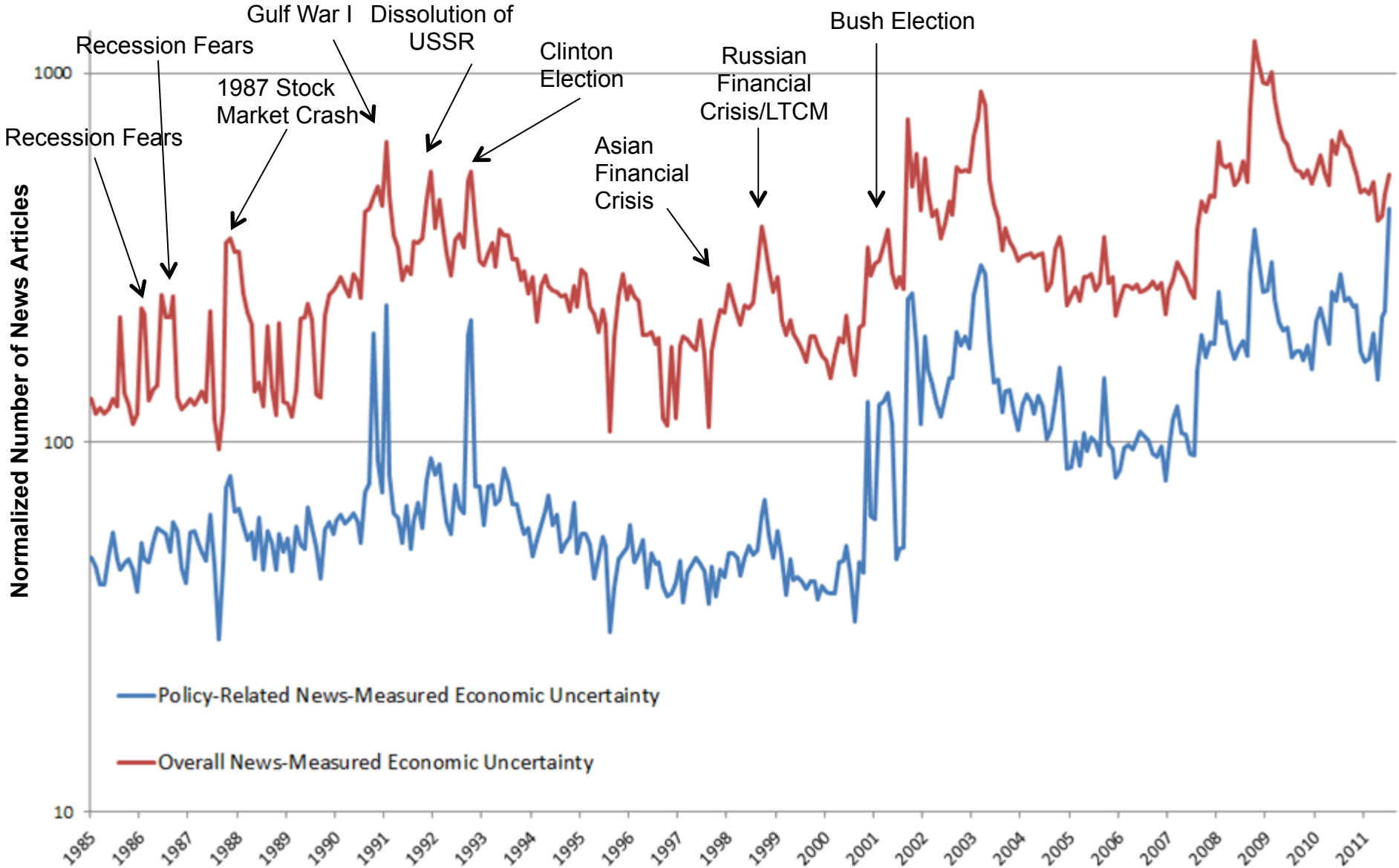
Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year ahead forecasts (which are made every quarter) of total federal government expenditures relative to the mean forecast. Normalized to a mean 100 index.

Figure 5: CPI Forecasters Interquartile Range Index



Notes: From the Philadelphia Federal Reserve Survey of Professional Forecasters. Takes the interquartile (IQ) range of the 1-year forecasts of CPI (which are made every quarter). Normalized to a mean 100 index.

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-July 2011. Axis shown as a log scale. Query run on August 11, 2011. Smoothed Ratio is the HP trend for the ratio of the levels of Policy-Related Economic Uncertainty to Overall Economic Uncertainty.

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

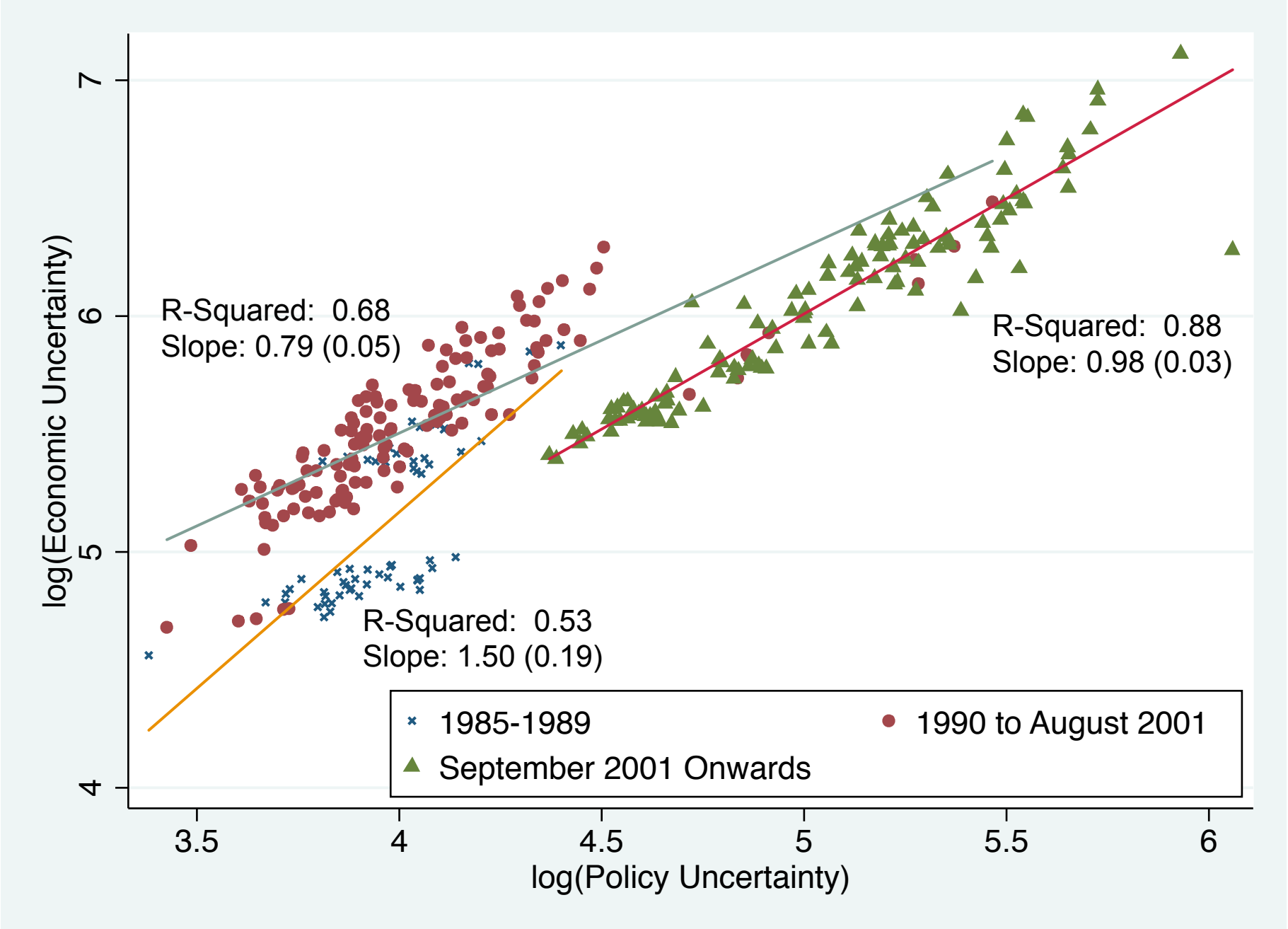
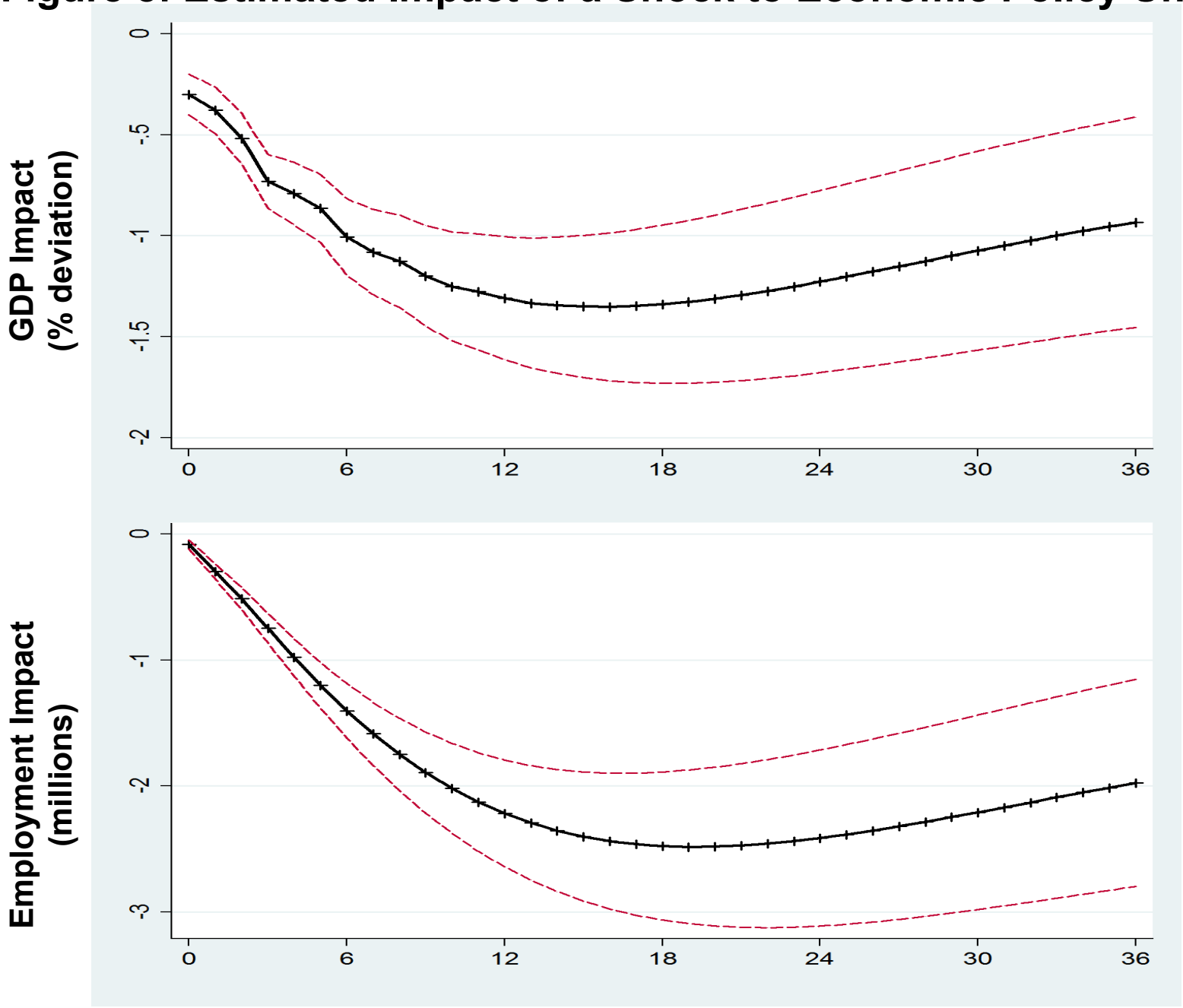
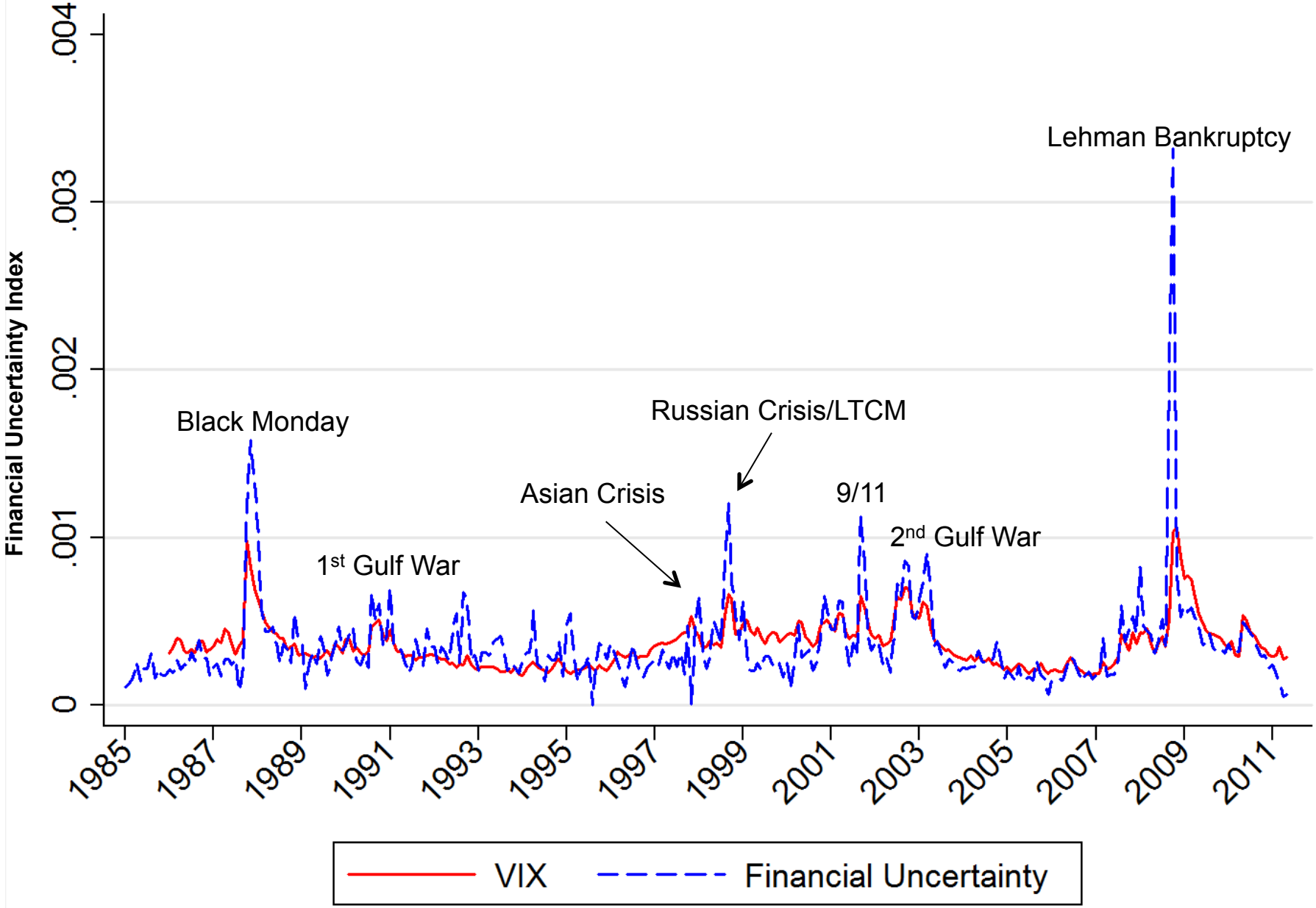


Figure 8: Estimated Impact of a Shock to Economic Policy Uncertainty



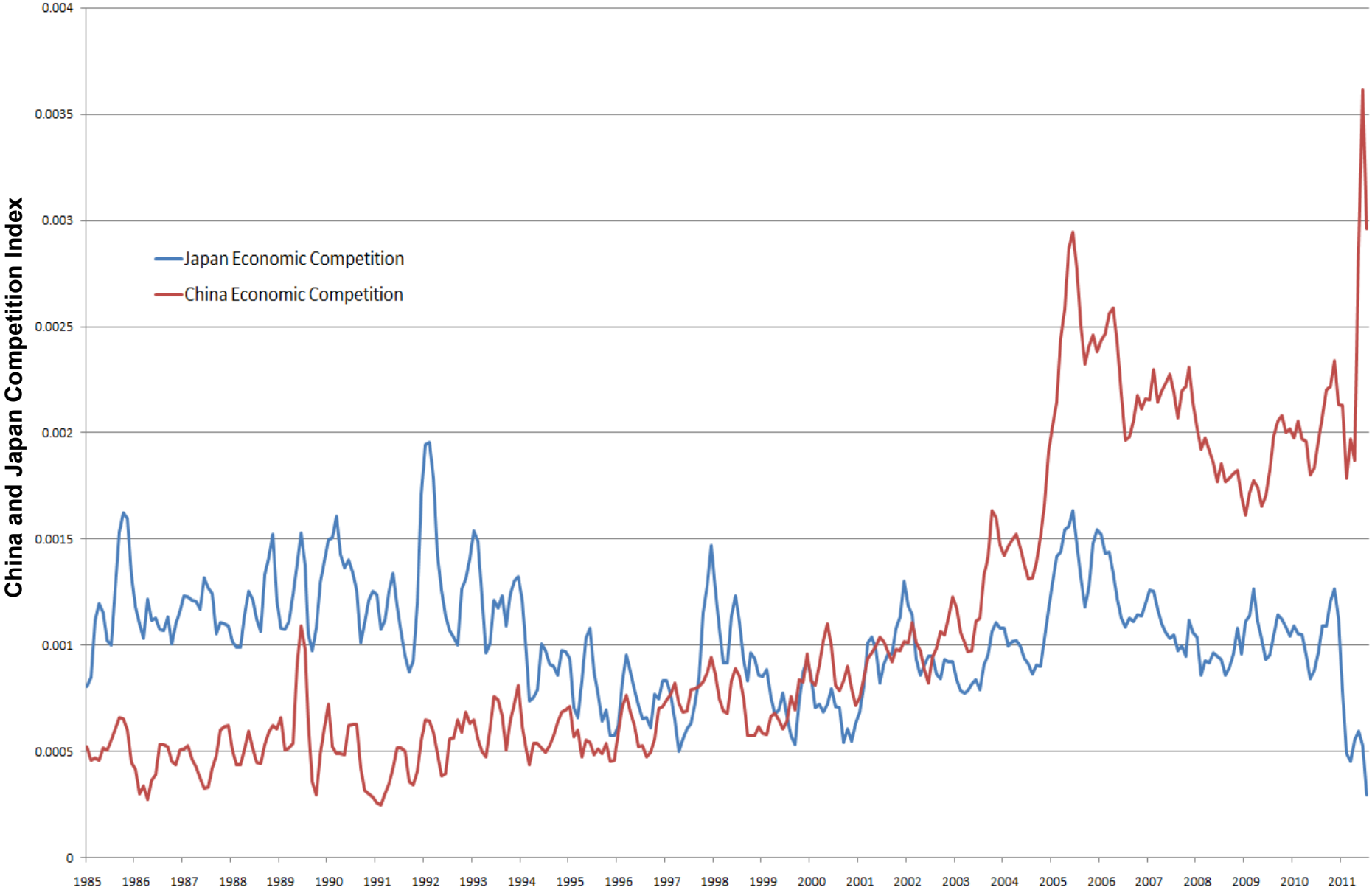
Notes: This shows the impulse response function for GDP and employment to an 85 unit increase in the policy-related uncertainty index, the increase from 2006 (the year before the current crisis) until the first 6 months of 2011. The central (black) solid line is the mean estimate while the dashed (red) outer lines are the one-standard-error bands. Estimated using a monthly Cholesky Vector Auto Regression (VAR) of the uncertainty index, the S&P 500 index, federal reserve funds rate, log employment, log GDP and time trend. Data from 1985 to 2011.

Figure 9: News-Based Financial Uncertainty Index



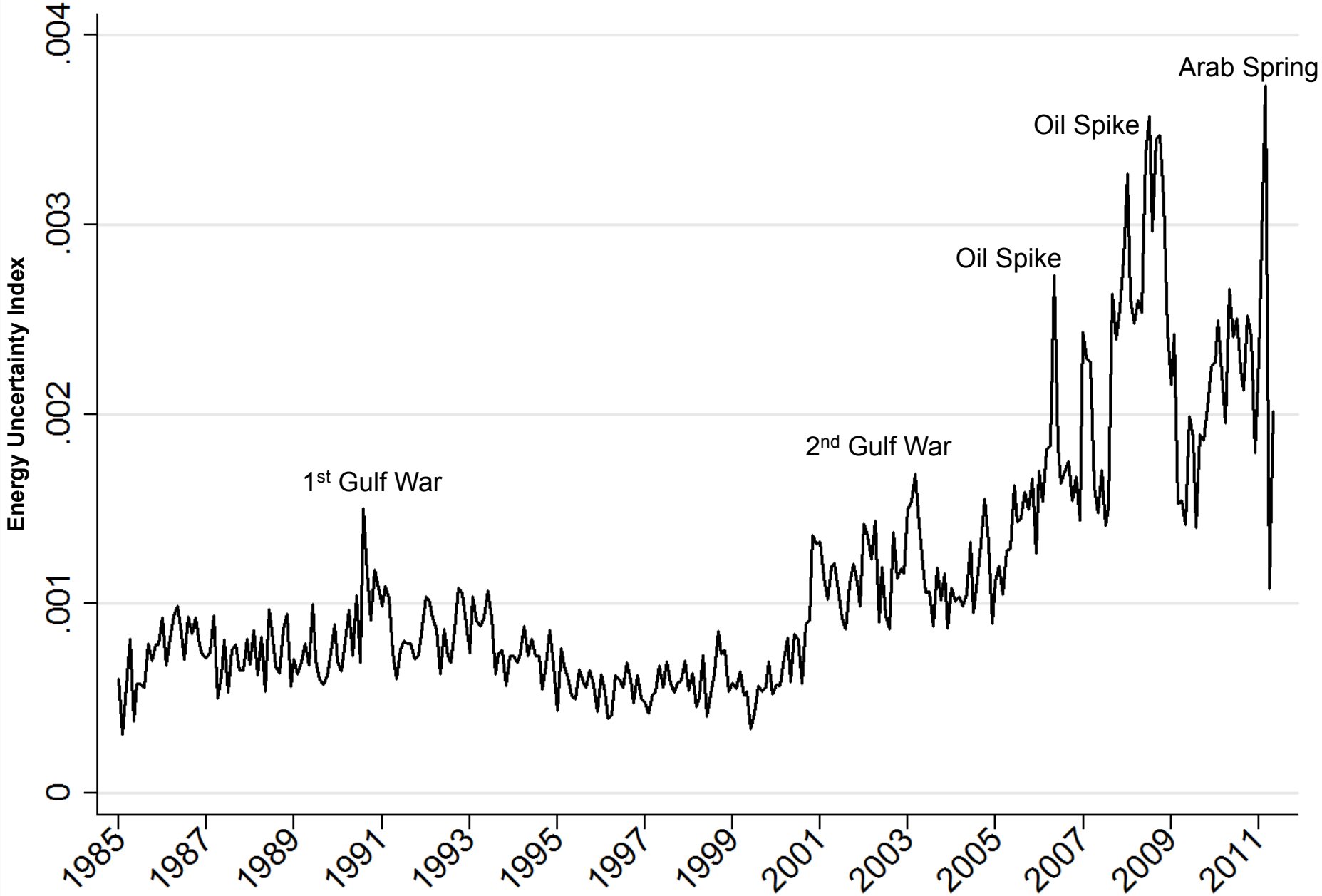
Notes: News-Based Financial Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty, economic or economy, as well as terms relevant to financial markets (normalized by the number of articles containing 'today'). These terms include economic or economy as well as 'stock prices', 'equity prices', or 'stock market'. VIX is scaled so both series have equal means. Google query run June 15, 2011. Data January 1985-May 2011.

Figure 10: News-Based China and Japan Competition Indexes



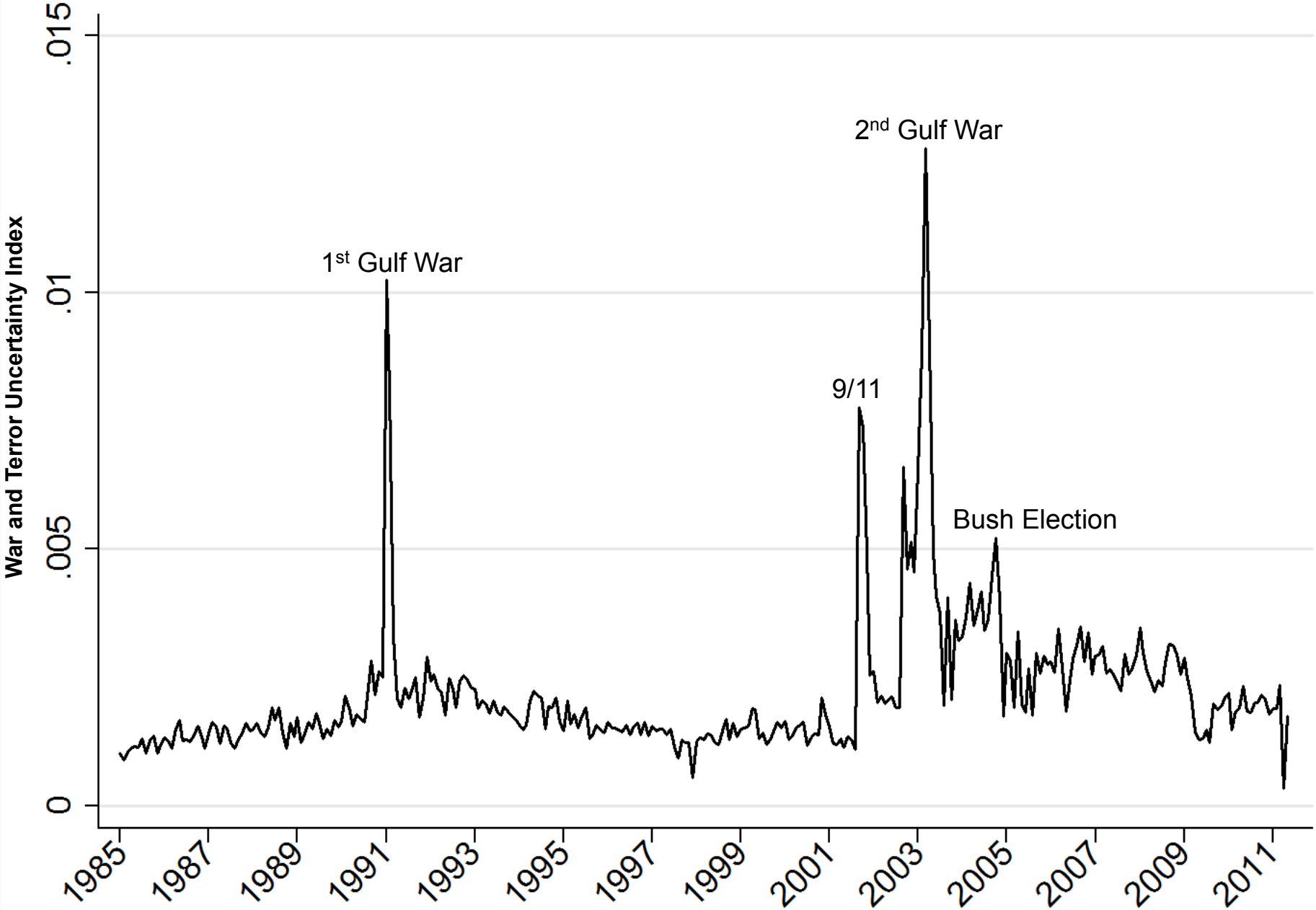
Notes: News-Based China and Japan Competition Index composed of monthly number of news articles containing competition and economy and Japan or China (scaled by the smoothed number of articles containing 'today'). Google query run August 26, 2011. Index covers January 1985-July 2011.

Appendix Figure A1: News-Based Energy Uncertainty Index



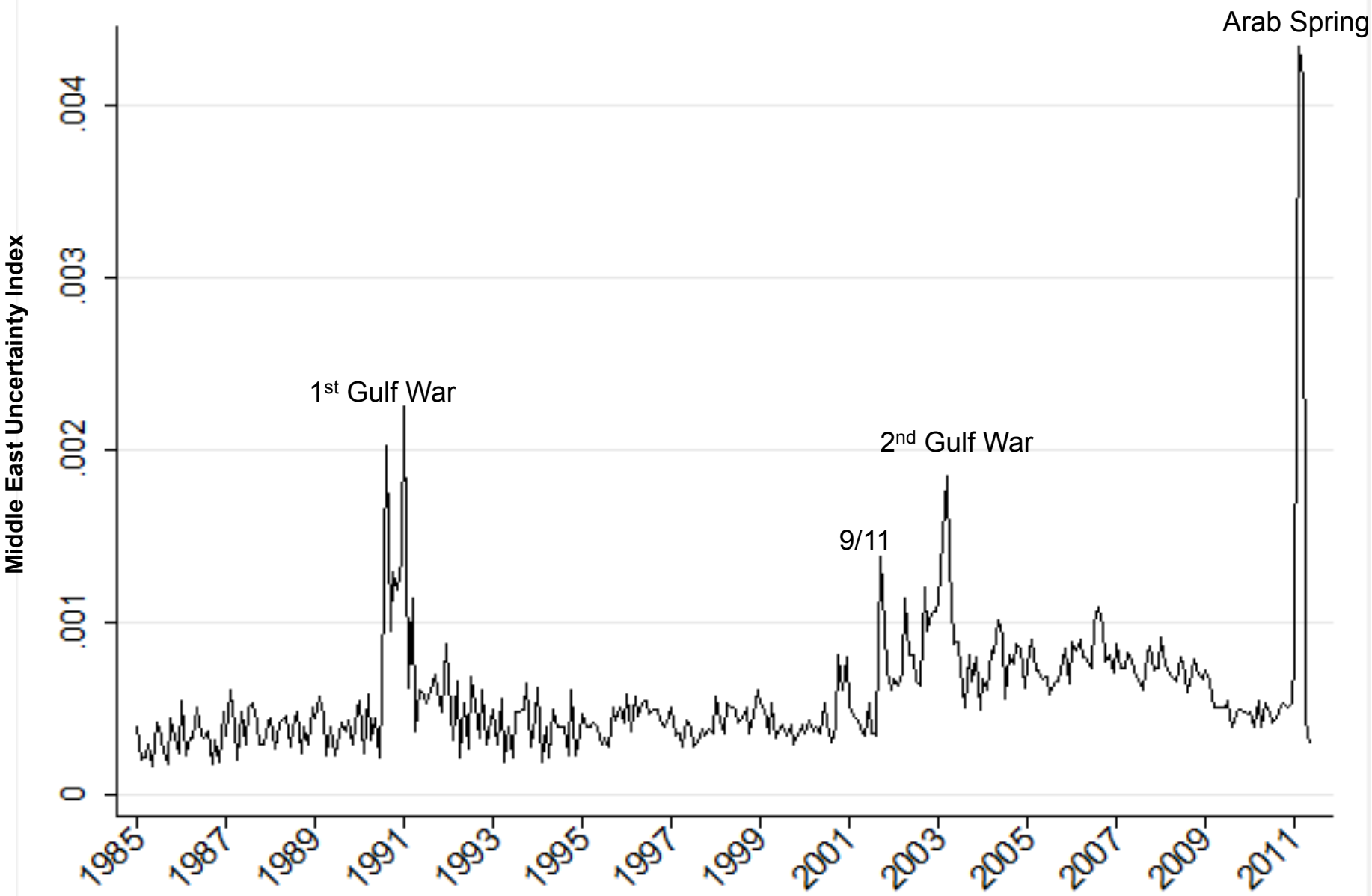
Notes: Energy Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'energy' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

Appendix Figure A2: News-Based War and Terror Uncertainty Index



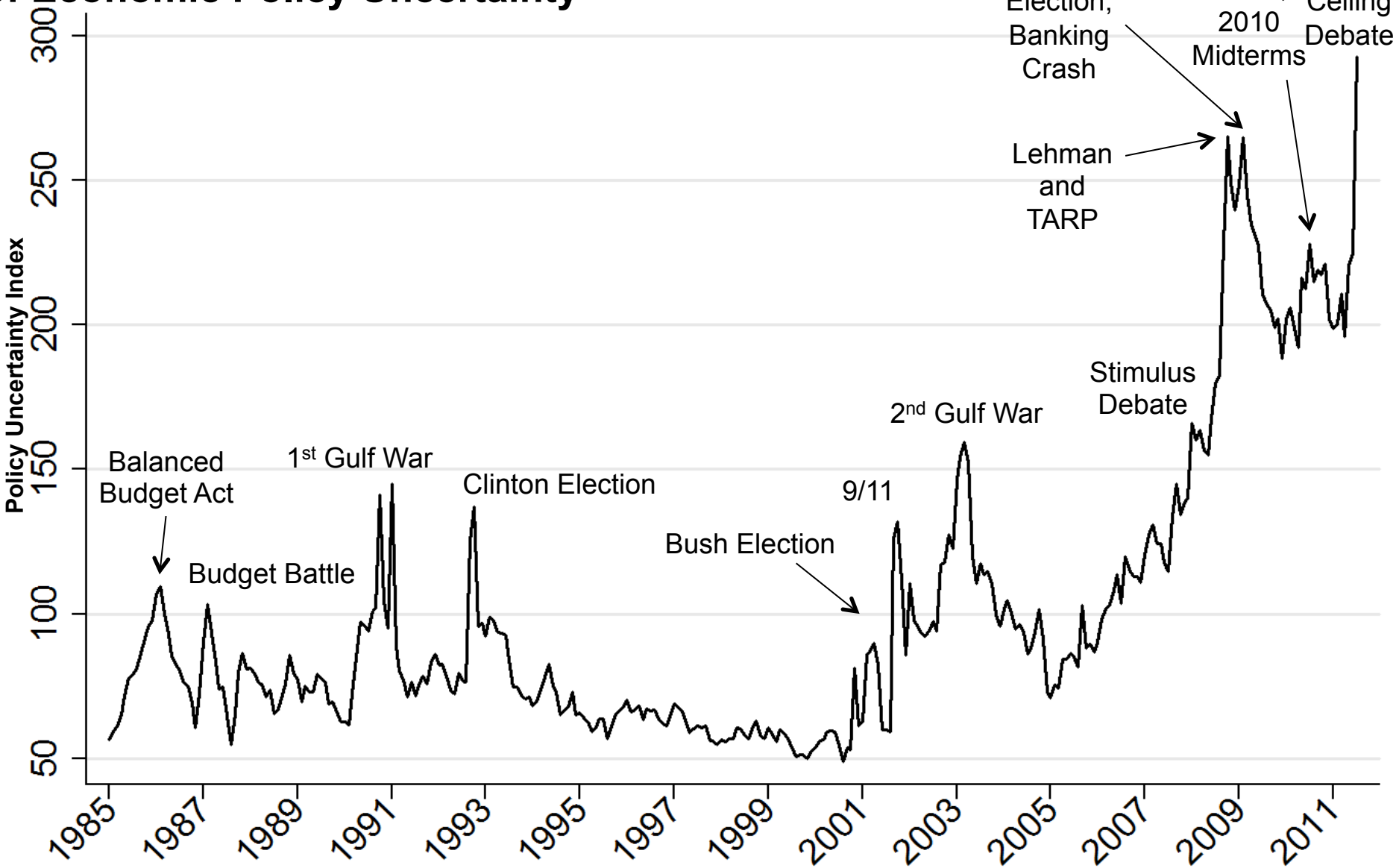
Notes: News-Based War and Terror Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'war' or 'terror' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

Appendix Figure A3: News-Based Middle East Uncertainty Index



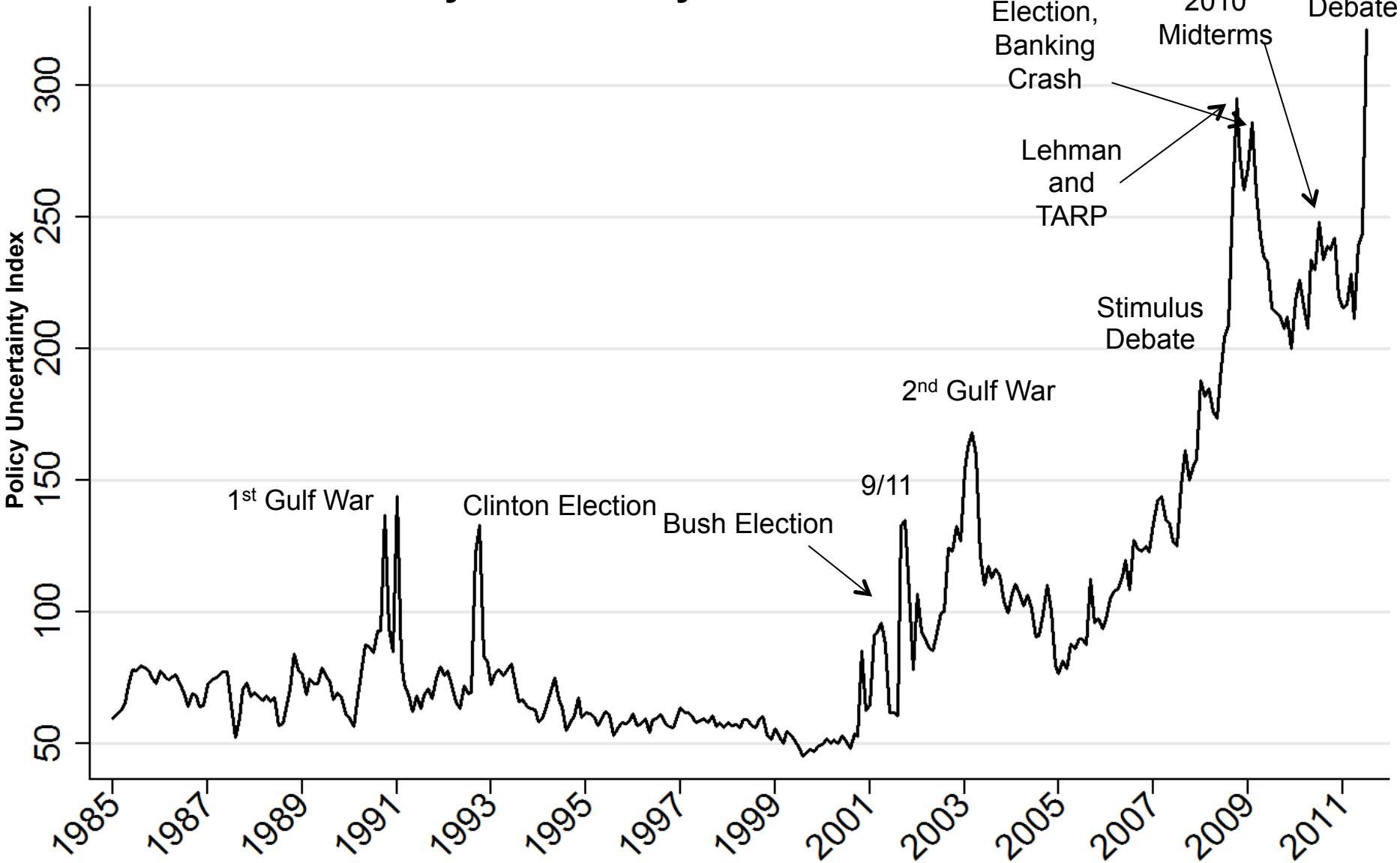
Notes: News-Based Middle East Uncertainty Index composed of monthly number of news articles containing uncertain or uncertainty as well as the term 'Middle East' (scaled by the smoothed number of articles containing 'today'). Google query run June 15, 2011. Index covers January 1985-May 2011

Appendix Figure A4: Equal Weighted Index of Economic Policy Uncertainty



Notes: Index of Policy-Related Economic Uncertainty composed of 4 series. Included are 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 quarterly measures of the interquartile range of estimates of federal government expenditures and 1-year CPI from the Philadelphia Fed Survey of Forecasters. Weights: .33 Google News, .33 tax expirations, .167 CPI disagreement, .167 Federal expenditures disagreement. Google query run August 11, 2011. Series normalized to mean 100. Index covers January 1985-July 2011.

Appendix Figure A5: Principal Component Weighted Index of Economic Policy Uncertainty



Notes: Index of Policy-Related Economic Uncertainty composed of 4 series. Included are 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 quarterly measures of the interquartile range of estimates of federal government expenditures and 1-year CPI from the Philadelphia Fed Survey of Forecasters. Weights: .38 Google News, .39 tax expirations, .22 CPI disagreement, .02 Federal expenditures disagreement. Google query run August 11, 2011. Series normalized to mean 100. Index covers January 1985-July 2011.