

# U.S. Economic Policy and Consumer Sentiment

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## Abstract

Unanticipated news shocks about future productivity impact consumer sentiment Barsky and Sims (2012). These informative shocks are captured by our direct measure of public approval of the President's handling of the economy (*PHE*). We estimate the impact of this variable on U.S. consumer sentiment controlling for several observable macroeconomic, news-based uncertainty measures and political variables. *PHE* explains between 20% and 30% of the consumer sentiment variance at different horizons. Economic Policy Uncertainty is weakly correlated with *PHE* explaining at most 10% of consumer sentiment variance. *PHE* constitutes fundamental information and shapes consumer expectations about the future state of the economy.<sup>1</sup>

*Keywords:* Consumer Sentiment, Macroeconomics, Uncertainty Shocks, Economic Policy

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<sup>1</sup>Supporting technical appendices and the replication material for this article are available at <https://github.com/rayduch/U.S.-Economic-Policy-and-Consumer-Sentiment>.

Barsky and Sims (2012) show that there is a significant impact of unanticipated news shocks about future productivity on consumer sentiment. Those shocks are, however, not captured in tangible news about the macroeconomy or other national news. They are captured by the public’s concern about economic policy management. The quite dramatic 2008-2010 shock to the U.S. economy has highlighted the importance of economic policy management, i.e., the political component of the economy. The effect of uncertainty in economic policy management has been identified as contributing to economic shocks such as the Great Recession (Bloom, 2009, Bernanke, 1983) and also to subsequent low levels of business investment.

The puzzle addressed here is how best to calibrate the average consumer’s concerns about economic policy management. Baker et al. (2016) propose a measure of Economic Policy Uncertainty (*EPU*) 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). There is compelling evidence that *EPU* is correlated with economic outcomes – investment, employment, and industrial production (Baker et al., 2016, Brogaard and Detzel, 2015, Mumtaz and Surico, 2018).<sup>2</sup>

We concur with this focus on economic policy (Baker et al., 2016). And clearly many economic agents condition their decisions on perceptions of uncertainty in economic policy management. But for consumers we argue for an alternative measure of concern about economic policy management. The average member of the public will articulate a fairly general expression of approval or disapproval of the government’s management of the economy. And it is not at all clear that these expressions of approval or disapproval are synonymous with, or reflect, the economic policy uncertainty sentiment that is expressed by the financial community or major media outlets. Our conjecture is that the general public’s expression of concern about economic policy management should better predict consumer

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<sup>2</sup>Although (Born et al., 2018) suggest that the contribution of shocks in economic policy uncertainty to unemployment and GDP growth are relatively minor.

behavior than is the case for these mediated representations of policy uncertainty. We demonstrate this is in fact the case by modeling consumer sentiment, a widely accepted metric of consumption intentions.

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 (Matusaka and Sbordone, 1995). Innovations to consumer sentiment, as shown by Barsky and Sims (2012), are driven by fundamental information about the current and future states of the economy: shocks to the expected growth rate of the economy. This fundamental information is interpreted as "news shocks" that are not reflected in "tangible" news, that is economic news events (such as "rising unemployment") that are recalled by survey respondents. Barsky and Sims (2012) argue that these shocks aggregate many pieces of disparate information in the hands of various consumers.

Our contribution is to demonstrate that this direct measure of the public's approval of economic policy management, *PHE*, is highly correlated with consumer sentiment. Using GMM-IV 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. These results are extremely robust to how we define the outcome variable. They persist when we disaggregate the Michigan Index into its two major components: current conditions and consumer expectations. Similarly, the explanatory power of *PHE* persists when we define consumer sentiment using the survey series from the Conference Board, the OECD consumer series and the single-item E5Y from the Michigan Survey that asks consumers about expectations over the next five years.

Our results suggest that *PHE* measures public concerns 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*.<sup>4</sup> *EPU*, particularly in its original operationalization, measures the print media’s characterization of economic policy management. Our conjecture, is that *EPU* reflects the tangible macroeconomic news which, as shown by Barsky and Sims (2012), have a modest impact on consumer sentiment, whereas our *PHE* measure better reflects fundamental information about the current and future states of the economy. This is confirmed by the estimated long-lasting effect of *PHE* on consumer sentiment, which works primarily via consumer expectations: The effect is stronger for consumer expectations about the future. This suggests that a shock to household perceptions of the President’s handling of the economy is a persistent innovation that may capture expected changes in permanent income levels. In contrast, the *EPU* has a relatively smaller impact on consumer sentiment that dissipates quickly.

Our paper accomplishes two goals: 1) it proposes directly measuring the average citizen’s concern about economic policy management – *PHE*; 2) it demonstrates that consumer sentiment is clearly shaped by this measure of the average citizen’s concern about economic policy management. The paper is organized as follows: we begin with a discussion of the *PHE* measure; this is followed by a discussion of our estimation methods and data sources; a fourth section presents the econometric results along with robustness tests; and we then conclude.

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<sup>3</sup>This series summarizes responses to the following question: “Turning to economic conditions in the country as a whole, do you expect that over the next five years we will have mostly good times, or periods of widespread unemployment and depression, or what?” The E5Y variable is defined as the difference between the percentage giving a favourable answer and the percentage giving a negative answer, plus one hundred. The series is used in Barsky and Sims (2012) and Fève and Guay (2018)

<sup>4</sup>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.

## 1. Consumer sentiment and economic policy management

We build on evidence that economic policy uncertainty anticipates shocks in investment, production and employment (Baker et al., 2016). Our focus is specifically on consumer decision-making. We argue that shocks in consumers' concerns about economic policy management will anticipate changes in consumer sentiment. A widely-employed metric for consumer sentiment is the Michigan consumer sentiment index. The 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.<sup>5</sup> It is employed as such because consumer sentiment is an important contributor to economic activity (Shapiro et al., 2018, Barsky and Sims, 2012, Benhabib and Spiegel, 2019, Ludvigson, 2004, Gillitzer and Prasad, 2016, Carroll et al., 1994).

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.

Consumer sentiment does not simply reflect contemporaneous and historical economic fundamentals. As Barsky and Sims (2012) demonstrate, innovations in consumer confidence

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<sup>5</sup>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.

can be characterized as either “animal spirits” shocks in consumer sentiment or as conveying information about future fundamentals. In the former case, the impact on macro-economic variables are very small and short-lived. While in the latter case, the impact is significant and over a long-horizon. And this is consistent with other findings suggesting that observed shocks to consumer sentiment, unrelated to economic fundamentals, are quite transitory and temporary (Starr, 2012, Ludvigson, 2004).

Our conjecture is that the public’s concern about economic policy management conveys information about future fundamentals. Economic policy management matters for the average consumer and will impact consumer sentiment. And these shocks to consumer sentiment that are related to economic policy sentiment will be long-lived. The challenge we address here is measuring the average consumer’s concern about economic policy management. The widely-employed *EPU* measure clearly calibrates the economic policy uncertainty of firms and the investment community. We measure consumers’ economic policy management concerns with a survey question asking respondents to evaluate the President’s management of the economy. A measure that directly calibrates consumers’ concerns about economic policy management is more likely to reflect fundamental information and hence have a large and long-lived impact on consumer sentiment and behavior.

*President’s Handling of the Economy (PHE)*.. Our survey data measure focuses on Presidential management of economic policy. 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/Obama/Trump) 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. Appendix A 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).<sup>6</sup>

The public primarily attributes responsibility for the U.S. government’s management of economic policy to the executive branch and specifically to the President.<sup>7</sup> 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.), Presidents 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.<sup>8</sup> 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.

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

The general public assembles information regarding economic policy management from disparate sources – for example, from various print, electronic and social media but also

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<sup>6</sup>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/U.S.-Economic-Policy-and-Consumer-Sentiment>.

<sup>7</sup>See for example Chart 1 in Sweet et al. (2016).

<sup>8</sup>Moreover, similar economic performance differences are not associated with variations in party control of Congress.

from personal experiences and conversations with friends and family. We argue that this gets summarized in an overall assessment of economic policy management that is informative about future productivity. Our measure of this overall assessment is a survey question that asks respondent whether they approve of the President’s handling of the economy. The question has been asked regularly over the past 30 years.

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 constellation of political and economic factors that determine Presidential Approval (Fair, 1978, Edwards et al., 1995, Mueller, 1970, Erikson et al., 2000). And the public’s concerns about economic policy management will be reflected in Presidential Approval. 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. Our *PHE* measure captures various dimensions of the public’s assessment of economic policy management. 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 sur-



vey question captures concerns about economic policy that have implications for economic fundamentals.<sup>9</sup>

*PHE* is a particularly good measure of concerns about economic policy management because the question wording specifically asks respondents to consider the President’s management of the economy, rather than priming a host of other political considerations. 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.<sup>10</sup>. 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. We do not make any strong claims here because the two series are correlated. Our conservative claim is that including Presidential Approval as a control in our estimation helps identify the informative added value from the *PHE* measure.

*Economic Policy Uncertainty*.. Economic policy uncertainty is widely recognized as contributing to recent economic shocks such as the 2008 financial crisis. Baker et al. (2016) provide persuasive evidence to this effect by constructing a measure of economic policy uncertainty (*EPU*). The measure is a count, from the ten leading newspapers in the U.S., of 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 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

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<sup>9</sup>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 et al., 2015).

<sup>10</sup>As a number of studies have demonstrated, partisanship affects economic attitudes and consumer sentiment (Duch et al., 2000, Benhabib and Spiegel, 2019, Gerber and Huber, 2009, Gillitzer and Prasad, 2018)

U.S. and non-U.S. markets and is widely used by the investment community.

The focus of this essay is on whether this economic policy uncertainty specifically accounts for shocks in consumer sentiment. The empirical claim here is that while *EPU* is correlated with consumer sentiment, our *PHE* measure better captures the general public’s economic policy concerns and hence accounts for more of the volatility in consumer sentiment than would be case for *EPU*. Recent evidence questioning the relationship between *EPU* and consumer sentiment (Perić and Sorić, 2018) is suggestive in this regard.

This implies that our *PHE* will not be highly correlated with 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.<sup>11</sup> 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 at all for others – in fact, they are more likely to be out of synch.

We suspect the two measures may reflect economic policy management concerns of two distinct opinion publics. The *EPU* captures concerns expressed by the investment and financial community while *PHE*, on the other hand, measures the general public’s attitudes about the government’s economic policy management. Our intuition here is that elite concerns about economic policy management react immediately to short-term events while the general public’s concerns are more modulated and hence more indicative of the long-term implications of economic policy management. As a result there can be quite significant 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,

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<sup>11</sup>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 counter-intuitive) and also a small adjusted-R square of 3%.

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 concerned 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 (2002) 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, *PHE*: 1) it is a direct measure of the general public's concern about economic policy management and hence is strongly correlated with consumer sentiment; and 2) it measures fundamental concerns about economic policy management and hence shocks in *PHE* will represent persistent innovations that may impact permanent income levels.

## **2. Methodology and Data**

### *2.1. GMM Instrumental Variables*

Consumer sentiment, macroeconomic developments and politics are potentially endogenous. People may feel more optimistic about the government's economic management when the economy is booming. For example, there could be a common (arbitrary) shock driving up all indicators of consumer sentiment about the economy, this could generate both higher optimism about government management (*PHE*) and higher optimism about the economy

more generally (consumer sentiment). Thus, consumer sentiment and *PHE* could be correlated without consumer sentiment being driven by the public's concern about stewardship of economic policies. To address this potential endogeneity problem, we estimate the relationship between consumer sentiment and a set of economic and political variables using a Generalized Method of Moments (GMM) with instrumental variables.<sup>12</sup> This method has been used extensively in many applications. For instance, it is employed to estimate the monetary policy reaction function in the US and other countries (see Clarida et al. (1998) and Clarida et al. (2000) among others). This approach corrects the bias generated by the correlation between the error term and the explanatory variable. In particular, it works by choosing instruments that are correlated with the explanatory variables but independent of innovations in the dependent variable.

If consumer sentiment,  $cs_t$ , depends on a vector of variables  $\mathbf{X}_t$ , that contains both macroeconomic and political indicators, we can conjecture that there is a stable relationship between  $cs_t$  and  $\mathbf{X}_t$  such that:

$$cs_t = \beta \mathbf{X}_t + \epsilon_t \quad (1)$$

Now, innovations to  $cs_t$  are potentially correlated to the set of explanatory variables in  $\mathbf{X}_t$ , so  $E_t(\mathbf{X}_t \epsilon_t)$  is different from zero. In this context, estimating the vector of coefficients  $\beta$  in Equation (1) using OLS will generate biased estimators. To overcome this problem, we choose a set of instruments,  $\boldsymbol{\nu}_t$  which is orthogonal to  $\epsilon_t$  but is correlated to the explanatory variables in  $\mathbf{X}_t$ , such that  $E_t(\epsilon_t | \boldsymbol{\nu}_t) = 0$ . In this context, Equation (1) implies the following set of orthogonality conditions we exploit for estimation:

$$E_t [cs_t - \beta \mathbf{X}_t | \boldsymbol{\nu}_t] = 0 \quad (2)$$

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<sup>12</sup>Since dependent variables may be endogenous, at a monthly frequency, we instrument all of them.

To estimate the parameter vector  $\beta$  we use the generalized method of moments. The instrument set,  $\nu_t$ , includes lagged values of all explanatory variables. Each of these variables is potentially useful for forecasting  $\mathbf{X}_t$  and is exogenous with respect to  $\epsilon_t$ . Since the potential instrument set — and hence the number of orthogonality conditions — exceeds the parameter vector, the model is over-identified, in which case it is straightforward to test the over-identifying restrictions (Hansen (1982)).

## 2.2. Structural VAR

In order to assess the dynamic response of consumer sentiment to different shocks, we estimate a Structural Vector Autoregression (SVAR) model. From this exercise we derive the impulse response function as well as the variance decomposition of alternative consumer sentiment indices. The SVAR can be represented as:

$$\begin{bmatrix} cs_t \\ \mathbf{X}_t \end{bmatrix}_t = \mathbf{A} \begin{bmatrix} cs_{t-1} \\ \mathbf{X}_{t-1} \end{bmatrix} + \mathbf{u}_t \quad (3)$$

where, as before, the set of explanatory variables is contained in  $\mathbf{X}_t$ . In this setup, we identify structural shocks via the Cholesky decomposition, ordering the most exogenous variables first. To decide the ordering of the variables, we use Granger causality tests.

## 2.3. Data

We use monthly data from January, 1985 to June, 2018. The log of consumer sentiment,  $cs_t$ , is from the University of Michigan.<sup>13</sup> 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 ( $d(stock_t)$ ).<sup>14</sup> In

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<sup>13</sup>This is taken directly from <https://fred.stlouisfed.org/series/UMCSENT>.

<sup>14</sup>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

addition, we consider the measure of the public’s approval of the President’s management of the economy, *PHE*, and the Presidential approval index, *PA*, from Gallup. We also consider the Economic Policy Uncertainty Index, *EPU*, which is the broad-based series for the U.S. constructed by Baker et al. (2016).

### 3. Results

#### 3.1. Consumer Sentiment, Political and Economic Variables

Using the GMM-IV method, we estimate the relationship between *cs* and a set of economic fundamentals, which are all instrumented in order to avoid potential correlation between innovations to *cs* and the explanatory variables.<sup>15</sup> As shown in column (a), Table 1, an increase of 1% in the unemployment rate reduces consumer confidence by 6.6%; an increase in real wages of 1% has a positive effect of 5.0%; 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. To this initial specification, we add the *PA* index, which is also instrumented. As shown in column (b), Table 1, the impact of *PA* on *cs* is positive and significant: a 10% rise in the *PA* increases consumer confidence by nearly 3%. The responses of *cs* to unemployment and to the stock market are virtually unchanged and, despite the fact that the response to wages declines, it is not statistically different from the response in the initial scenario. Once *PA* is included, the response to both inflation and the output gap become significant and with the expected sign. Including *PA* increases the adjusted R-squared from 0.493 to 0.588.

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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.

<sup>15</sup>We use twelve lags of each dependent variable as instruments. Our results are robust to alternative methods of correcting the endogeneity bias. In particular, we find similar results when using Dynamic OLS (DOLS).

Of particular interest are the results when we add *PHE* to the model specification. As shown in column (c) in Table 1, the impact of *PHE* is positive and significant: a 10% rise in the percentage of surveyed respondents who approve the President’s handling of the economy increases consumer confidence by 5%.<sup>16</sup> Moreover, including *PHE* in the model results in a significantly higher adjusted  $R^2$  – it rises from .493 to .655. 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).<sup>17</sup>

If *PHE* is included along with *PA*, its impact is virtually unchanged (Model (d) in Table 1). In this case, the economic variables have the expected sign and are, with the exception of inflation, statistically different from zero. If in addition to *PA* and *PHE* the *EPU* index is included, Model (e) in Table 1, the impact of *PHE* on consumer sentiment is still positive, significant and similar in size to all previous specifications. In this case, a decline in 10% in *EPU* reduces consumer confidence nearly 2%; an effect that is statistically significant.

The impact of *PHE* is well identified and it remained unchanged across the different specifications in Table 1. The impacts of *PA*, inflation and output are more difficult to identify. In the next subsection we allow for the possibility of differentiated *PHE* impact across administrations and assess whether this enable a more precise estimation of the impact of *PA* as well as output and inflation.

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<sup>16</sup>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, as shown in Figure 1.

<sup>17</sup>We conclude this from comparing the in-sample residuals of model (a) and (c) in Table 1. For brevity, we do not report them, but they are available upon request.

### 3.1.1. *The Impact of PHE across Administrations*

The economic climate differs, and economic policies vary in saliency, across Presidential administrations (Edwards et al., 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 model that allows *PHE* to vary over President administration. We re-estimate Equation (1) including a dummy variable for each administration that is interacted with the *PHE*. The results, presented in column (b) of Table 2, indicate a significant impact of *PHE* on consumer sentiment across all administrations. The impact 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 around 5.0%. In the case of Obama’s and Clinton’s administration the response to the same increase is around 3.0%. For Bush and Bush Jr. administrations, the response is virtually the same: 2.4%.

Once we allow *PHE* to vary across administrations we can better identify the independent impact of *PA*. In particular, the response to this variable is positive, statistically significant and close to the value estimated when *PA* is the only policy related variable in the model (column (b) in the baseline specification in Table 1). Also, once we specify a different *PHE* effect across administrations, the impact of inflation and output is better identified.

### 3.1.2. *The Role of Consumer Expectations*

Our conjecture is that *PHE* should be more important for explaining consumer sentiment through the expectation channel because economic policies take time to impact the economy. Hence a shock to *PHE* could affect current consumer behavior but would have a particularly significant effect in future periods because of the anticipated delay between



policy actions and their effect on the economy.

The Michigan University consumer sentiment,  $cs$ , can be decomposed into an index associated with current conditions,  $cc$ , and another associated with expectations of future conditions,  $ce$ . We leverage this decomposition in order to test the hypothesis that  $PHE$  affects consumer's sentiments, mostly, through the expectations channel,  $ce$ . As shown in Appendix Appendix B, the  $cc$  index is based on two questions included in the Michigan Survey of Consumption. The first one asks whether the household is financially better off or worse off than a year ago. The second question asks whether today is a good or bad time to buy major household items. The  $cc$  index captures current conditions with respect to the past or present. The  $ce$  index, on the other hand, is composed of three questions that make reference to conditions expected in one year time or during the next five years.

We estimate the impact of political and economic variables for the different consumer sentiment indices:  $cs$ ,  $cc$  and  $ce$ . The reaction of  $cc$  to  $PHE$  is positive and significant only for the Trump and Bush administrations (model (b) in Table 3). The response is such that a 10% rise in the percentage of surveyed respondents who approve the President's handling of the economy increases consumer confidence by 2.5% in the case of Bush's administration and 3.0% under Trump's administration. For the rest of the administrations the impact of  $PHE$  on  $cc$  is indistinguishable from zero. Now, when the  $ce$  index is considered, the impact of  $PHE$  is positive and statistically different from zero for all administrations (model (c) in Table 3). In particular, a 10% rise in  $PHE$  leads to an increase in  $ce$  of 8% in the case of Trump administration and 7% in the case of Reagan. For the other administrations the response in  $ce$  is close to 5%. For  $ce$ , the response, under all administrations, is considerable larger than the one estimated for the  $cs$  and  $cc$  indices (compare model (c) to models (a) and (b) in Table 3).

As expected, unemployment and real wages have a significant impact on current conditions: a 1% increase in the unemployment rate reduces  $cc$  index by nearly 3.8%, whereas

an increase in real wages of 1% increases  $cc$  by 3.8% (model (b) in Table 3) . For consumer expectations, on the other hand, the impact of both unemployment and wages is not statistically different from zero (model (c) in Table 3).

The reaction to both,  $PA$  and  $EPU$  is remarkably stable across the three different consumer sentiment measures ( $cs$ ,  $cc$ , and  $ce$ ). It is not possible to reject the null hypothesis that the coefficients for these two variables are equal across the three models. As Table 3 indicates, regardless of which of the three consumer sentiment index are considered, an increase in the  $PA$  rate of 10% increases consumer sentiment by nearly 3%. An increase of  $EPU$  by 10% reduces  $cc$  by 2.3% and reduces  $ce$  by 2.9%. Finally, inflation has a negative impact only on  $ce$ ; the consumer expectation index falls by 3% when inflation increases by 1%.

By deconstructing the Michigan consumer sentiment index we gain further confidence in this consumer-focused measure of the public’s concerns about economic policy. Economic policy concerns should primarily impact consumer expectations, rather than sentiment about current or past conditions. Individuals who are concerned about economic policy management today, anticipate that this will have economic consequences in future periods, and hence expect to adjust their consumption behavior accordingly. This is exactly what we found:  $PHE$  indeed affects consumer sentiment mainly through the expectation channel, although current conditions react to  $PHE$  for two republican administrations. And, interestingly, this is not the case for the  $EPU$  and  $PA$  measures: their affects on retrospective and prospective consumer sentiment are identical.

### 3.1.3. *PHE from the Michigan University Survey*

$PHE$  is a direct measure of the public’s concern about the management of economic policy. The Michigan Survey’s Government Economic Policy index is measured similarly

to *PHE*; it directly asks survey respondents to reflect on economic policy.<sup>18</sup> Question A.9 in the Michigan Survey asks: “As to the economic policy of the government—I mean steps taken to fight inflation or unemployment—would you say the government is doing a good job, only fair, or a poor job?”. As in Benhabib and Spiegel (2019), we measure this variable as the share of respondents who answered ‘1’, indicating that they thought that the government was doing a ‘good job’ in its economic policy. We refer to the resulting index as *PHE – MICHIGAN*. Our expectations regarding *PHE – MICHIGAN* are two-fold. First, this is one of many question wordings that could calibrate the public’s concern with economic policy. Hence we expect it should correlate with consumer sentiment in a fashion similar to *PHE*. Second, the question mentions two specific economic policy outcomes – inflation and unemployment; this might detract respondents from expressing a concern for overall economic policy management and lead respondents to express a specific preference for policy outcomes or assess only these particular economic outcomes. *PHE – MICHIGAN* clearly differs from *PHE* but it is capturing concerns about economic policy management. If this is the case, both indices should have a positive impact on consumer sentiment, which should be statistically different from zero.

In Table 4 we report the impact of *PHE – MICHIGAN* on our three consumer sentiment indices: consumer sentiment (*cs*), current conditions (*cc*) and consumer expectations (*ce*). Models 1, 4, and 7 are our original specifications with *PHE*. In Models 2, 5 and 8, we substitute *PHE – MICHIGAN* for *PHE*. The *PHE – MICHIGAN* coefficients are correctly signed and significant. Overall variance explained is similar. Given the correlation between the two series it is reassuring that *PHE – MICHIGAN* performs similarly to *PHE*.<sup>19</sup>

By including both *PHE – MICHIGAN* and *PHE* in the equations (Models 3, 6 and 9), we get an indication of their relative contribution to explaining variations in consumer

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<sup>18</sup>This alternative index is used by Mian et al. (2018) and Benhabib and Spiegel (2019).

<sup>19</sup>The correlation between *PHE* and *PHE – MICHIGAN* is 0.87.

sentiment. In all three of these cases, our *PHE* measure continues to have a positive impact on consumer sentiment that is statistically distinguishable from zero. *PHE*–*MICHIGAN* performs less well. *PHE* – *MICHIGAN* is positive and statistically significant in the *cs* and *ce* equations but has the wrong sign and is weakly significant in the *cc* equation. And *PHE* continues to have a strong and statistically significant impact in all three consumer sentiment equations when *PHE* – *MICHIGAN* is introduced as a control. In Subsection 4.2 we will assess which of the two measures of policy management contributes more to explain the overall volatility of consumer sentiment.

On balance our expectations are confirmed here: this alternative measure of the public’s concern for economic policy management is correlated with consumer sentiment but the strong correlation between *PHE* and the consumer sentiment variables persists when we include *PHE* – *MICHIGAN* as a control variable. This is an indication that both measure, despite being highly correlated, capture different information.

### 3.2. Structural VAR

#### 3.2.1. Dynamic Response of Consumer Sentiment to *PHE*

The previous results support our central contention that the *PHE* measure is strongly correlated with consumer sentiment. And also as expected, the economic fundamentals and the widely-employed measure of 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 SVAR. In order to recover orthogonal shocks, we use a Cholesky decomposition with the following ordering: *EPU*, *PA*, *PHE*, *d(stock)*, *w*,  $\pi$ , *y*, *u* and *cs*.<sup>20</sup> Based on the Akaike information criterion, our VAR specification contains two lags.

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<sup>20</sup>The Granger causality test indicates that *PHE* Granger causes *CS*. Also, it shows that *PA* and *EPU* Granger cause *PHE* but not viceversa and that *PHE* Granger cause *PHE* – *MICHIGAN*. Based on this, we ordered first *EPU*, then *PA* and in third place *PHE* and in fourth place *PHE* – *MICHIGAN*. This is followed by the economic variables and *CS* is placed at the end. For brevity, we do not report these Granger causality test, although they are available upon request.

Based on the Cholesky decomposition previously described, we compute the response of the  $cs$  to a one-standard deviation shock. The responses of consumer sentiment to both, inflation and the output gap are not different from zero in all horizons; hence we estimate a SVAR excluding these variables.<sup>21</sup> 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 four months. A shock to  $PA$  reaches its maximum impact on consumer sentiment in the second month, becoming zero from the forth month onward. A shock to  $PHE$  has a positive effect on consumer sentiment, reaching its maximum impact in the third month. This effect lasts far longer: it is positive and statistically different from zero and extends out to 30 months. The response to  $PHE - MICHIGAN$ , on the other hand, has its maximum impact in the first month and it dissipates quickly: after the third month the response is not different from zero. We think that this much shorter horizon reflects the  $PHE - MICHIGAN$  question wording; in particular its identification of policy management with inflation and unemployment. The responses to  $d(stock)$ ,  $w$  and  $u$  have the expected sign and are significant in the first months. Overall, the impact of  $PHE$  is significant and long-lasting, when compared to the effect of the other variables on consumer sentiment.

Again, its particularly informative to deconstruct consumer sentiment,  $cs$ , into its two components, current sentiment,  $cc$ , and expectations,  $ce$ . We re-estimate the SVAR for the case of current conditions and the consumer expectation indices. As before, the impact of inflation and the output gap is not different from zero, so we exclude these variables from the estimation. We compare the normalized response of  $cs$ ,  $cc$  and  $ce$  to a one standard deviation in  $PHE$ . As shown in Figure 4, a shock to  $PHE$  has a larger impact on  $ce$  and a smaller impact on  $cc$ . In particular, a shock to  $PHE$  of 10% increases  $ce$  by 4% on impact. This effect increases over time and reaches its maximum level in the fifth month, where

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<sup>21</sup>In the case of inflation and output the responses of  $cs$  have the expected sign, but as in the long-run equation, the dynamic impacts are not different from zero.

the response of  $ce$  is 8%. In the case of  $cc$  this shock increases the index by nearly 1% on impact. After nine months, the increase in  $cc$  is 4.4% and then it slowly declines. Re-estimating the SVAR for the current consumer sentiment,  $cc$ , and consumer expectations,  $ce$ , confirms the results we observed for the composite index,  $cs$ :  $PHE$  has a significant and long-lasting impact when compared to all the other variables in the model.

### 3.2.2. The Relative Importance of $PHE$ : Variance Decomposition

In order to assess the relative contribution of each variable, we compute the variance decomposition of consumer sentiment with respect to different shocks. We do so based on the SVAR which orders  $PHE$  after  $EPU$  and  $PA$ .<sup>22</sup> In this case,  $PHE - MICHIGAN$  is also introduced, and it is ordered after  $PHE$ .<sup>23</sup>

As shown in Table 5,  $PHE$  has the single largest effect on the variance of the forecast error for  $cs$ ,  $cc$  and  $ce$  at horizons of 12 to 48 months. In particular, at those horizons it explains between 16 and 26% of the variance in  $cs$ , between 20 and 30% in the case of  $ce$  and between 8 and 15% in the case of  $cc$ . In the short run, at a one month horizon, the  $PHE - MICHIGAN$  is the most important variable. Its importance, however, dissipates as we move forward.

The contribution of  $EPU$  is smaller than the contribution of  $PHE$  or  $PHE - MICHIGAN$ , for all horizons and consumer sentiment indices (Table 5).  $EPU$  explains between 4 and 8% of consumer sentiment between one and forty eight months for  $cs$ ,  $cc$  and  $ce$ . The contribution of the  $PA$  is, in general, below that of  $EPU$ .  $PA$  contributes, at most, to 4% of  $cc$  volatility and its impact is somehow larger, to  $ce$  variance.

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<sup>22</sup>This specification also excludes inflation and output, given the fact that the consumer sentiment response to these variables is not different from zero in any horizon.

<sup>23</sup>According to Granger causality test, the null hypothesis that  $PHE$  does not cause  $PHE - MICHIGAN$  is rejected to 0.003% confidence level. The null hypothesis that  $PHE - MICHIGAN$  does not cause  $PHE$  is also rejected, but at 0.6% confidence level. Based on this result, we order  $PHE$  first. In any case, as robustness test we reverse the order and assess whether our results still hold.

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 SVAR model that orders *PHE* after *PHE – MICHIGAN*. The relative importance of *PHE* declines marginally, but the qualitative results are unchanged: *PHE* is the most important variable, from 12 month onward, in explaining consumer sentiment volatility for all the indices under analysis.

We conclude that the direct measure of the public’s concerns about 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, *PHE – MICHIGAN*, economic variables and the *EPU* index constructed by Baker et al. (2016). The effect of *PHE* on consumer sentiment is long-lasting, suggesting that shocks to reported assessments of the President’s handling of economic policy represent 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 *EPU* (Jurado et al., 2015, Blinder and Watson, 2016, Duca and Saving, 2018).

### 3.3. Robustness: Conference Board, OECD and E5Y Indices

A direct measure of the public’s concern about economic policy management has a very robustly estimated impact on consumer sentiment. Our reported estimations include alternative model specifications; we have estimated *PHE*’s impact on different sub-components of the Michigan Consumer Confidence Index; and we evaluated the effect of an alternative survey measure of economic policy management, i.e., the *PHE – MICHIGAN*. The outcome variables we have relied on are from the University of Michigan Consumer Confidence survey. There are other consumer confidence survey metrics. In this subsection we test whether the *PHE* effect is similar when we estimate models employing these alternative

consumer sentiment series as the dependent variable.

Another widely used measure of consumer sentiment is the Conference Board’s Consumer Confidence Index (*C.Board*) (Lahiri et al., 2016). It began in 1967 as a bi-monthly survey; since June 1977, the survey has been administered monthly.<sup>24</sup> We re-estimate a model in which the dependent variable is *C.Board*. The results are presented in model (b) of Table 7. The semi-elasticity of *PHE* is positive, significant and larger than in the previous cases (compare model (a) to model (b) in Table 7). As before, the Trump and Reagan administrations have larger impacts. In those cases an increase in *PHE* of 10% leads to an increase in consumer sentiment between 15 and 16%. In the case of the other administrations this increase generates a rise in consumer sentiment of around 10%.

We estimate the variance decomposition from a SVAR with two lags in order to see the dynamic impact of *PHE* on *C.Board*, as well as its relative importance. As with the Michigan series, the impact of inflation and output is not different from zero, and hence we exclude those variables from the specification. The results, presented in Table 8, show that *PHE* explains between 23% and 38% of *C.Board* variance at horizons of 12 to 48 months. This result is larger than the one obtained for the University of Michigan sentiment series, *cs*. And as we saw with the Michigan estimations, *PHE* is the single most important variable explaining consumer sentiment from 12 month onward.

The OECD also produces a consumer confidence index for several countries, including the U.S.. This index, *C.OECD*, 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

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<sup>24</sup>Similar to the Michigan Consumer Confidence Index, the *C.Board* 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.



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, when compared to the ones obtained for the other indices. In model (c) 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 indices. Nevertheless, *PHE* has the expected sign and it is statistically different from zero. As before, the response to *PHE* under Trump and Reagan are larger than for the other administrations. The response to *EPU* and *PA* have the expected sign and are statistically different from zero. The absolute value of the estimated coefficient is, in both cases, the same. In terms of the variance decomposition, the results in Table 9 show that, as before, the *PHE* is the single most important variable explaining consumer sentiment from 12 month onward. In this particular case, *PHE* explains between 13% and 18% of *C.OECD* variance at horizons of 12 to 48 months.

A number of recent efforts to measure consumer confidence about future economic conditions have singled out *E5Y* as a dependent variable. This is based on one of the three Michigan survey items measuring consumer expectations, *ce* (Benhabib and Spiegel, 2019, Barsky and Sims, 2012).<sup>25</sup> The exact wording of the *E5Y* survey question is: “Turning to

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<sup>25</sup>All of the survey items are presented in Appendix Appendix B

economic conditions in the country as a whole, do you expect that over the next five years we will have mostly good times, or periods of widespread unemployment and depression, or what?” The variable is constructed as the percentage giving a favorable answer minus the percentage giving an unfavorable answer plus 100. As noted by Barsky and Sims (2012), the particular affinity for this question arises from the fact that it is aimed at gauging expectations over a relatively long horizon, and because of its specificity as to the relevant time frame. Barsky and Sims (2012) also argue that this question gives the animal spirits hypothesis its “best shot”.

In model (d) of Table 7, we present the estimated results when  $E5Y$  is used as a proxy for consumer confidence.<sup>26</sup> In this case, the effect of  $PHE$  on consumer sentiment is positive and statistically significant. On average the effect is larger than the one found for other consumer sentiment indices from the Michigan survey. As before, the response under Trump’s administration is the largest one. For the rest of the administrations, including Reagan, an increase in  $PHE$  of 10% leads to an increase in  $E5Y$  of 8%. The exception is the Bush administration, for which the response declines to 6%. The response to  $PA$  is 0.273 and the reaction to  $EPU$  is -0.217. Those values are similar to the ones found for the other consumer sentiment indices from the Michigan survey (see Table 3). The rest of the coefficients, with the exception of real wages which is not different from zero, have the expected sign and are statistically different from zero. In terms of the variance decomposition, the results in Table 10 show that, as before, the  $PHE$  is the single most important variable explaining consumer sentiment from 12 month onward. In this particular case,  $PHE$  explains between 22% and 35% of  $E5Y$  variance at horizons of 12 to 48 months.

As a final robustness exercise, Table 11, introduces  $PHE - MICHIGAN$  as an additional variable. As before, the coefficients for  $PHE$  remain positive and statistically differ-

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<sup>26</sup>As in the other consumer sentiment indices, the variable is in logs.

ent from zero. The coefficients for  $PHE - MICHIGAN$  are significant and in the expected direction although their magnitudes suggest a relatively smaller impact on consumer sentiment. The exception is  $E5Y$  in which the coefficient associated to  $PHE - MICHIGAN$  is larger than the response to  $PHE$ . In any case, as shown in Table 10,  $PHE$  explains a larger fraction of  $E5Y$  variance from 12 month onward.

#### 4. Discussion

We are persuaded by evidence suggesting that shocks in consumer sentiment reflect real information about the macro-economy (Barsky and Sims, 2012) and, accordingly, affect long-term outcomes. Similarly, we are convinced by evidence that management of economic policy explains macro-economic outcomes; in particular, the recent efforts by Baker et al. (2016) demonstrating the correlation between their measure of economic policy uncertainty ( $EPU$ ) and macro-economic outcomes. Hence, our (and other's) interest in understanding the link between the public's concern with economic policy management and consumer sentiment.

Evidence that the  $EPU$  measure explains shocks in macro-economic outcomes is convincing (see Bloom et al. (2018)). But the measure is more weakly correlated with consumer sentiment. Our explanation is that economic agents are heterogeneous and that the  $EPU$  does a poor job of calibrating the concerns that the general public has regarding economic policy management.  $EPU$  is a measure of expressions of economic uncertainty appearing in major U.S. newspaper stories. It clearly reflects the concerns of the business, investment and financial communities. In the case of average consumers, we argue for a different, and more direct, measure that is based on their responses to a survey questions about the U.S. President's management of economic policy ( $PHE$ ).

Our contribution is to propose this direct measure of the general public's concern with economic policy management: a survey-based measure that asks representative samples of the general public to evaluate economic policy management. The general U.S. public

associates economic policy management with the executive branch, and specifically with the President. Hence, 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).

We present very compelling evidence that *PHE* explains U.S. consumer sentiment as measured by the Michigan Consumer Sentiment Index. As expected, consumer sentiment responds to economic fundamentals – unemployment, real wages and inflation all account for considerable variation in consumer sentiment. Our major contribution is to demonstrate that the *PHE* 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. The *EPU* measure is more weakly correlated with economic sentiment – at most *EPU* accounts for less than 10% of the variance in consumer sentiment over a 48 month horizon.

A second important contribution is to establish that *PHE* constitutes fundamental information and hence shapes consumer expectations about the future state of the economy. Changes in the public’s concerns about the President’s handling of economic policy represent persistent innovations that may impact permanent income levels. We demonstrate that the impact of *PHE* on consumer sentiment works primarily via consumer expectations: The effect is stronger for consumer expectations about the future; specifically, the consumer expectations (*ce*) component of the Michigan University consumer sentiment index (*cs*) and the *E5Y* item from the Michigan index (*cs*) that measures confidence about future economic conditions. The SVAR evidence suggests the effect of the *PHE* variable is much more long lasting when we specify the outcome variable with these measures of consumer expectations about the future. It is also the case when we compare the impact on consumer confidence (either the composite indices or those measuring expectations) *EPU*, and other economic variables, have a relatively smaller impact on consumer sentiment that quickly dissipates.

The impact of *PHE* on consumer sentiment is extremely robust. It is strongly corre-

lated with U.S. consumer confidence at medium and long horizons. Most impressively, the model specifications for consumer sentiment include controls for a range of economic outcome variables, Presidential Approval, different administrations and *EPU*. The estimated *PHE* effect on consumer sentiment persists regardless of how these controls are included in different model specifications.

Public concerns about economic policy management have consequences for consumer sentiment. A challenge is isolating the information content that shapes expectations about economic fundamentals (Barsky and Sims, 2012). Our *PHE* measure, the President’s Handling of the Economy, represents information shocks about future productivity that impacts consumer sentiment. Changes in evaluations of the President’s handling of the economy result in persistent innovations in consumer sentiment that may reflect expected changes in permanent income levels.

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Table 1: Consumer Sentiment Determinants: GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	Economic Var. (a)	Including PA (b)	Including PHE (c)	Including PA and PHE (d)	Including EPU (e)
$un_t$	-6.635*** (0.341)	-6.400*** (0.334)	-4.977*** (0.335)	-5.046*** (0.255)	-2.783*** (0.313)
$w_t$	5.029*** (1.531)	3.409*** (1.272)	2.085* (1.148)	2.554** (1.106)	1.755* (1.007)
$\pi_t$	-0.043 (0.523)	-1.396*** (0.486)	-0.107 (0.442)	-0.050 (0.431)	-0.825** (0.349)
$y_t$	0.614 (0.397)	1.484*** (0.349)	0.852** (0.353)	0.637* (0.343)	1.305*** (0.346)
$d(stock_t)$	1.529*** (0.219)	1.340*** (0.174)	1.198*** (0.190)	1.122*** (0.154)	0.616*** (0.122)
$PHE_t$			0.501*** (0.060)	0.564*** (0.062)	0.514*** (0.057)
$PA_t$		0.287*** (0.058)		-0.083* (0.049)	0.035 (0.048)
$EPU_t$					-0.178*** (0.019)
Adjusted R-squared	0.493	0.588	0.655	0.663	0.699
$J$ -statistic	33.3	40.7	40.5	45.4	48.2
Prob( $J$ -statistic)	0.94	0.96	0.96	0.98	0.99

\*\*\*  $p < 0.01$

\*\*  $p < 0.05$

\*  $p < 0.10$

Table 2: Consumer Sentiment across Administrations: GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	Including EPU (a)	Including Admin. (b)
$un_t$	-2.783*** (0.313)	-2.026*** (0.397)
$w_t$	1.755* (1.007)	1.778* (0.971)
$\pi_t$	-0.825** (0.349)	-1.644*** (0.461)
$y_t$	1.305*** (0.346)	1.655*** (0.288)
$d(stock_t)$	0.616*** (0.122)	0.391*** (0.101)
$PHE_t$	0.514*** (0.057)	
$PA_t$	0.035 (0.048)	0.281*** (0.062)
$EPU_t$	-0.178*** (0.019)	-0.260*** (0.018)
TRUMP* $PHE_t$		0.581*** (0.063)
OBAMA* $PHE_t$		0.297*** (0.063)
BUSH* $PHE_t$		0.241*** (0.078)
CLINTON* $PHE_t$		0.314*** (0.062)
BUSH I* $PHE_t$		0.238*** (0.088)
REAGAN* $PHE_t$		0.502*** (0.066)
Adjusted R-squared	0.699	0.751
$J$ -statistic	48.2	44.6
Prob( $J$ -statistic)	0.99	0.99

\*\*  $p < 0.01$

\*  $p < 0.05$

\* $p < 0.10$

Table 3: Current and Expected Conditions: GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	Dependent $CS_t$ (a)	Dependent $CC_t$ (b)	Dependent $CE_t$ (c)
$un_t$	-2.026*** (0.397)	-3.773*** (0.420)	-0.661 (0.495)
$w_t$	1.778* (0.971)	3.766*** (1.054)	-0.339 (1.133)
$\pi_t$	-1.644*** (0.461)	-0.095 (0.490)	-3.042*** (0.547)
$y_t$	1.655*** (0.288)	1.615*** (0.306)	1.843*** (0.339)
$d(stock_t)$	0.391*** (0.101)	0.469*** (0.134)	0.325*** (0.115)
$PA_t$	0.281*** (0.062)	0.290*** (0.063)	0.269*** (0.070)
$EPU_t$	-0.260*** (0.018)	-0.226*** (0.020)	-0.288*** (0.023)
TRUMP* $PHE_t$	0.581*** (0.063)	0.299*** (0.057)	0.800*** (0.070)
OBAMA* $PHE_t$	0.297*** (0.063)	0.067 (0.054)	0.483*** (0.068)
BUSH* $PHE_t$	0.241*** (0.078)	-0.065 (0.067)	0.502*** (0.087)
CLINTON* $PHE_t$	0.314*** (0.062)	0.021 (0.052)	0.543*** (0.069)
BUSH I* $PHE_t$	0.238*** (0.088)	-0.082 (0.081)	0.519*** (0.095)
REAGAN* $PHE_t$	0.502*** (0.066)	0.248*** (0.057)	0.734*** (0.070)
Adjusted R-squared	0.751	0.736	0.711
$J$ -statistic	44.6	48.8	43.5
Prob( $J$ -statistic)	0.999	0.998	0.999

\*\*\*  $p < 0.01$

\*\*  $p < 0.05$

\*  $p < 0.10$

Table 4: Consumer Sentiment and PHE Michigan: GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	Dependent $CS_t$			Dependent $CC_t$			Dependent $CE_t$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$un_t$	-2.783*** (0.313)	-2.193*** (0.376)	-2.310*** (0.302)	-4.183*** (0.332)	-4.003*** (0.377)	-4.339*** (0.323)	-1.878*** (0.367)	-0.988** (0.450)	-1.033*** (0.388)
$w_t$	1.755* (1.007)	1.548 (1.060)	1.508* (0.911)	2.941*** (1.084)	3.053*** (1.059)	2.920*** (0.987)	0.349 (1.198)	0.153 (1.226)	0.367 (1.106)
$\pi_t$	-0.825*** (0.349)	-0.862** (0.415)	-0.798** (0.337)	0.098 (0.306)	-0.064 (0.356)	0.139 (0.285)	-1.503*** (0.465)	-1.553*** (0.524)	-1.315*** (0.471)
$y_t$	1.305*** (0.346)	1.295*** (0.377)	1.279*** (0.322)	1.032*** (0.385)	1.245*** (0.394)	0.974*** (0.355)	1.218*** (0.380)	1.373*** (0.409)	1.235*** (0.364)
$d(stock_t)$	0.616*** (0.122)	0.707*** (0.116)	0.635*** (0.110)	0.671*** (0.149)	0.804*** (0.136)	0.663*** (0.138)	0.568*** (0.137)	0.637*** (0.134)	0.602*** (0.126)
$PA_t$	0.035 (0.048)	0.133*** (0.042)	0.052 (0.045)	-0.039 (0.043)	0.059 (0.041)	-0.046 (0.043)	0.062 (0.059)	0.205*** (0.056)	0.103* (0.057)
$EPU_t$	-0.178*** (0.019)	-0.191*** (0.023)	-0.183*** (0.018)	-0.123*** (0.018)	-0.131*** (0.020)	-0.114*** (0.017)	-0.206*** (0.022)	-0.231*** (0.028)	-0.223*** (0.023)
$PHE_t$	0.514*** (0.057)		0.290*** (0.086)	0.298*** (0.047)		0.339*** (0.079)	0.701*** (0.072)		0.293*** (0.102)
$PHE - MICHIGAN_t$		0.548*** (0.048)	0.311*** (0.080)		0.245*** (0.046)	-0.046* (0.085)		0.750*** (0.066)	0.524*** (0.105)
Adjusted R-squared	0.699	0.701	0.708	0.671	0.659	0.672	0.670	0.684	0.689
$J$ -statistic	48.2	47.9	50.3	44.5	45.3	45.9	46.3	47.0	49.6
Prob( $J$ -statistic)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99

\*\*\*  $p < 0.01$

\*\*  $p < 0.05$

\*  $p < 0.10$

Table 5: SVAR Variance Decomposition of  $cs_t$ : PHE ordered before PHE Michigan  
(expressed in %)

Consumer Sentiment Index (CS)								
Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	CS
1	3.8	2.9	1.8	<b>6.7</b>	5.7	1.5	2.0	75.6
12	9.3	6.1	<b>16.1</b>	2.9	9.6	2.1	6.1	47.9
24	8.4	5.4	<b>22.1</b>	3.7	8.7	2.0	6.8	43.1
36	8.1	4.8	<b>24.4</b>	4.2	8.3	1.9	7.2	41.1
48	8.1	4.5	<b>25.5</b>	4.4	8.1	1.9	7.4	40.2
Consumer Current Conditions Index (CC)								
Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	CC
1	1.5	1.1	0.2	<b>1.9</b>	4.7	0.2	2.0	88.4
12	9.2	3.6	<b>8.1</b>	1.3	6.0	5.5	3.7	62.7
24	8.9	3.8	<b>12.0</b>	2.1	5.6	5.8	3.7	58.1
36	8.7	3.7	<b>14.2</b>	2.8	5.3	6.0	3.7	55.6
48	8.5	3.6	<b>15.3</b>	3.2	5.2	6.1	3.7	54.4
Consumer Expectations Index (CE)								
Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	CE
1	4.0	3.7	3.1	<b>8.1</b>	4.3	2.3	1.4	73.2
12	8.5	8.0	<b>20.1</b>	4.8	8.8	1.6	5.4	42.8
24	7.6	7.1	<b>26.5</b>	5.7	7.7	1.6	6.3	37.4
36	7.4	6.4	<b>28.8</b>	6.1	7.4	1.6	7.0	35.3
48	7.5	6.1	<b>29.8</b>	6.2	7.2	1.5	7.5	34.2

Table 6: SVAR Variance Decomposition of  $cs_t$ : PHE ordered after PHE Michigan  
(expressed in %)

Consumer Sentiment Index (CS)								
Horizon (months)	EPU	PA	PHE (Michigan)	PHE	d(stock)	w	u	CS
1	3.8	2.9	<b>8.2</b>	0.3	5.7	1.5	2.0	75.6
12	9.3	6.1	7.1	<b>11.9</b>	9.6	2.1	6.1	47.9
24	8.4	5.4	9.5	<b>16.2</b>	8.7	2.0	6.8	43.1
36	8.1	4.8	10.8	<b>17.8</b>	8.3	1.9	7.2	41.1
48	8.1	4.5	11.3	<b>18.5</b>	8.1	1.9	7.4	40.2
Consumer Current Conditions Index (CC)								
Horizon (months)	EPU	PA	PHE (Michigan)	PHE	d(stock)	w	u	CC
1	1.5	1.1	<b>2.1</b>	0.0	4.7	0.2	2.0	88.4
12	9.2	3.6	3.4	<b>6.0</b>	6.0	5.5	3.7	62.7
24	8.9	3.8	5.4	<b>8.7</b>	5.6	5.8	3.7	58.1
36	8.7	3.7	6.9	<b>10.1</b>	5.3	6.0	3.7	55.6
48	8.5	3.6	7.8	<b>10.8</b>	5.2	6.1	3.7	54.4
Consumer Expectations Index (CE)								
Horizon (months)	EPU	PA	PHE (Michigan)	PHE	d(stock)	w	u	CE
1	4.0	3.7	<b>10.4</b>	0.8	4.3	2.3	1.4	73.2
12	8.5	8.0	10.7	<b>14.2</b>	8.8	1.6	5.4	42.8
24	7.6	7.1	13.5	<b>18.8</b>	7.7	1.6	6.3	37.4
36	7.4	6.4	14.5	<b>20.3</b>	7.4	1.6	7.0	35.3
48	7.5	6.1	14.9	<b>21.1</b>	7.2	1.5	7.5	34.2

Table 7: Consumer Sentiment : Alternative Measures, GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	$CS_t$ (a)	$(C.Board)_t$ (b)	$(C.OECD)_t$ (c)	$(E5Y)_t$ (d)
$un_t$	-2.026*** (0.397)	-7.967*** (0.524)	-0.236*** (0.038)	-2.098*** (0.570)
$w_t$	1.778* (0.971)	-2.188 (1.402)	0.141 (0.092)	-1.083 (1.236)
$\pi_t$	-1.644*** (0.461)	-0.896 (0.739)	-0.131*** (0.048)	-2.536** (0.704)
$y_t$	1.655*** (0.288)	4.174*** (0.396)	0.140*** (0.027)	2.239*** (0.383)
$d(stock_t)$	0.391*** (0.101)	0.823*** (0.175)	0.018** (0.009)	0.322*** (0.130)
$PHE_t$				
$PA_t$	0.281*** (0.062)	0.143** (0.071)	0.021*** (0.005)	0.273*** (0.078)
$EPU_t$	-0.260*** (0.018)	-0.438*** (0.029)	-0.021*** (0.002)	-0.217*** (0.028)
TRUMP* $PHE_t$	0.581*** (0.063)	1.617*** (0.092)	0.060*** (0.006)	1.004*** (0.085)
OBAMA* $PHE_t$	0.297*** (0.063)	1.185*** (0.097)	0.034*** (0.005)	0.842*** (0.074)
BUSH* $PHE_t$	0.241*** (0.078)	1.079*** (0.103)	0.029*** (0.007)	0.815*** (0.100)
CLINTON* $PHE_t$	0.314*** (0.062)	0.998*** (0.085)	0.038*** (0.006)	0.750*** (0.078)
BUSH I* $PHE_t$	0.238*** (0.088)	1.161*** (0.111)	0.029*** (0.008)	0.608*** (0.100)
REAGAN* $PHE_t$	0.502*** (0.066)	1.534*** (0.091)	0.054*** (0.006)	0.831*** (0.081)
Adjusted R-squared	0.751	0.839	0.815	0.696
$J$ -statistic	44.6	45.1	42.1	47.7
Prob( $J$ -statistic)	0.99	0.99	0.99	0.99

\*\*\*  $p < 0.01$

\*\*  $p < 0.05$

\*  $p < 0.10$



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

Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	CB
1	3.8	2.7	0.4	<b>1.6</b>	10.0	1.3	1.7	78.5
12	15.5	1.5	<b>22.9</b>	0.7	12.0	1.7	6.7	38.9
24	14.2	1.4	<b>32.8</b>	2.0	9.6	2.7	7.5	29.9
36	13.8	1.1	<b>36.4</b>	3.0	8.5	3.2	7.8	26.1
48	13.7	1.0	<b>38.1</b>	3.5	8.0	3.4	8.0	24.2

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

Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	COECD
1	4.3	3.0	2.6	<b>1.1</b>	5.1	0.5	1.9	81.5
12	1.3	1.9	<b>12.5</b>	0.2	2.1	0.6	7.2	74.2
24	1.1	2.6	<b>17.1</b>	0.7	1.7	0.7	8.9	67.1
36	1.1	3.6	<b>17.7</b>	0.8	1.6	0.8	9.6	64.7
48	1.2	4.4	<b>17.8</b>	0.8	1.6	0.8	10.0	63.4

Table 10: Variance Decomposition of E5Y Index (LE5Y)  
(expressed in %)

Horizon (months)	EPU	PA	PHE	PHE (Michigan)	d(stock)	w	u	LE5Y
1	3.0	3.1	1.9	<b>9.6</b>	3.1	0.7	1.1	77.6
12	5.0	6.7	<b>22.4</b>	9.6	5.3	0.9	5.6	44.6
24	5.0	5.4	<b>29.2</b>	10.6	4.5	1.1	6.8	37.3
36	5.5	5.0	<b>31.5</b>	10.7	4.3	1.2	7.7	34.2
48	5.9	4.9	<b>32.4</b>	10.6	4.2	1.2	8.4	32.6

Table 11: Consumer Sentiment and PHE-Michigan : Alternative Measures, GMM-IV Estimation  
(1986.01 to 2018.04)

Variable	$CS_t$ (1)	$(C.Board)_t$ (2)	$(C.OECD)_t$ (3)	$(LE5Y)_t$ (4)
$un_t$	-2.310*** (0.302)	-9.787*** (0.611)	-0.254*** (0.029)	-1.669*** (0.492)
$w_t$	1.508* (0.911)	-0.185 (1.346)	0.150* (0.081)	-2.672** (1.123)
$\pi_t$	-0.798** (0.337)	0.685 (0.659)	-0.051 (0.036)	-3.678*** (0.475)
$y_t$	1.279*** (0.322)	3.070*** (0.473)	0.116*** (0.035)	1.891*** (0.334)
$d(stock_t)$	0.635*** (0.110)	1.317*** (0.197)	0.043*** (0.010)	0.395*** (0.129)
$PA_t$	0.052 (0.045)	-0.065 (0.081)	-0.002 (0.004)	0.139** (0.057)
$EPU_t$	-0.183*** (0.018)	-0.211*** (0.030)	-0.015*** (0.002)	-0.182*** (0.021)
$PHE_t$	0.290*** (0.086)	0.914*** (0.143)	0.041*** (0.008)	0.237** (0.106)
$PHE - MICHIGAN_t$	0.311*** (0.080)	0.249* (0.148)	0.024*** (0.008)	0.785*** (0.121)
Adjusted R-squared	0.708	0.804	0.766	0.719
$J$ -statistic	50.3	41.4	48.8	47.9
Prob( $J$ -statistic)	0.99	0.99	0.99	0.99
*** $p < 0.01$				
** $p < 0.05$				
* $p < 0.10$				

## Appendix A. Construction of PHE

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

## Appendix B. Michigan Survey of Consumer

Surveys of Consumers

University of Michigan

### INDEX CALCULATIONS

#### Index of Consumer Sentiment

To calculate the Index of Consumer Sentiment (ICS), first compute the relative scores (the percent giving favorable replies minus the percent giving unfavorable replies, plus 100) for each of the five index questions (see  $x_1 \dots x_5$  listed below). Round each relative score to the nearest whole number. Using the formula shown below, sum the five relative scores, divide by the 1966 base period total of 6.7558, and add 2.0 (a constant to correct for sample design changes from the 1950s).<sup>1</sup>

$$ICS = \frac{X_1 + X_2 + X_3 + X_4 + X_5}{6.7558} + 2.0$$

#### Index of Consumer Expectations and the Index of Current Economic Conditions

Using the same procedures given above, the Index of Current Economic Conditions (ICC) and the Index of Consumer Expectations (ICE) are calculated as follows.

$$ICC = \frac{X_1 + X_5}{2.6424} + 2.0 \qquad ICE = \frac{X_2 + X_3 + X_4}{4.1134} + 2.0$$

#### Index Questions

The Index of Consumer Sentiment (ICS) is derived from the following five questions:

$x_1 = \text{PAGO\_R}$  = "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?"

$x_2 = \text{PEXP\_R}$  = "Now looking ahead--do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?"

$x_3 = \text{BUS12\_R}$  = "Now turning to business conditions in the country as a whole--do you think that during the next twelve months we'll have good times financially, or bad times, or what?"

$x_4 = \text{BUS5\_R}$  = "Looking ahead, which would you say is more likely--that in the country as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression, or what?"

$x_5 = \text{DUR\_R}$  = "About the big things people buy for their homes--such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?"

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<sup>1</sup>There was no constant added until 1972:4 (except for 1972:1), from 1972:4 until 1981:11 the constant was 2.7, and from 1981:12 to present the constant is 2.0.

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

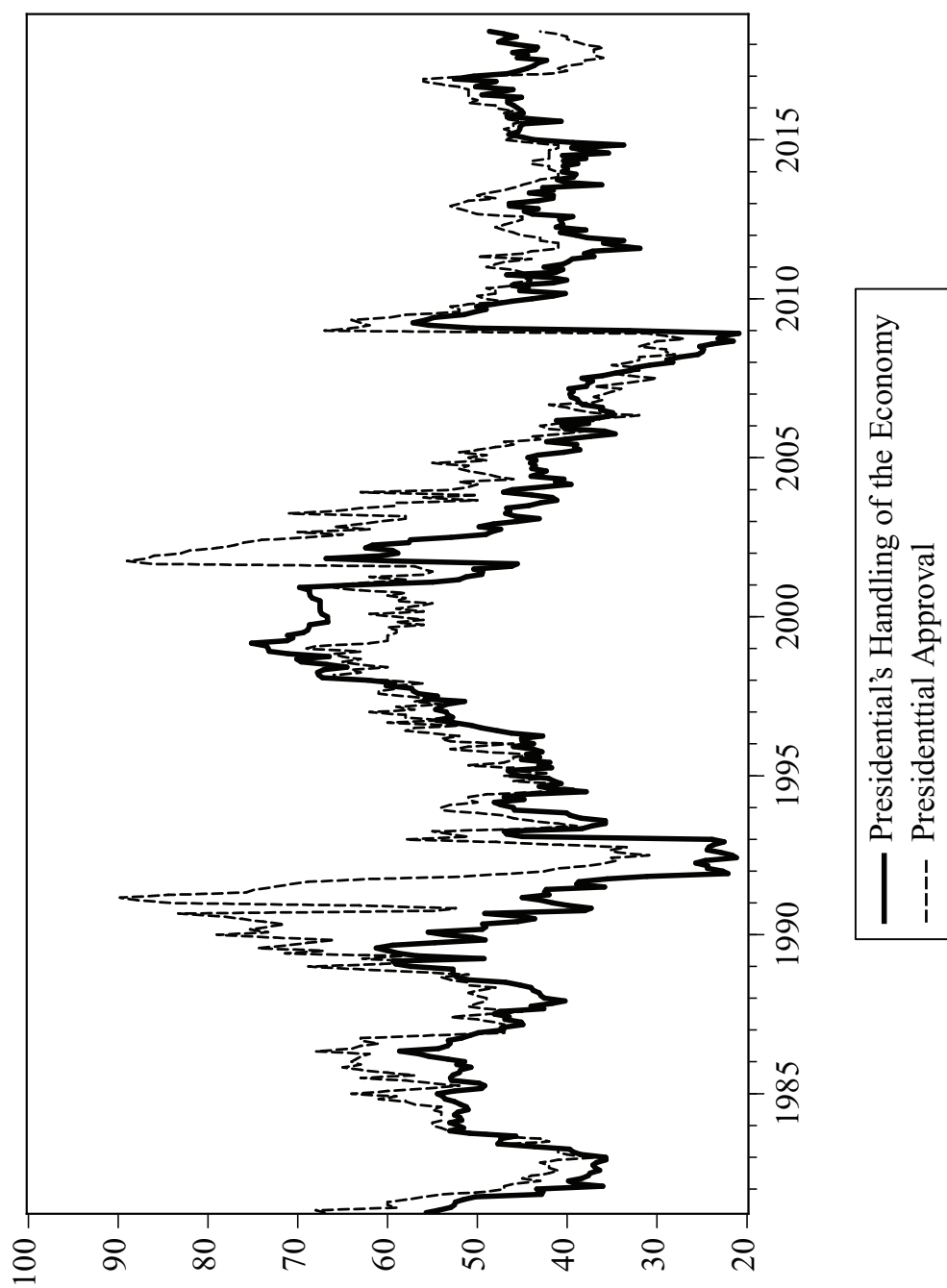


Figure 2: Economic Policy Uncertainty and Presidential Handling of the Economy Indices

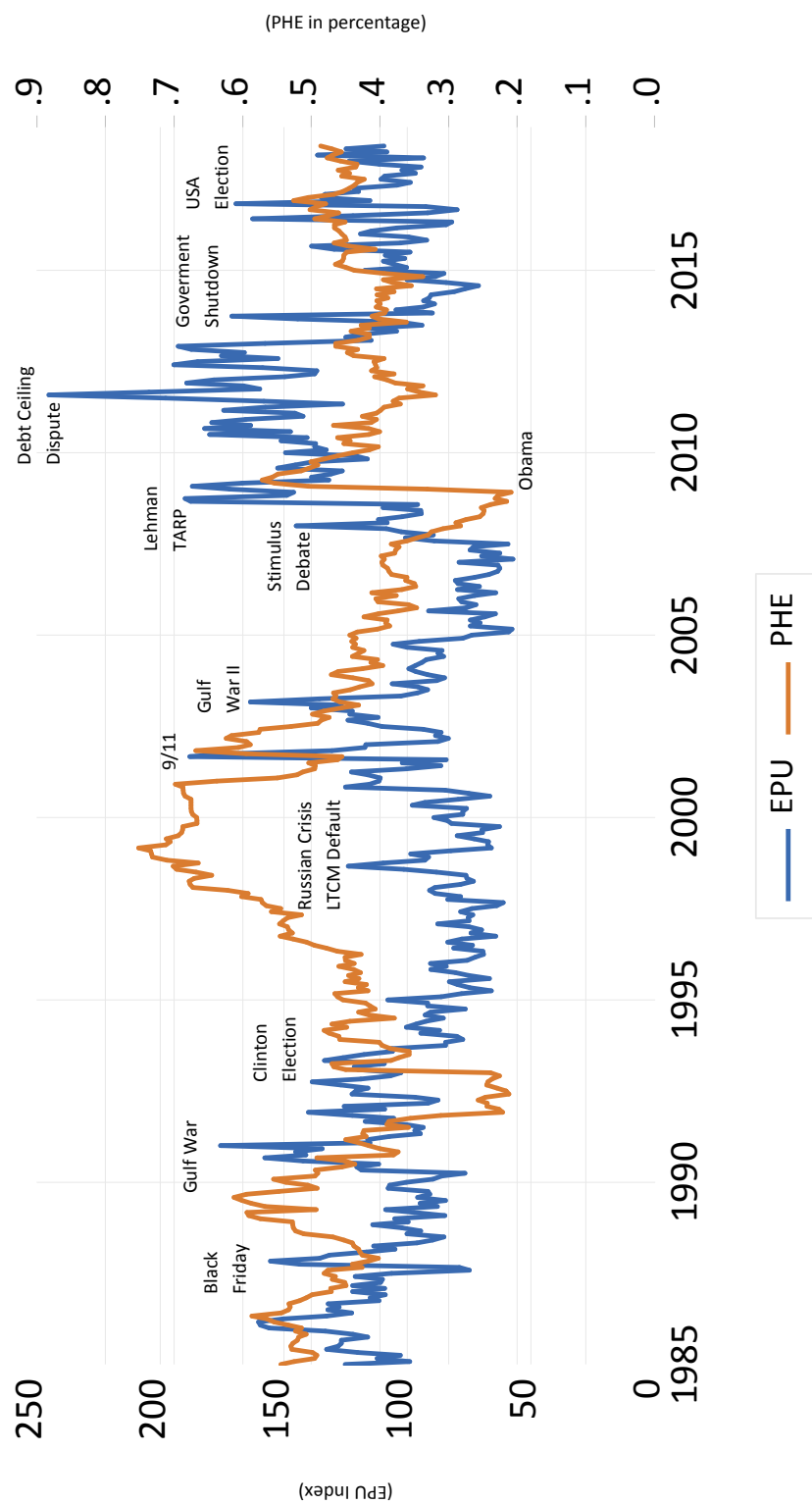


Figure 3: Responses of  $cs$  to different shocks

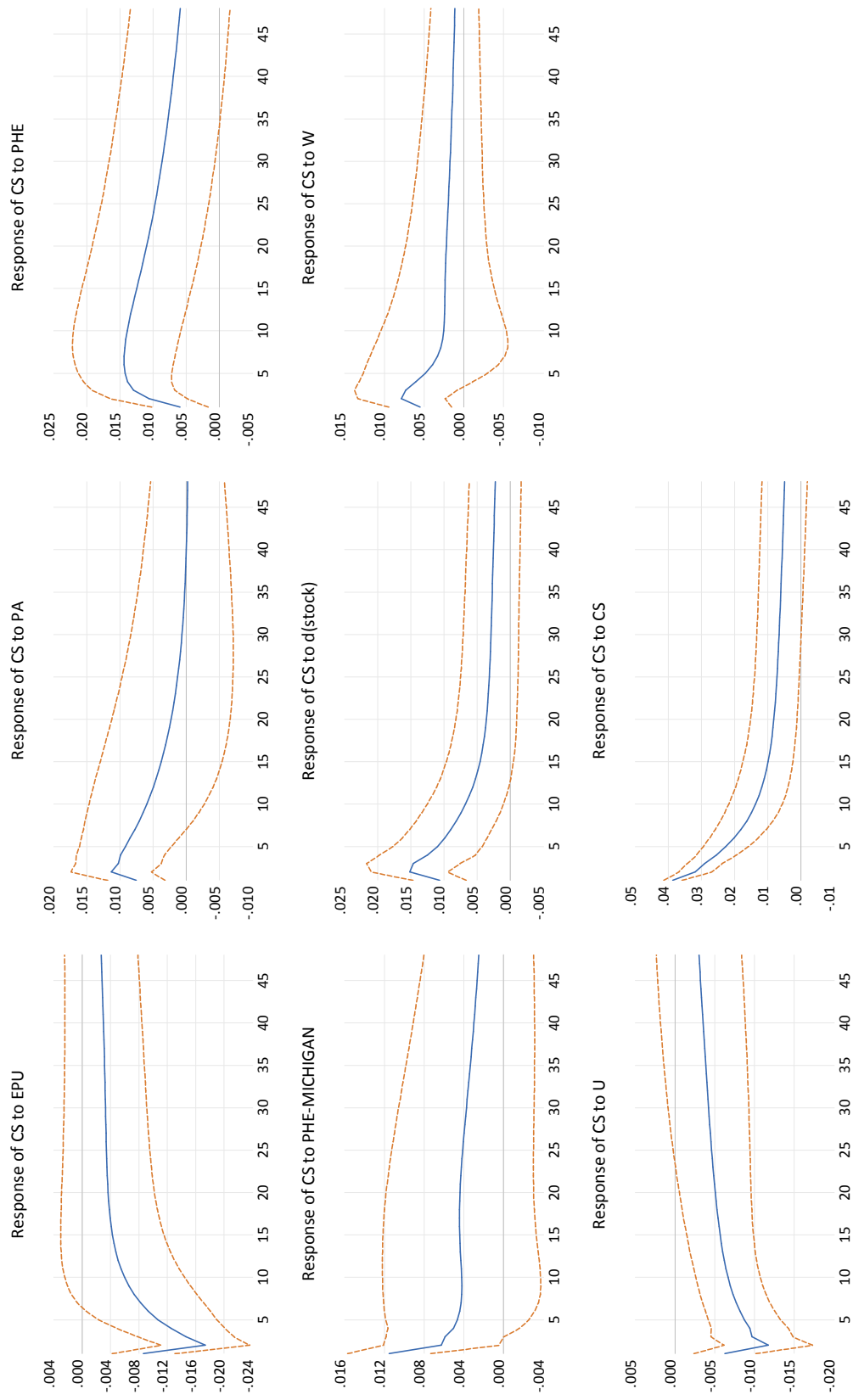


Figure 4: Normalized Responses of Consumer Sentiment Indices to *PHE*

