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ABSTRACT

There have recently been suggestions for monetary policy to engineer higher inflation expectations so as to stimulate current spending. But what is the empirical relationship between inflation expectations and spending? We use the underlying micro data from the Michigan Survey of Consumers to test whether increased inflation expectations are indeed associated with greater reported readiness to spend. Cross-sectional data deliver the necessary variation to test whether the relationship between inflation expectations and spending changes in the recent zero lower bound regime compared to normal times, as suggested by many standard models. We find that the impact of inflation expectations on the reported readiness to spend on durable goods is statistically insignificant and small in absolute value when compared to other variables, such as household income or expected business conditions. Moreover, it appears that higher expected price changes have an adverse impact on the reported readiness to spend. A one percent increase in expected inflation reduces the probability that households have a positive attitude towards spending by about 0.1 percentage points. At the zero lower bound this small adverse effect remains, and is, if anything, slightly stronger. We also extend our analysis to the reported readiness to spend on cars and houses and obtain similar results. Altogether our results tell a cautionary tale for monetary (or fiscal) policy designed to engineer inflation expectations in order to generate greater current spending.

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"But he could have paid the balance of 25 marks at any time and thus have made the teeth his own. If he did not do so, it was because he had heard from many people that the accession of the Nationalists to power would be followed by inflation of currency, [...]. And yet business was better than one might have expected during this rather quiet winter season. The talk of inflation induced many people to spend their money on household needs instead of putting it in the savings bank."

From: Lion Feuchtwangers "The Oppermanns" (in the translation by Ruth Gruber), about the business dealings of the furniture salesman Markus Oppermann with his dentist and his clients right after the rise to power of the Nazi party in January 1933.

1 Introduction

There have recently been suggestions by economists and policy-makers alike to engineer higher private sector inflation expectations with the goal of stimulating current spending.[1] The German author Lion Feuchtwanger, in his celebrated portrayal of the late Weimar Republic and the early Nazi era, "The Oppermanns", describes rather intuitively why inflation might be good news for debtors and businesses. Basic economic theory echoes some of these ideas on how inflation expectations and spending relate. Increased inflation expectations might lower real interest rates and thus boost interest-sensitive components of aggregate demand, particularly in an environment in which nominal interest rates are constrained from below. Increased inflation expectations also mean expected wealth gains for debtors. To the extent that debtors have on average higher propensities to spend out of wealth than creditors, increased inflation expectations might lead to higher current spending. On the other hand, inflation is a tax on the holders of cash and other highly liquid assets and hence might be a tax on economic activity, so higher inflation expectations may have the opposite effect on spending (see Aruoba and Schorfheide, 2011, who find this effect to be large in U.S. data).

This paper provides some econometric evidence on the nexus between inflation expectations and spending. To do so, we make use of the cross-sectional data on quantitative inflation expectations and qualitative measures of spending attitudes from the Michigan Survey of Consumers. The latter are gathered from the responses to qualitative questions about whether now is a good or bad time to buy a variety of different kinds of goods, such as durable household

[1] Ken Rogoff (in Ydstie, 2011): "They need to be willing, in fact actively pursue, letting inflation rise a bit more. That would encourage consumption. It would encourage investment"; Naryana Kocherlakota (in WSJ.com, 2010): "To a limited extent, this should be a good thing in some sense, to have more expected inflation"; and Christina Romer (in *New York Times*, 2011): "In the current situation, where nominal interest rates are constrained because they can't go below zero, a small increase in expected inflation could be helpful. It would lower real borrowing costs, and encourage spending on big-ticket items like cars, homes, and business equipment."

items, cars and houses. We will frequently refer to this as "readiness to spend", which we show to be positively correlated in the aggregate with actual spending data from the National Income and Product Accounts. Using cross-sectional data helps us identify what the link between inflation expectations and spending is at the level of economic decision makers and whether it works differently at the zero lower bound compared to normal times, as many standards models suggest. Given that in U.S. post-war history zero lower bound regimes have been rare occurrences (they are in point of fact a singular event), it is difficult to investigate empirically with only aggregate data the relationship between inflation expectations and the readiness to spend at very low nominal interest rates.

Few papers have made use of the underlying micro data of the Michigan survey. Souleles (2004) uses these data to test the rationality of individual forecasts. Coibion and Gorodnichenko (2011) use the micro level inflation forecasts to examine how disagreement about inflation reacts to different shocks as a test of competing models of informational rigidities. Their line of research – informational frictions – also presents a theoretical justification of the existence and persistence of cross-sectional heterogeneity in inflation expectations, which we exploit in this paper. A very recent paper by Carvalho and Nechio (2012) uses the Michigan survey data to test whether agents understand Taylor rules.

We begin by exploring some basic raw correlations between expected inflation and the reported readiness to spend on durables, cars and houses. We find that these correlations are negative and small in absolute value, meaning that there is little prima facie evidence for an inflation-related demand for these big ticket items. In contrast, the reported readiness to spend on durables, cars and houses is much more strongly positively correlated with the expected aggregate business conditions or the current financial situation of households. These raw correlations turn out to be independent of demographic factors, such as sex, age, race, education, marital status, household size, geographic location, income, homeownership (which one might interpret as a proxy for wealth), or birth cohort. The correlations are also quite stable and show little systematic variation over time, including the recent zero lower bound episode.

The next step is to analyze the data more formally. Given the discrete and qualitative nature of respondents' answers to questions about whether now is a good time to buy large household items, we employ ordered probit models to investigate the relationship between expected inflation and reported readiness to spend. Controlling for both aggregate and idiosyncratic economic conditions and expectations, this empirical specification allows us to estimate the effect of increased inflation expectations on the probability of answering that now is a good time to spend. We allow for state-dependence of this relationship and investigate whether the link between inflation expectations and the reported readiness to spend is different at the zero lower bound compared to normal times. Ideally, we would like to examine the relationship between

inflation expectations and actual expenditure. Given that there is no information on actual expenditure in the survey (or – to the best of our knowledge – any other survey that contains information on inflation expectations), we view the qualitative buying conditions questions as the best available proxy.

We find that the impact of inflation expectations on the reported readiness to spend on durables is small in absolute value when compared to other variables, such as the current or expected financial situation of the household or its expectations about business conditions one year ahead. This finding is consistent with recent theoretical results in Mackowiak and Wiederholt (2010), as well as Gabaix (2012), who argue that in boundedly rational environments economic decision makers will not pay much attention to real interest rates. If anything, higher expected price changes have an adverse impact on spending. A one percent increase in expected inflation reduces the probability that households have a positive attitude towards spending by somewhat under 0.1 percentage points.

How should one interpret these reduced-form results? In what sense can they matter for the conduct of monetary (or fiscal) stabilization policy? We show that these small negative effects of inflation expectations on spending persist across different age groups, different birth cohorts, different education levels and different income quintiles. They are also rather stable over time. These findings together at least suggest that the relationship between inflation expectations and spending we uncover is somewhat structural. They tell a cautionary tale for policies designed to engineer inflation expectations in order to generate greater readiness to spend. At the very least, our results suggest that policy makers face a tough communication challenge when they advocate inflationary policy measures and that they need to convince the public that somewhat higher inflation for the foreseeable future is macroeconomically beneficial, because it might lead to more growth and less unemployment down the road.

Related Literature

Economists are split about the effectiveness and desirability of using inflation expectations as a means of stabilization policy. For the case of monetary policy this has been advocated by Krugman (1998), Eggertson and Woodford (2003), and Eggertson (2006). Furthermore, Eggertson (2010), Christiano, Eichenbaum and Rebelo (2011) as well as Woodford (2011) show in standard New Keynesian models that the fiscal multiplier may be large when the zero lower bound for nominal interest rates is binding due to the interaction between inflation expectations and real interest rates. Eggertson (2008) argues that it was a mix of fiscal and monetary policies designed to generate inflation expectations that led to the recovery from the Great Depression. On the other hand, economists like Edward Leamer (in Leamer, 2011) have polemicized against the role of deflation or inflation expectations as being important for stabilization policy. Paul

Volcker (in Volcker, 2011) and John Taylor (in Ydstie, 2011) view the engineering of higher inflation expectations as dangerous and, ultimately, as a sign of desperation of policy-makers that portends bad times ahead.

The remainder of this paper is organized as follows: Section 2 describes the micro data and provides a basic correlational analysis between inflation expectations and readiness to spend. Section 3 explains the ordered probit empirical design and Section 4 presents the results. A final section concludes. The Appendix provides detailed information on the survey questions used throughout the paper.

2 Data Description and Analysis

This section provides a detailed description of the inflation expectations and buying attitudes data from the Michigan Survey of Consumers. In addition, it presents some basic correlational analysis among expected inflation and buying attitudes at the micro level, as well as actual aggregate spending.

2.1 Data Sources

We use the underlying micro data from the Survey of Consumers conducted by the Survey Research Center at the University of Michigan. These data are available at a monthly frequency and cover (depending on the empirical specification, at most) the period 1984:01 to 2010:12.[2] Each month, about 500 interviews are carried out via random telephone dial and the samples are designed to be representative of all American households. There is a small panel component to the survey, in that about 40 percent of households are interviewed one more time six months after the original interview. Given the overlapping and short time dimension of the panel, for the most part we will treat the data as coming from repeated cross-sections, though we do make use of the panel aspect in two robustness checks in Section 4.2.

We focus on the following two questions in our baseline scenario:[3]

Q 1 *"About the big things people buy for their homes – such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items?"*

[2] Part of the original data set goes back to 1978, but we focus on this particular subsample in order to avoid a possible structural break in the conduct of monetary policy during the Volcker era. The results which follow are nevertheless quite similar in the extended sample.

[3] A18 and A12b, respectively, of the Survey of Consumers.

Q 2 *"By about what percent do you expect future prices to go (up/down) on the average, during the next 12 months?"*

Responses to (Q1) take on three different qualitative categories: good, bad, and neutral, while the responses to (Q2) are quantitative and expressed in percentage points. The survey only asks about spending conditions for durables, not about nondurables and services. While durables are usually a relatively small part of the current spending budget of households, they are also the most sensitive to both idiosyncratic and aggregate economic conditions. We thus do not view the 'limited' data availability in the survey as a problem.

As an alternative to household consumer durables, we also consider questions about the readiness to buy cars and houses, using the following survey questions:

Q 3 *"Speaking now of the automobile market – do you think the next 12 months or so will be a good time or a bad time to buy a vehicle, such as a car, pickup, van or sport utility vehicle?"*

Q 4 *"Generally speaking, do you think that now is a good time or a bad time to buy a house?"*

While we believe that one-year ahead inflation expectations cover the right time horizon for smaller household consumer durables and are also more precisely answered by survey participants, we include, as a robustness check, specifications with five-year ahead inflation expectations that the survey started to ask about in 1990. Notice that the survey asks households whether *the next twelve months or so* will be a good or a bad time to buy a car, in contrast to the questions about household durables and houses. Given the wording of the question, we need to ensure that inflation expectations lie strictly in the future relative to the purchasing horizon. We thus account for the fact that the question asks not whether *now* is a good time to buy a car but instead refers to the *next 12 months or so* by pairing up the "readiness to spend on cars" question only with expected inflation over a five-to-ten-year horizon (we will often refer to this question as five-year inflation expectations for the sake of brevity).

Q 5 *"By about what percent per year do you expect prices to go (up/ down) on the average, during the next 5 to 10 years?"*

In addition to those listed above the Michigan Survey asks several other questions about expectations for both idiosyncratic and aggregate economic outcomes. Among these are questions about the expected change in the household's financial situation over the next year (Q6), the expected change in household real income (Q7), expected movements in nominal interest

rates (Q8), expected overall aggregate business conditions over both a twelve month (Q9) and a five-year horizon (Q10), the expected movement in the aggregate unemployment rate (Q11), and assessments of the overall economic policy of the government (Q14). The exact wording of these questions is presented in the Appendix. Similarly to the buying conditions questions, responses to these questions are generally coded into three qualitative categories: good/up, indifferent/no change, or bad/down. The survey also contains fairly rich demographic information on the household respondents, including information on sex, age, race, education, marital status, household size, geographic location, income, and homeownership.

2.2 Basic Data Analysis

In this subsection we present summary statistics on both the buying conditions and inflation expectations questions. For this purpose and for all other results in the paper we exclude all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value to ensure that our results are not affected by extreme outliers. Figure 1 plots the relative score for (Q1), defined as the fraction of respondents with a favorable outlook on current buying conditions for durable household goods minus those with an unfavorable outlook. The shaded gray regions are recessions, as defined by the NBER Business Cycle Dating Committee. This series is clearly procyclical, with a particularly large drop during the Great Recession episode.

We next investigate to what extent the reported readiness to spend on durable goods is correlated with aggregate consumer spending on durables from the National Income and Product Accounts. Given that we want to learn from the micro data whether increased inflation expectations are indeed associated with greater consumer spending, it is crucial that there exists a link between what people report in the Michigan survey about their readiness to spend and what actually shows up in the data. For this purpose, we compare the aforementioned aggregate index of spending readiness with detrended real aggregate consumer spending on durables at a monthly frequency. We apply an HP-filter (with smoothing parameter $\lambda = 129,600$) to the actual aggregate spending series in order to obtain a measure for the cyclical component of consumer spending. Figure 2 shows a scatterplot of the two series and a clear positive correlation between the average reported readiness to spend on durables and aggregate durables consumption. The contemporaneous correlation among the series is 0.46. Figure 3 displays the dynamic correlogram between the reported readiness to spend in the survey and the actual aggregate spending series. It has a peak correlation of 0.51 at a lead of the readiness series of 3 months. Overall, we conclude that the reported readiness to spend on durables is a reasonable proxy (or predictor) for movements in aggregate durables consumption.

The left panel of Figure 4 plots the average of the one-year ahead expected inflation rate across individual responses at each point in time together with the actual inflation rate. The shaded gray regions represent +/- one standard deviation of the survey responses. The actual inflation rate is the corresponding 12 months ahead rate as measured by the headline CPI, and has thus been brought into sync with inflation expectations. Overall, it appears that the one-year inflation expectations from the Michigan Survey of Consumers track the actual inflation rate reasonably well. The graph also suggests that we have sufficient variation across households in inflation expectations to learn from a cross-sectional analysis of the data. The right panel plots the five-to-ten-year-ahead inflation expectations. Even for longer horizon inflation expectations we have a substantial amount of cross-sectional heterogeneity that should help us identify the link between long-term inflation expectations and spending.

2.3 Correlational Analysis

Next we explore some basic raw correlations between the one-year-ahead inflation expectations and the qualitative measures of readiness to spend (five-year-ahead inflation expectations for the "readiness to spend on cars" question). Results are reported in Table 1. The correlation coefficient between expected inflation and the readiness to spend on durable goods is -0.039 when pooling observations across respondents and across time. This correlation is not only negative but is also small. In comparison, the bottom of the Table shows the correlation between the reported readiness to spend and other idiosyncratic variables: expected aggregate business conditions, the current financial situation of the households, and unemployment expectations. These correlations are of the expected sign and are much larger in absolute value. In particular, the correlation between readiness to spend and expected aggregate business conditions (see Q9) is 0.217. As with buying attitudes about durable goods, the correlations between expected inflation and readiness to spend on cars and houses are also negative (-0.078 and -0.089, respectively), but still small in comparison to the correlations between readiness to spend and other idiosyncratic variables.

The remainder of Table 1 reports correlations between readiness to spend and expected inflation conditional on a variety of different demographic factors. These correlations are quite similar across groups, and with few exceptions range from -0.01 to -0.05 for readiness to spend on durables, similarly for readiness to spend on cars, and -0.08 to -0.10 for houses. While any differences between the magnitudes of the correlation coefficients are quantitatively small and statistically indistinguishable, there are nevertheless a few patterns that comport with standard intuition. For example, the negative correlation between expected inflation and buying attitudes is stronger for older households (who are more likely to live on fixed incomes) than

younger households (who are more likely to be in debt), is smaller for more educated households, and is smaller the higher in the income distribution a household is. Also, the negative correlation between expected inflation and buying attitudes is most negative for households born between 1930-1949; it was households in these birth cohorts who would have been economically most active during the high inflation period of the 1970s. While interesting, it bears repeating that these differences are nevertheless quite small.

Figure 5 plots the correlations between expected inflation and readiness to spend on durables, cars, and houses across time. The correlations are constructed by pooling the monthly observations within each year; the shaded gray regions are the 90 percent confidence intervals. The annual correlations typically range between 0 and -0.1 for all three spending categories and are, with few exceptions, significantly (in the statistical sense) negative. Importantly, the correlations for all three spending categories are quite stable, showing no obvious trend over time nor any clear relationship with the state of the business cycle. Combined with the results in Table 1, the figures provide little prima facie evidence in support of the notion that there is a strong inflation-related current demand for big-ticket items. The correlations between expected inflation and readiness to spend are consistently negative and small, and are quite stable both across time and across demographic groups.

3 Empirical Setup

The correlational analysis of the previous section suggests that the relationship between expected inflation and readiness to spend is weak and negative. Simple correlations can obviously be misleading, however, as inflation expectations could be correlated with some omitted factor relevant for spending decisions. This section addresses this issue by specifying regression equations in which we control for a number of potentially confounding factors.

The discrete nature of the responses to the qualitative buying attitudes questions presents some challenges that render conventional linear regression specifications inappropriate. We assume that there exists an unobserved, continuous measure of readiness to spend, $y^*_{i,t}$. We model the evolution of this continuous measure of readiness to spend as:

$$y^*_{i,t} = \beta_1 \pi^e_{i,t} + \beta_2 \pi^e_{i,t} \times D_{ZLB} + x_{i,t}\gamma + \epsilon_{i,t} \tag{1}$$

where $y^*_{i,t}$ is the continuous latent variable measuring willingness to spend on durables, $\pi^e_{i,t}$ the amount of inflation (expressed in percentage points) that household i expects in the 12 months subsequent to date t, D_{ZLB} is a dummy variable for the zero lower bound period, which takes on unity from 2008:12 to 2010:12 (and zero otherwise). $x_{i,t}$ is a vector of controls. It includes

the dummy variable ZLB as well as a number of different idiosyncratic and aggregate controls which we discuss in more detail below. β_1 measures the partial effect of an increase in expected inflation on the willingness to spend, holding all factors in $x_{i,t}$ constant. The interaction term between expected inflation and the ZLB dummy allows this relationship to be different when the nominal interest rate is fixed at zero, with the partial effect of more expected inflation on readiness to spend given by $\beta_1 + \beta_2$. γ denotes the coefficient vector for the controls.

The latent variable $y^*_{i,t}$ is not observable, but the discrete survey responses, $y_{i,t}$, are. The survey responses are coded in such a way that three outcomes are possible: '1' indicating that now is a good time to buy household consumer durables, '-1' meaning that now is bad time to buy, and '0' saying that now is neither a good nor a bad time to buy. We model the relationship between $y^*_{i,t}$ and $y_{i,t}$ as:

$$y_{i,t} = \begin{cases} -1 & \text{if } \; y^*_{i,t} \leq \alpha_1 \\ 0 & \text{if } \; \alpha_1 < y^*_{i,t} \leq \alpha_2 \\ +1 & \text{if } \; \alpha_2 < y^*_{i,t} \end{cases}$$

with threshold values α_1 and α_2. We estimate this model as an ordered probit, using the observations on y to estimate $(\beta_1, \beta_2, \gamma)$ as well as α_1 and α_2 via maximum likelihood.[4]

To be able to interpret β_1 and $\beta_1 + \beta_2$ as the "causal" effect of expected inflation on desired spending we need to control for determinants of spending which may be correlated with expected inflation. We start by including (qualitative) *idiosyncratic expectations* about the *idiosyncratic situation* of the household: its expected change in financial situation (Q6) and the expected trajectory of its real income (Q7). Next, we include *idiosyncratic expectations* about the *aggregate economic situation*: the expected (qualitative) changes in the nominal interest rate (Q8) and the expected (qualitative) aggregate business conditions in a year (Q9) as well as in five years (Q10). Moreover, we add the expected (qualitative) change in the unemployment rate (Q11). We include the current financial situation of the household relative to the previous year (Q12) and a question, (Q14), which asks whether the government is doing a good job, a fair job, or a poor job in fighting inflation and unemployment to measure the respondents' trust in U.S. economic policy. We surmise that households with a lack of trust in economic policy will be reluctant to commit themselves to major purchases. Like with the buying attitudes question, the responses to all these questions are coded in one of three discrete categories: up, down, or "about the same". Finally we include the natural logarithm of current real income of the household.[5]

[4] We experimented with ordered logits and found very similar results.

[5] We use the survey question on the current nominal household income (in U.S. dollars) and deflate it with the consumer price index (CPIAUCSL) from the St. Louis Federal Reserve Bank data base FRED.

As aggregate controls we use (Q9) to construct an index of *aggregate expectations* about the *aggregate economic situation*: the index measures the share of respondents saying that the U.S. as a whole will have good business conditions during the next 12 months minus the share of those respondents answering that the country will have bad business conditions. This index is normalized in [-100, 100]. We also include the cross-sectional standard deviation of expected inflation for each month to measure the degree of dispersion as a proxy for time-varying idiosyncratic inflation uncertainty.

The next set of controls concerns current aggregate conditions. Basic real options theory suggests that higher uncertainty should dampen the readiness to spend on durables. In order to proxy for the overall amount of uncertainty in the economy, we consider Bloom's volatility index (see Bloom, 2009). We also include the federal funds rate, the civilian unemployment rate and the current inflation rate (percentage year-over-year change in the consumer price index), all three denoted in percentage points.[6] Moreover, we add a rolling 12-months forward-looking window estimate of inflation volatility as a proxy for aggregate inflation uncertainty. Lastly, we consider regional relative durable goods prices, according to the census region in which the respondent resides: West, North Central, Northeast, and South. We use the all urban consumers CPI for durables per region from the U.S. Bureau of Labor Statistics divided by the all items CPI for that region. Prior to January 1987 both series are available at a bi-monthly frequency only and we interpolate the series by assuming no change between months. Before calculating relative prices, we seasonally adjust both series. We finally take natural logs and linearly detrend the relative durable goods price. The inclusion of the relative price of durables ensures that the coefficient on expected inflation is not being driven by changes in the relative price of durables.

The final set of controls concerns demographic factors. We include a dummy which takes on unity for female respondents and zero for males ('Sex'), a dummy which switches on if the respondent is married and otherwise not ('Married'), and a dummy which takes on unity in case the respondent holds a college degree and zero otherwise ('College'). We also add dummies for each race, except for non-Hispanic Caucasians, i.e. 'African American', 'Hispanic American', 'Native American', and 'Asian American' as well as for each census region, except for North Central, i.e. 'West', 'Northeast', and 'South'. We also consider the family size of the respondent and add polynomials of the age of the respondent ('Age', 'Age^2', and 'Age^3') to account for possible changes in the life-cycle behavior of consumption. We address seasonality by including a set of monthly dummies.

Finally, recall that there is an overlapping panel aspect to the survey data set. To avoid in-

[6]The series are from the St. Louis Federal Reserve Bank data base FRED. We use FEDFUNDS, UNRATE and CPIAUCSL.

troducing correlations across error terms, we restrict attention to those respondents who are interviewed only once, which means that the data set is truly a set of repeated cross-sections. This leaves us with a sample of about 63,000 observations. We do make use of the small panel aspect of the survey data later in two robustness checks in Section 4.2.

4 Results

This section presents results from ordered probit specifications as laid out in the previous section. Subsection 4.1 presents the baseline results, 4.2 conducts a variety of robustness checks, and subsection 4.3 considers extensions to the cases of buying attitudes about cars and houses.

4.1 Baseline Results

This section presents the main results of the paper. For our baseline specification we focus on buying conditions for durable goods and expected inflation over a one-year horizon.

The results for the baseline specification (except for demographic controls) are shown in Table 2. This table shows the estimated coefficients as well as marginal effects evaluated for "normal" times, when the federal funds rate was larger than zero (ZLB=0), and at the zero lower bound (ZLB=1).[7] The marginal effects have the economic interpretation as the change in the probability of having a favorable outlook on buying durable goods for a one percentage point increase in expected inflation. When calculating marginal effects, we set the remaining variables to their means conditional on ZLB=1 and ZLB=0, respectively.[8] In each case we document the point estimates together with standard errors in parentheses underneath, and denote significance at the 1 percent, 5 percent, and 10 percent level by '***', '**', and '*', respectively. The baseline estimates for the demographic controls are shown in Table 3. They show that young, male, non-Hispanic Caucasians without a college degree are, everything else equal, the likely spenders on durable household items.

With respect to the coefficients of the economic control variables, we obtain for the most part plausible and significant estimates, which makes us confident that the Michigan data do

[7] We report the marginal effects for the probability of the highest outcome, i.e. $p_1 = P\left(y=1|z\right)$ with $z = (\pi^e, \pi^e \times D_{ZLB}, x)$, and thus for the case that households find buying conditions favorable. Let $\phi(\cdot)$ denote the first derivative of the normal density function $\Phi(\cdot)$ and $\delta = \left(\beta_1, \beta_2, \gamma\right)$. The marginal effect for inflation expectations at $ZLB = 1$ is calculated as $\partial p_1(z)/\partial \pi^e = \left(\beta_1 + \beta_2\right)\phi\left(\alpha_2 - \bar{z}_{|ZLB=1}\delta\right)$, where $\bar{z}_{|ZLB=1}$ denotes the mean of z within the zero lower bound regime. Accordingly, $\partial p_1(z)/\partial \pi^e = \beta_1\phi\left(\alpha_2 - \bar{z}_{|ZLB=0}\delta\right)$ is the corresponding marginal effect at $ZLB = 0$. The marginal effect with respect to a control variable x_k is $\partial p_1(z)/\partial x_k = \gamma_k\phi\left(\alpha_2 - \bar{z}_{|ZLB=1}\delta\right)$ within the zero lower bound regime and $\partial p_1(z)/\partial x_k = \gamma_k\phi\left(\alpha_2 - \bar{z}_{|ZLB=0}\delta\right)$ when interest rates are away from it. See also Wooldridge (2002), Chapter 15.

[8] We have also calculated marginal effects at more percentiles of the inflation expectation distribution, i.e. at the 10th, 25th, 50th, 75th, and 90th percentiles, and found similar values.

indeed measure the underlying economic variables of interest reasonably well. The coefficient for inflation volatility is negative, but not statistically significant, and the coefficient for the relative price of durable goods is essentially zero. As one would expect, the expected financial situation of the household and its real income, the expected business conditions (idiosyncratic and aggregate), the current financial situation, and the current real household income all have positive effects on the reported spending readiness. In addition, a positive judgement of U.S. economic policy also affects spending conditions positively. Moreover, an expected increase in *future* nominal interest rates makes people want to spend more *today*, while higher economic uncertainty in the form of stock market volatility and higher unemployment rates (both current and expected) decrease the probability that people find buying conditions favorable. Higher cross-sectional dispersion in expected inflation also has negative effects and is thus consistent with the interpretation of time-varying inflation dispersion as a measure of time-varying idiosyncratic inflation uncertainty. The coefficient on the ZLB dummy is positive and significant, suggesting that households were about 4 percentage points more likely to have a favorable attitude about buying durables in the period 2008-2010. This may seem puzzling, but recall that this coefficient measures the effect of the ZLB regime holding all other control variables fixed. One interpretation of this positive coefficient is that non-standard policy actions led households to have more optimistic buying attitudes than otherwise would have been warranted given observed economic conditions.

Next, we discuss the coefficients for inflation expectations. For the expected one-year inflation rate, we obtain a negative coefficient ($\beta_1 = -0.0022$), which is even more negative when the economy is at the zero lower bound for nominal interest rates ($\beta_2 = -0.0031$). Neither of these coefficients are, however, statistically significantly different from zero. Moreover, the marginal effect of expected inflation on spending is equal to -0.0007 for times of positive interest rates, meaning that a 1 percentage point increase in expected inflation approximately lowers the probability that households have a positive attitude towards spending by somewhat under 0.1 percentage points. This result could be consistent with a forward-looking Taylor rule operating during normal times: households with high inflation expectations may assume that the monetary policy maker adjusts nominal interest rates and by more than one-for-one to counteract increased inflation expectations, thus resulting in higher real interest rates. We control for nominal interest rate expectations, but due to the construction of the survey data we can do so only in a qualitative and thus imperfect way. Since the adverse effect of inflation expectations on willingness to spend is even larger when evaluated at the zero lower bound (marginal effect of -0.21 percentage points), i.e. when the Taylor rule is no longer valid, this negative result, however, is more likely consistent with the view of inflation being a tax on decentralized economic activity, an effect which has recently been found to be large in U.S. data by Aruoba

and Schorfheide (2011). It is also consistent with the aforementioned Volcker-view of inflation as a sign of economic distress.

Whether the zero lower bound binds or not, the impact of inflation expectations on desired spending is small in absolute value when compared to the impact of other variables (see the theoretical results in Mackowiak and Wiederholt, 2010, as well as Gabaix, 2012, who argue that in boundedly rational environments economic decision makers will not pay much attention to real interest rates). For example, if the household reports a good one-year ahead business outlook versus a neutral one, its positive attitude towards spending on durable households goods increases by almost 4 percentage points. Similarly important are the current financial situation of the household relative to the previous year and the overall trust in economic policy.

4.2 Robustness

This subsection considers a number of robustness checks on our baseline specification, described in detail below. In all specifications we find that the impact of inflation expectations on readiness to spend on durable goods is small and typically negative.

4.2.1 Control Function Approach

A potential concern with our baseline specification is that we may have failed to control for some factor relevant for both buying attitudes and inflation expectations, thereby biasing the estimated coefficient on inflation expectations. A related concern is that survey-recorded inflation expectations may be observed with measurement error, which would work to bias the estimated coefficient towards zero. For example, survey respondents might put less effort into coming up with their best estimate for the inflation outlook when answering the survey as opposed to making actual purchase decisions. On average their recorded survey responses may be right, but noisier than their true expectations.

We address these potential criticisms by following the recommendation of Rivers and Vuong (1988), Wooldridge (2002), and Imbens and Wooldridge (2007) and employ a so-called control function (CF) approach to estimate our baseline specification. The CF approach is a two stage instrumental variable estimation method that can also be applied to non-linear models. For this exercise, instead of focusing only on those households who are interviewed once, we now restrict attention to those households that are interviewed twice.[9] This leaves us with roughly 50,000 observations. As discussed in Section 2, the time span between the two interviews is six

[9]We have checked that the households that are interviewed twice are not special in some sense, i.e. we have estimated our baseline ordered probit model also only for those that are interviewed twice, and for both groups pooled, and found similar point estimates for coefficients and marginal effects.

months. Given that inflation, and hence also inflation expectations, is fairly persistent, lagged individual inflation expectations are an obvious instrument for current expected inflation.

In the first stage we regress household inflation expectations from the second interview on all exogenous control variables from the baseline estimation plus the household inflation expectations from the previous interview six months earlier. The results for the first stage are shown in the upper panel of Table 4. Individual lagged inflation expectations enter the first stage with a coefficient of 0.21 that is highly statistically significant (the t statistic is greater than 50), suggesting that lagged inflation expectations constitute a reasonably strong instrument for current expected inflation. The R^2 for the first stage is equal to 0.1331.

In the second stage we estimate our baseline ordered probit which includes expected inflation on the right hand side, and the residual from the first stage regression as an additional control variable. Including the residual from the first stage directly controls for any potential endogeneity in expected inflation; it also controls for potential endogeneity of functions of expected inflation, such as the interaction term between expected inflation and the zero lower bound dummy (see Imbens and Wooldridge, 2007). The second stage estimates are in the bottom panel of Table 4. There are two important results here. First, the coefficient on the first stage residual in the second stage ordered probit is statistically significant from zero at only the ten percent level, which suggests that endogeneity of individual inflation expectations is indeed not a severe problem (see Wooldridge, 2002, chapter 15). Moreover, the point estimates on the coefficients and marginal effects of interest – expected inflation and expected inflation interacted with the zero lower bound dummy – are again negative and small in absolute value, if somewhat larger than our baseline estimates and the standard ordered probit estimates on the sample with only those that are interviewed twice. The important point is that the effects of inflation expectations on spending readiness are still negative and small.

4.2.2 Changes in Inflation Expectations and Changes in the Readiness to Spend

Suppose there are two types of agents in the economy: an "optimist" who always has low inflation expectations and high readiness to spend, and a "pessimist" who always has high inflation expectations and low readiness to spend. If this kind of cross-sectional variation was present and dominated the time-series variation in our repeated cross-section set up, then we would indeed find that inflation expectations are negatively correlated with readiness to spend on durables, yet each household and therefore the aggregate may very well be induced to spend more if monetary policy could engineer higher inflation expectations. Nevertheless, to the extent that the aforementioned cross-sectional variation in general "optimism" is correlated with observables, in particular with other idiosyncratic expectations and demographics, our baseline approach will not suffer from this spurious effect. To be able to control for so many different

idiosyncratic expectations is the great advantage of the Michigan Survey of Consumers.

However, to the extent that a negative cross-sectional correlation between inflation expectations and readiness to spend on durables is itself unrelated to other observables, the baseline estimates might be biased. Notice that the control function approach in the previous subsection does not take care of this unobserved cross-sectional effect – it would only remedy potential time-series endogeneity problems (or biases resulting from measurement error). We therefore consider two alternative variants of our baseline estimation which exploit the panel dimension of the data so as to control for time-invariant cross-sectional "optimism" or "pessimism". As such the samples are restricted to those respondents who are interviewed twice. The results are presented in Table 5.

The upper panel of the Table presents results in which the level of inflation expectations on the right hand side is replaced with the change in inflation expectations for respondent i between the two interview dates. The idea here is that cross-sectional "optimism" or "pessimism" is like a fixed effect, and so differencing inflation expectations removes that source of variation from expected inflation. The remaining control variables on the right hand side are otherwise the same as in the baseline specification. For this specification the marginal effect of the difference in expected inflation is positive but insignificant outside of the zero lower bound, but is negative and significant at the 10 percent level in the zero lower bound (marginal effects of 0.0007 and -0.0022, respectively).

The second specification also has the change in expected inflation on the right hand side, but also effectively differences the readiness to spend variable by creating a new dummy variable equal to '+1' if respondent i's readiness to spend improved between interviews, '0' if it stayed the same, and '-1' if buying attitudes got worse. The motivation is the same as the first specification – by pseudo-differencing we hope to remove any fixed "pessimism" or "optimism" factor that might be driving the results.[10] These results are presented in the lower panel of Table 5. The results are quite similar to the specification in the upper panel – the marginal effect of the change in expected inflation is essentially zero in both normal times and when the nominal interest rate is stuck at zero.

4.2.3 Excluding Idiosyncratic Expectations Controls

Next, we re-run our baseline model and successively leave the idiosyncratic expectations controls out. The upper row of Table 6 shows just the coefficient on expected inflation and the marginal effects, both outside and inside the zero lower bound regime, when the (qualita-

[10] A true fixed effect estimator differences the entire regression specification. Because of the qualitative nature of the dependent variable, however, an exact difference specification is not possible and so we create the new variable described in the text to measure discreet changes in reported readiness to spend.

tive) nominal interest rate expectations (Q8) are excluded. We do not report coefficients and marginal effects for the control variables, which turn out to be similar across specifications. Seeing how the results vary when interest rate expectations are left out potentially provides some insight on the mechanisms at work – as noted above, one possible explanation for the negative relationship between expected inflation and buying attitudes is a Taylor-type interest rate rule at work, whereby the central bank raises real interest rates when expected inflation rises. Excluding the nominal rate allows this effect to be present more fully, so one might expect the relationship between expected inflation and buying attitudes to become more negative. In point of fact, however, the opposite result obtains (albeit statistically insignificant) – the marginal effects both inside and outside the zero lower bound are about the same as in the benchmark, and, if anything, are a bit closer to zero.

In a second step, we drop *all* idiosyncratic expectations from our standard set of control variables, i.e. besides the interest rate expectations we also leave out the expected financial situation of the household (Q6), its expected real income (Q7), the expected unemployment rate (Q11) as well as both the one-year and five-year expected aggregate business conditions (Q9 and Q10, respectively). One might be concerned that in general equilibrium inflation expectations really work through growth or unemployment expectations - others expect higher inflation, they spend more now, this increases aggregate demand, households will be richer and thus start spending now, etc. Thus controlling for growth expectations might be depriving expected inflation of its beneficial role. The second row of Table 6, however, shows that the negative impact of increased inflation expectations on the reported readiness to spend on durable consumption goods becomes even larger when idiosyncratic expectations controls are excluded from the empirical model. Moreover, the coefficient on expected inflation ($\beta = -0.0042$) is now significantly different from the zero, which is also the case for both marginal effects (-0.0013 at ZLB = 0 and -0.0028 at ZLB = 1).

4.2.4 Gas Price Expectations, Home Ownership, and Subjective Job Loss Probabilities

As a next robustness check, we add the expected one-year change in the price of gasoline in cents per gallon, based on (Q17), to our baseline model. It might be the case that households' primarily have gas price changes in mind when asked about their expected inflation rate and not controlling for gas price expectations might thus contaminate our results. We also add a dummy which takes on unity if the respondent owns a house and zero if not ('Home Owner') as an additional demographic control in order to proxy for the wealth status of the household. Finally, we also include the subjective probabilities for real income gains (Q15) and job loss (Q16), denoted in percentage points. The question on the probability of a job loss during the next 5 years is particularly interesting since we have not included a measure for the individ-

ual job situation (as opposed to the overall unemployment rate) so far. While the data on gas price expectations and homeownership are available from 1990 on, the questions on subjective probabilities for real income gains and job loss were introduced into the survey only from 1998 on. We present the specification with all four additional controls, i.e. on a sample from 1998:01 onwards.[11]

In the third row of Table 6 we show that the one-year gas price expectations are essentially irrelevant for the reported readiness to spend on durables, while the impact of home ownership tends to be negative, which is perhaps counterintuitive. However, the impact of home ownership is not significantly different from zero and measures the effect of home ownership after controlling for current and expected household income. The probability that households report a positive attitude towards spending increases with the probability of real income gains and decreases with the probability of a job loss. With respect to the effect of increased inflation expectations on the reported readiness to spend on durables we find that the coefficient as well as the marginal effects are now positive. The effects are, however, statistically insignificant and equal to zero for all intents and purposes.

4.2.5 Five-to-Ten-Year Inflation Expectations

We show the estimation results for the specification replacing one year ahead expected inflation with the five-to-ten-year inflation expectations in the fourth row of Table 6. There is a possibility that longer-term inflation expectations conform better with the average time horizon for the buying decision on some consumer durables. In line with our previous findings we estimate economically negligible marginal effects for the expected five-to-ten year inflation rate on the reported readiness to spend on durables for both the zero lower bound period and normal times. The marginal effect of expected inflation is slightly positive (0.04 percentage points) but insignificant at the zero lower bound and weakly significantly negative if interest rates are away from it (0.014 percentage points). Because of the availability of the long-term inflation expectations only from 1990:4 on, we have to estimate this specification on a somewhat smaller sample.

4.2.6 Cross-sectional Heterogeneity

In the next set of results we explore whether our main findings differ across demographic groups: (i) "old" vs. "young", split at the mean age of respondents in the sample, 48; (ii) college degree vs. no college degree; and (iii) "rich" vs. "poor" (reported income in the top twenty percent for

[11] The results from a specification including only gas price expectations and home ownership as controls, using a sample from 1990:01 onwards, are very similar.

that year vs. in the bottom twenty percent). The results are shown in the final three rows of Table 6. The coefficients on expected inflation in each specification turn out to be very similar to one another – the coefficients are usually negative and always small in an absolute sense. The differences in the coefficients across groups are negligible, both statistically and economically.

Table 7 presents the results from the baseline ordered probit run separately on eight different birth cohorts. We define a birth cohort as a decade from 1920-1929, 1930-1939, etc. Additionally, we look at, respectively, respondents born before 1920 and after 1980. This is to test whether the relationship between inflation expectations and spending is different for households that have lived through or were collectively influenced by very different inflationary episodes. The answer is negative: just as for the pooled sample spending inclinations on household durables are negatively related to inflation expectations for almost all birth cohorts and the effect is always small in absolute value.

4.2.7 Time Variation

As a final check, we investigate whether our baseline results change over time. To that end, we estimate our baseline specification with one-year inflation expectations and household durables for each year between 1984 and 2010 and report in Figure 6 the time-varying coefficient on expected inflation (upper panel) as well as its time-varying marginal effect (lower panel). The figures show the point estimates/marginal effects (solid line) together with a 90 percent confidence interval (gray shaded area). The coefficients and marginal effects are rather stable over time. The estimates are always small in absolute value and rarely significantly different from zero. Consistent with our baseline estimates, in most years the coefficient and marginal effect are negative.

4.2.8 A First Interpretation of the Results

Naturally, caution is in order when using reduced-form results to draw policy conclusions. However, our results that readiness to spend on household durables is largely unrelated to inflation expectations are pervasive and robust. In particular, they are robust across a variety of socio-demographic indicators, such as age, education and income. They are also robust across birth cohorts, suggesting that having lived through different periods of inflation levels and volatility as well as monetary policy stances does not affect the underlying relationship between inflation expectations and spending readiness. A similar conclusion can be drawn from the fact that our results are stable across time. Finally, the results from changes in inflation expectations suggest that our negative finding is not driven by hard-wired cross-sectional relationships that would have no implication for the success or lack thereof of monetary policy.

All these results taken together at least intimate that the lack of a positive relationship between inflation expectations and spending readiness is perhaps indeed a structural property of the U.S. economy. At the very least, they suggest that the monetary authority would have to overcome a tough communication problem, in that it would have to convince the public that higher inflation for the foreseeable future is actually a good economic development and potentially related to better business situations and lower unemployment down the road, factors that, as we have seen in the micro data, do have a positive influence on readiness to spend.

4.3 Extensions: Cars and Houses

In this subsection we consider two extensions to our baseline specification. In the first we use the responses to the "buying conditions for cars" question instead of readiness to spend on durable household items; in the second we use buying attitudes about houses as the dependent variable. As with durable goods, both cars and houses are "big-ticket" purchases that ought to be sensitive to real interest rates and household wealth. Since the two main channels which proponents of "inflation-induced demand" point to are lowering real borrowing costs and devaluing existing debt, it is important to examine whether inflation expectations have effects on cars and houses.

Table 8 shows the results for cars, where we use the five-year inflation expectations. In addition to all of the baseline controls (plus the 'Home Owner' dummy), we also include as independent variables the expected change in gasoline prices over the next five years in cents per gallon (Q18) and an aggregate measure of the car loan rate, in percentage points.[12] Qualitatively the results are similar to those for durable household items. Increased five-to-ten-years inflation expectations reduce the probability that households report a positive attitude towards spending on cars. The effect is even more negative at the zero lower bound but still small in absolute value. Outside of the zero lower bound, a one percentage point increase in expected inflation makes households 0.12 percentage points less likely to report a favorable attitude; in the lower bound regime it is 0.50 percentage points less likely. For both additional controls, we obtain significant and plausible coefficient estimates and marginal effects. An increase in expected gasoline prices reduces the probability that households find buying conditions favorable. Moreover, higher car loan rates are associated with a smaller probability that households have a positive attitude towards spending on cars.

As a second extension, we consider the question on buying conditions for houses, asking if *now* is a good or a bad time to buy a house (Q4). In addition to our standard set of controls, we add an aggregate measure of the 30-year mortgage rate (in percentage points) to the model

[12] We obtain the car loan rate series from the Federal Reserve Board of the Governors: "Terms of Credit at Commercial Banks and Finance Companies - New car loans at auto finance companies".

to control for financing costs.[13] Moreover, we include the S&P Case-Shiller 10-City Home Price Index from FRED, expressed relative to the CPI. We take the natural logarithm of the series and then linearly detrend. This index is available only from 1987 onwards.

The results for the baseline specification with the "buying conditions for houses" question as the independent variable are shown in the upper panel of Table 9. As one might expect, the mortgage rate and the level of current house prices both have negative effects on buying attitudes about houses. Furthermore, the coefficient on the zero lower bound dummy is quite negative, which makes sense given that the period of the zero lower bound coincides with the collapse of the housing market. The coefficient on expected inflation is negative and statistically significant at better than the one percent level; the coefficient on the interaction term between expected inflation and the ZLB dummy is also negative. This is reflected in the estimated marginal effects. Outside of the zero lower bound regime, expecting one percentage point more inflation over the next year is associated with a reduction in the probability of finding the present a good time to buy houses by 0.33 percentage points. At the zero lower bound this effect is even larger at -0.65 percentage points.

We consider two other alterations on the specification with buying attitudes for houses, with results shown in the second and third panels of Table 9. In the first we measure inflation expectations over a five-year horizon as opposed to the one-year horizon, which reduces the size of the available sample somewhat by restricting the start date to 1990:04. Houses are significantly more long-lived than household durable goods and cars, and hence expected inflation over a longer time horizon than one year may be more relevant for buying attitudes. The results are fairly similar to the baseline – the coefficient on expected inflation is negative, though a little smaller in absolute value than in the benchmark. The marginal effect is negative both inside and outside of the zero lower bound regime, but is only significant in the zero lower bound time.

The second alteration we consider is to include qualitative survey responses on subjective expectations about future house price changes. The data on one-year house price expectations (Q19) are not available for the period prior to May 2007.[14] We also include as control variables the subjective probabilities of job loss and real income gains. The results are in the bottom panel of Table 9. The estimated coefficient and marginal effect of expected inflation are quite similar to what obtains in the full sample results shown in the upper panel. Increases in expected inflation make households less likely to report having a positive attitude towards buy-

[13]The mortgage rate series is from the Federal Reserve Board of the Governors. The series ID is MORTG.

[14]The qualitative house price expectations are coded '+1' for an expected increase in house prices, '0' for no price change, and '-1' for an expected decrease in house prices. The Michigan survey also asks for an expected percentage change in house prices. Unfortunately, this quantitative series shows a large number of missing observations and hence we decided not to use it.

ing a house, and this effect is even stronger during the zero lower bound period. Interestingly, households do understand that expected house prices increases make now a good time to buy houses. This suggests that indeed households may understand the relevant relative price effect, but not the effects of general inflation and real interest rates.

5 Discussion and Conclusion

This paper investigates the empirical link between inflation expectations and readiness to spend on large household items, both outside and inside the zero lower bound regime for the federal funds rate. We do so using cross-sectional household data from the Michigan Survey of Consumers. There is little evidence to support the idea that inflation expectations matter in an important way for the buying decisions of households, either inside or outside the lower bound. The impact of higher expected inflation on buying attitudes is generally small and negative, and obtains in a variety of different specifications with different measures of buying attitudes and different sets of control variables.

Though we emphasize that the empirical link between inflation expectations and buying attitudes appears rather weak, if anything our results support the view that higher inflation is a tax on economic activity, or even portends the impotence of macroeconomic stabilization policy and economic distress in the future. While we are of course aware that our reduced-form results are potentially subject to the Lucas critique, we nevertheless think that they tell a cautionary tale about the notion that stabilization policy at the zero lower bound should attempt to generate inflation expectations to lower real rates and stimulate spending. Suppose that a household has high inflation expectations for idiosyncratic reasons and, according to our estimates, is therefore disinclined to make big ticket purchases. Why should that household react differently to higher expected inflation if those inflation expectations have been successfully engineered by the monetary or fiscal authority?

Indeed, our results on various socio-demographic groups, birth cohorts and over time taken together at least intimate that the lack of a positive relationship between inflation expectations and spending readiness might indeed be a structural property of the U.S. economy. At the very least, they suggest that the monetary authority would have to overcome a tough communication problem, in that it would have to convince the public that higher inflation for the foreseeable future is actually a good economic development and potentially related to better business situations and lower unemployment down the road.

Finally, it should be noted that our results do not invalidate per se the underlying macroeconomic models on which the policy recommendations in favor of engineering higher inflation expectations are based: it could very well be that consumers have not yet understood the new

policy regime at the zero lower bound, having a conventional forward-looking Taylor rule in their minds when they think about the consequences of higher expected inflation. Another possibility could be that the envisioned channel – inflation expectations generating aggregate demand – works through investment rather than consumption expenditures.

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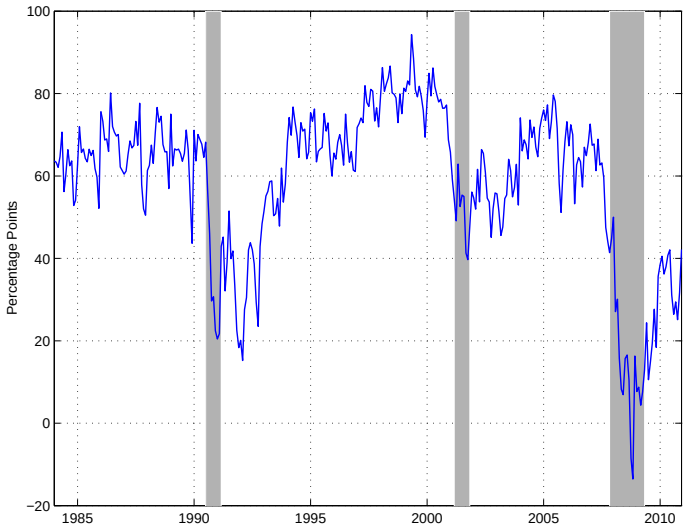
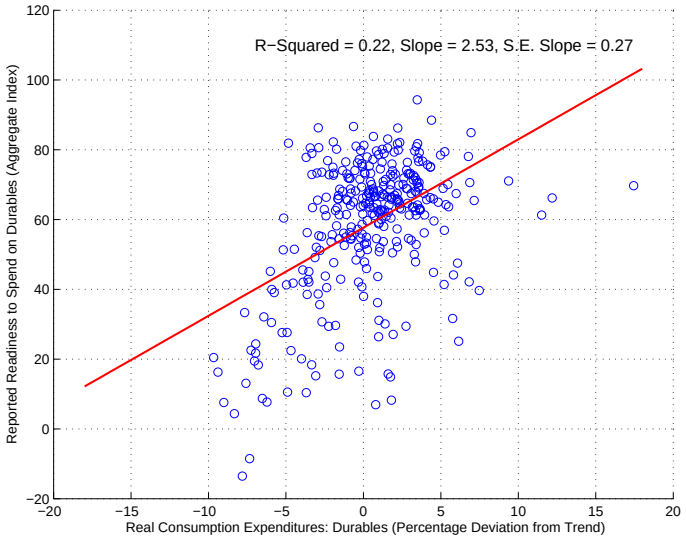
Figure 1: Buying Conditions for Durable Goods - Aggregate Index



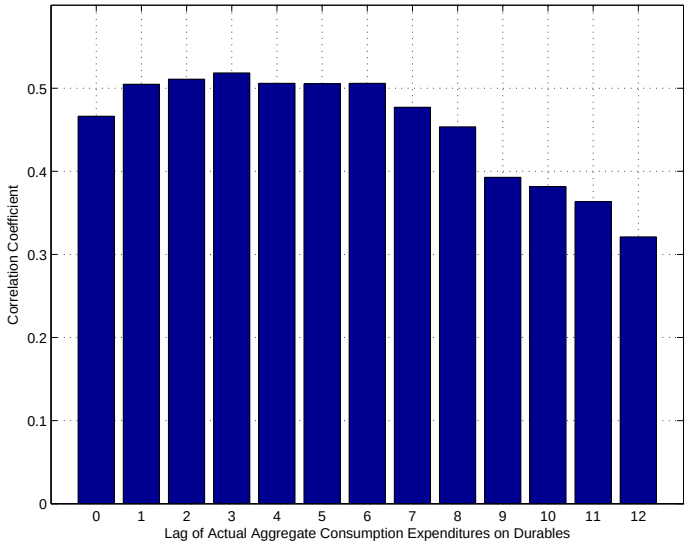
Notes: This figure shows the monthly time series of the fraction of people saying that now is a good time to buy durable goods minus those responding that now is a bad time to buy (solid line) together with U.S. recessions as dated by the NBER (gray shaded area). This aggregate index is based on (Q1). We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value.

Figure 2: Relationship between Aggregate Actual Consumption Expenditures on Durables and the Reported Readiness to Buy Durables



Notes: This figure shows a scatter plot between the reported readiness to spend on durables (aggregate index, see notes to Figure 1) and the detrended actual aggregate spending series together with a fitted regression line. We use the monthly series on Real Personal Consumption Expenditures: Durables (PCEDGC96) from the Federal Reserve Economic Database (FRED). Since this series starts only in 1995, we deflate the corresponding nominal series (PCEDGC) for the period prior to 1995 with the linearly interpolated quarterly price index for expenditures on durable goods from the Bureau of Economic Analysis (Table 2.3.4). We link both series. We apply an HP-filter (with smoothing parameter $\lambda = 129,600$) to the actual aggregate spending series in order to obtain a measure for the cyclical component of consumer spending.

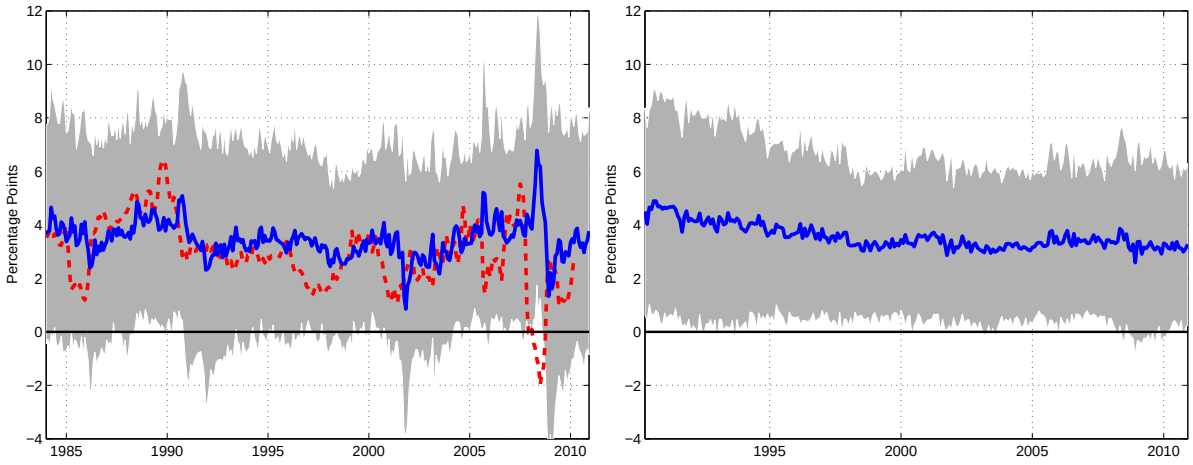
Figure 3: Dynamic Correlogram between Aggregate Actual Consumption Expenditures on Durables and the Reported Readiness to Buy Durables



Notes: See notes to Figure 2. This figure shows a dynamic correlogram between the reported readiness to spend on durables (aggregate index) and the detrended actual aggregate spending series.

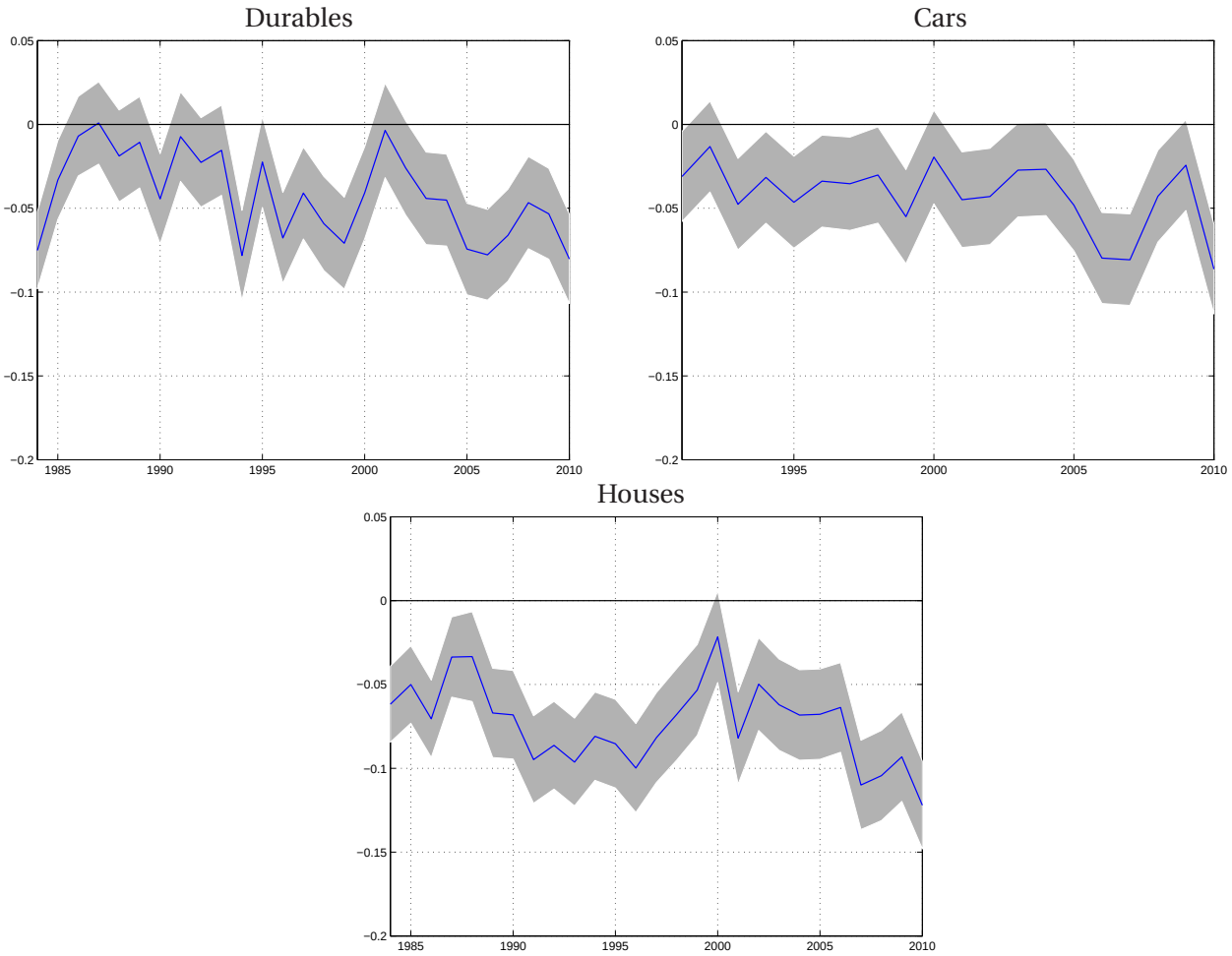
Figure 4: Inflation Expectations

One Year Ahead: Five-Ten Years Ahead:



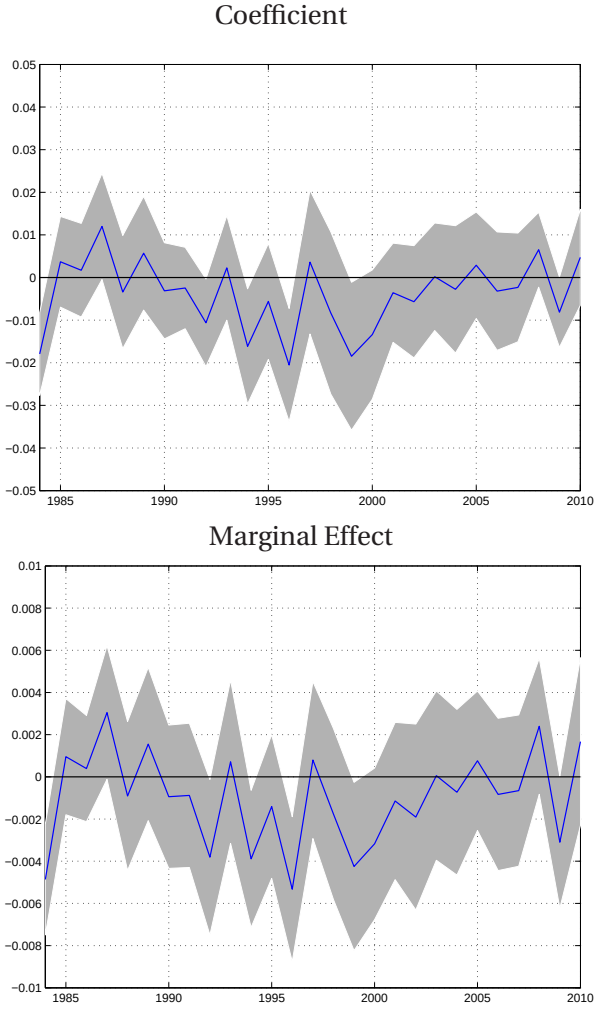
Notes: The left panel, labeled "One Year Ahead", plots the average one-year inflation expectations (solid line) together with the actual one-year-ahead inflation (dashed line) and a cross-sectional one standard deviation interval (gray shaded area). Inflation expectations in this panel are based on survey question (Q2). We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value. Actual inflation, the timing of which has been brought in sync with the point in time for which inflation expectations were uttered, is based on the headline CPI (series CPIAUCSL from the St. Louis Federal Reserve Bank data base FRED). The right panel, labeled "Five-Ten Years Ahead", shows the average five-to-ten year annual inflation expectations together with the cross-sectional one standard deviation interval. Inflation expectations in this panel are based on survey question (Q5). We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value.

Figure 5: Time-Varying Correlation between Expected Inflation and Reported Readiness to Spend on Durables, Cars as well as Houses



Notes: This figure shows the correlation coefficient between the reported readiness to spend on durables, cars, or houses (Q1, Q3, Q4) and inflation expectations (solid line) together with a 90 percent confidence interval (gray shaded area) year-by-year, where the monthly data were pooled within a year. We use one-year inflation expectations (Q2) for durables and houses, and five-to-ten-year inflation expectations (Q5) for cars. We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value.

Figure 6: Time-Varying Coefficient on Expected Inflation (1Y) in Baseline Specification



Notes: The upper panel plots the estimated coefficient on one-year inflation expectations (β_1) in the baseline specification together with a 90 percent confidence interval for each year, and the lower panel plots the associated marginal effect, along with the 90 percent confidence interval. The marginal effects are computed conditional on the means of the included control variables within that year. We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value.

Table 1: Correlation Between Reported Readiness to Spend and Expected Inflation

		Reported Readiness to Spend on		
		Durables	Cars	Houses
All Respondents		−0.039	−0.047	−0.089
Gender	Female	−0.037	−0.042	−0.092
	Male	−0.031	−0.047	−0.074
Age	Younger than 48 Years	−0.035	−0.049	−0.092
	Older than 48 Years	−0.046	−0.046	−0.087
Race	African American	−0.034	−0.024	−0.083
	Hispanic American	−0.039	−0.045	−0.083
	Native American	−0.026	−0.021	−0.078
	Asian American	−0.017	−0.034	−0.093
	Non-Hispanic Caucasian American	−0.038	−0.049	−0.087
Education	College Degree	−0.036	−0.044	−0.075
	No College Degree	−0.039	−0.043	−0.089
Marital Status	Married	−0.041	−0.054	−0.087
	Not Married	−0.035	−0.037	−0.088
Family Size	Single Person	−0.039	−0.038	−0.076
	Two Persons	−0.040	−0.048	−0.090
	Three Persons	−0.036	−0.053	−0.085
	Four and More Persons	−0.038	−0.049	−0.102
Census Region	West Region	−0.025	−0.038	−0.079
	Northeast Region	−0.031	−0.049	−0.086
	South Region	−0.052	−0.047	−0.101
	North Central Region	−0.039	−0.052	−0.085
Income Quintile	Top 20 Percent Income Distribution	−0.019	−0.040	−0.071
	60 to 80 Percent Income Distribution	−0.032	−0.037	−0.080
	40 to 60 Percent Income Distribution	−0.036	−0.045	−0.080
	20 to 40 Percent Income Distribution	−0.037	−0.041	−0.086
	Bottom 20 Percent Income Distribution	−0.040	−0.044	−0.075
Homeownership	Home Owner	−0.051	−0.049	−0.095
	Not Home Owner	−0.037	−0.039	−0.088
Birth Cohort	Born before 1920	−0.033	−0.005	−0.076
	Born between 1920 and 1929	−0.032	−0.018	−0.065
	Born between 1930 and 1939	−0.053	−0.052	−0.100
	Born between 1940 and 1949	−0.053	−0.056	−0.094
	Born between 1950 and 1959	−0.039	−0.065	−0.105
	Born between 1960 and 1969	−0.030	−0.051	−0.083
	Born between 1970 and 1979	−0.028	−0.032	−0.094
	Born after 1980	−0.022	−0.069	−0.034
Pooled Correlation of Other Idiosyncratic Expectations With Reported Readiness to Spend				
Expected 1Y Aggregate Business Conditions (Idiosyncratic)		0.217	0.173	0.162
Expected 5Y Aggregate Business Conditions (Idiosyncratic)		0.163	0.163	0.159
Current Financial Situation		0.157	0.108	0.106
Expected Unemployment		−0.141	−0.125	−0.114

Notes: This table shows the correlation coefficients between inflation expectations and the reported readiness to spend on durables, cars and houses - pooled across all respondents as well as conditional on various demographics. We use one-year inflation expectations (Q2) for durables and houses, and five-to-ten-year inflation expectations (Q5) for cars. We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value. This table also shows the correlation coefficients between the reported readiness to spend on durables, cars and houses - pooled across all respondents - and the idiosyncratically expected (1Y) aggregate business conditions, based on (Q9), the idiosyncratically expected (5Y) aggregate business conditions, based on (Q10), the current financial situation, based on (Q11), as well as the expected unemployment situation, based on (Q12).

Table 2: Baseline Specification: Readiness to Spend on Durables and 1Y Inflation Expectations

Dependent Variable: Buying Conditions for Durables	Sample: 1984:01 to 2010:12		
Number of observations: 62847	Pseudo R^2: 0.0644		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Inflation Expectations (1Y)	−0.0022	−0.0007	−0.0021
	(0.0015)	(0.0004)	(0.0014)
ZLB Dummy Interacted with Expected Inflation (1Y)	−0.0031		
	(0.0039)		
ZLB Dummy	0.1100***	0.0326***	
	(0.0381)	(0.0113)	
Expected Financial Situation of Household	0.0507***	0.0151***	0.0198***
	(0.0084)	(0.0025)	(0.0033)
Expected Real Household Income	0.0172**	0.0051**	0.0067**
	(0.0086)	(0.0025)	(0.0033)
Expected Change in Nominal Interest Rate	0.0473***	0.0140***	0.0185***
	(0.0077)	(0.0023)	(0.0030)
Expected 1Y Aggregate Business Conditions (Idiosyncratic)	0.1331***	0.0395***	0.0521***
	(0.0070)	(0.0021)	(0.0028)
Expected 5Y Aggregate Business Conditions (Idiosyncratic)	0.0612***	0.0182***	0.0239***
	(0.0070)	(0.0021)	(0.0028)
Expected Unemployment	−0.0612***	−0.0182***	−0.0239***
	(0.0093)	(0.0028)	(0.0036)
Current Financial Situation	0.1105***	0.0328***	0.0432***
	(0.0071)	(0.0021)	(0.0028)
Economic Policy Trust (Idiosyncratic)	0.1082***	0.0321***	0.0423***
	(0.0091)	(0.0027)	(0.0036)
Current Real Household Income (in logs)	0.0476***	0.0141***	0.0186***
	(0.0085)	(0.0025)	(0.0033)
Expected 1Y Aggregate Business Conditions (Index)	0.0019***	0.0006***	0.0008***
	(0.0003)	(0.0001)	(0.0001)
Cross-sectional Dispersion in Expected Inflation (1Y)	−0.0771***	−0.0229***	−0.0301***
	(0.0157)	(0.0047)	(0.0062)
Bloom's Volatility Index	−0.0052***	−0.0016***	−0.0020***
	(0.0008)	(0.0002)	(0.0003)
Federal Funds Rate	0.0217***	0.0064***	0.0085***
	(0.0038)	(0.0011)	(0.0015)
Civilian Unemployment Rate	−0.0556***	−0.0165***	−0.0217***
	(0.0077)	(0.0023)	(0.0030)
Current Inflation Rate	−0.0207***	−0.0062***	−0.0081***
	(0.0068)	(0.0020)	(0.0027)
Current Inflation Volatility	−0.0272	−0.0081	−0.0107
	(0.0181)	(0.0054)	(0.0071)
Relative Price of Durable Goods	0.0001	0.0000	0.0000
	(0.0020)	(0.0006)	(0.0008)

Notes: This table shows the results from the ordered probit baseline estimation. '***', '**', and '*' denote significance at the 1 percent, 5 percent, and 10 percent level, respectively. Standard errors are in parentheses. The Zero Lower Bound (ZLB) Dummy takes on unity from 2008:12 to 2010:12 (and zero otherwise). Marginal effects measure the effect of a particular variable on the probability that households find buying conditions favorable in percentage points; evaluated inside and outside the ZLB regime with the remaining variables set at their respective conditional means. We have removed all month-household observations with inflation expectation observations that are larger than 20 percent in absolute value. The baseline specification was run on the subsample of only those households that were interviewed once.

Table 3: Baseline Specification: Demographic Controls

Dependent Variable: Buying Conditions for Durables	Sample: 1984:01 to 2010:12		
Number of observations: 62847	Pseudo R^2: 0.0644		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Sex	−0.0647***	−0.0191***	−0.0253***
	(0.0114)	(0.0034)	(0.0047)
Married	0.0013	0.0004	0.0005
	(0.0138)	(0.0041)	(0.0054)
College Degree	−0.0386***	−0.0114***	−0.0151***
	(0.0126)	(0.0037)	(0.0049)
African American	−0.0118	−0.0035	−0.0046
	(0.0202)	(0.0060)	(0.0079)
Hispanic American	−0.0959***	−0.0285***	−0.0375***
	(0.0258)	(0.0077)	(0.0101)
Native American	−0.0632	−0.0188	−0.0247
	(0.0571)	(0.0169)	(0.0223)
Asian American	−0.1320***	−0.0392***	−0.0516***
	(0.0411)	(0.0121)	(0.0161)
Census Region: West	−0.0336**	−0.0100**	−0.0131**
	(0.0166)	(0.0049)	(0.0065)
Census Region: Northeast	−0.0013	−0.0004	−0.0005
	(0.0168)	(0.0050)	(0.0066)
Census Region: South	−0.0025	−0.0008	−0.0010
	(0.145)	(0.0043)	(0.0057)
Family Size	−0.0202***	−0.0060***	−0.0079***
	(0.0049)	(0.0015)	(0.0019)
Age	−0.0159**	0.0000	0.0004
	(0.0075)	(0.0002)	(0.0003)
Age^2	0.0003*		
	(0.0002)		
Age^3	0.0000		
	(0.0000)		

Notes: See notes to Table 2. The demographic controls include a dummy which takes on unity for female respondents and zero for males ('Sex'); a dummy which takes on unity if the respondent is married and zero if not ('Married'); a dummy which takes on unity if the respondent holds a college degree and zero if not ('College'). Moreover, we include dummies for each race, except for non-Hispanic Caucasians, i.e. 'African American', 'Hispanic American', 'Native American', and 'Asian American' as well as for each census region, except for North Central, i.e. 'West', 'Northeast', and 'South'. We also add the family size, polynomials of the age of the respondent ('Age', 'Age^2', 'Age^3'), and a set of month dummies (not reported).

Table 4: Control Function Approach: Readiness to Spend on Durables and 1Y Inflation Expectations

First Stage			
Dependent Variable: Individual Inflation Expectations (1Y) Number of observations: 49473	Sample: 1984:01 to 2010:12 R^2: 0.1331 S.E. Residual: 3.4138		
Independent Variables	Coefficients		
Individual Lagged Inflation Expectations (1Y)	0.2128^{***} (0.0040)		
Second Stage			
Dependent Variable: Buying Conditions for Durables Number of observations: 47901	Sample: 1984:01 to 2010:12 Pseudo R^2: 0.0736		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Inflation Expectations (1Y)	-0.0138^{*} (0.0078)	-0.0039^{*} (0.0022)	-0.00105^{***} (0.0034)
ZLB Dummy Interacted with Expected Inflation (1Y)	-0.0139^{***} (0.0052)		
First Stage Residual	0.0144^{*} (0.0079)	0.0040^{*} (0.0022)	0.0055^{*} (0.0030)

Notes: This table shows results from the control function approach to estimating the benchmark specification. The upper part of the table shows the first-stage regression results of individual inflation expectations (1Y) from the second-time interviews on the individual lagged inflation expectations (1Y) from the first-time interviews. The same control variables as in the baseline estimation are included in the regression but their coefficients and standard errors are omitted for the sake of brevity. Following Wooldridge (2002) the estimated coefficient (marginal effect) in the second stage is computed from the standard ordered probit coefficient (marginal effect) divided by $[1 + (\text{coefficient on first-stage residual})^2 \times (\text{S.E. residual from first stage})^2]^{1/2}$. See also notes to Table 2.

Table 5: Baseline Specification with Change in 1Y Inflation Expectations

Dependent Variable: Buying Conditions for Durables Number of observations: 47901	Sample: 1984:01 to 2010:12 Pseudo R^2: 0.0735		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Change in Inflation Expectations (1Y)	0.0024	0.0007	−0.0022*
	(0.0015)	(0.0004)	(0.0013)
ZLB Dummy Interacted with Change in Expected Inflation (1Y)	−0.0083**		
	(0.0037)		
Dependent Variable: Change in Buying Conditions for Durables Number of observations: 45946	Sample: 1984:01 to 2010:12 Pseudo R^2: 0.0078		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Change in Inflation Expectations (1Y)	−0.0009	−0.0000	−0.0004
	(0.0013)	(0.0001)	(0.0001)
ZLB Dummy Interacted with Change in Expected Inflation (1Y)	−0.0087**		
	(0.0035)		

Notes: This specification is similar to the baseline specification, with two exceptions. In the upper panel we replace inflation expectations with the change in inflation expectations between interviews (this specification is run on the sample of those that were interviewed twice). In the lower panel we change the dependent variable by creating a new dummy variable: '+1', if the household increased its readiness to spend, '0', if it had the same qualitative level of readiness to spend and '-1', if it decreased it. See also notes to Table 2.

Table 6: Baseline Specification: Robustness Checks

Specification	Independent Variables	Coefficients	Marginal Effects at ZLB = 0	Marginal Effects at ZLB = 1
w/o Exp. Nominal Interest Rate				
(N = 63380, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0010	−0.0003	−0.0017
		(0.0014)	(0.0004)	(0.0014)
w/o Idiosyncratic Exp.				
(N = 73294, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0042***	−0.0013***	−0.0028**
		(0.0013)	(0.0004)	(0.0013)
w/ Gas Price Exp., Home Owner, & Subjective Probabilities				
(N = 7879, Sample: 1998:01 to 2010:12)	Exp. Inflation (1Y)	0.0004	0.0002	0.0006
		(0.0046)	(0.0017)	(0.0019)
	Prob. of Job Loss	−0.0016***	−0.0006***	−0.0006***
		(0.0006)	(0.0002)	(0.0002)
	Prob. of Real Income Gains	0.0016**	0.0006**	0.0006**
		(0.0007)	(0.0003)	(0.0003)
	Exp. Change in Gas Price (1Y)	−0.0001	−0.0000	−0.0001
		(0.0004)	(0.0002)	(0.0002)
	Home Owner	−0.0571	−0.0217	−0.0224
		(0.0452)	(0.0172)	(0.0177)
5Y Inflation Expectations				
(N = 28603, Sample: 1990:04 to 2010:12)	Exp. Inflation (5Y)	−0.0047*	−0.0014*	0.0004
		(0.0028)	(0.0008)	(0.0026)
Age > 48				
(N = 24488, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0014	−0.0004	−0.0018
		(0.0024)	(0.0007)	(0.0018)
Age < 48				
(N = 38359, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0035*	−0.0010*	−0.0023
		(0.0018)	(0.0005)	(0.0021)
College Degree				
(N = 24691, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	0.0009	0.0003	−0.0027
		(0.0027)	(0.0008)	(0.0021)
No College Degree				
(N = 38156, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0038**	−0.0011**	−0.0008
		(0.0017)	(0.0005)	(0.0019)
Top 20 % Income				
(N = 14190, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0002	−0.0001	−0.0037
		(0.0036)	(0.0011)	(0.0033)
Bottom 20 % Income				
(N = 6983, Sample: 1984:01 to 2010:12)	Exp. Inflation (1Y)	−0.0054	−0.0016	−0.0032
		(0.0037)	(0.0011)	(0.0036)

Notes: This table displays a variety of robustness checks on the baseline specification, as described in the column "Specification". All of the standard controls from the baseline specification are included in each regression, but their coefficients and standard errors are omitted. Marginal effects at ZLB = 1 are calculated based on the interaction coefficient between expected inflation and the ZLB dummy, which is omitted in the table. The number N in parentheses below each specification description is the number of observations used in the estimation of that specification; there the time horizon of the various samples is also specified. Like the baseline specification all these regressions were run on the subsample of only those households that were interviewed once. See also notes to Table 2.

Table 7: Baseline Specification: By Birth Cohort

		Marginal Effects	
Birth Cohort	Coefficient	at ZLB = 0	at ZLB = 1
< 1920 ($N = 2491$)	−0.0009	−0.0001	0.0055
	(0.0065)	(0.0010)	(0.0218)
1920-1929 ($N = 4678$)	0.0031	0.0007	0.0106*
	(0.0051)	(0.0011)	(0.0059)
1930-1939 ($N = 6467$)	−0.0068	−0.0019	−0.0043
	(0.0047)	(0.0014)	(0.0048)
1940-1949 ($N = 11491$)	−0.0055	−0.0016	−0.0081**
	(0.0036)	(0.0011)	(0.0034)
1950-1959 ($N = 16193$)	−0.0015	−0.0005	−0.0003
	(0.0029)	(0.0009)	(0.0030)
1960-1969 ($N = 13758$)	−0.0024	−0.0007	−0.0016
	(0.0031)	(0.0010)	(0.0031)
1970-1979 ($N = 6149$)	−0.0018	−0.0003	−0.0004
	(0.0046)	(0.0007)	(0.0002)
> 1980 ($N = 1620$)	−0.0059	−0.0021	0.0045
	(0.0092)	(0.0034)	(0.0050)

Notes: This table presents separate regressions using only observations from individuals in a particular birth cohort. All of the standard controls from the baseline specification are included. The number N in parentheses refers to the number of observations in each cohort. The sample runs from 1984:01 to 2010:12, just as in the baseline specification. Like the baseline specification all these regressions were run on the subsample of only those households that were interviewed once. See also notes to Table 2.

Table 8: Readiness to Spend on Cars and 5Y Inflation Expectations

Dependent Variable: Buying Conditions for Cars	Sample: 1990:04 to 2010:12		
Number of observations: 28756	Pseudo R^2: 0.0416		
		Marginal Effects	
Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Inflation Expectations (5Y)	−0.0033	−0.0012	−0.0050**
	(0.0027)	(0.0009)	(0.0024)
ZLB Dummy Interacted with Expected Inflation (5Y)	−0.0106		
	(0.0072)		
Expected Change in Gasoline Prices (5Y)	−0.0005***	−0.0002***	−0.0002***
	(0.0001)	(0.0000)	(0.0000)
Car Loan Rate	−0.0236***	−0.0083***	−0.0084***
	(0.0059)	(0.0021)	(0.0021)

Notes: This table shows ordered probit results where the dependent variable is "Buying conditions for cars", based on (Q3), which is coded '+1' for good, '0' for neither good nor bad, and '-1' for bad. We add the car loan rate from the Federal Reserve Board of the Governors, the expected gasoline price change over the next five years in cents per gallon and based on (Q18), and the 'Home Owner' dummy as additional controls to the ones included in the baseline specification. Like the baseline specification all this regression was run on the subsample of only those households that were interviewed once. See also notes to Table 2.

Table 9: Readiness to Spend on Houses and Inflation Expectations

			Marginal Effects	
Specification	Independent Variables	Coefficients	at ZLB = 0	at ZLB = 1
Benchmark	Exp. Inflation (1Y)	−0.0118***	−0.0033***	−0.0065***
(N = 55323,		(0.0016)	(0.0004)	(0.0013)
Sample: 1987:01 to 2010:12)	ZLB Dummy × Exp. Inflation (1Y)	−0.0085**		
		(0.0042)		
	ZLB Dummy	−0.8017***	−0.2254***	
		(0.0620)	(0.0173)	
	Mortgage Rate	−0.0143	−0.0040	−0.0045
		(0.0127)	(0.0036)	(0.0041)
	S&P Case-Shiller Index	−0.0053***	−0.0015***	−0.0017***
		(0.0004)	(0.0001)	(0.0001)
5Y Expected Inflation	Exp. Inflation (5Y)	−0.0018	−0.0005	−0.0037*
(N = 43397,		(0.0022)	(0.0007)	(0.0021)
Sample: 1990:04 to 2010:12)	ZLB Dummy × Exp. Inflation (5Y)	−0.0086		
		(0.0062)		
	ZLB Dummy	−0.7769***	−0.2272***	
		(0.0714)	(0.0219)	
	Mortgage Rate	−0.0779***	−0.0228***	−0.0281***
		(0.0150)	(0.0046)	(0.0059)
	S&P Case-Shiller Index	−0.0088***	−0.0026***	−0.0032***
		(0.0007)	(0.0002)	(0.0003)
	Home Owner	0.1451***	0.0424***	0.0524***
		(0.0181)	(0.0053)	(0.0067)
w/ Subj. Probabilities	Exp. Inflation(1Y)	−0.0148**	−0.0043**	−0.0059***
(N = 5560,		(0.0059)	(0.0017)	(0.0022)
Sample: 2007:05 to 2010:12)	ZLB Dummy × Exp. Inflation (1Y)	−0.0017		
		(0.0077)		
	ZLB Dummy	−0.2657	−0.0762	
		(0.2314)	(0.0590)	
	Subjective Prob. of Job Loss	−0.0010	−0.0003	−0.0003
		(0.0008)	(0.0002)	(0.0003)
	Subjective Prob. of Real Income Gains	0.0022***	0.0006**	0.0008**
		(0.0009)	(0.0003)	(0.0003)
	Expected Change in House Prices (1Y)	0.0719**	0.0206**	0.0255**
		(0.0285)	(0.0084)	(0.0114)
	Expected Change in Gas Price (1Y)	0.0001	0.0000	0.0000
		(0.0005)	(0.0001)	(0.0002)
	Mortgage Rate	−0.1895	−0.0543	−0.0673*
		(0.1251)	(0.0332)	(0.0385)
	S&P Case-Shiller Index	−0.0485**	−0.0139**	−0.0172***
		(0.0208)	(0.0062)	(0.0053)
	Home Owner	0.1803***	0.0517***	0.0640***
		(0.0544)	(0.0163)	(0.0235)

Notes: This table shows ordered probit results for three different specifications, each using as the dependent variable "Buying conditions for houses", based on Q4, which is coded '+1' for good, '0' for neither good nor bad, and '-1' for bad. All of the standard controls from the benchmark specification are included. The upper panel shows results adding the mortgage rate from the Federal Reserve Board of Governors and the S&P Case-Shiller 10 City Home Price Index, available from FRED, as additional controls. The middle panel is similar to the first but instead using inflation expectations over a five-to-ten year horizon. The final panel augments the specification in the first panel to include subjective one-year-ahead house price expectation series, Q19, but also Q15, Q16, and Q17. The number N in parentheses refers to the number of observations used to estimate each specification; there the time horizon of the various samples is also specified. Like the baseline specification all these regressions were run on the subsample of only those households that were interviewed once. See also notes to Table 2.

A Survey Questions Used

Q 1 *(A18)*[15] *"About the big things people buy for their homes - - such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items? "*

Q 2 *(A12b) "By about what percent do you expect future prices to go (up/down) on the average, during the next 12 months? "*

Q 3 *(A19) "Speaking now of the automobile market - - do you think the next 12 months or so will be a good time or a bad time to buy a vehicle, such as a car, pickup, van or sport utility vehicle?"*

Q 4 *(A16) "Generally speaking, do you think that now is a good time or a bad time to buy a house?"*

Q 5 *(A13b) "By about what percent per year do you expect prices to go (up/ down) on the average, during the next 5 to 10 years?"*

Q 6 *(A3) "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 sam as now? "*

Q 7 *(A14) "During the next year or two, do you expect that your (family) income will go up more than prices will go up, about the same, or less than prices will go up? "*

Q 8 *(A11) "No one can say for sure, but what do you think will happen to interest rates for borrowing money during the next 12 months - - will they go up, stay the same, or go down? "*

Q 9 *(A4) "Now turning to business conditions in the country as a whole - - do you think that during the next 12 months we'll have good times financially, or bad times, or what? "*

Q 10 *(A8) "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 5 years or so, or that we will have periods of widespread unemployment or depression, or what? "*

[15] This ID is used by the Michigan Survey.

Q 11 *(A10) "How about people out of work during the coming 12 months - - do you think that there will be more unemployment than now, about the same, or less? "*

Q 12 *(A2) "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago? "*

Q 13 *"To get a picture of people's financial situation we need to know the general range of income of all people we interview. Now, thinking about (your/ your family's) total income from all sources (including your job), how much did (you/ your family) receive in the previous year? "* [16]

Q 14 *(A9) "As to the economic policy of the government - - I mean steps taken to fight inflation or unemployment - - would you say the government is doing a good job, only fair, or a poor job?"*

Q 15 *(A23a) "What do you think the chances are that your (family) income will increase by more than the rate of inflation during the next five years or so?"*

Q 16 *(A23b) "During the next 5 years, what do you think the chances are that you (or your husband/ wife) will lose a job that you wanted to keep?"*

Q 17 *(A20c) "About how many cents per gallon do you think gasoline prices will (increase/ decrease) during the next twelve months compared to now?"*

Q 18 *(A20a) "About how many cents per gallon do you think gasoline prices will (increase/ decrease) during the next five years compared to now?"*

Q 19 *(A22b) "What do you think will happen to the prices of homes (like yours) in your community over the next 12 months? Will they increase at a rapid rate, increase at a moderate rate, remain about the same, decrease at a moderate rate, or decrease at a rapid rate?"*

[16] This question does not have an ID in the Michigan survey.