What Determines Household Expectations?*

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Abstract

This paper investigates what information households use when they form expectations. We use daily data from the Gallup Daily Tracking Poll (2008-17) and Michigan Survey of Consumers (1980-2019) to study which macroeconomic announcements cause households to adjust their expectations. We build a model to isolate the unanticipated component of macroeconomic announcements and generate two different shock series - one assuming households are sophisticated, and one assuming households are naive. We document four primary results. First, we show that information about the labor market is an important determinant of not only households' subjective expectations about the economy, but also their inflation expectations. Second, we find that even in episodes when unemployment is decreasing and inflation is increasing, shocks to unemployment account for significant adjustments in households' subjective expectations about the economy. Third, most changes in inflation expectations are driven by shocks to unemployment. Inflation expectations may or may not respond to shocks to CPI, but they almost always respond to shocks to unemployment. Fourth, during negative supply and demand shocks, which are traditionally associated with recessions, it is unemployment that drives household expectations.

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1 Introduction

It is well established that households' expectations affect real outcomes (D'Acunto & Weber 2024).[1] However, little is known about which information households use to form these expectations. Households are constantly inundated with different signals about the state of the economy, such as monetary policy announcements, government data releases like the Bureau of Labor Statistics' (BLS) jobs report, inflation numbers, and GDP. All of these sources provide different kinds of information. We analyze which of this information is important to households in their expectation formation process.

One of the key challenges with identifying which signals households use in their belief formation process has been the fact that while households receive signals quite frequently[2], we do not have measures of household beliefs at the same frequency.[3] We overcome this challenge by using daily data on households' expectations about the economy from the Gallup Daily Tracking Poll from 2008 to 2017. This allows us to use a high frequency identification approach in order to determine which macroeconomic variables matter for households expectation formation process. We proxy for new information on these variables by looking at the days when new data on them are released. We focus on a small set of variables that carry the most information about the economy: inflation, output, unemployment rate and housing. We construct a narrow window around the release dates of announcements for each variable and examine whether any change in expectations occurs in that window. Since the window is small, we can argue that any effect we find is likely caused by the macroeconomic announcement.

Before we can interpret these effects, however, we must first understand how households form expectations. To infer whether new information on macro statistics causes households to adjust their expectations, we need to measure what part of the announcement was actually 'new'. In other words, we need to measure the extent to which the data were anticipated versus unanticipated. To address this, we impose some structure on the households' expectation formation process and consider two extreme cases regarding how they form forecasts. First, we assume that households are *sophisticated*, i.e they incorporate all available information while forming expectations.[4] So in this case, the 'new' information contained in the announcement is captured by the surprise in forecast error (Gürkaynak et al. 2005). On the other extreme, we assume that households are *naive*, i.e. they do not use any new information to form forecasts. Thus, the unanticipated part of the

[1] Household expectations have been shown to matter for several fundamental economic decisions like consumption, savings and investment, and labor market outcomes(Greenwood & Shleifer 2014, Armona et al. 2018, Coibion, Georgarakos, Gorodnichenko & van Rooij 2019, Roth & Wohlfart 2019, Mueller et al. 2021)

[2] Most of the statistics are released monthly, some are released weekly.

[3] The two most popular sources of expectations in the US are the University of Michigan's Survey of Consumers and the NY Fed's SCE, both of which are monthly.

[4] Thus we assume that their forecast is as good as that of professional forecasters, which we take to be our benchmark.

current announcement is given by the difference between the value of the macroeconomic variable between two consecutive announcements. Looking at these two extreme cases of household forecasts helps us to provide an upper and lower bound on the true response of expectations.

We find that households' expectations about the economy adjust when presented with new information about the labor market, but do not necessarily adjust in response to information about other macroeconomic variables. This is surprising given that most of the literature focuses on the role of inflation in forming household expectations, not unemployment. In order to ensure that this is not a function of our sample period, we also use microdata from the Michigan Survey of Consumers (MSC) from 1980 to 2019. We use the dates of the interview to build a daily series of expectations and examine the behavior of household expectations to unemployment and inflation announcements. We find that in the longer sample, although expectations respond to movements in inflation, they respond more strongly to movements in unemployment.

Further, we find that the response of household expectations to new information is asymmetric. Households respond more to a negative information shock (i.e. one that indicates a worsening of the economy) compared to a positive shock (i.e. one that indicates an improvement in the economy).

To form expectations, households can prioritize different variables at different points in time. For instance, if unemployment starts rising rapidly, as seen during the Covid-19 pandemic, it will likely become the primary driver of households' economic expectations. Conversely, in the early 80s, when the US experienced very high levels of inflation, inflation likely shaped their expectations. To account for these shifts, we divide the MSC into four scenarios and re-estimate our results for each scenario separately: (1) both unemployment and inflation are increasing, (2) both are decreasing, (3) only unemployment is increasing, and (4) only inflation is increasing. In all four of these scenarios, we find that unemployment continues to affect expectations in a statistically sign way, regardless of whether households are assumed to be sophisticated or naive (the only scenario it is insignificant is in the case of naive households when both unemployment and inflation are decreasing). It is interesting to note that even in the cases when inflation is increasing, it is shocks to unemployment that have a larger effect on household expectations than shocks to CPI.

So far, we have tested the response of household expectations about the economy in general. However, MSC allows us to further test whether the same patterns holds true for inflation expectations. Inflation expectations are an important policy tool, and it is possible that while sentiment responds to unemployment, inflation expectations do not. We test this hypothesis using our data and identification strategy to provide novel insights on the relative importance of unemployment to inflation in households' expectations formation process. We find that relative weights depend on how households form forecasts. We find that for both kinds of households, shocks to unemployment affect inflation expectations at

least as much as shocks to CPI (and strictly more in some cases). Sophisticated households respond only to unemployment shocks, and only when unemployment is increasing (even when inf is inc). In the case of naive households, we do find some response to CPI shocks, but still the response to unemployment shocks is larger in most cases. Sophisticated households consider only unemployment announcements and respond solely to scenarios that are conventionally associated with negative supply and demand shocks. Naive households in contrast, respond to all scenarios and mostly use information from shocks to unemployment to adjust their inflation expectations.

We thus make four main contributions. First, we develop a model to isolate the unanticipated component of macroeconomic announcements and build two different shock series. These allow us to provide bounds on the true expectation adjustment process. Second, we show that information about the labor market is an important determinant of not only households' subjective expectations about the economy, but also their inflation expectations. We also find that households living in counties with high local unemployment respond more to shocks to unemployment, but not CPI. Third, we find that even in episodes when unemployment is decreasing and inflation is increasing, shocks to unemployment account for significant adjustments in households' subjective expectations about the economy. Fourth, most changes in inflation expectations are driven by shocks to unemployment. Inflation expectations may or may not respond to shocks to CPI, but they almost always respond to shocks to unemployment. Fifth, shocks to CPI matter more than shocks to unemployment only in the case of a positive supply or demand shock. In the case of a negative supply or demand shock, which are traditionally associated with recessions, it is unemployment that drives household expectations.

Related Literature Our paper contributes to the literature on the macroeconomic announcement premium using high-frequency events. Researchers have found that announcements affect spot exchange rates (Andersen et al. 2003, Evans & Lyons 2008), commodity returns (Caporale et al. 2016), futures contracts (Balduzzi et al. 2001, Andersen et al. 2007), global asset prices (Boehm & Kroner 2023), and market volatility (Jiang et al. 2014). We also contribute to the subsection of this literature that has focused on the effect of monetary policy announcements on long-term interest rates (Gürkaynak et al. 2005) and household expectations (Coibion, Gorodnichenko & Weber 2019). Our paper is most closely related to Binder et al. (2024) and Mertens et al. (2020). Binder et al. (2024) exploit an event study approach with the Survey of Consumer Expectations, constructing a daily time series to examine the response of household expectations. While our findings are complementary, our approach differs in significant ways. First, we use local projections with shocks to expectations to assess the effect of macroeconomic news. This allows us to account for the fact that some events generate far greater surprise or contain more novel information than others, and thus capture asymmetries and non-linearity in household expectations. Similar to us, Mertens et al. (2020) use daily data from Gallup and local projections to analyze

whether monetary policy announcements shift household expectations. We examine other macroeconomic announcements as well, in order to understand which information matters to households in their expectation formation process. Further, in a significant divergence from both these papers, we build a model to isolate the unanticipated component of macro announcements and provide two different shock series. We further extend the analysis over a much longer time horizon by leveraging micro-data from the Michigan Survey of Consumers which allows us to study not just households' subjective expectations about the economy but also their inflation expectations, covering different economic episodes.

Our paper also contributes to the literature that studies survey-based expectations to understand the behavior of households (Malmendier & Nagel 2015, Kuchler & Zafar 2015, Roth & Wohlfart 2019, Mian et al. 2021). Most of this literature focuses on point estimates of expectations of specific variables such as inflation (Armantier et al. 2015, Bachmann et al. 2015, Coibion et al. 2018), house prices (Armona et al. 2018), or the labor market (Potter 2020, Mueller et al. 2021). However, it is not known which expectations are the most important in the decision-making process of households. In fact, more recent papers, such as those by Kamdar (2019), Ehrmann et al. (2015), Andre et al. (2019), and Roth & Wohlfart (2019) suggest that households do not form expectations about individual variables, but rather form expectations about the aggregate economy jointly. We use a measure of subjective household expectations about the entire economy and ask which variables are important in influencing these expectations. We present novel evidence in this direction by finding that household expectations are most responsive when presented with new information about the labor market. We further validate these results by examining households' inflation expectations and show that while inflation expectations may or may not respond to shocks to CPI, they almost always respond to shocks to unemployment.

2 Data

We use three main data sources for our study. Our primary data source is the Gallup Daily Tracking Poll, which provides us with daily data on household expectations. The high frequency nature of the Gallup survey allows for a cleaner identification.

Our second data source is the Michigan Survey of Consumers (MSC), a monthly survey of household expectations in the United States. MSC reports both a future sentiment index as well as point estimates for inflation expectations. The microdata contains interview dates, which allows for analysis at a daily and weekly level.

Our third data source is Bloomberg's United States Economic Calendar, which reports the median expectations of professional forecasters prior to each macroeconomic release. These forecasts help us to capture a measure of the unanticipated component of releases.

2.1 Gallup's US Daily Tracking Poll

The US Daily Tracking Poll (GDTP) is a repeated cross-sectional survey conducted by Gallup, a premier polling and analytics firm. It was fielded to about 1000 individuals every day from 2008 to 2013, and 500 individuals every day from 2013 to 2017. We show the average number of respondents each day in a month in Figure 2b and it is consistently in the range of 450-500 each day.[5] The data is representative at the daily level and it matches targets from the US Census Bureau by age, sex, region, gender, education, ethnicity, race, and population density of self-reported location. Appendix Table 5b displays summary statistics of Gallup's poll.[6]

The main variable we are interested in is a measure of households' expectations about the future of the economy. Specifically, participants are asked the following question:

"Right now, do you think that economic conditions in the country, as a whole, are getting better or getting worse?"

Participants can choose between three options: getting better, staying the same, or getting worse. We denote this variable as our *Expectations Index*. The proportion of people who respond by saying that the economy is going to stay the same is less than 5% for the entire sample, thus we drop them. We are therefore left with a binary index that takes value 1 when people are optimistic (i.e. when they report that the economy is going to get better) and 0 when people are pessimistic (i.e when they report that the economy is going to get worse). Higher values of the index indicate more optimism about the future of the economy, while lower values indicate more pessimism. We use this question as a measure of household expectations about the performance of the aggregate economy in the future.

Figure 1 represents the evolution of the *Expectations Index* over time. Since our index is binary, it can also be interpreted as the share of optimists.[7] Figure 1 shows that the *Expectations Index*, or the proportion of people who are optimistic about the future of the economy, has risen over time. We also plot the share of optimists from the Michigan Survey of Consumers (MSC).[8] The expectations indices from both Gallup and Michigan display high co-movement with a correlation coefficient of 0.86, and have a similar trend over time. This is reassuring since it indicates that both indices capture similar economic expectations.

Appendix table 6 shows the change in our Expectations Index around major events that occurred in our sample period. Column 4 reports the difference in expectations one day

[5]The survey is conducted for 350 days every year. The respondents are evenly divided between the Well-being track and the Politics and Economy track. Certain variables, such as employment indicators and key demographics, are asked on both tracks.

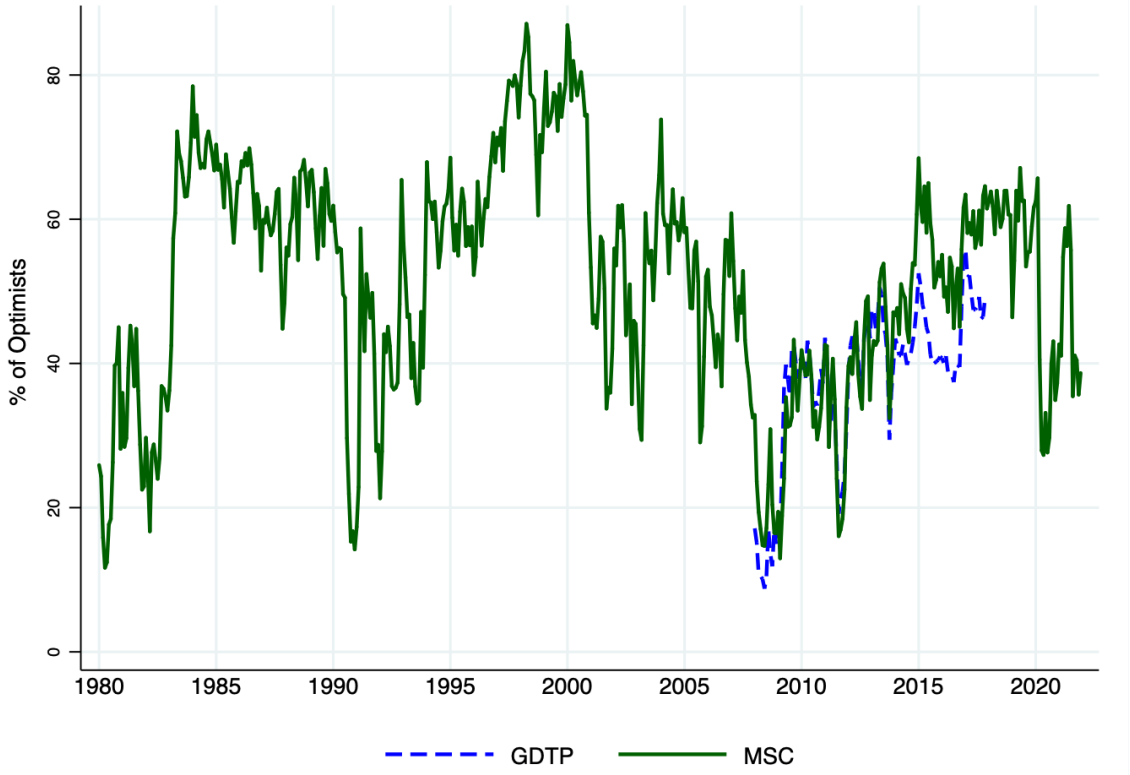
[6]We restrict our sample to individuals between the ages of 18 and 90

[7]Here, we define optimists as those participants who report that they expect the economy to be *getting better*, while pessimists as those participants who expect the economy to be *getting worse*.

[8]This corresponds to the Question BUS12 in the MSC Questionnaire.

after the event to one day before the event. The first row reports the change in household expectations that occurred when the Lehman Brothers filed for bankruptcy, triggering the 2008 recession. We observe that household expectations decreased by -0.22 points on average. Finally, we observe substantial heterogeneity in household expectations across demographic groups. We discuss these in Appendix Section A.1.1.

Figure 1: Household Expectations Index



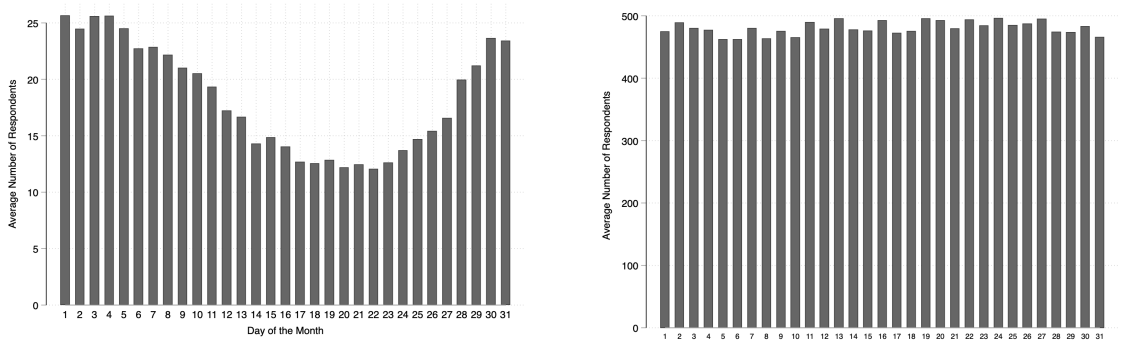
Notes: The GDTP Expectations Index is based on the fraction of respondents rating future economic conditions ('Getting better' or 'Getting worse'). The MSC share of optimists is calculated from the fraction of respondents rating business conditions in the country as a whole during the next twelve months as good times financially (relative to bad times). The correlation coefficient between these two series is 0.86.

2.2 University of Michigan's Survey of Consumers

The Michigan Survey of Consumers (MSC) began in January 1978 and is the longest running survey of household expectations in the United States. It collects both qualitative

and quantitative expectations by interviewing approximately 500 individuals each month, selected to be representative of the US population. Participants answer several questions covering topics ranging from qualitative assessments of changes in their current economic situation and future expectations to quantitative estimates, such as point forecasts of inflation. We use the MSC microdata not only because it is the longest-running survey on household expectations but also because, since June 1979, the interview dates of respondents have been recorded and made publicly available, as noted by York (2023). This allows for a high-frequency identification at the daily as well as weekly level. We report the average number of respondents each day of a month for the MSC in Figure 2a.

Figure 2: Number of Respondents Each Day of the Month



(a) Michigan Survey of Consumers (b) Gallup Daily Tracking Poll

Notes: This figure shows the average number of respondents every day of the month in the Michigan Survey of Consumers as well as the Gallup Daily Tracking Poll.

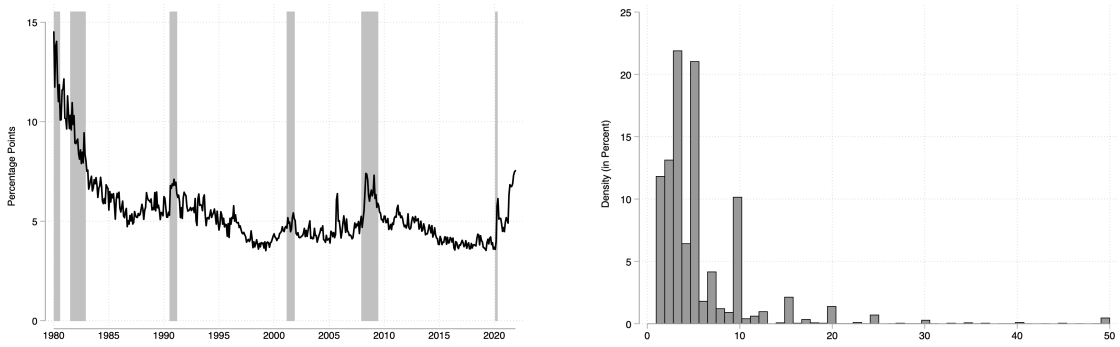
We use two measures of expectations from MSC - a qualitative measure describing households expectations about future business condition, and a quantitative measure of inflation expectations. Let us start by examining the qualitative measure first. While MSC offers several qualitative measures of different kinds of expectations, as well as a composite measure, we pick the one that asks about business conditions in order to get as close to our Gallup's Expectation Index as possible. [9] Specifically, the survey asks:

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?

Similar to Gallup, participants can pick one of the following three choices - good times, uncertain, or bad times. Here also, the proportion of people answering 'uncertain' is very

[9] For robustness, we also check our results using the Index of Consumer Expectations, which is a composite index offered by MSC. We get similar results, which are reported in the appendix.

Figure 3: 12-Month Ahead Inflation Expectations



(a) Time-Series (b) Distribution

low, so we drop them from our sample, and we are once again left with a binary index that is qualitatively similar to Gallup's *Expectation Index.* Changes in this index can also be interpreted in a similar way - an increase denotes a rise in optimism, whereas a decrease denotes a fall in optimism or a rise in pessimism. Our sample period covers the period from January 1980 to November 2021. [10]

The second measure of expectations we use is a quantitative one: MSC's inflation expectations. Specifically, we use the following question from the survey:

"*By about what percent do you expect prices to go up/down on the average, during the next 12 months?*"

This question gives us point estimates of households' inflation expectations. Respondents are asked to report a number from 0 to 100. We test our results using this quantitative measure, in addition to the qualitative expectations described above. Figure 3a shows the evolution of inflation expectations. Inflation expectations were very high in the early 1980s, which is also the time when actual inflation was very high in the US. Expectations declined rapidly as realized inflation came down, and they have been more or less stable since then. However, during certain episodes, particularly around the time of recessions, inflation expectations have gone up. Figure 3b reports the distribution of inflation expectations. While there are some outliers, most of the distribution lies in the 0 to 10% range. Appendix Table 5b provides summary statistics for both our expectation measures.

[10] Although the survey started in 1978, for the first two years, we only have data on the week in which participants were interviewed, not the date. Moreover, while there is monthly data available after 2021, interview dates are only available till November 2021, which is why our sample ends there.

2.3 Bloomberg's US Economic Calendar

Bloomberg's US Economic Calendar reports data for all major macroeconomic announcements,[11] as well as the average ex ante median forecast of professional forecasters, called the Consensus Forecast. Before every macroeconomic announcement, Bloomberg surveys economists and asks them what they expect to see in the upcoming announcement. For this paper, we focus on four variables of policy relevance: unemployment rate, output as measured by GDP growth (Advance), inflation as measured by the month-on-month consumer price index (CPI) and housing starts. New data for all variables is released every month, except for GDP, which is released quarterly. Table **??** in the Appendix reports the basic summary statistics related to these variables.

3 A Model of Expectation Formation

To determine which macro variables are important to households in their expectation formation process, we look at when new information on these variables is released and investigate whether expectations adjust in response to that information. To do this, we need to know how much of the information released during macroeconomic announcements is new to households, i.e., we need a measure of *shock* to households' information set. Since the true expectation formation process is unknown, finding a shock becomes challenging. To address this problem, we develop a model of expectation formation and examine how macroeconomic announcements feature in it.

3.1 Households' Expectations Formation Process

Consider a macroeconomic announcement X_t that occurs on date t. Let Z denote some fundamental of the economy based on which households form expectations about the future. Once the announcement is made, household expectations can be written as:

$$E_t[Z] = p \cdot g(X_t) + (1-p) \cdot h(\psi_t)$$

where ψ_t contains all information aside from the announcement that is available to agents for forming expectations. The parameter p indicates the weight that households give to the announcement in their belief formation process. Household expectations before the announcement is made can similarly be written as:

$$\begin{aligned} E_{t-1}[Z] &= E_{t-1}[E_t[Z]|X_{t-1}, \psi_{t-1}] \\ &= E_{t-1}[p \cdot g(X_t) + (1-p) \cdot h(\psi_t)|X_{t-1}, \psi_{t-1}] \\ &= p \cdot E_{t-1}[g(X_t)] + (1-p) \cdot E_{t-1}[h(\psi_t)] \end{aligned}$$

[11] Bloomberg also reports any revisions to the actual releases. However, we only look at the initial reported data point, since that captures new information released during the announcement.

where the first equality follows from the Law of Iterated Expectations. Since we have daily data on expectations, we will restrict our attention to comparing expectations right after the announcement with expectations just before.

$$E_t[Z] - E_{t-1}[Z] = p \cdot [g(X_t) - E_{t-1}[g(X_t)]] + (1-p) \cdot [h(\psi_t) - E_{t-1}[h(\psi_t)]] \tag{1}$$

A strong identifying assumption would be that the only new information households have between day t and $t-1$ is what is provided in the announcement. This implies that $\psi_t = \psi_{t-1} = \psi$. Thus, $E_{t-1}[h(\psi_t)] = E_{t-1}[h(\psi_{t-1})] = h(\psi_{t-1}) = h(\psi)$. So the change in expectations simplifies to:

$$\begin{aligned} E_t[Z] - E_{t-1}[Z] &= p \cdot [g(X_t) - E_{t-1}[g(X_t)]] + (1-p) \cdot [h(\psi) - h(\psi)] \\ &= p \cdot [g(X_t) - E_{t-1}[g(X_t)]] \end{aligned}$$

However, this is a much stronger assumption than what we need. We only need that no other information is released systematically with an announcement i.e. $cov[g(X_t), h(\psi_t)] = 0$. This implies that $cov[g(X_t) - E_{t-1}[g(X_t)], h(\psi_t) - E_{t-1}[h(\psi_t)]] = 0$, which is the standard OLS assumption. We assume that g is a linear function of the form $g(X_t) = aX_t + b$. Equation 1 thus becomes:

$$E_t[Z] - E_{t-1}[Z] = p \cdot a \cdot [X_t - E_{t-1}[X_t]] + (1-p) \cdot [h(\psi_t) - E_{t-1}[h(\psi_t)]]$$

a allows us to build in under-reaction or over-reaction into our expectation formation process. For our purposes, we will assume $a = 1$. Hence, we get the following regression equation:

$$E_t[Z] - E_{t-1}[Z] = \alpha + \beta \cdot ShockX_t + \epsilon_t \tag{2}$$

where $ShockX_t = X_t - E_{t-1}[X_t]$ and $\epsilon_t = (1-p) \cdot [h(\psi_t) - E_{t-1}[h(\psi_t)]]$. $ShockX_t$ is just the difference between the actual value of the variable released in the announcement and households' forecast of it. Our identification assumption can be written as $cov(ShockX_t, \epsilon_t) = 0$, which is the standard OLS assumption. The change in households' expectations due to the macroeconomic announcement depends on the difference between the information released in the announcement and households' forecast of it, denoted by $ShockX_t$.

3.2 Sophisticated versus Naive Households

We posit that households' forecasts are a combination of backward looking variables and forward looking expectations:

$$E_{t-1}[X_t] = (1-\omega)X_{t-1} + \omega \mathbb{E}_{t-1}[X_t] \tag{3}$$

where X_{t-1} is the value of the macroeconomic variable in the previous period, and $\mathbb{E}_{t-1}[X_t]$ is the full information forecast of X_t at time $t-1$. Since we cannot observe households' forecasts directly, we analyze two extreme cases - when the forecast is fully backward looking, and when it is fully forward looking. Looking at these two extremes will help us get a range of households' forecasts.

First, we consider the case of naive households. Since households know X_{t-1} when making their forecast about X_t, we assume that they cannot do any worse in their prediction. Thus the naive forecast of X_t is simply the value of the macroeconomic variable from the previous announcement, X_{t-1}. Naive households do not make use of any new information between two announcements of the same variable to update their beliefs. Their forecast is entirely backward looking, i.e. $\omega = 0$. The unanticipated part of current announcement in then given by:

$$\begin{aligned} ShockX_t &= X_t - E_{t-1}[X_t] \\ &= X_t - X_{t-1} \end{aligned}$$

Thus in this case, the shock from the announcement is measured simply by the difference the value of the macroeconomic variable in the current announcement to the previous.

On the other extreme, consider the case of sophisticated households. These households use all the information available to them to make their forecast. Thus in this case, we consider that household forecasts are the same as that of professional forecasters, which we take to be our benchmark full information forecast. For these households, $\omega = 1$. The unanticipated part of current announcement in this case is then given by:

$$\begin{aligned} ShockX_t &= X_t - E_{t-1}[X_t] \\ &= X_t - \mathbb{E}_{t-1}[X_t] \\ &= X_t - E^{PF}_{t-1}[X_t] \\ &= SurpriseX_t \end{aligned}$$

where $E^{PF}_{t-1}[X_t]$ is professional forecasters' forecast of X_t before the announcement. This is commonly known in the literature as a *Surprise* (Gürkaynak et al. (2005)). Households' expectations in this case can only be affected by the information they were not able to predict. This is the standard rational expectations formulation.

In reality, households' forecasts probably lie somewhere between these two extremes. Analyzing these two cases helps us provide a bound on the true response of household expectations to new macroeconomic information.

4 Empirical Strategy

With our model of expectations formation in hand, analyzing which macroeconomic variables affect household expectations is now straightforward. Following Gürkaynak et al. (2005) and Mertens et al. (2020), we propose that if we estimate the change in expectations within a narrow window around the release date of a macroeconomic announcement, then we can assign a causal claim to it. In other words, by choosing a tight window, we assume that the only event occurring in that time frame is the macroeconomic announcement, and therefore any change in expectations in this window must be due to the announcement.[12]

To be precise, let the announcement occur on day t. We then consider the change in household expectations in the window $[t-1, t+h]$, where h denotes days from t. Since people may take some time to update their expectations, we vary the horizon h from one to five days. Let $E_t^i[Z]$ denote expectations of individual i on day t and $ShockX_t$ denote the shock coming from new information in the announcement. Then, following Jordà (2005), the effect of the announcement on expectations can be estimated using the following local projection:

$$E_{t+h}^i[Z] - \bar{E}_{t-1}[Z] = \alpha_h + \beta_h \cdot ShockX_t + D_{t+h}^i + \epsilon_{th}^i \tag{4}$$

This follows from Equation 2. D_t^i denotes demographic characteristics of person i at time t and include age, education, income, gender, occupation, job status and, state of residence. Note that since the Gallup poll is not a panel survey, we cannot track expectations of the same person over time. Thus, we average expectations for day $t-1$ and subtract them. Since Gallup is representative at the daily level, $\bar{E}_{t-1}[Z]$ denotes the expectations for a representative agent. We also match on observables and subtract those expectations, in order to get close to the true expectations of person i at time $t-1$. Our results remain unchanged, so in the rest of the paper, we subtract the representative agent's expectations.

Although we do not observe the time at which a person is surveyed, Gallup only surveys people after 5 pm on weekdays. Since most announcements come out early in the morning, we feel that it is safe to include responses obtained on day t as coming after the announcement.[13] Our results, however, remain robust to the exclusion of day t.

It is also important to talk about the timeline of macroeconomic releases. The BLS jobs report is the first major macroeconomic release of every month, and it is released on the first Friday of every month. It is followed by CPI, which comes out in the middle of the month. Next is the housing report, which is released between the 15th and 20th of every

[12] We check for overlaps of major events with macroeconomic releases and omit the days where any overlap occurs.

[13] The survey occurs from 11 am on weekends, but no announcements are made on weekends.

month. Finally, the GDP report is released between the 27th and the last day of every month.

Since we use the timing of announcements for identification, it is crucial that our release dates not clash with other announcements. For this reason, we do not look at the Index of Industrial Production (IIP) because it is often released very close to the housing report. A similar issue is present with the BLS jobs report, which comes out on the first Friday of every month. It is preceded by the jobless claims numbers that are released every Thursday. Furthermore, ADP Research Institute also usually releases its employment report on the first Wednesday of every month. It could thus be argued that the correct prior to look at for the unemployment rate would be Tuesday, since Wednesday to Friday are filled with new information regarding the labor market. Appendix table # looks at this case and finds the results to be robust.

We are using unemployment to proxy for BLS's jobs report. However, several data is released in the jobs report, such as labor force participation, non-farm payroll etc. While labor force participation tends to be acyclical, non-farm payroll is very procyclical and could be another candidate with which to proxy the jobs report. However, ADP Research Institute also releases numbers on non-farm payroll in its report, which is highly correlated with the non-farm numbers in the BLS's report. Since ADP's report comes out before BLS's jobs report, we consider that non-farm payroll numbers are not actually new data and would already be incorporated in household's expectations at day $t-1$ prior to the jobs report. Therefore, we use unemployment rate to proxy the BLS's jobs report, not non-farm payroll.

The shock to information coming from macroeconomic announcements will vary depending on which case we consider. In section 3.2, we showed that in the case of sophisticated households, only unanticipated changes in the announcement can influence expectations. Since households are utilizing all available information to make their forecast, we assume that their forecast is the same as that of professional forecasters, which we take to be the benchmark. This is also consistent with Carroll (2003), who shows that household expectations derive from news reports about the views of professional forecasters. We utilize data from Bloomberg's Consensus Forecast to get information on professional forecasters' expectations. Before every announcement, Bloomberg asks experts what they think will occur in the upcoming announcement. Following Gürkaynak et al. (2005), we define:

$$SurpriseX_t = X_t - E^{PF}_{t-1}(X_t)$$

where X_t is the announcement that comes out on date t, and $E^{PF}_{t-1}(X_t)$ is the forecast of announcement X_t made using information at time $t-1$ by professional forecasters. $Surprise_t$ thus gives a measure of the unanticipated component of every announcement. Since households have the same forecast as experts, $Surprise_t$ serves as our measure of shock to households' information set.

In the case when households are naive, households predict that the macroeconomic variable will take the same value that it had in the previous announcement. The shock in this case will be given by the difference in the value of the variable from this announcement to the previous. Therefore, the unanticipated component of each macroeconomic announcement can be summarized as follows:

$$ShockX_t = \begin{cases} \Delta X_t & \text{if naive} \\ SurpriseX_t & \text{if sophisticated} \end{cases}$$

5 Results

We now move on to estimate Equation 4 for both sophisticated and naive households for Gallup data. We will then explore whether positive and negative shocks affect household expectations differently. Next, we will move on to the Michigan survey. We will perform the same exercise that we did for Gallup by estimating the baseline response and response to asymmetric shocks. We will then make use of the longer time period of MSC to study how the response of expectations depends on the co-movement between unemployment and inflation.

5.1 Gallup Daily Tracking Poll

5.1.1 Baseline Results

We estimate a local projection as given in Equation 4 to study whether household expectations respond to macroeconomic variables by using their announcements to identify shocks to the variables. We identify the effect of an announcement that comes out on day t by comparing the change in expectations the day before the announcement to the day after. The use of narrow windows allows us to give a causal interpretation to the coefficient. We vary the horizon to look at up to five days after the announcement in the regression tables, and up to twenty five days in the impulse responses (see appendix). This allows time for households to update their expectations in response to new information. However, the broader the window becomes, the less precise the estimate will be, because there is a greater chance that households could be exposed to other new information during a longer time period.

Sophisticated Expectations Process. Panel A in Table 1 presents our primary results from Equation 4. The columns denote the number of days from t (i.e., from when the announcement came out). Hence the dependent variable in column 1 is the change in expectations between day t and $t-1$, in column 2 is the change in expectations between

Table 1: Response of Household Expectations to Macroeconomic Announcements

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Panel A: Sophisticated Households						
Surprise(Unemp)	-0.568*	-0.565*	-0.642*	-0.377	-0.170	-0.578*
	(0.298)	(0.316)	(0.341)	(0.299)	(0.300)	(0.313)
Surprise(CPI)	0.434	-0.168	0.391	-0.123	-0.419	0.111
	(0.290)	(0.306)	(0.308)	(0.282)	(0.288)	(0.295)
Surprise(GDP)	0.168	0.427	0.252	0.690**	-0.0763	0.189
	(0.324)	(0.325)	(0.324)	(0.323)	(0.341)	(0.327)
Surprise(Housing)	0.0147	-0.107	0.115	0.650**	-0.216	0.749**
	(0.321)	(0.331)	(0.331)	(0.328)	(0.343)	(0.337)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)$	-0.790***	-0.640**	-0.951***	-0.392	-0.184	-0.591*
	(0.300)	(0.315)	(0.329)	(0.305)	(0.303)	(0.307)
$\Delta(CPI)$	0.0657	-0.0737	0.663**	0.308	0.666**	0.157
	(0.288)	(0.293)	(0.294)	(0.289)	(0.294)	(0.296)
$\Delta(GDP)$	0.787**	0.817**	0.625*	0.963***	0.397	0.204
	(0.343)	(0.345)	(0.351)	(0.344)	(0.352)	(0.356)
$\Delta(Housing)$	-0.484	-0.339	-0.167	0.571*	-0.131	0.378
	(0.337)	(0.352)	(0.350)	(0.343)	(0.344)	(0.349)

This table reports estimates of β_h from Equation 4. Standard errors are presented in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

day $t+1$ and $t-1$, and so on. Each cell is a separate regression.[14] In the case when households' expectations process is sophisticated, we find that expectations respond negatively to unanticipated changes in the unemployment rate, but not to other variables. A one standard deviation surprise in unemployment causes our *Expectations Index* to

[14]We have combined all regressions into one table for ease of viewing. Individual regressions can be found in the Appendix Tables 7a and 7b.

decline by 0.5%. In other words, a one standard deviation surprise in the unemployment rate causes the proportion of people who were optimistic about the future to decline by 0.5%. By the Law of Large Numbers, this implies that the probability that one agent was optimistic about the economy declined by 0.5%.

In Appendix Figure 5, we plot the dynamic response of household expectations over time by plotting the impulse response functions for three weeks after the announcement. We report 90% confidence intervals. Sophisticated households respond the most to unanticipated changes in unemployment rate, and household expectations keep worsening for about a week from the time of the announcement. In contrast, for other variables, expectations do not respond on impact nor is there any dynamic impact. There is a mild response to housing on days 3 and 5, but it is not persistent. Unanticipated shocks from output growth, inflation, and housing starts do not change household expectations over time in any significant manner.

Our results indicate that households consider the unemployment rate an important indicator in their expectation formation process. The fact that households give importance to the labor market while forming expectations is not surprising, since labor income is the largest component of total income for most households. In addition, being unemployed has huge negative effects on the health and well-being of households (Sullivan & Von Wachter 2009, Blanchflower & Oswald 2004, Lucas et al. 2004, Michaillat & Saez 2021). Carbone & Hey (2004) and Saporta-Eksten (2014) show that changes in labor markets influence households' decisions. It is therefore not surprising that the labor market influences household expectations about the economy as well.

Interestingly, households do not adjust their expectations in response to unanticipated changes in any of the other variables, including output, inflation, and housing. The fact that households do not respond to unanticipated movements in inflation is consistent with Andrade et al. (2020). Furthermore, it must be noted that our sample period from 2008 to 2017 was mostly a period of low inflation, which might also contribute to the non-response of household expectations.

Naive Expectations Process. We now consider the case of naive households. In this scenario, once an announcement is made, households update their beliefs to that value, which anchors their beliefs until a new announcement is made. Thus, our measure of shock to households' information is the difference between the value of the macroeconomic variable in this announcement and the value in the previous one; that is, $ShockX_t = \Delta X_t = X_t - X_{t-1}$. We follow the same high frequency–local projection approach outlined in the previous section and estimate Equation 4 with the shock being ΔX_t. Once again, we vary the horizon h to look at up to five days after the announcement in the regression table, and up to twenty five days in the impulse responses.

Panel B in Table 1 reports the response of naive household expectations to new information on macroeconomic variables. We find that naive households update their expectations in a statistically significant way to changes in the unemployment rate and output growth, but not to changes in other variables. A one standard deviation increase in the unemployment rate causes the share of optimists in the economy to decline by 0.79%, whereas a one standard deviation increase in GDP growth rate (Advance) causes the share of optimists to increase by 0.787%.

In Appendix Figure 6, we plot the dynamic response of household expectations over time by plotting the impulse response functions. Analogous to the case of sophisticated households, naive households also respond most to shocks in the unemployment rate. Once again, output growth and inflation do not respond on impact nor do they have any dynamic effects on household expectations. There are small effects on housing but they are not consistent.

For unemployment, the coefficient -0.79 in the naive case is larger in magnitude than the coefficient in the sophisticated case (-0.568). Since these two cases provide bounds, we can conclude that the true decrease in optimism about the future (taking into account the confidence intervals) after the unemployment announcement is between $[-0.37\%, -1.1\%]$.[15] Similarly, after the GDP announcement, expectations will change between $(-0.16, 1.1)$. Since this interval contains zero, we cannot conclude that the GDP announcement has a significant effect on household expectations. Thus, it is only shocks to unemployment that affect household expectations.

5.1.2 Asymmetry

So far, we have looked at the response of household expectations to aggregate shocks. However, shocks in opposing directions could have different effects since they signify different information. Thus, it is possible that by reporting the net effect, we are missing out on differential movements caused by these shocks. To rectify this, we separate announcements into two categories: those with positive shocks and those with negative shocks. We estimate two separate regressions:

$$E^i_{t+h}[Z] - \bar{E}_{t-1}[Z] = \alpha_{1h} + \beta_{1h} \times (ShockX_t | ShockX_t > 0) + D^i_{1t+h} + \epsilon_{1th} \quad (5)$$

$$E^i_{t+h}[Z] - \bar{E}_{t-1}[Z] = \alpha_{2h} + +\beta_{2h} \times (ShockX_t | ShockX_t < 0) + D^i_{2t+h} + \epsilon_{2th} \quad (6)$$

where t is the day of the announcement, h indicates days from t, E_τ indicates expectations formed by person i on day τ, D^i_{t+h} denotes demographic information for person i, and

[15] The confidence interval in the sophisticated case is $(-0.37, -0.87)$, and the confidence interval in the naive case is $(-1.1, -0.5)$.

$ShockX_t$ denotes the shock to households' information set. The value of $ShockX_t$ will, of course, be different in our two cases. In the sophisticated case, $ShockX_t = SurpriseX_t$. A positive (negative) surprise means that the actual value of the macroeconomic variable turned out to be higher (lower) than forecasted.[16] In the naive case, $ShockX_t = \Delta X_t$. So a positive (negative) shock now means that the variable increased (decreased) in value from this announcement to the last.

Given that our baseline results suggest a large role of unemployment in affecting expectations, we focus our attention on the unemployment announcement in this section. However, given the pervasiveness of inflation and it's affect on household expectations in the literature, we will continue studying the inflation announcement as well. Table 2 reports the results for asymmetric response of household expectations. Panel A report results for sophisticated households, while panel B reports results for naive households. We find that positive shocks to unemployment affect household expectations much more than negative shocks. Note that a positive shock to unemployment (i.e., when unemployment is higher than anticipated) indicates a worsening of economic conditions, whereas a negative shock to unemployment indicates an improvement of economic conditions. We find that households respond asymmetrically: they become pessimistic upon receiving information indicating worsening economic outcomes, but do not necessarily turn optimistic upon receiving information indicating improving economic outcomes. The coefficient for a positive shock is also much larger than the coefficient for a negative shock in both the sophisticated and naive cases. These results are not surprising, especially when we consider that unemployment has been declining since the Great Recession and a higher than expected unemployment rate has been associated with a recession.

Turning now to CPI, we observe that in the case of sophisticated households, only positive surprises have an effect on household expectations. However, in the case of naive households, both positive and negative shocks influence expectations, and in fact, negative shocks continue affecting expectations even five days after the announcement. Again, given that GDTP spans the decade after the 2008 recession, which is a time when inflation is low and mostly falling, it makes sense to see a greater effect on negative shocks.

5.1.3 Expanding to the Michigan Survey of Consumers

Estimates from the Gallup survey reveal that households respond primarily to unemployment announcements, regardless of whether they are sophisticated or naive in their forecasts, but not necessarily to CPI announcements. This finding is particularly striking, given that most of the literature as well as conventional macroeconomic models focus predominantly on inflation expectations. We identify two threats to external validity- i)

[16] Note that a positive surprise might imply different things for different variables. For example, a positive surprise in unemployment indicates a worsening of the economy, whereas a positive surprise in GDP growth implies an improvement in the economy.

there is something specific about the time period of the Gallup survey that is giving these results (for example, inflation was not a concern in this decade), and ii) our measure of expectations is a qualitative sentiment based index, and is not nuanced enough to capture changes due to other macroeconomic variables. To address both of these, we move to the Michigan survey.

Table 2: Asymmetric Response of Household Expectations to Macroeconomic Announcements

Panel A: Sophisticated Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\text{Surp(U)}_t > 0$	-0.466	-1.369**	-0.792	-0.0541	0.246	-0.160
	(0.588)	(0.571)	(0.578)	(0.562)	(0.568)	(0.583)
$\text{Surp(U)}_t < 0$	-0.0591	0.271	-0.642	-1.485**	-0.525	-1.344*
	(0.727)	(0.797)	(0.942)	(0.739)	(0.717)	(0.747)
$\text{Surp(CPI)}_t > 0$	0.954**	0.330	1.029**	0.402	-0.0827	0.775*
	(0.459)	(0.510)	(0.523)	(0.446)	(0.449)	(0.451)
$\text{Surp(CPI)}_t < 0$	0.101	-0.701	-0.0420	-0.669	-1.083***	-0.235
	(0.430)	(0.436)	(0.434)	(0.410)	(0.419)	(0.428)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)_t > 0$	-1.221**	-1.803***	-2.277***	-0.721	-0.435	-0.652
	(0.524)	(0.526)	(0.501)	(0.516)	(0.503)	(0.508)
$\Delta(Unemp)_t < 0$	0.631	2.544**	1.870	-1.039	0.701	-1.478
	(1.037)	(1.097)	(1.224)	(1.153)	(1.066)	(1.104)
$\Delta(CPI)_t > 0$	-1.408**	-1.874***	0.0419	-0.928	-0.0950	-0.0548
	(0.627)	(0.662)	(0.675)	(0.636)	(0.638)	(0.636)
$\Delta(CPI)_t < 0$	1.679***	0.857	3.078***	1.853***	1.177*	1.580**
	(0.609)	(0.620)	(0.606)	(0.585)	(0.602)	(0.616)

This table reports the estimates of β_{lh} from Equations 5 and 6. Here, β_{lh} is change in the expectations of due to positive or negative shock in the BLS jobs report, in the window $[t-1, t+h]$ where t is the day of the announcement and $h = 0, 1, 2, 3, 4$.Standard errors are presented in parentheses. *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

While GDTP provides a clean identification of how households respond to economic news, the sample covers only the decade after the Great Recession, limiting the scope of our analysis. To validate our findings over a longer period and further explore the nuances of household expectations, we turn to microdata from the Michigan Survey of Consumers (MSC), which spans from 1980 to 2019. Our use of the MSC microdata serves two key purposes: (1) to ensure that the household response estimates from the Gallup survey are not merely a function of the sample period, and (2) to extend the analysis beyond the traditional focus on inflation expectations and CPI announcements by examining how household expectations respond to news about unemployment. Given our baseline findings that household expectations react more strongly to labor market conditions, it is essential to assess their responses under different scenarios, including the co-movement of inflation and unemployment, periods of high and low inflation and unemployment, and positive versus negative economic shocks. The following sections address these objectives in detail, shedding light on the factors driving household expectations.

Estimates from the Gallup survey reveal that households respond primarily to unemployment announcements, regardless of whether they are sophisticated or naive in their forecasts, but not necessarily to CPI announcements. This finding is particularly striking, given that most of the literature as well as conventional macroeconomic models focus predominantly on inflation expectations. We identify two threats to external validity of our results. The first threat comes from the possibility that is something specific about the time period of the Gallup survey (2008-2017) that is giving these results. For example, it could be that because inflation is pretty low in this period, households are not paying attention to it, and that is why shocks to inflation fail to influence household expectations. To ensure our results are not sensitive to time, we turn to the Michigan Survey of Consumers (MSC), which is the longest running survey of household expectations in the US.

The second threat to external vailidity comes from the fact that our measure of expectations in GDTP is a qualitative sentiment based index, and is not nuanced enough to capture changes due to other macroeconomic variables. We overcome this by using point estimates of households' inflation expectations from the MSC. Since inflation expectations is also a key variable in several macroeconomic models, it is important to study if it shows similar patterns as our qualitative indices/if it also reacts to the labor market/if our results go through with it.

Using MSC also has several other advantages. Since the data span almost forty years from 1980 to 2019 (we stop before the Covid-19 pandemic), it allows us to study the behavior of expectations in a wide array of economic conditions. The longer time frame of MSC also helps us in getting more power for our sub-sample regressions. GDTP contains twelve monthly announcements over ten years for a total of 120 announcements. To check for asymmetry, we needed to further divide these 120 announcements into two categories, which reduces the power of our regressions. MSC alleviates this issue to a large extent

because of the longer sample period.

5.2 Michigan Survey of Consumers

We follow York (2023) in using microdata from the Michigan Survey of Consumers (MSC) to create a daily cross section and re-estimate Equation 4. However, the number of survey respondents each day in MSC is usually low, since the survey has 500 households spread over one month. Therefore, to ensure that our statistical analysis has enough power, we create a seven day long window around each announcement date and examine whether expectations changed the week after the announcement compared to the week before. We report results for the first week in tables 3 and 4. We estimate the following local projection:

$$E^i_w[Z] - \bar{E}_{w-1}[Z] = \alpha_w + \beta_w \cdot ShockX_t + D^i_w + \epsilon^i_{tw} \tag{7}$$

where t is the day of the announcement, $w = [t, t+6]$ i.e. w indicates the week (seven days) after the announcement, $w-1$ indicates the week (seven days) before the announcement, E^i_τ indicates expectations formed by person i on week τ, D^i_τ denotes demographic information for person i surveyed in week τ, and $ShockX_t$ denotes the shock to households' information set. Similar to Gallup, since Michigan is also not a panel at the daily level, we take the average expectations in the week preceding the announcement and subtract those from person i's expectation. We use the same two measures of shocks to households that we have been using so far. In the sophisticated case, $ShockX_t = SurpriseX_t$.[17] In the naive case, $ShockX_t = \Delta X_t$.[18]

We consider two measures of expectations from MSC. The first is the fraction of optimists, calculated from the question on expectations abut 12-month ahead general business conditions in the economy. This is comparable to the GDTP share of optimists. For our second measure of expectations, we use point estimates of 12-month ahead inflation expectations. Since inflation expectations are by far the most popular measure of expectations in the literature, we focus on them to try and study whether our results carry over to them or not.

5.2.1 Business Conditions in the Country as a Whole

To be able to compare our results with GDTP, we start by studying Michigan's business condition index. Similar to Gallup, this index denotes the share of people who are optimistic about future business conditions. An increase in the value of the index indicates that

[17] Bloomberg Consensus Forecast, which we use to calculate our shock in the case of sophisticated households, is only available post 1997.

[18] To calculate the shock in the case of naive households, we have used data on the initial release of each announcement. However, we don't have information on initial releases for the older time series (pre-1996). Therefore, we use the final revised data to calculate our naive shock so that we can have the series starting all the way from 1980. Usually the revisions are minor, and we don't expect this to affect our results in a significant way. We do robustness by checking the effect of initial releases post 1997, and find similar results.

more people are becoming optimistic, whereas a decrease indicates that fewer people are optimistic or more people are pessimistic. Panel A of table 3 reports the results for sophisticated households.[19] Column 1 reports results around the unemployment announcement and column 2 reports results around the CPI announcement. Panel A reports results for sophisticated households. Our baseline result is that shocks to both unemployment and CPI affect household expectations, but shocks to CPI have a larger effect, in line with conventional wisdom. This relationship, however, breaks down once we consider positive and negative shocks separately. We find that positive surprises affect expectations more than negative surprises. A positive surprise occurs when the value of the macroeconomic variable as released in the announcement turns out to be larger than expected. Households interpret this as bad news in the case of unemployment and inflation, and decrease their expectations. We also observe that shocks to unemployment cause larger movements in household expectations than shocks to CPI, which is consistent with the results in GDTP. Panel B reports results assuming that households are naive. In the baseline, we find that changes in unemployment have a larger effect on household expectation than changes in CPI announcement. Looking at asymmetry, we once again find that positive changes (i.e. an increase in the variable from last period) have bigger effects than negative changes. Focusing on positive changes, we find an increase in unemployment affects household expectations more than an increase in CPI. However, the reverse is true for negative shocks. This makes sense because in most of our sample, inflation was very low, and in fact, there were even fears of deflation during some years.

5.2.2 Inflation Expectations

Next, we move on to studying the effects of a quantitative measure of expectations - the twelve month ahead inflation expectations. Inflation expectations feed into a lot of macroeconomic models, so it is important to study them and see if they behave similarly to qualitative measures of expectations.

In Table 4, we present the response of households' 12-month-ahead inflation expectations to macroeconomic announcements. Panel A presents results for sophisticated households while panel B presents results for naive households. We find similar results to the qualitative measures in MSC and GDTP. In the baseline, in the sophisticated case, inflation expectations are only significantly affected by the unemployment announcement, not by the CPI announcement. In the naive case, expectations respond to both announcements. Looking at asymmetry, we once again find that positive shocks have a much larger effect than negative shocks. For sophisticated households, only the positive shocks significantly affect inflation expectations, and even here, unemployment affects inflation expectations

[19] Note that although we have data until 2021, we are currently reporting results for the pre-Covid-19 period. That is because the Covid-19 pandemic was a huge shock (with standard deviation 13 times higher than average), and including it biases the results. We present results including the Covid-19 period in the appendix.

Table 3: Response of Business Conditions Index to Macroeconomic Announcements

y_t = Business Outlook		X_t = U (1)	X_t =CPI (2)
Panel A: Sophisticated Households 1997-2019			
Baseline	Surp X_t	-1.2***	-1.6***
		(0.32)	(0.41)
Asymmetry	Surp $X_t > 0$	-13***	-6.5***
		(1.27)	(1.22)
	Surp $X_t < 0$	-0.8	0.6
		(0.84)	(1.34)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	-3.8***	-1*
		(1.07)	(1.05)
	$\Delta U < 0, \Delta\pi < 0$	2.7***	-3.5***
		(0.96)	(1.11)
	$\Delta U > 0, \Delta\pi < 0$	-4.4**	-0.4
		(1.41)	(0.91)
	$\Delta U < 0, \Delta\pi > 0$	3.9***	-2.8***
		(1.14)	(0.94)
Panel B: Naive Households 1980-2019			
Baseline	Change X_t	-5***	-1.7***
		(0.24)	(0.32)
Asymmetry	Change $X_t > 0$	-7***	-8***
		(0.45)	(0.62)
	Change $X_t < 0$	-2.3***	4***
		(0.64)	(0.47)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	-17***	0.5
		(0.94)	(0.56)
	$\Delta U < 0, \Delta\pi < 0$	-0.2	-3.5***
		(0.77)	(0.93)
	$\Delta U > 0, \Delta\pi < 0$	-5.7***	-3.2***
		(0.93)	(0.63)
	$\Delta U < 0, \Delta\pi > 0$	-6.1***	-2.8***
		(1.14)	(0.90)

This table reports estimates of β_h from Equation 7. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

more than CPI. In the naive case, inflation expectations respond to both positive and negative shocks to unemployment, but only to positive shocks to CPI. The response to unemployment is also slightly larger than the response to CPI. These results show that unemployment is an important determinant of inflation expectations.

5.2.3 Supply versus Demand Shocks

Given that we have data for forty years from MSC, it is possible to divide the time period into sub-samples based on various episodes of co-movement of inflation and unemployment and study those separately. We look at four scenarios -(1) both unemployment and inflation[20] are increasing, (2) both are decreasing, (3) unemployment is increasing while inflation is decreasing, and (4) inflation is increasing while unemployment is decreasing. Appendix table 19 reports the proportion of occurrences of each scenario.

We can also interpret these scenarios as supply and demand shocks. Demand shocks typically move output and inflation in the same direction, which means they move unemployment and inflation in opposite directions. Supply shocks move output and inflation in opposite directions, implying they move unemployment and inflation in the same direction. Thus our first scenario of both unemployment and inflation increasing would correspond to a negative supply shock, and second scenario of both decreasing would correspond to a positive supply shock. Similarly, the third scenario of increasing unemployment with decreasing inflation would correspond to a negative demand shock, whereas the fourth would correspond to a positive demand shock. The section named *Scenarios* in both panels of table 3 and table 4 presents the results of this exercise.

We first examine the response of our business conditions index to these scenarios. When both unemployment and inflation increase, we find that both sophisticated and naive households react strongly to shocks to unemployment, with shocks to CPI having little or no significant effect. When both unemployment and inflation are decreasing, shocks to unemployment and the CPI have nearly the same effect for sophisticated households, but only shocks to the CPI have a significant effect for naive households. When unemployment and inflation move in the opposite direction, households place significantly more weight on shocks to unemployment in forming their expectations. Thinking in terms of supply and demand shocks, we find that the only case in which shocks to CPI matter more than shocks to unemployment is the case of positive supply shocks.

Turning to inflation expectations, we observe similar patterns. When both unemployment and inflation increase, we find that both sophisticated and naive households react strongly to shocks to unemployment, with shocks to CPI having little or no significant effect. In the second scenario, when both unemployment and inflation decrease, only unemployment has a significant effect, and that too only in the case of naive households. When unemployment

[20]We consider monthly change in unemployment and monthly change in inflation to create these scenarios.

Table 4: Response of 12 Month Ahead Inflation Expectations to Macroeconomic Announcements

$y_t = E_t\pi_{t+12}$		$X_t = \text{U}$ (1)	$X_t = \text{CPI}$ (2)
Panel A: Sophisticated Households 1997-2019			
Baseline	Surp X_t	0.1***	0.05
		(0.02)	(0.03)
Asymmetry	Surp $X_t > 0$	0.7***	0.3***
		(0.11)	(0.11)
	Surp $X_t < 0$	0.05	-0.07
		(0.06)	(0.11)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	0.3***	-0.02
		(0.09)	(0.09)
	$\Delta U < 0, \Delta\pi < 0$	-0.03	0.1
		(0.07)	(0.08)
	$\Delta U > 0, \Delta\pi < 0$	0.3**	0.02
		(0.11)	(0.08)
	$\Delta U < 0, \Delta\pi > 0$	-0.1	0.2**
		(0.08)	(0.07)
Panel B: Naive Households 1980-2022			
Baseline	Change X_t	0.2***	0.3***
		(0.03)	(0.04)
Asymmetry	Change $X_t > 0$	0.5***	0.6***
		(0.06)	(0.08)
	Change $X_t < 0$	-0.3***	0.04
		(0.07)	(0.05)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	0.6***	0.2***
		(0.13)	(0.07)
	$\Delta U < 0, \Delta\pi < 0$	-0.5***	0.05
		(0.09)	(0.08)
	$\Delta U > 0, \Delta\pi < 0$	0.7***	0.2***
		(0.12)	(0.07)
	$\Delta U < 0, \Delta\pi > 0$	0.1	0.5***
		(0.11)	(0.09)

This table reports estimates of β_h from Equation 7. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

is increasing while inflation is decreasing, we find that shocks to unemployment are the larger driver of inflation expectations. In the final case when unemployment is decreasing while inflation is increasing, both naive and sophisticated households only respond to shocks to CPI. Thinking in terms of supply and demand shocks, we find that here the only case in which shocks to CPI matter more than shocks to unemployment is the case of positive demand shocks.

Overall, these findings highlight the important role of news about unemployment in shaping household expectations, not only about the general economy but also about inflation. This suggests that labor market conditions are a crucial driver of household expectation formation, even in outcomes traditionally associated with inflation dynamics. We also find that shocks to CPI matter more than shocks to unemployment in the case of positive shocks (supply or demand).

5.3 Robustness and Additional Exercises

We conduct several robustness checks to ensure the validity of our results. This section provides a summary of these exercises, with further details available in the appendix. One potential concern is that the timing of announcements may be driving our findings, particularly because the BLS employment situation report is typically released on the first Friday of each month. If households update their expectations primarily based on the first major announcement of the month, our observed effects could simply reflect this sequencing rather than the specific impact of the employment report itself. To address this concern, we adjust our analysis for subsequent announcements, such as the CPI release, by computing the change in expectations as $E^i_{t+h}[Z] - \bar{E}^{first}_{t-1}[Z]$, where $\bar{E}^{first}_{t-1}[Z]$ is the average expectations before the employment situation release each month. This exercise allows us to calculate changes in expectation around each release relative to the expectations set before the first announcement of the month. Our results are robust to this exercise which indicates that our estimates are not driven by the sequencing of macroeconomic news. A closely related exercise analysis examines the BLS announcement window. While the BLS typically releases its employment report on the first Friday of each month, other relevant labor market indicators, such as the ADP employment report and jobless claims data, are released earlier in the same week—on Wednesday and Thursday, respectively. To account for potential information spillovers, we redefine the change in expectations for unemployment announcements as $E^i_{t+h}[Z] - \bar{E}^{Tuesday}_{t-1}[Z]$ where $\bar{E}^{Tuesday}_{t-1}[Z]$ represents the expectations prior to these early labor market releases. Our results remain robust under this specification; however, naive households exhibit a weaker response, suggesting that early announcements on non-farm payroll and jobless claims provide households with additional labor market information, thereby moderating their reaction to the BLS report.

Next, we perform several additional exercises and are highlighting some of these for brevity. Next, we consider several scenarios based on the absolute levels of unemployment and

inflation. We control for recessions since household sentiments might be more responsive in recessions and find that sophisticated households are more responsive during recessions while naive households are not.

We find that households respond more in times of high unemployment and inflation relative to when both of these are low. Additionally, we construct a synthetic panel by matching respondents based on demographic observables and analyze how expectations adjust within this panel. Our results remain robust across all these exercises, further reinforcing the validity of our findings.

Finally, we estimate our main empirical specification in the Survey of Consumer Expectations as well. We use the survey dates to create a daily time-series. We then use both measures of shocks to estimate the response of household expectations. Our results align with those from the GDTP and the MSC. We report these results in the Appendix.

Potential Mechanisms. Now that we have documented that labor market conditions, particularly shocks to unemployment, play a central role in influencing household expectations, it is also useful to think about potential channels that might be driving this behavior. Our results are consistent with Masolo (2022), who find that news about business cycle and labor market fluctuations are related, implying that people look at the labor market to infer movements in business conditions.

One possible explanation is that personal experiences and local economic conditions influence the extent to which households pay attention to labor markets. The GDTP allows us to observe whether respondents reside in counties with high or low local unemployment rates. We find that individuals living in counties with higher local unemployment are more sensitive to changes in the national unemployment rate. We further find that respondents residing in high local unemployment regions do not respond to shocks to CPI. These results are reported in Table 11. These results suggest that household expectations may be shaped by immediate economic environment, indicating an element of state-dependence at play which we do not discuss further in this paper and leave for future research.

6 Conclusion

In this paper, we analyze what information do households use to adjust their expectations about the economy as well as inflation. Using high-frequency data from the Gallup Daily Tracking Poll and the Michigan Survey of Consumers, we identify systematic patterns in expectation formation, revealing that labor market conditions, particularly shocks to unemployment, play a central role in influencing household expectations, often more so than shocks to inflation or other variables such as output growth and housing starts. We document that households respond more strongly to negative economic shocks than

to positive ones. Moreover, we find that even when inflation is increasing, unemployment remains the dominant factor in household adjustments to both general economic expectations and inflation expectations.

Our study makes several contributions. First, we develop a framework to isolate the unanticipated component of macroeconomic announcements, allowing us to provide bounds to the expectation adjustment process. Second, we show that labor market information is crucial not only for subjective economic expectations but also for inflation expectations. Third, even in periods of rising inflation and declining unemployment, shocks to unemployment significantly influence household expectations, highlighting the importance of labor market information in this process. Finally, we show that inflation expectations are primarily shaped by unemployment shocks, except in cases of positive supply or demand shocks, where shocks to the price level play a more dominant role.

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A Appendix

In this section we report several results from robustness checks as well as some statistics to better understand the data in our study.

A.0.1 Summary Statistics

Table 5a: General Summary Statistics

Variable	GDTP (1)	MSC (2)
Age	47 years	49 years
Female	51%	54%
Low Income	38%	43%
Middle Income	47%	33%
High Income	15%	25%
White	73%	NA
Black	12%	NA
$<$ High School	11%	4%
High School	35%	6%
Some College	31%	28%
N	1,705,158	277,160

This table records summary statistics for demographic variables for both GDTP and MSC. Survey weights used.

Table 5b: Summary Statistics: Expectations

Variable	Total Obs (1)	Mean (2)	Std. Dev. (3)	Frequency (4)
Michigan Survey of Consumers				
Index of Consumer Expectations (ICE)	277,160	79.8	45.8	Daily
12-month ahead Inflation Expectations	209,744	5.4	5.5	Daily
Fraction of Optimists	231,304	51.9	50.0	Daily
Change in Fraction of Optimists	12,227	-0.03	22	Daily
Gallup Daily Tracking Poll				
Fraction of Optimists	1,705,161	0.4	0.5	Daily
Change in Fraction of Optimists	3387	-0.009	3.8	Daily
Bloomberg Economic News (1996-2019)				
Surprise(Unemployment)	273	-0.03	0.14	Monthly
Surprise(CPI)	276	-0.01	0.12	Monthly
Surprise(Housing)	257	1.67	78.63	Monthly
Surprise (GDP)	84	0.01	0.71	Quarterly
Actual Economic Variables (1980-2019)				
Change(Unemployment)	480	-0.005	0.17	Monthly
Change(CPI)	480	0.38	0.47	Monthly
Change(Housing)	257	0.16	183	Monthly
Change (GDP)	84	-0.04	2.1	Quarterly

This table records summary statistics for key household expectations for both GDTP and MSC. We also report Surprises and Actual Variables from the Bloomberg Economic News Consensus Forecast. Actual news about Housing and GDP is reported from 1997-2019. Survey weights used.

A.1 Gallup

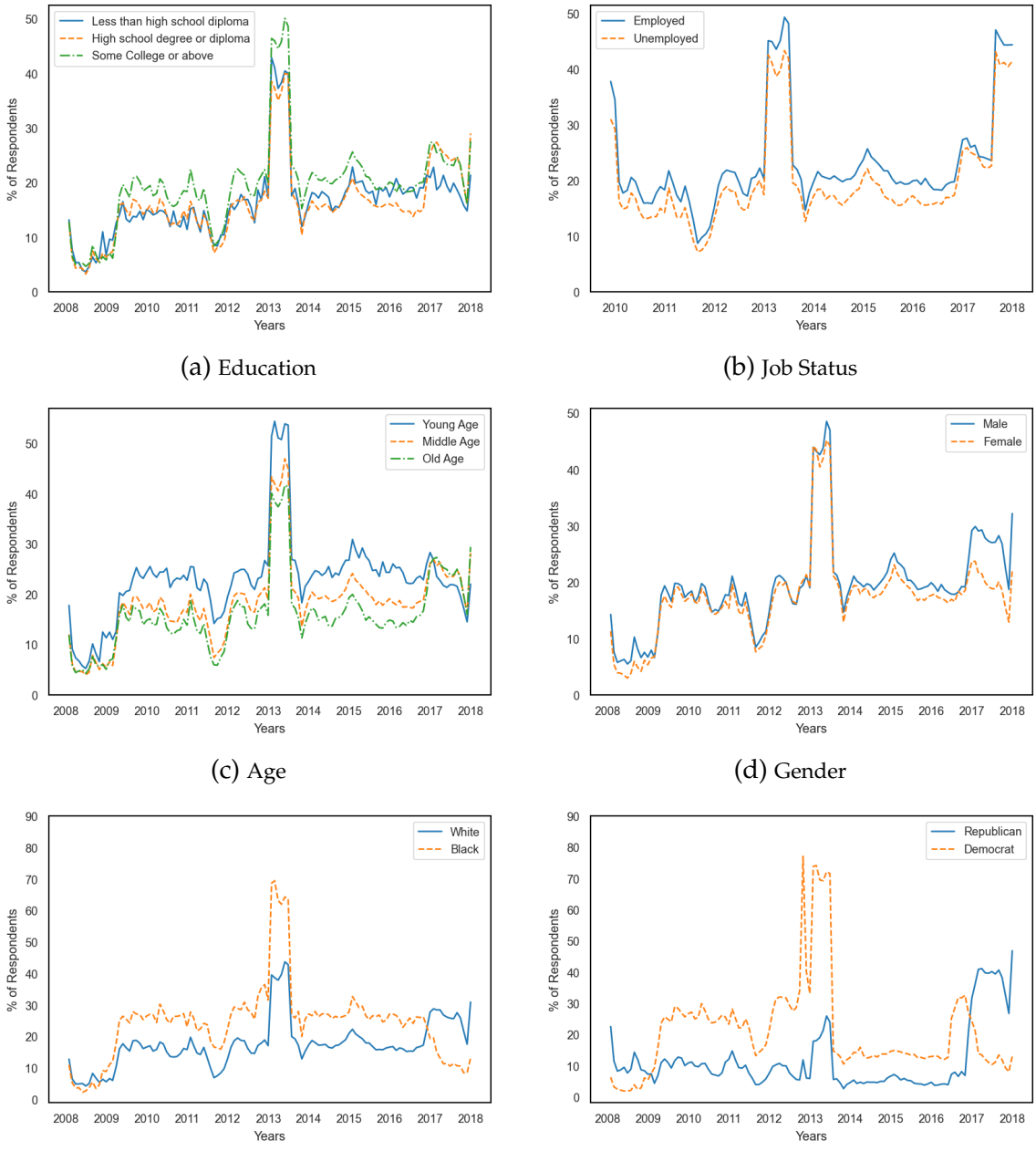
A.1.1 Heterogeneity in Household Expectations

We observe substantial heterogeneity in household expectations across demographic groups. In Figure 4a, we find that college graduates were systematically the most optimistic over time. This can be linked to job status, since college graduates tend to have the highest employment rates and thus tend to be consistently more optimistic than the unemployed (Figure 4b). Looking across age groups in Figure 4c, we find that younger respondents are consistently more optimistic than middle-aged and older respondents. While little difference in optimism exists across genders in most years (Figure 4d), there seems to be a sharp increase among men post 2016.

Interestingly, we find a reversal when looking at heterogeneity across political affiliation and race. As Figure 4f demonstrates, households' optimism is proportional to their party affiliation, and changes depending on the ruling party (Mian et al. 2021).[21] This reversal is also present when looking at heterogeneity by race (Figure 4e).[22]

[21] At the start of 2008, when the Republican party is in power, we observe that households affiliated with the Republican party are more optimistic than those affiliated with the Democratic party. In the 2008 elections, when the Democrats win, we see that expectations of households affiliated with them increase, while those of households affiliated with the Republicans decline. Democrats stay consistently more optimistic than Republicans after winning the 2012 election, but become pessimistic after losing in 2016.

[22] After the 2008 Presidential election when Barack Obama is elected as the first Black president of the United States, Black households become significantly more optimistic, even exceeding the proportion of white households who are optimistic. In contrast, after the 2016 election which brought Donald Trump to power, the reverse occurs and Black households become more pessimistic than White households.



(a) Education

(b) Job Status

(c) Age

(d) Gender

(e) Race

(f) Party Affiliation

Figure 4: Heterogeneity in Household Expectations

A.1.2 Major Events 2008-2017

Table 6: Change in Expectations Index around Major Events

Date	Event	E_{t+1} - E_{t-1}
15 Sep 2008	Lehman Bankruptcy	-0.22
4 Nov 2008	US Election 2008	0.27
25 Nov 2008	Quantitative Easing	-0.03
23 Mar 2010	Affordable Care Act	-0.06
9 Aug 2011	Forward Guidance	0.04
6 Nov 2012	US Election 2012	0.11
1-17 Oct 2013	Congress Shutdown	-0.13
Nov 2016	US Election 2016	0.05

A.1.3 Detailed Regression Tables for GDTP

Table 7a: Baseline: Sophisticated Households

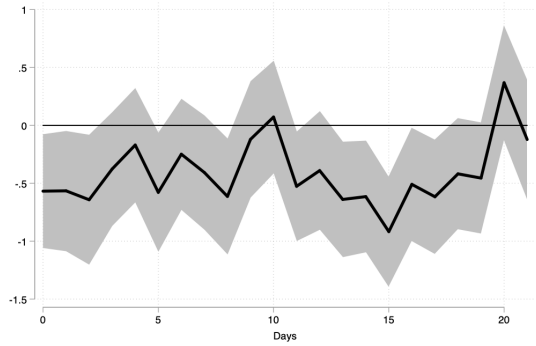
Panel A: Sophisticated Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Surprise(Unemp)	-0.568*	-0.565*	-0.642*	-0.377	-0.170	-0.578*
	(0.298)	(0.316)	(0.341)	(0.299)	(0.300)	(0.313)
Observations	33363	32657	30264	32826	33950	31544
R^2	0.051	0.049	0.045	0.052	0.049	0.048
Surprise(CPI)	0.434	-0.168	0.391	-0.123	-0.419	0.111
	(0.290)	(0.306)	(0.308)	(0.282)	(0.288)	(0.295)
Observations	32697	31409	31836	33342	33528	32386
R^2	0.049	0.047	0.051	0.051	0.055	0.055
Surprise(GDP)	0.168	0.427	0.252	0.690**	-0.0763	0.189
	(0.324)	(0.325)	(0.324)	(0.323)	(0.341)	(0.327)
Observations	32112	31029	29208	30264	29008	30338
R^2	0.056	0.051	0.049	0.048	0.045	0.057
Surprise(Housing)	0.0147	-0.107	0.115	0.650**	-0.216	0.749**
	(0.321)	(0.331)	(0.331)	(0.328)	(0.343)	(0.337)
Observations	34746	32693	33347	33745	32740	31851
R^2	0.053	0.044	0.049	0.045	0.054	0.051
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Table 7b: Baseline: Naive Households

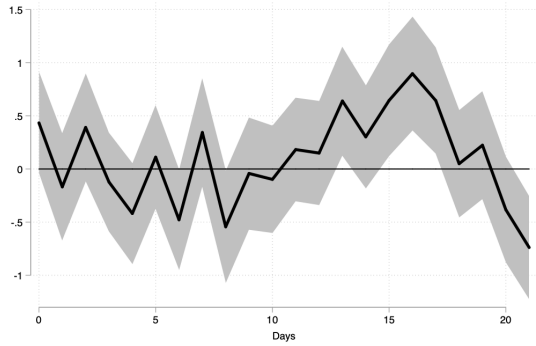
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)$	-0.790***	-0.640**	-0.951***	-0.392	-0.184	-0.591*
	(0.300)	(0.315)	(0.329)	(0.305)	(0.303)	(0.307)
Observations	32657	31955	29556	32156	33276	30858
R^2	0.053	0.051	0.047	0.053	0.050	0.050
$\Delta(CPI)$	0.0657	-0.0737	0.663**	0.308	0.666**	0.157
	(0.288)	(0.293)	(0.294)	(0.289)	(0.294)	(0.296)
Observations	32003	30699	31113	32589	32834	32386
R^2	0.049	0.048	0.053	0.052	0.056	0.055
$\Delta(GDP)$	0.787**	0.817**	0.625*	0.963***	0.397	0.204
	(0.343)	(0.345)	(0.351)	(0.344)	(0.352)	(0.356)
Observations	31690	30593	28761	29814	28569	29890
R^2	0.058	0.052	0.050	0.049	0.046	0.058
$\Delta(Housing)$	-0.484	-0.339	-0.167	0.571*	-0.131	0.378
	(0.337)	(0.352)	(0.350)	(0.343)	(0.344)	(0.349)
Observations	33937	31857	32493	32937	32617	31379
R^2	0.054	0.045	0.050	0.046	0.053	0.051
Controls	Yes	Yes	Yes	Yes	Yes	Yes

A.1.4 Impulse Response Functions for GDTP

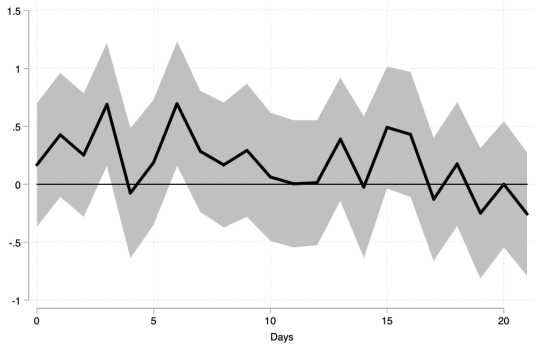
Figure 5: Baseline: Sophisticated Households



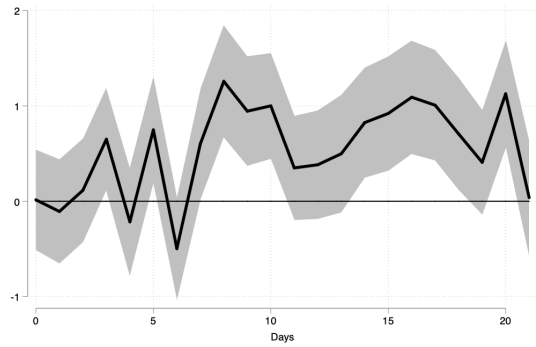
(a) Unemployment



(b) CPI

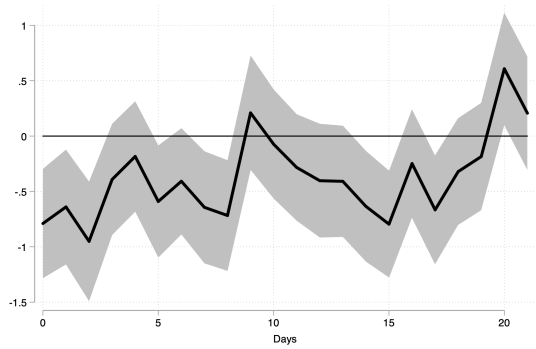


(c) GDP Advance

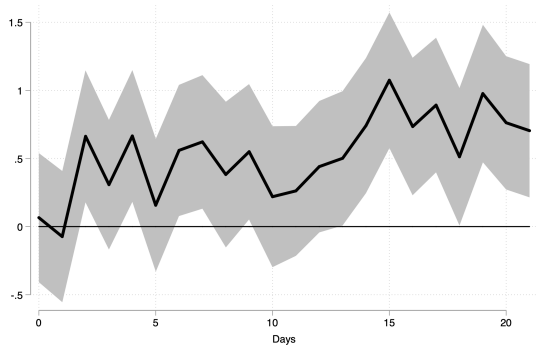


(d) Housing Starts

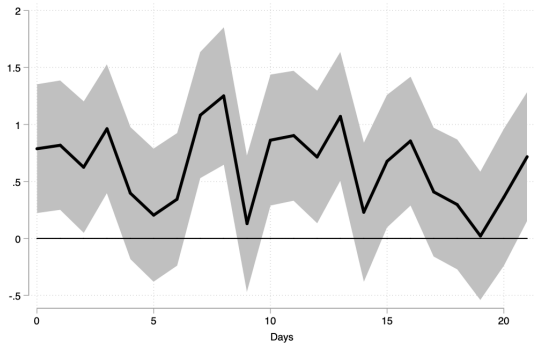
Figure 6: Baseline: Naive Households



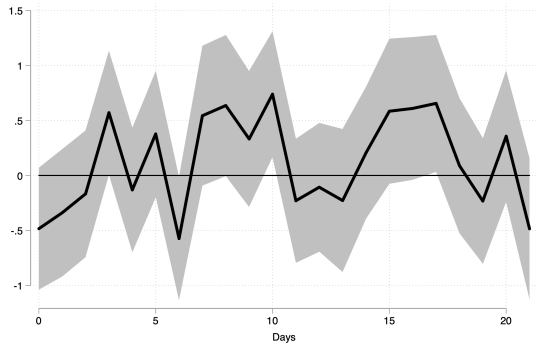
(a) Unemployment



(b) CPI

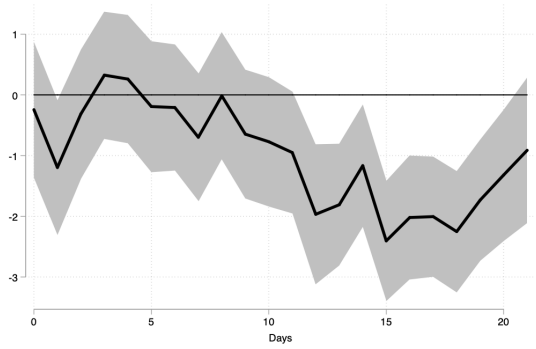


(c) GDP Advance

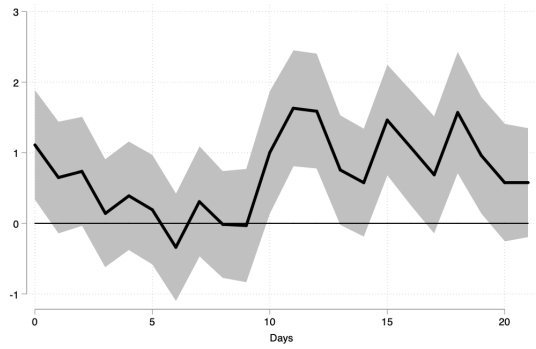


(d) Housing Starts

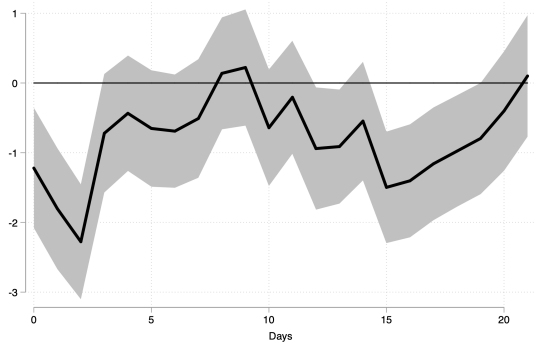
Figure 7: Asymmetry: Response to Positive Shocks



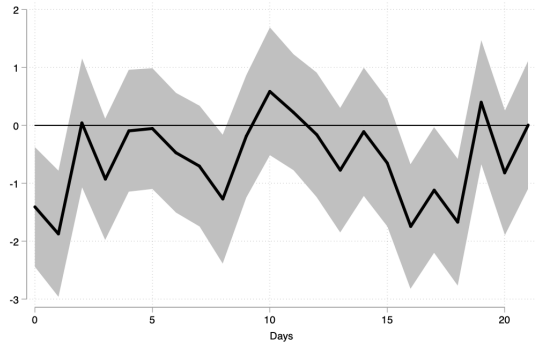
(a) Sophisticated HHs: Unemployment



(b) Sophisticated HHs: CPI

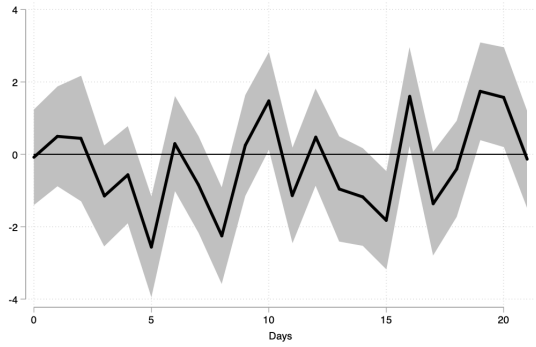


(c) Naive HHs: Unemployment

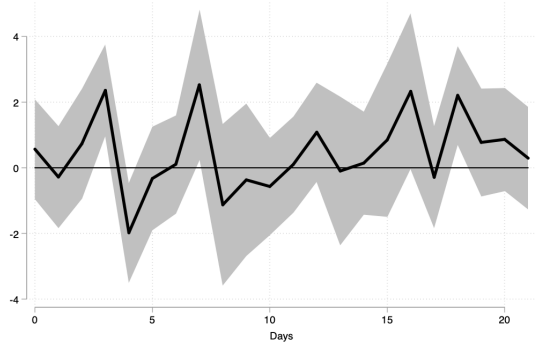


(d) Naive HHs: CPI

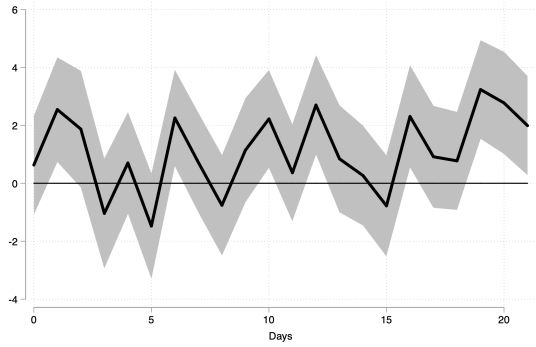
Figure 8: Asymmetry: Response to Negative Shocks



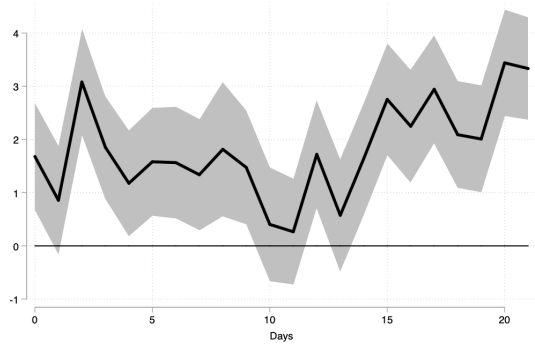
(a) Sophisticated HHs: Unemployment



(b) Sophisticated HHs: CPI



(c) Naive HHs: Unemployment



(d) Naive HHs: CPI

A.1.5 Gallup weekly results

Table 8: GDTP Weekly Estimates

	$X_t =$	$X_t =$ CPI	$X_t =$ GDP	$X_t =$ Housing
	1	2	3	4
Panel A: Sophisticated Households				
Surp X_t	-3***	-2***	0.07	-0.03
	(0.12)	(0.12)	(0.13)	(0.13)
N	222644	227598	215142	229071
R^2	0.047	0.046	0.043	0.045
Controls	Yes	Yes	Yes	Yes
Panel B: Naive Households				
Change X_t	-4.5***	-0.3**	1.8	2***
	(0.12)	(0.12)	(0.14)	(0.14)
N	217823	223661	212041	224846
R^2	0.053	0.045	0.045	0.047
Controls	Yes	Yes	Yes	Yes

This table shows the estimates from a weekly window around each announcement in the GDTP, equivalent to the weekly windows in the MSC. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.1.6 Taking $t-1$ expectations for all announcements as the expectations the day before the first announcement in the month, i.e. the unemployment announcement

Table 9: GDTP: $E^i_{t+h}[Z] - \bar{E}^{first}_{t-1}[Z] = \alpha_h + \beta^{first}_h \cdot ShockX_t + D^i_{t+h} + \epsilon^i_{th}$

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Panel A: Sophisticated Households						
Surprise(CPI)	0.501*	-0.000281	0.426	-0.0285	-0.224	0.384
	(0.292)	(0.307)	(0.309)	(0.272)	(0.276)	(0.283)
Surprise(GDP)	0.0357	-0.0171	-0.183	0.350	-0.390	0.148
	(0.412)	(0.417)	(0.363)	(0.364)	(0.387)	(0.603)
Surprise(Housing)	0.593*	0.341	0.818**	1.169***	0.209	1.496***
	(0.321)	(0.332)	(0.331)	(0.328)	(0.343)	(0.337)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(CPI)$	-0.163	-0.121	0.507*	0.150	0.482*	0.0631
	(0.289)	(0.293)	(0.294)	(0.288)	(0.291)	(0.293)
$\Delta(GDP)$	1.030*	0.868	0.785*	0.961**	0.737	0.132
	(0.566)	(0.563)	(0.456)	(0.453)	(0.491)	(0.710)
$\Delta(Housing)$	0.345	0.337	0.685*	1.357***	0.637*	1.338***
	(0.337)	(0.353)	(0.351)	(0.342)	(0.344)	(0.349)

This table shows the estimates from computing the change in expectations as as $E^i_{t+h}[Z] - \bar{E}^{first}_{t-1}[Z]$, where $\bar{E}^{first}_{t-1}[Z]$ is the average expectations before the employment situation release each month. This exercise allows us to calculate changes in expectation around each release relative to the expectations set before the first announcement of the month. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.1.7 Taking $t-3$ expectations for the unemployment announcement instead of $t-1$

Table 10

Panel A: Sophisticated Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Surprise(Unemp)	-0.00519*	-0.00600*	-0.00683*	-0.00588*	-0.000968	-0.00425
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Observations	30407	29659	27281	29719	30921	29203
R^2	0.052	0.049	0.044	0.054	0.048	0.047
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)_t$	-0.00480	-0.00381	-0.00701**	-0.00296	0.000810	-0.00153
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Observations	30407	29659	27281	29719	30921	29203
R^2	0.052	0.049	0.044	0.054	0.048	0.047

This table reports estimates for Equation 4 taking the prior expectation to be 3 days before the announcement, instead of one day before. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.1.8 Local unemployment

We now test whether people change their expectations differently depending on their local economic conditions. Both personal as well as local conditions can influence an individual's expectations.[23] People living in areas with traditionally higher unemployment could be more sensitive to movements in the unemployment rate. It could also be that when unemployment increases, the shock is greatest to people in areas with traditionally lower unemployment, so they respond more. We examine these hypotheses empirically by estimating:

$$E^i_{t+h}[Z] - \bar{E}_{t-1}[Z] = \alpha_{1h} + \beta_{1h} \times (ShockX_t | LocalU_t > median(LocalU_t)) + D^i_{1t+h} + \epsilon_{1th} \tag{8}$$

$$E^i_{t+h}[Z] - \bar{E}_{t-1}[Z] = \alpha_{2h} + +\beta_{2h} \times (ShockX_t | LocalU_t > p75(LocalU_t)) + D^i_{2t+h} + \epsilon_{2th} \tag{9}$$

where t is the day of the announcement, h indicates days from t, E_τ indicates expectations formed by agent i on day τ, D^i_{t+h} denotes demographic information for person i, $ShockX_t$ denotes the shock in information due to the announcement, $LocalU_t$ denotes the local unemployment rate of the fipscode that agent i lives in. We cluster standard errors by state. We find the median and the 75th percentile local unemployment rate for all fipscode every month, and split areas according to that value. We find that people living in areas with high local unemployment pay more attention to shocks to the national unemployment rate. This result, however, does not hold for shocks to CPI.

[23] Borgschulte & Martorell (2018) use data on military personnel records and they find that service members would forgo 1.5% in reenlistment earnings to avoid a 1 percentage point increase in local unemployment rate.

Table 11: Response of Household Expectations to Unemployment Shocks Depending on Local Area Unemployment

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Panel A: Sophisticated Households						
Surp(U)$_t$, $High50$	-0.678**	-0.630**	-0.649	-0.357	-0.201	-0.691**
	(0.259)	(0.260)	(0.421)	(0.329)	(0.323)	(0.287)
Surp(U)$_t$, $Low50$	0.0875	-0.637	-0.565	-0.00299	-0.0558	0.668
	(0.909)	(0.583)	(0.899)	(1.002)	(0.851)	(0.740)
Surp(U)$_t$, $High75$	-0.650**	-0.633**	-0.516	-0.313	-0.327	-0.675**
	(0.308)	(0.271)	(0.458)	(0.385)	(0.329)	(0.268)
Surp(U)$_t$, $Low75$	-0.104	-0.610	-1.237	-0.690	0.577	-0.0739
	(0.912)	(0.455)	(0.708)	(0.785)	(0.808)	(0.650)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)_t$, $High50$	-0.753***	-0.682**	-0.893**	-0.364	-0.135	-0.602**
	(0.278)	(0.284)	(0.388)	(0.349)	(0.399)	(0.297)
$\Delta(Unemp)_t$, $Low50$	-0.721	-0.708	-1.420	-0.363	-0.669	-0.168
	(0.676)	(0.732)	(0.970)	(0.856)	(0.810)	(0.797)
$\Delta(Unemp)_t$, $High75$	-0.715**	-0.742**	-0.759*	-0.255	-0.255	-0.623**
	(0.316)	(0.320)	(0.411)	(0.384)	(0.428)	(0.306)
$\Delta(Unemp)_t$, $Low75$	-0.805	-0.562	-1.894**	-0.953	0.107	-0.489
	(0.678)	(0.459)	(0.704)	(0.678)	(0.738)	(0.638)

This table reports the estimates of β_h from Equation 8 for shocks to unemployment. Here, β_h is change in the expectations due to a shock in the unemployment rate in the BLS jobs report interacted with the state's unemployment rate, in the window $[t-1, t+h]$ where t is the day of the announcement and $h = 0, 1, 2, 3, 4$. In both panels, rows 1 and 2 indicate areas with high and low local unemployment depending on median county level unemployment, and rows 2 and 4 indicate areas with high and low local unemployment depending on 75% percentile county level unemployment. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Response of Household Expectations to CPI Shocks Depending on Local Area Unemployment

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Panel A: Sophisticated Households						
Surp(CPI)$_t$, $High50$	0.578*	-0.0716	0.424	0.00657	-0.264	0.213
	(0.316)	(0.333)	(0.335)	(0.307)	(0.313)	(0.323)
Surp(CPI)$_t$, $Low50$	-0.395	-0.587	0.451	-0.958	-1.169	-0.375
	(0.750)	(0.803)	(0.829)	(0.748)	(0.773)	(0.756)
Surp(CPI)$_t$, $High75$	0.441	0.0685	0.369	0.110	-0.0578	0.267
	(0.329)	(0.345)	(0.348)	(0.318)	(0.327)	(0.337)
Surp(CPI)$_t$, $Low75$	0.242	-0.937	0.224	-0.808	-1.505**	-0.282
	(0.615)	(0.662)	(0.667)	(0.615)	(0.608)	(0.620)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(CPI)_t$, $High50$	0.120	-0.0258	0.535**	0.245	0.535	0.432
	(0.326)	(0.327)	(0.261)	(0.222)	(0.348)	(0.349)
$\Delta(CPI)_t$, $Low50$	-0.0491	0.116	1.720	0.595	1.264*	-1.238
	(0.678)	(0.886)	(1.031)	(0.596)	(0.701)	(0.898)
$\Delta(CPI)_t$, $High75$	-0.0687	0.190	0.534*	0.331	0.707*	0.406
	(0.353)	(0.266)	(0.285)	(0.244)	(0.362)	(0.338)
$\Delta(CPI)_t$, $Low75$	0.690	-0.938	1.220**	0.405	0.638	-0.465
	(0.489)	(0.780)	(0.564)	(0.529)	(0.707)	(0.903)

his table reports the estimates of β_h from Equation 8 for shocks to CPI. Here, β_h is change in the expectations due to a shock in the unemployment rate in the BLS jobs report interacted with the state's unemployment rate, in the window $[t-1, t+h]$ where t is the day of the announcement and $h = 0, 1, 2, 3, 4$. In both panels, rows 1 and 2 indicate areas with high and low local unemployment depending on median county level unemployment, and rows 2 and 4 indicate areas with high and low local unemployment depending on 75% percentile county level unemployment. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.1.9 Pre vs post 2012

Table 13: Response of Expectations in Recession versus Non-recession Years

	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Panel A: Sophisticated Households						
Surp(U)$_t$, *Pre*2012	-0.00269	-0.00893**	-0.0104***	-0.00570	-0.00324	-0.00762**
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Surp(U)$_t$, *Post*2012	-0.0111*	0.000518	-0.000430	-0.00192	0.00201	0.00209
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)
Surp(CPI)$_t$, *Pre*2012	0.00280	-0.00192	0.00126	-0.00285	-0.00943***	-0.00230
	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Surp(CPI)$_t$, *Post*2012	0.00961*	0.000798	0.00988	0.00115	0.00491	0.00930*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)_t$, *Pre*2012	-0.00697**	-0.0109***	-0.0153***	-0.00776**	-0.00526	-0.00587
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
$\Delta(Unemp)_t$, *Post*2012	-0.0125*	0.00137	-0.000297	-0.00339	0.00801	-0.00122
	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)
$\Delta(CPI)_t$, *Pre*2012	-0.00191	-0.00259	0.00521	0.00470	0.00536	0.00394
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
$\Delta(CPI)_t$, *Post*2012	0.00445	0.00180	0.00858	-0.000261	0.00922*	-0.00203
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)

This table reports estimates for two subsamples for GDTP - the period of the Great Recession (2008-2011), and the non-recession period (2012-2017). Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2 Michigan

A.2.1 Index of Consumer Expectations (ICE)

ICE is a composite index of three forward looking survey questions:

1. *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?*
2. *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?*
3. *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?*

MSC calculates ICE in the following manner: first computes the relative scores (the percent giving favorable replies minus the percent giving unfavorable replies, plus 100) for each of the three index questions. Each relative score is then rounded to the nearest whole number. Then, $\{ICE = \frac{X1 + X2 + X3}{4.1134} + 2.0\}$ where, the relative scores are divided by the 1966 base period total the added constant is to correct for sample design changes from the 1950s.

These three questions taken together provide a measure of household's expectations about the future of the economy, making it qualitatively similar to Gallup's Expectation Index. Changes in ICE can also be interpreted in a similar way - an increase in ICE denotes a rise in optimism, whereas a decrease denotes a fall in optimism or a rise in pessimism.

Table 14: MSC Scenarios Dependent on Level of U_t and π_t

$y_t =$ ICE		$X_t =$ U (1)	$X_t =$CPI (2)
Panel A: Sophisticated Households 1997-2019			
Baseline	Surp X_t	-0.6***	-1.2***
		(0.13)	(0.2)
Asymmetry	Surp $X_t > 0$	-10.4***	-4.7***
		(0.47)	(0.59)
	Surp $X_t < 0$	-0.5*	0.1
		(0.30)	(0.62)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	-3.8***	-0.6
		(0.45)	(0.44)
	$\Delta U < 0, \Delta\pi < 0$	2.6***	-2.6***
		(0.28)	(0.40)
	$\Delta U > 0, \Delta\pi < 0$	-4.6***	-0.5
		(0.48)	(0.47)
	$\Delta U < 0, \Delta\pi > 0$	3***	-2.4***
		(0.46)	(0.4)
Panel B: Naive Households 1980-2019			
Baseline	Change X_t	-3.3***	-1.2***
		(0.09)	(0.17)
Asymmetry	Change $X_t > 0$	-5.8***	-4.4***
		(0.17)	(0.29)
	Change $X_t < 0$	-1***	2.8***
		(0.23)	(0.20)
Scenarios	$\Delta U > 0, \Delta\pi > 0$	-13***	0.02
		(0.30)	(0.26)
	$\Delta U < 0, \Delta\pi < 0$	0.9***	-2.1***
		(0.25)	(0.40)
	$\Delta U > 0, \Delta\pi < 0$	-7.1**	-2.2***
		(0.38)	(0.33)
	$\Delta U < 0, \Delta\pi > 0$	-3.6***	-3.2***
		(0.45)	(0.49)

This table shows the estimates scenarios dependent on levels of inflation and unemployment. We define high unemployment to be greater than 5% and high inflation to be greater than 3%. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.2 Level category tables

Table 15: MSC Scenarios Dependent on Level of U_t and π_t

y_t = Business Outlook	X_t = U 1	X_t =CPI 2
Panel A: Sophisticated Households		
High U_t, High π_t	-2***	-2.8*
	(0.80)	(0.98)
Low U_t, Low π_t	-2.7***	-0.9
	(0.70)	(0.96)
High U_t, Low π_t	-1.6***	0.9
	(0.50)	(0.74)
Low U_t, High π_t	0.08	-3.6***
	(1.10)	(1.08)
Panel B: Naive Households		
High U_t, High π_t	-5.7***	-7***
	(0.43)	(0.65)
Low U_t, Low π_t	-1.2	-2.5***
	(0.78)	(0.84)
High U_t, Low π_t	-5***	1.2***
	(0.38)	(0.45)
Low U_t, High π_t	-5.4***	-2.7*
	(1.51)	(1.55)

This table shows the estimates for scenarios dependent on levels of inflation and unemployment. We define high unemployment to be greater than 5% and high inflation to be greater than 3%. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.3 MSC: Response of Expectations during US Recessions

In this section we estimate

$$E^i_{t+h}[Z] - \bar{E}_{t-1}[Z] = \alpha_h + \beta_{1h} \times ShockX_t + \beta_{2h} \times \mathbb{1}(Recession) + \beta_{3h} \times (ShockX_t \times \mathbb{1}(Recession)) + D^i_{t+h} + \epsilon_{th}$$

Table 16: Share of Optimists in Recessions

y_t = Share of Optimists	X_t = U	X_t =CPI
	1	2
Panel A: Sophisticated Households		
Surprise(X_t)	1***	-1.6*
	(0.36)	(0.46)
Recession Year	-23***	-24***
	(1.13)	(1.33)
Surprise(X_t)× Recession Year	-3.5***	1.2
	(0.86)	(0.92)
Panel B: Naive Households		
ΔX_t	-1***	-0.8*
	(0.41)	(0.48)
Recession Year	-21***	-24***
	(1.40)	(1.32)
ΔX_t× Recession Year	-1	0.3
	(0.83)	(0.87)

This table shows the estimates for change in share of optimists during US Recessions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 17: Response of Household Inflation Expectations in Recessions

$y_t = E_t\pi_{t+12}$	$X_t =$ U 1	$X_t =$CPI 2
Panel A: Sophisticated Households		
Surprise(X_t)	0.003 (0.025)	0.05 (0.04)
Recession Year	1.2*** (0.10)	-1.6*** (0.14)
Surprise(X_t)$\times$ Recession Year	0.18** (0.08)	-0.05 (0.09)
Panel B: Naive Households		
ΔX_t	0.06** (0.03)	0.03 (0.04)
Recession Year	1.1*** (0.13)	1.6*** (0.14)
$\Delta X_t\times$ Recession Year	0.03 (0.08)	0.1 (0.09)

This table shows the estimates for change in household inflation expectations during US Recessions. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.4 Michigan daily results

Table 18a: MSC Daily Estimates

Panel A: Sophisticated Households 1997-2019						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Surprise(Unemp)	0.438	0.189	0.273	-0.257	-0.459	0.700
	(0.860)	(0.858)	(0.862)	(0.766)	(0.806)	(0.822)
N	3208	3711	3302	4470	4295	3918
R^2	0.027	0.022	0.033	0.019	0.023	0.024
Surprise(CPI)	-0.637	2.361**	-2.049*	4.313***	-2.255**	1.651
	(1.048)	(1.076)	(1.184)	(1.093)	(0.999)	(1.037)
N	2284	2233	1941	2146	2280	2352
R^2	0.028	0.019	0.023	0.030	0.031	0.020
Panel B: Naive Households 1980-2019						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)$	-0.0389	0.373	0.711	-0.166	-1.288**	1.145*
	(0.635)	(0.654)	(0.647)	(0.563)	(0.604)	(0.613)
N	6357	6845	6315	8557	8468	7936
R^2	0.024	0.022	0.026	0.020	0.023	0.018
$\Delta(CPI)$	-1.380*	1.925**	-0.663	1.571**	-1.248*	2.589***
	(0.746)	(0.773)	(0.806)	(0.707)	(0.715)	(0.843)
N	4561	4228	3715	4026	4238	4408
R^2	0.026	0.016	0.023	0.019	0.025	0.024

This table shows the estimates from a daily window around each announcement in the MSC for the full sample: 1980-2019. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.5 Michigan daily results-gallup subsample

Table 18b: MSC Daily Estimates: 2008 to 2017

Panel A: Sophisticated Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
Surprise(Unemp)	-1.476	1.204	-0.756	0.997	-2.839***	3.499***
	(0.964)	(0.981)	(1.038)	(0.868)	(0.875)	(1.116)
N	1459	1479	1262	1861	1773	1603
R^2	0.026	0.040	0.058	0.016	0.026	0.045
Surprise(CPI)	-3.625**	2.620	-0.370	3.196*	-4.093***	4.153***
	(1.649)	(1.802)	(1.869)	(1.811)	(1.444)	(1.579)
N	986	925	891	973	1020	1035
R^2	0.042	0.034	0.050	0.030	0.042	0.049
Panel B: Naive Households						
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5
$\Delta(Unemp)$	-0.162	3.109***	0.0219	-1.894*	-0.437	0.162
	(1.015)	(1.099)	(1.153)	(0.975)	(1.033)	(1.081)
N	1681	1698	1434	2103	2040	1832
R^2	0.027	0.036	0.045	0.016	0.019	0.037
$\Delta(CPI)$	-2.212**	1.535	-0.528	0.638	-2.691***	3.519***
	(1.008)	(1.066)	(1.094)	(0.979)	(0.924)	(1.194)
N	1132	1086	1034	1095	1111	1132
R^2	0.031	0.024	0.056	0.022	0.034	0.037

This table shows the estimates from a daily window around each announcement in the MSC, equivalent to the daily window in the GDTP for 2008-17. Standard errors are presented in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A.2.6 Proportion of scenarios

Table 19: Distribution of Scenarios

Scenario	Number of Days (1)	% of Sample (2)
$\Delta U > 0, \Delta \pi > 0$	68	20%
$\Delta U < 0, \Delta \pi < 0$	105	30%
$\Delta U > 0, \Delta \pi < 0$	89	25%
$\Delta U < 0, \Delta \pi > 0$	86	25%
Total	348	100%

This table shows the proportion of occurrence of each scenario between 1980-2019.