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Abstract

Economic policy uncertainty (EPU) has increased markedly in recent years in the U.S. and Europe, and some have posited a link between this phenomenon and subpar economic growth in advanced economies (see Baker, Bloom, and Davis, 2015). But methodological and data concerns have thus far raised doubts about whether EPU contains marginal and exogenous information about other economic phenomena. Our work analyzes the impact on EPU of several possibly endogenous variables, such as inflation and unemployment rates in countries where EPU is measured. We also consider longer-term technological factors, such as media fragmentation, which by undermining political consensus may indirectly elevate EPU. We find that about 40 percent of EPU movements can be explained by long- and short-run movements in these determinants, which is consistent with limited evidence that de-trended movements in EPU may contain marginal information about GDP growth and other macro variables.

Keywords: economic policy uncertainty, business cycles, political polarization, political economy

JEL Codes: E61, D72

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Economic uncertainty rose dramatically following the onset of the Great Recession and remains elevated today in the United States and Europe. The Great Recession, immigration, globalization, and fiscal indebtedness are among the reasons individuals across advanced economies express concern for their futures, as reflected in media coverage. Rapid changes in immigration and technology have dramatically diminished the income prospects of groups such as low-skilled natives, prompting the rise of a populism across the developed world that promises to vastly change the economic order and has induced angst among policymakers about how much of this agenda to adopt—and how much to resist.

High levels of uncertainty about the fundamental economic policy making environment— the "rules of the game" under which individuals and businesses must operate—can have ambiguous effects on macroeconomic aggregates such as saving and investment. However, when driven by growing polarization on the part of voters and legislators, periods of high economic policy uncertainty may be characterized by episodes in which fiscal crises go unresolved, potentially triggering credit downgrades or even an inability of government to borrow when it's most needed. The Greek debt crisis and the 2011 debt-ceiling debacle in the United States illustrate this phenomenon, as do other examples such as the phase-out of the Bush tax cuts in the U.S. and bitter disputes over labor-market reform across both periphery (e.g., Italy, Spain, Portugal) and core (e.g., France) EU member countries.

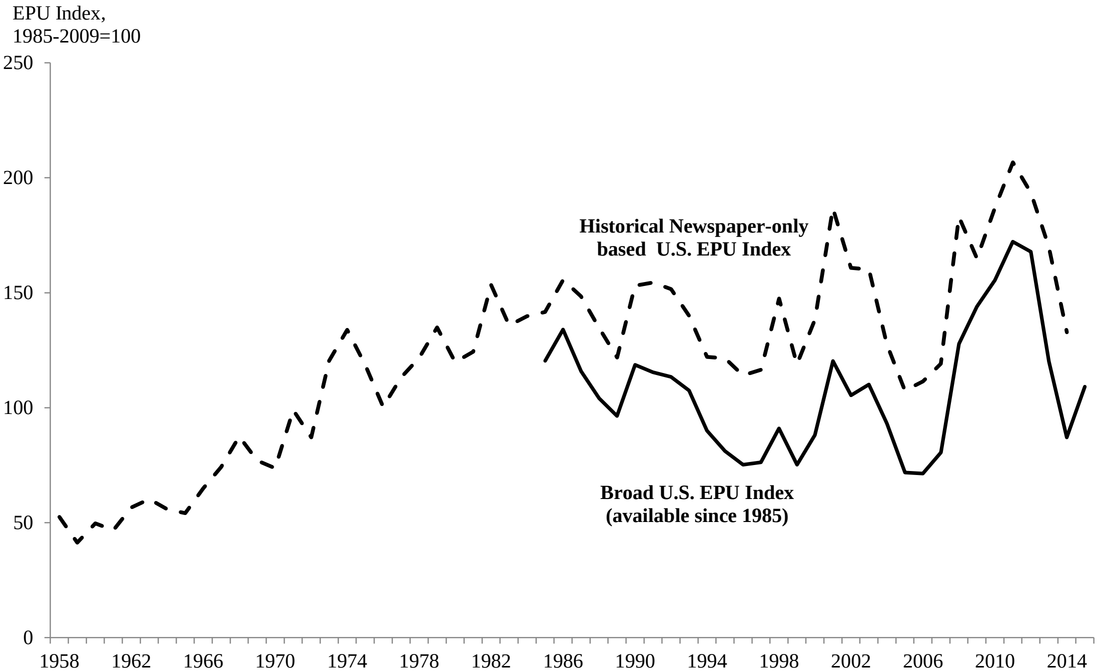
These developments have increased the importance of properly gauging economic policy uncertainty across the United States and Europe. Perhaps the best-known measure, and the focus of our analysis is the media-based index devised by Baker, Bloom, and Davis ("BBD"). They find evidence that economic policy uncertainty (*EPU*) has information content for U.S. GDP (BBD 2015). Other studies have found that EPU may have marginal information about asset prices (Brogaard and Detzel 2013), bank loan growth (Bordo, Duca, and Koch 2016), and the yield curve (Leippold and Matthys 2015).

Nevertheless, the BBD index is often met with skepticism by economists who are concerned that *EPU* either reflects other economic factors or is so endogenous as to be meaningless. One particular and common shortcoming of studies analyzing EPU is that long-term trends in EPU are ignored or omitted. Accounting for these trends is important because they could shed light on factors underlying the time series. That, in turn, would help social scientists better interpret and gauge short- and long-term movements in economic policy uncertainty.

Three stylized patterns are evident in the EPU indexes of BBD (Figure 1). First, there have been upward trends in their historical "news-based" EPU since the early 1970s, suggesting that some shifts in public discourse emanating from the underlying structure of the political environment that may affect the range in which EPU fluctuates. Second, both the historical narrow-based and the broader post-1984 based EPU series of BBD tend to rise after business cycle peaks and remain elevated during the early stages of subsequent economic recoveries. Third, and consistent with the second stylized fact, EPU tends to be positively correlated with short-run indicators of macroeconomic distress—e.g., the misery index, which sums the inflation and unemployment rates.

These last two patterns suggest that poor economic conditions may induce more debate and news coverage of possible countercyclical policy responses, thereby elevating EPU indexes. Together, these stylized facts suggest that there may be both long-run as well as cyclical factors that partly drive EPU. Identifying these influences may help researchers better decipher movements in EPU and their marginal information about other political or economic variables.

Figure 1: U.S. Economic Policy Uncertainty:
Broad-based versus News-only-based Historical Measures



Models of conflict resolution may provide some guidance concerning how to empirically model EPU. Such models embody the notion that bad states of the world (e.g., poor economic conditions) give rise to disagreement (policy uncertainty), depending on structural factors affecting the underlying level of policy uncertainty and perhaps its sensitivity to bad states of the world. Our study tests the hypothesis that medium- to long-run trends in EPU largely reflect measures of economic distress—as measured by the misery index—and structural factors that affect the underlying level of political discord (political polarization). In related work, Duca and Saving, (forthcoming (a)) find that the degree of political polarization (using updated data on Poole and Rosenthal's (1994) indexes of congressional political polarization) is cointegrated with and positively correlated with a proxy measure of the degree to which American media is fragmented, and this relationship is tighter than that between polarization and income inequality (which also matters).

Because EPU may be a manifestation of political polarization and cyclical conditions, it is plausible that EPU partially reflects structural factors that contribute to the lack of political consensus (political polarization) and the degree of economic distress. Consistent with the broad empirical implications of conflict resolution models, we find that EPU is positively correlated and cointegrated with both the economic misery index and a proxy for media fragmentation (share of Americans having cable/wireless TV), with these variables explaining about 40 percent of EPU movements. Our findings, thus, provide partial support for both sides of the EPU debate— and by shedding light on the sources of EPU, we provide not only a more political-economic perspective on the indexes of BBD (2015), but may also help researchers isolate some of the more exogenous content of EPU that may contain marginal information for other variables.

To establish these results, the rest of the paper is organized as follows. The next section reviews conflict resolution models, discussing their possible empirical implications for EPU. Section 3 then lays out the empirical specification to test these implications and presents the data and variables. Section 4 then reviews the estimation results, whose broader implications are reviewed in the conclusion.

II. What Theoretical Models of Conflict Resolution Imply

In examining conflict, social scientists typically ask important causal questions. When and where is conflict most likely to occur? Conditional on conflict occurring, what is the channel through which it is most likely to manifest itself? And what underlying social, economic, or political reasons might drive the potential incidence of conflict?

One consensus that has emerged from the conflict literature is that increased polarization lies at its root (Esteban and Ray, 1999). Across a wide variety of dimensions, increased polarization has been found to increase the risk of societal conflict (Ostby, 2008). One of the most important drivers of war and other violent conflict has been ethnic diversity, especially among societies that either undergo relatively rapid demographic change or have institutions in place that impede members of one group from fully participating in civic or economic life (Montalvo and Reynal-Querol, 2005). Another important driver is economic inequality, which increases the potential gains from redistribution for those at the bottom while simultaneously increasing the potential losses from redistribution for those at the top (Esteban and Ray 2011).

At times, the current political discourse in the U.S. and Europe makes it seem as if nothing can be done to affect this dynamic, yet previous work has identified some answers to these issues. Institutional structures that encourage power sharing across societal groups, such as U.S.-style "checks and balances," tend to foster collaboration and decrease the risk of conflict (Schneider and Wiesehomeier, 2008). Decentralized power structures also reduce the risk of conflict by enabling localities to indulge their own preferences, at least to some degree, without being overruled by the center (Brancati, 2006).

Central to the conflict literature is the idea that factions within society believe—rightly or wrongly—their wellbeing to be under siege by others. The likelihood of conflict rises when people in society come to see those outside their faction as wishing them harm, and legislation moves from general policymaking to particularized benefits that disproportionately affect favored factions, (Esteban, et al. 2012). As government loses its ability to credibly protect all groups in society, the likelihood of conflict further increases (Lake and Rothchild, 1996).

While the conflict literature is most commonly applied to actual physical conflict, it has also been used to examine the incidence of political polarization in advanced economies. Generally speaking, greater societal division is found to drive up the salience of political decision-making as individuals seek to ensure a proper division of spoils, thereby fostering voting and other forms of political activity (Abramowitz and Saunders 2008). Of course, divisions can occur regarding whether policymakers can resolve pressing political-economic issues (Fiorina 2011), though recent developments in the U.S. and Europe do not provide great hope in this regard.

Two implications of this literature are especially important from our perspective. First, higher levels of political polarization lead to greater economic instability and uncertainty (Alesina, et al. 1989). Second, as people with similar beliefs find ways to self-segregate, the amount of conflict and its severity tends to rise unless offset by social networks that cut across group lines (Buskens, et al., 2008). In other words, recent increases in political polarization, especially after the onset of the recent financial-market crisis, would naturally lead to elevated levels of economic uncertainty as groups come to see other groups as posing a threat, whether it be natives versus immigrants, low-skilled versus high-skilled, or the poor versus the rich. And the current media environment, which has frequently been found to foster the "silo-ing" of individuals into ideological similar "echo chambers" within which scant sympathy toward alternative viewpoints is discussed, could be expected to drive this polarization and, thus, raise the level of economic uncertainty (Duca and Saving, 2016a).

III. Empirical Framework and Data

IIIA. Empirical Approach to Testing for Long-Run and Short-Run Relationships

An error-correction framework is used to estimate long-run (equilibrium) and short-run movements in EPU to model nonstationary variables that are cointegrated—that is the deviation between actual and equilibrium levels are themselves stationary. Because this approach allows for lagged adjustment to underlying factors such as media fragmentation and economic misery, the estimated equilibrium level of EPU should move slightly ahead of its actual level. Short-run changes in EPU should have a statistically significant tendency to narrow (correct) the gap between the actual and equilibrium levels, proxied by the prior period's gap (or error). Basically, we use cointegration tests to see if long-run relationships exist across non-stationary, long-run variables and estimate short-run models to test for error-correction toward equilibrium in the short-run.

We use the Johansen-Juselius approach to estimate the long-run relationships. Cointegration analysis also enables testing whether right-hand side variables are exogenous to the dependent variable, providing evidence on possible bi-directional feedback between economic policy uncertainty and economic misery. We use vector-error correction models (VECMs) to jointly estimate the long-run relationship between two sets of variables, X and Y, in a cointegrating vector and short-run effects in first difference equations, respectively:

$$\ln(X) = \alpha_0 + \alpha_1 \ln(Y)$$

$$\Delta\ln(X) = \beta_1[\ln(X) - \alpha_0 + \alpha_1\ln(Y)]_{t-1} + \Sigma_{i=1}\gamma_i\Delta\ln(X)_{t-i} + \Sigma\delta_i\Delta\ln(Y)_{t-i} + \lambda_1 Z_t + \varepsilon_{1t}$$

$$\Delta\ln(Y) = \beta_1[\ln(X) - \alpha_0 + \alpha_1\ln(Y)]_{t-1} + \Sigma_{i=1}\gamma_i\Delta\ln(Y)_{t-i} + \Sigma\delta_i\Delta\ln(X)_{t-i} + \lambda_2 Z_t + \varepsilon_{2t} \qquad (1)$$

where X denotes EPU, Y is a vector of long-run drivers of EPU, the lags of first difference endogenous variables minimize the Akaike Information Criterion (AIC,) Z is a vector of exogenous factors, ε_{it} are residuals, and the λ_i, γ_i, and $\delta_{i\ v}$ are row vectors of coefficients. We jointly estimate long- and short-run relationships, which partly depend on the sets of exogenous, short-run factors included (the vector Z). The next two subsections describe the short- and long-run variables used.

IIIB. The Long-Run Variables

To assess the relative impact of the misery index and media fragmentation on economic political uncertainty, we examine relationships among these three types of long-run variables separately for the U.S. and Western Europe, each of which exhibits a unit root according to KPSS tests of stationarity, reported in Table 1. For economic policy uncertainty, our main models use the broad-based EPU series for the U.S. (*EPUUS*) and the BBD index of EPU for Europe (*EPUEUR*), both available since 1985. In addition, we also separately analyze the BBD historical news-based EPU series for the U.S. (*EPUHistUS*), which has the advantage of assessing how robust the qualitative findings are versus using the broader-based EPU series.

The misery index traditionally has been defined as the sum of inflation and the unemployment rate. For the latter, we use the civilian unemployment rate for the U.S. and the population-weighted sum of the civilian unemployment rate for the five Western European countries (source: OECD) where the newspapers for the BBD European EPU index are domiciled. These countries are Germany, France, Italy, Spain, and the UK. We modify the misery index definition by replacing simple inflation with the absolute deviations of inflation from the implicit/explicit 2 percent inflation goal of most central banks. We can, thus, account for the macro-stabilization and other problems arising from unexpected price movements due to below-target inflation rates.[1] To construct these deviation or inflation-gap measures, we use the annual CPI inflation for the U.S. and the population-weighted sum of harmonized CPI inflation rates for the five aforementioned Western European countries (source: OECD). To track the impact of media fragmentation for the U.S., we use annual averages of Duca and Saving's

[1] The inflation-gap modified misery index outperformed a simple misery index for modeling U.S. and Europe EPU.

(forthcoming a, b) data on the share of American households having cable or satellite TV (*CableUS*), following earlier work by Baum and Kernell (1999). To track media fragmentation in Europe, we use population-weighted averages of the share of households having cable or satellite TV (*CableEUR*) in Germany, France, Italy, Spain, and the UK, paralleling the construction of the European measures of EPU and the misery index. The underlying sources of European data are OECD (1999, 2009); the construction of *CableEUR* is detailed in the Appendix.

To gauge the impact of technology on how media composition may affect noncyclical trends regarding the propensity for conflict resolution, we proxy the degree of media fragmentation with the share of households having cable or satellite TV. The lower the share, the greater the likelihood that households watch a common source of news, providing a common frame of reference from which political opinions arise (Baum and Kernell, 1999). The rise of alternative news outlets has diminished what was formerly a common frame of reference in at least two major ways. First, a wider set of media choices enable households to self-select by watching channels that reinforce pre-existing opinions rather than challenging them. As a consequence, individuals more readily sort themselves into ideological "silos" (Iyengar and Hahn, 2005). A wider array of entertainment programming has also reduced news watching, together with better recording technology that reduced incidental viewing of news programs, thus lowering awareness of current developments (Prior 2005, 2007) and reinforcing "silo" effects. Whether owing to "silo" or "entertainment" effects, increased cable and satellite TV use is likely associated with a declining exposure of people to alternative viewpoints and less common political ground from which to resolve political disputes. As a consequence, there is plausibly an increased tendency for slower political resolution of issues and increased economic political uncertainty when conditions create grounds for policy disputes and uncertainty surrounding them.

IIIC. Additional Short-Run Variables

To avoid misspecification bias, arising from a limited sample of annual data, some pronounced short-run drivers of EPU may need to be incorporated. Because the VECMs include lagged first differences of long-run variables—they already include lagged changes in media composition (the Cable share variables) and the economic misery index—inclusion of additional short-run variables should not mimic these. For the U.S., there are large positive outliers in 2000, when the Internet stock boom of the late 1990s busted and in 2001, when the September 11, 2001, terror attacks raised uncertainty temporarily. In both cases there was little observable effect on annual inflation or unemployment. For these effects, we include a dummy equal to 1 in 2000 and 0 otherwise (*InternetBust*) and a separate dummy equal to 1 in 2001 and 0 otherwise (*Sept11*). Each dummy is expected to have a positive estimated coefficient in the U.S. model. In addition, the failure of Lehman and the sudden shock of the financial crisis created a large shock to EPU in 2008 not tracked well by lags of the misery index. A dummy for the failure of Lehman is also included (*Lehman* = 1 in 2008; 0, otherwise).

For the model of European EPU, there are notable annual outliers coinciding with two political-economic events. The first is a surge of EPU in 1993 when the Maastricht Treaty forming the euro was negotiated, followed by a temporary decline in 1994; the second is the 2010 surge in risk surrounding the onset of the Greek debt crisis that threatened euro zone survival. For the former, we include a discrete variable equal to 1 in 1993, -1 in 1994, and 0 otherwise (*DMaastricht*, expected to have a positive estimated effect). To address the latter, we included a dummy variable equal to 1 in 2010 (*GreekOnset*).

IV. Estimation Results

IVA. What Drives Economic Policy Uncertainty in the Long-Run?

Using the broad-based EPU measures of BBD, the upper panel of Table 1 reports cointegration tests on what drives economic policy uncertainty in the long run for Europe (Western) and the U.S. in VECMs, while the lower portion summarizes results pertaining to modeling short-term movements in EPU, as reflected in the first difference of *EPUUS* and *EPUEUR*. For purposes of comparing EPU in the U.S. and Europe, these models are estimated over a common sample period, 1989–2015. Since researchers may differ over which short-run variables to include, we estimate models of European and U.S. EPU with and without short-run controls in odd and even numbered models, respectively, as a robustness check on the coefficient estimates of the impact of the long-run variables.

In each of the four models, test statistics indicate the existence of only one significant long-run relationship (cointegrating vector).[2] The lag length of 1 in each European model used to estimate these vectors was chosen based on a lag length needed to obtain a unique, significant cointegrating variable that also maximized the Schwartz Information Criterion, and, if possible, also yielded clean model residuals using the VECLM statistics on lags t-1 through t-6, for each models on an individual basis. A lag length of 2 was selected for the U.S. models based on these criteria.

The cable TV share variable has a significant and positive long-run coefficient (in the upper part of Table 1) in each case, ranging from 1.00 to 1.35 for the European EPU and between 2.09 and 2.60 for the U.S. EPU. These findings indicate a robust long-run effect for the

[2] Specifically, the eigenvalue and trace statistics reject the null hypothesis of no significant long-run relationship among EPU, cable share, and the misery index, but accept the hypothesis that there are not two or more significant cointegrating relationships. In other words, there is evidence of one unique and significant long-run relationship.

U.S. and Europe, that is unaffected by the inclusion of the highly significant short-run variables in modeling changes in EPU. This tight range implies that increases in the share of households with cable/pay TV are consistently associated with increases in the underlying long-run trends in EPU.

In each model, the economic misery index has a significant and positive long-run coefficient (in the upper part of Table 1). For the U.S., the coefficient ranges from 21.30 to 23.86, reflecting a robust long-run effect in the U.S. unaffected by the inclusion of the significant short-run variables. For Europe, the coefficient on the misery index ranges between 16.91 and 17.23, also reflecting a robust long-run effect for this region that is immune to inclusion of the highly significant short-run variables. The existence of somewhat smaller (but not statistically different) estimated misery coefficients for modeling European EPU is plausible because the greater social safety net in Europe relative to the U.S. likely softens the impact of unemployment and inflation for the European versus American electorates (Fatas and Mihov, 2001).

The implied equilibrium levels of EPU line up well with the actual levels. For example, as shown in Figure 2, the estimated equilibrium level of EPU in the U.S. from model 3 tracks the actual level of EPU well, where short-run effects are also taken into account. Similarly, as shown in Figure 3, the estimated equilibrium level of *EPUEUR* from model 1 (and inclusive of estimated short-run effects) tracks the actual level. Abstracting from the short-run effects, the equilibrium levels move slightly ahead of actual levels.

Figure 2: U.S. Economic Policy Uncertainty Highly Related to Media Fragmentation and the Economic Misery Index

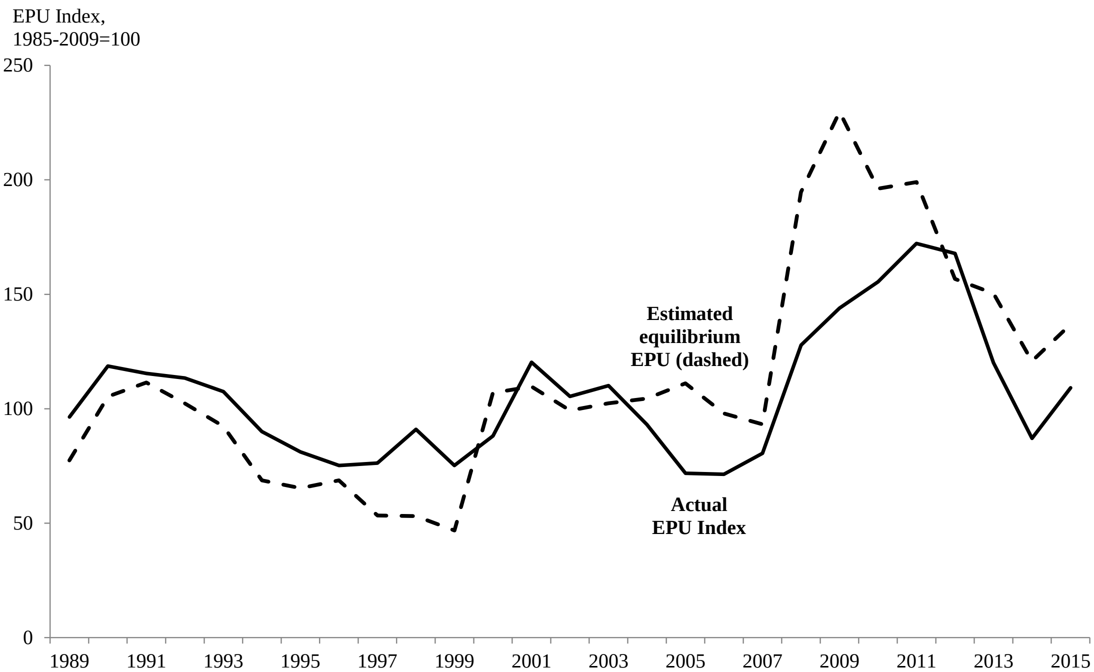


Figure 3: European Economic Policy Uncertainty Highly Related to Media Fragmentation and the Economic Misery Index

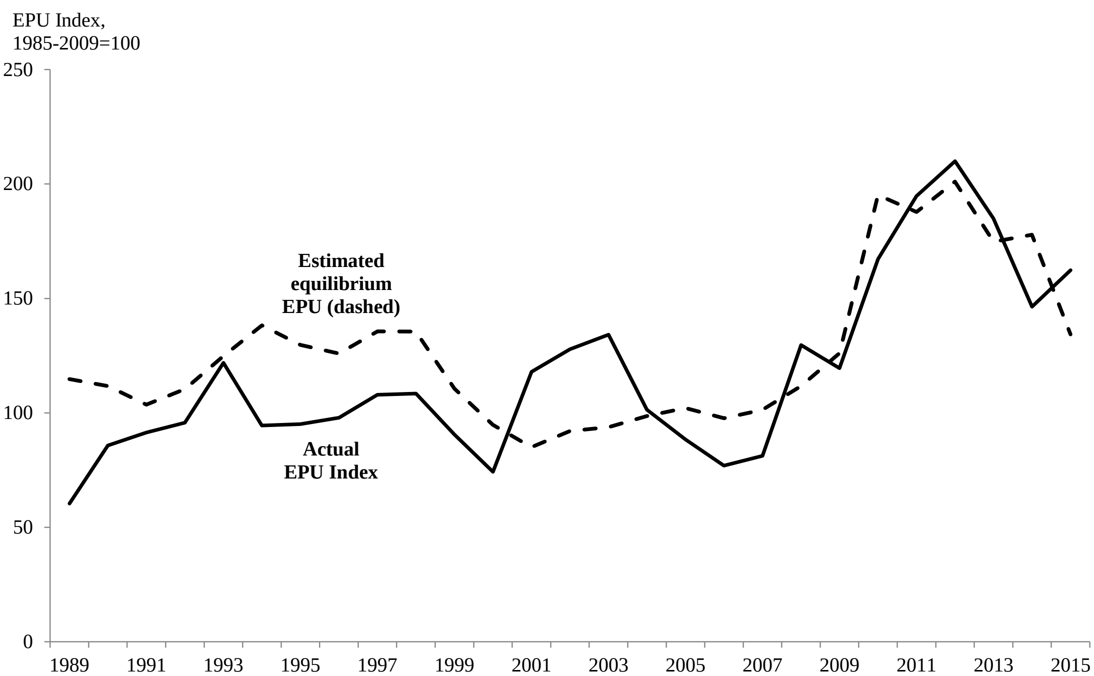


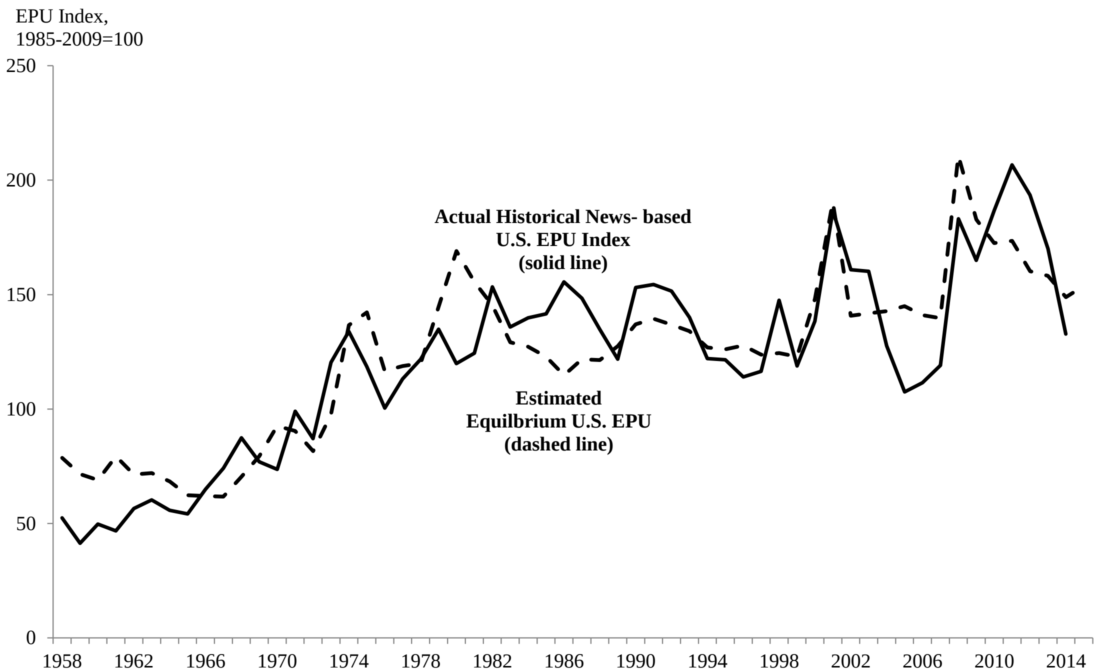
Table 2 reports results from estimating three models of the historical news-based EPU series from BBD. Model 1 mimics U.S. Model 3 from Table 1 by including all three short-run extra control variables, Model 2 only adds *Sept11* and *Lehman*, and model 3 mimics U.S. Model 4 from Table 1 by including no extra short-run variables. As with the broader-based EPU models for the U.S. in Table 1, a lag length of 2 was chosen based on similar criteria. Owing to the start of cable share data in 1954 and the use of two lags of first differences in the VECMs, the sample period starts in 1958 and ends in 2014 as the historical series estimates end in October 2014 (we use the average reading between January and October of that year for the 2014 annual value).

The qualitative long-run results for using the historical U.S. series are similar to those of Table 1. In each of models 1–3, a unique and statistically significant cointegrating vector is identified, with EPU positively and significantly related to both the cable share and economic misery index. One difference is that the estimated long-run coefficients differ, with the marginal effects of the long-run variables roughly one-third the size of the coefficients estimated using the narrower-based EPU gauge, and the constant being notably lower.

However, because the indexes have a different scaling, it is more accurate to compare the relative importance of the two factors for tracking each series. For example, model 1 in Table 2 and model 3 in Table 1 use the same long-run and short-run variables, except for how EPU is measured. Nevertheless, the coefficient on the cable share is 13 percent the size of that on the misery index in model 3 of Table 1, while the relative coefficient on the cable share is 10 percent of that on the misery index in model 1 in Table 2. In this sense, the relative estimated long-run impacts of the cable share and misery indexes are similar for the two U.S. measures of EPU.

And, mirroring the plot in Figure 2, the estimates of equilibrium historical U.S. EPU line up well with the actual values plotted in Figure 4.

Figure 4: Historical U.S. Economic Policy Uncertainty Highly Related to the Cable Share and Economic Misery



IVB. What Drives Economic Policy Uncertainty in the Short Run?

The lower panel of Table 1 summarizes the results from the four models of the change in EPU. In the presence of cointegration, proper specification requires including an error-correction term (*EC)* that essentially implies that long-run deviations of actual from equilibrium levels of EPU add information about short-run movements in EPU. Accordingly, models 1 through 4 include error-correction terms testing for the impact of cable share and economic misery on short-run changes in economic policy uncertainty. In each case, EC_{t-1}, equals the gap between the actual polarization reading and the equilibrium share implied by the two long-run drivers of EPU from the corresponding cointegrating vector in the upper-panel of Table 1. When the actual share exceeds the equilibrium share in the prior quarter, long-run equilibrium implies a tendency for the EPU to fall in the short-run, thus implying a negatively signed coefficient on the variable EC_{t-1}.

In the models containing short-run factors, the error-correction term is negative and statistically significant at the 99 percent confidence level, implying that EPU tends to fall when its actual level exceeds its equilibrium in the prior year, where the equilibrium is increasing in the share of households with cable TV and in economic misery. The size of the error-correction coefficients suggests that the gap between actual and equilibrium polarization is closed by 38 to 41 percent per year in Europe and the U.S. The error-correction coefficient for the European model is only marginally significant in the absence of additional short-run controls, while the error-correction coefficient for the U.S (model 4) is not significant, albeit correctly signed. This distinction likely reflects that the parsimonious models omit controls for important political-economic events that are either not tracked in a timely way or not tracked at all (e.g., models 2 and 4). As expected, there are positive and significant coefficients on each of the short-term variables, with the exception of *Sept11*, which is only marginally significant. The inclusion of these political economic short-run variables notably improves the fit of the models tracking short-run changes in EPU, as reported in the lower panel.

The short-run results for modeling the historical U.S. EPU index are generally similar in several ways, as reported in the lower panel of Table 2. First, the error-correction coefficients are about .40 in each of the three models containing short-run controls in Table 2, indicating that roughly 40 percent of the gap between actual and equilibrium levels of EPU in time period t-1 is eliminated by the change in EPU in the following year (period t). Second, the short-run controls for September 2001 (*Sept11*) and the onset of the financial crisis (*Lehman*) are statistically significant and positive. Third, the corrected R^2s of models including all three short-run controls are not far apart, with the standard errors of models 3 from Table 1 and model 1 from Table 2 very similar (14.0 vs. 15.3). Nevertheless, there are some minor differences, such as the coefficient on the Internet stock bust of 2000 (*InternetBust*) being insignificant in the model of the historical U.S. series.

V. Conclusion

The bulk of the new empirical literature on economic policy uncertainty examines the information content of detrended EPU for GDP and other variables (e.g., investment or bank lending). Rather than ignoring the long-run determinants of EPU, the current study examines long-run trends and finds linkages not only to medium-term swings in business cycles, but also to the evolving structure of media that other studies have linked to an increased tendency toward political polarization. In this regard, our findings imply the recent heightened tendency toward economic policy uncertainty does not merely reflect the Great Recession, as some have proposed, but also an underlying structural trend toward more pronounced and persistent political discord.

To the extent this discord is exacerbated or generated by an increasingly fragmented media environment that promotes entertainment over news programs and inhibits information-sharing and discussion across ideological groupings, this trend may perhaps be slower to change than may be commonly believed. Rather than expecting EPU to “return to normal” as the Great Recession recedes into the rear-view mirror, it can be expected to remain relatively high for the foreseeable future absent efforts to address underlying factors such as media fragmentation that are partially responsible for its elevation. In these ways, our study provides connections between the new literature on economic policy uncertainty and the literature documenting the rise and return of political polarization in the U.S. amid signs of increased political discord within the nation-states of Europe.

Nevertheless, the fit of our error-correction models of short-run changes in EPU reveals that a notable amount of the variance of changes in EPU is *not* attributable to the combination of long-run political trends, medium-run trends in economic misery, lagged short-run changes in these variables, and a handful of controls for major political-economic shocks that would elevate economic policy uncertainty. These unexplained components of EPU are analogous to detrended movements in EPU, which others, such as BBD (2015) and Bordo, Duca, and Koch (2016), have found to contain marginal information about U.S. output and bank lending in the presence of other economic variables. From a broader perspective, our findings are consistent with EPU containing information that not only is partly endogenous to the business cycle and long-term political undercurrents but also is partly reflective of other aspects of policy uncertainty that may contain marginal information about the economy.

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Appendix A: The Share of European Households with Cable/Satellite TV

Mirroring the national domiciles of the European newspapers that BBD use to construct a European EPU index, we apply population weights to the share of European households having either cable or satellite TV in France, Germany, Italy, Spain, and the UK. Underlying national data on the cable (hard-wire) and satellite-TV shares of households are from OECD (1999, 2009) source data on the absolute numbers of households with those services and are scaled by OECD estimates of households in each country. In some isolated cases, there were a handful of missing annual data on the numbers of households having cable, for which we used linear interpolations of surrounding annual readings. These include interpolating the following years for the following countries: France (2008), Germany (2003-04), and Italy (1998—both cable and satellite). In addition, 1999 data on the numbers of cable and satellite equipped households were unavailable and were linearly interpolated. In all cases the surrounding actual observations were similar, implying that the interpolations gave accurate readings for the missing years. The resulting series rises a great deal in the late-1980s through the late-1990s, increases at a more moderate pace in the early and mid-2000s, and flattens out by 2009, when the series ends. We extend the annual observations through 2014 by assuming that the cable share stays at its 2009 level, a pattern that matches actual U.S. data that are essentially flat from 2009 to 2015. When newer European data become available, we will update the European cable share series.

Table 1: Annual Models of Economic Policy Uncertainty in the U.S. and Europe

Long-Run Relationship: $EPU_t = \lambda_0 + \lambda_1 Cable_t + \lambda_2 Misery_t$

	(Western) Europe		**The United States**	
Model sample	1989-2015	1989-2015	1989-2015	1989-2015
	Model 1	**Model 2**	**Model 3**	**Model 4**
Constant	-118.243	11.948	-205.676	-262.780
$Cable_t$	1.352**	0.997**	2.087**	2.596**
	(2.52)	(9.71)	(7.39)	(6.53)
Misery	17.233**	16.913**	21.300**	23.856**
	(3.63)	(3.42)	(10.54)	(9.38)
Trace (1 v.)	32.24*	32.46*	51.54**	45.20**
Trace (2 v.)	14.13	15.20	8.49	12.59
MaxEigen (1)	18.11	17.25	43.05**	32.61**
MaxEigen (2)	11.54	11.40	7.75	8.74
Unique Coint-	Mixed*,	Mixed*,	Yes**,**	Yes**,**

Short-Run Models: $\Delta EPU_t = \alpha_0 + \alpha_1(EC)_{t-1} + \beta_i\Delta(Cable)_{t-i} + \theta_i\Delta(Misery)_{t-i} + \delta Y_t$

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Constant	11.194^{+}	13.80^{+}	17.993*	12.511
	(1.80)	(1.86)	(2.44)	(1.14)
EC_{t-1}	-0.376*	-0.300^{+}	-0.405*	-0.280
	(2.42)	(1.87)	(2.33)	(1.36)
$InternetBust_t$			35.28*	
			(2.13)	
$Sept11_t$			28.53^{+}	
			(1.86)	
Lehman			54.38**	
			(3.60)	
DMaastricht	29.031*			
	(2.16)			
$GreeceOnset_t$	51.831*			
	(2.61)			
Adjusted R^2	.354	.056	.516	.011
S.E.	18.69	22.60	14.02	20.04
VECLM(1)	10.49	12.37	15.86	1.97
VECLM(4)	8.72	10.50	9.45	8.94

ADF Unit Root Tests

	ADF Statistic on Null of Stationarity					***Unit Root?***
EPUUS	-0.583	(accepted)	Δ*EPUUS*	-5.686^{**}	(rejected)	yes
EPUEUR	-2.362	(accepted)	Δ*EPUEUR*	-4.730^{**}	(rejected)	yes
CableUS	0.344	(accepted)	Δ*CableUS*	-3.823^{*}	(rejected)	yes
CableEUR	0.164	(accepted)	Δ*CableEUR*	-5.649^{**}	(rejected)	yes
MiseryUS	-2.056	(accepted)	Δ*MiseryUS*	-4.871^{**}	(rejected)	yes
MiseryEUR	-2.392	(accepted)	Δ*MiseryEUR*	-3.507^{+}	(rejected)	yes
EPUHistUS	-3.125	(accepted)	Δ*EPUHistUS*	-8.002^{**}	(rejected)	yes

Notes: first differences of lagged variables omitted in the short-run results section to conserve space (full results are available). "v." denotes vector, while $^{+}$,*and ** denote 90%, 95%, and 99% significance levels, respectively. Absolute t-statistics are in parentheses. Significance indicators for a unique cointegrating vector refer to trace then max-eigen statistics. Lag lengths of 1 and 2 are used in each European and American mode1, respectively, which yielded unique, significant vectors. The significance level of VECLM statistics accounts for size of the vector. The ADF unit root tests selected the lag length that minimized the Schwartz Information Criterion. The statistics reported are for data spanning 1985-2015 for all variables, except for *EPUHistUS*, for which the sample period is 1955-2014.

Table 2: Annual Models of the U.S. Historical Index of Economic Policy Uncertainty

Long-Run Relationship: $EPU_t = \lambda_0 + \lambda_1 Cable_t + \lambda_2 Misery_t$

				Post-1984 index
Model sample	1958-2014	1958-2014	1958-2014	1989-2015
	Model 1	**Model 2**	**Model 3**	**Model 3, Table 1**
Constant	27.623	27.097	28.388	-205.676
$Cable_t$	0.868^{**}	0.848^{**}	0.954^{**}	2.087^{**}
	(9.64)	(9.11)	(10.54)	(7.39)
Misery	6.638^{**}	6.804^{**}	6.108^{**}	21.300^{**}
	(5.99)	(6.07)	(5.51)	(10.54)
Trace (1 v.)	35.90^{**}	35.38^{**}	30.53^{*}	51.54^{**}
Trace (2 v.)	8.08	8.18	7.18	8.49
MaxEigen (1)	27.83^{**}	27.20^{**}	23.35^{*}	43.05^{**}
MaxEigen (2)	5.20	6.16	6.53	7.75
Unique Coint-	Yes**,**	Yes**,**	Yes*,*	Yes**,**

Short-Run Models: $\Delta EPU_t = \alpha_0 + \alpha_1(EC)_{t-1} + \beta_i\Delta(Cable)_{t-i} + \theta_i\Delta(Misery)_{t-i} + \delta Y_t$

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 3, Table 1**
Constant	-4.511	-4.523	-2.883	17.993^{*}
	(1.33)	(1.33)	(0.71)	(2.44)
EC_{t-1}	-0.423^{**}	-0.420^{**}	-0.568^{**}	-0.405^{*}
	(3.08)	(3.16)	(3.31)	(2.33)
$InternetBust_t$	17.155			35.28^{*}
	(1.04)			(2.13)
$Sept11_t$	55.859^{**}	57.208^{**}		28.53^{+}
	(3.45)	(3.53)		(1.86)
Lehman	56.068^{**}	56.653^{**}		54.38^{**}
	(3.51)	(3.55)		(3.60)
Adjusted R^2	.390	.389	.126	.516
S.E.	15.28	15.29	18.28	14.02
VECLM(1)	5.01	5.38	2.92	15.86
VECLM(4)	11.08	12.12	12.55	9.45

Notes: first differences of lagged variables omitted in the short-run results section to conserve space (full results are available). "v." denotes vector, while $^{+}$,*and ** denote 90%, 95%, and 99% significance levels, respectively. Absolute t-statistics are in parentheses. Significance indicators for a unique cointegrating vector refer to trace then max-eigen statistics. A lag length of 2 is used in each mode1, which yielded unique, significant vectors. The significance level of VECLM statistics accounts for size of the vector.