# U.S. Economic Policy Uncertainty is Presidential

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**Abstract**

We propose a direct measure of the public's uncertainty about government economic policy management: public approval of the the President's handling of the economy ($PHE$). We estimate the impact of $PHE$ on U.S. consumer sentiment after controlling for several observable macroeconomic and political variables. We conclude that the direct measure of $PHE$ is the single most important variable, explaining between 20% and 30% of the consumer sentiment variance at different horizons. The widely employed Economic Policy Uncertainty ($EPU$) measure is weakly correlated with $PHE$ and explains at most 10% of consumer sentiment variance. Economic policy uncertainty is decidedly politically, and, at least in the U.S., also Presidential.

**Keywords:** Consumer Sentiment, Macroeconomics, Uncertainty Shocks .

**JEL codes:** E7, E2, C1.

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# 1 Introduction

In response to the quite dramatic 2008-2010 shock to the U.S. economy, the importance of economic policy management, i.e., the political component of the economy, has increased. In particular, the effect of uncertainty in economic policy management has been identified as contributing to economic shocks such as the Great Recession (Bernanke, 1983) and also to subsequent low levels of business investment. Caldara et al. (2016) conclude that uncertainty shocks and especially those that do not rely on financial asset prices, are also an important source of macroeconomic disturbances. Mumtaz and Surico (2018) argue that about 25% of output fluctuations in the U.S. are accounted for by policy uncertainty, with government debt making the largest contribution at longer horizons. A recent contribution, Benhabib and Spiegel (Forthcoming), suggests that policy uncertainty may have political foundations – they find a positive relationship between partisan election outcomes and future state economic activity.[1]

How should we measure economic policy uncertainty? Baker, Bloom and Davis (2016) propose an Economic Policy Uncertainty ($EPU$) metric that is composed primarily of the volume of policy uncertainty topics expressed in major U.S. newspapers (although later versions incorporate tax changes and forecaster disagreement).[2] The $EPU$ measures mediated representations of economic policy uncertainty. We propose complementing this with a direct measure of the general public's uncertainty about economic policy. Public uncertainty about government economic policy is reflected in their disapproval of the President's handling of the economy ($PHE$).

Economic policy uncertainty arguably explains a variety of economic outcomes – examples include business investment, savings, consumer expenditures. This essay focuses on a

[1] We focus explicitly on economic policy uncertainty in this paper. Other approaches include Basu and Bundick (2017) who measure uncertainty about future economic outcomes with the the Chicago Board Options Exchange Volatility (VXO) Index. In their baseline model uncertainty accounts for one-fourth of the decline in output associated with the 2008 Great Recession.

[2] And evidence from others has demonstrated that $EPU$ affects various economic outcomes including, for example, stock fluctuations (Brogaard and Detzel, 2015) and output and consumption (Mumtaz and Surico, 2018).

single economic indicator - consumer sentiment. Consumer sentiment in the U.S. is typically measured by the Michigan Consumer Sentiment Index that has been published monthly since June, 1968 and is considered an important component of the leading indicators of U.S. economic activity (Matsusaka and Sbordone, 1995; Barsky and Sims, 2012).

We demonstrate that our direct measure of the public's approval of economic policy management, $PHE$, is highly correlated with consumer sentiment. Using cointegration techniques and structural vector autorregression models we find that this survey-based measure of the public's approval of the President's handling of the economy ($PHE$) plays a significant role in explaining consumer sentiment. This variable explains between 20% and 30% of the consumer sentiment variance at different horizons. This contribution is larger, at all horizons, than the contribution of the $EPU$ measure and than all of the other economic variables in the model.

Our results suggest that $PHE$ measures public concerns, or uncertainties, regarding economic policy management that are not captured by the $EPU$ index. In fact, $PHE$ is only weakly correlated with the $EPU$ index. As a consequence, at least in the U.S., $PHE$ better predicts consumer sentiment than does $EPU$.[3] $EPU$, on the other hand, particularly in its original operationalization, measures the mediated economy. It measures the print media's characterization of economic policy management. And as with other efforts to measure the correlation between the mediated economy and consumer sentiment (De Boef and Kellstedt, 2004; Duch and Kellstedt, 2011), it has a small although not insignificant effect. Much of the direct effect of uncertainty about economic management is picked up by our political variable – survey questions asking respondents to evaluate the President's management of the economy, $PHE$.

Moreover, the effect of $PHE$ on consumer sentiment is long-lasting, suggesting that a shock to household perceptions of the President's handling of the economy is a persistent

[3]Previous contributions, (De Boef and Kellstedt, 2004; Duch and Kellstedt, 2011) have also found a positive and significant impact of $PHE$ on consumer sentiment, although they consider a shorter period and do not assess the relative contribution of this variable to the overall volatility of consumer sentiment.

innovation that may impact permanent income levels. In contrast, the $EPU$ has a relatively smaller impact on consumer sentiment that dissipates quickly.

## 2 The political economy of consumer sentiment

Consumer sentiment is one of a number of economic outcomes affected by economic policy uncertainty. The Michigan consumer sentiment index is constructed from five survey questions concerning personal finances, the country's overall economic performance and the respondent's household expenditures. The index is employed to forecast future spending and saving behavior.[4] It is employed as such because consumer sentiment is unquestionably an important contributor to economic activity (Shapiro, Sudhof and Wilson, 2018; Barsky and Sims, 2012; Benhabib and Spiegel, Forthcoming; Ludvigson, 2004; Gillitzer and Prasad, 2016). Carroll, Fuhrer and Wilcox (1994), for example, present evidence suggesting that lagged consumer sentiment has some explanatory power for current changes in household spending.

The earlier work of De Boef and Kellstedt (2004) and Duch and Kellstedt (2011) identified three distinct factors that shape fluctuations in consumer sentiment (De Boef and Kellstedt, 2004): economic fundamentals; assessments of the government's management of economic policy; and, indirectly, mediated representations of economic outcomes and policy. We contend that their measure of the President's handling of the economy ($PHE$) best captures, directly, the public's uncertainty about government management of economic policy. The Baker, Bloom and Davis (2016) measure of economic policy uncertainty ($EPU$) most closely resembles the De Boef and Kellstedt (2004) measure of mediated representations of economic policy management. They find that it has an indirect and modest impact on consumer sentiment.

[4]Details on the index construction are available at `https://data.sca.isr.umich.edu/fetchdoc.php?docid=24770`. Ludvigson (2004) has an excellent overview of USA consumer sentiment indices based on survey questions.

## 2.1 Economic Fundamentals

Economic fundamentals account for fluctuations in consumer sentiment. The evidence to this effect seems conclusive although the precise fundamentals shaping consumer sentiment are debated. Throop (1998) provides one of the earliest efforts at identifying those variables. Others have demonstrated, for Europe, the impact on consumer sentiment of specific fundamentals such as stock prices (Jansen and Nahuis, 2003). Duch and Kellstedt (2011) show that the economic time series characterizing the state of the economy in Canada, France, Germany and the UK explain between 50 and 88 percent of the variance in consumer sentiment in those countries. Following this literature, we consider the following set of economic fundamentals: the unemployment rate, real wages, inflation, changes in the value of the stock market and a measure of the output gap.

## 2.2 Approval of the President's Handling of the Economy (PHE)

Public uncertainty about economic policy management affects consumer confidence (Caldara et al., 2016; Baker, Bloom and Davis, 2016). In fact, many argue policy uncertainty plays an extremely important role in helping explain economic shocks (Mumtaz and Surico, 2018). Hence, the considerable attention to measuring public concern about economic policy management (Baker, Bloom and Davis, 2016). It complements the role played by economic fundamentals in explaining consumer confidence.

Management of economic policy is political. And politics plays an important direct and indirect role in either exaggerating or moderating uncertainty regarding economic policy which in turn shapes household spending and firm investment decisions (Jens, 2017). While it may be true that the U.S. Constitution and legislation accord considerable economic authority to non-executive institutions (Congress, the Federal Reserve, the Supreme Court, etc.), President's dominate economic policy making. A case in point is Blinder and Watson (2016) who find a strong Presidential partisan difference in economic performance – the U.S. economy has performed considerably better under Democratic as opposed to Republican

Presidents.[5] They provide some evidence to suggest that this partisan performance gap might result from consumer confidence anticipating differences in economic policy management by Democratic versus Republican Presidents.

How do we know whether the government's economic policy actions are creating perceptions of more or less uncertainty in the general public? We argue for a direct measure of the public's evaluations of economic policy management. And we make two important measurement assumptions.

First, the public's economic policy uncertainty registers in their overall assessment of economic policy management. Assessments of economic policy stewardship will certainly include a number of dimensions. A reasonable expectation of the survey respondent is for them to provide their overall assessment of economic policy management. Our expectation is that if economic policy uncertainty is high, assessments will be low and vice versa. And we expect these responses will reflect a diverse set of concerns regarding economic policy management – uncertainty, of course, will be prominent but other concerns such as approval of policy content will register here.

A second measurement assumption is that the public primarily attributes responsibility for the U.S. government's management of economic policy to the executive branch and specifically to the President.

Historical polling data on economic policy management provides a very simple confirmation of both these assumptions. First, historically, there are very few public opinion questions asked specifically about economic policy uncertainty. Understandably, public opinion organizations have asked quite general questions about overall policy management. Second, public opinion research in the U.S. suggests that the public holds U.S. Presidents more accountable, than the U.S. Congress, for economic performance (Duch and Stevenson, 2008). And U.S. Presidents dominate media coverage of national economic events (Pew Research Center, 2009). Consistent with this President-centric economic vote, public opinion organi-

[5]Moreover, similar economic performance differences are not associated with variations in party control of Congress.

zations have asked fewer, and on a less consistent basis, questions about the economic policy management by other government actors, such as Congress, or the Fed, or the Courts.

Accordingly, we adopt a direct survey measure of the public assessments of the President's management of economic policy. We use the same public opinion-based approval measurement strategy employed by De Boef and Kellstedt (2004). A typical phrasing of the question is: "Do you approve or disapprove of the way (Reagan/Bush/Clinton/Bush) is handling the nation's economy?"

In total we identified 895 public opinion survey items asking the U.S. general public to evaluate the President's management of the economy. These questions were asked by six different polling organizations: Gallup, ABC News, ABC/NBC, CBS, CBS/NYT, and the LA Times. Table 11 presents the questions and identifies the survey organizations. The questions are very similarly worded; there is considerable time-period overlap for each of the six series; and the response sets are comparable. Accordingly, we combine, as did De Boef and Kellstedt (2004), the approval marginals from the six time series employing the method developed by Stimson (1999).[6]

We contend that most events that contribute to economic policy uncertainty in the general public are, either directly or indirectly, linked to the executive office.[7] Higher levels of economic policy uncertainty will be directly captured in our Presidential economic management approval series. As De Boef and Kellstedt (2004) point out, this measure of public approval of the President's handling of the economy is quite distinct from conventional measures of Presidential job approval. Figure 1 benchmarks our economic management approval series against the conventional presidential approval item – "Do you approve of the way President is handling his job as president?" Note, the two series are distinct. The two series of course are correlated (the correlation coefficient in our case is 0.64 compared to the 0.56 reported by De Boef and Kellstedt (2004)). PHE will be affected by the the constellation of

[6]The approval data from the 895 opinion surveys along with the R code employed for implementing Stimson's method for estimating an economic approval series is available at https://github.com/rayduch/US-Economic-Policy-Uncertainty-is-Presidential

[7]See for example Chart 1 in Sweet, Ozimek and Asher (2016).

political and economic factors that determine Presidential Approval (Fair, 1978; Edwards, Mitchell and Welch, 1995; Mueller, 1970; Erikson, MacKuen and Stimson, 2000). And concerns that shape Presidential Approval will reflect economic policy uncertainty on the part of the public. Nevertheless, there are many months over the 30 year period when the two measures behave quite differently. Its typically the case that Presidential overall job approval is higher than is the case for approval of the President's handling of the economy. But there are exceptions. G.W. Bush's economic approval was higher than his general approval over much of his first term. And most recently, President Trump has had persistently better economic job approval than overall job approval.

Lets be clear about what we claim to measure – approval of the President's handling of the economy measures the public's uncertainty about economic policy. This approval measure will also capture other dimensions of the public's assessment of economic policy. It is beyond the scope of this essay to account for the specific factors that shape public approval of the President's handling of the economy. As Figure 1 suggests, some, although clearly not all, of the variation in economic job approval could be correlated with non-economic and decidedly political outcomes. Our contention is simply that the economic job approval survey question best captures the public's concern about economic policy (whether this attitude is generated by political, economic or other non-economic factors).[8]

Our claim is that $PHE$ is a particularly good measure of uncertainty about economic policy because the question wording specifically asks respondents to consider the President's management of the economy, rather than questions that prime a host of other political considerations. In fact, in our estimation we include a control for general Presidential Approval that we believe further helps isolates specifically economic policy evaluations that affect consumer sentiment.[9] We do not make any strong claims here because the two series are quite

[8] An alternative, and possibly more robust, strategy here might be to estimate this economic policy uncertainty directly in an econometric framework such as the efforts (Jurado, Ludvigson and Ng, 2015).

[9] As a number of studies have demonstrated, partisanship affects economic attitudes and consumer sentiment (Duch, Palmer and Anderson, 2000; Benhabib and Spiegel, Forthcoming; Gerber and Huber, 2009). Its entirely likely that partisanship also shapes the public's economic policy uncertainty – while extremely important, deconstructing the sources of economic policy uncertainty are beyond the scope of this essay.

highly correlated. Our relatively conservative claims is simply that by including Presidential Approval as a control in our estimation, we at a minimum get some sense of the informative added value from the $PHE$ measure.

## 2.3 The Media Coverage of the Economy ($EPU$)

Baker, Bloom and Davis (2016) propose a measure of economic policy uncertainty that relies on the analysis of media content. For the ten leading newspapers in the U.S., they count the frequency with which three trios of terms appear in news stories: "economic" or "economy"; "uncertain" or "uncertainty"; and one or more of "Congress", "deficit", "Federal Reserve", "legislation", "regulation" or "White House". This is the basis for their economic policy uncertainty ($EPU$) measure. A reasonable measurement strategy given that individuals learn a lot about economic fundamentals and economic policy performance via the media (Blinder and Krueger, 2004). Moreover, the $EPU$ measure has been demonstrated to predict investment, savings, and consumption decisions in both U.S. and non-U.S. markets and is widely used by the investment community.

Media representations of uncertainty about economic policy will influence consumer sentiment although we see these as complementing directly measured indicators of the public's approval of Presidential handling of the economy. The direct effect of economic policy uncertainty will be captured by our $PHE$ measure. The Baker, Bloom and Davis (2016) $EPU$ metric should capture mediated representations of economic policy uncertainty that are distinct from our $PHE$ measure.[10]

This implies that our $PHE$ will not be highly correlated with mediated representations of economic policy uncertainty – the $EPU$. Figure 2 plots the $EPU$ and $PHE$ indices over the past 30 years. In fact, the two measures, $PHE$ and $EPU$, are only weakly correlated.[11]

[10] And it is important to point out that in general carefully automated analysis of social and electronic media provide invaluable insights into the diverse aspects of the economy that shape this "augmented" economic reality (Melody, Rojas and Convery, 2018).

[11] Regressing $PHE$ on $EPU$ from 1985 to 2018 gives a negative correlation among the variables, although the adjusted-R square is only 4%. Regressing $PHE$ on the VIX index gives a positive correlation (which is

The measures are obviously not measuring the same thing! We identify key political and economic events that correspond to some of the shocks in the series. The two metrics fluctuate in tandem for some events but clearly not all for others – in fact, they are more likely to be out of synch.

We suspect the two measures may capture quite distinct concerns about economic policy: the media-based $EPU$ captures short-lived shocks in concerns while $PHE$ measures more fundamental public attitudes about economic policy management. As a result there can be quite signifiant disconnects between the two series. A case in point, as shown in Figure 2, is the after-math of the 9/11 terrorist attacks. $EPU$ registers a large positive spike in the after-math while the response of the $PHE$ is exactly the opposite – it improves. Clearly, and understandably, there was an immediate panic spike in market indicators. Moreover, the immediate reaction of media outlets was, again not surprisingly, to speculate about the economic consequences of this unprecedented event.

Its not at all clear that the public became fundamentally uncertainty about economic policy management in the aftermath of the 9/11 attacks. The notion, popularized in the press, that 9/11 pushed the economy into a full recession has been debunked. As Makinen (2002) points out the U.S. economy was already in a recession in September and the third quarter decline in GDP was clearly not the result of 9/11. And GDP growth in the fourth quarter returned to positive territory. Similarly Consumer Confidence (both Conference Board and Michigan) dropped in the third quarter but stabilized and grew in subsequent quarters. Garner (N.d.) makes the convincing case that consumer confidence trends post-9/11 were entirely consistent with macro-economic conditions that had nothing to do with the terrorist attack. The fact that the $PHE$ did not plunge into negative territory seems perfectly consistent with this notion that economic fundamentals had not changed much in response to the 9/11 attacks.

Hence we make two claims regarding our political measure of economic policy uncertainty,

counter-intuitive) and also a small adjusted-R square of 3%.

$PHE$: 1) it is a direct measure of concern about economic policy management and hence is more strongly correlated with consumer sentiment than $EPU$ that measures mediated accounts of concern with economic policy; and 2) it measures more fundamental concerns about economic policy management and hence shocks in $PHE$ will represent persistent innovations that may impact permanent income levels.

# 3 Methodology

We estimate the relationship between consumer sentiment and a set of economic and political variables using co-integration techniques. As a first step, we perform unit root tests on the relevant variables. If some of the series are non-stationary, we test for the existence of a long-run relationship among the variables. This long-run relationship, or co-integrating vector, is estimated using dynamic OLS. An error correction model (ECM) estimates the short-run behavior of consumer sentiment. Finally, we estimate a SVAR in order to compute the dynamic contribution of each variable to the overall behavior of consumer sentiment over different time horizons.

## 3.1 Unit Root and Cointegration Tests

We use monthly data from January, 1985 to June, 2018. The log of consumer sentiment, $cs_t$, is from the University of Michigan.[12] We consider five economic-related variables: year-on-year inflation ($\pi_t$), detrended real wages ($w_t$), unemployment rate ($un_t$), detrended output ($y_t$) and the percentage change in the U.S stock market value ($d(stock_t)$).[13] In addition, we consider the measure of the public's approval of the President's management of the economy,

[12]This is taken directly from https://fred.stlouisfed.org/series/UMCSENT.

[13]Inflation is based on the consumer price index (CPI) for all urban consumers, real wages is the ratio between the average hourly earnings of production and nonsupervisory employees to CPI. Output is proxied by the monthly industrial production index. The U.S stock market value is the index of total share prices for all shares for the United States. All series, with the exception of unemployment, are taken from the Federal Reserve Bank of St. Louis. Unemployment is taken from the Bureau of Labor Statistics. Output and real wages are expressed as the percentage deviation from the Hodrick-Prescott trend.

$PHE$, and the Presidential approval index, $PA$, from Gallup. We also consider the Economic Policy Uncertainty Index, $EPU$, as a measure of the mediated "augmented" economy. This is the the broad-based $EPU$ series for the U.S. constructed by Baker, Bloom and Davis (2016).

As shown in Table 1 most of the series are stationary. The exceptions are $cs$, $\pi$ and $w$ that have a unit root.[14] Accordingly, we perform a cointegration test to determine the existence of a long-run relationship between $cs$ and the economic, policy related and uncertainty variables we have constructed. In Table 2 we present the unrestricted cointegration rank test (trace) that confirms the existence of one cointegrating vector with a 1% confidence. Given this evidence, we proceed to estimate the long-run relationship between $cs$ and the set of economic fundamentals.

## 3.2 Dynamic OLS

We implement a Dynamic Ordinary Least Squares (DOLS) procedure. This methodology controls for the reverse causality due to any correlation between the disturbances to the $cs_t$ and the independent variables in the model. This problem is addressed by including leads and lags of the first differences of the independent variables as suggested by Phillips and Loretan (1991), Saikkonen (1991) and Stock and Watson (1993). In particular, if $X_t$ is the vector containing the independent variables, the long run responses of $cs_t$ to its determinants is estimated with the following expression:

$$cs_t = \alpha + \beta X_t + \sum_{k=-p1}^{p2} \gamma_k \Delta X_{t-k} + \varepsilon_t \tag{1}$$

where $X_t = [un_t, w_t, \pi_t, y_t, d(stock_t), EPU_t, PHE_t, PA_t]$ and $\beta$ is a vector containing the long-run elasticities and semi-elasticities relating $cs_t$ to the variables in $X_t$. In this model, we incorporate one lead $p_1$ and one lag $p_2$ in the independent variables [15].

[14] Results are robust to using alternative unit root tests.

[15] Results are robust to inclusion of additional leads and lags. As is noted by Choi, Hu and Ogaki (2008)

### 3.3 Error Correction Representation

From the estimation of $\beta$, we can express contemporaneous misalignment as:

$$\mu_t = cs_t - \left(\hat{\alpha} + \hat{\beta} X_t\right) \tag{2}$$

Now, in order to understand the short-run dynamics of $cs$, we specify an Error Correction Model (ECM) as follows:

$$\Delta cs_t = \theta \mu_{t-1} + \psi \Delta cs_{t-1} + \sum_{j=0}^{J} \delta_j \Delta X_{t-j} + \xi_t \tag{3}$$

The previous equation reflects the way in which past misalignments, $\mu_{t-1}$, are dissipated over time as $cs$ changes. In this case, the speed of adjustment is reflected by the coefficient $\theta$ which is expected to be negative and less than one in absolute value. This ECM allows for changes in fundamental variables, $X_t$, have an impact on the short-run dynamics of consumer sentiment.

## 4 Results

Table 3 presents the estimates of the cointegrating relationship (employing DOLS) between $cs$ and the independent variables, $X_t$, in Equation 1. Column 2 begins with the estimated effects on consumer sentiment for the block of economic fundamental variables. As expected an increase of 1% in the unemployment rate reduces consumer confidence by 7.2%; an increase in real wages of 1% has a positive effect of 6.5%; a rise of 1% in share prices increases consumer sentiment by 1.5%. Changes in inflation and output have the correct sign: higher inflation reduces consumer confidence and an increase in output above its trend increases consumer confidence. These effects are, however, not statistically different from zero.

Model 2 in Table 3 includes $PHE$ in addition to the economic fundamentals. As ex-

the lead and lag selection issue has not been settled in the DOLS literature, hence the need to check for the robustness of alternative values of $p_1$ and $p_2$.

pected $PHE$ has a significant impact on consumer sentiment: a 10% rise in the percentage of surveyed respondents who approve the President's handling of the economy increases consumer confidence by 5%.[16] Moreover, including $PHE$ in the model results in a significantly higher adjusted $R^2$ – it rises from .71 to .81. All three of the significant economic fundamentals from Model 1 have the expected signs and remain statistically significant although their magnitudes decline. As shown in Figure 4, including the $PHE$ reduces, systematically, the in-sample forecast errors. In some particular periods the reduction is of 10% or more (January 1992, January 2000, November and December 2008).

Two additional control variables are added to the estimation in Model 3 of Table 3. We include the economic policy uncertainty variable proposed by Baker, Bloom and Davis (2016): the elasticity of consumer sentiment to $EPU$ is negative although relatively small: -0.7%. Presidential Approval is the second control variable. The Presidential Approval effect is relatively small compared to $PHE$. A rise in $PA$ of 10% increases the consumer confidence by 0.95%, whereas in the case of $PHE$ the effect is 4.39%. Including $EPU$ and $PA$ has little effect on overall model fit – the adjusted R-squared increases only marginally, to 0.81 when they are added to the estimation.

The economic climate differs, and economic policies in general vary in saliency, across Presidential administrations (Edwards, Mitchell and Welch, 1995). In fact, in some cases quite dramatically: The latter years of the G.W. Bush administration and the early years of the Obama administrations were engulfed in the Great Recession economic crisis. Reagan took office during a serious oil price-induced recession. Accordingly, as a robustness test we estimate a cointegrating vector that allows $PHE$ to vary over President administration. We reestimate Equation 1 including a dummy variable for each administration that is interacted with the $PHE$. The results, presented in the Model 4 of Table 3, indicate that we observe a significant impact of $PHE$ on consumer sentiment across all administrations. The impact

[16]Note that a 10% change in $PHE$ represents roughly one standard deviation in the $PHE$ variable. It is not uncommon for responses to the $PHE$ question to vary 10% or more over the course of one year. In some specific periods, these changes are particularly important: the $PHE$ increased from 21% in December 2008 to 33% in January 2009 and to 57% by March 2009.

has the expected sign, although there is some variation in magnitude. In the Trump and Reagan administrations, an increase of 10% in the percentage of people who approve the President's handling of the economy increases the consumer confidence by 3.8% on average. In the case of Obama's administration the response to the same increase is just 1.4%. For the other three administrations, Clinton, Bush and Bush Jr., the response is around 2%.

## 4.1 Short-Run Dynamics: a Vector Error Correction Model

To understand the short-run dynamics of $cs$, we estimate an ECM as in Equation 3.[17] We do so for the specification containing only economic variables (Model 1 in Table 3), as well as for the specification that introduces political and news variables. Also, we consider a specification in which a dummy variable for each administration is interacted with the $PHE$. Results for the estimation with only the economic fundamental variables are presented in Model 1 of Table 4: the speed adjustment coefficient, $\theta$, is negative and statistically different from zero implying that consumer sentiments moves so that after three months half of the misalignment is corrected. Model 2 of Table 4 includes $PHE$ and the two control variables – the adjustment coefficient is -0.23, which implies that half-life of consumer sentiment of three months. Model 3 in Table 4 includes dummy variables for each administration and the estimated speed of adjustment increases so that now the half-life of consumer sentiment misalignment is 2 months.

As Model 1 of Table 4 indicates, the short-run responses of consumer sentiment to changes in the fundamental economic variables are as expected. Changes in the rate of growth of the stock prices imply an increase in consumer confidence, independently of the effect of past misalignments in $cs$. Changes in the unemployment rate, on the other hand, reduce the consumer confidence in the short-run. The short-run impact of inflation on consumer sentiment is negative and close to -2.0 under the three specifications. The impact of the

[17] We test whether $PHE$ is weakly exogenous to consumer sentiment. Based on Granger causality tests, we conclude that $PHE$ causes consumer sentiment but not vice-versa. The $EPU$ index also Granger causes $cs$, but not vice-versa.

output gap, on the other hand, is positive and statistically significant. In this particular case, the short-term elasticity is close to one.

In all ECM models in Table 4, $PHE$ has a significantly positive impact on consumer sentiment in the short-run. The two control variables, $EPU$ and $PA$, are also correctly signed and statistically significant.

## 4.2 Structural VAR and Variance Decomposition

The previous results support our central contention that the $PHE$ measure of economic policy uncertainty is strongly correlated with consumer sentiment. And also as expected, the economic fundamentals and a measure of mediated policy uncertainty, $EPU$, are correlated with consumer sentiment. We now assess how much of the variation in consumer sentiment is accounted by each variable. To determine the dynamic contribution of each variable to the $cs$ we estimate a VAR. [18] In order to recover orthogonal shocks, we use a Cholesky decomposition with the following ordering: $EPU$, $PHE$, $PA$, $d(stock)$, $w$, $\pi$, $y$, $u$ and $cs$.[19] These are the variables included in our baseline DOLS estimation. Based on the Akaike information criterion, our VAR specification contains three lags.

Based on the Cholesky decomposition previously described, we compute the response of the $cs$ to a one-standard deviation shock. As shown in Figure 3, an increase of $EPU$ has a negative impact on $cs$ with a maximum impact after two months. This effect dissipates after fourth months. The response of $cs$ to an increase in $PHE$ is positive and reaches its maximum impact in the third month. This effect lasts for longer: it is positive and statistically different from zero and extends out to 15 months. A shock to $PA$ reaches its maximum impact in the second month, becoming zero from the forth month. The responses to $d(stock)$, $w$ and $u$ have the expected sign and are significant in the first months. In the case of inflation and output the responses of $cs$ have the expected sign, but as in the long-run

[18] As in the estimation of the long-run relationship, the VAR includes a constant.

[19] The variable $EPU$ Granger causes $PHE$, $un$, $d(stock)$ and $cs$. The variables $PHE$ and $PA$, on the other hand, Granger causes $cs$ but do not cause $EPU$. Also, we expect that $PHE$ will affect $PA$.

equation, the dynamic impacts are not different from zero. Overall, the impact of $PHE$ is significant and long-lasting, when compared to the effect of the other variables.

In order to assess the relative contribution of each variable to the dynamics of the $cs$, we compute the variance decomposition of consumer sentiment with respect to different shocks. As shown in Table 5, the President's handling of the economy, $PHE$, has the single largest effect on the variance of the forecast error for consumer sentiment at horizons of 1 to 36 months. It accounts for about 4.4% of the total variance at a horizon of one month. From 12 months up to 36 months its contribution increases to nearly 20%. [20] The contribution of $EPU$ is smaller and it is clearly less than both the contribution of $PHE$ and of $d(stock)$. And, finally, the contribution of the $PA$ variable is small, explaining around 2% of the variance of the forecast error for consumer sentiment.

These results, in particular the relative contribution of $PHE$, are very robust to the specification of the VAR model. Table 6 presents the estimates for a VAR model that excludes inflation and output. In this case, $PHE$ has still the single largest effect, explaining between 20% and 30% of the variance of the forecast error for consumer sentiment at horizons of 12 to 36 months.

We conclude that the direct measure of the President's handling of the economy is the single most important variable to explain the evolution of consumer sentiment. This is true after controlling for Presidential Approval, economic variables and the $EPU$ index constructed by Baker, Bloom and Davis (2016). The effect of $PHE$ on consumer sentiment is long-lasting, suggesting that households perceive changes in presidential economic policies as more persistent innovations that may impact permanent income levels. This is consistent with an earlier literature that singles out the President's handling of the economy as an important determinant of consumer sentiment (De Boef and Kellstedt, 2004). In contrast, the $EPU$ and other economic variables have a relatively smaller impact on consumer sentiment that quickly dissipates. This claim is also in line with other recent reservations raised regarding

[20] Our results regarding the importance of $PHE$ for consumer sentiment are robust to a VAR with just one lag. These results are also robust to the order of the variables in the VAR.

*EPU* (Jurado, Ludvigson and Ng, 2015; Blinder and Watson, 2016; Duca and Saving, 2018).

## 4.3 Robustness

Our estimated $PHE$ effect on consumer sentiment is robust to alternative model specifications; different measures of consumer sentiment and to sample selection.

### 4.3.1 $PHE$ Value Added

As Figure 1 quite clearly illustrated, and as one would expect, $PHE$ and $PA$ are strongly correlated. Nevertheless, we argue that $PHE$ represents the appropriate measure of economic policy uncertainty and, accordingly, has considerable value added for models of economic outcomes that explicitly incorporate economic policy uncertainty as an independent variable. But of course, given the correlation between $PHE$ and $PA$, it is difficult to tease out the precise value added – and we do not pretend to do that in this essay. As a robustness check on $PHE$ value added we re-estimate the model of $ci$ with versions of $PHE$ and $PA$ that exclude their shared variance.

We construct two variables: 1) $PA - RES_t$, is the residual derived from regressing Presidential Approval on $PHE$' 2) $PHE - RES_t$ is the residual obtained by regressing the President's Handling of the Economy on $PA$. These residual terms consist, respectively, of variation in $PA$ that is orthogonal to $PHE$ and variation in $PHE$ that is orthogonal to $PA$. Model 1 in Table 7 substitutes $PA - RES_t$ for the $PA$ variable. All of their shared variance is allocated to $PHE$. The results are very similar to those we obtained for the equivalent (non-residualized) model in Table 3. A more conservative robustness check is to apportion effectively all of the shared variance to $PA$ – in Model 2 of Table 3, the $PHE - RES_t$ variable has had all of the $PA$ shared variance removed. The $PHE - RES_t$ is essentially the same as the $PHE$ coefficient in Model 3 of Table 3. On the other hand the $PA$ coefficient in Model 2 in Table 7 is quite a bit larger than its equivalent in Model 3 of Table 3. Model 3 of Table 7 includes both $PHE - RES_t$ and $PA - RES_t$ as control variables. In both cases, the

coefficients on the residualized variables are positive and significant. Of particular interest here though is that the coefficient for the $PHE$ variable is almost identical to its coefficient in Model 3 in Table 3. It is reasonable to conclude that in spite of the correlation between $PHE$ and $PA$, $PHE$ clearly has a significant impact on consumer sentiment independent of its shared variance with $PA$.

The evidence presented in Table 7, reinforce the results we presented previously. The $PHE$ has a positive and significant impact on $cs$ independently of the way in which the correlation between $PHE$ and $PA$ is removed from the estimation. Overall, the semi-elasticity of $cs$ to $PHE$ is between 0.44 and 0.89. In terms of the variance decomposition, we find that the contribution of $PHE$ is between 5% and 20% as the results we reported previously in Table 5. This is true for Model 1 to 3 in Table 7. [21] For brevity, we do not report these results, although they are available upon request.

#### 4.3.2 Consumer Sentiment: Conference Board and OECD

Another widely used measure of consumer sentiment is the Conference Board's Consumer Confidence Index (CCI) (Lahiri, Monokroussos and Zhao, 2016). It began in 1967 as a bi-monthly survey; since June 1977, the survey has been administered monthly. [22] We re-estimate a model in which the dependent variable is the CCI constructed by the Conference Board. The results are presented in Model 4 of Table 7. The semi-elasticity of $PHE$ is positive, significant and larger than in the previous cases. The adjusted R-squared is 0.88. Now, to see the dynamic impact of $PHE$ on consumer sentiment as well as its relative importance, we estimate the CCI variance decomposition from a SVAR with three lags. The results, presented in Table 8, show that $PHE$ explains between 20% and 25% of $cs$ variance

[21] In Model 3 we compute a VAR in which the $PA - RES_t$ is ordered before $PHE - RES_t$. This ordering is based on the fact that $PA - RES_t$ Granger cause $PHE - RES_t$.

[22] Similar to the Michigan Consumer Confidence Index, the CCI can also be separated into two components: the present situation component and the expectations component. Each month, a mail survey is sent out and approximately 3000 completed questionnaires are collected. Preliminary estimates are based on survey responses collected before the 18th of each month. Final estimates are published with the release of the following month's data, scheduled on the last Tuesday of each month.

at horizons of 12 to 36 months. This is a similar result to the one obtained for the University of Michigan sentiment series, *cs*. Again, the $PHE$ is the single most important variable explaining consumer sentiment.

The OECD also produces a consumer confidence index for several countries, including the U.S.. This index is standardized in three steps: period conversion, smoothing and amplitude-adjustment. In terms of period conversion, quarterly indicators are first converted to monthly frequency. Such a conversion is achieved through linear interpolation of quarterly series followed by an alignment to the most appropriate month of the quarter. Most series are aligned to the central month of the quarter; quarterly series based on surveys conducted in a given month of the quarter are aligned to the month itself. In order to remove irregular roughness, seasonal adjusted series are smoothed by applying the Hodrick-Prescott filter. Fluctuations with periodicity below 6 month are cut-off, which corresponds to setting the multiplier lambda to 1. In so doing, the OECD preserves the trend-cycle component of the time series.

As a consequence of the standardization process, the OECD consumer confidence indicator has much less volatility than those constructed by the University of Michigan and the Conference Board. Hence, the elasticities for the OECD index are lower. In Model 5 of Table 7, we present the estimated model results when the OECD consumer confidence index is the dependent variable. All the elasticities and semi-elasticities are lower, in absolute value, than the ones estimated for the two other *cs* indices. Nevertheless, $PHE$ has the expected sign and it is statistically different from zero. The response to $EPU$ is comparatively smaller, as in the previous specifications, whereas the response to the residual political assessment variable is no different from zero. In terms of the variance decomposition, the results in Table 9 show that most of the variables, as expected, contributed little to the overall volatility. The $PHE$ explains between 3% to 5% of the overall variance and it is the most important non-economic variables. At horizons of 1 to 12 months, this is the second most important variable in explaining the volatility of *cs*, although most of the volatility is explained by *cs*

itself – a direct consequence, we believe, of the way in which the OECD standadizes and smooths this series.

### 4.3.3 Subsample analysis

We conduct a robustness analysis to assess the relative importance of $PHE$ in the baseline model across two different samples. The first sample, from 1985.03 to 1999.12, corresponds roughly to the sample period considered by De Boef and Kellstedt (2004). As shown in Table 10, the effect of $PHE$ has the expected sign and it is statistically different from zero. Also, this semi-elasticity is larger than under the full sample estimation. In terms of the variance decomposition, the results indicate that $PHE$ is the single most important variable explaining between 5% and 21% of the *cs* variance at different horizons (for brevity we do not report the results, although they are available upon request).

We estimate the model for a second sub-sample that goes from 2000.01 to 2018.03. This sample contains the 20 years of additional observations not included in the De Boef and Kellstedt (2004) sample. The results are shown in the last column of Table 10. The estimated semi-elasticity of $PHE$ is positive and statistically different from zero – larger size than the value under the full sample estimation. In terms of the variance decomposition, the $PHE$ explains between 6% and 18% of the *cs* volatility at horizons of 1 to 36 months. In this case, $PHE$ is the second most important variable after unemployment (for brevity we do not report the results, although they are available upon request).

### 4.3.4 Subcomponents of Michigan Consumer Sentiment: Future Jobs

Bram and Ludvigson (1998) provide evidence that the item in the Michigan Survey asking about future job prospects is a particularly good indicator of future economic activity. Accordingly, we isolate the effect of our measure of $PHE$ on this one sub-component. We replace, as the dependent variable in our baseline specification, this job prospects survey item:

the "expected change in unemployment next year" (i.e., Model 3 in Table 3).[23] We find that $PHE$ has a positive impact on this variable explaining a significant fraction of its volatility; approximately 10% from 12 to 36 months. Also, if we introduce the "expected change in unemployment next year" index as an independent variable in our baseline specification, the impact of $PHE$ on consumer sentiment is still positive and statistically different from zero. Furthermore, in this case the $PHE$ is still contributing approximately 20% of the volatility as shown in Table 5.[24]

#### 4.3.5 Leading Economic Indicators

We include stock prices in our original model as a control for economic expectations. Here we consider an additional control for economic expectations. We introduce in our baseline specification the index of leading economic indicators ($LEI$) constructed by the Conference Board. This variable, de-trended using the Hodrick Prescott filter, has no significant impact on consumer sentiment and the relative importance of $PHE$ is unchanged. The $LEI$ variable has some impact on the short-run dynamics, without affecting the speed of adjustment nor the relative impact of the other variables [25]. Hence, our results hold up after controlling for the $LEI$, providing convincing evidence that PHE is indeed adding political information beyond that contained in current economic variables and leading indicators.

## 5 Discussion

Various factors contribute to macroeconomic uncertainty (Jurado, Ludvigson and Ng, 2015). This essay focus on the measurement of one of these factors, specifically economic policy uncertainty. And of interest here is how economic policy uncertainty affects consumer sentiment as measured by the Michigan Consumer Sentiment Index. We argue for a direct political

[23]This index is contained in Chart 30 of the series used to construct the aggregate index. The charts can be found in https://data.sca.isr.umich.edu/charts.php

[24]For brevity, we do not report the results although they are available in the online appendix.

[25]For brevity, we do not report the results although they are available in the online appendix.

measure of economic policy uncertainty. The general U.S. public recognizes economic policy management as being decidedly political and they overwhelmingly associate economic policy management with the executive branch, and specifically with the President. We argue that a good measurement strategy is simply to ask the U.S. public – do they approve of the President's handling of the economy (De Boef and Kellstedt, 2004).

The media is a source of what we call "augmented" assessments of economic policy management, i.e., evaluations not captured by our direct survey measure. Media content will of course reflect much of the public's evaluation of economic policy management (and in fact may be responsible for shaping these assessments). The $EPU$ measure proposed by Baker, Bloom and Davis (2016) summarizes, for the most part, expressions of economic uncertainty appearing in major U.S. newspaper stories.

As expected, consumer sentiment responds to economic fundamentals – unemployment, real wages and inflation all account for considerable variation in consumer sentiment. Consumer sentiment is also correlated with public uncertainty regarding economic policy. Our contribution is to demonstrate that the $PHE$ is a particularly good measure of public concern with economic policy and is strongly correlated with consumer sentiment. This survey-based measure of the President's handling of the economy is the single most important variable, explaining between 20% and 30% of the consumer sentiment variance at different horizons. Mediated accounts of economic uncertainty, that are measured by $EPU$, are more weakly correlated with economic sentiment – at most $EPU$ accounts for less than 10% of the variance in consumer sentiment over a 36 month horizon.

We make a strong case for treating policy uncertainty as being decidedly politically, and, at least in the U.S., also Presidential. And the $PHE$ measure we propose is strongly correlated with U.S. consumer confidence at short and long horizons. Moreover, this relationship is robust to different consumer sentiment indices, model specification, and sampled time periods. Hence, we are quite comfortable that these results hold for the U.S. institutional context. Our results suggest that households perceived changes in presidential economic

policies as more persistent innovations that may impact permanent income levels. In contrast, the $EPU$ and other economic variables have a relatively smaller impact on consumer sentiment that quickly dissipates.

A puzzle, that we are exploring in ongoing research, is whether economic policy uncertainty, and its measurement, assumes a similar political character in other countries with varying institutional structures.

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Table 1: Augmented Dickey Fuller Unit Root Tests (1985.01-2018.03)

| Variable | ADF Unit Root | Unit Root? |
|---|---|---|
| $cs_t$ | -2.450 | Yes |
| $\pi_t$ | -2.214 | Yes |
| $w_t$ | -6.885*** | No |
| $un_t$ | -2.597 | Yes |
| $y_t$ | -5.945*** | No |
| $d(stock_t)$ | -14.865*** | No |
| $PHE_t$ | -3.092*** | No |
| $PA_t$ | -3.802** | No |
| $EPU_t$ | -3.693*** | No |

Notes: *,** and *** denote 90%, 95% and 99% significance levels, respectively. The null hypothesis is the existence of a unit root. All of the unit root tests selected the lag length that minimized the Schwartz Information Criterion.

Table 2: Unrestricted Cointegration Rank Test (Trace)

| Hypothesized No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.** |
|---|---|---|---|---|
| None * | 0.166 | 251.090 | 221.444 | 0.000 |
| At most 1 | 0.137 | 180.660 | 181.522 | 0.011 |
| At most 2 | 0.092 | 123.732 | 145.398 | 0.183 |

Trace test indicates 1 cointegrating eqn(s) at the 0.01 level.
* denotes rejection of the hypothesis at the 0.01level.
**MacKinnon-Haug-Michelis (1999) p-values.

Figure 1: Presidential Approval and the President's Handling of the Economy

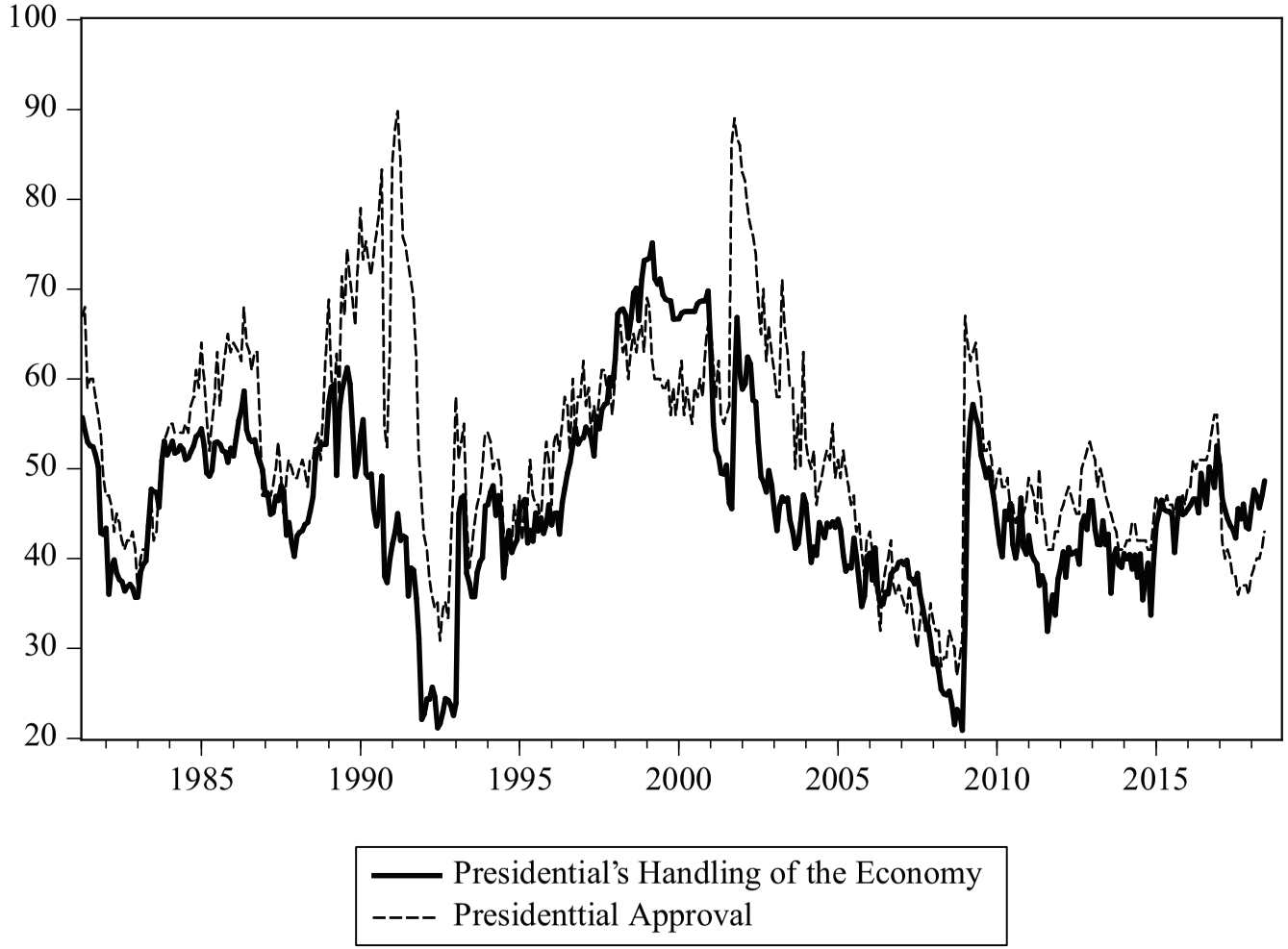

Figure 2: Economic Policy Uncertainty and Presidential Handling of the Economy Indices

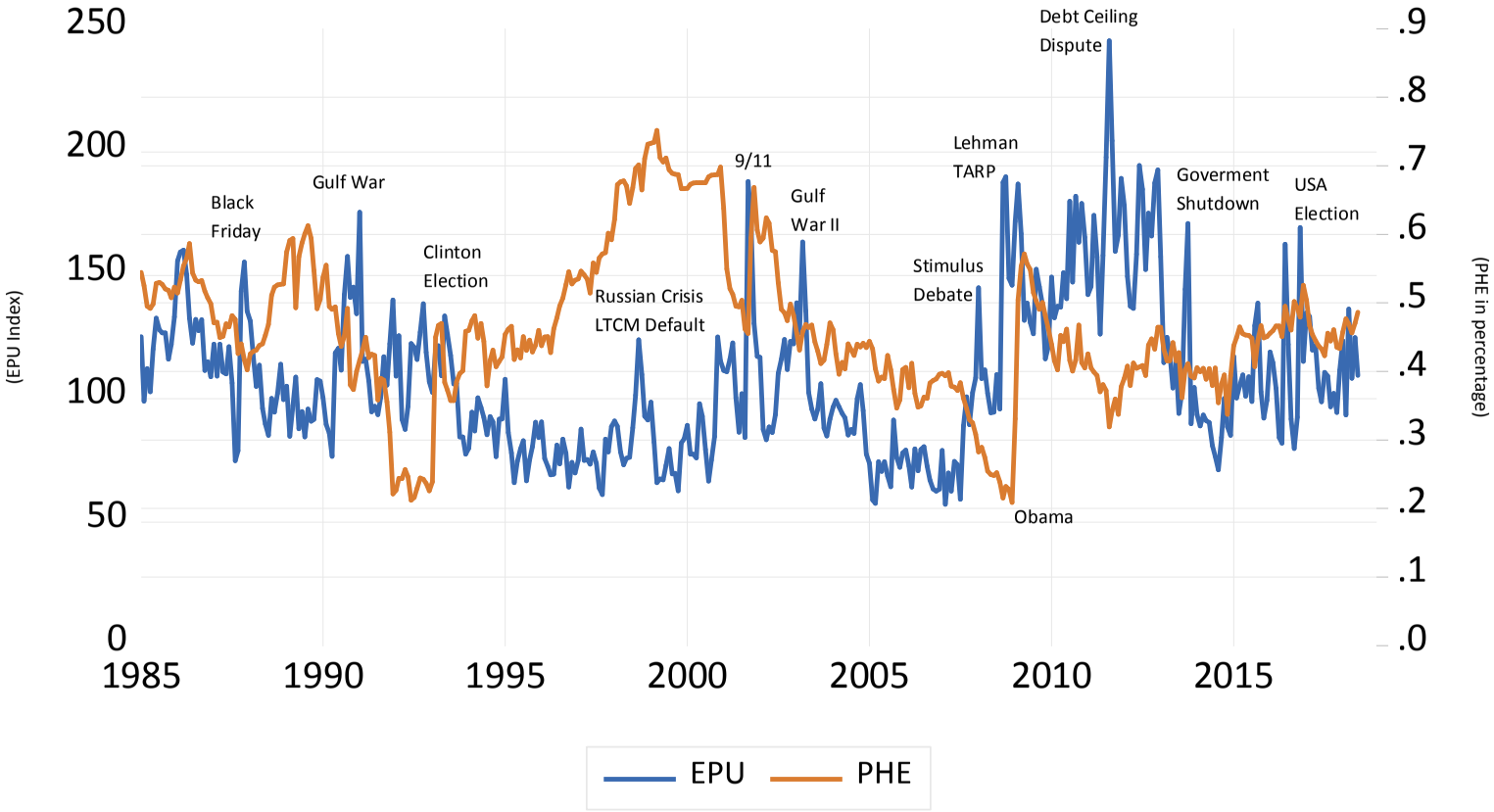

Table 3: Cointegrating Vectors: Alternative Specifications (1985.03-2018.03)

| Model<br>Variable | Model 1<br>Econ. Variables | Model 2<br>PHE | Model 3<br>Final | Model 4<br>PHE Interaction |
|---|---|---|---|---|
| $un_t$ | -7.192*** | -5.399*** | -4.500*** | -3.675*** |
| | (0.283) | (0.288) | (0.347) | (0.429) |
| $w_t$ | 6.491*** | 3.231*** | 2.693*** | 2.500** |
| | (1.059) | (0.912) | (0.891) | (0.974) |
| $\pi_t$ | 0.228 | 0.274 | -0.193 | -2.048*** |
| | (0.339) | (0.326) | (0.357) | (0.599) |
| $y_t$ | -0.762* | -0.152 | 0.112 | 0.754** |
| | (0.356) | (0.274) | (0.295) | (0.304) |
| $d(stock_t)$ | 1.418*** | 1.039*** | 1.005*** | 0.742*** |
| | (0.230) | (0.190) | (0.213) | (0.173) |
| $PHE_t$ | | 0.497*** | 0.439*** | |
| | | (0.040) | (0.054) | |
| $PA_t$ | | | 0.094** | 0.264*** |
| | | | (0.041) | (0.057) |
| $EPU_t$ | | | -0.074*** | -0.133*** |
| | | | (0.019) | (0.024) |
| TRUMP*$PHE_t$ | | | | 0.380*** |
| | | | | (0.073) |
| OBAMA*$PHE_t$ | | | | 0.139* |
| | | | | (0.075) |
| BUSH*$PHE_t$ | | | | 0.181** |
| | | | | (0.078) |
| CLINTON*$PHE_t$ | | | | 0.244*** |
| | | | | (0.063) |
| BUSH I*$PHE_t$ | | | | 0.194** |
| | | | | (0.087) |
| REAGAN*$PHE_t$ | | | | 0.385*** |
| | | | | (0.069) |
| Adjusted R-squared | 0.713 | 0.806 | 0.814 | 0.861 |
| S.E. of regression | 0.076 | 0.063 | 0.061 | 0.052 |
| Sum squared resid | 2.177 | 1.455 | 1.364 | 0.963 |

Notes: *,** and *** denote 90%, 95% and 99% significance levels, respectively.
All specifications are estimated with a constant and one lag, one lead of the first difference of all variables. For brevity they are not shown.

Table 4: Error Correction Model: Alternative Specifications (1985.03-2018.03)

| Model<br>Variable | Model 1<br>Economic | Model 2<br>Final | Model 3<br>PHE Interaction |
|---|---|---|---|
| $u_{t-1}$ | -0.151*** | -0.230*** | -0.287*** |
| | (0.031) | (0.036) | (0.042) |
| $\Delta(EPU_t)$ | -0.045** | -0.046** | -0.048** |
| | (0.020) | (0.020) | (0.019) |
| $\Delta(EPU_{t-1})$ | -0.056*** | -0.046*** | -0.037*** |
| | (0.015) | (0.014) | (0.013) |
| $\Delta(d(stock_t))$ | 0.180*** | 0.185*** | 0.184*** |
| | (0.057) | (0.054) | (0.051) |
| $\Delta(PHE_t)$ | 0.171** | 0.213*** | 0.159** |
| | (0.080) | (0.075) | (0.078) |
| $\Delta(PA_t)$ | 0.122* | 0.135** | 0.154** |
| | (0.063) | (0.063) | (0.062) |
| $\Delta(un_t)$ | -0.038** | -0.048*** | -0.053*** |
| | (0.016) | (0.016) | (0.016) |
| $\Delta(un_{t-1})$ | -0.036** | -0.046*** | -0.051*** |
| | (0.015) | (0.015) | (0.015) |
| $\Delta(\pi_t)$ | -2.054*** | -2.045*** | -2.128*** |
| | (0.749) | (0.665) | (0.643) |
| $\Delta(y_{t-1})$ | 1.152*** | 1.069*** | 1.002*** |
| | (0.347) | (0.327) | (0.322) |
| Half life (months) | 4.2 | 2.7 | 2.0 |
| Adjusted R-squared | 0.227 | 0.266 | 0.287 |
| S.E. of regression | 0.041 | 0.041 | 0.040 |
| Sum squared resid | 0.672 | 0.639 | 0.621 |
| Log likelihood | 705 | 718 | 724 |
| Durbin-Watson stat | 2.061 | 2.018 | 1.979 |

Notes: *,** and *** denote 90%, 95% and 99% significance levels, respectively. The residual, $u_t$, is computed for each specification. The half life is: $\frac{ln(0.5)}{ln(1+\theta)}$. We keep only the variables that are statistically different from zero.

Table 5: Variance Decomposition of $cs_t$ at Different Horizons
(expressed in %)

| Horizon (months) | $EPU$ | $PHE$ | $PA$ | $d(stock)$ | $w$ | $\pi$ | $y$ | $u$ | $cs$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.7 | 4.4 | 2.3 | 3.7 | 3.1 | 1.2 | 0.4 | 2.0 | 80.2 |
| 12 | 6.0 | 18.0 | 2.4 | 8.9 | 1.3 | 1.4 | 4.6 | 9.7 | 47.8 |
| 24 | 4.5 | 18.7 | 1.8 | 7.5 | 2.0 | 3.6 | 9.6 | 10.2 | 42.1 |
| 36 | 4.0 | 18.0 | 1.6 | 6.9 | 2.7 | 6.9 | 9.5 | 11.2 | 39.3 |

The VAR contains the following variables: $EPU$, $PHE$, $PA$, $d(stock)$,$w$, $\pi$, $y$, $u$ and $cs$. We use the we use a Cholesky decomposition where $EPU$ is ordered first.

Table 6: Variance Decomposition of $cs_t$ at Different Horizons
(expressed in %)

| Horizon (months) | $EPU$ | $PHE$ | $PA$ | $d(stock)$ | $w$ | $u$ | $cs$ |
|---|---|---|---|---|---|---|---|
| 1 | 3.2 | 4.0 | 2.0 | 4.4 | 2.8 | 1.8 | 81.8 |
| 12 | 9.7 | 19.8 | 3.3 | 9.0 | 3.2 | 7.9 | 47.0 |
| 24 | 9.2 | 25.3 | 2.5 | 8.2 | 3.3 | 7.7 | 43.7 |
| 36 | 9.2 | 27.6 | 2.4 | 7.7 | 3.5 | 7.5 | 42.1 |

The VAR contains the following variables: $EPU$, $PHE$, $PA$, $d(stock)$,$w$,$u$ and $cs$. We use the we use a Cholesky decomposition where $EPU$ is ordered first.

Figure 3: Responses of *cs* to different shocks

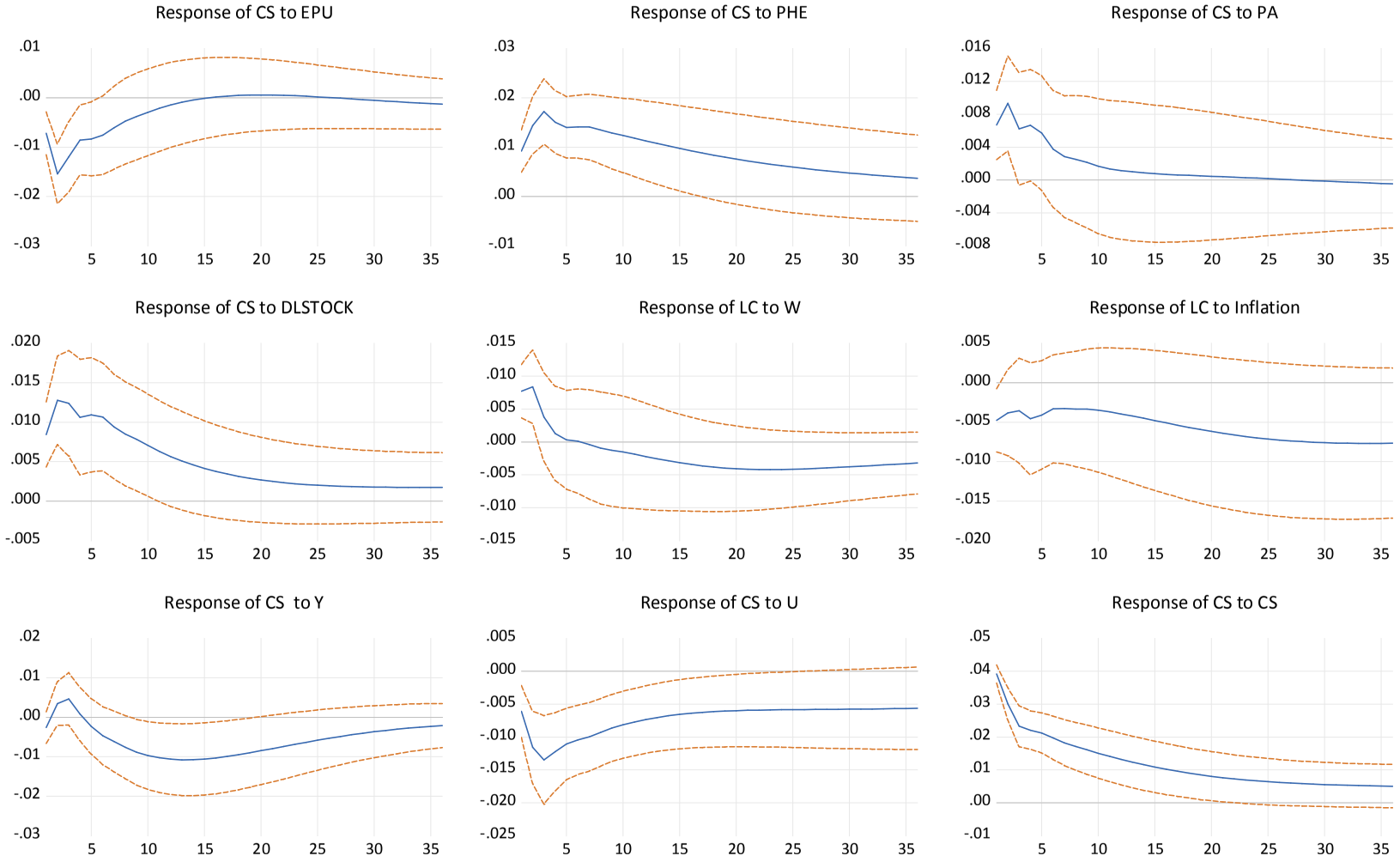

Table 7: Cointegrating Vectors: Robustness Exercises (1985.03-2018.03)

| Model<br>Variable | Model 1<br>$PA_t$ (res.) | Model 2<br>$PHE_t$ (res.) | Model 3<br>$PA_t$ and $PHE_t$ (res.) | Model 4<br>Conf. Board | Model 5<br>OECD |
|---|---|---|---|---|---|
| $un_t$ | -4.500*** | -4.500*** | -4.500*** | -12.432*** | -0.418*** |
| | (0.347) | (0.347) | (0.347) | (0.347) | (0.030) |
| $w_t$ | 2.693*** | 2.693*** | 2.693*** | 0.218 | 0.228 |
| | (0.891) | (0.891) | (0.891) | (1.542) | (0.072) |
| $\pi_t$ | -0.193 | -0.193 | -0.193 | 1.897*** | -0.013 |
| | (0.357) | (0.357) | (0.357) | (0.621) | (0.031) |
| $y_t$ | 0.112 | 0.112 | 0.112 | 0.899* | 0.015 |
| | (0.295) | (0.295) | (0.295) | (0.491) | (0.025) |
| $d(stock_t)$ | 1.005*** | 1.005*** | 1.005*** | 1.576*** | 0.052*** |
| | (0.213) | (0.213) | (0.213) | (0.392) | (0.005) |
| $EPU_t$ | -0.074*** | -0.074*** | -0.074*** | -0.067*** | -0.007*** |
| | (0.019) | (0.019) | (0.019) | (0.032) | (0.002) |
| $PHE_t$ | 0.508*** | | | 1.062*** | 0.052*** |
| | (0.040) | | | (0.094) | (0.005) |
| $PHE - RES_t$ | | 0.439*** | 0.889*** | | |
| | | (0.054) | (0.069) | | |
| $PA_t$ | | 0.348*** | | -0.051 | 0.004 |
| | | (0.041) | | (0.076) | (0.003) |
| $PA - RES_t$ | 0.094** | | 0.609*** | | |
| | (0.041) | | (0.052) | | |
| Adjusted R-squared | 0.814 | 0.814 | 0.814 | 0.875 | 0.849 |
| S.E. of regression | 0.061 | 0.061 | 0.061 | 0.108 | 0.005 |
| Sum squared resid | 1.364 | 1.364 | 1.364 | 4.228 | 0.010 |

Notes: *,** and *** denote 90%, 95% and 99% significance levels, respectively.

Table 8: Variance Decomposition of $cs_t$ Conference Board
(expressed in %)

| Horizon (months) | $EPU$ | $PHE$ | $PA(res)$ | $d(stock)$ | $w$ | $\pi$ | $y$ | $u$ | $cs$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.6 | 2.6 | 3.3 | 6.6 | 3.1 | 0.0 | 0.3 | 1.1 | 80.4 |
| 12 | 10.5 | 20.4 | 0.8 | 9.5 | 1.7 | 0.1 | 2.9 | 12.7 | 41.5 |
| 24 | 7.9 | 24.8 | 1.2 | 7.1 | 1.4 | 1.8 | 7.4 | 13.4 | 34.9 |
| 36 | 7.1 | 25.2 | 1.4 | 6.1 | 1.2 | 5.6 | 7.2 | 14.7 | 31.5 |

The VAR contains the following variables: $EPU$, $PHE$, $PA$, $d(stock)$,$w$, $\pi$, $y$, $u$ and $cs$.
We use the we use a Cholesky decomposition where $EPU$ is ordered first.

Table 9: Variance Decomposition of $cs_t$ OECD
(expressed in %)

| Horizon (months) | $EPU$ | $PHE$ | $PA(res)$ | $d(stock)$ | $w$ | $\pi$ | $y$ | $u$ | $cs$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.63 | 3.12 | 0.78 | 3.87 | 0.44 | 1.97 | 0.01 | 0.65 | 86.53 |
| 12 | 0.83 | 4.81 | 0.24 | 3.88 | 2.16 | 3.00 | 8.82 | 2.02 | 74.25 |
| 24 | 0.74 | 3.73 | 0.24 | 3.40 | 5.64 | 6.25 | 17.00 | 1.78 | 61.22 |
| 36 | 0.88 | 3.18 | 0.31 | 3.03 | 7.99 | 9.64 | 18.40 | 2.01 | 54.58 |

The VAR contains the following variables: $EPU$, $PHE$, $PA$, $d(stock)$,$w$, $\pi$, $y$, $u$ and $cs$.
We use the we use a Cholesky decomposition where $EPU$ is ordered first.

Figure 4: Responses of *cs* to different shocks

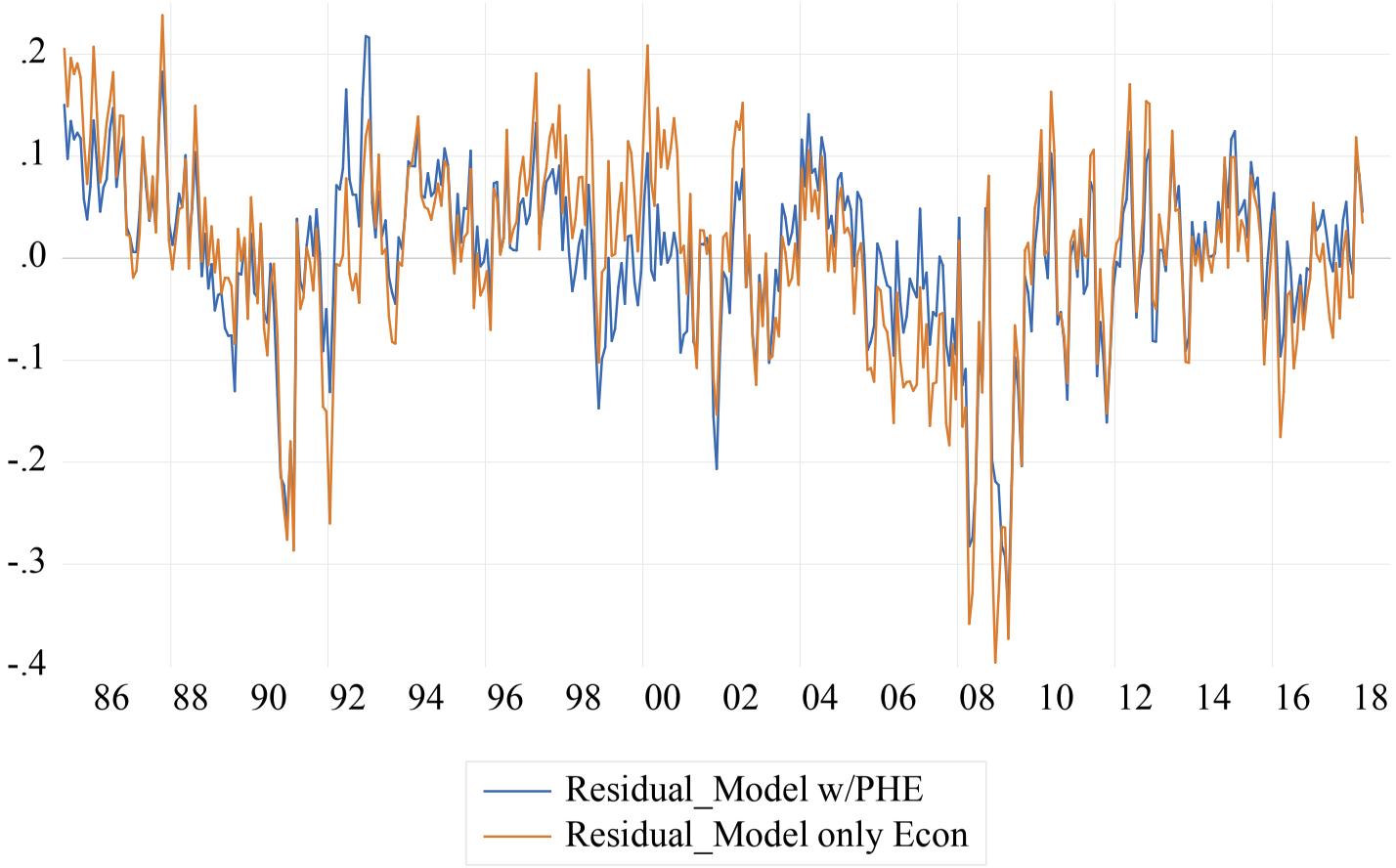

Table 10: Cointegrating Vectors: Alternative Specifications (1985.03-2018.03)

| Variable | Full Sample 1985.03-2018.03 | First Sub-Sample 1985.03-1999.12 | Second Sub-Sample 2000.01-2018.03 |
|---|---|---|---|
| $un_t$ | -4.527*** | 2.237*** | -5.472*** |
| | (0.334) | (0.762) | (0.305) |
| $w_t$ | 2.362*** | -2.275* | 2.366*** |
| | (0.803) | (1.295) | (0.812) |
| $\pi_t$ | -0.257 | -2.617*** | -0.738** |
| | (0.340) | (0.561) | (0.399) |
| $y_t$ | 0.006 | 2.670*** | 0.201 |
| | (0.258) | (0.454) | (0.239) |
| $d(stock_t)$ | 1.048*** | 0.472** | 1.348*** |
| | (0.170) | (0.208) | (0.212) |
| $EPU_t$ | -0.073*** | -0.120*** | -0.043*** |
| | (0.018) | (0.026) | (0.022) |
| $PA_t$ | 0.095** | -0.013 | 0.118** |
| | (0.044) | (0.063) | (0.049) |
| $PHE_t$ | 0.435*** | 0.706*** | 0.528*** |
| | (0.047) | (0.064) | (0.062) |
| Adjusted R-squared | 0.840 | 0.862 | 0.905 |
| S.E. of regression | 0.057 | 0.042 | 0.047 |
| Sum squared resid | 1.170 | 0.249 | 0.403 |
| Log likelihood | 593 | 332 | 379 |
| F-statistic | 62 | 33 | 62 |

Notes: *,** and *** denote 90%, 95% and 99% significance levels, respectively.
All specifications are estimated with a constant and one lag, one lead of the first difference of all variables. For brevity they are not shown.

Table 11: Approval of U.S. President's Handling of the Economy

| Poll | Period | Typical Question Wording | N | Corr. |
|---|---|---|---|---|
| Gallup | 2/93-2/18 | Now thinking about some issues, do you approve or disapprove of the way President (Ronald Reagan/George Bush/Bill Clinton/George Bush Jr./Barack Obama/Donald Trump) is handling the economy? | 179 | 0.918 |
| ABC | 9/81-4/03 | Do you approve or disapprove of the way (Reagan/Bush/Clinton/Bush Jr./Obama/Trump) is handling the nation's economy? | 23 | 0.956 |
| ABC/WP | 10/81-4/18 | Do you approve or disapprove of the way (Reagan/Bush/Clinton/Bush Jr./Obama/Trump) is handling the economy? | 240 | 0.906 |
| CBS | 1/92-6/18 | Do you approve or disapprove of the way President (Ronald Reagan/George Bush/Bill Clinton/George Bush Jr./Barack Obama/Donald Trump) is handling the economy? | 165 | 0.873 |
| CBS/NYT | 4/81-7/16 | How about the economy – do you approve or disapprove of the way (Ronald Reagan/George Bush/Bill Clinton/George Bush) is handling the economy? | 221 | 0.949 |
| LATIMES | 4/83-5/08 | Generally speaking, do you approve or disapprove of the way (Reagan/Bush/Clinton/Bush Jr./Obama/Trump) is handling the nation's economy? | 66 | 0.924 |